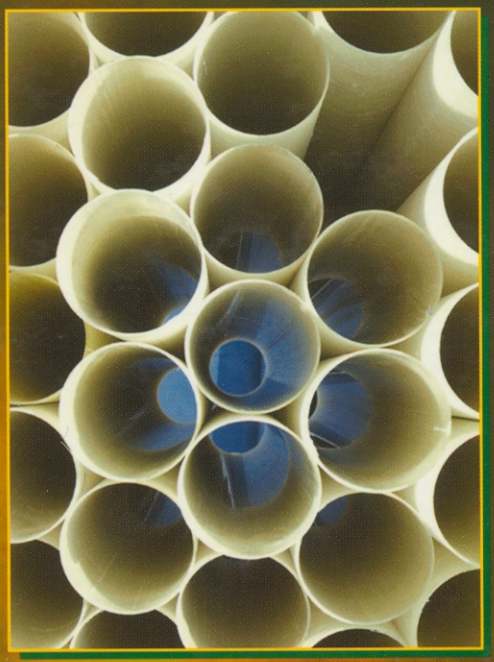
CORROSION RESISTANCE TABLES

Metals, Nonmetals, Coatings, Mortars, Plastics, Elastomers and Linings, and Fabrics

Fifth Edition, Revised and Expanded



Philip A. Schweitzer, P.E.

PART B, CHR-IOD

CORROSION RESISTANCE TABLES

Part B, CHR-IOD

CORROSION TECHNOLOGY

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2. *Corrosion Resistant Coatings Technology*, Ichiro Suzuki
3. *Corrosion Resistance of Elastomers*, Philip A. Schweitzer
4. *Corrosion Resistance Tables: Metals, Nonmetals, Coatings, Mortars, Plastics, Elastomers and Linings, and Fabrics: Third Edition, Revised and Expanded (Parts A and B)*, Philip A. Schweitzer
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ADDITIONAL VOLUMES IN PREPARATION

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MARCEL DEKKER

MARCEL DEKKER, INC. NEW YORK • BASEL

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Library of Congress Cataloging-in-Publication Data
A catalog record for this book is available from the Library of Congress.

ISBN:

Part A, 0-8247-5673-8
Part B, 0-8247-5674-6
Part C, 0-8247-5675-4
Part D, 0-8247-5676-2

This book is printed on acid-free paper.

Headquarters
Marcel Dekker, Inc.
270 Madison Avenue, New York, NY 10016, U.S.A.
tel: 212-696-9000; fax: 212-685-4540

Distribution and Customer Service
Marcel Dekker, Inc.
Cimarron Road, Monticello, New York 12701, U.S.A.
tel: 800-228-1160; fax: 845-796-1772

Eastern Hemisphere Distribution
Marcel Dekker AG
Hutgasse 4, Postfach 812, CH-4001 Basel, Switzerland
tel: 41-61-260-6300; fax: 41-61-260-6333

World Wide Web
http://www.dekker.com

The publisher offers discounts on this book when ordered in bulk quantities. For more information, write to Special Sales/Professional Marketing at the headquarters address above.

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Current printing (last digit):

10 9 8 7 6 5 4 3 2 1

PRINTED IN THE UNITED STATES OF AMERICA

Preface

The field of corrosion resistance is one of constant change. Research and development is continuously underway, both involving new materials and expanding the uses of known materials. These advances are particularly important for such areas as chemical processing and pollution control. Increased knowledge of corrosion resistance and the mechanisms of corrosion is a vital factor in this work.

This fifth edition of the corrosion resistance tables has been prepared in an attempt to provide the most current information available. Data on the corrosion resistance for the materials and corrodents covered in the previous editions have been greatly expanded, and data for 83 additional corrodents have been incorporated in this edition.

Philip A. Schweitzer, P.E.

Introduction

For years the chemical engineer has been faced with the problem of selecting the proper material to be used for the construction of processing vessels, storage tanks, valves, piping systems, and whatever else comes into contact with potentially corrosive chemicals. During the early days of the chemical engineering profession, the list of materials from which to choose was relatively small, consisting primarily of various metals and their alloys.

As technology made advances, new alloys were developed as well as synthetic materials such as plastics. Simultaneously, new chemicals came into being, many of which required the newly developed materials of construction for safe handling.

However, the problem of material selection is not limited to the chemical engineer. Many industries that use chemicals in their everyday operations cannot be classified as members of the chemical processing industry, yet they have the same problems of selecting the proper materials of construction to handle these products. This is particularly true in the area of pollution control. Many processes for the elimination of air and/or water pollution involve chemical changes in the pollutants that result in problems of corrosion that were not present before.

The dictionary defines corrosion as "eating or wearing away by slow degrees," a definition that is rather broad and does not restrict the application of the word to the destruction of metals. This is as it should be because of the availability of so many nonmetallic materials of construction.

Most reference sources for the selection of proper materials of construction are devoted to either a specific group of metals or alloys, plastics, rubbers (synthetic and natural), gasketing materials, or packing materials. An individual with the problem of selecting materials of construction must usually make a selection in more than one of the preceding categories, which necessitates going to several sources for the information. It is the purpose of this book to provide one source from which all the components of a system may be selected, including processing vessels, tanks, pumps, piping, valves, gaskets, packing, etc.

These corrosion tables have been prepared with the intention of assisting not only the practicing engineer, but whoever may be charged with the responsibility of selecting the proper materials of construction for a specific application. Any table of this type should be used only as a guide since it is extremely difficult, and at times impossible, to duplicate actual operating conditions. To fully guarantee the suitability of a particular material of construction, corrosion tests should be conducted under actual operating conditions.

In the tables, all the chemicals are assumed to be in the pure state or in concentrated or saturated aqueous solutions, unless otherwise indicated. Concentration percentages used are by weight.

Two types of notation have been employed to indicate the suitability of a specific material of construction—one for metallic materials and one for nonmetallic materials. This is necessary because their mechanisms of corrosion differ.

CORROSION OF METALLICS

The four most common forms of corrosion of metals are

1. General corrosion
2. Galvanic corrosion
3. Stress corrosion cracking
4. Intergranular corrosion

General Corrosion

Metals resist corrosion by the formation of a passive film on the surface, which in a sense is also corrosion but once formed prevents further degradation of the base metal. Most metals form this film after a period of time of exposure to the air. *Passivation* is the name applied to the chemical treatment procedure that helps to form the film more rapidly. For example, exposure of austenitic stainless steels to nitric acid will produce this protective film.

As long as these films remain intact, they protect the base metal from further attack. Certain chemicals attack various films at varying rates. When this occurs, the metal is said to corrode. Such interaction between a chemical and a metal can be determined from the corrosion tables. This type of corrosion is known as general corrosion.

Galvanic Corrosion

Galvanic corrosion occurs when two or more dissimilar metals are in contact, or when metals having the same analysis have different surface conditions and an electrolyte is present.

Under these conditions an electrolytic cell is formed. All metals and alloys have certain "built-in" properties that cause them to react as an anode or a cathode when in contact with dissimilar metals or alloys. Whether a particular material will react as a cathode or an anode can be determined from the relative positions of the materials in the galvanic series. The farther apart two materials are from each other in the galvanic series, with all other factors being equal, the greater the rate of corrosion. The material closest to the anodic end will be the one to corrode. For example, if tin and zinc were in contact, the zinc would corrode, whereas if tin and copper were in contact, the tin would corrode.

The rate of attack is also affected by the relative size of the materials and the specific electrolyte present. A small anode area in contact with a large cathode area will result in a rapid severe attack. Conversely, a large anode area in contact with a small cathode area will lessen the rate of galvanic attack since the same total electromagnetic driving force of corrosion will be spread out over a larger area. The higher the degree of ionization of the electrolyte, the greater the rate of attack.

Galvanic corrosion can be prevented by judicious use of dissimilar metals.

Galvanic series

Anodic (corroded) end	Hastelloy C (active)
Magnesium	Brasses
Magnesium alloys	Copper
Zinc	Bronzes
Aluminum 5052	Cupro-nickel alloys
Aluminum 6061	Monel
Cadmium	Silver solder
Aluminum AA 2017	Nickel (passive)
Iron and carbon steel	Inconel (passive)
Copper steel	Ferritic stainless (passive)
4-6% Chromium steel	Austenitic stainless (passive)

Galvanic series	
Ferritic stainless (active) 400 series	Titanium
Austenitic stainless (active) 18-8 series	Hastelloy C (passive)
Lead-tin solder	Silver
Lead	Graphite
Tin	Gold
Nickel (active)	Platinum
Inconel (active)	*Cathodic (protected) end*

Stress Corrosion Cracking

All metals are subject to stress corrosion cracking, which results from residual or applied stress in the metal. Residual stresses can occur as a result of cold forming or quenching after heat treating. Annealing after fabrication will minimize these stresses. Applied stresses can result from faulty design, vibrations, flexing, and excessive expansion and contraction due to thermal changes.

The particular corrodent will determine the degree of effect. Halogen salts are among the materials that will attack metals most vigorously when stresses are present.

Intergranular Corrosion

Corrosive attack involving intergranular corrosion occurs only at the grain boundaries of austenitic stainless steels. All austenitic stainless steels contain carbon in small amounts. When this material is heated to the sensitizing range (850 to 1650°F), such as in welding, carbon is precipitated out at the grain boundaries in the form of chromium carbide. The chromium has been taken from the grain boundaries, changing the composition and making this area even more susceptible to corrosive attack.

This effect can be minimized by annealing the stainless steel after it has been sensitized. This is done by heating the alloy to 1800°F or higher, depending on the specific alloy, and then quickly cooling it through the sensitizing range to prevent the carbon from precipitating out. Another way to reduce this effect is to limit the carbon content to less than 0.03%. This extra-low-carbon (ELC) stainless steel can be welded without the danger of carbide precipitation.

CORROSION OF NONMETALLICS

Plastic materials are attacked by solvation and chemical reactions. Solvation is the penetration of the plastic by corrosive elements that cause softening, swelling, and ultimate failure. Plastics, in contrast to metals, do not exhibit a useful corrosion rate; they usually either completely resist attack or deteriorate rapidly. Because of this difference in corrosion mechanism, the two types of notation used in the tables were established.

Plastic and elastomeric materials are compounded by the manufacturer. Properties of the materials produced can vary from manufacturer to manufacturer. By compounding, it is possible to improve specific mechanical/physical properties, but usually at the expense of another property. Consequently, materials that have been produced to improve a mechanical property may have had their ability to resist corrosion reduced. Since all plastic or elastomeric materials produced may not have the corrosion resistance indicated in the charts, the manufacturer of the material to be used should be consulted. The same reasoning applies to the physical/mechanical properties required for the application.

A word of caution should also be given regarding temperatures. The table shows only the resistivity to corrosive attack at various temperatures. Although the material may be corrosion-resistant at a specific temperature, this does not mean that the physical/mechanical properties would be satisfactory at these temperatures. These must be investigated at the operating temperature to ensure that the material has the proper mechanical strength for the application.

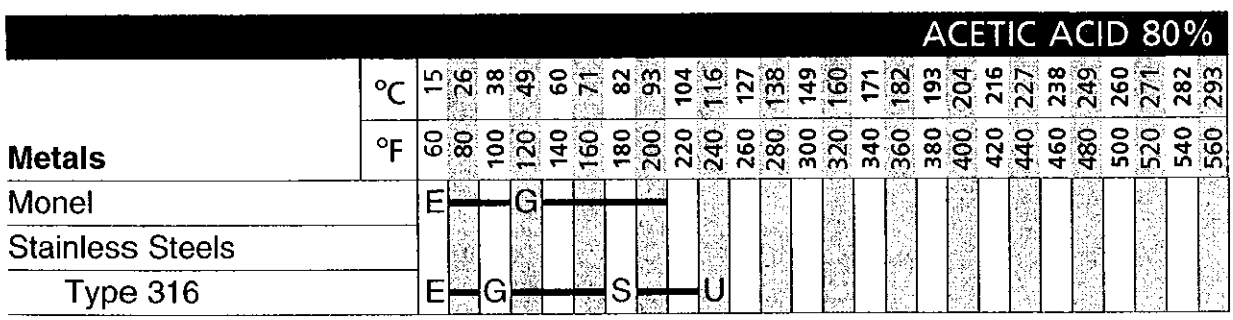
Using the Tables

The tables are arranged alphabetically according to corrodent. Unless otherwise noted, the corrodent is considered pure in the case of liquids, or a saturated aqueous solution in the case of solids. All percentages shown are by weight.

There are four pages for each corrodent: one for the resistance to metals; one for the resistance to nometallic materials, coatings, and mortars; one for the resistance to plastics; and one for the resistance to elastomers, linings, and fabrics.

TABLE NOTATION

Since corrosion is a function of temperature, the tables indicate the suitability of each material at varying temperatures. Symbols used to designate specific corrosion rates are shown on the bottom of the metals pages. The use of the temperature scale is explained by the following example:



From the sample table, it is seen that in the presence of an 80% solution of acetic acid, monel has a corrosion rate varying with temperature rated as follows:

- From 60 to 120°F, excellent (E): <2 mils penetration/year.
- From 120 to 210°F, good (G): <20 mils penetration/year.
- There are no data for temperatures beyond 210°F.

Type 316 stainless steel has a corrosion rate for the same corrodent varying with temperature rated as follows:

- From 60 to 100°F, excellent (E): <2 mils penetration/year.
- From 100 to 180°F, good (G): <20 mils penetration/year.
- From 180 to 240°F, satisfactory (S): <50 mils penetration/year.
- Above 240°F, unsatisfactory (U): >50 mils penetration/year.

Nonmetallics are only rated as resistant (R) or unsatisfactory (U), because they do not exhibit a useful corrosion rate, as explained previously.

Other Notation

Further information regarding the corrosion of specific materials by certain corrodents is provided by the following symbols. In the tables, the symbols follow the applicable material or corrodent name.

Symbol	Meaning
1	Material is subject to pitting.
2	Material is subject to stress cracking.
3	Material is subject to crevice attack.
4	Not for use with carbonated beverages.
5	Material should be passivated.
6	Alkaline.
7	Acid free.
8	Acid free and passivated.
9	Material is subject to intergranular corrosion.
10	Synthetic veil or surfacing mat should be used.
11	Material will cause stress cracking in many polyethylenes. A stress crack-resistant, high molecular weight polyethylene must be used.
12	Material is subject to stress cracking when wet.
13	Corrodent will be absorbed.
14	Corrodent will permeate.
ALL	Data applies to all concentrations.
ELC	Material is low-carbon grade.
SAT	Solution is saturated.

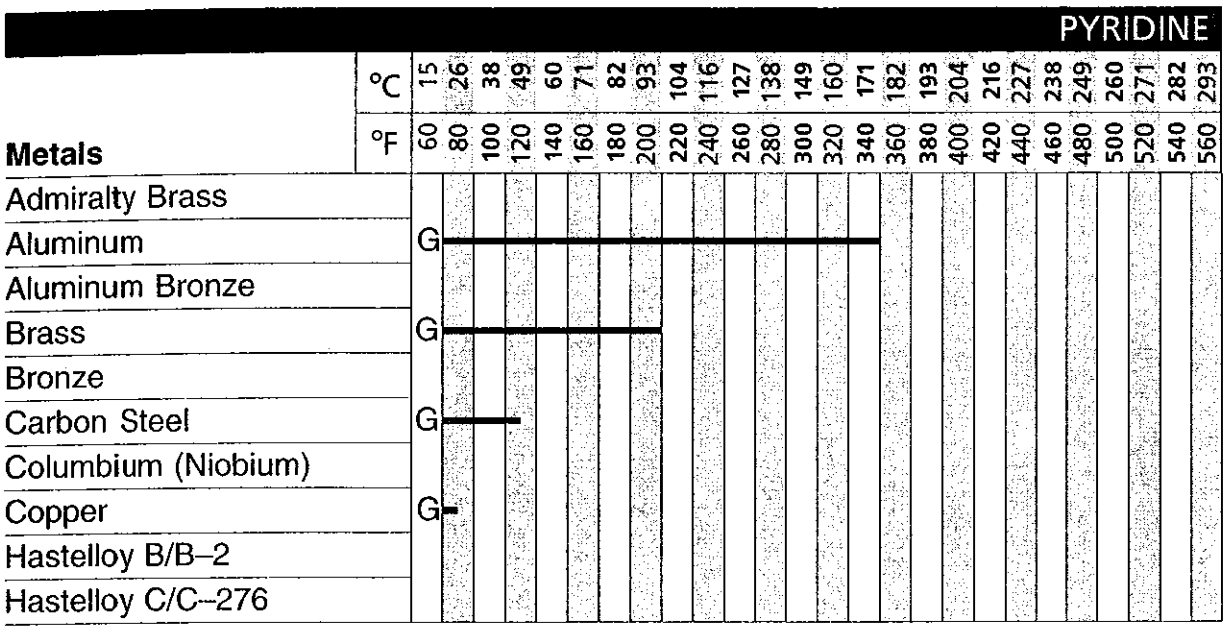
General Notes

- Incolloy category is applicable to grades 800 and 825 only, unless otherwise specified.
- Inconel category is applicable to grade 600, unless otherwise specified.
- The mortars specified are for use fully immersed or subject to constant flow.
- The coatings specified are for use fully immersed or for wet spills or wet fumes.
- There are many epoxy formulations. Where epoxy is shown as being a satisfactory material of construction, it indicates that there is a suitable formulation. Manufacturers should be consulted for the suitability of their specific formulation.
- See Appendix 3 for plating solution compositions.

READING THE TEMPERATURE SCALE

When using the tables, note that the vertical lines refer to temperatures midway between the temperatures cited (see the sample table below). Thus, aluminum is corroded by pyridine at a rate less than 20 mils/year between 60 and 350°F. Brass, carbon steel, and copper have the same corrosion rate between the temperatures of 60 and 210°F, 120°F, and 80°F, respectively.

When a material is indicated to be unsatisfactory at a specific temperature, it is also unsatisfactory at all temperatures above the one shown. A blank in the chart indicates that no data are available.


PYRIDINE
°C
15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293
°F
60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560
Metals
Admiralty Brass
Aluminum
Aluminum Bronze
Brass
Bronze
Carbon Steel
Columbium (Niobium)
Copper
Hastelloy B/B–2
Hastelloy C/C–276
G
G
G
G

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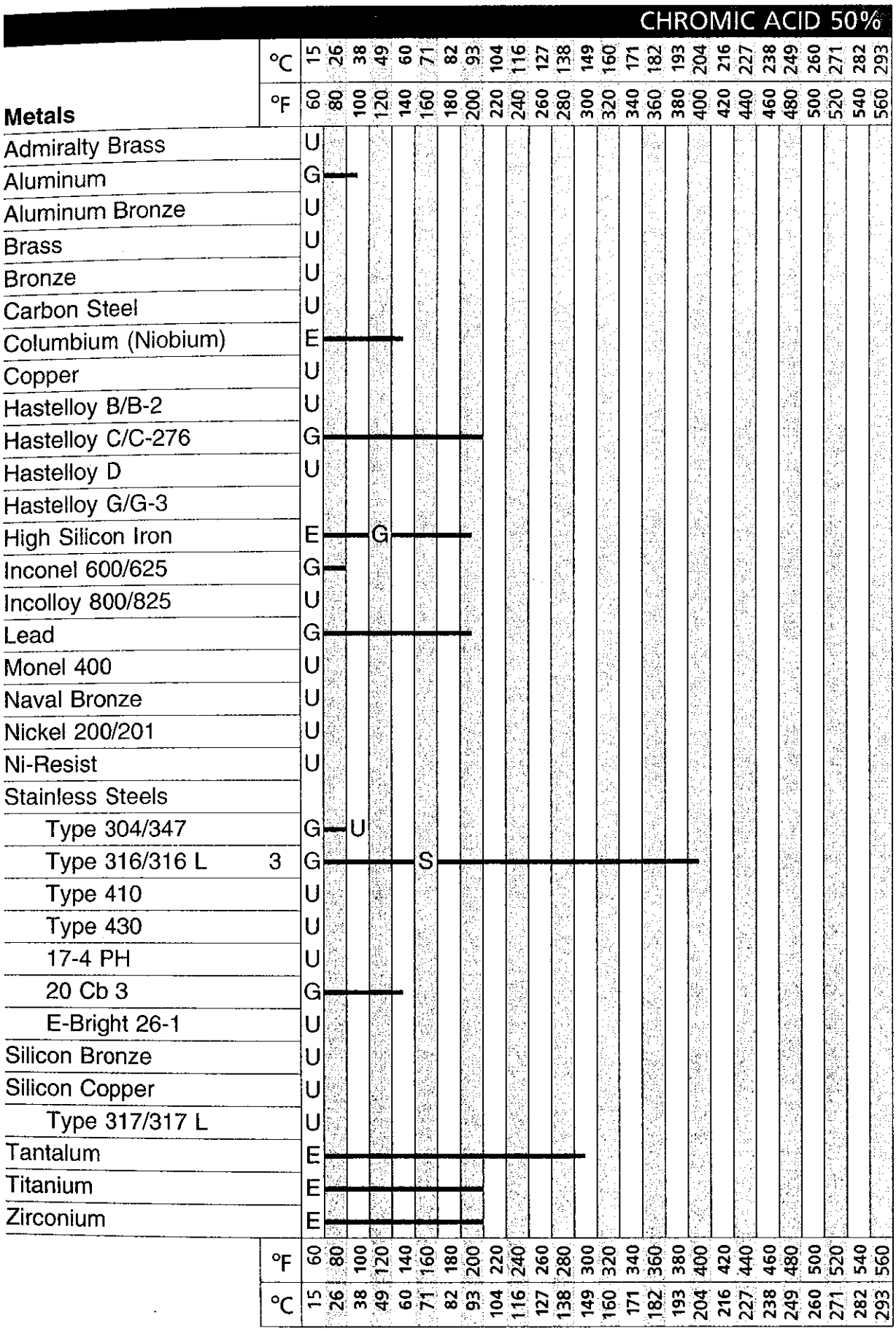
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CHROMIC ACID 50%



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

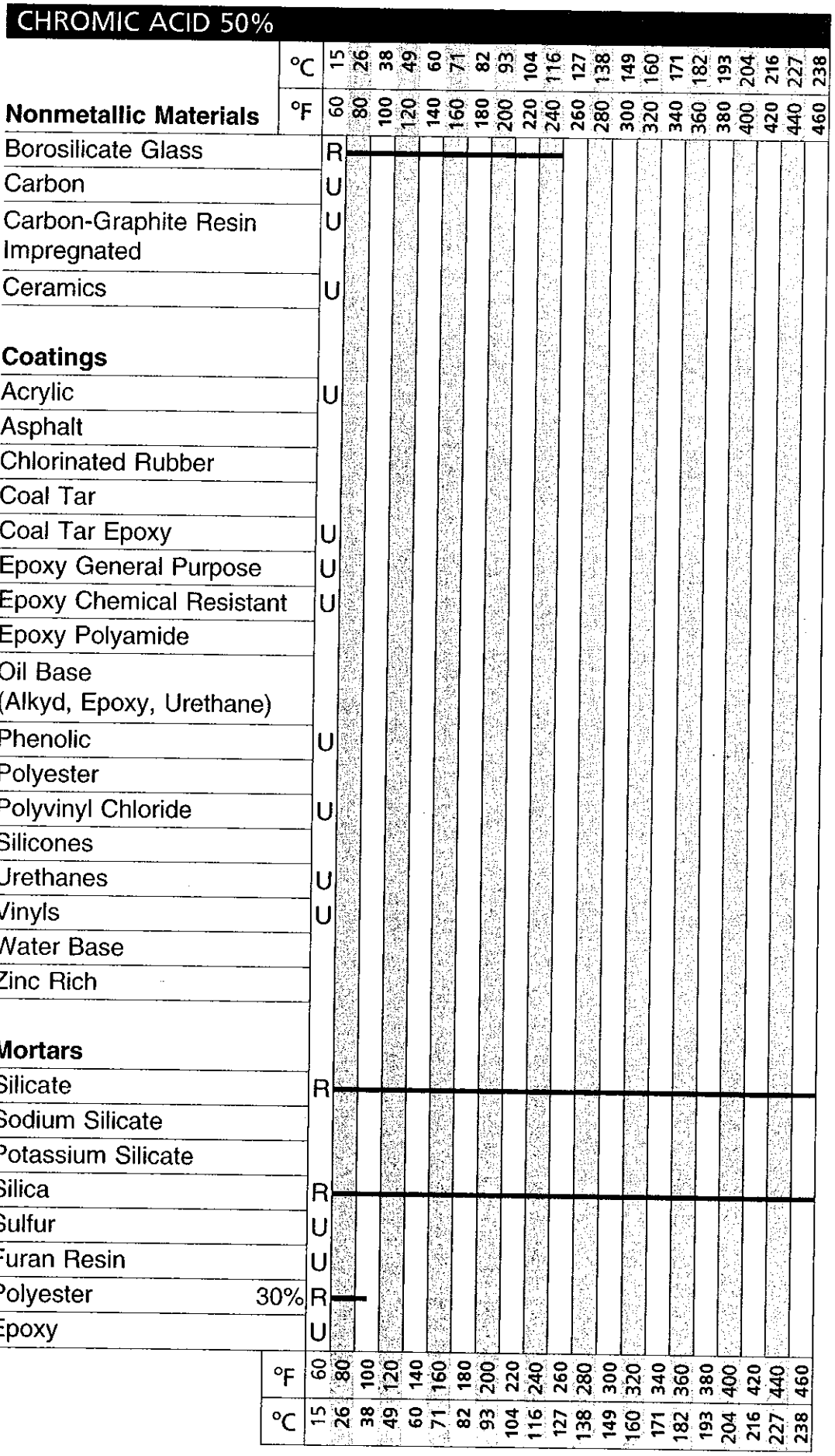
R = Resistant

U = Unsatisfactory

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CHROMIC ACID 50%



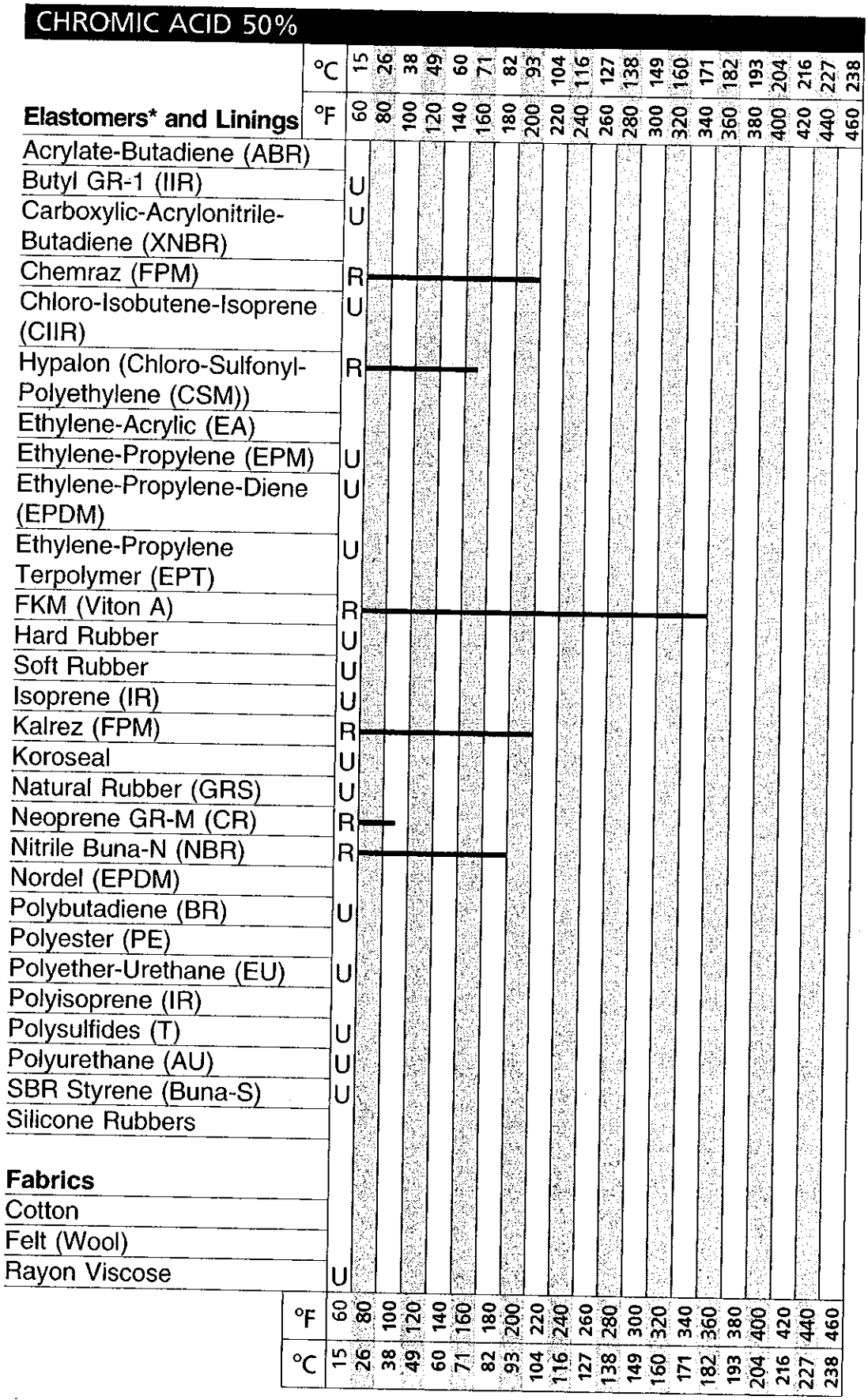
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CHROMIC ACID 50%

Plastics		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS			U																				
Acetal			R																				
Acrylics			U																				
Asbestos Reinforced Epoxy			U																				
Asbestos Reinforced Phenolic			U																				
Chlorinated Polyether (Penton)			R																				
CPVC			R																				
E-CTFE (Halar)			R																				
Epoxy			U																				
ETFE (Tefzel)			R																				
FEP	13		R																				
Furan (Furfural Alcohol)			U																				
Noryl			U																				
Nylon 6			U																				
Nylon 11			U																				
Nylon 66			U																				
Phenolic			U																				
PFA (Teflon)	13		R																				
Polyamide-Imide																							
Polyesters																							
Bisphenol A–fumarate			U																				
Halogenated			R																				
Hydrogenated Bisphenol A –Bisphenol A			U																				
Isophthalic			U																				
Terephthalate (PET)			R																				
Polyetherimide (ULTEM)																							
Polyetheretherketone (PEEK)			R																				
Polyethersulfone (PES)			U																				
Polyethylene HMW			R																				
Polyethylene UHMW			R																				
Polymethylpentene			R																				
Polypropylene (PP)			R																				
Polystyrene			U																				
Polysulfone			U																				
Polyvinylidene Chloride			R																				
PVC Type 1			U																				
PVC Type 2			U																				
PVDF (Kynar)			R																				
Ryton			R																				
TFE (Teflon)			R																				
Vinyl Ester			U																				
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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CHROMIC ACID 50%



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CHROMIUM POTASSIUM SULFATE

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																												
Aluminum																												
Aluminum Bronze																												
Brass																												
Bronze																												
Carbon Steel																												
Columbium (Niobium)																												
Copper																												
Hastelloy B/B-2	10%	S	S	S	S	S	S	S	S	S																		
Hastelloy C/C-276																												
Hastelloy D																												
Hastelloy G/G-3																												
High Silicon Iron																												
Inconel 600/625																												
Incolloy 800/825																												
Lead																												
Monel 400																												
Naval Bronze																												
Nickel 200/201																												
Ni-Resist																												
Stainless Steels																												
Type 304/347		G	G	G	G	G																						
Type 316/316 L																												
Type 400 series																												
Type 904-L																												
17-4 PH																												
20 Cb 3																												
E-Bright 26-1																												
Silicon Bronze																												
Silicon Copper																												
Stellite																												
Tantalum																												
Titanium																												
Zirconium																												
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

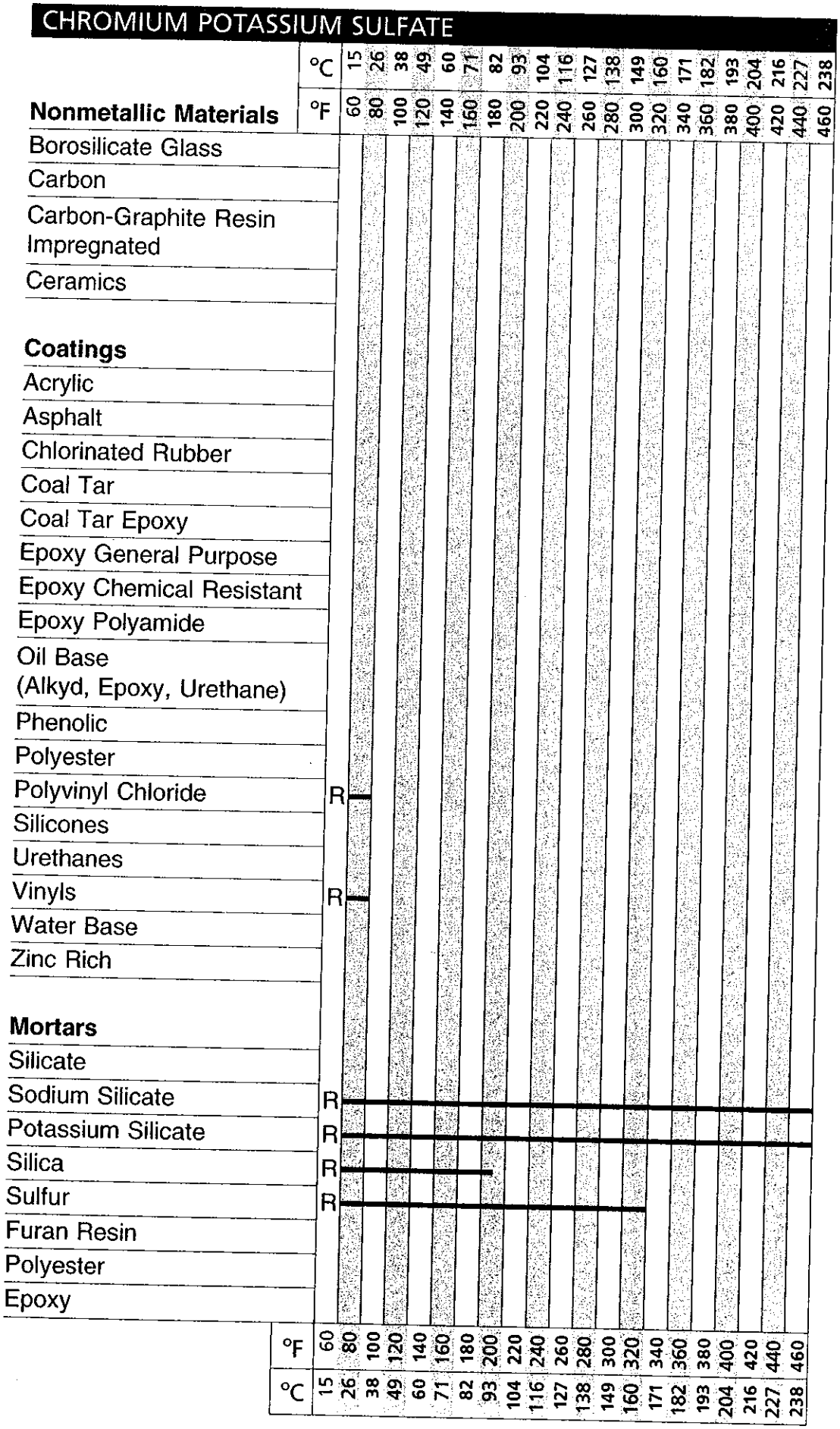
R = Resistant

U = Unsatisfactory

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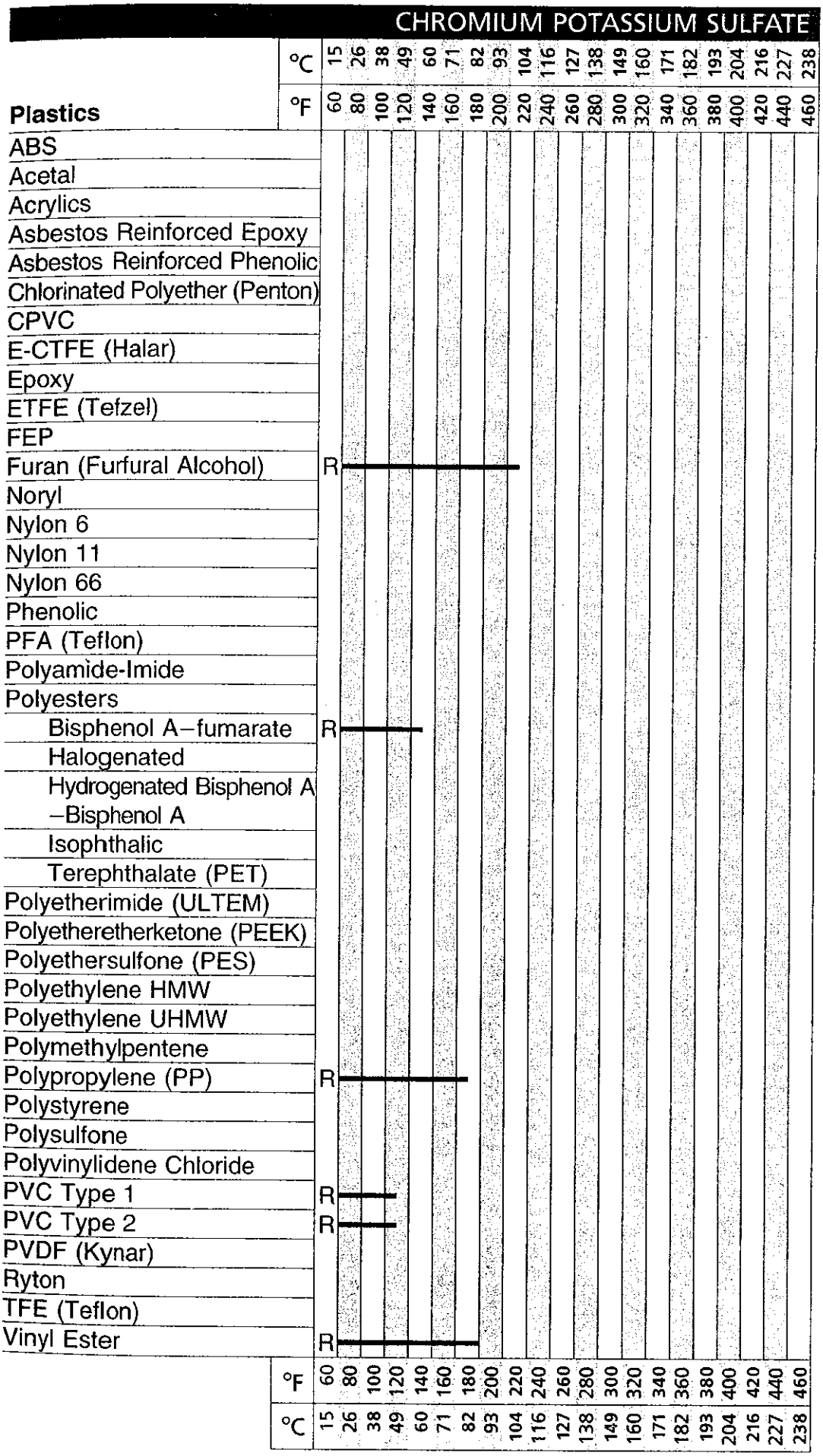
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CHROMIUM POTASSIUM SULFATE



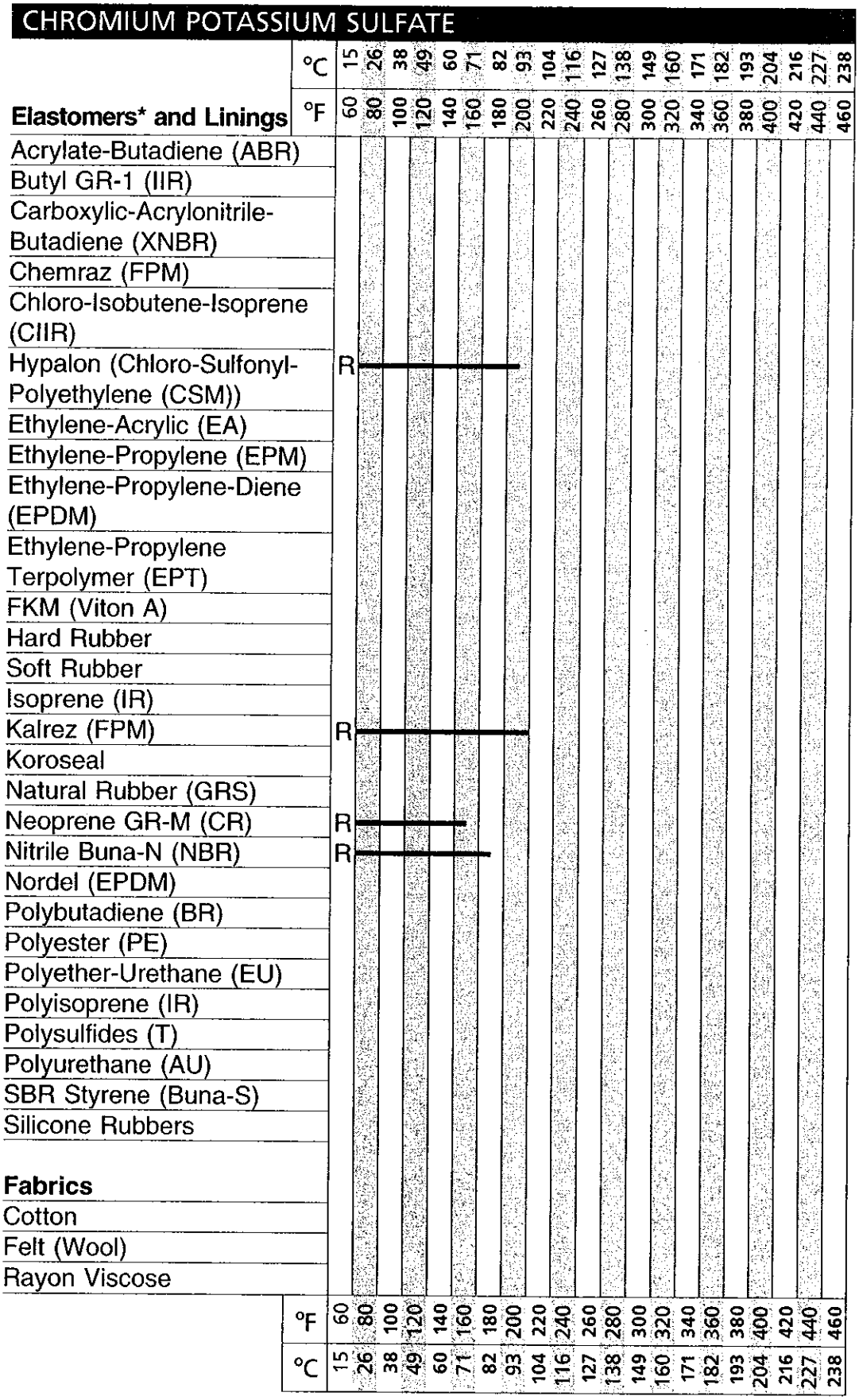
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CHROMIUM POTASSIUM SULFATE



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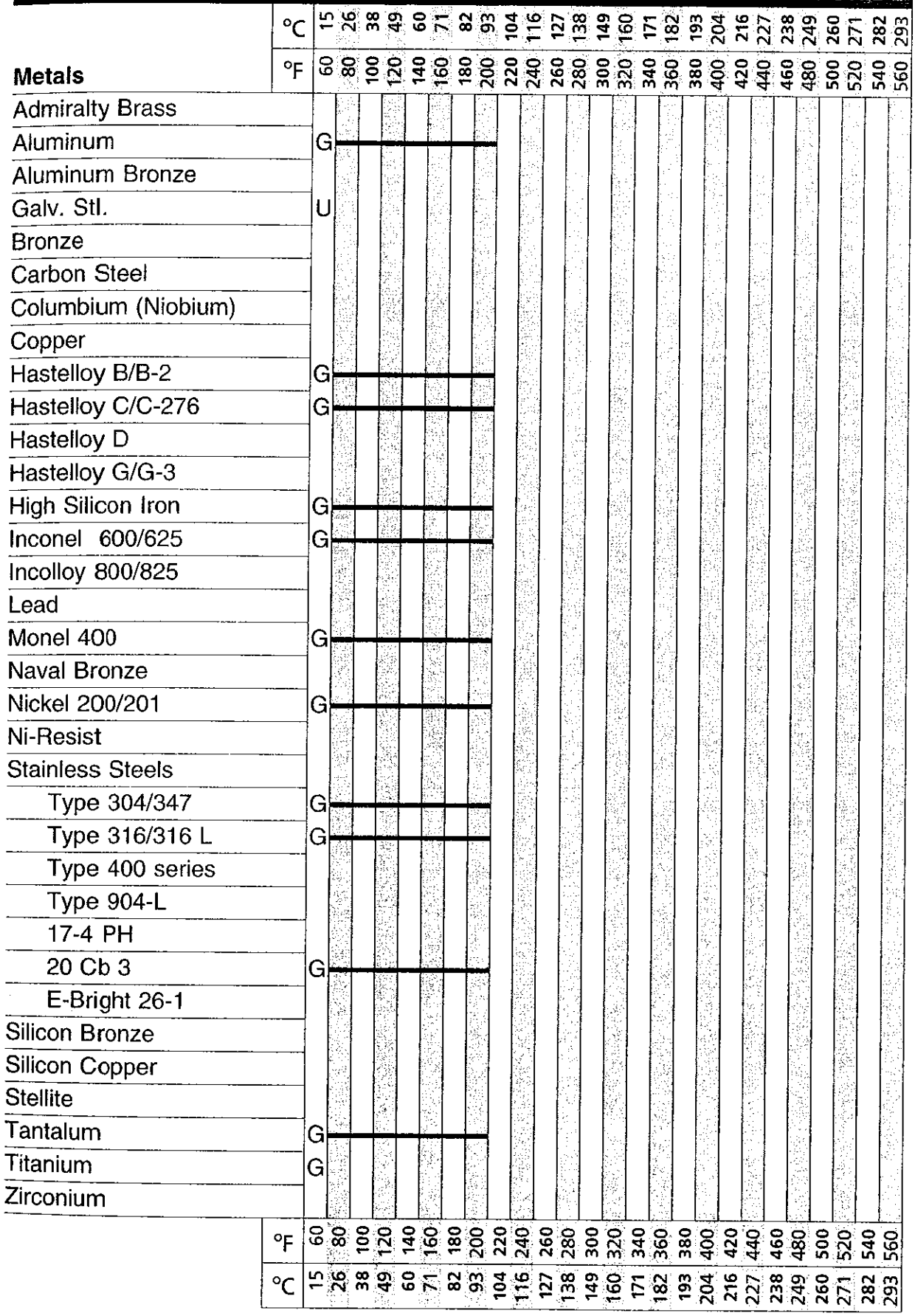
CHROMIUM POTASSIUM SULFATE



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CHROMYL CHLORIDE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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CHROMYL CHLORIDE

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic	U																					
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls	R																					
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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CHROMYL CHLORIDE

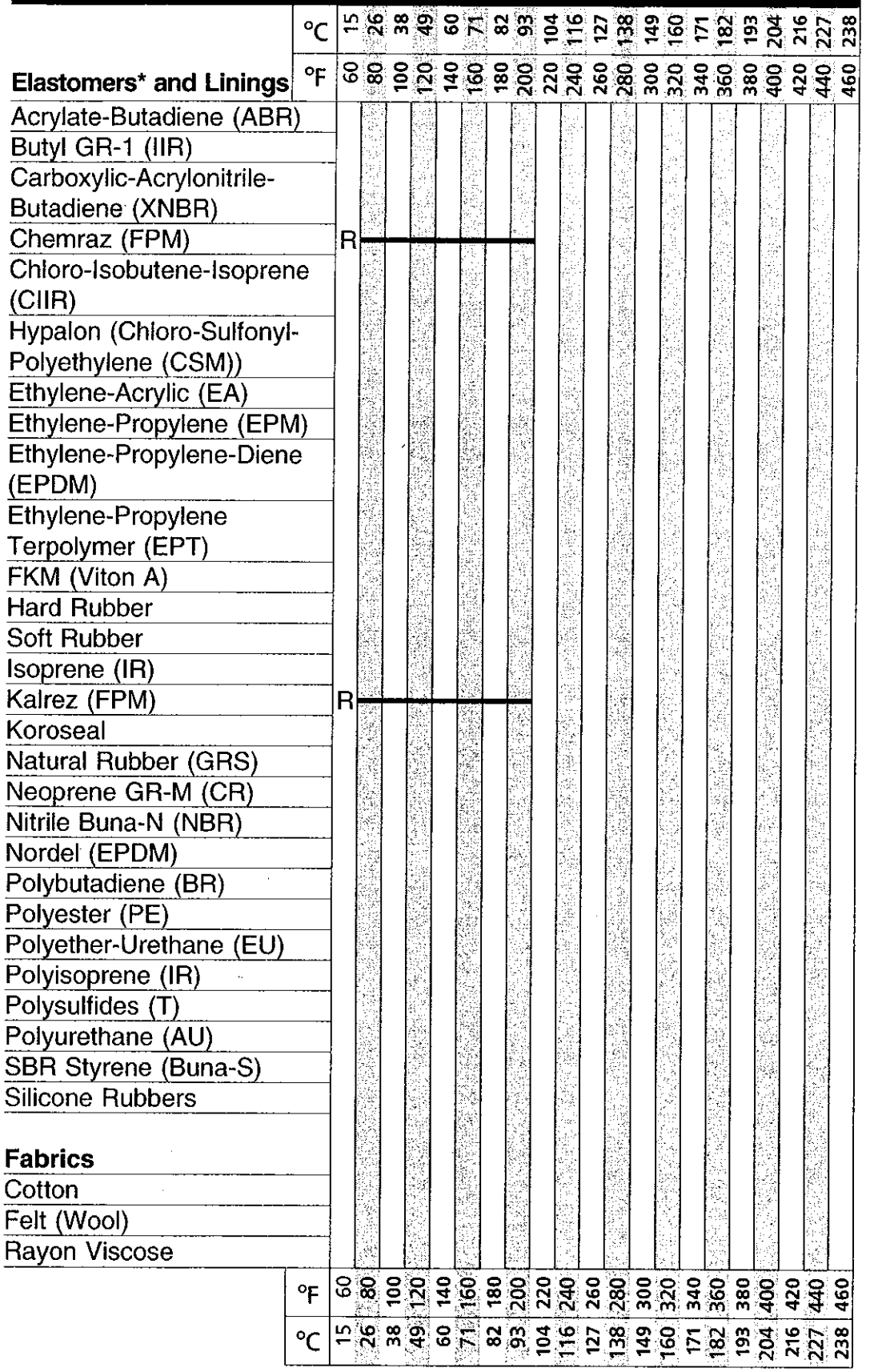
Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC	R	
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)	R	
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic	U	
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	R	
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	R	
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)	R	
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1	R	
PVC Type 2		
PVDF (Kynar)	R U	
Ryton		
TFE (Teflon)	R	
Vinyl Ester	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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CHROMYL CHLORIDE



*See also Nylon 11 under PLASTICS

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CIDER

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2	E																										
Hastelloy C/C-276	E																										
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625	E																										
Incolloy 800/825																											
Lead																											
Monel 400	E																										
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347	G																										
Type 316	G																										
Type 400 series																											
Type 317/317 L	G																										
17-4 PH																											
20 Cb 3	E																										
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum	E																										
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

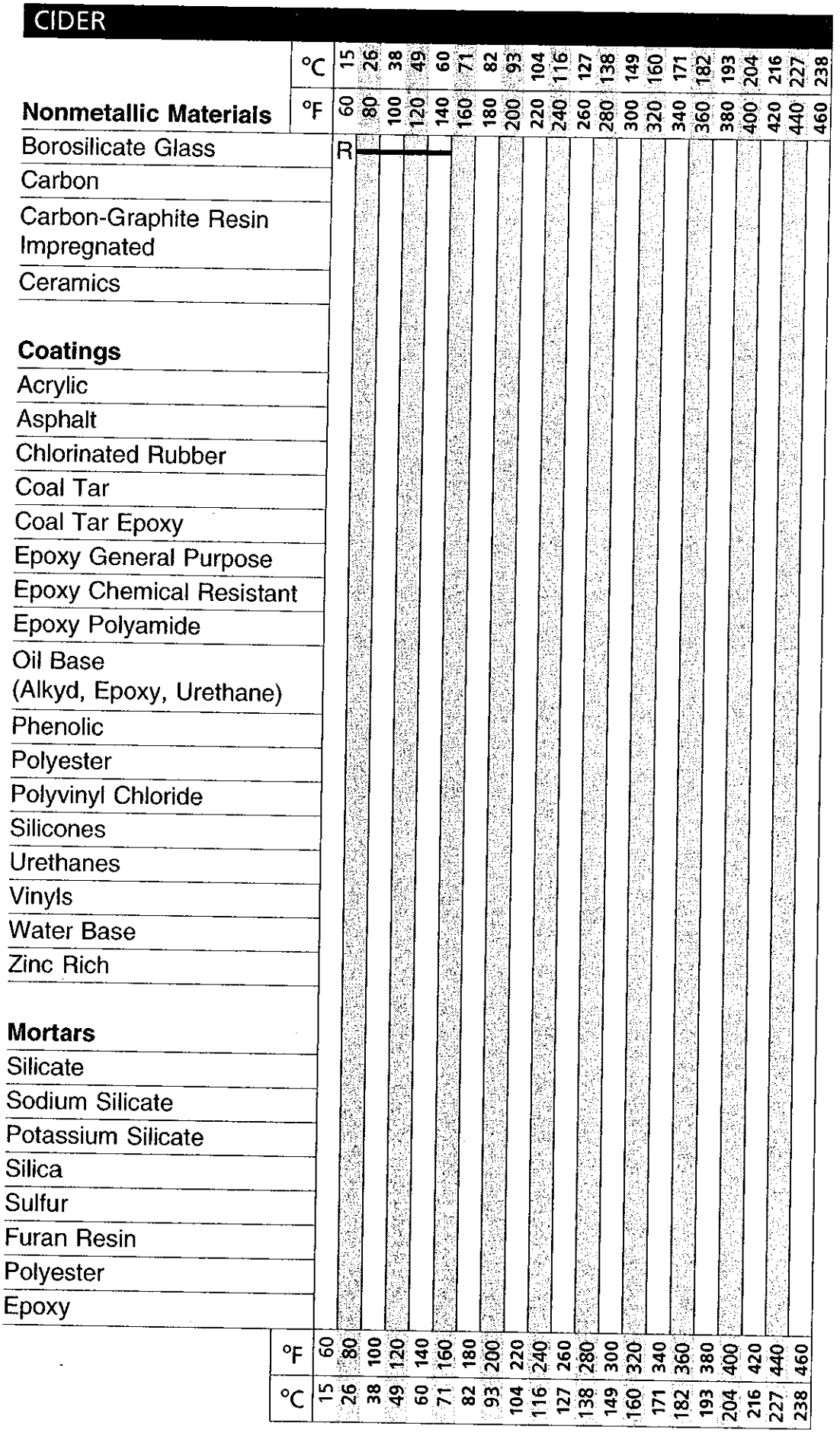
R = Resistant

U = Unsatisfactory

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CIDER



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CIDER

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)																						
Epoxy																						
ETFE (Tefzel)																						
FEP	R																					
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)	R																					
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)																						
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)																						
Ryton																						
TFE (Teflon)	R																					
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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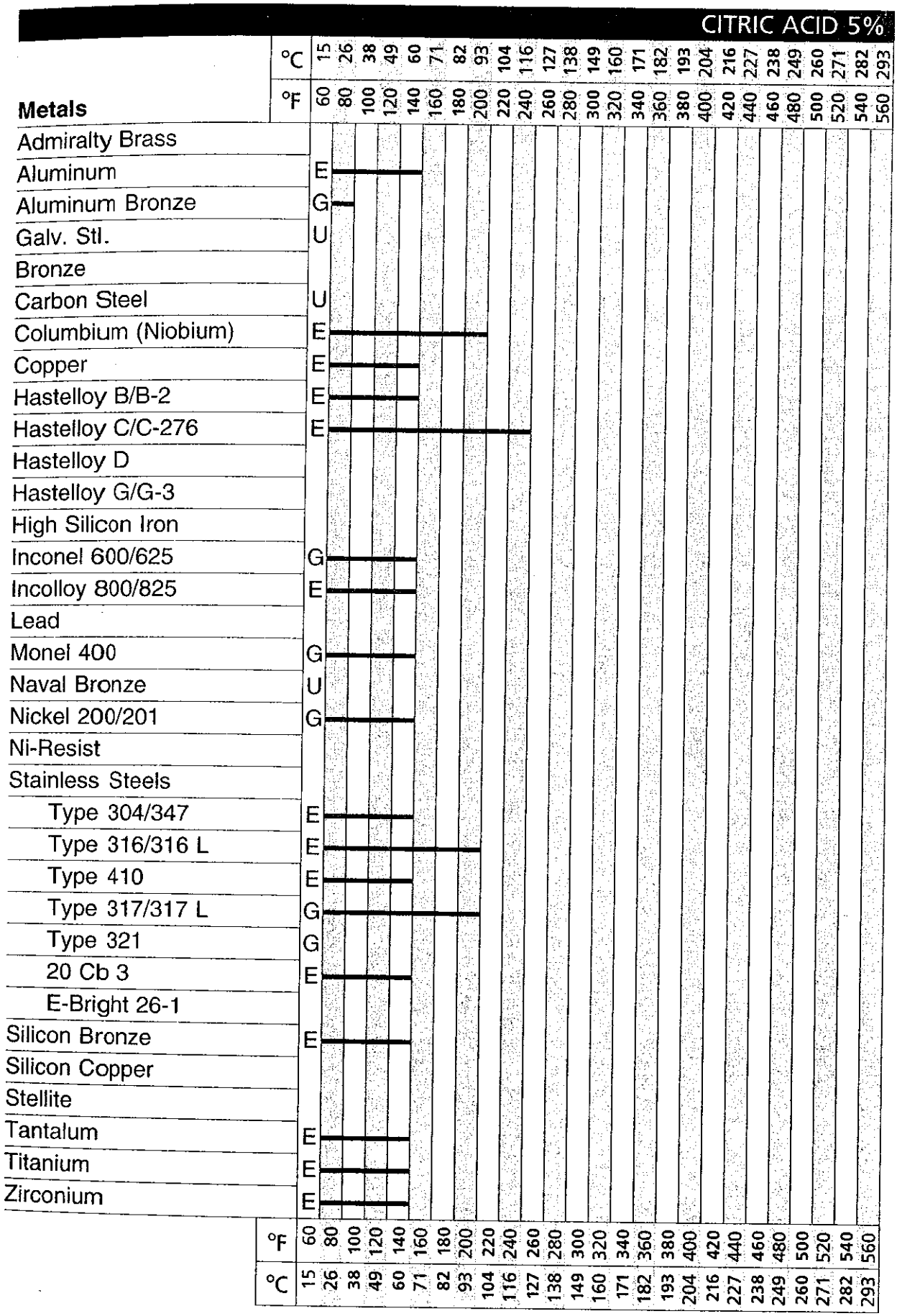
CIDER

Elastomers* and Linings	°F	°C
Acrylate-Butadiene (ABR)	60–460	15–238
Butyl GR-1 (IIR)	60–460	15–238
Carboxylic-Acrylonitrile-Butadiene (XNBR)	60–460	15–238
Chemraz (FPM)	60–460	15–238
Chloro-Isobutene-Isoprene (CIIR)	60–460	15–238
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	60–460	15–238
Ethylene-Acrylic (EA)	60–460	15–238
Ethylene-Propylene (EPM)	60–460	15–238
Ethylene-Propylene-Diene (EPDM)	60–460	15–238
Ethylene-Propylene Terpolymer (EPT)	60–460	15–238
FKM (Viton A)	60–460	15–238
Hard Rubber	60–460	15–238
Soft Rubber	60–460	15–238
Isoprene (IR)	60–460	15–238
Kalrez (FPM)	60–460	15–238
Koroseal	60–460	15–238
Natural Rubber (GRS)	60–460	15–238
Neoprene GR-M (CR)	60–460	15–238
Nitrile Buna-N (NBR)	60–460	15–238
Nordel (EPDM)	60–460	15–238
Polybutadiene (BR)	60–460	15–238
Polyester (PE)	60–460	15–238
Polyether-Urethane (EU)	60–460	15–238
Polyisoprene (IR)	60–460	15–238
Polysulfides (T)	60–460	15–238
Polyurethane (AU)	60–460	15–238
SBR Styrene (Buna-S)	60–460	15–238
Silicone Rubbers	60–460	15–238
Fabrics		
Cotton	60–460	15–238
Felt (Wool)	60–460	15–238
Rayon Viscose	60–460	15–238

*See also Nylon 11 under PLASTICS

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CITRIC ACID 5%



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

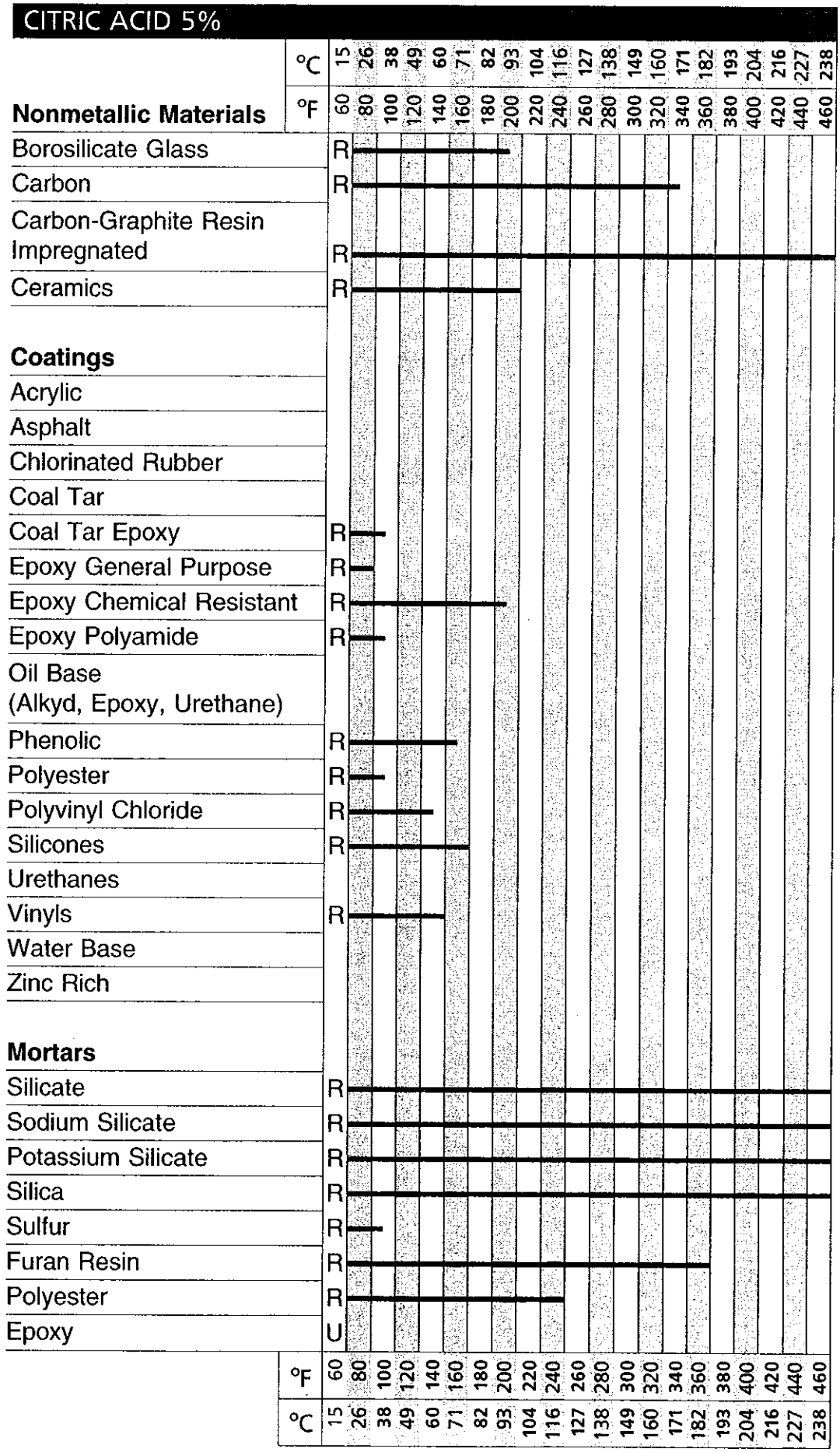
R = Resistant

U = Unsatisfactory

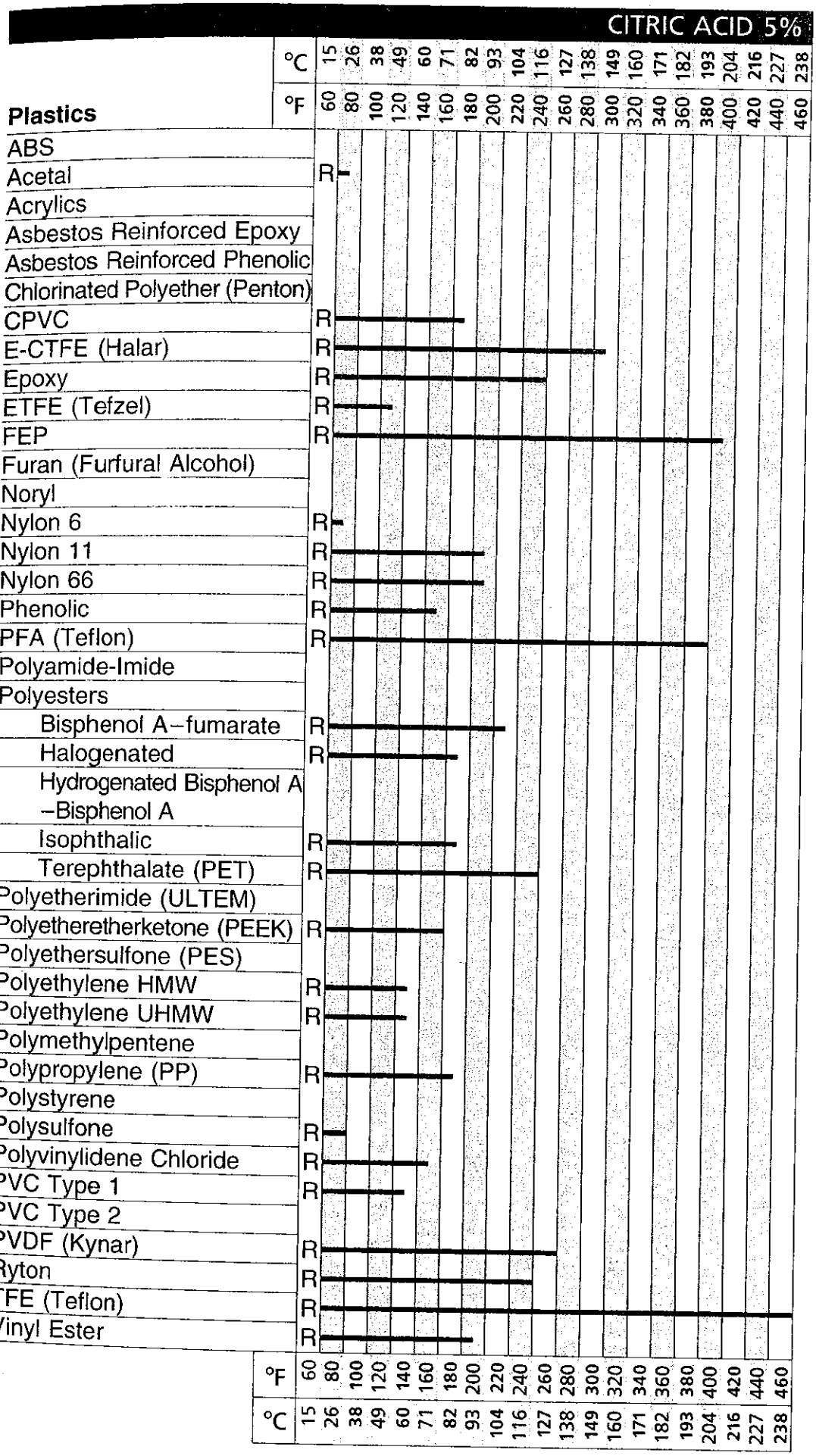
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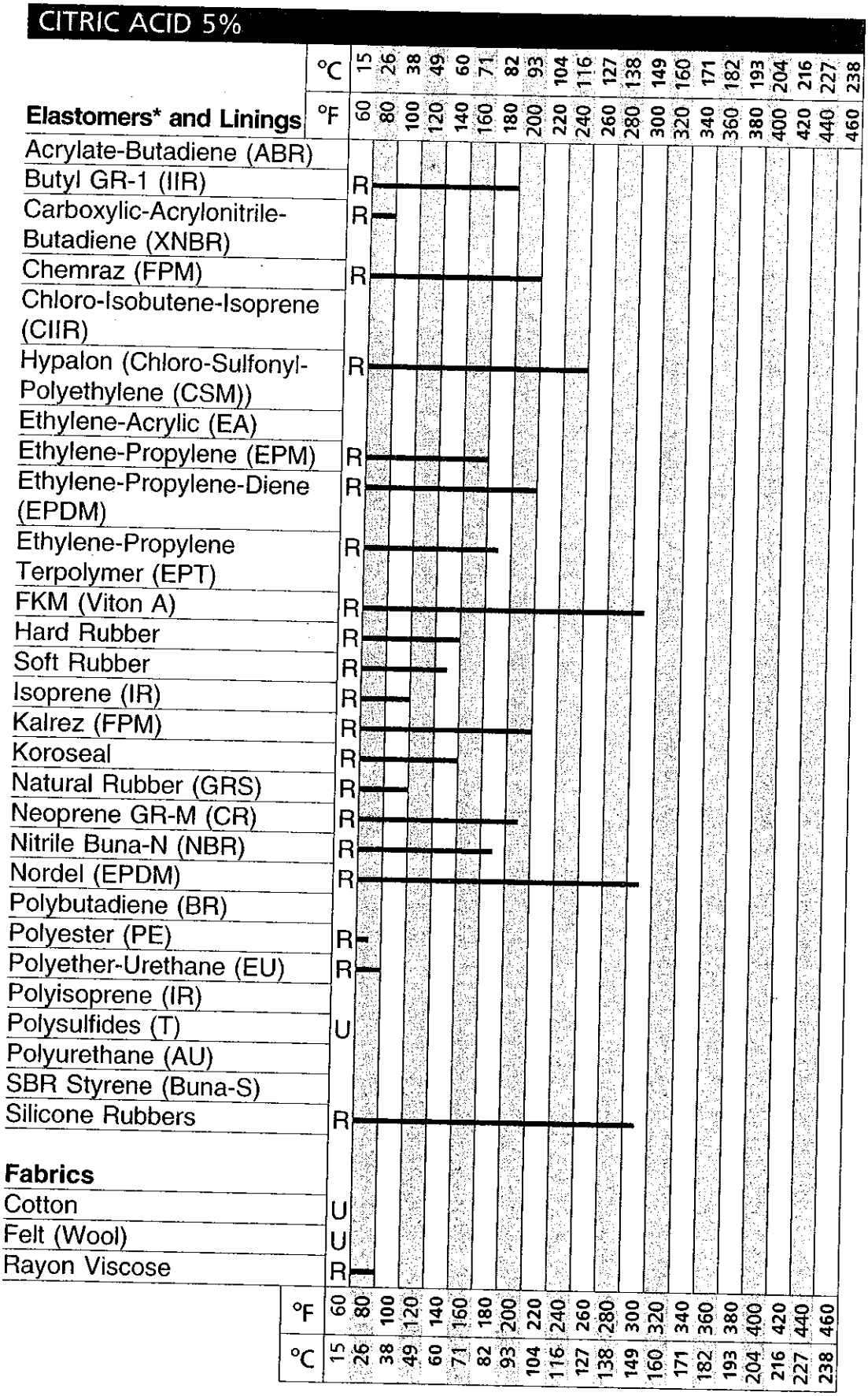


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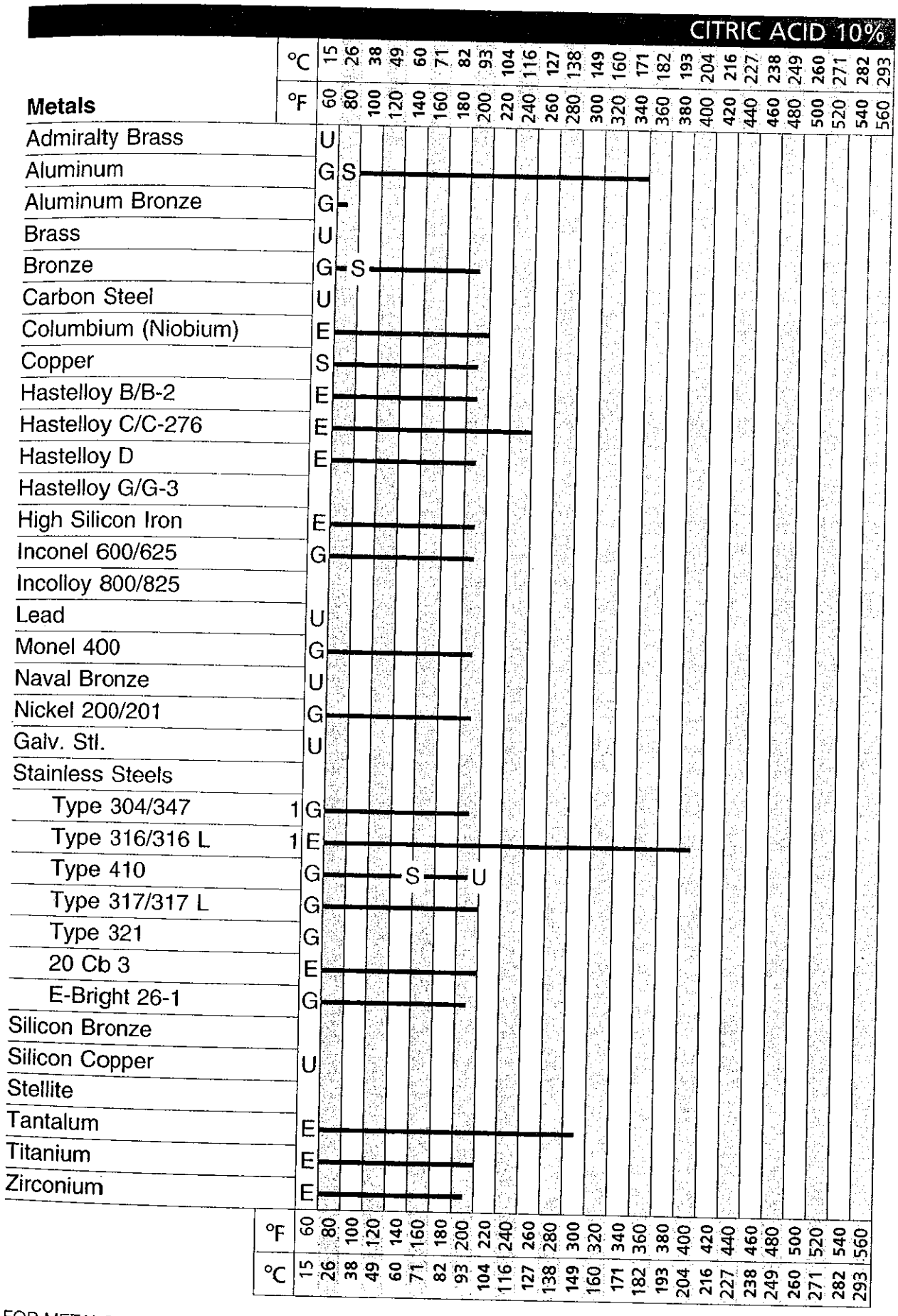
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FOR METALS

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S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

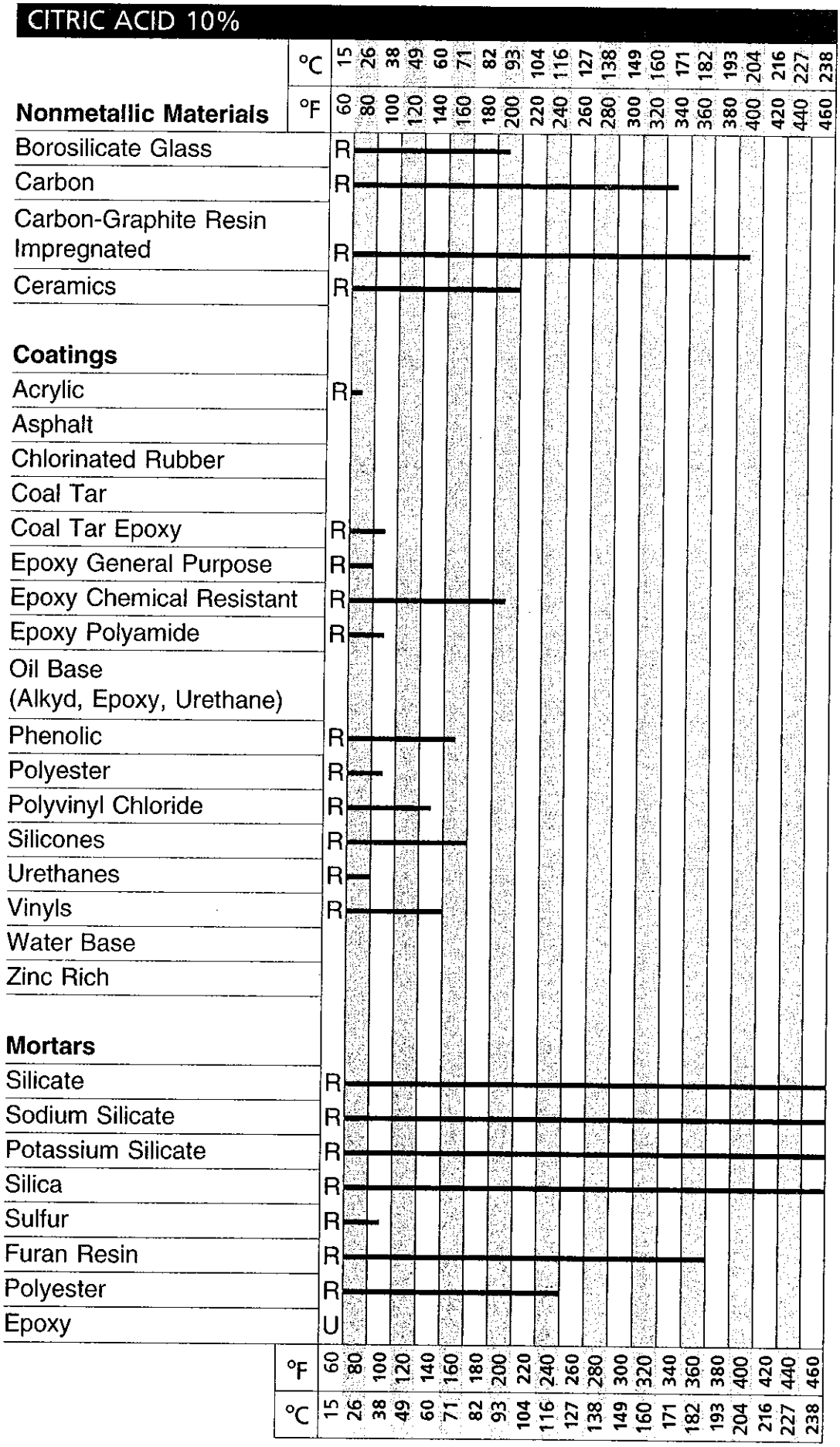
R = Resistant

U = Unsatisfactory

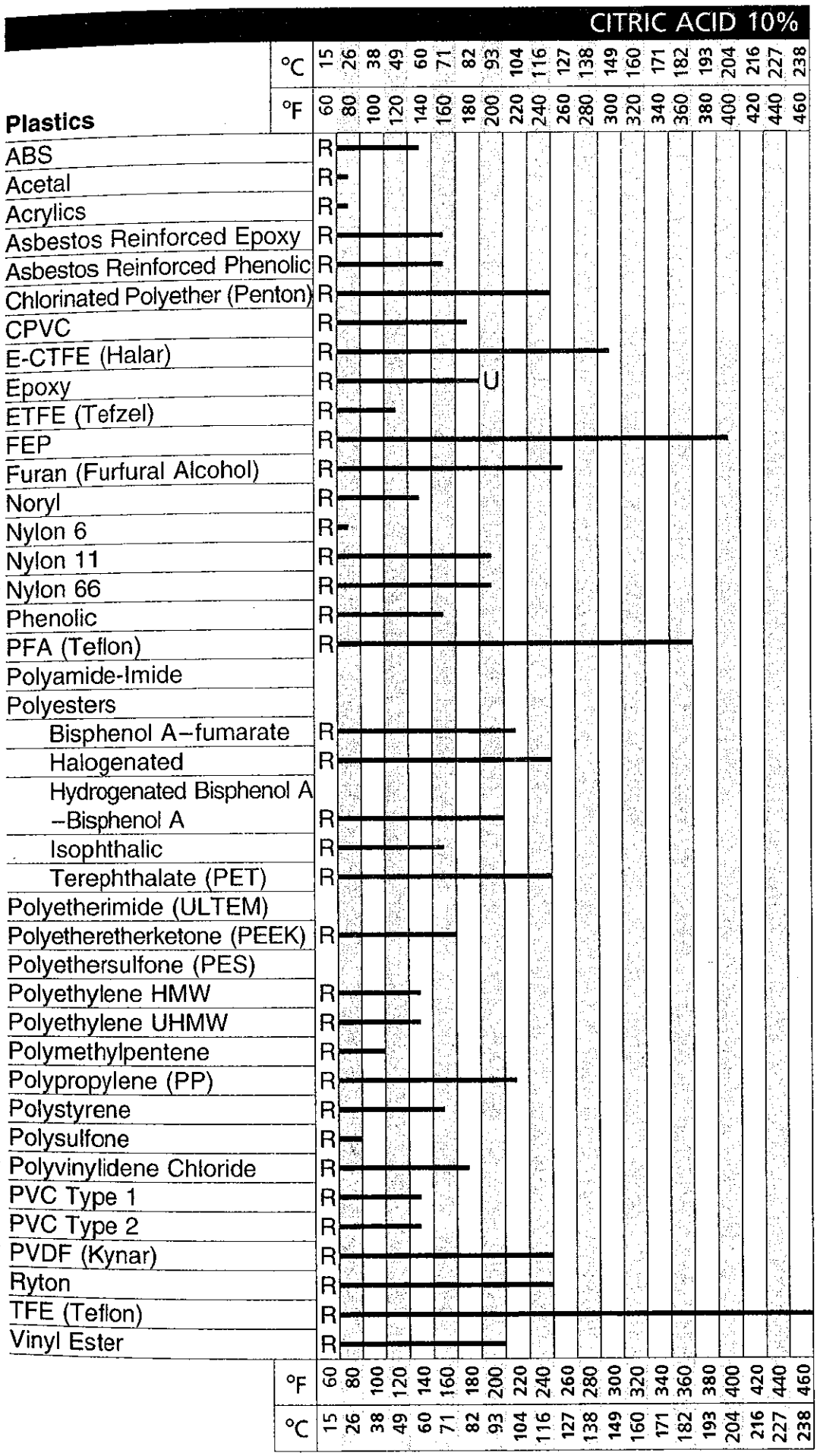
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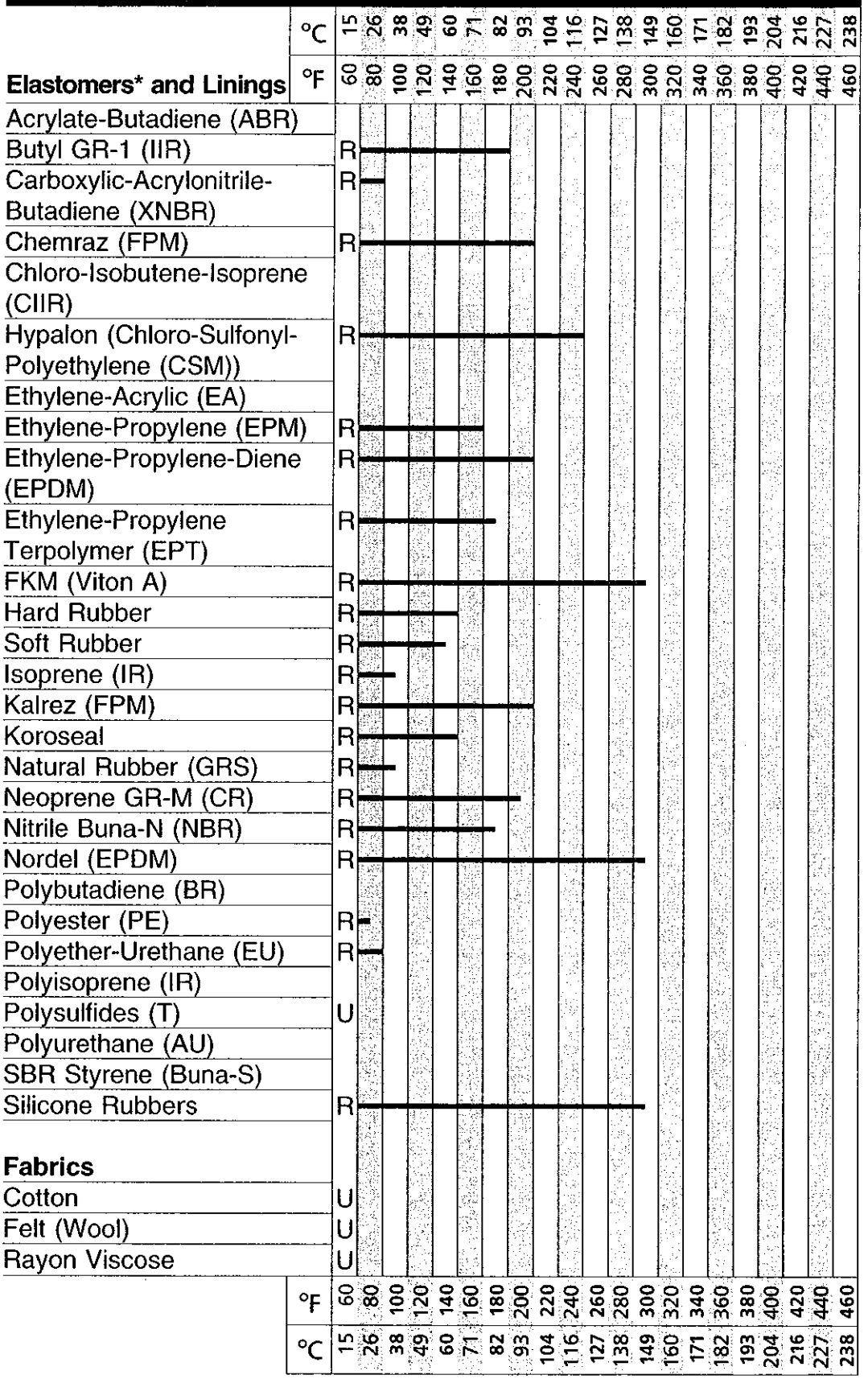


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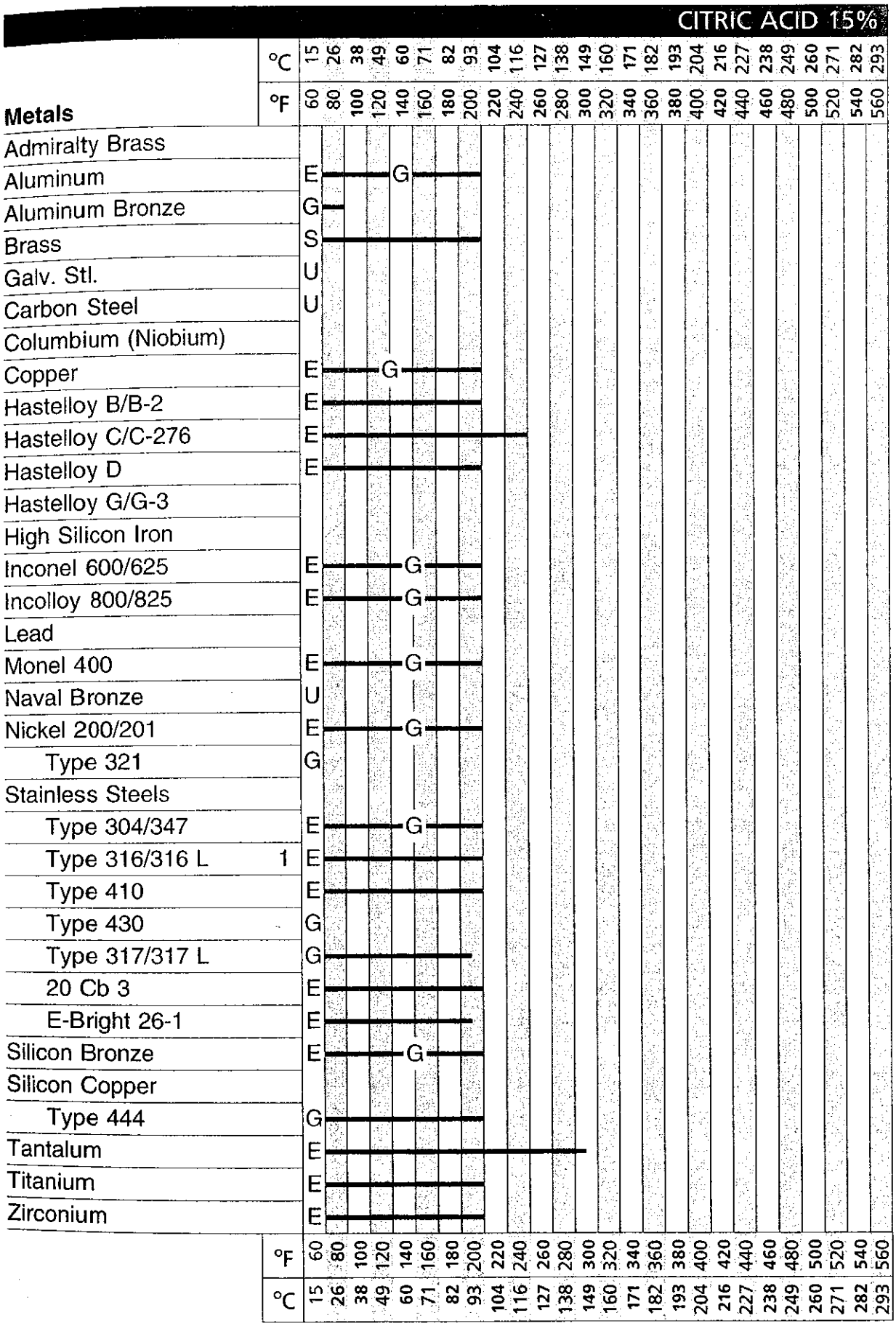
CITRIC ACID 10%



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CITRIC ACID 15%



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

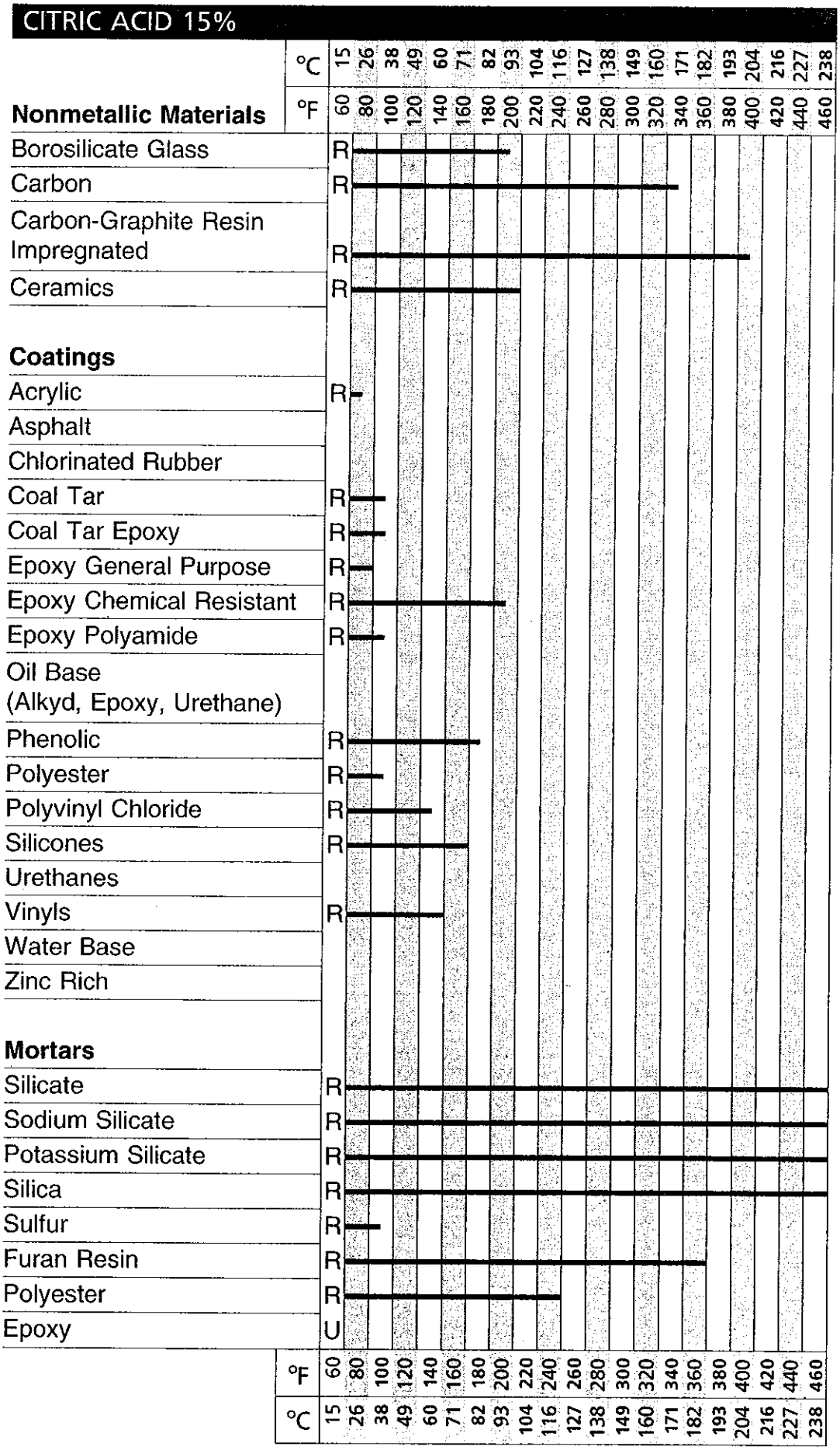
R = Resistant

U = Unsatisfactory

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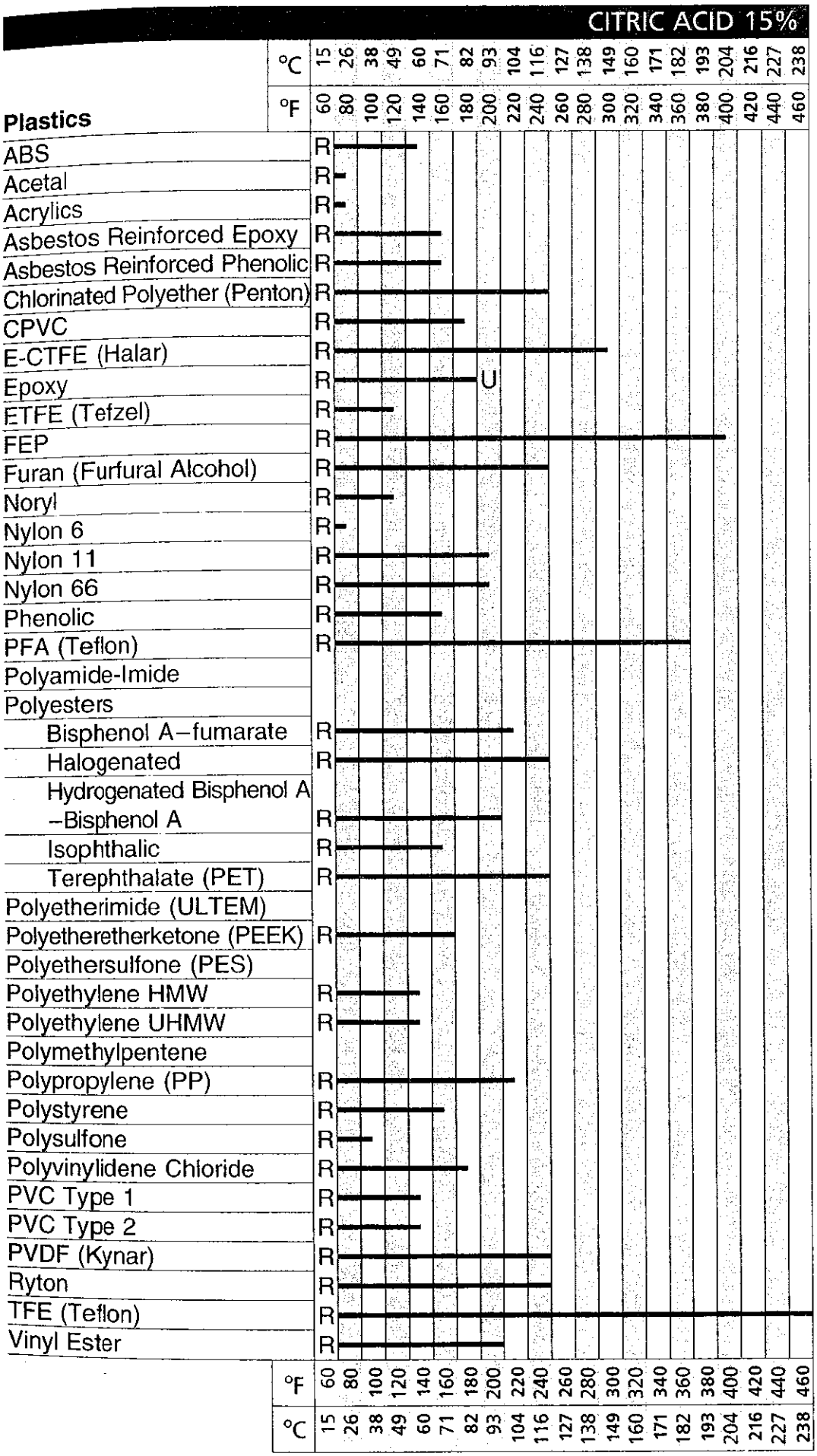
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CITRIC ACID 15%



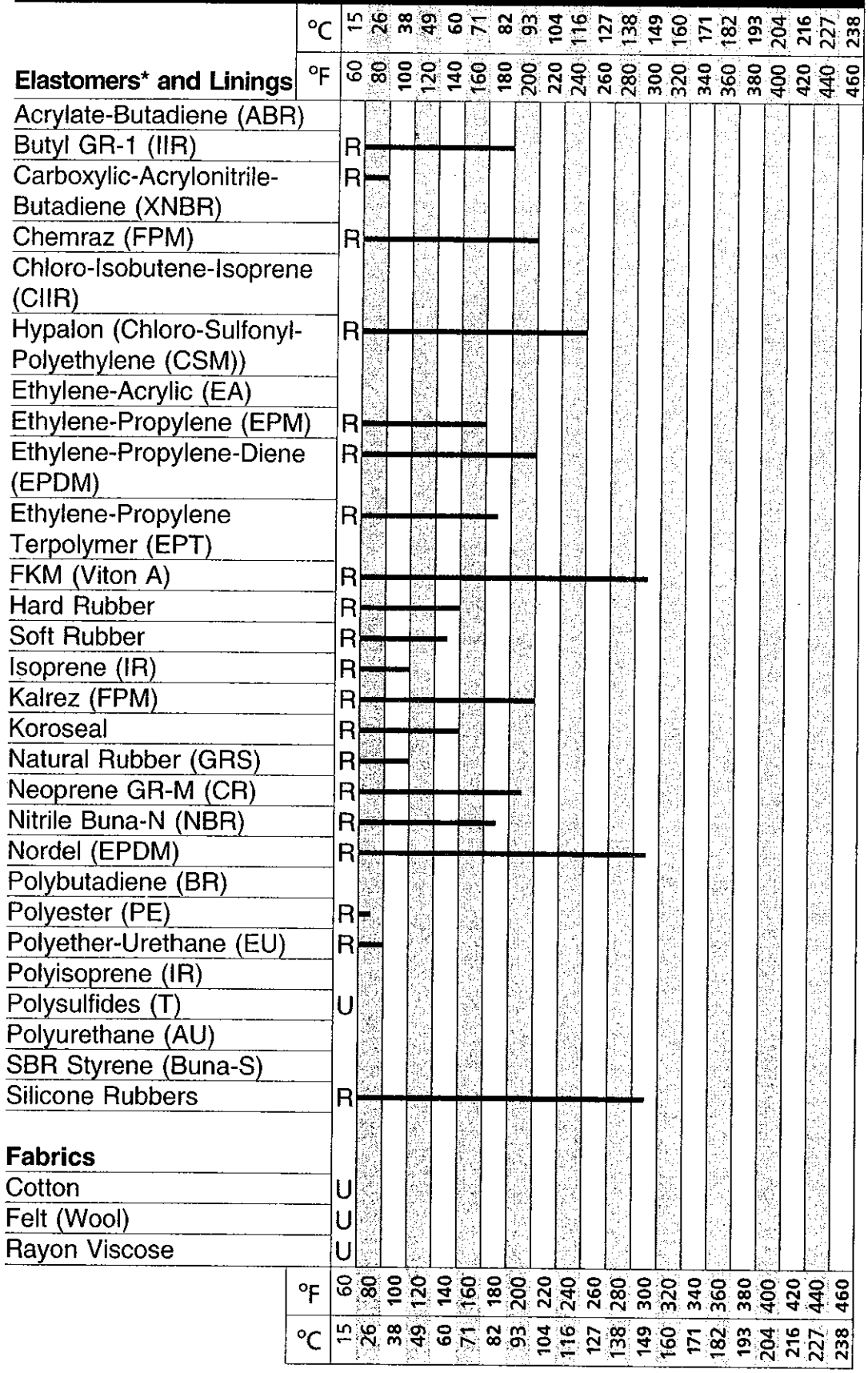
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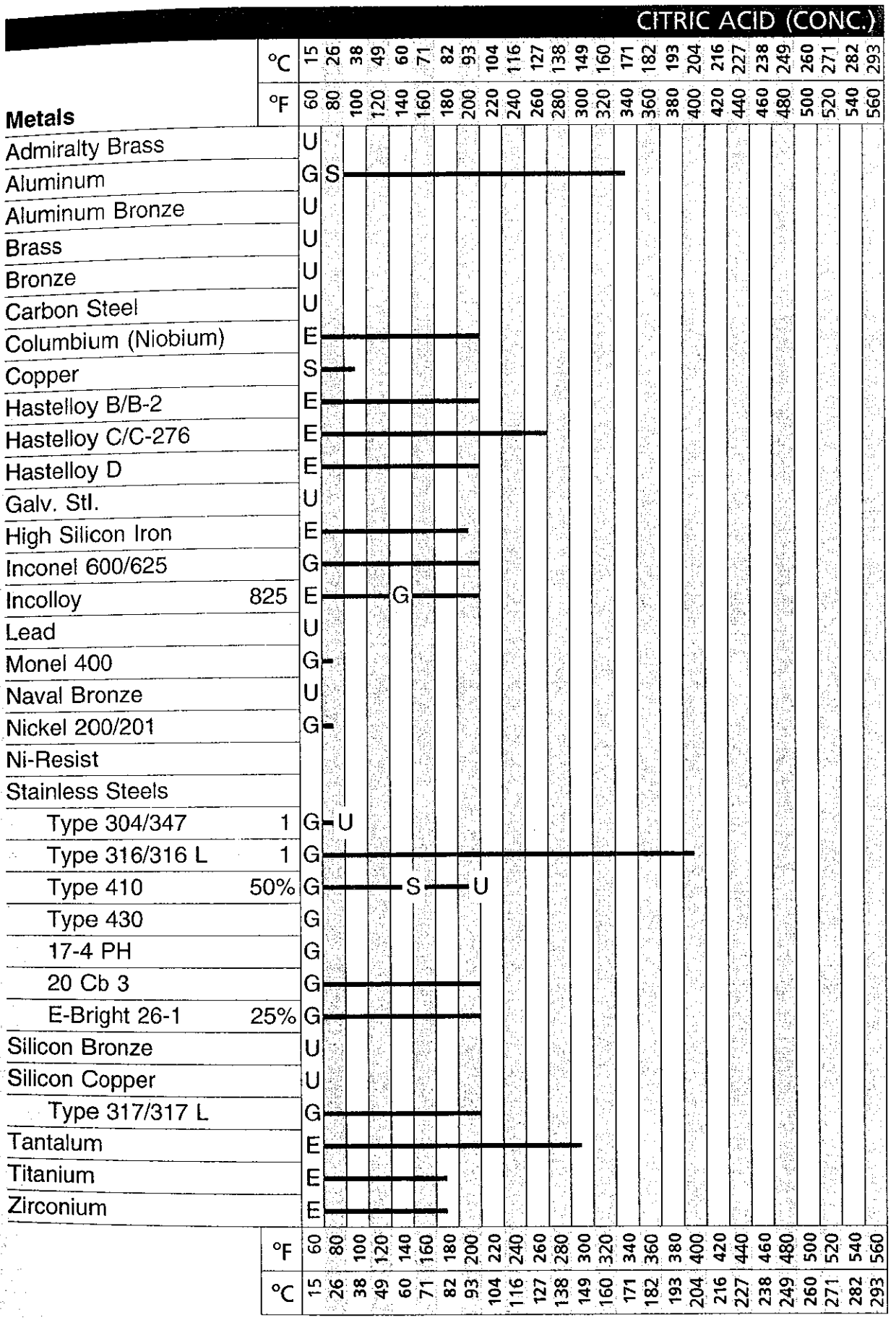
CITRIC ACID 15%



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CITRIC ACID (CONC.)



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

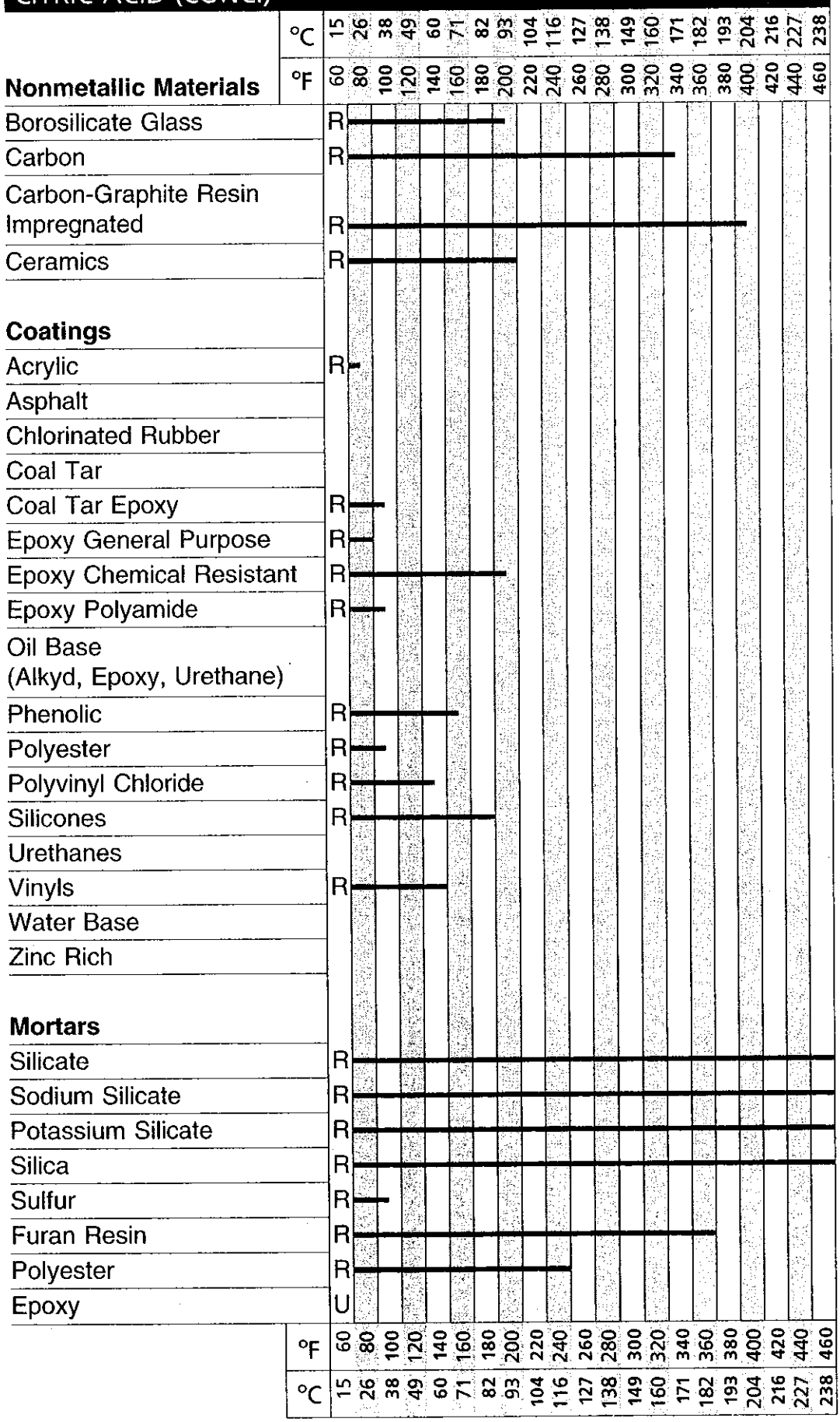
R = Resistant

U = Unsatisfactory

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CITRIC ACID (CONC.)



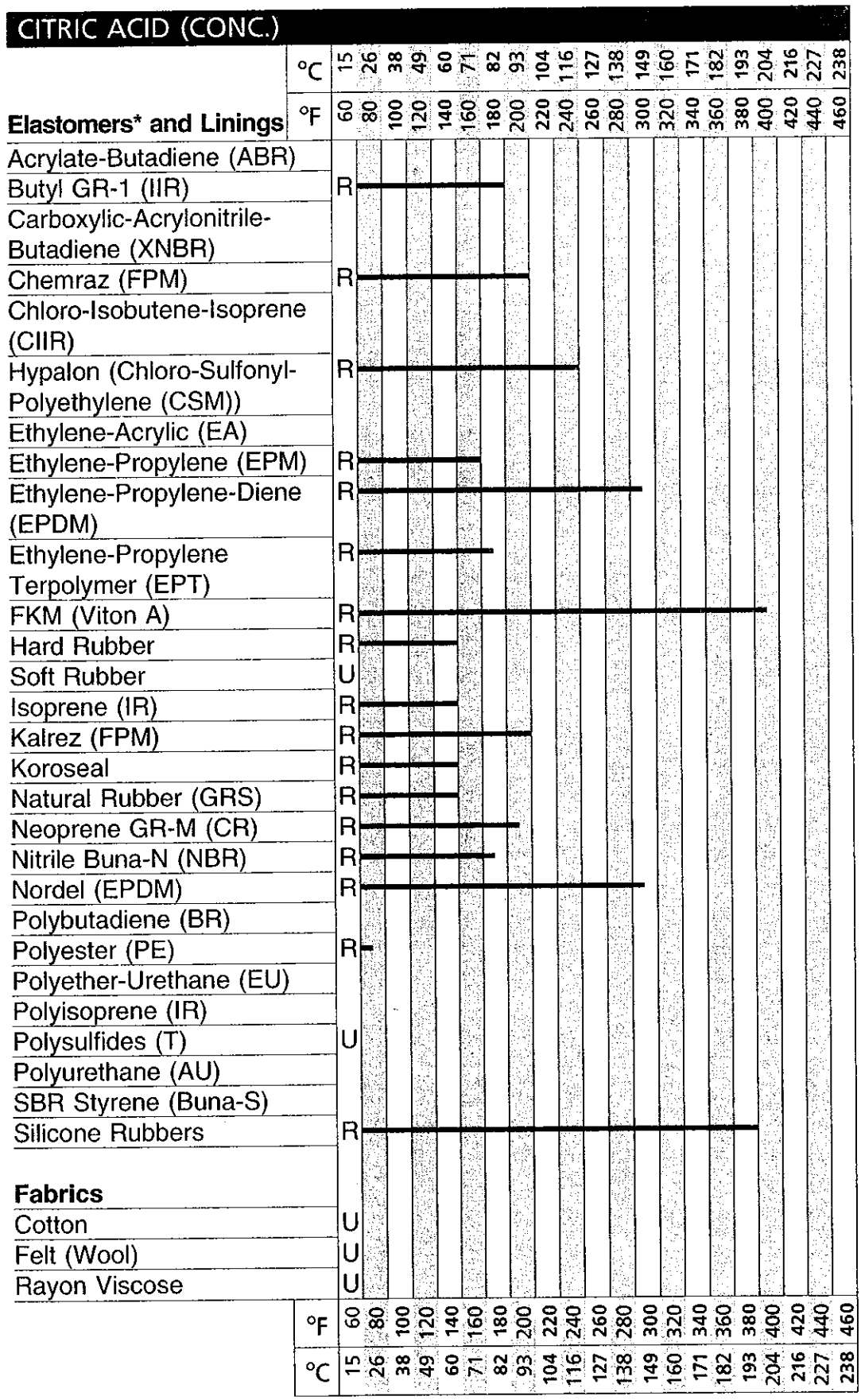
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CITRIC ACID (CONC.)

Plastics		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS	25%		R																				
Acetal			R																				
Acrylics			R																				
Asbestos Reinforced Epoxy			R																				
Asbestos Reinforced Phenolic			R																				
Chlorinated Polyether (Penton)			R																				
CPVC			R																				
E-CTFE (Halar)			R																				
Epoxy	32%		R							U													
ETFE (Tefzel)																							
FEP			R																				
Furan (Furfural Alcohol)			R										U										
Noryl			R																				
Nylon 6			R																				
Nylon 11			R																				
Nylon 66			R																				
Phenolic			R																				
PFA (Teflon)			R																				
Polyamide-Imide																							
Polyesters																							
Bisphenol A–fumarate			R																				
Halogenated			R																				
Hydrogenated Bisphenol A –Bisphenol A			R																				
Isophthalic			R																				
Terephthalate (PET)			R																				
Polyetherimide (ULTEM)			R																				
Polyetheretherketone (PEEK)			R																				
Polyethersulfone (PES)			R																				
Polyethylene HMW			R																				
Polyethylene UHMW			R																				
Polymethylpentene			R																				
Polypropylene (PP)			R																				
Polystyrene			R																				
Polysulfone	40%		R																				
Polyvinylidene Chloride			R																				
PVC Type 1			R																				
PVC Type 2			R																				
PVDF (Kynar)			R																				
Ryton	ALL		R																				
TFE (Teflon)			R																				
Vinyl Ester	ALL		R																				
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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CITRIC ACID (CONC.)



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CLOROX BLEACH SOLUTION, 5.5% CHLORINE

Metals	°C	°F
Admiralty Brass		
Aluminum	U	
Aluminum Bronze		
Brass		
Bronze		
Carbon Steel	U	
Columbium (Niobium)		
Copper		
Hastelloy B/B-2		
Hastelloy C/C-276		
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron	G	
Inconel 600/625		
Incolloy 800/825		
Lead		
Monel 400		
Naval Bronze		
Nickel 200/201		
Ni-Resist		
Stainless Steels		
Type 304/347	G	
Type 316/316 L	G	
Type 400 series		
Type 904-L		
17-4 PH		
20 Cb 3		
E-Bright 26-1		
Silicon Bronze		
Silicon Copper		
Stellite		
Tantalum		
Titanium		
Zirconium		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

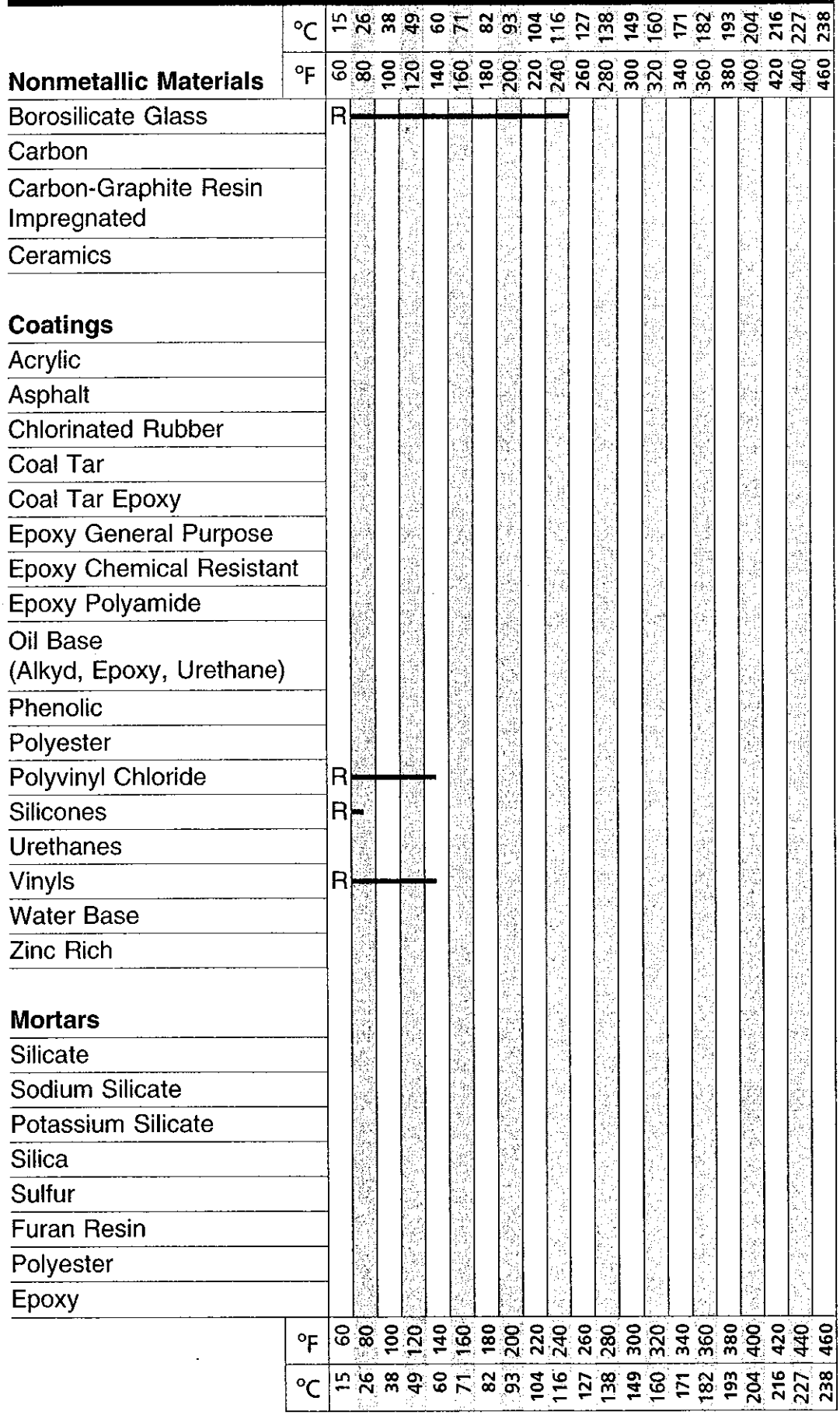
°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS
E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year
S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS
R = Resistant
U = Unsatisfactory

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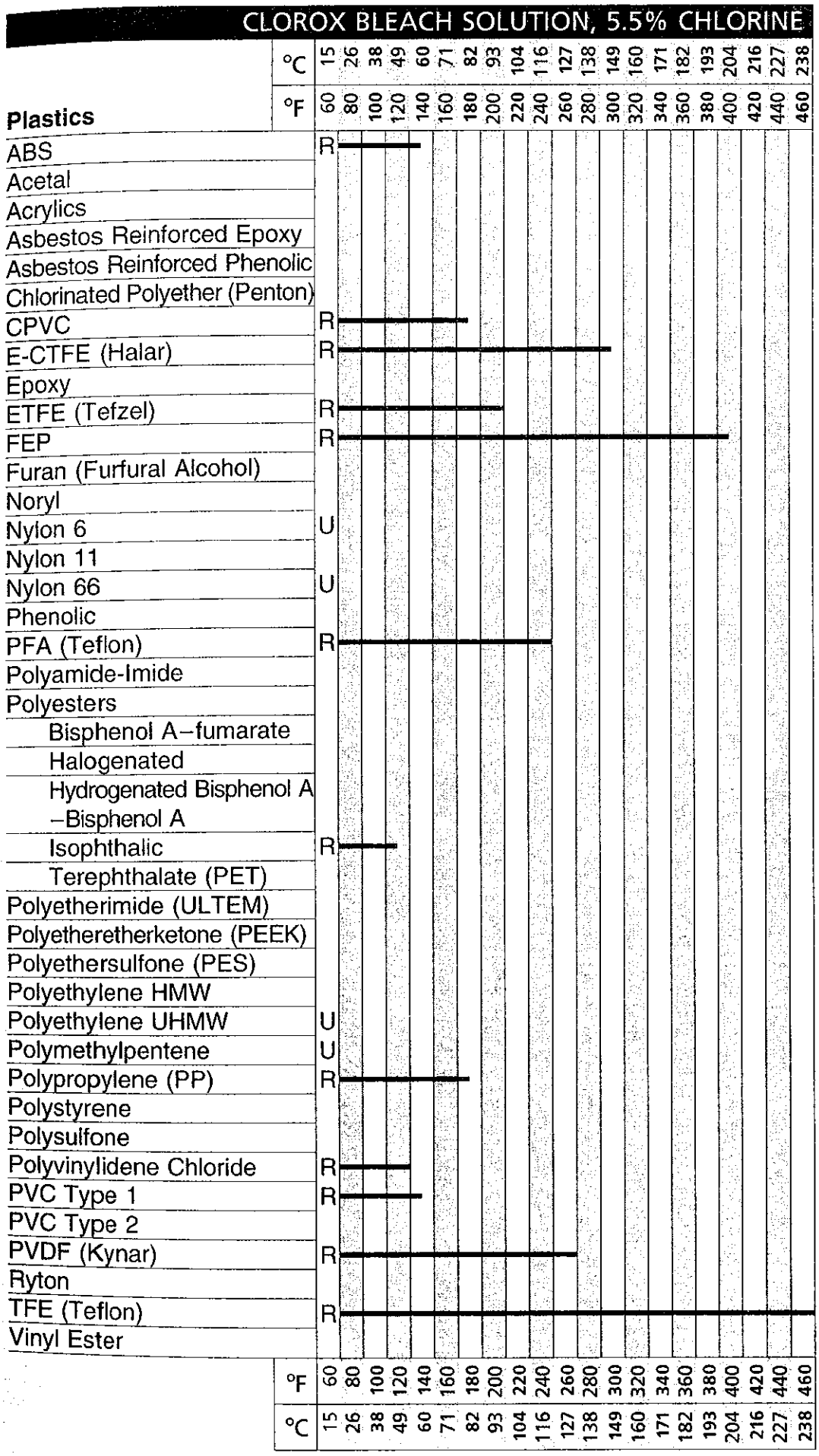
CLOROX BLEACH SOLUTION, 5.5% CHLORINE



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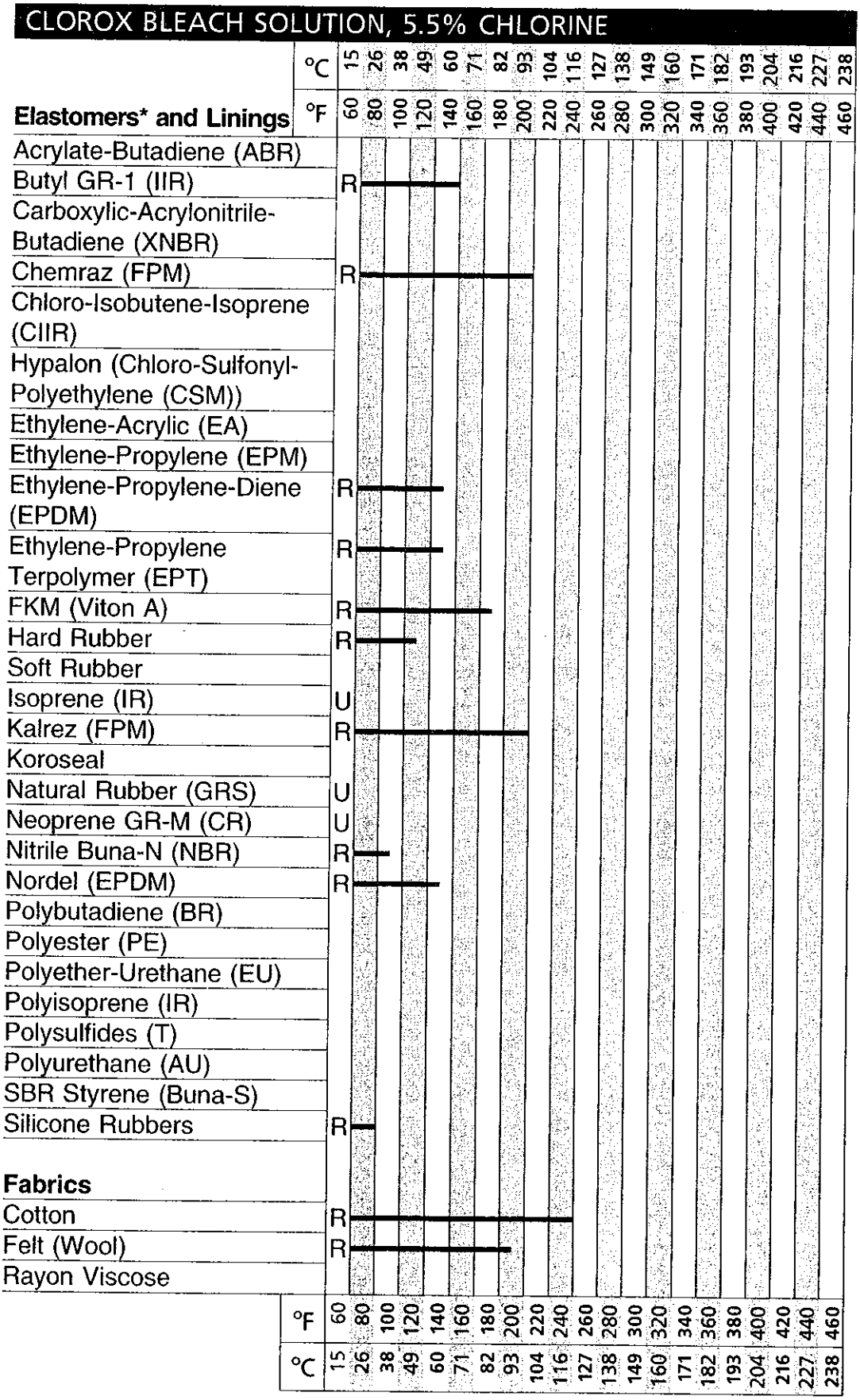
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CLOROX BLEACH SOLUTION, 5.5% CHLORINE



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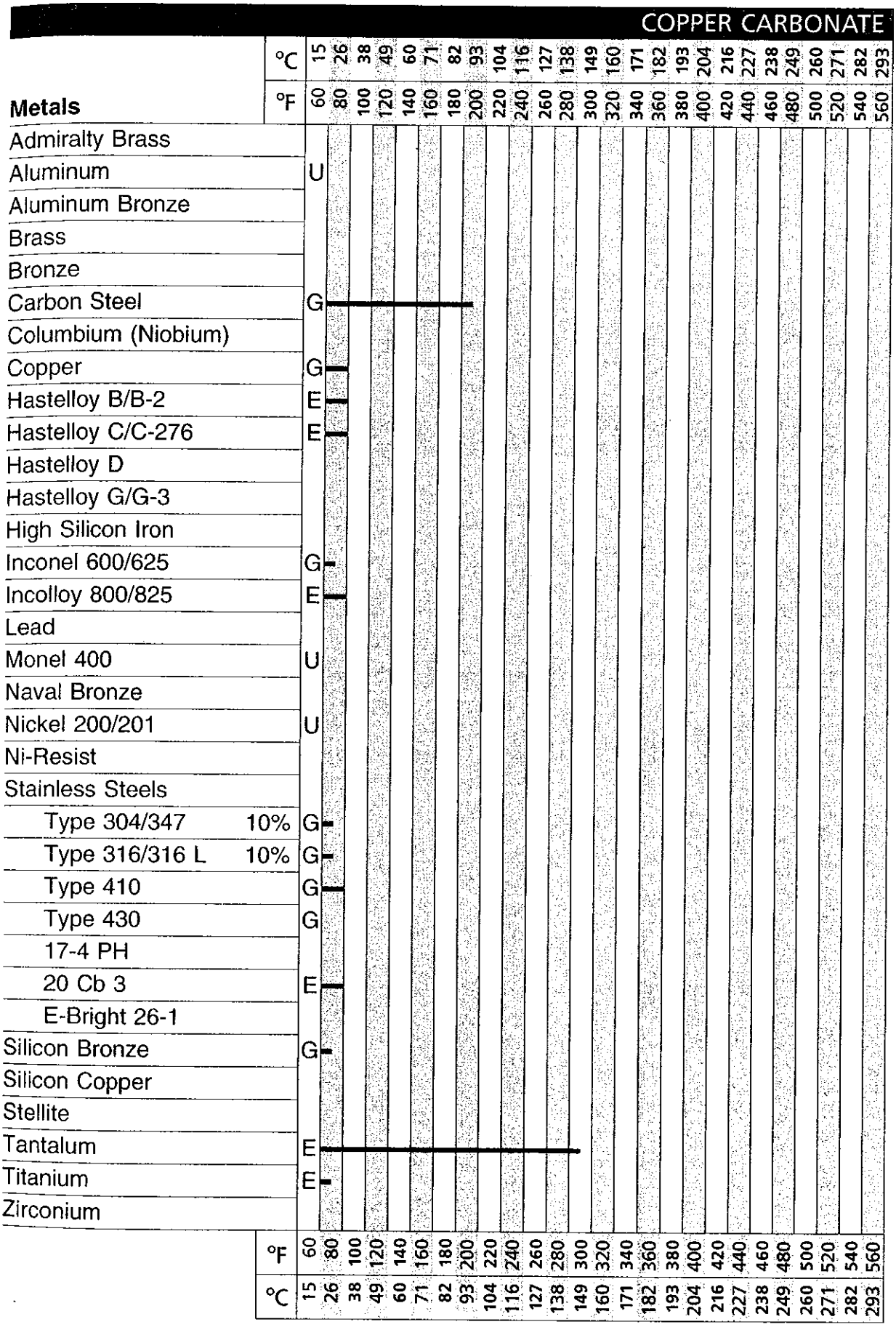
CLOROX BLEACH SOLUTION, 5.5% CHLORINE



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

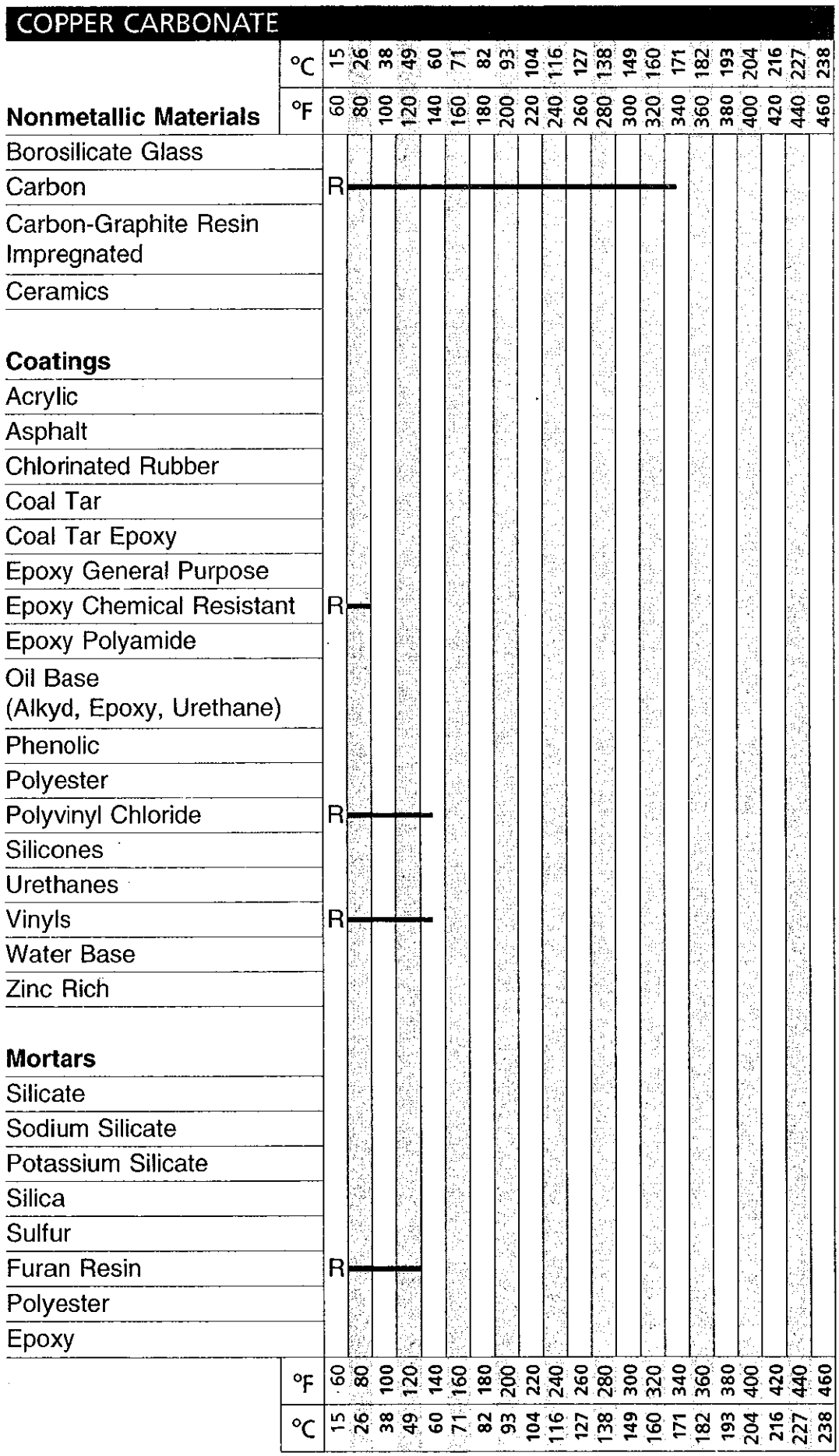
R = Resistant

U = Unsatisfactory

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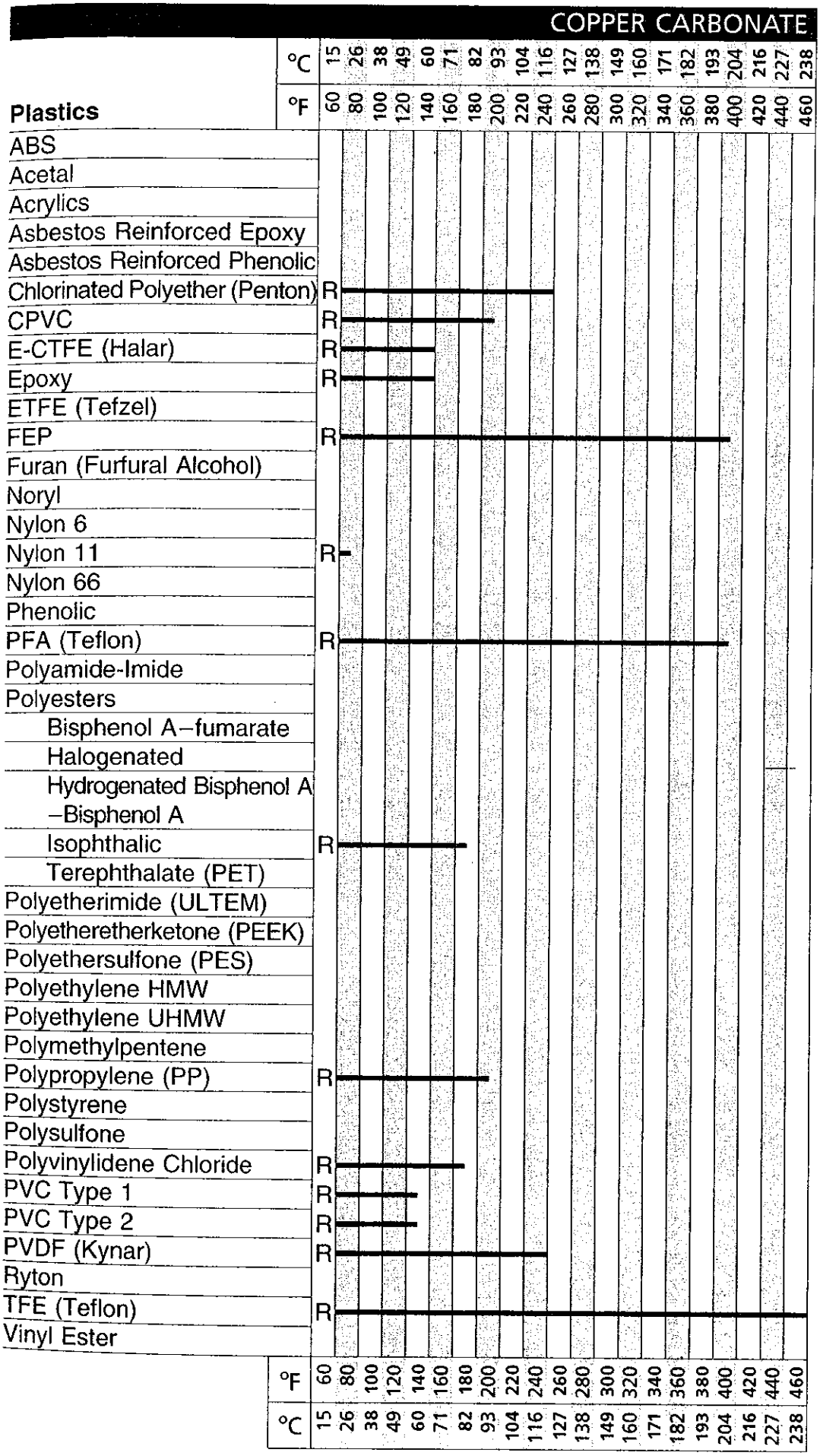
COPPER CARBONATE



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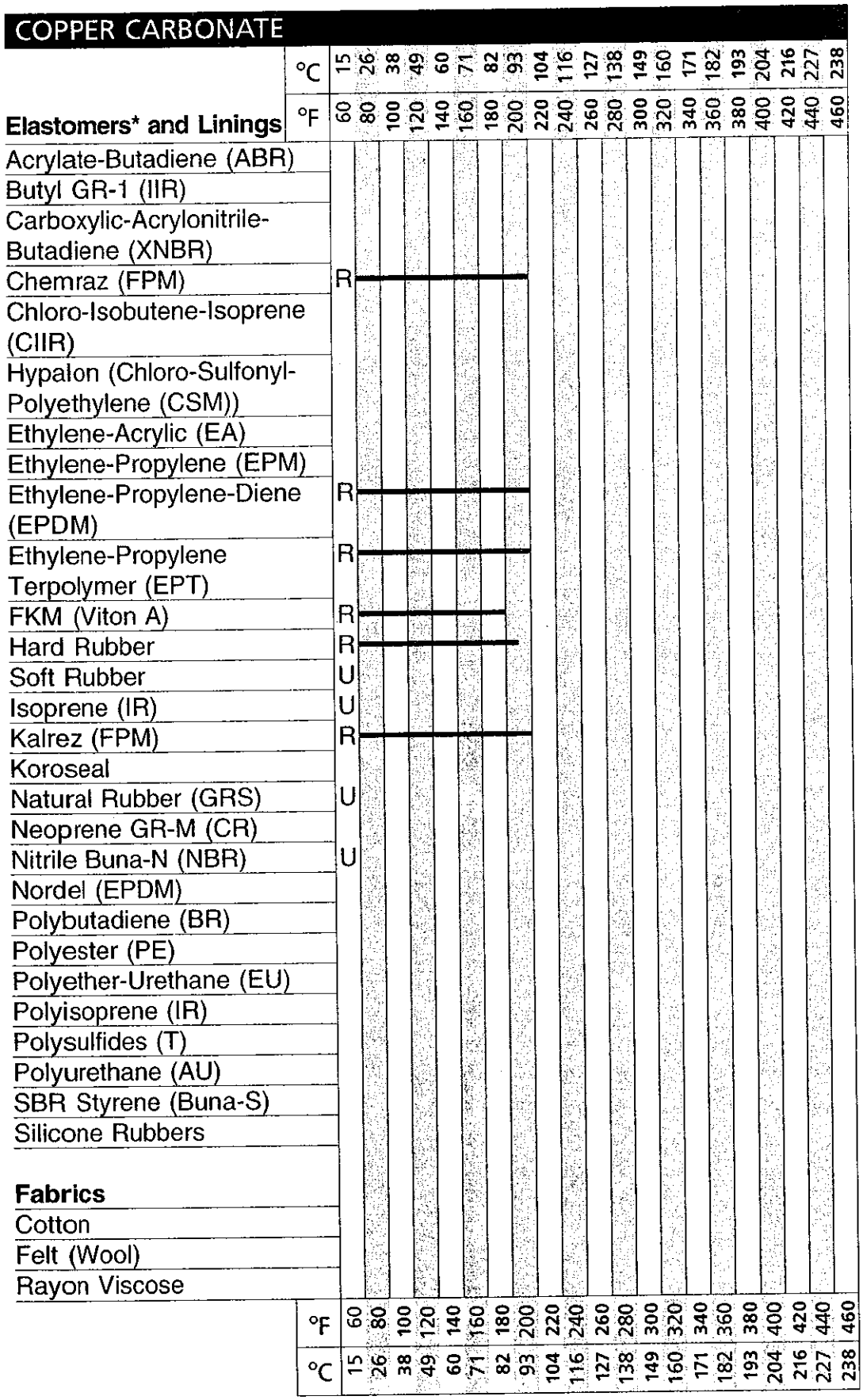
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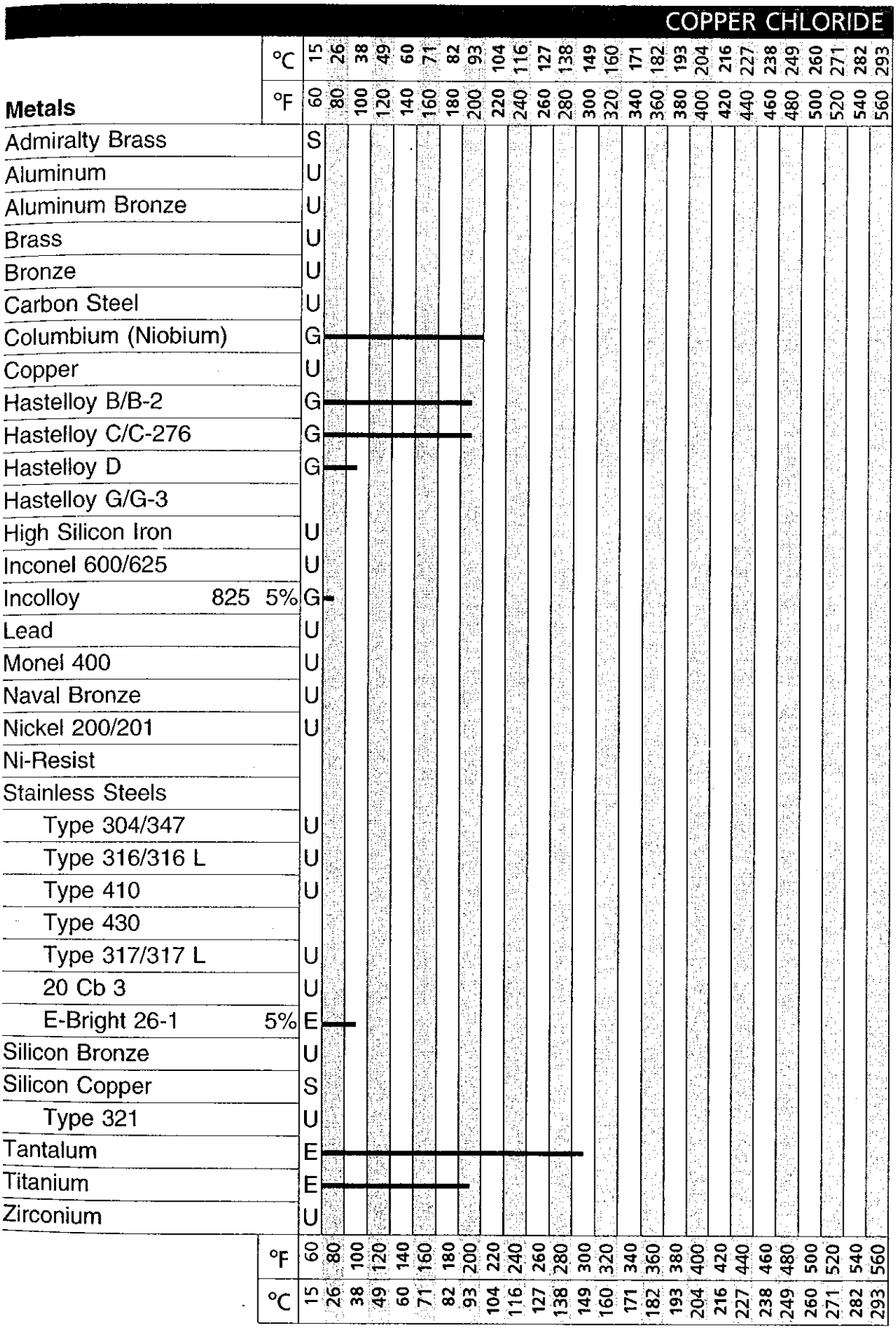


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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

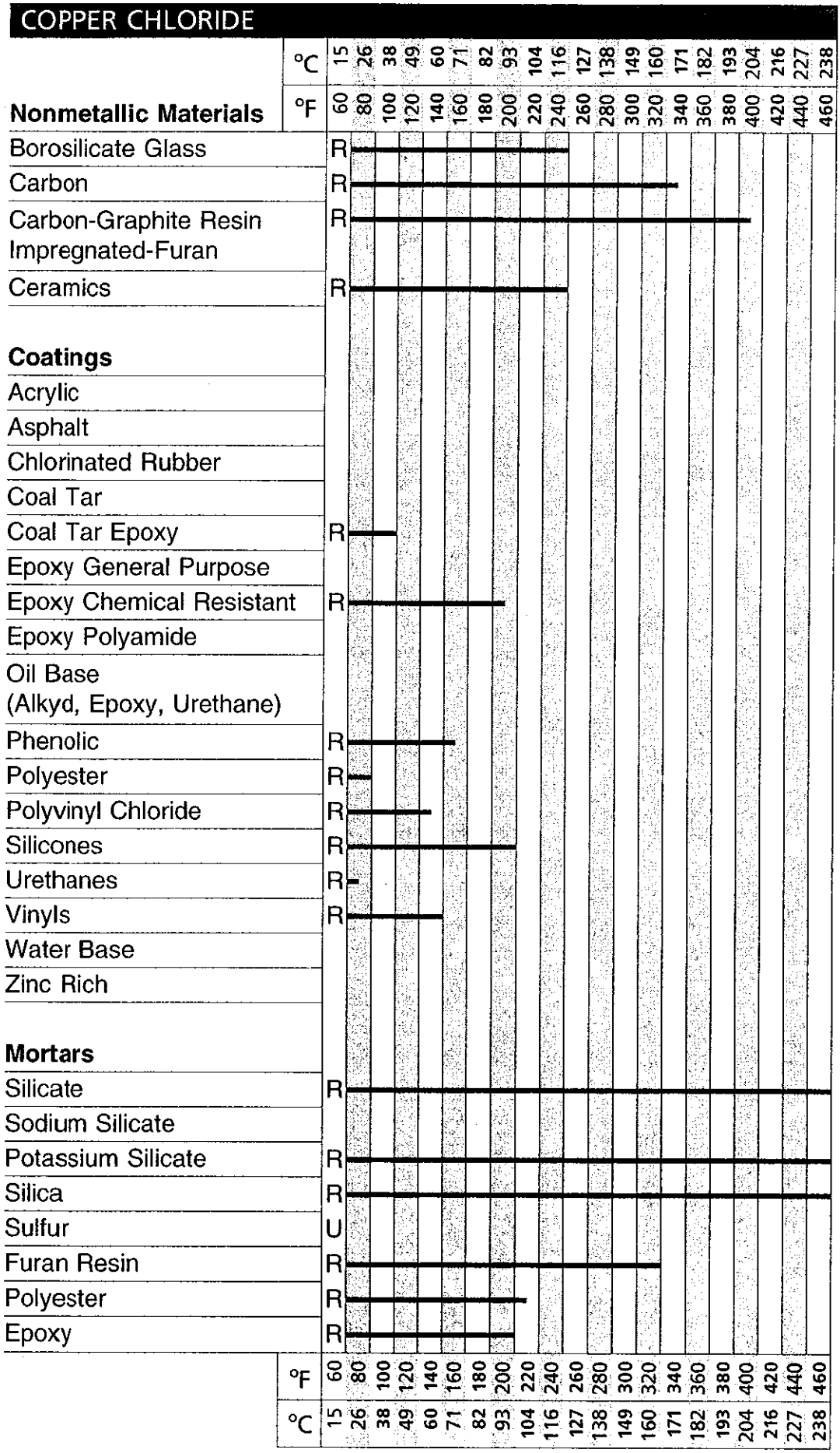
R = Resistant

U = Unsatisfactory

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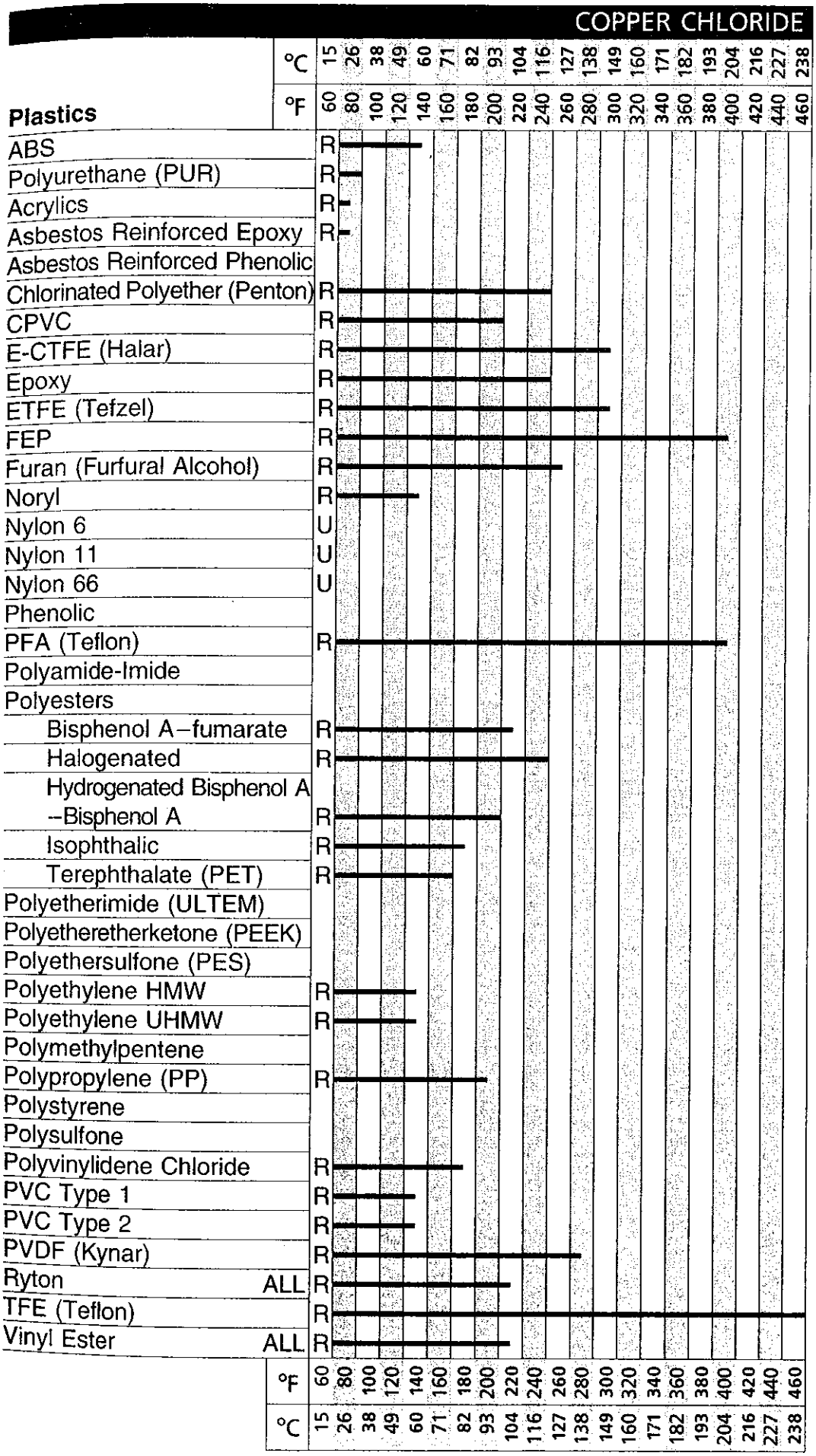
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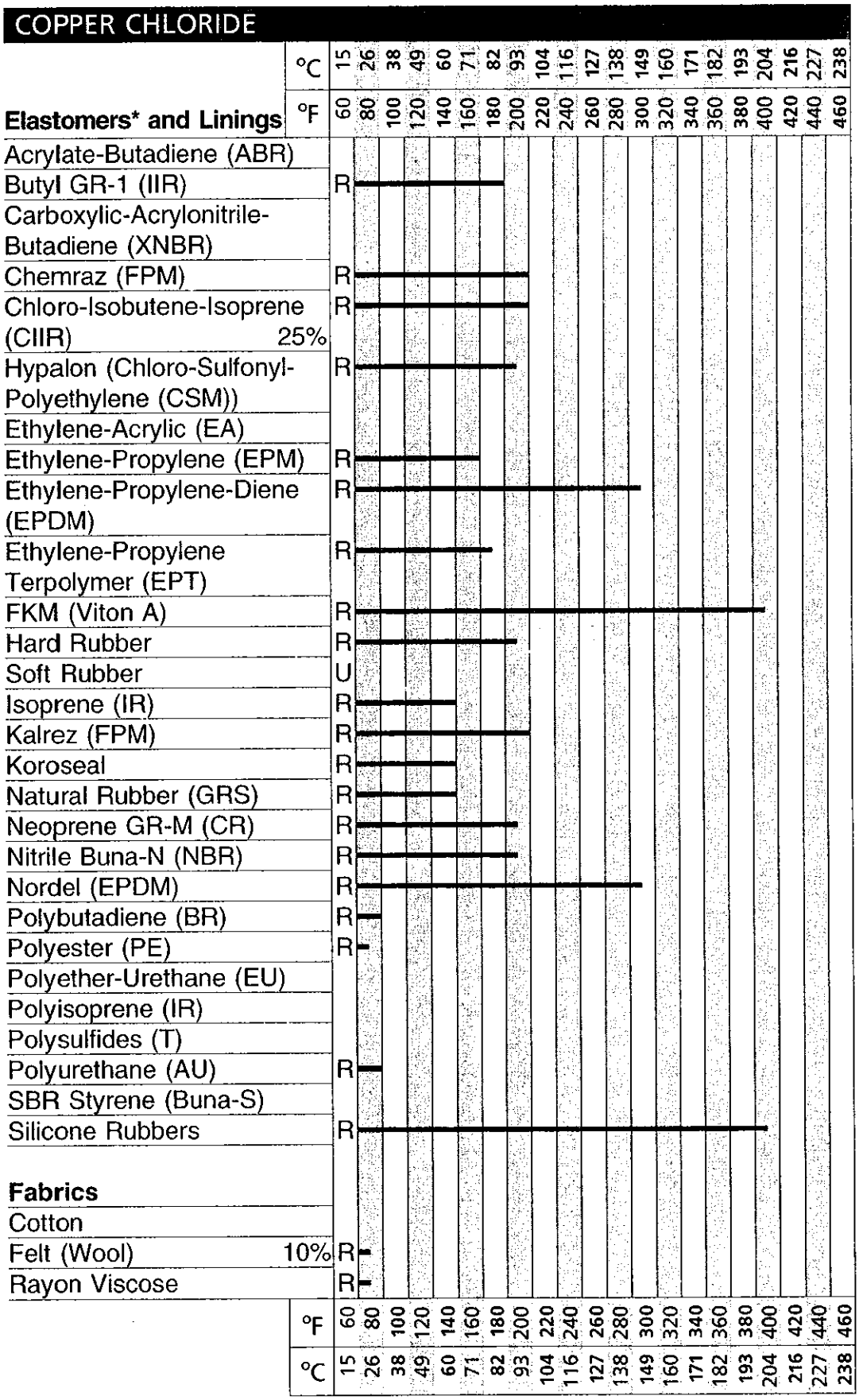
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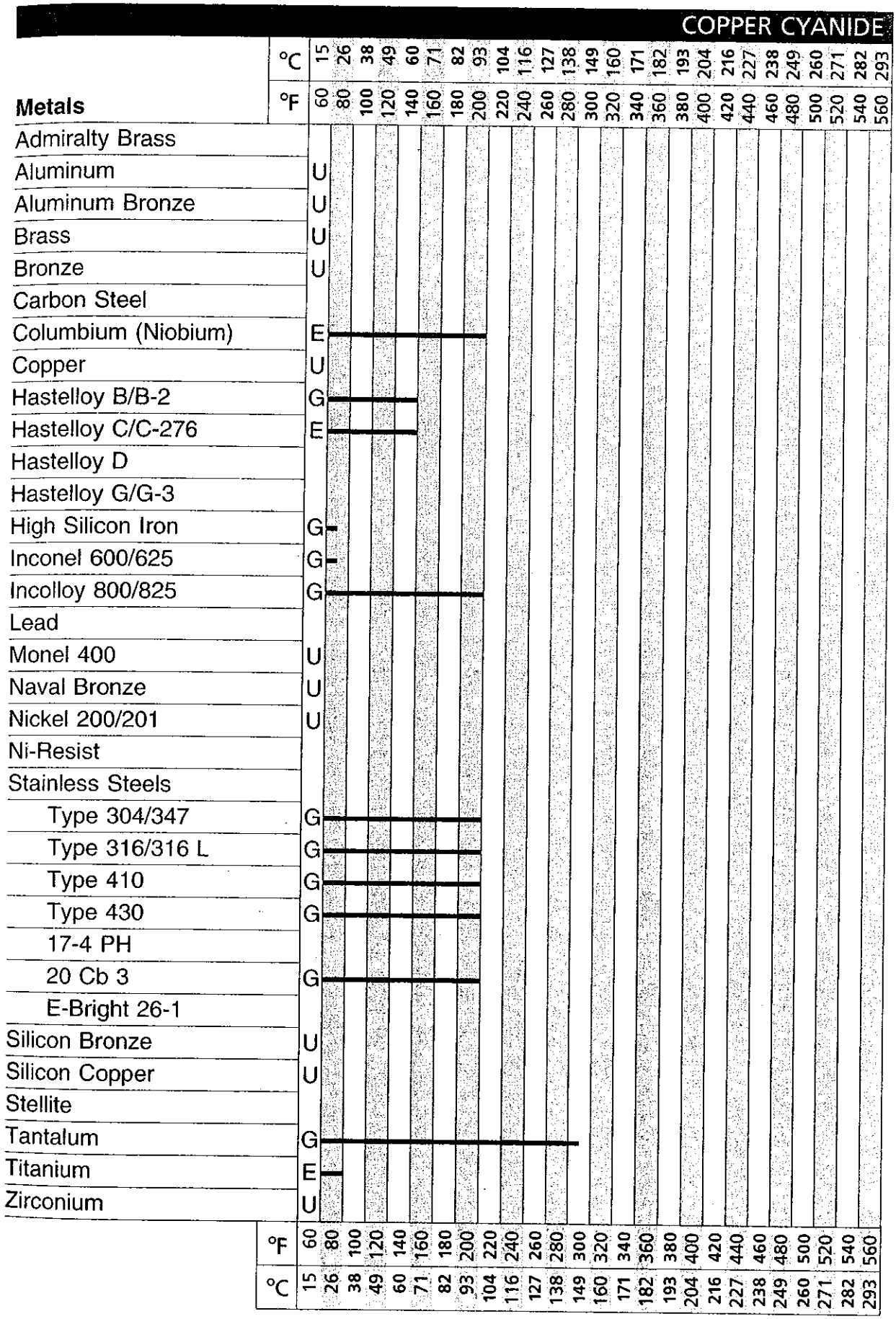
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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

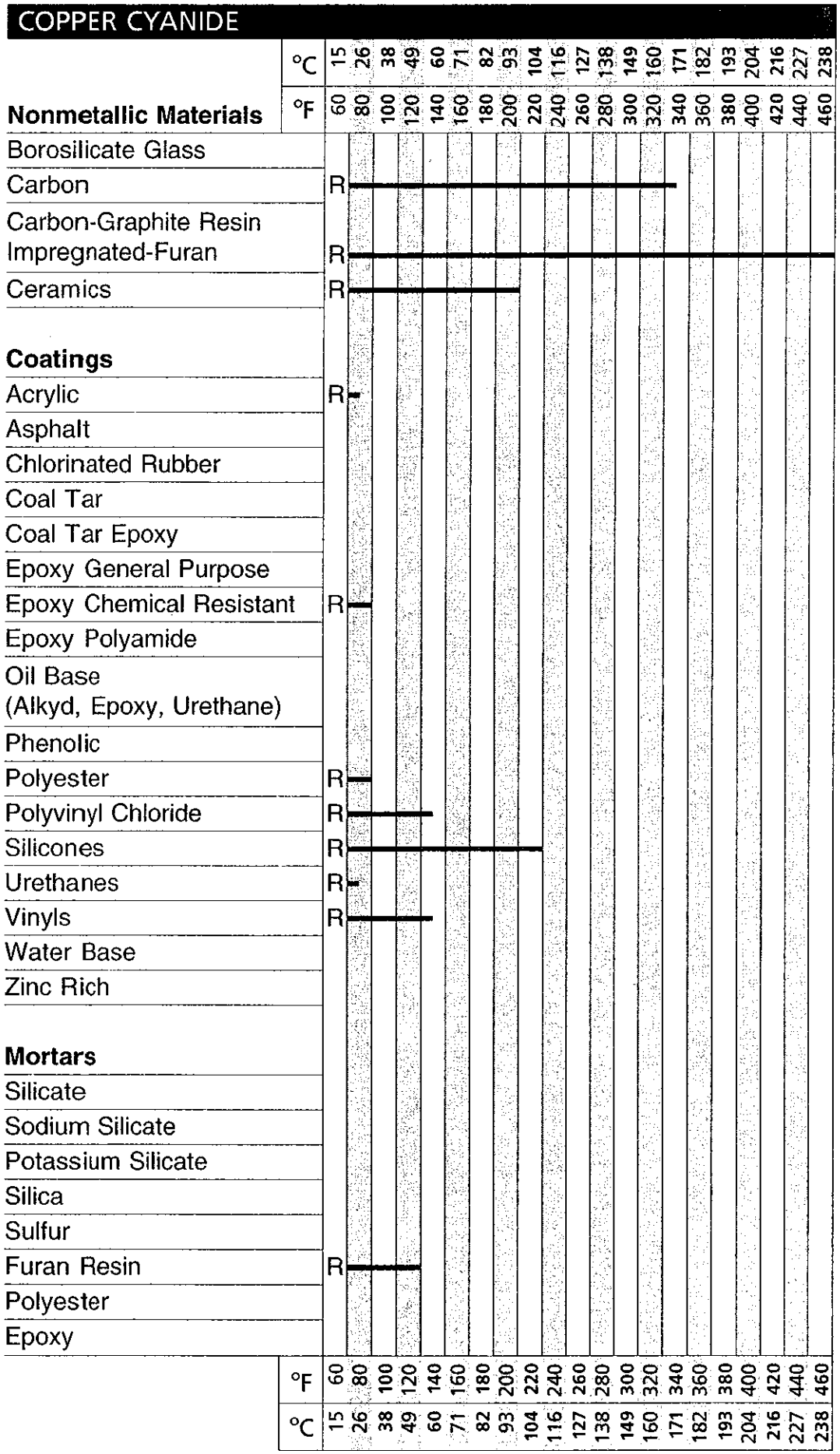
R = Resistant

U = Unsatisfactory

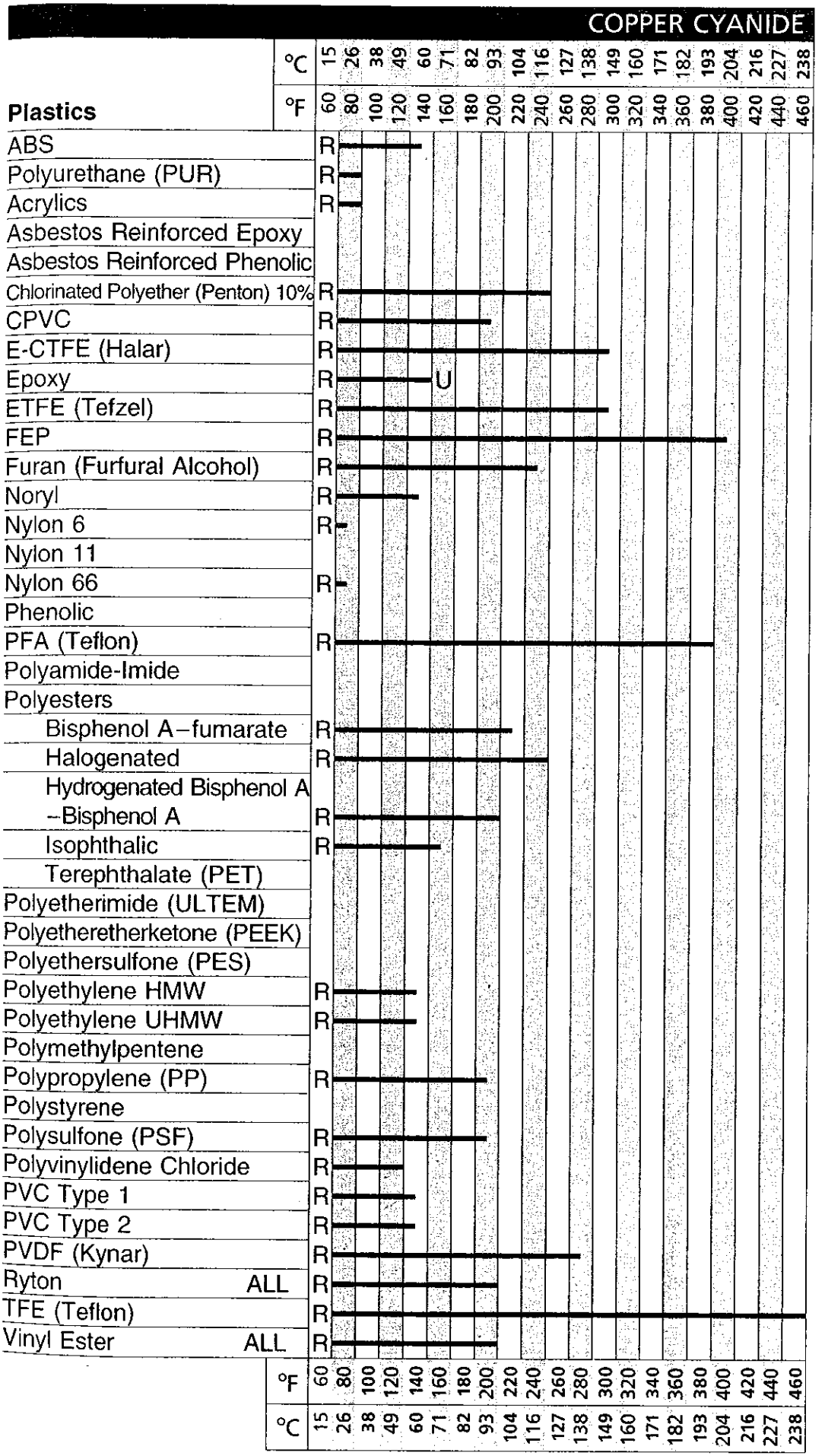
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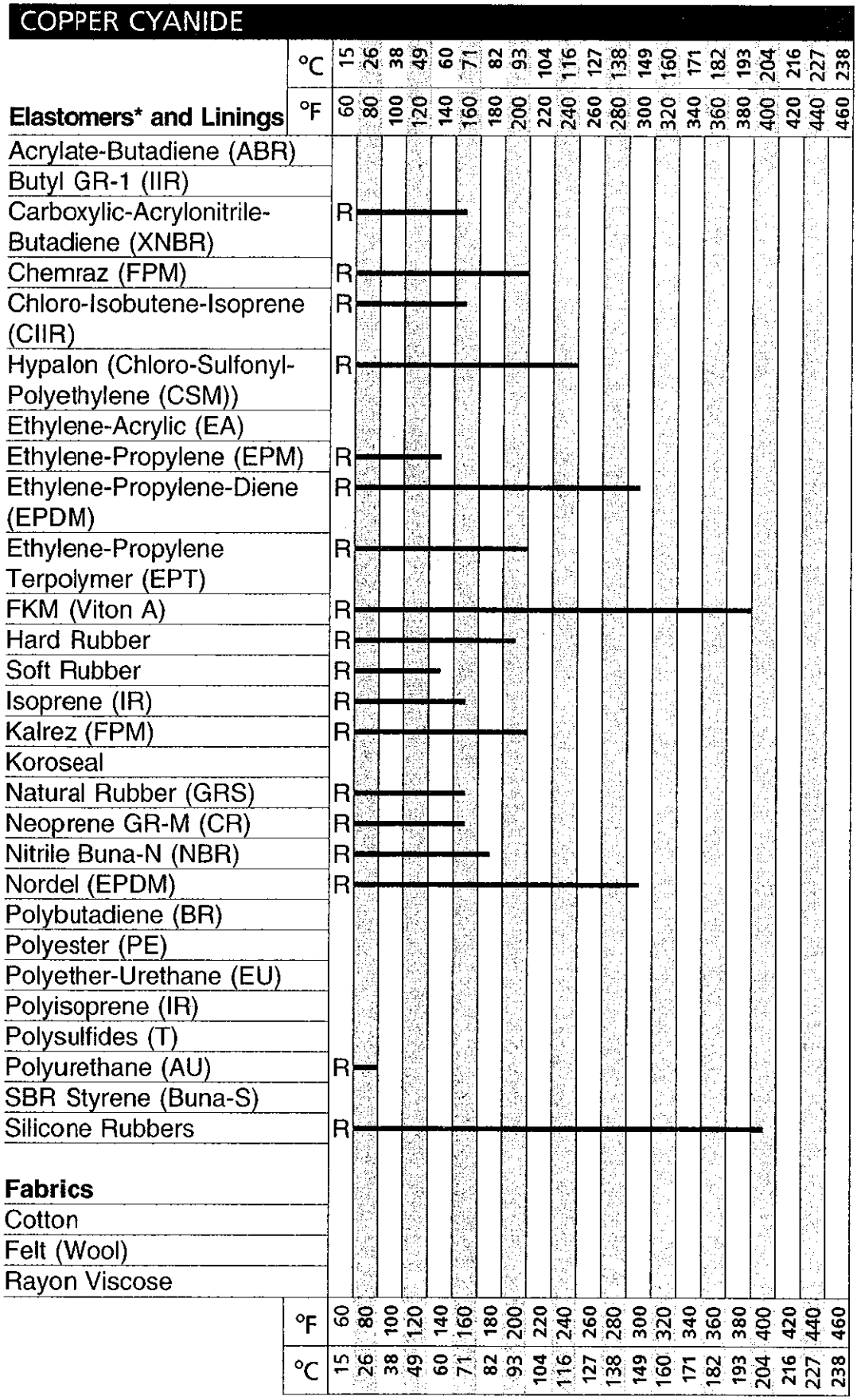


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Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)	U																										
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L																											
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum	U																										
Titanium	U																										
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

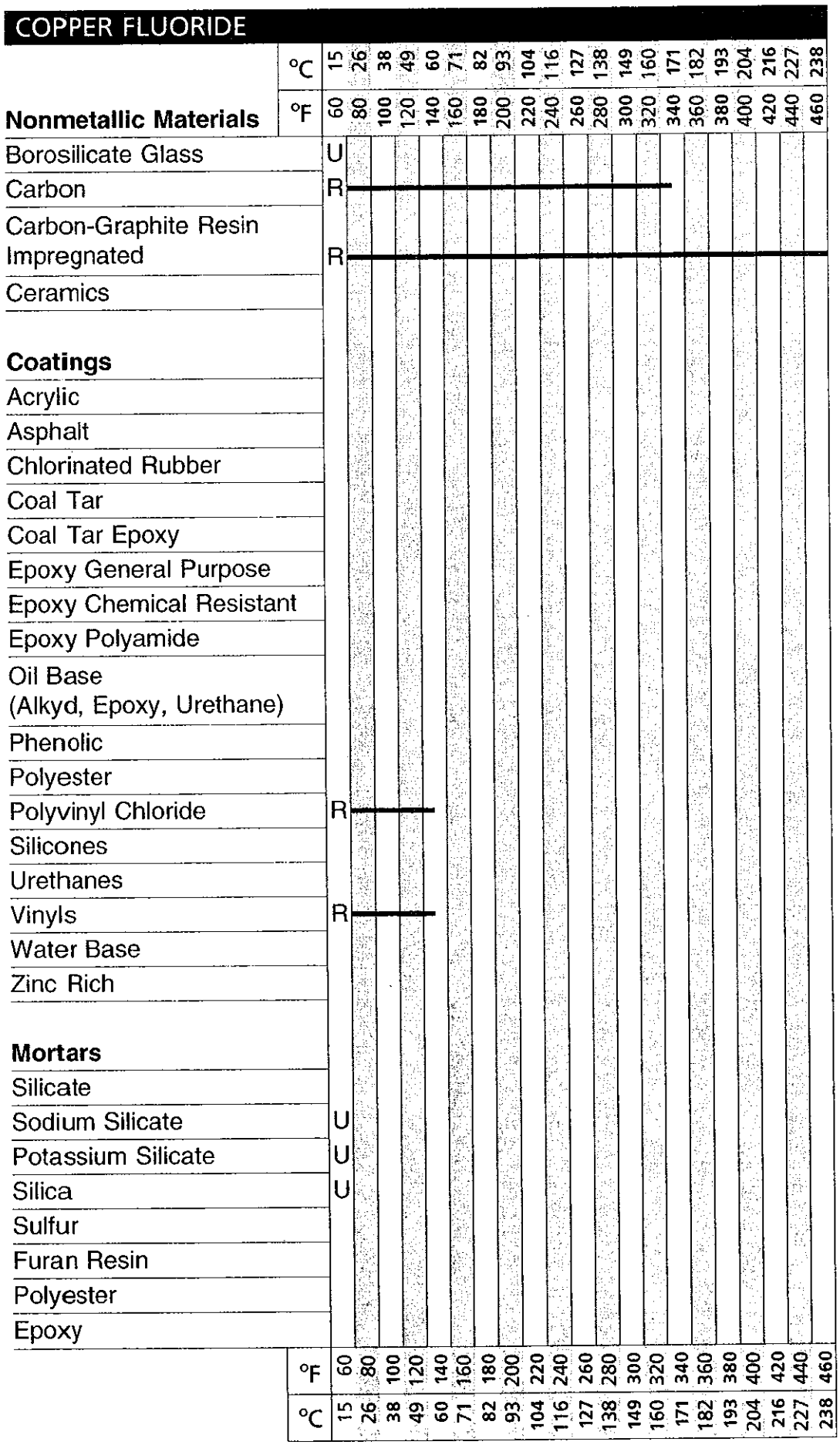
R = Resistant

U = Unsatisfactory

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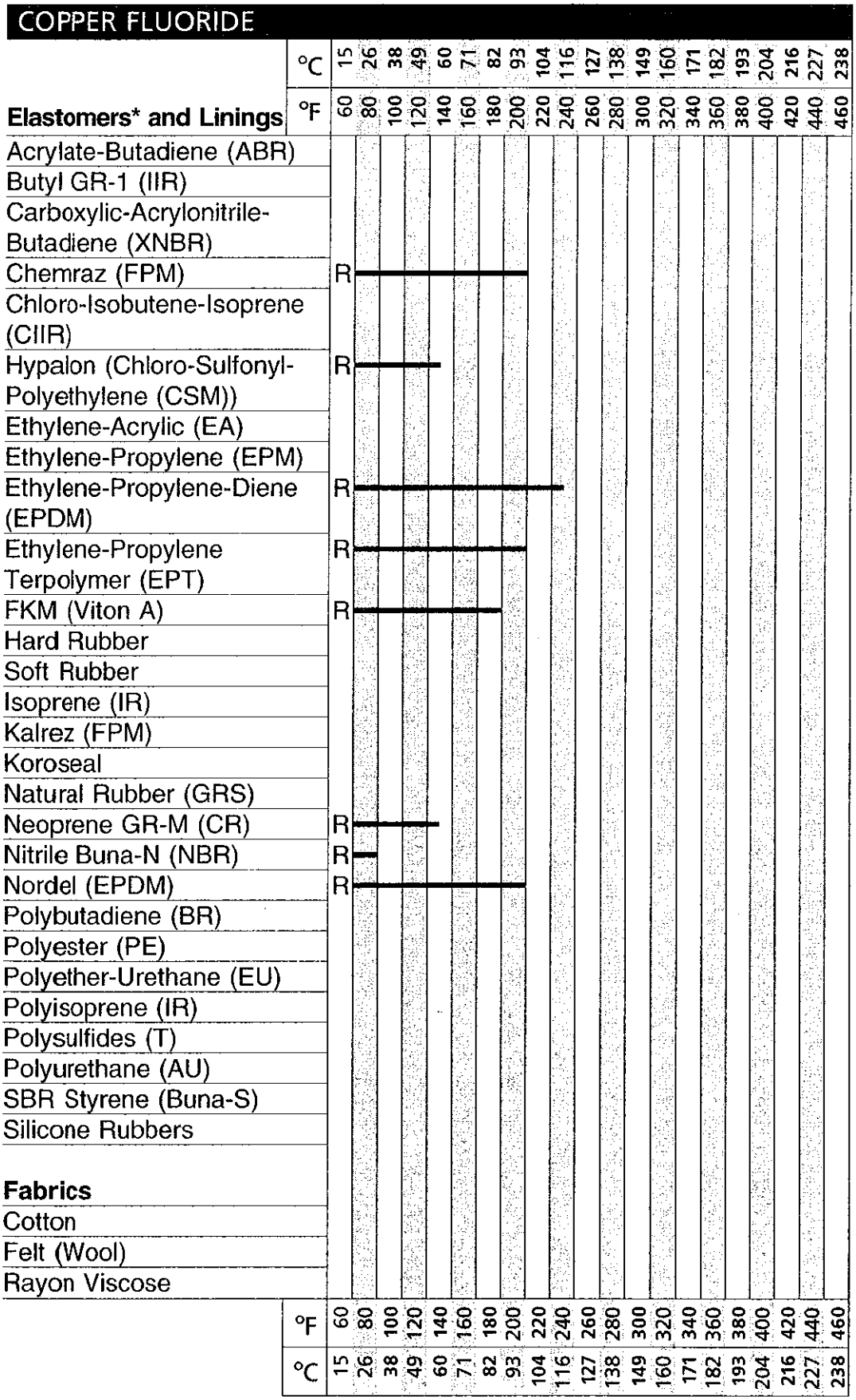
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Plastics		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS	2%		R																				
Acetal																							
Acrylics																							
Asbestos Reinforced Epoxy																							
Asbestos Reinforced Phenolic																							
Chlorinated Polyether (Penton)			R																				
CPVC			R																				
E-CTFE (Halar)			R																				
Epoxy			R																				
ETFE (Tefzel)			R																				
FEP			R																				
Furan (Furfural Alcohol)																							
Noryl			R																				
Nylon 6																							
Nylon 11																							
Nylon 66																							
Phenolic																							
PFA (Teflon)			R																				
Polyamide-Imide																							
Polyesters																							
Bisphenol A–fumarate			R																				
Halogenated			R																				
Hydrogenated Bisphenol A –Bisphenol A																							
Isophthalic			R	U																			
Terephthalate (PET)																							
Polyetherimide (ULTEM)																							
Polyetheretherketone (PEEK)																							
Polyethersulfone (PES)																							
Polyethylene HMW			R																				
Polyethylene UHMW			R																				
Polymethylpentene																							
Polypropylene (PP)			R																				
Polystyrene																							
Polysulfone																							
Polyvinylidene Chloride			R																				
PVC Type 1			R																				
PVC Type 2			R																				
PVDF (Kynar)			R																				
Ryton																							
TFE (Teflon)			R																				
Vinyl Ester			R																				
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass			S																									
Aluminum			U																									
Aluminum Bronze			U																									
Brass			G																									
Bronze			U																									
Carbon Steel			U																									
Columbium (Niobium)			E																									
Copper			U																									
Hastelloy B/B-2			U																									
Hastelloy C/C-276			G																									
Hastelloy D																												
Hastelloy G/G-3																												
High Silicon Iron			G																									
Inconel 600/625			U																									
Incolloy 800/825	50%		E																									
Lead																												
Monel 400			U																									
Naval Bronze			U																									
Nickel 200/201			U																									
Ni-Resist																												
Stainless Steels																												
Type 304/347			E																									
Type 316/316 L			E																									
Type 400 series			G																									
Type 904-L																												
17-4 PH																												
20 Cb 3			E																									
E-Bright 26-1																												
Silicon Bronze			U																									
Silicon Copper			U																									
Stellite																												
Tantalum			E																									
Titanium			E																									
Zirconium			U																									
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

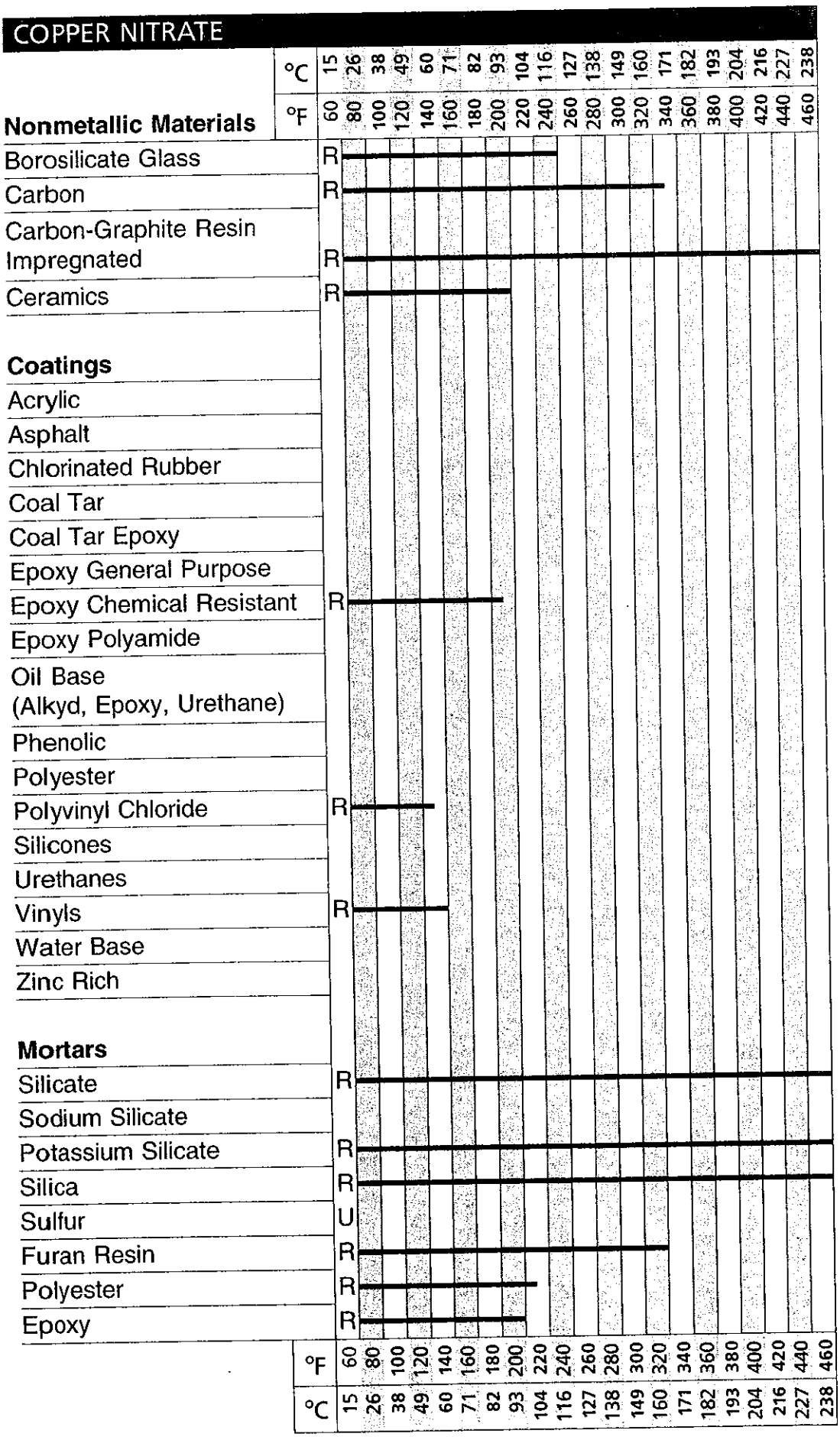
R = Resistant

U = Unsatisfactory

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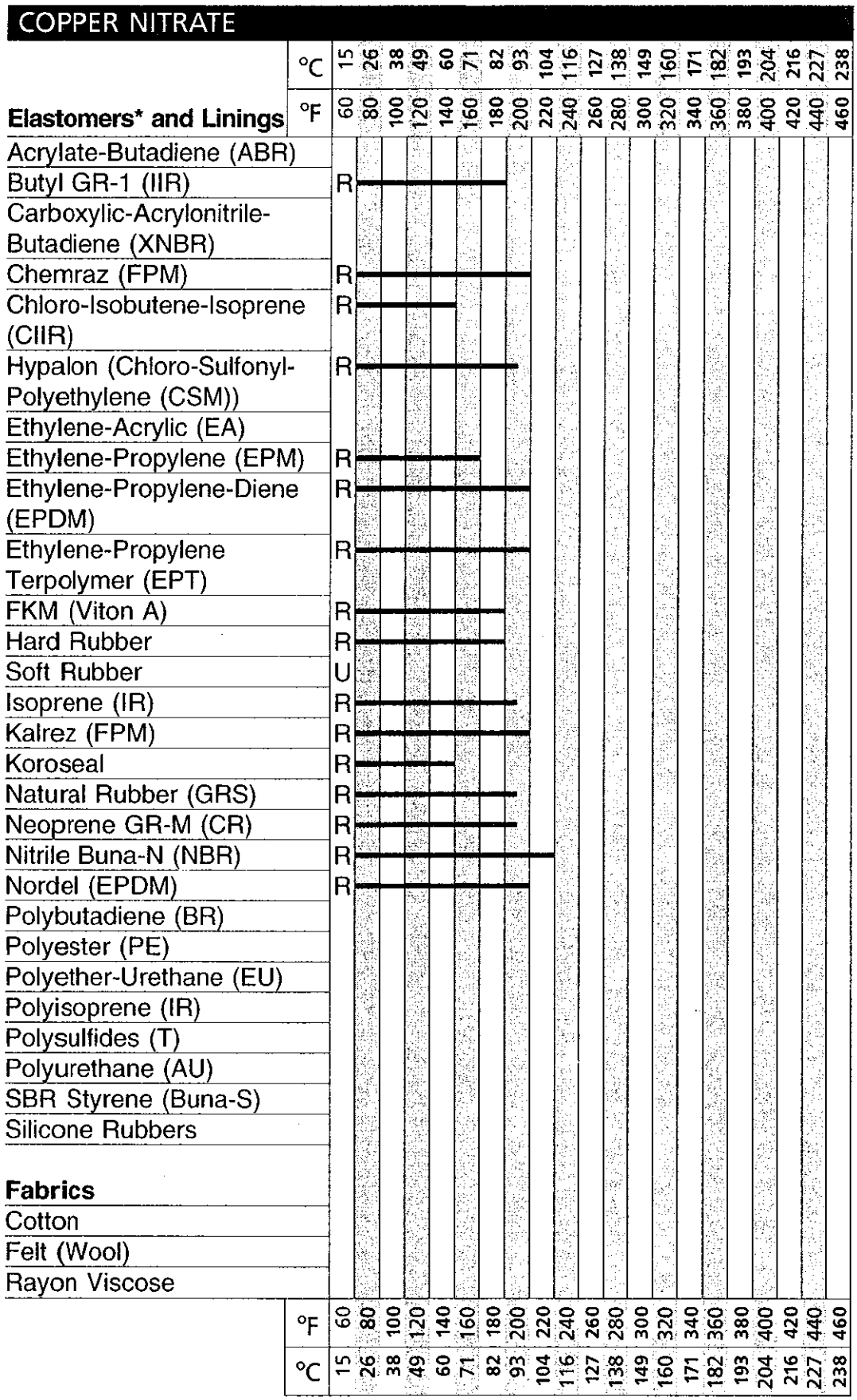
Plastics	°C	°F
ABS	R	
Acetal	U	
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)	R	
CPVC	R	
E-CTFE (Halar)	R	
Epoxy	R	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)	R	
Noryl	R	
Nylon 6	U	
Nylon 11	U	
Nylon 66	U	
Phenolic		
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	R	
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A	R	
Isophthalic	R	
Terephthalate (PET)	R	
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW	R	
Polyethylene UHMW	R	
Polymethylpentene		
Polypropylene (PP)	R	
Polystyrene		
Polysulfone	R	
Polyvinylidene Chloride	R	
PVC Type 1	R	
PVC Type 2	R	
PVDF (Kynar)	R	
Ryton		
TFE (Teflon)	R	
Vinyl Ester	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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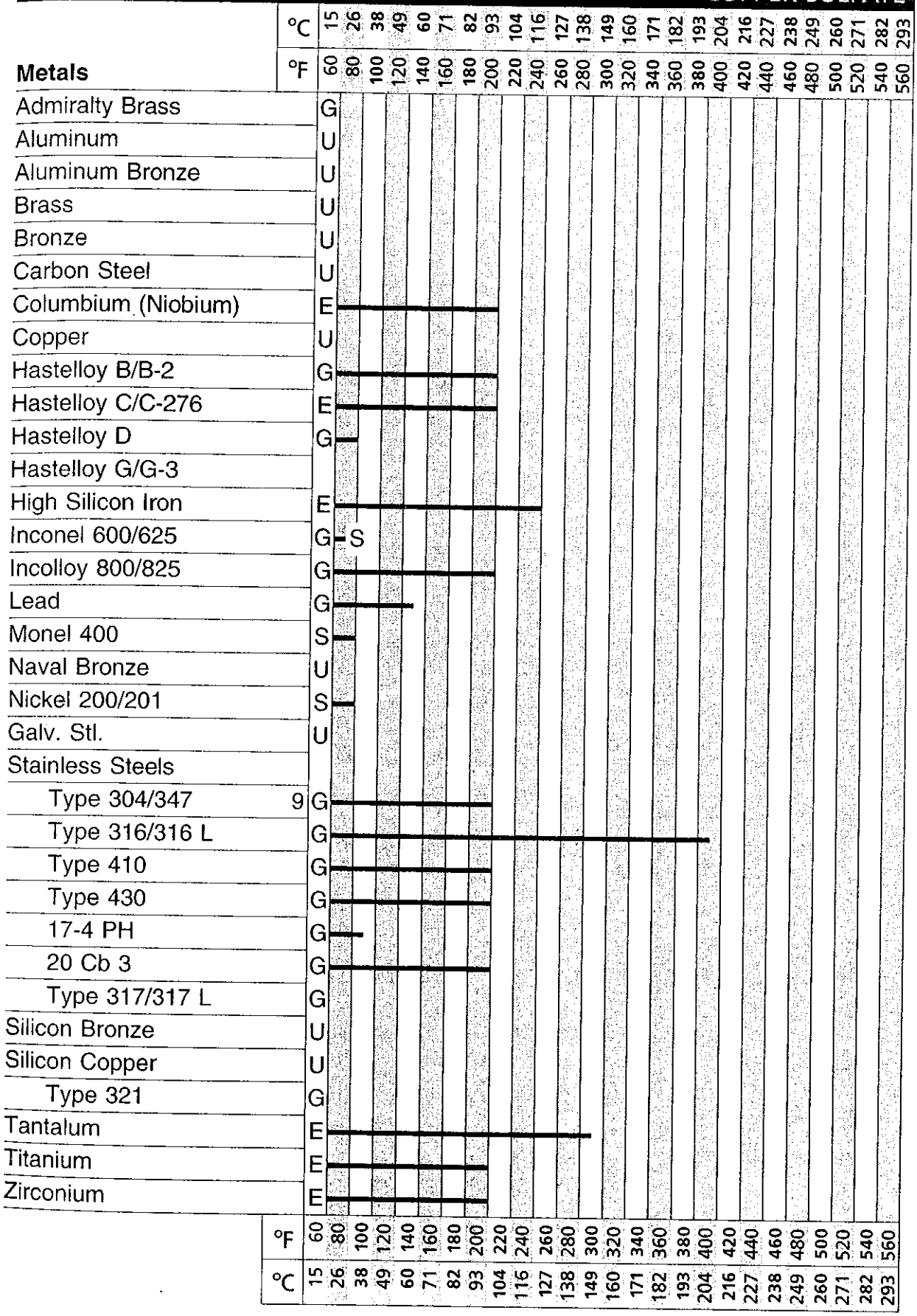
COPPER NITRATE



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COPPER SULFATE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

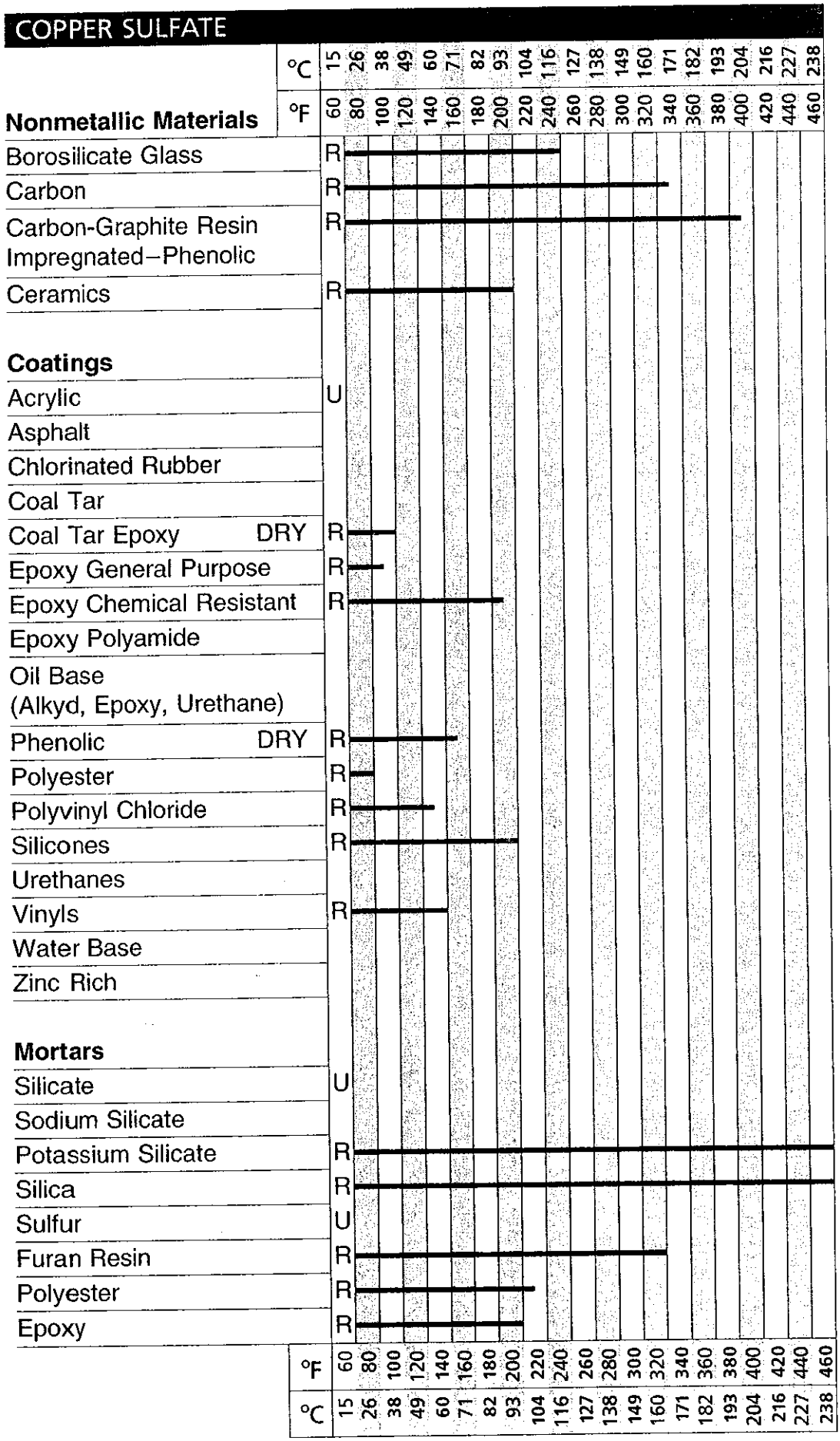
R = Resistant

U = Unsatisfactory

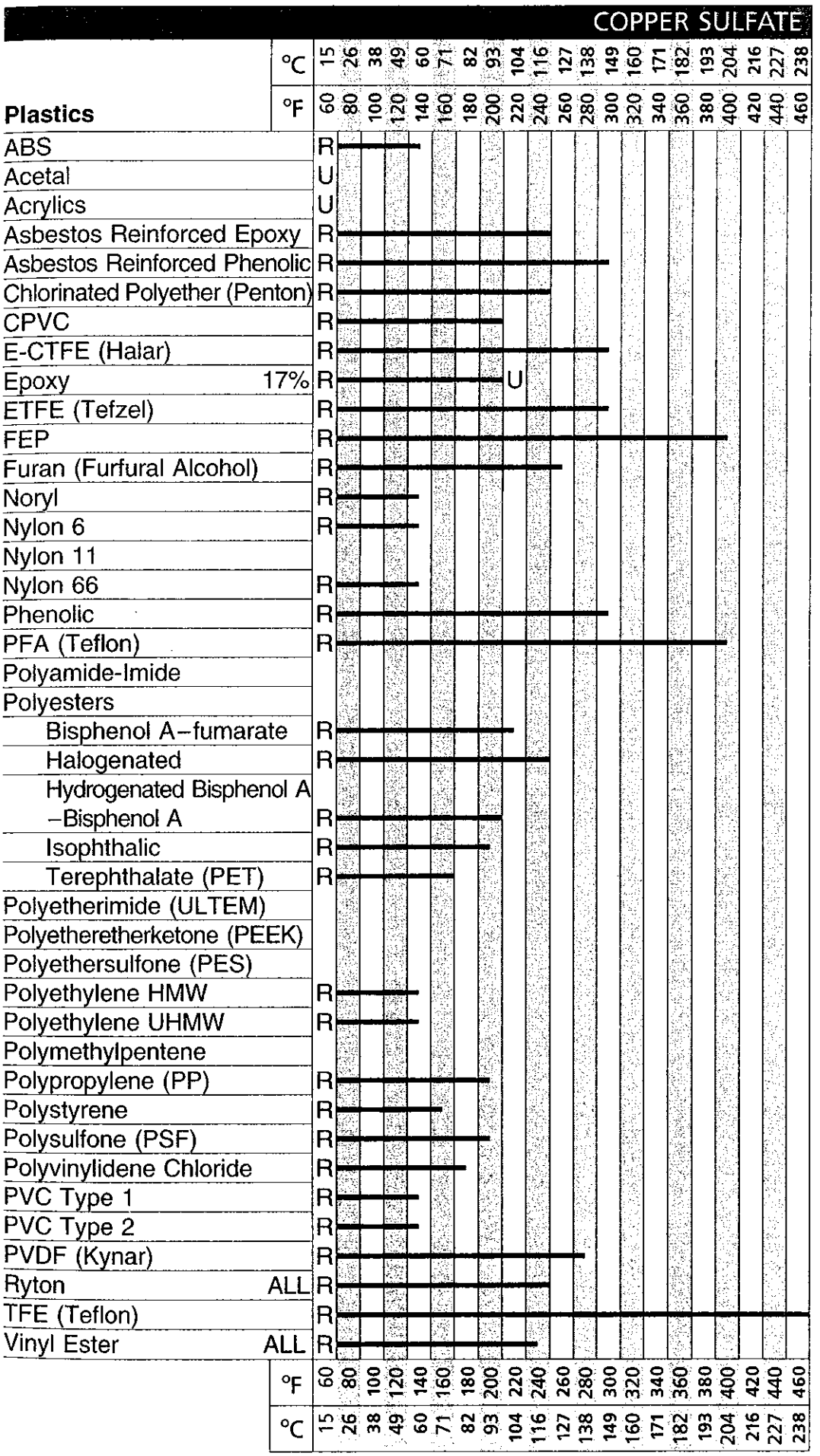
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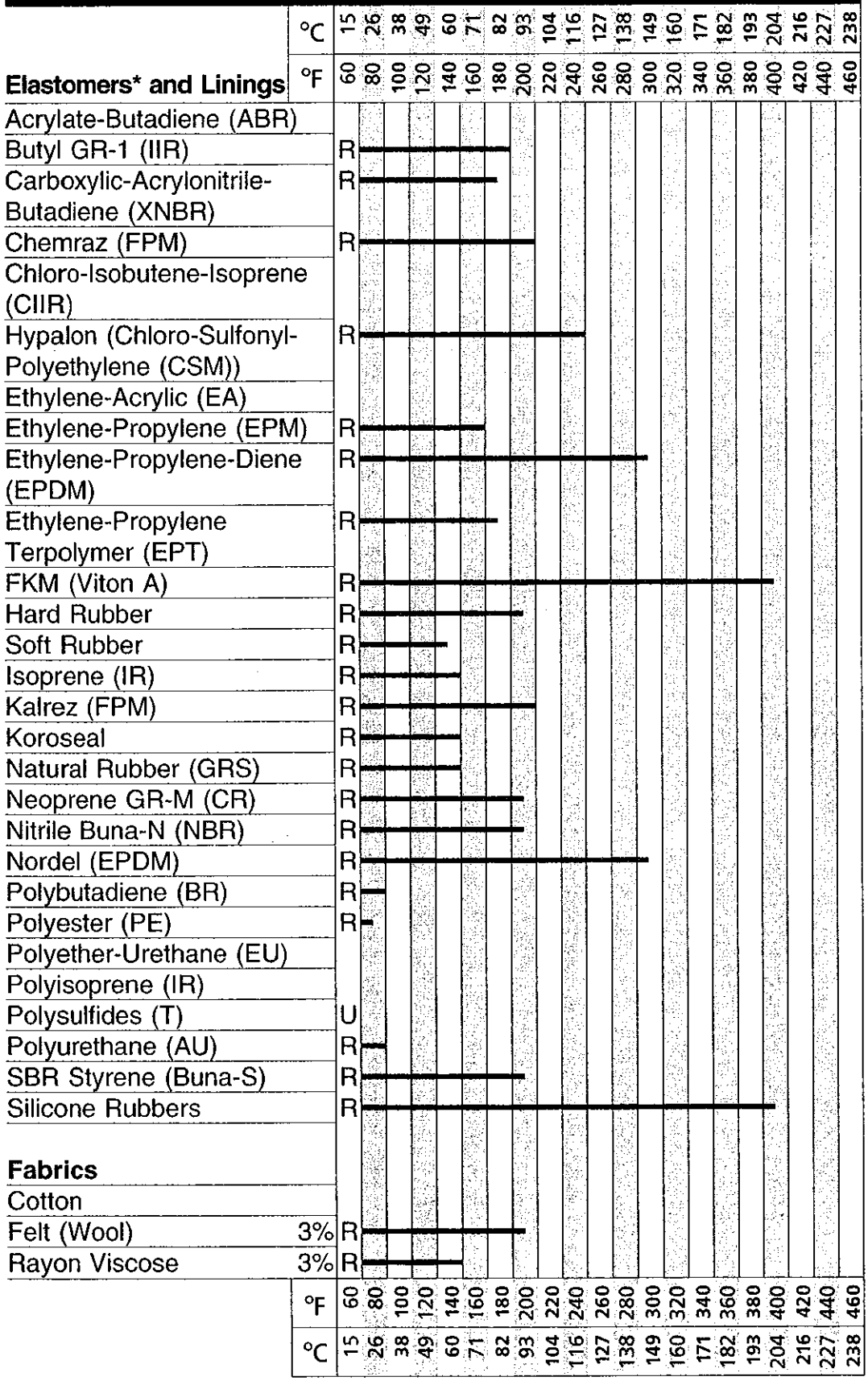


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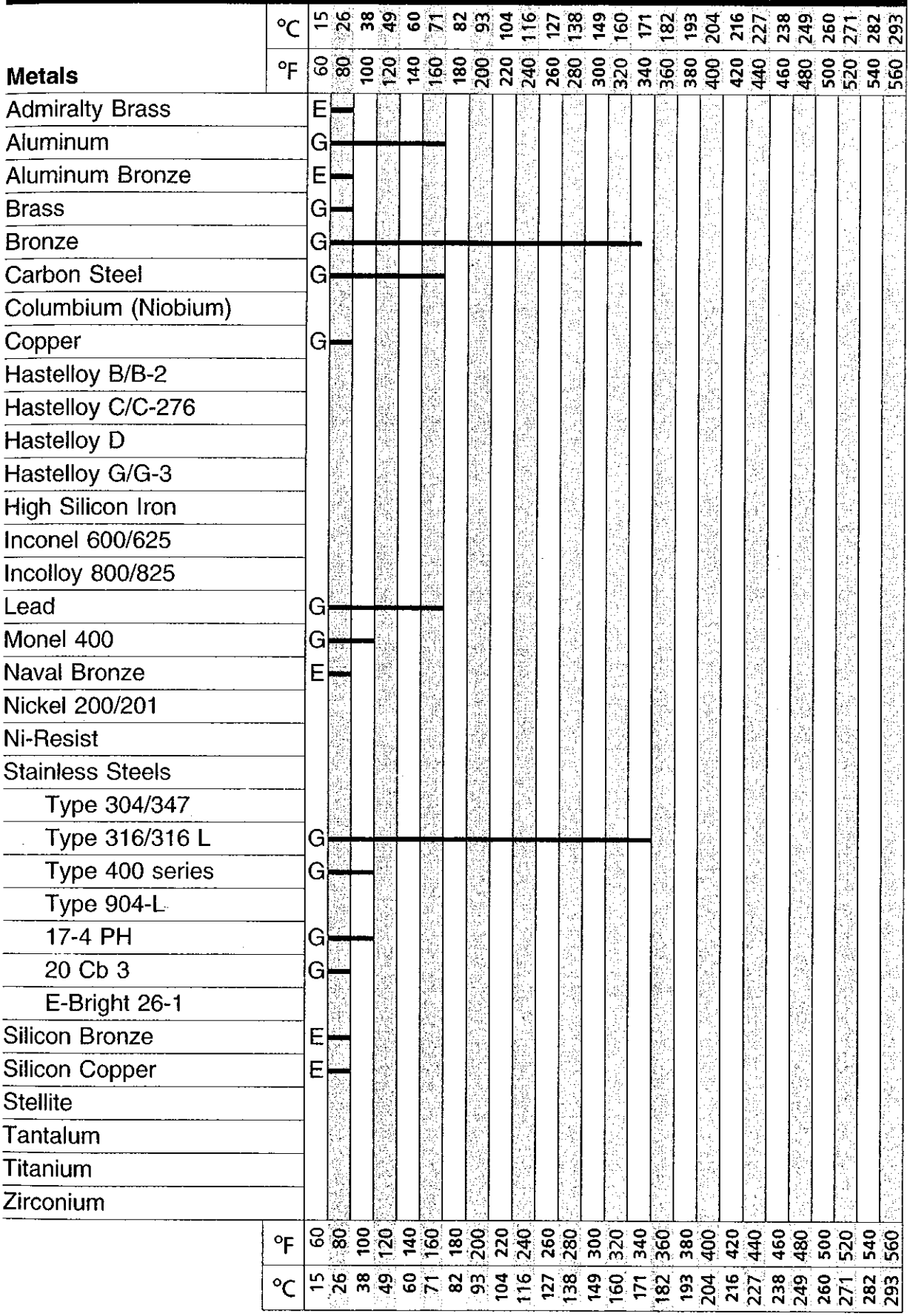
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CORN OIL



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

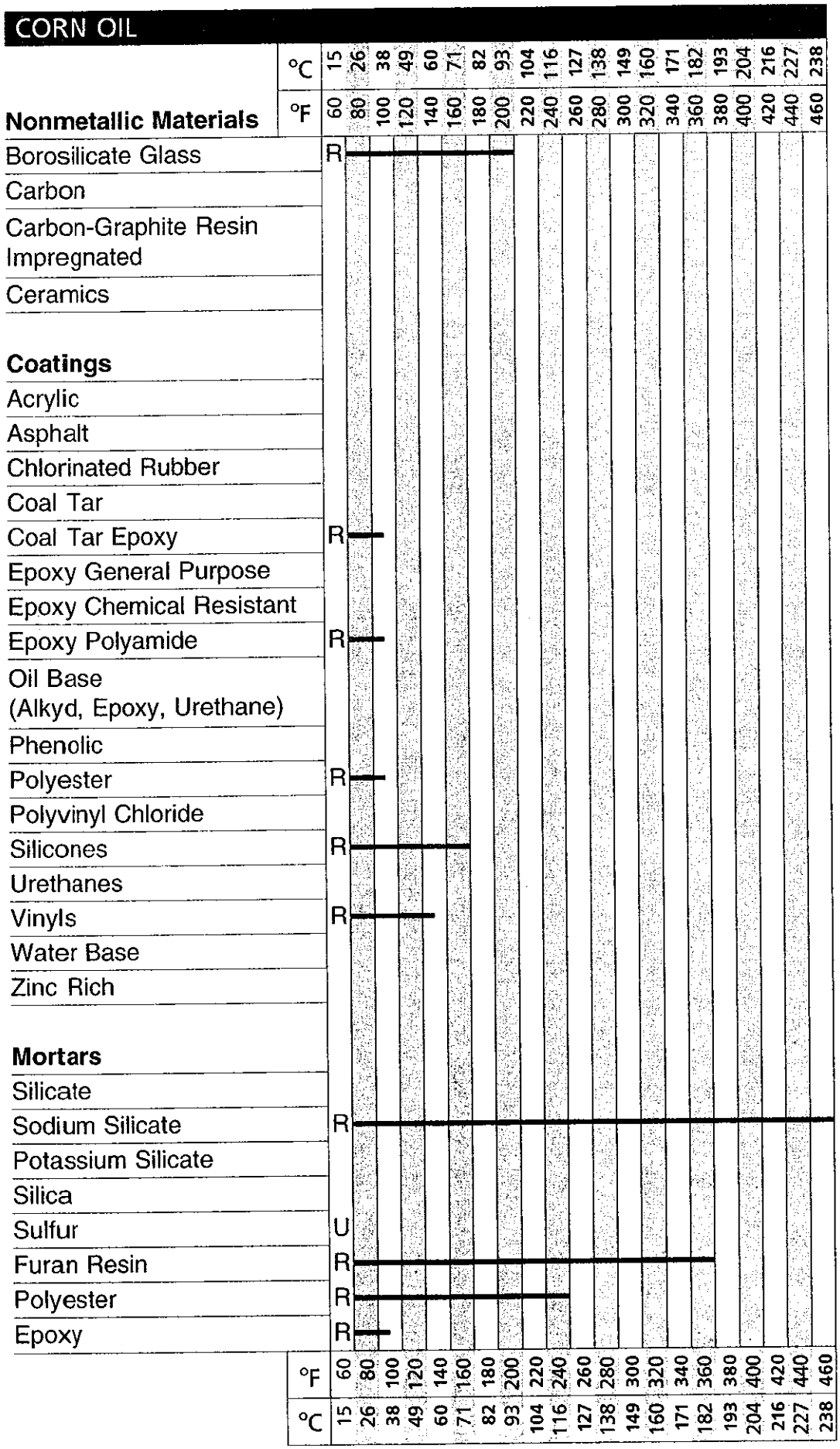
R = Resistant

U = Unsatisfactory

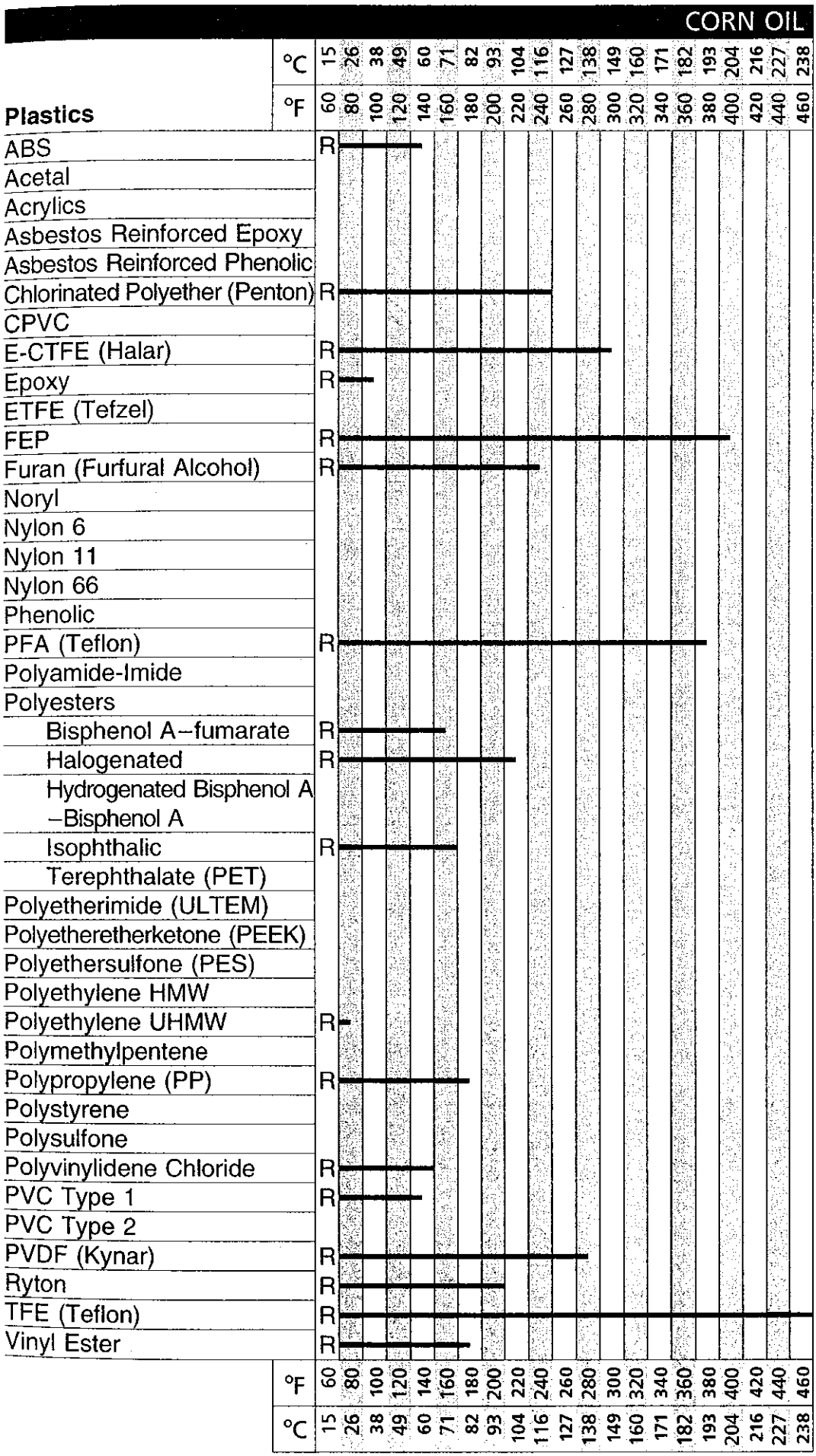
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CORN OIL

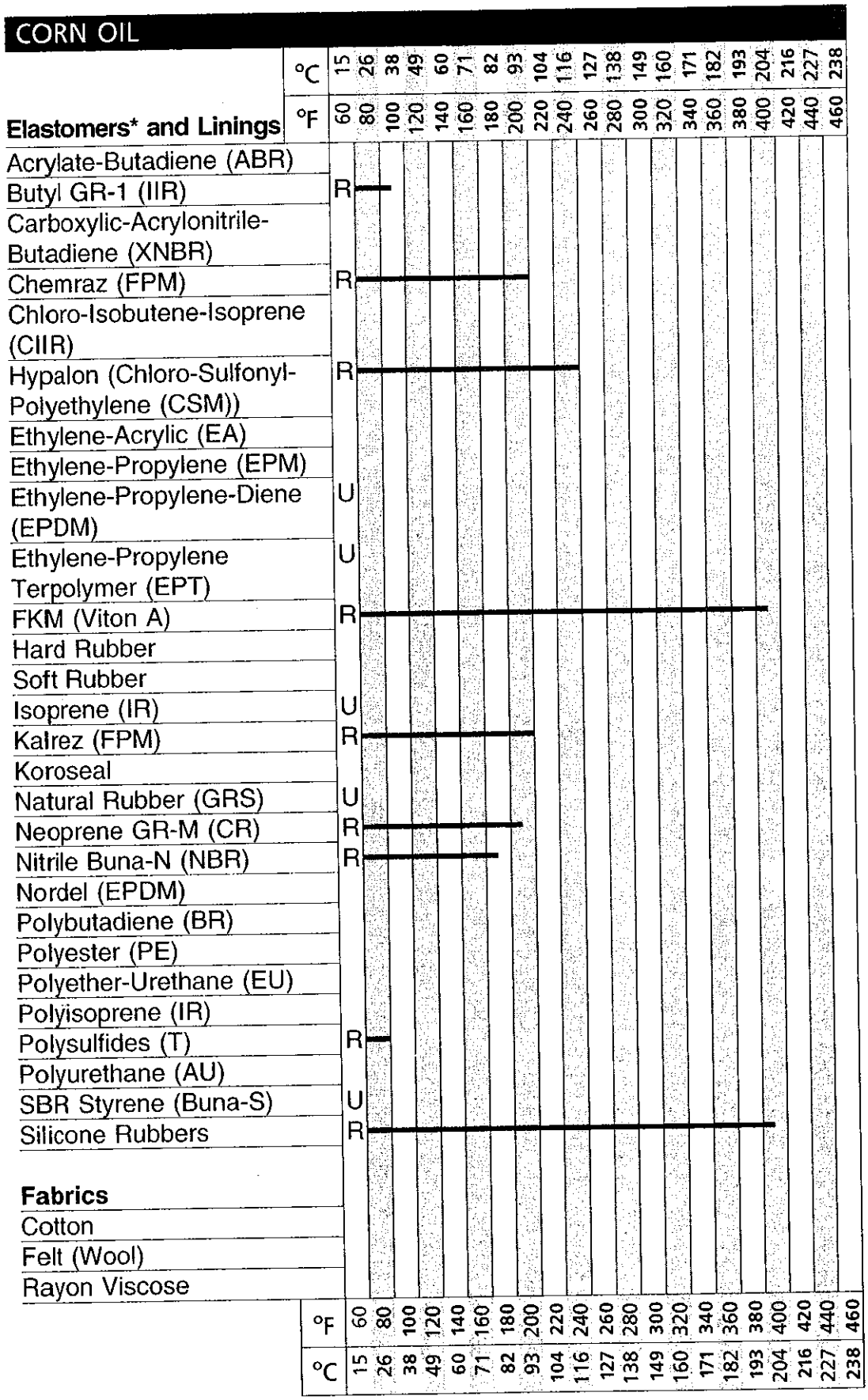


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CORN OIL

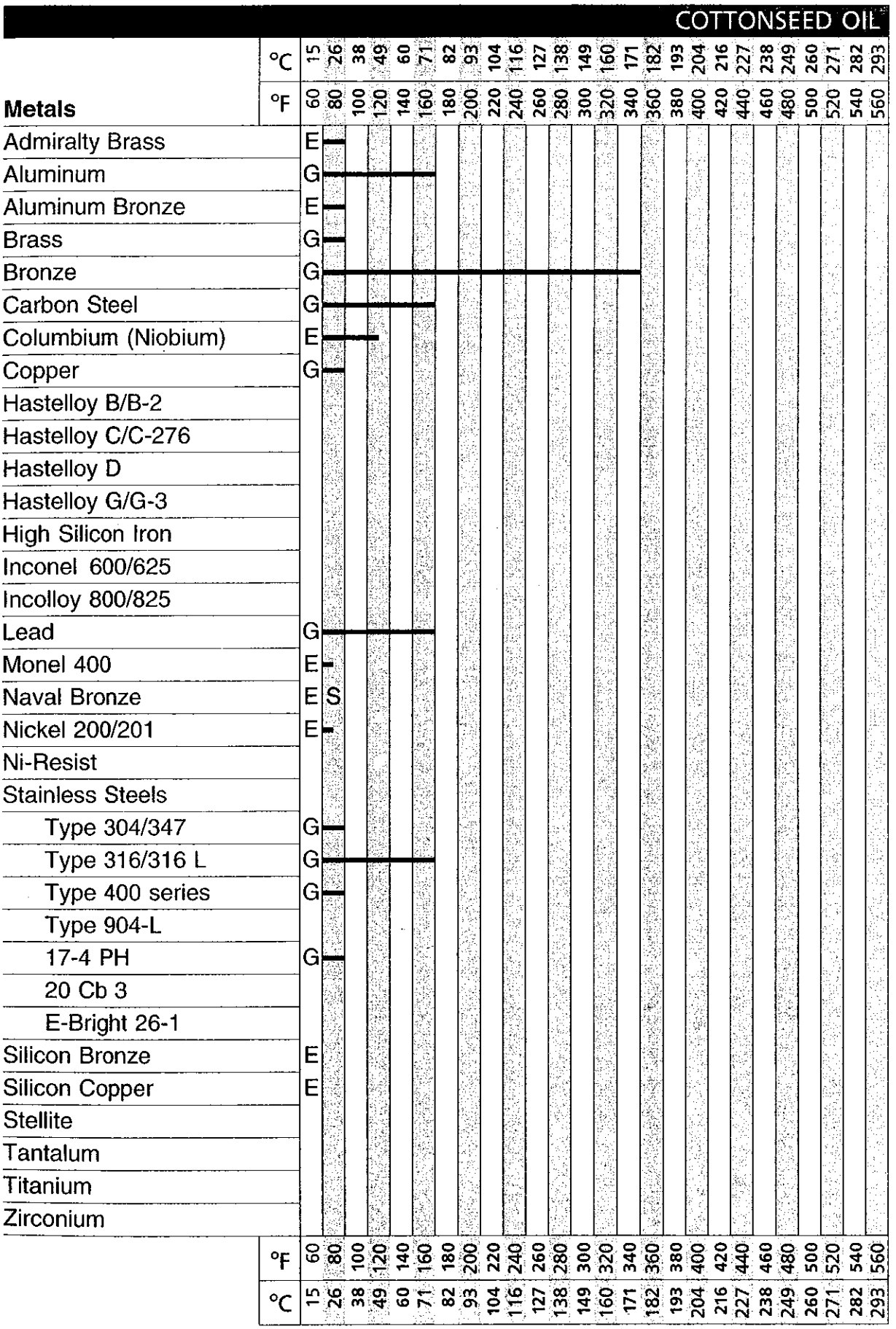


*See also Nylon 11 under PLASTICS

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COTTONSEED OIL



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

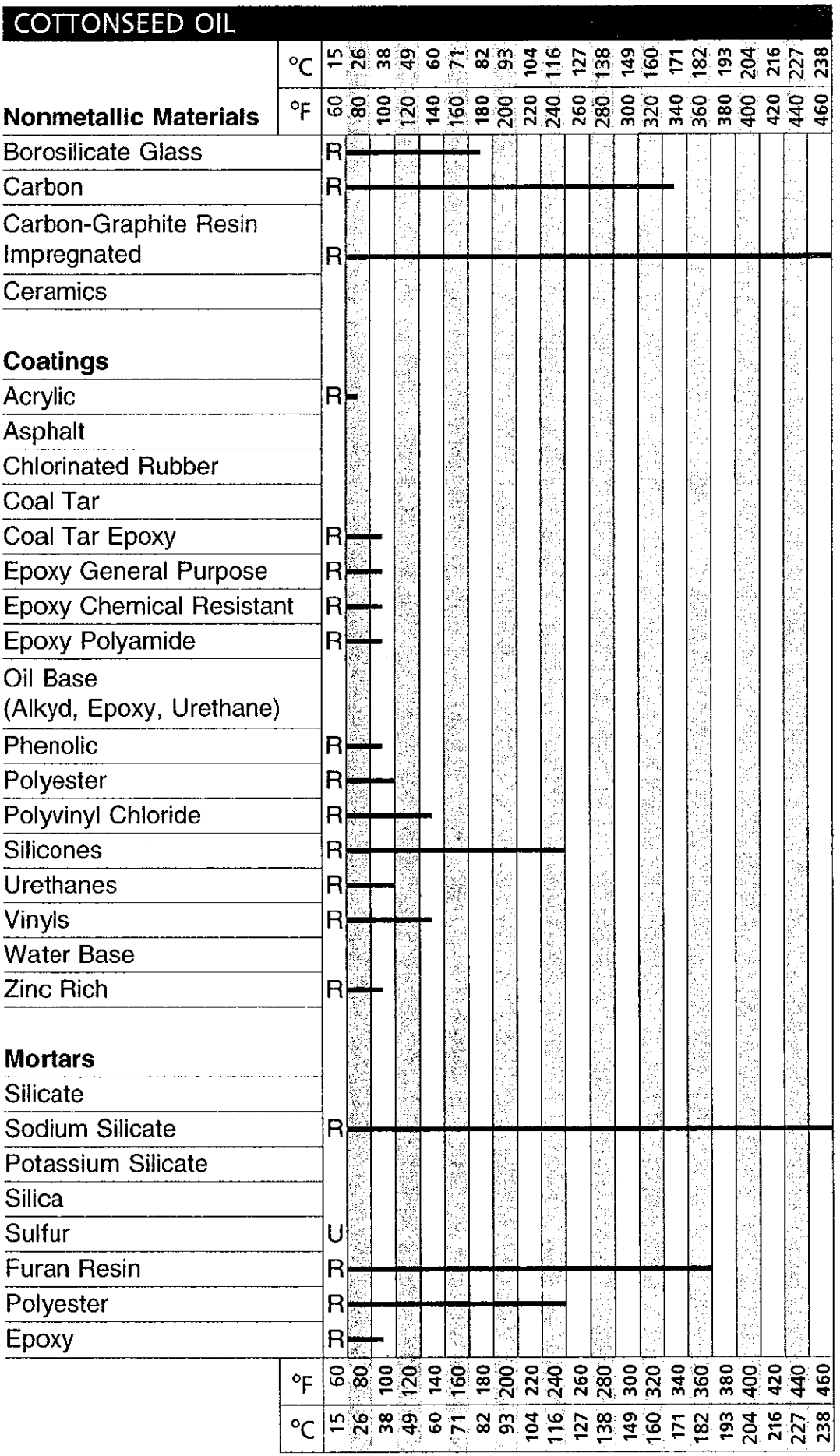
R = Resistant

U = Unsatisfactory

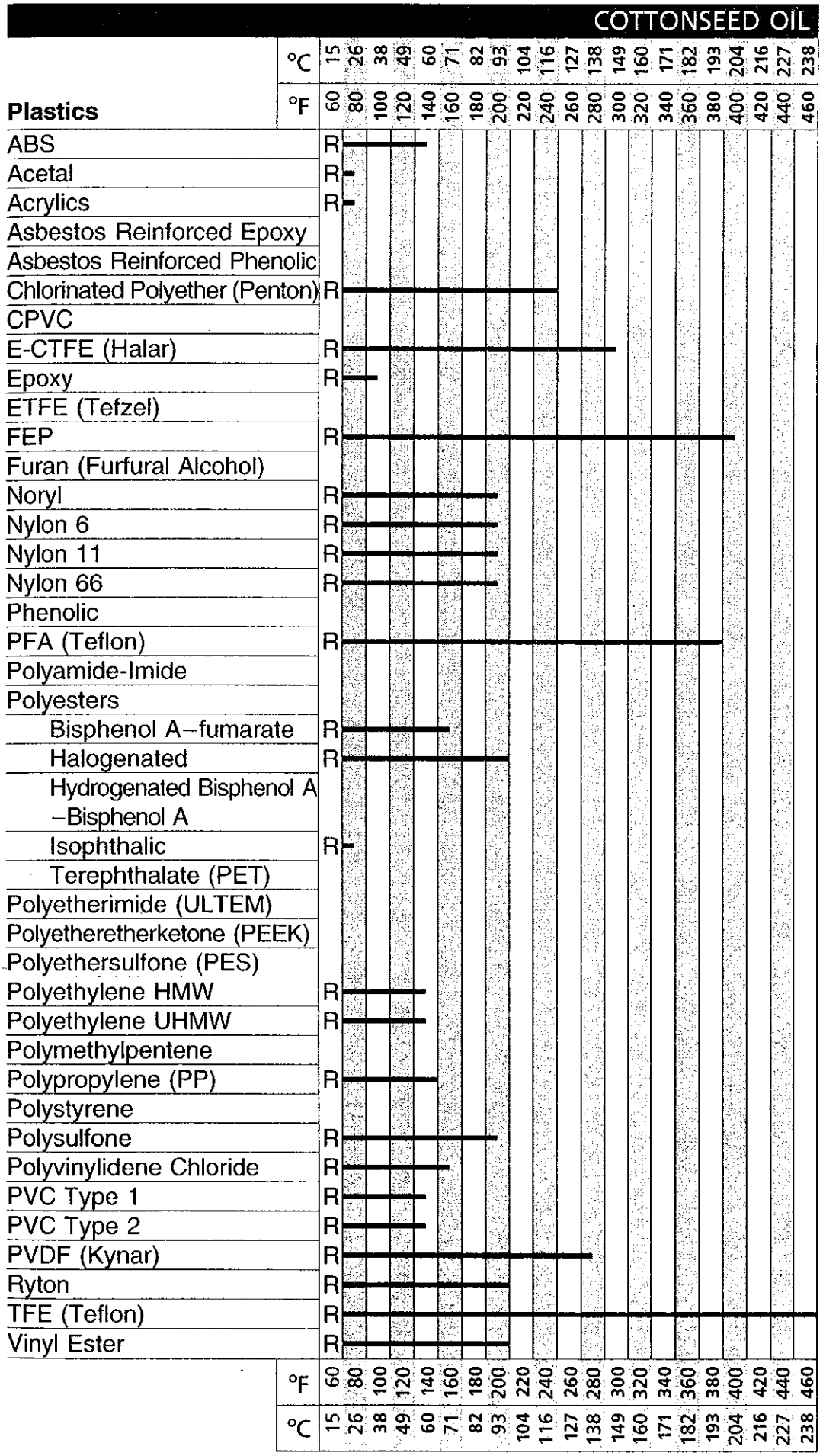
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COTTONSEED OIL

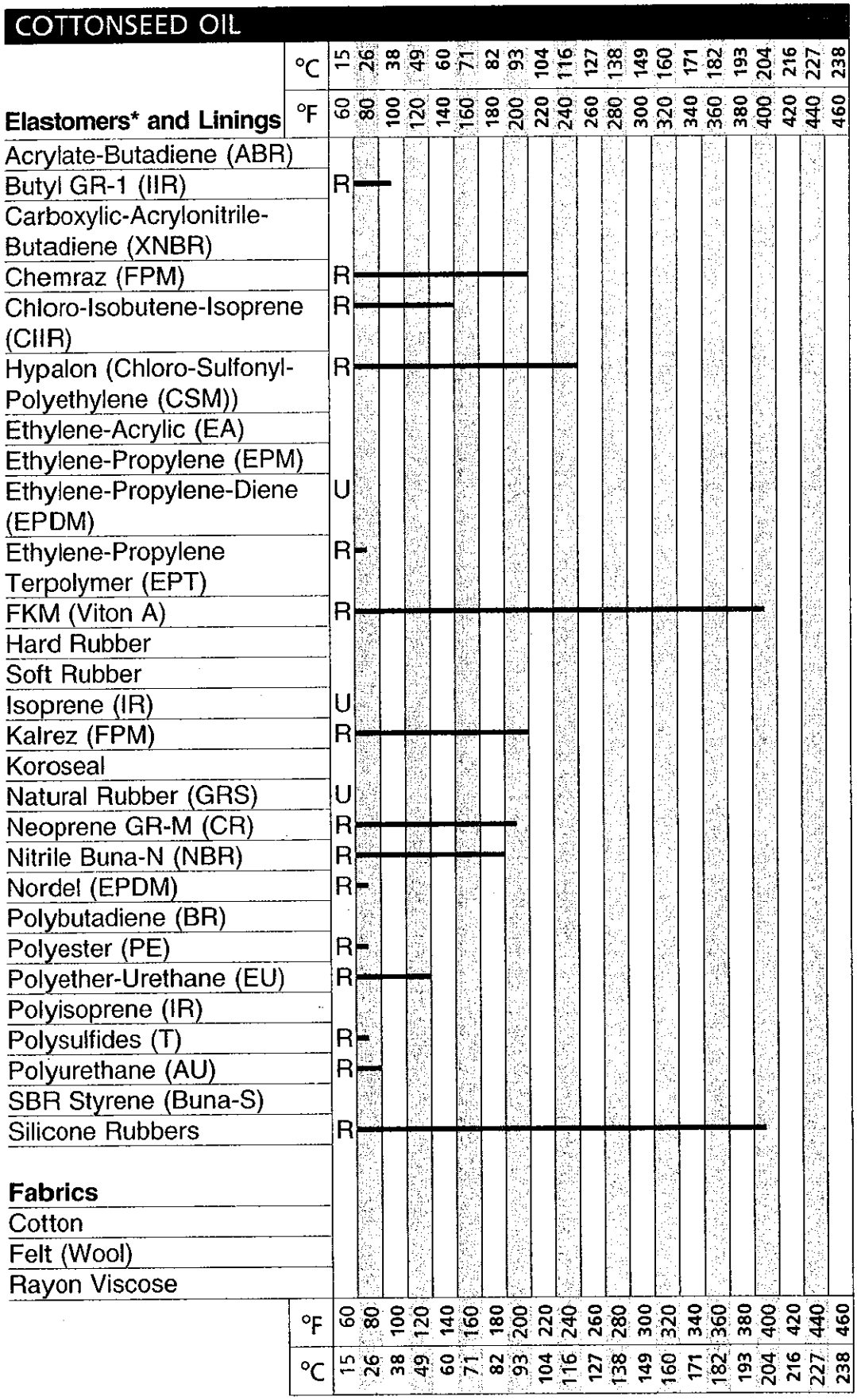


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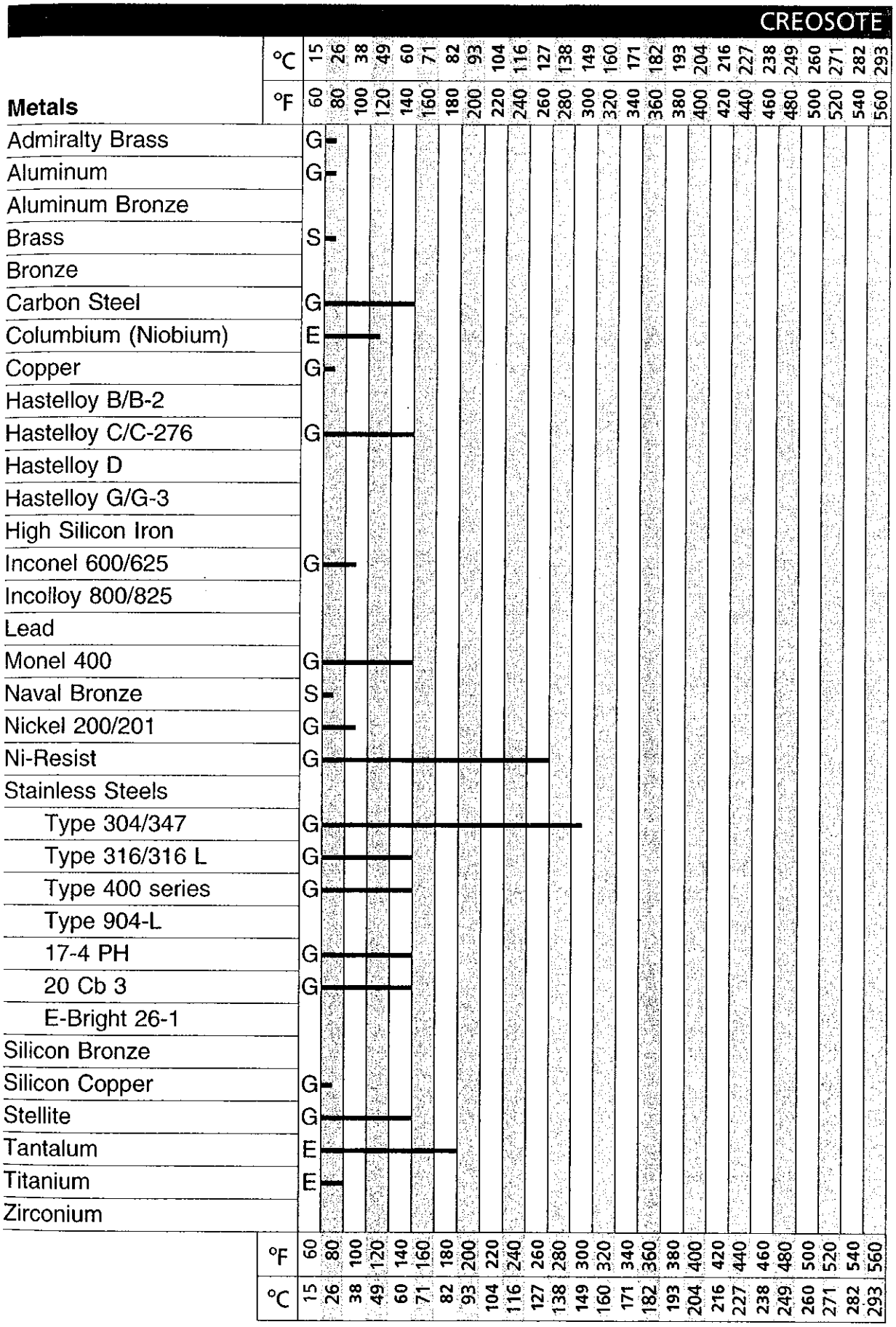
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COTTONSEED OIL



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

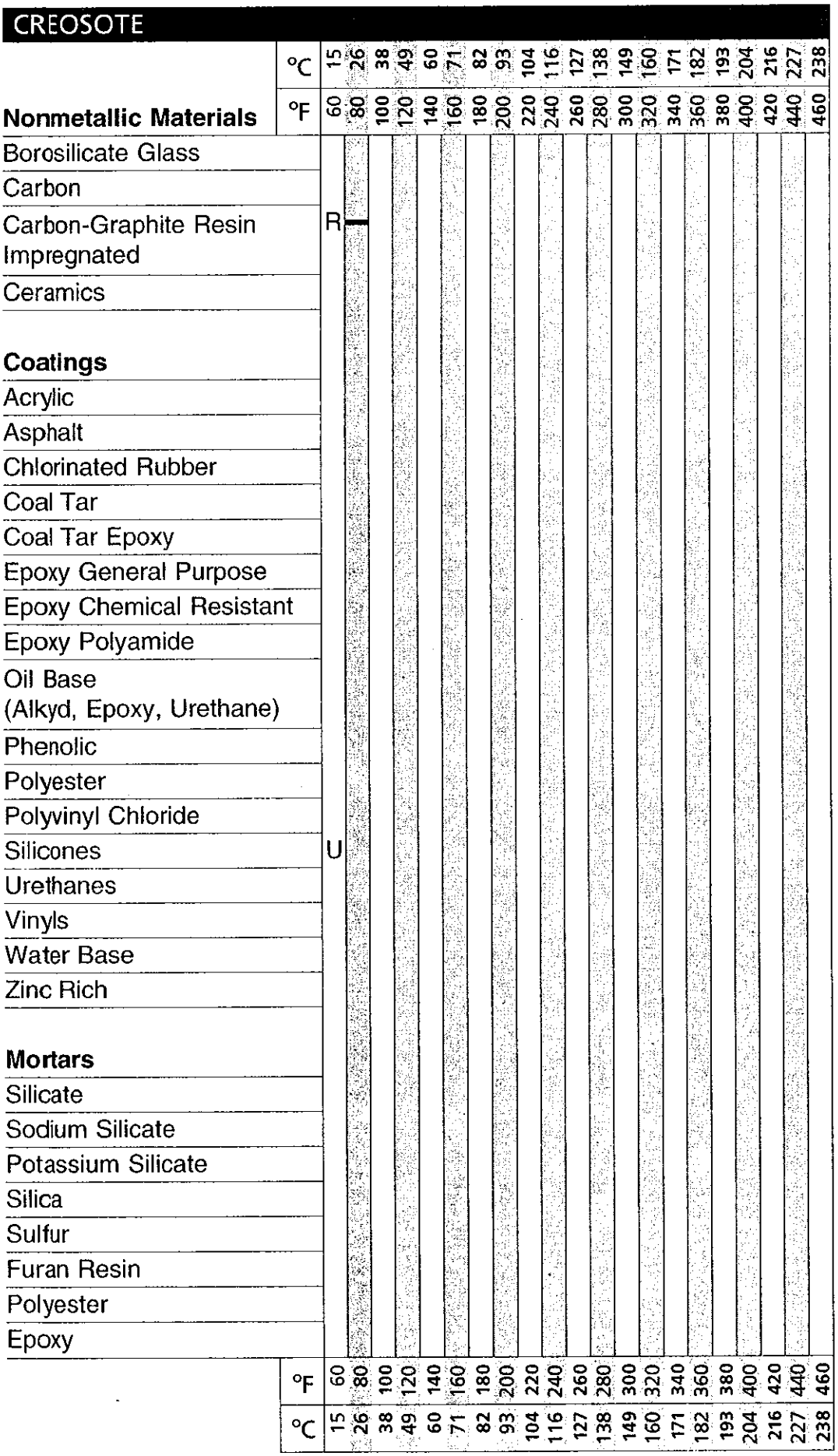
R = Resistant

U = Unsatisfactory

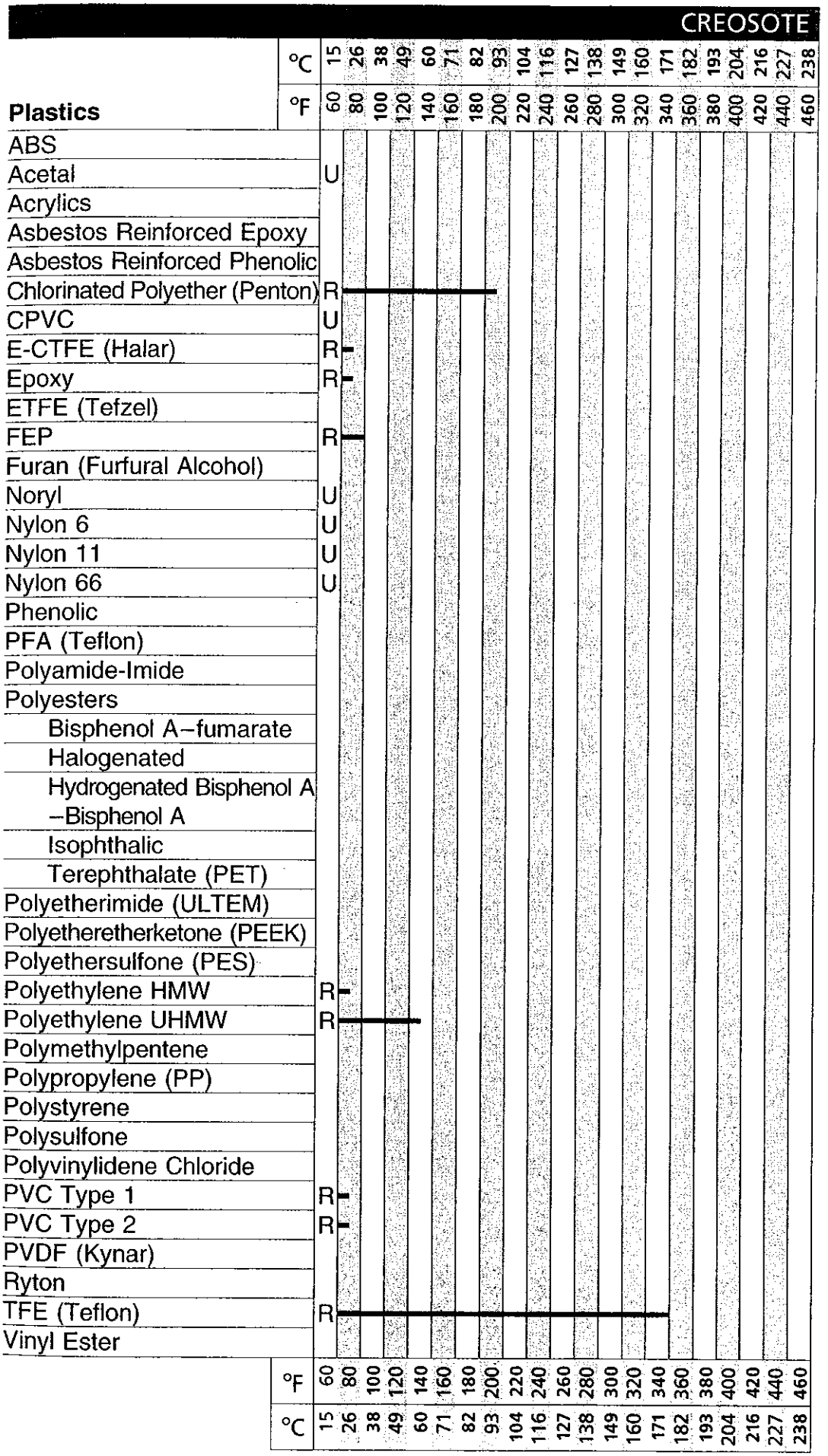
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CREOSOTE

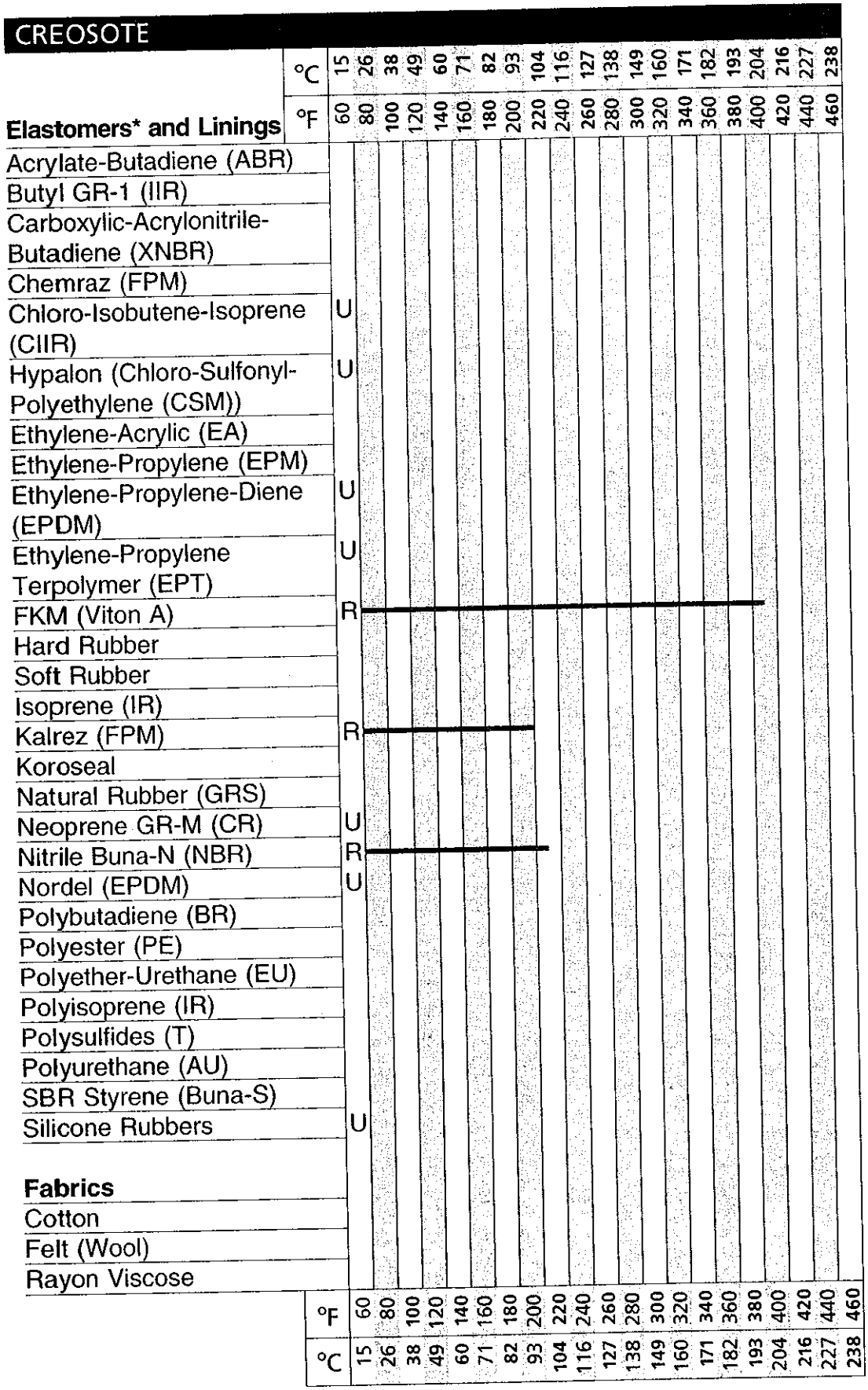


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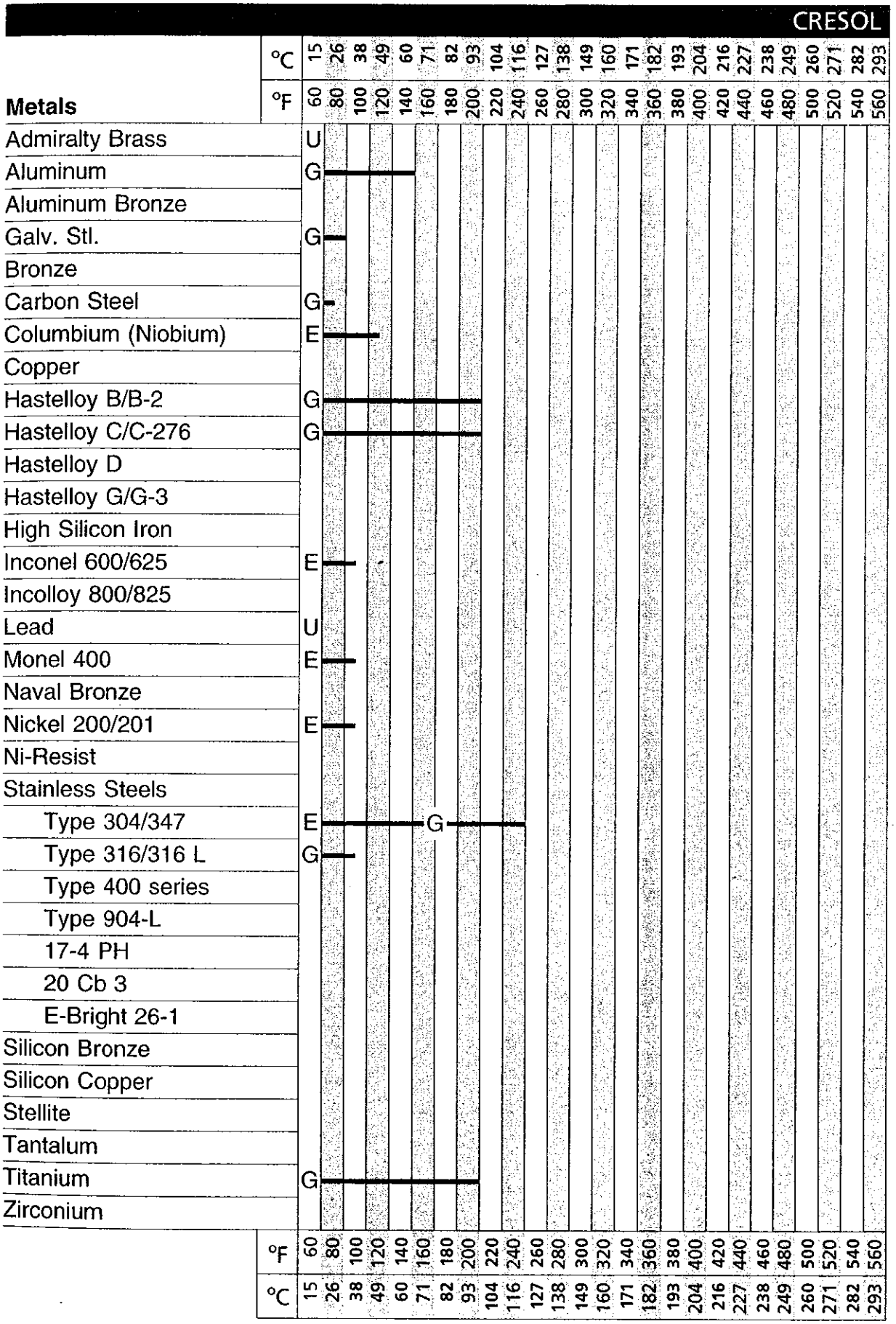
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CREOSOTE



*See also Nylon 11 under PLASTICS

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

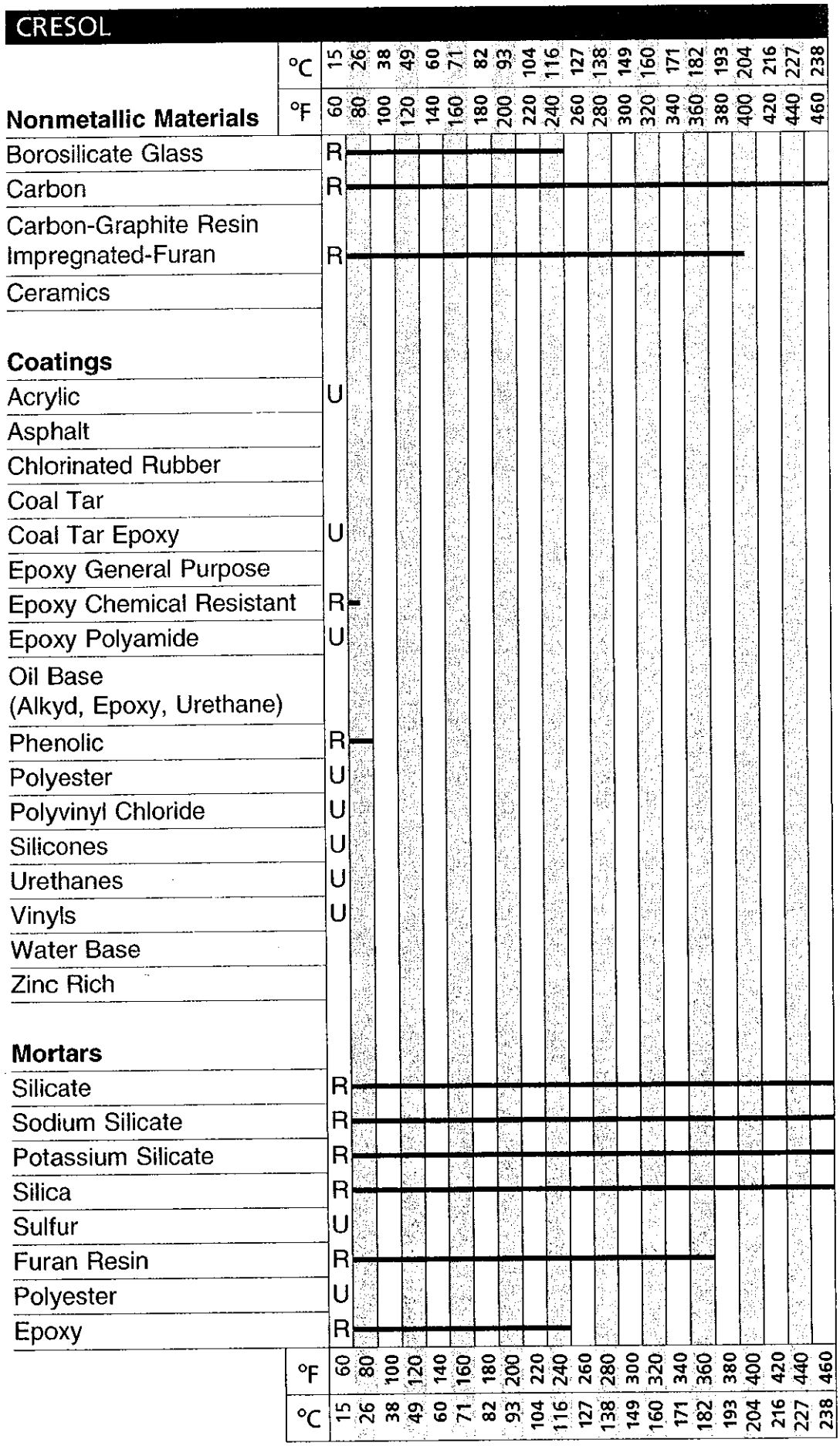
R = Resistant

U = Unsatisfactory

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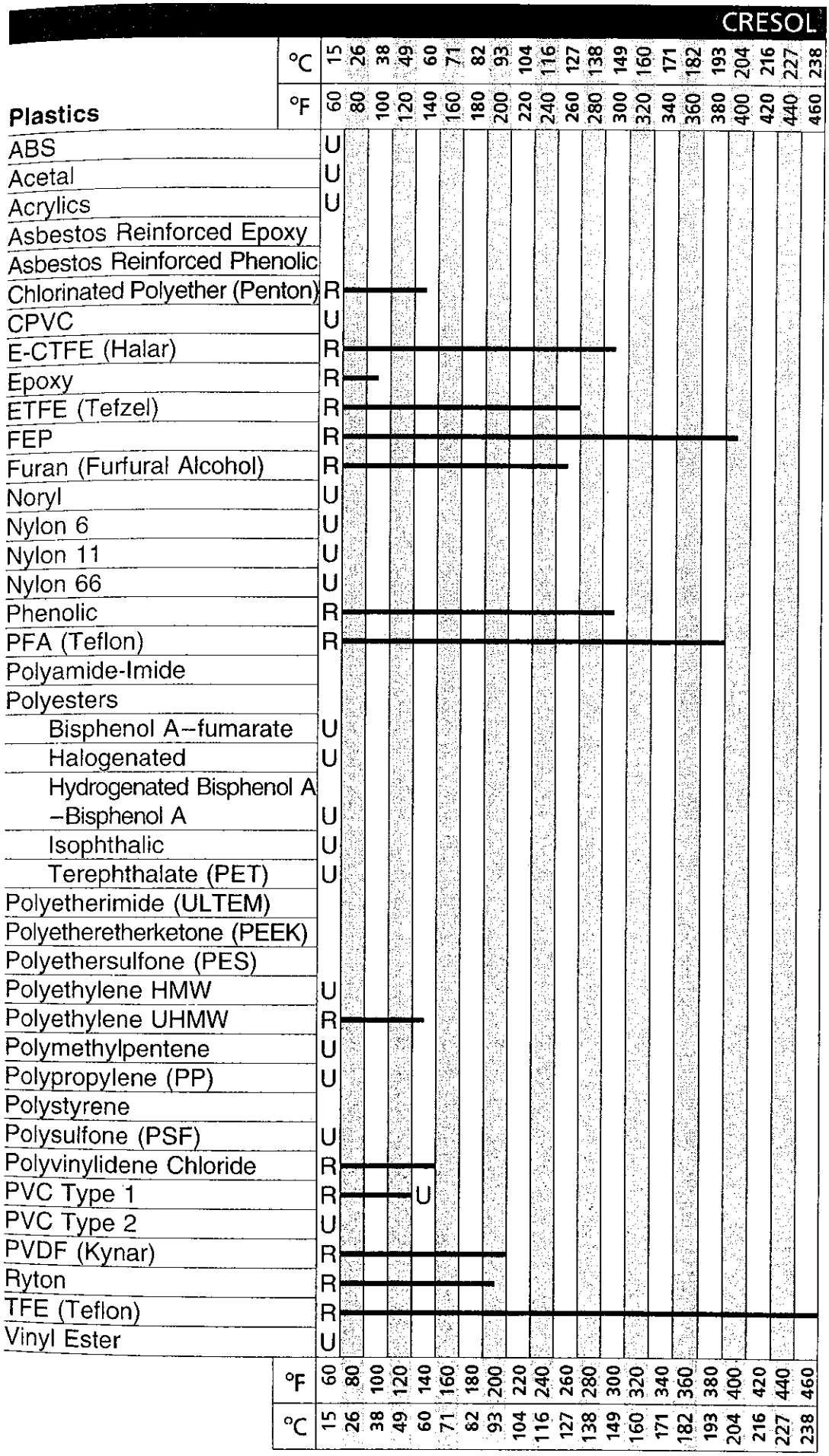
CRESOL



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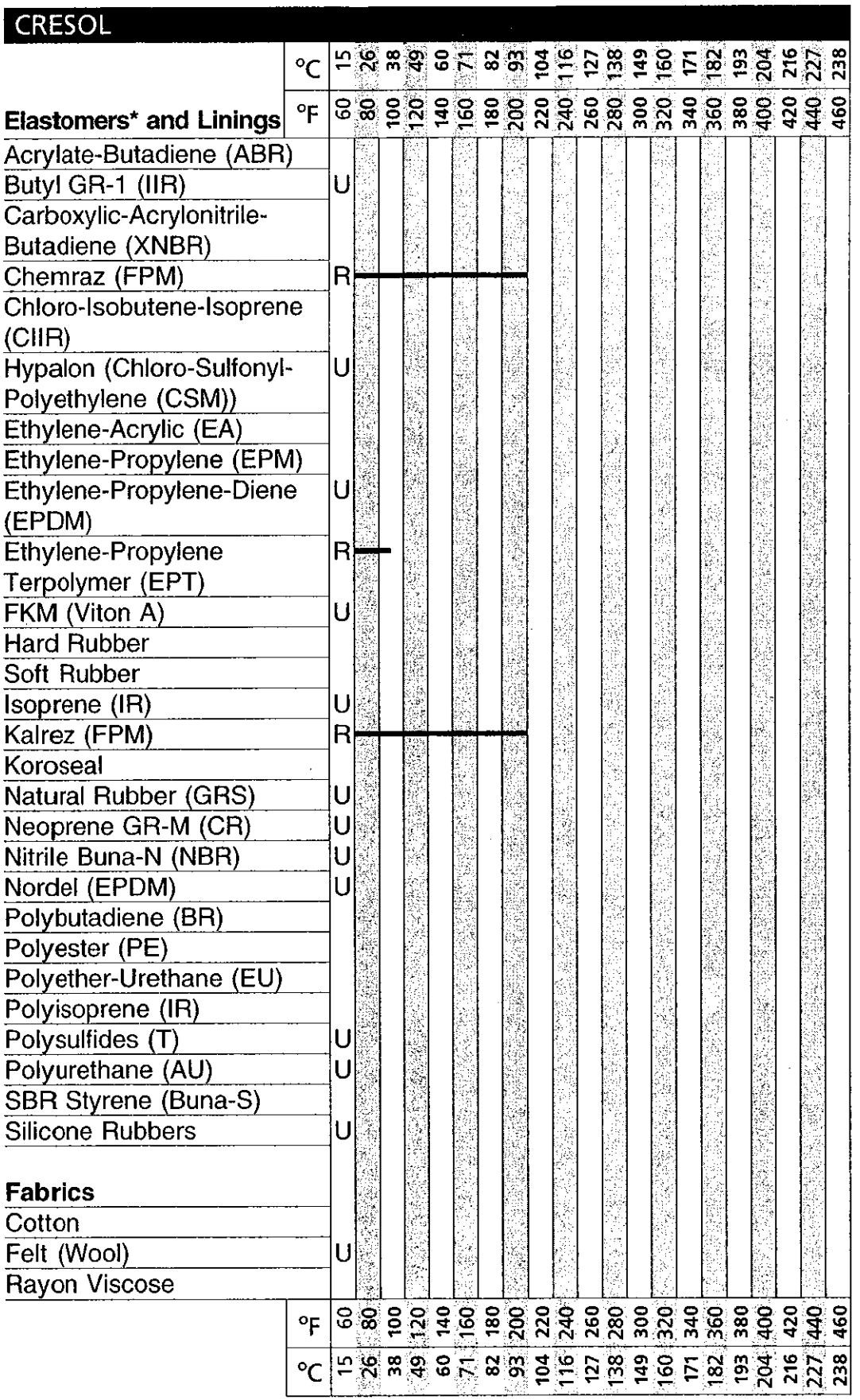
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CRESOL



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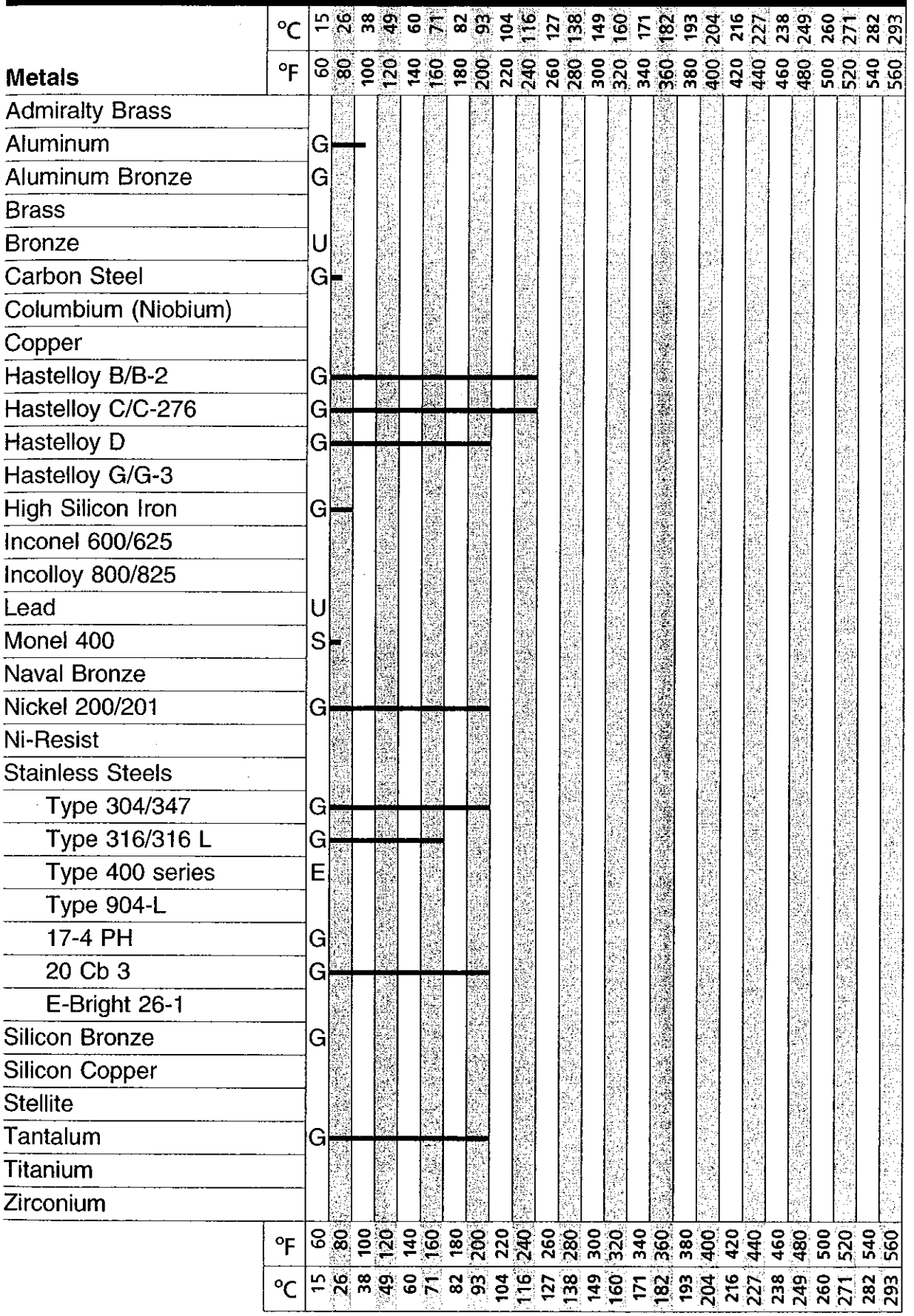
CRESOL



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CRESYLIC ACID 50%



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L																											
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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COAL GAS

	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Nonmetallic Materials																						
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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COAL GAS

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)	R																					
CPVC																						
E-CTFE (Halar)																						
Epoxy																						
ETFE (Tefzel)	R																					
FEP	R																					
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)	R																					
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)	R																					
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride	R																					
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)	R																					
Ryton																						
TFE (Teflon)	R																					
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

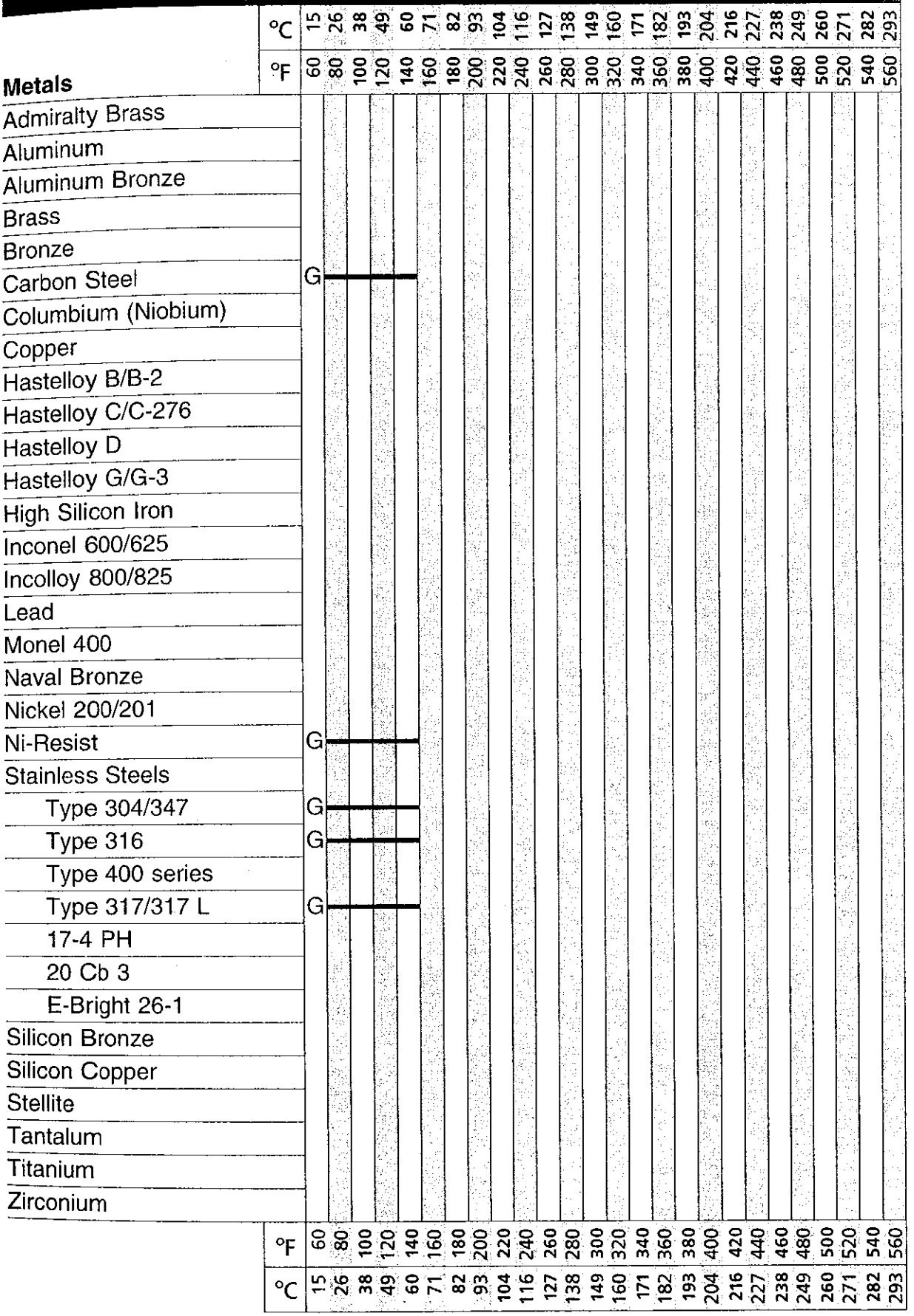
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COAL GAS

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)	R																					
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)																						
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)																						
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)	R																					
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)																						
Nitrile Buna-N (NBR)																						
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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COAL TAR

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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COAL TAR

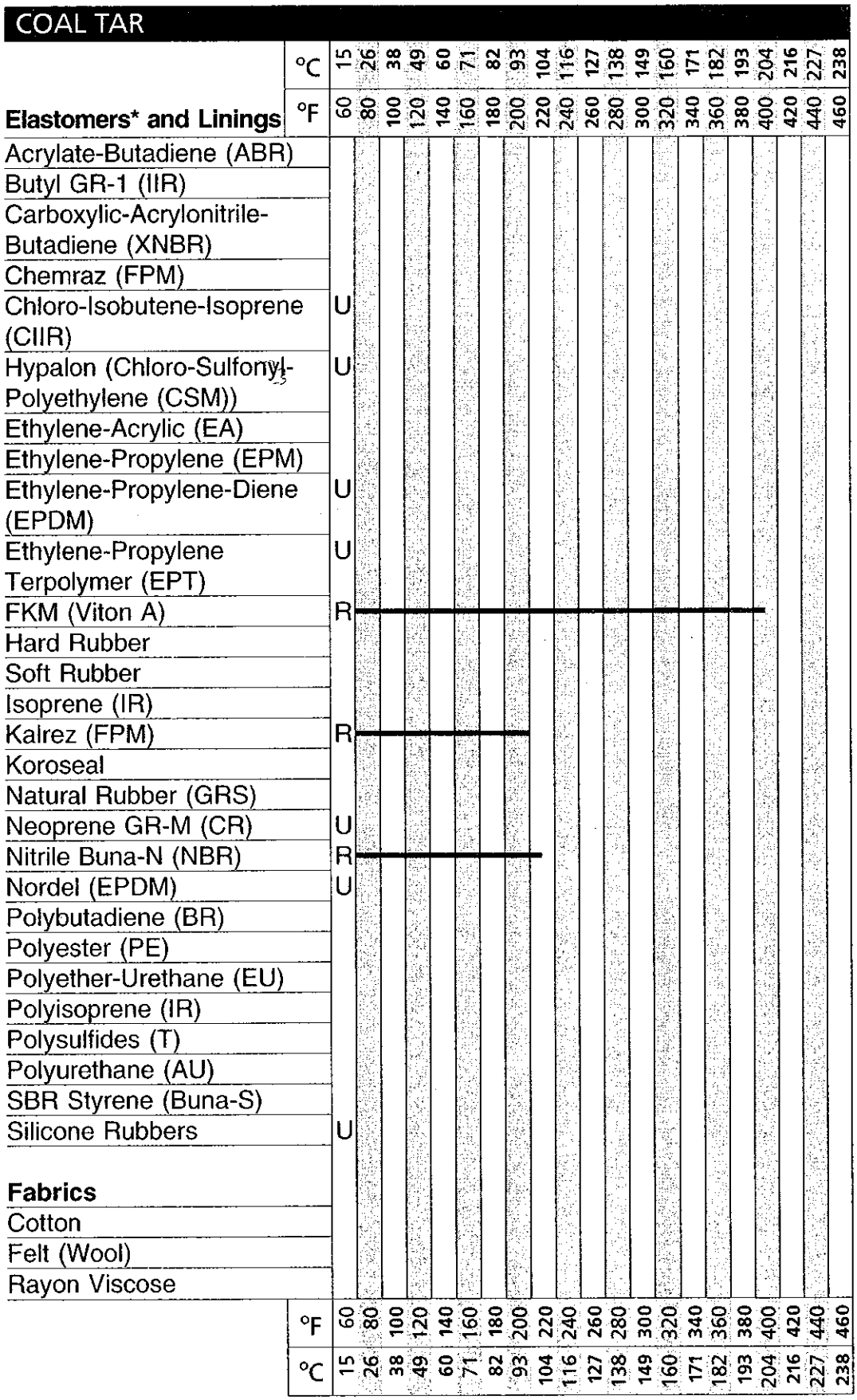
Plastics	°F	°C
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC		
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)		
FEP		
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated		
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic		
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)		
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1		
PVC Type 2		
PVDF (Kynar)		
Ryton		
TFE (Teflon)	R	
Vinyl Ester		

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

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COAL TAR



*See also Nylon 11 under PLASTICS

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COCO COLA SYRUP

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347	G																										
Type 316/316 L	G																										
Type 400 series																											
Type 317/317 L	G																										
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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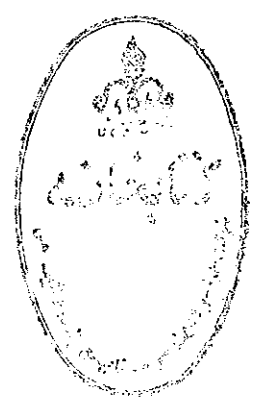
COCO COLA SYRUP

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass		R																				
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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COCO COLA SYRUP

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)																						
Epoxy																						
ETFE (Tefzel)																						
FEP																						
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)																						
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)																						
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)																						
Ryton																						
TFE (Teflon)																						
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238



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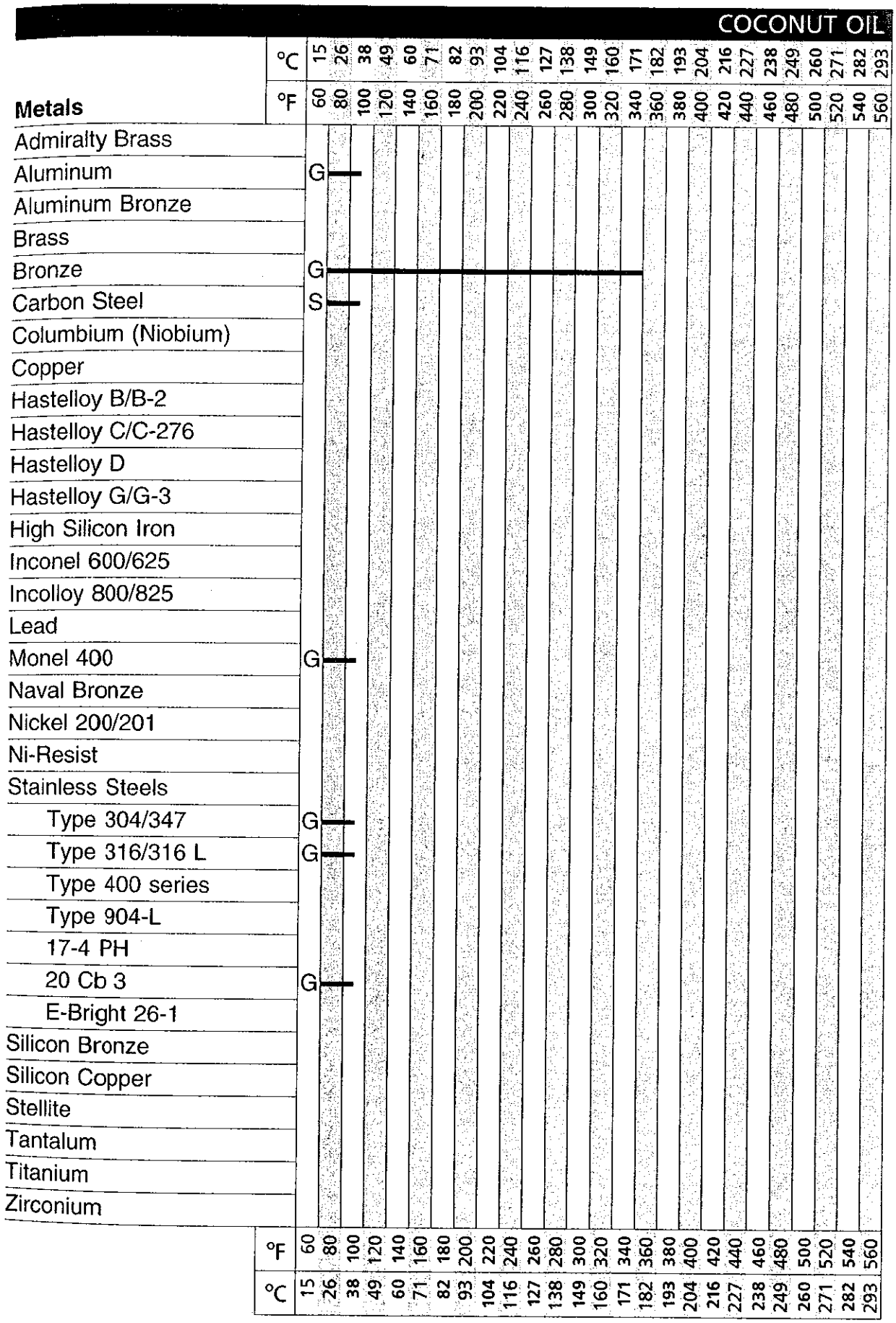
COCO COLA SYRUP

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)																						
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)																						
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)																						
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)																						
Nitrile Buna-N (NBR)																						
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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COCONUT OIL



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

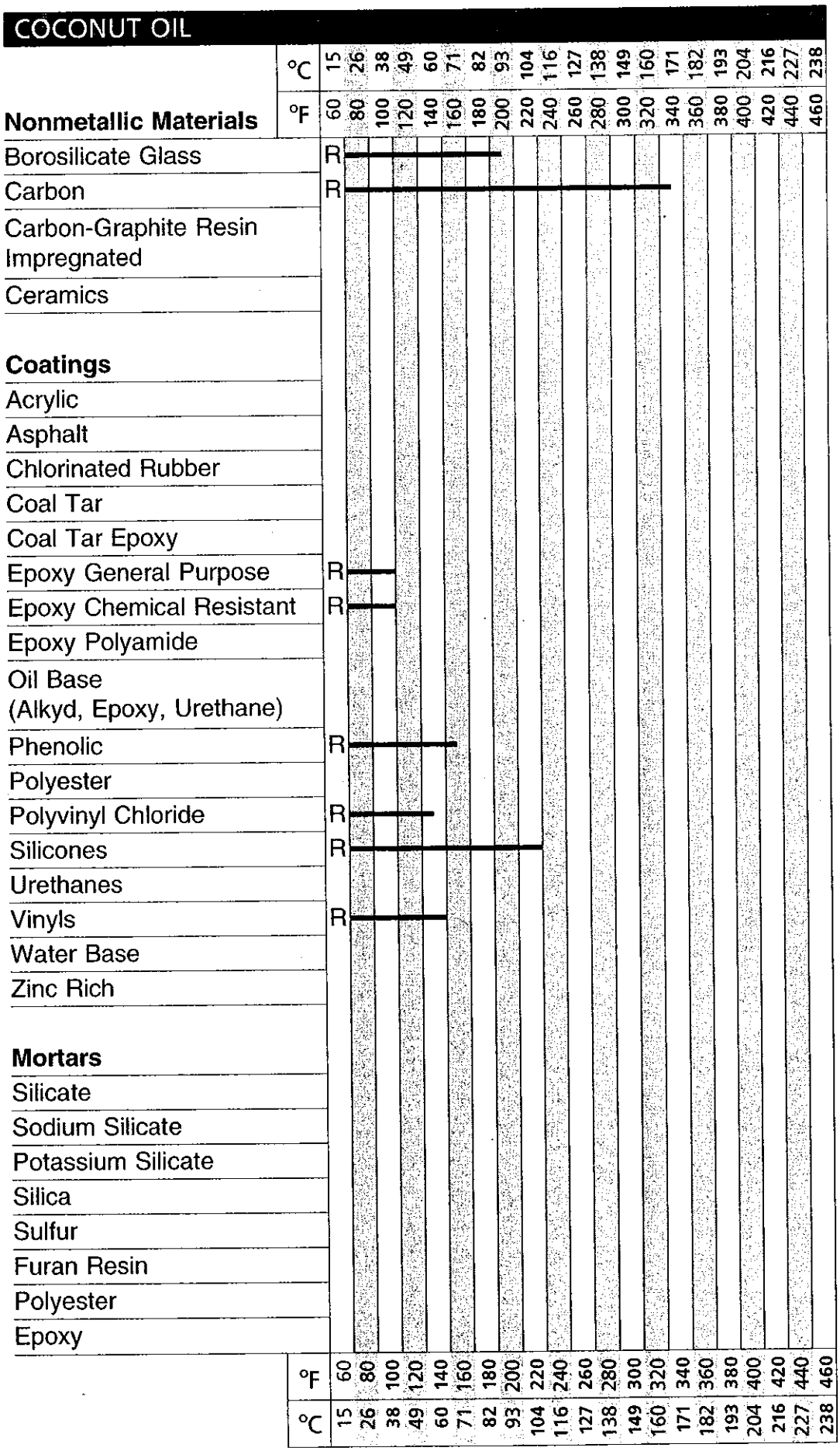
R = Resistant

U = Unsatisfactory

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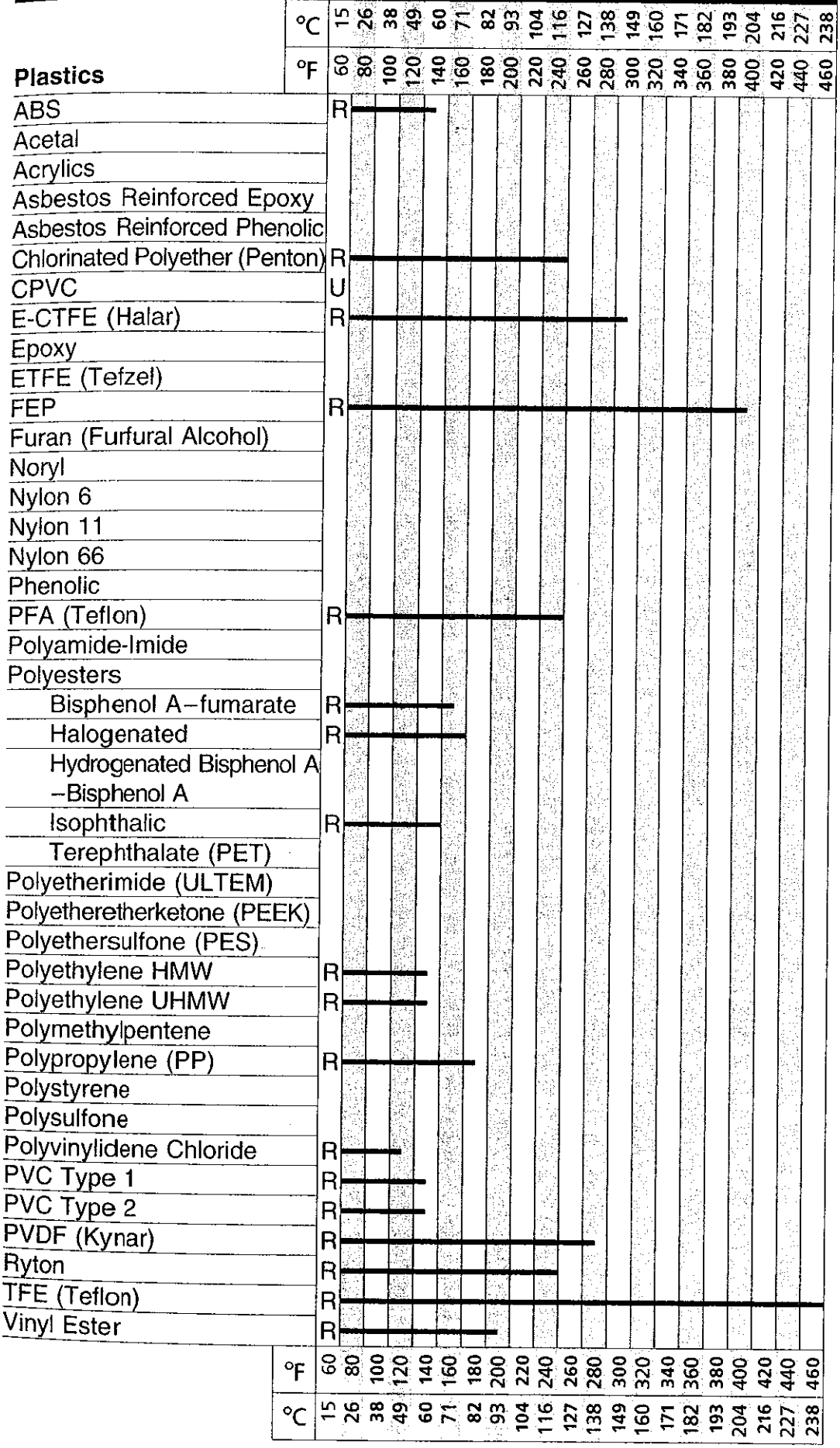
COCONUT OIL



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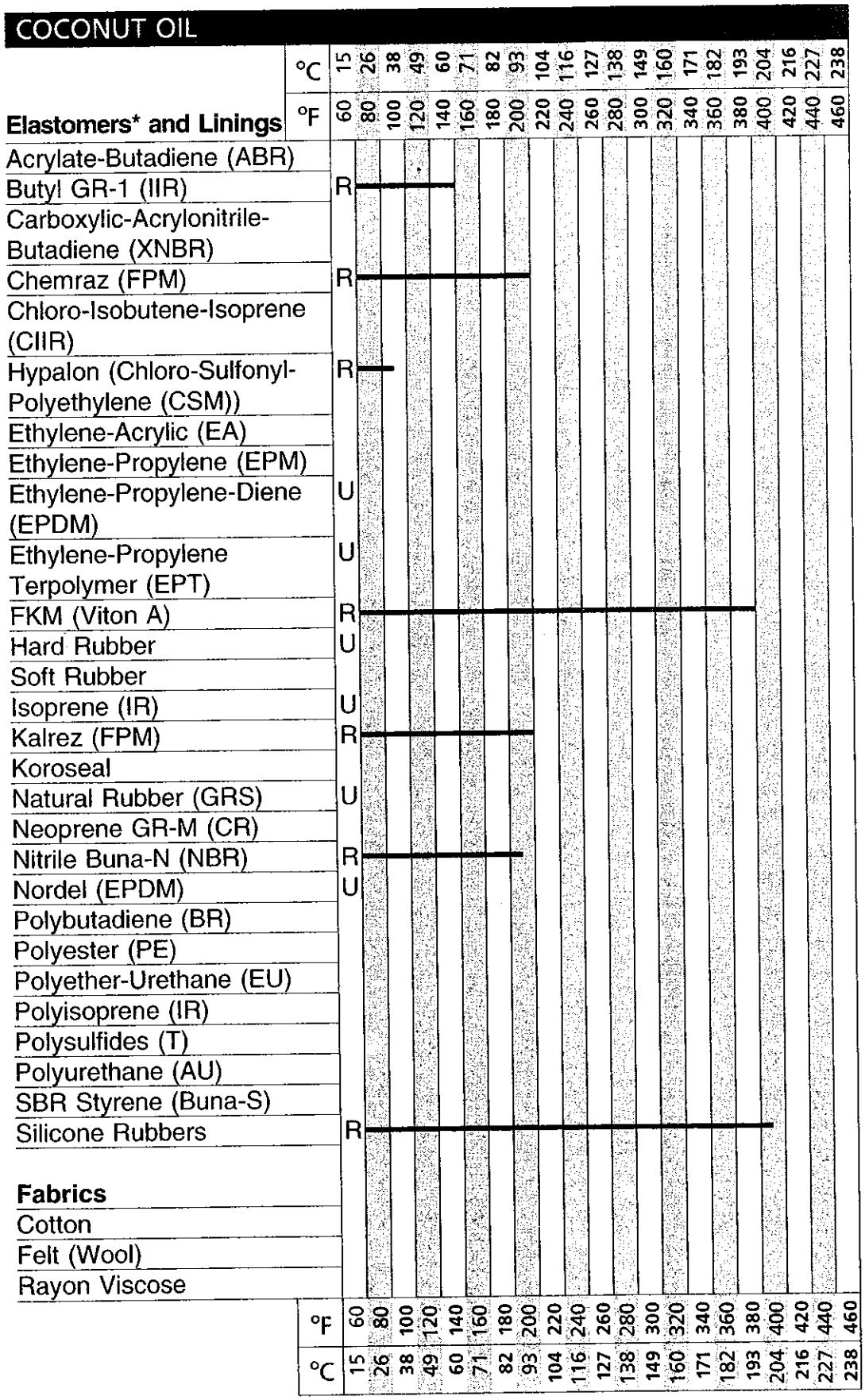
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COCONUT OIL



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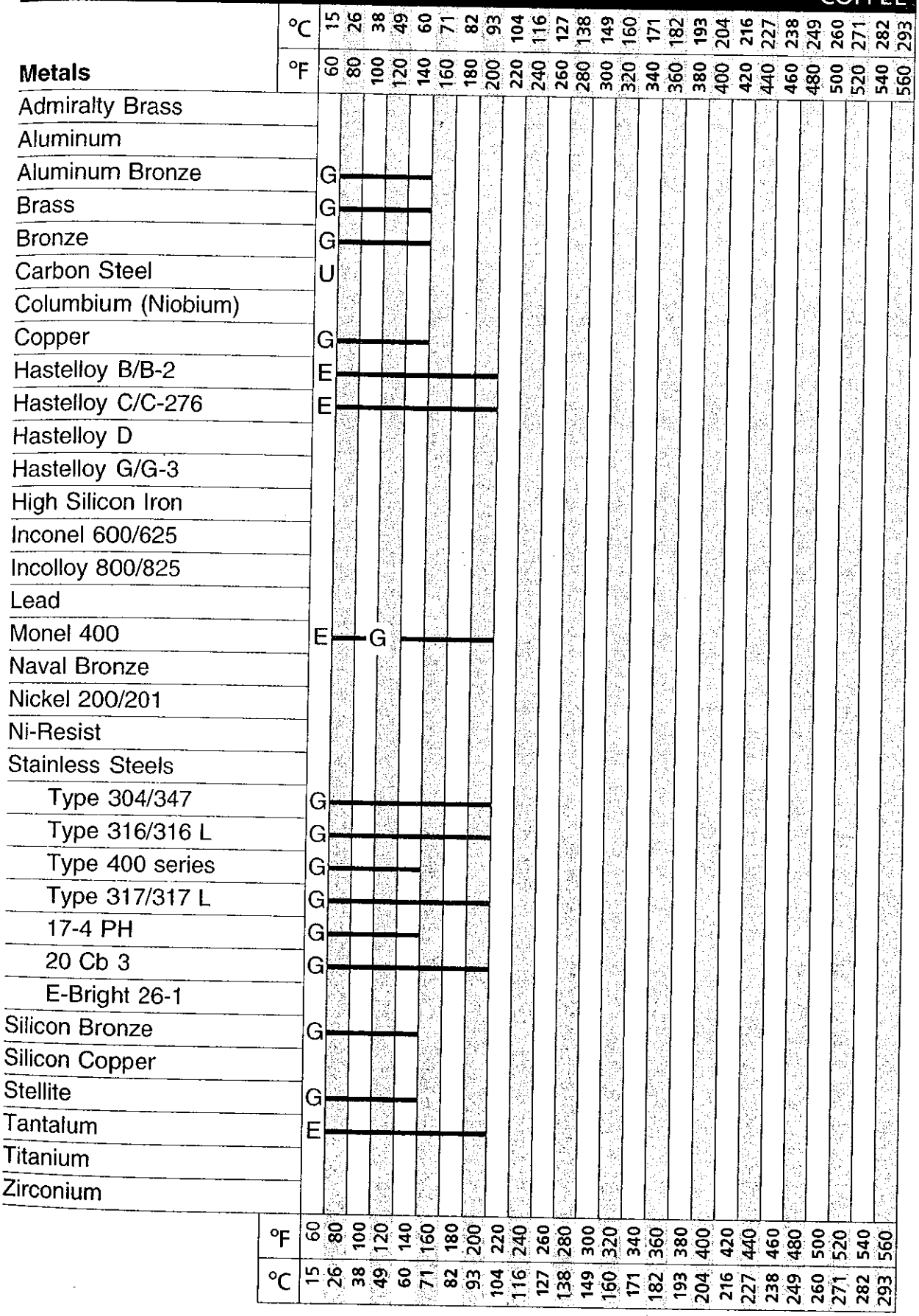
COCONUT OIL



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COFFEE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

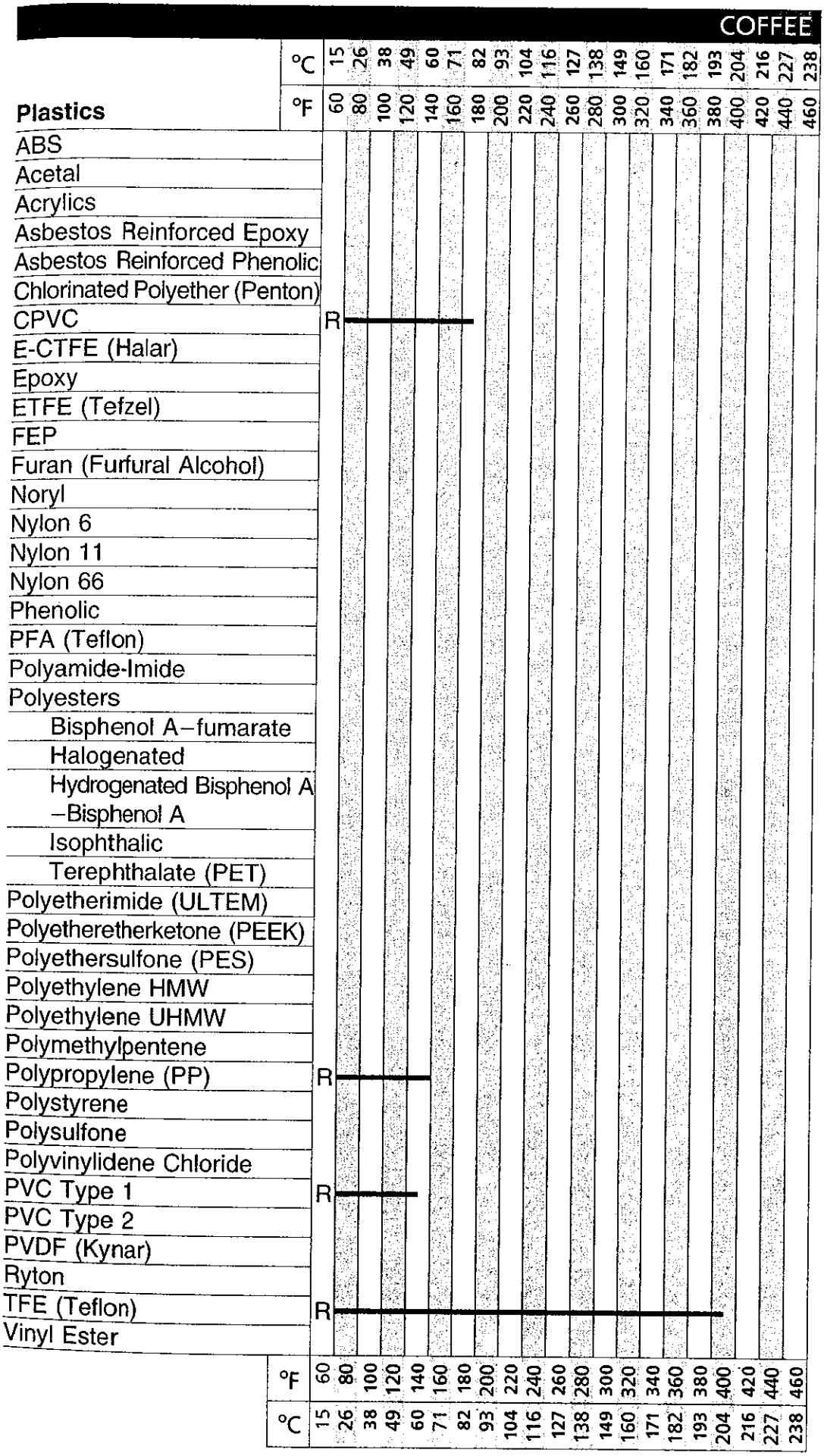
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COFFEE

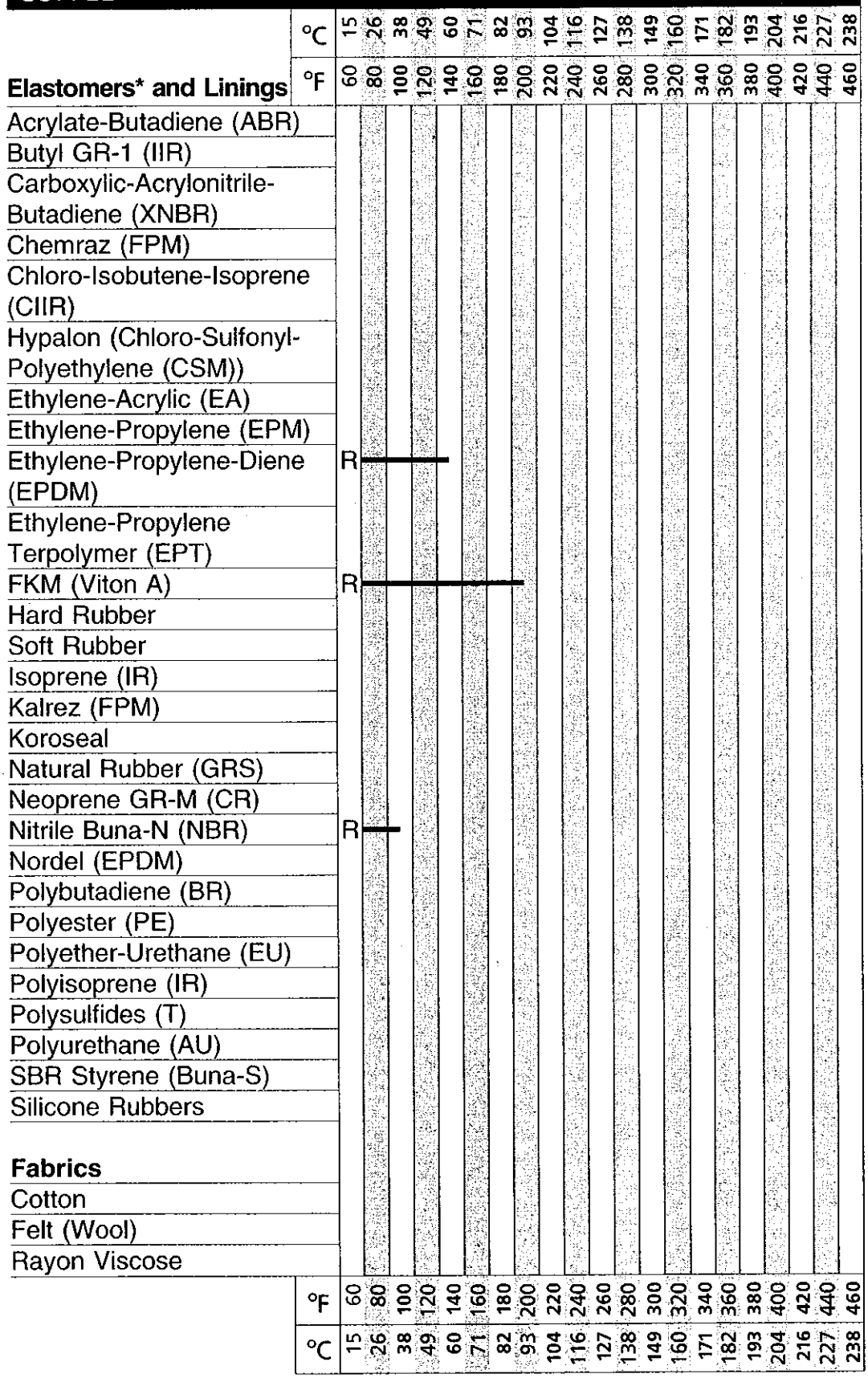
Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass		R																				
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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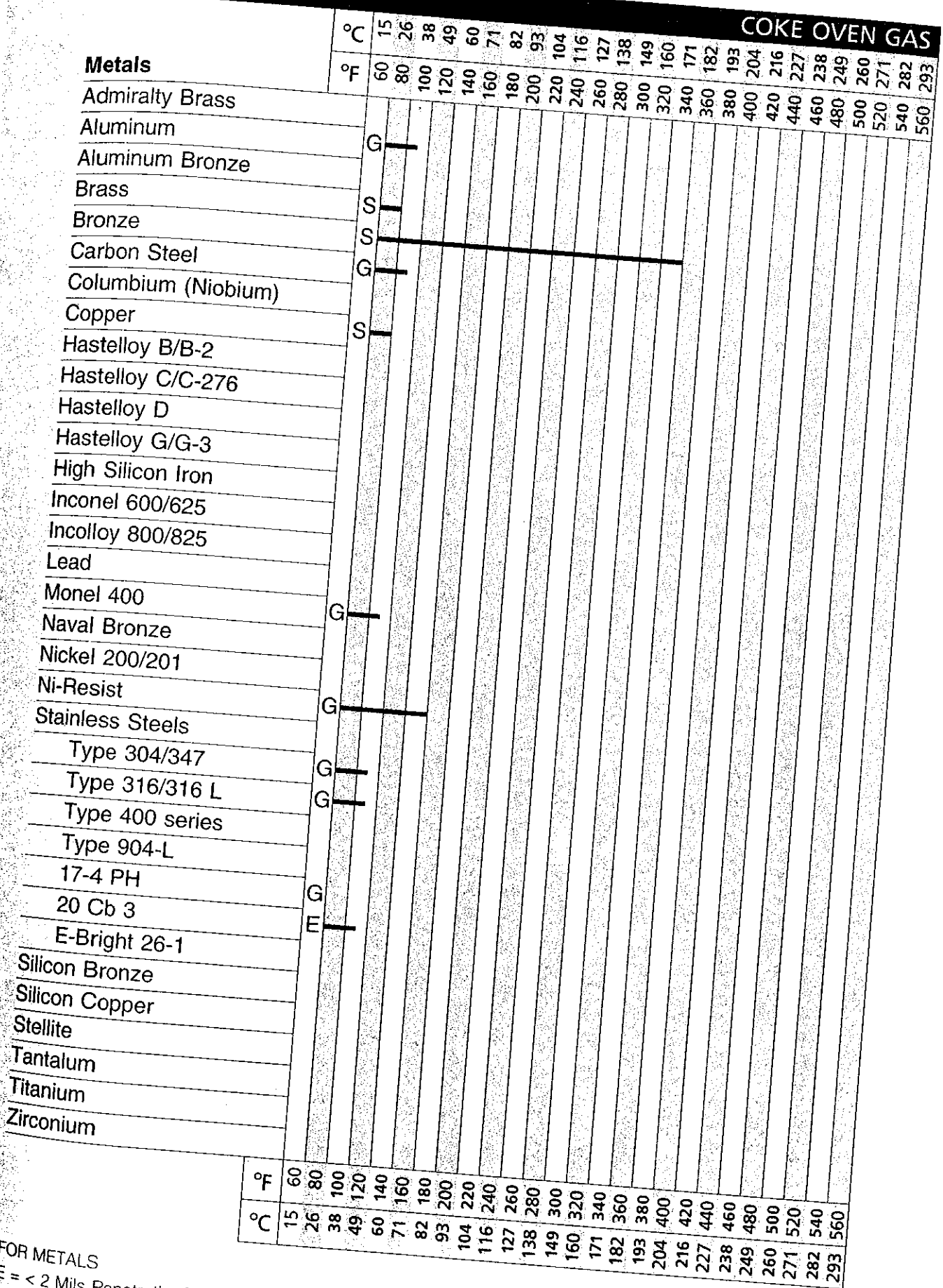
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COFFEE



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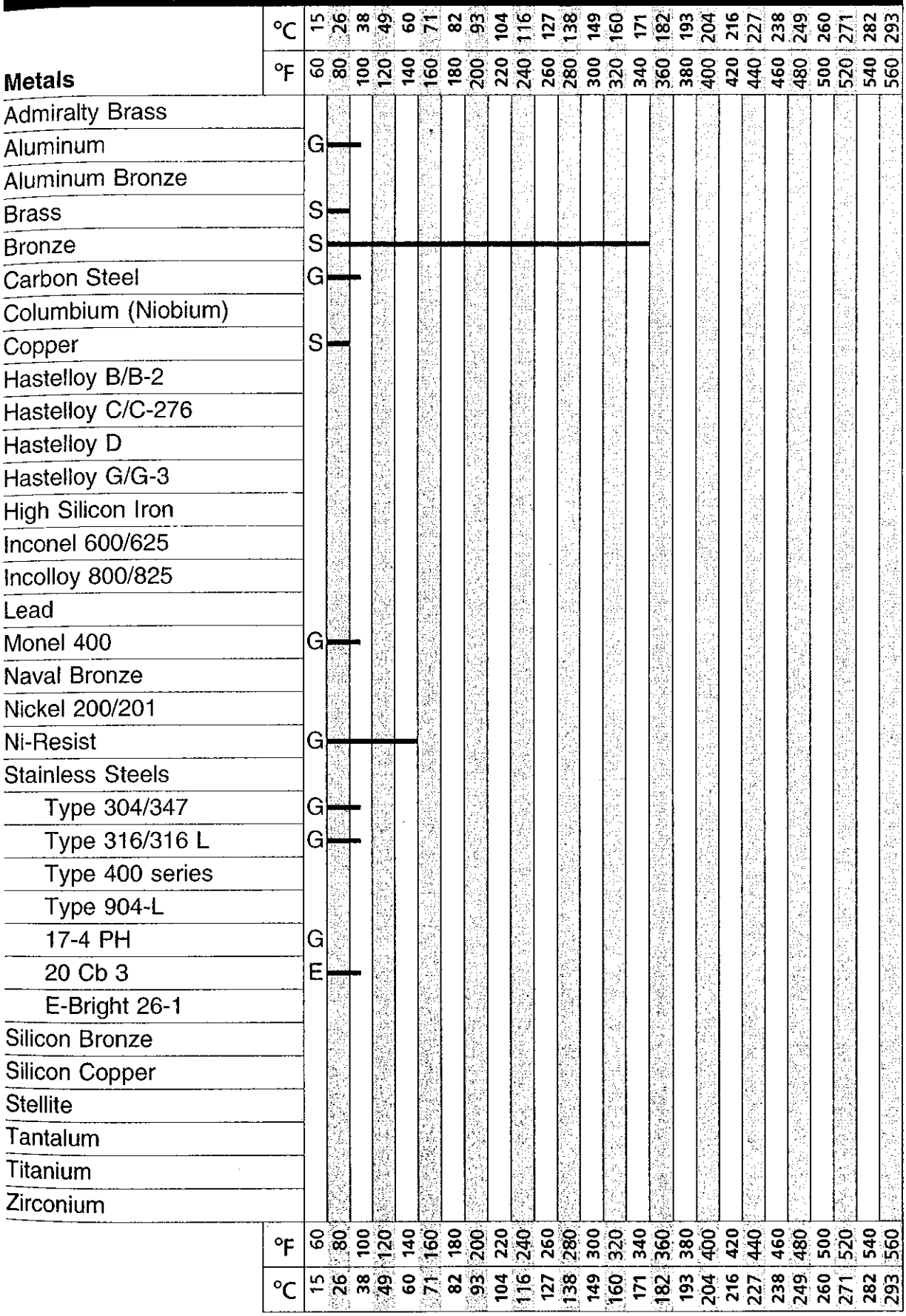


FOR METALS
E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year
S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS
R = Resistant
U = Unsatisfactory

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COKE OVEN GAS



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

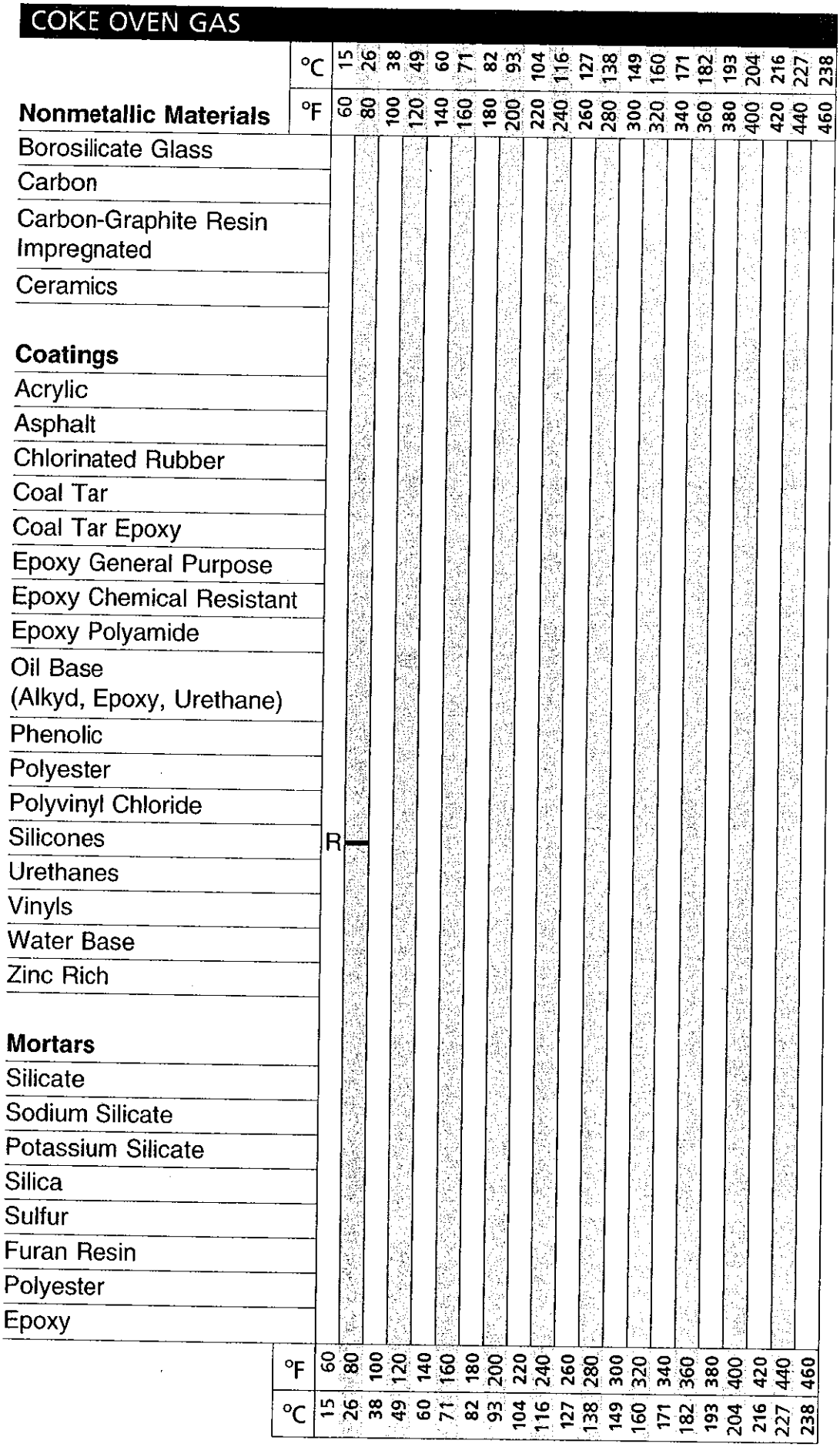
R = Resistant

U = Unsatisfactory

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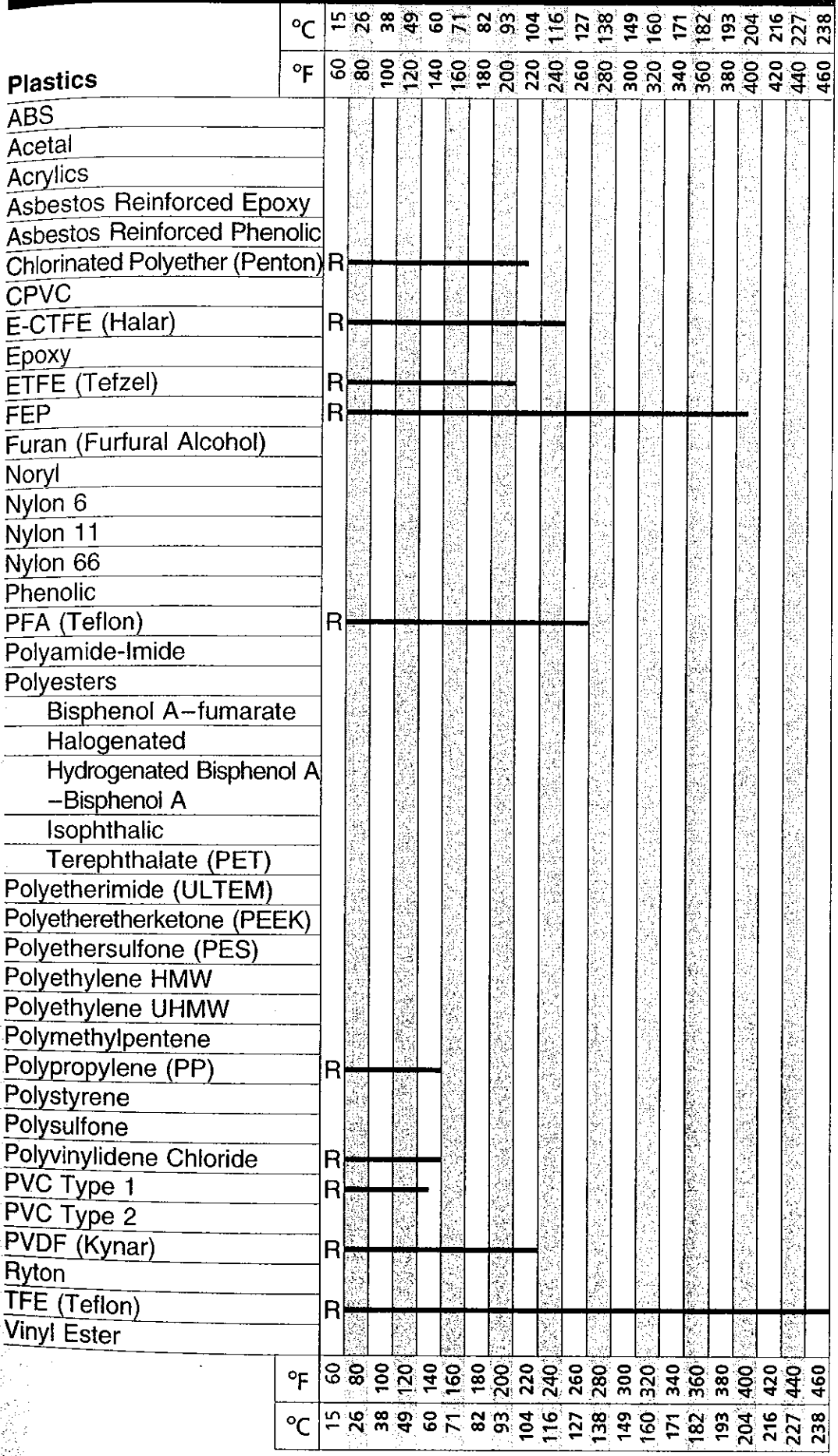
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COKE OVEN GAS



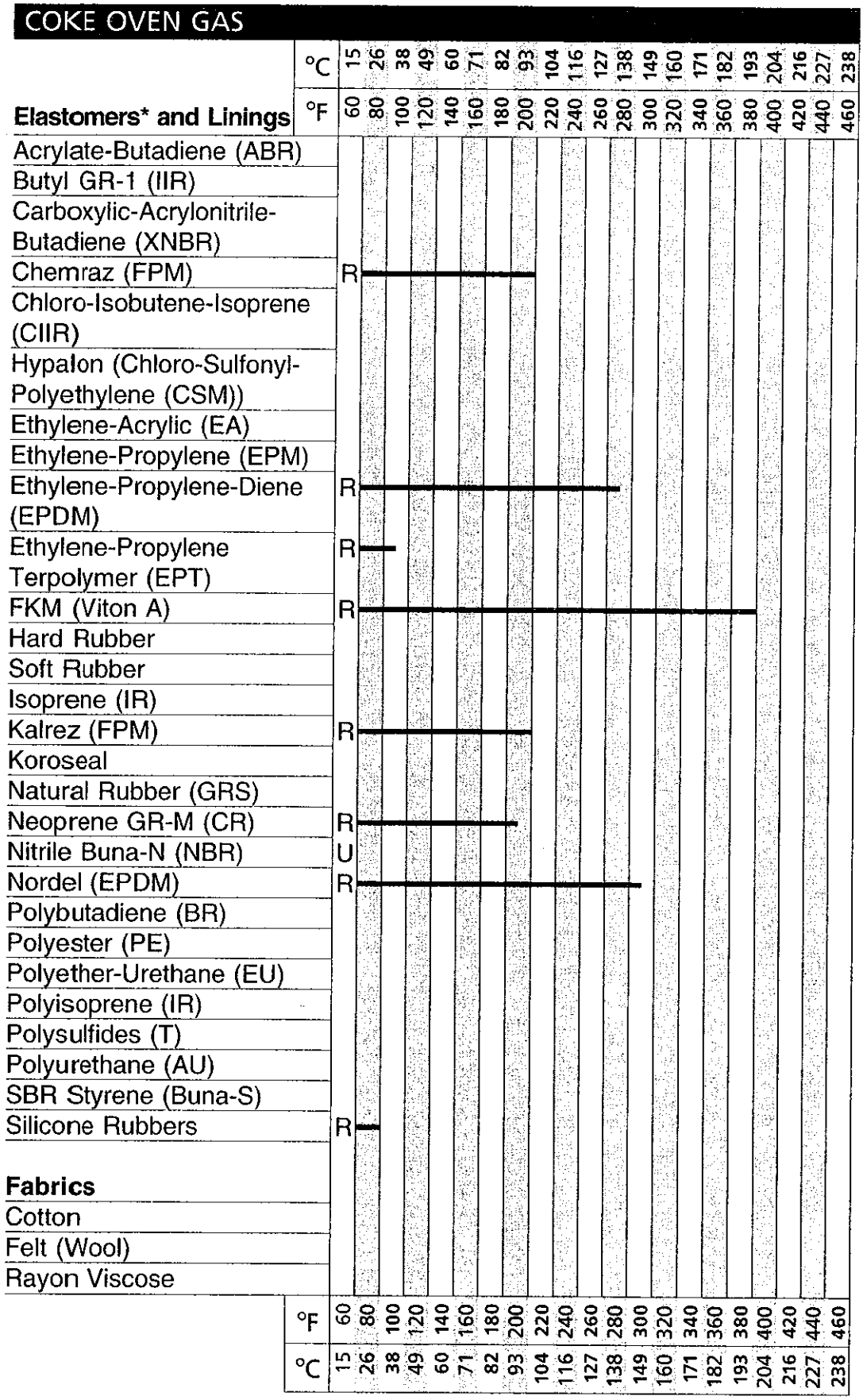
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COKE OVEN GAS



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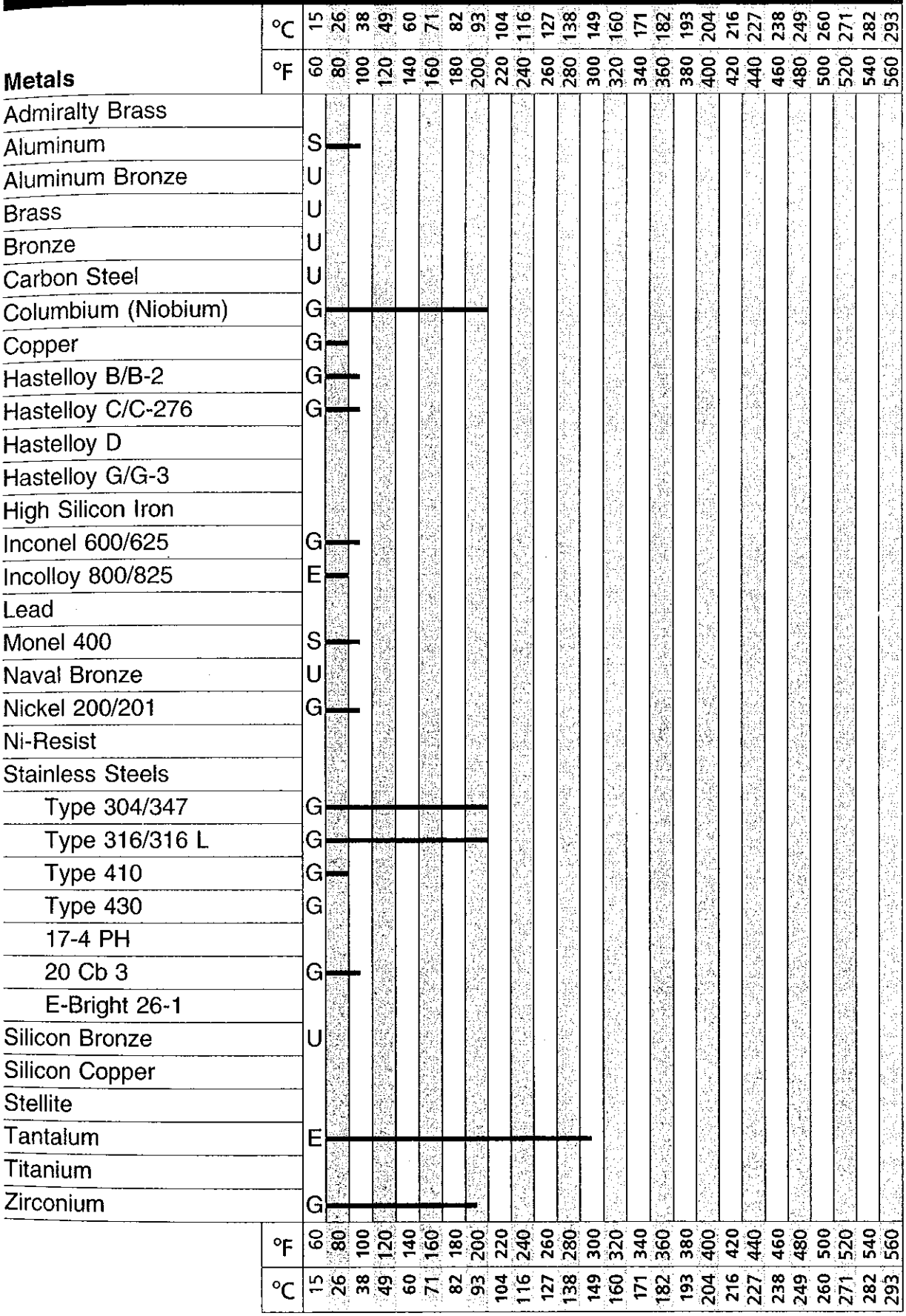
COKE OVEN GAS



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COPPER ACETATE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

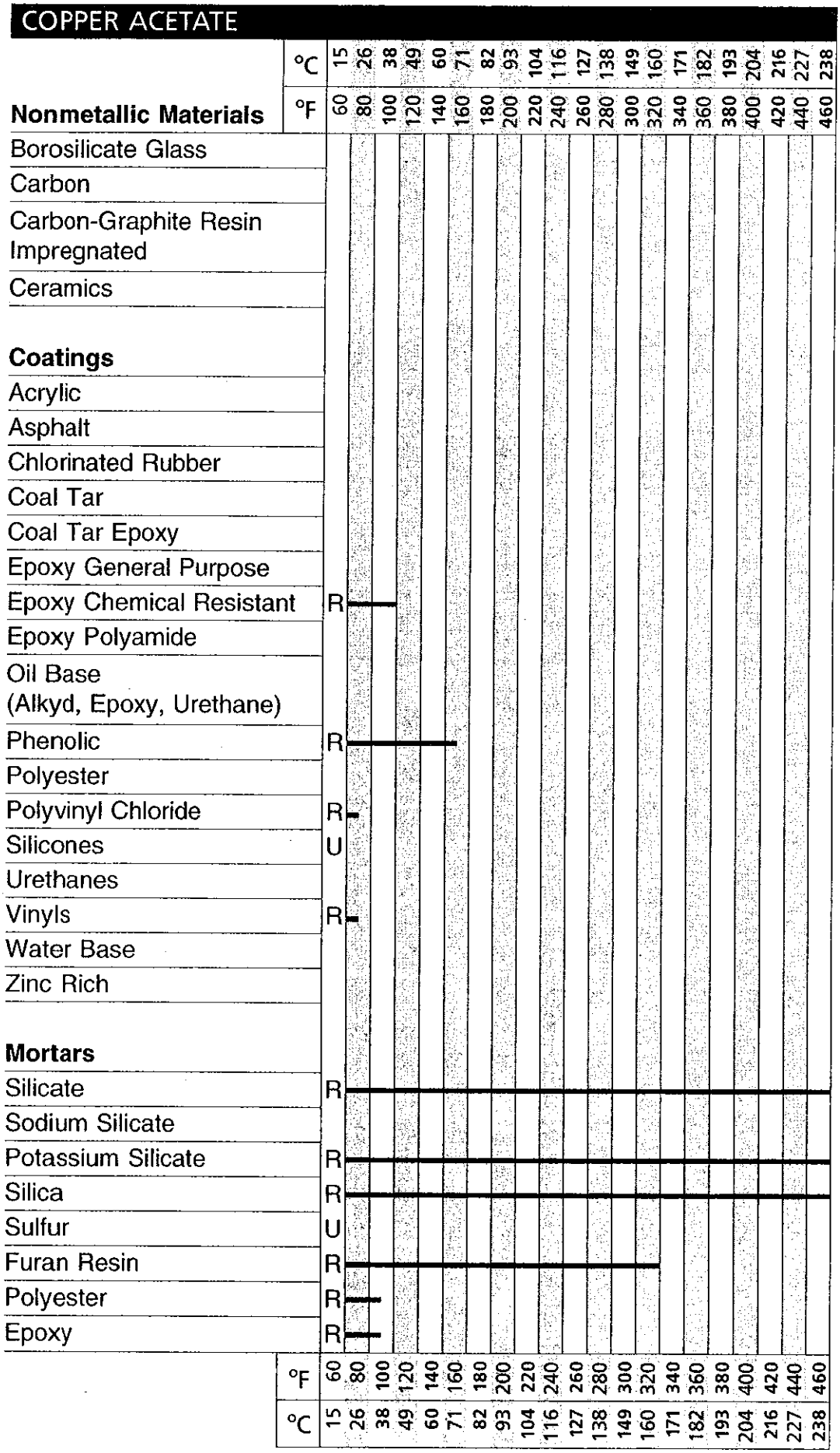
R = Resistant

U = Unsatisfactory

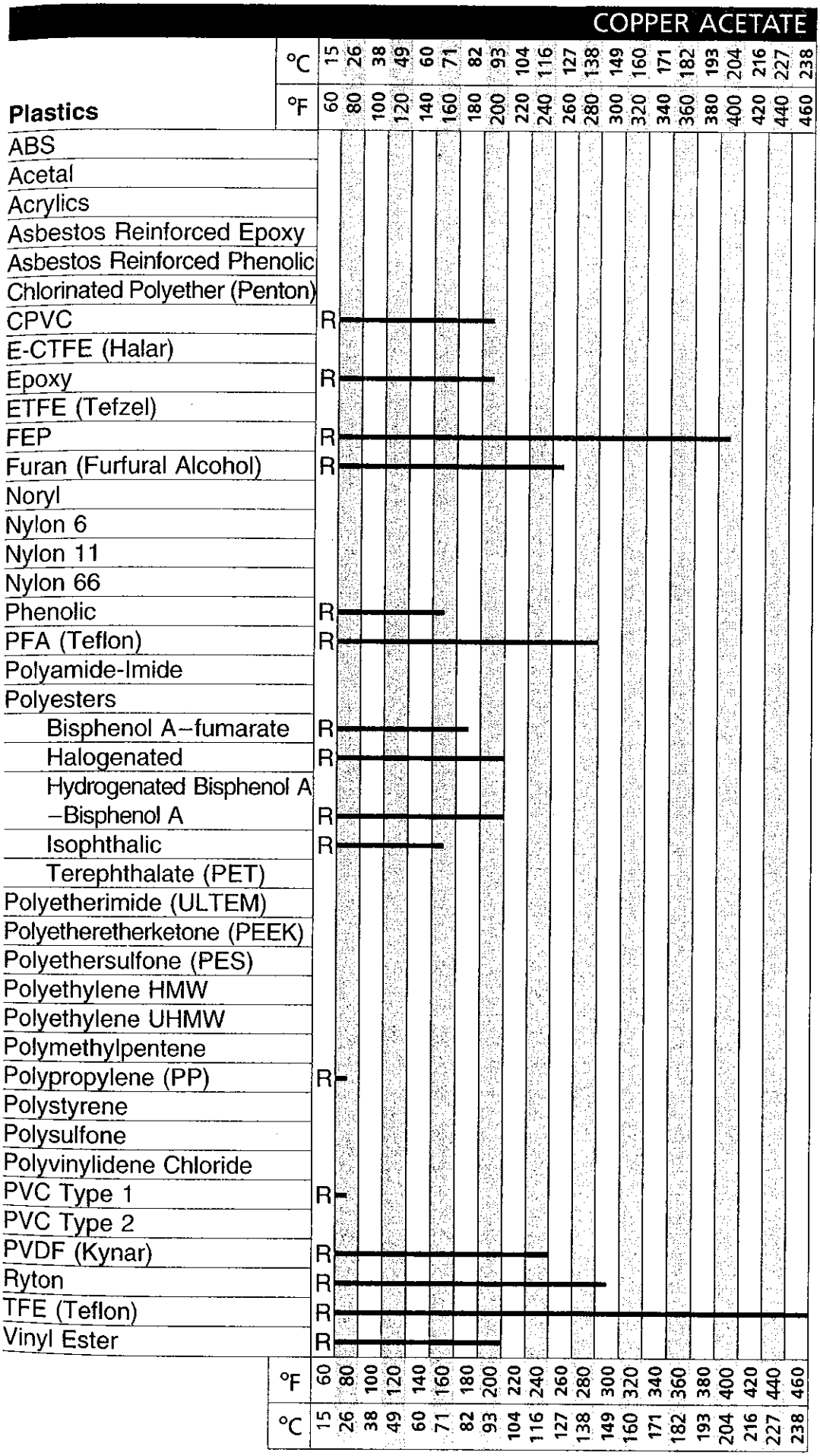
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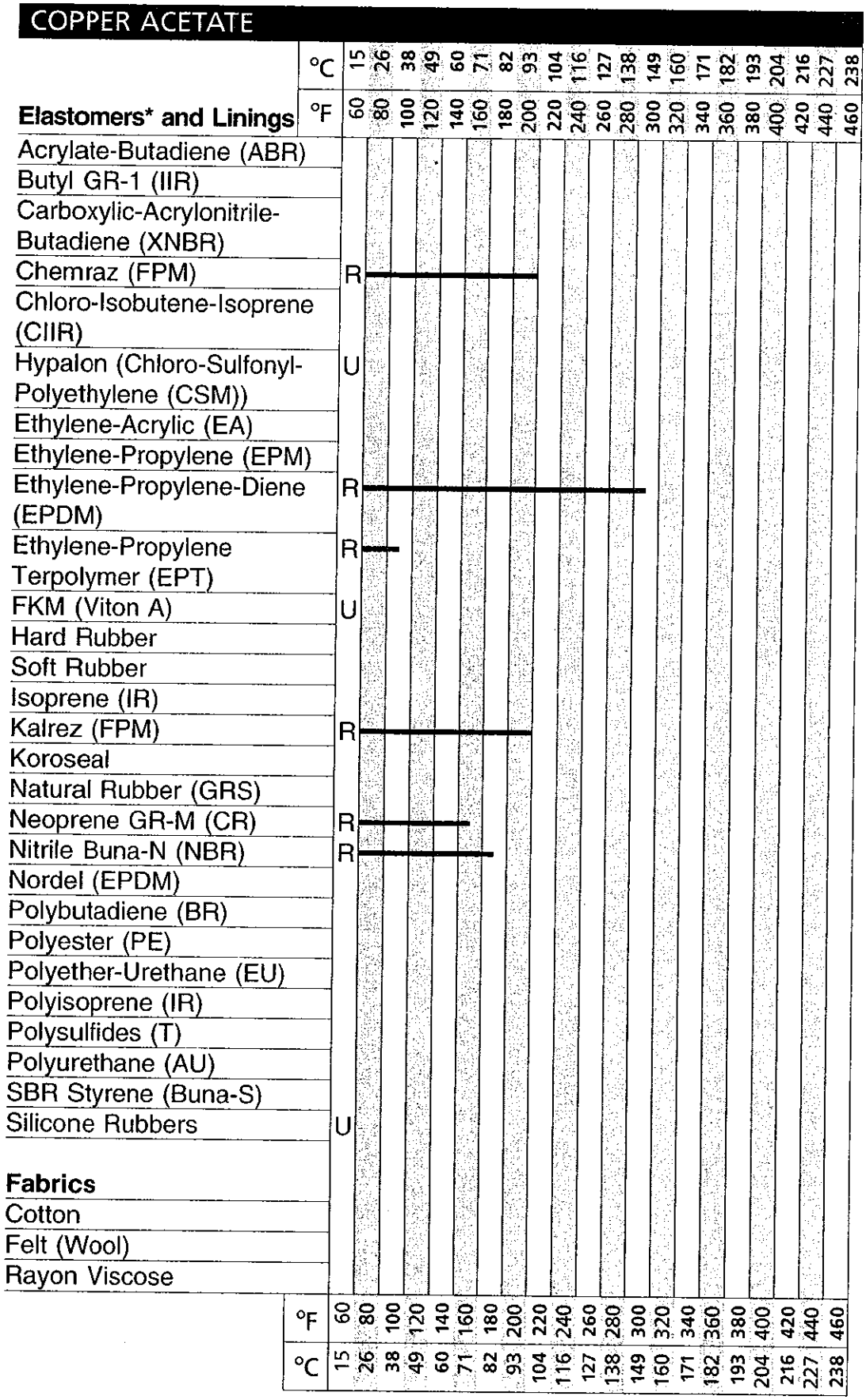


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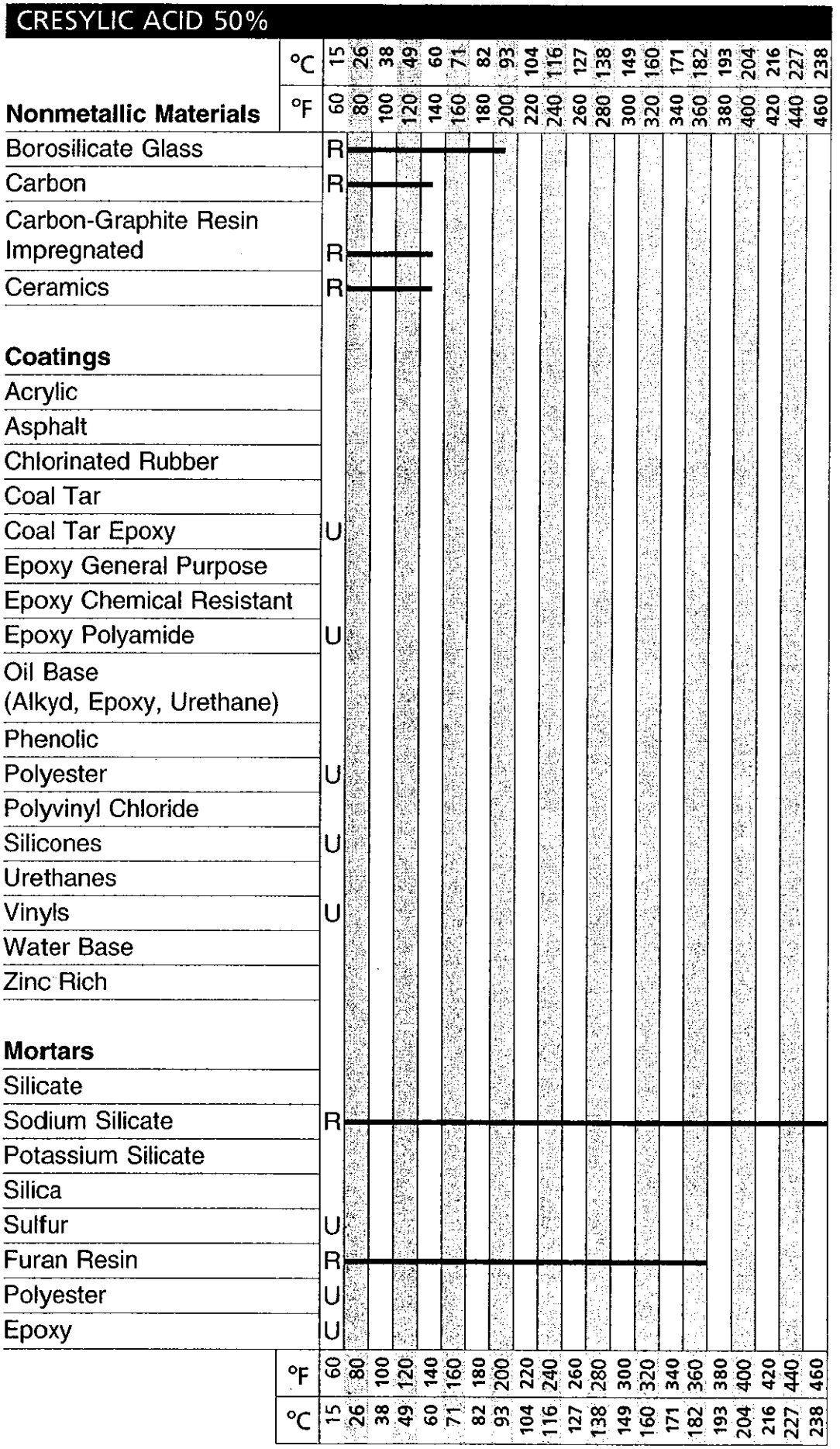
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CRESYLIC ACID 50%



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CRESYLIC ACID 50%

Plastics	°C	°F
ABS	U	
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)	R	
CPVC	R	U
E-CTFE (Halar)	R	
Epoxy	U	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)	R	
Noryl		
Nylon 6	U	
Nylon 11	U	
Nylon 66	U	
Phenolic		
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	U	
Halogenated FUMES	R	
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	U	
Terephthalate (PET)	R	
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW	R	
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)	U	
Polystyrene		
Polysulfone		
Polyvinylidene Chloride	R	
PVC Type 1	R	
PVC Type 2	R	U
PVDF (Kynar)	R	
Ryton		
TFE (Teflon)	R	
Vinyl Ester	U	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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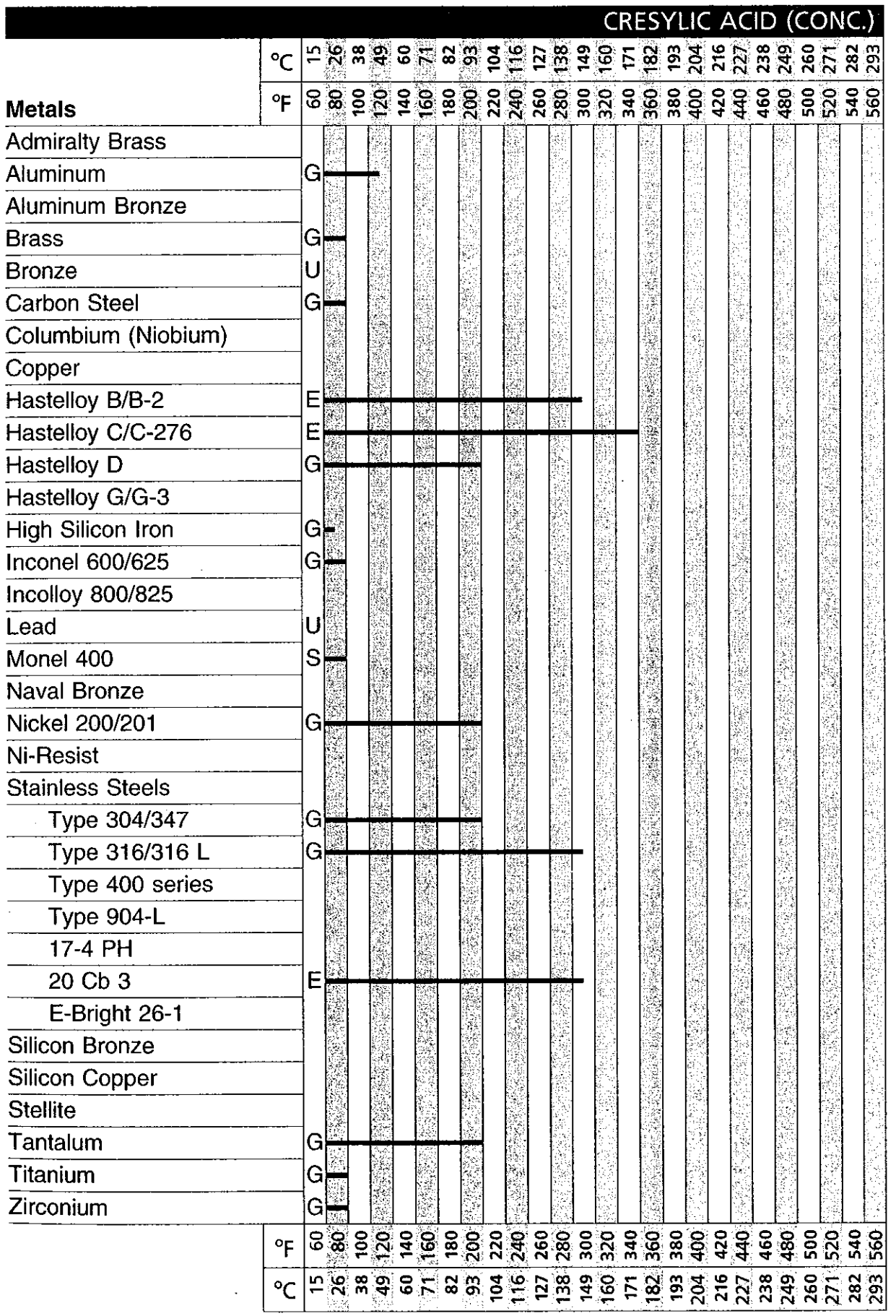
CRESYLIC ACID 50%

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)		U																				
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)		R																				
Chloro-Isobutene-Isoprene (CIIR)		U																				
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))		U																				
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)		U																				
Ethylene-Propylene-Diene (EPDM)		R																				
Ethylene-Propylene Terpolymer (EPT)		U																				
FKM (Viton A)		R																				
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)		U																				
Kalrez (FPM)		R																				
Koroseal																						
Natural Rubber (GRS)		U																				
Neoprene GR-M (CR)		U																				
Nitrile Buna-N (NBR)		U																				
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)		U																				
Polyisoprene (IR)																						
Polysulfides (T)		U																				
Polyurethane (AU)		U																				
SBR Styrene (Buna-S)																						
Silicone Rubbers		U																				
Fabrics																						
Cotton		U																				
Felt (Wool)		U																				
Rayon Viscose		R																				
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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CRESYLIC ACID (CONC.)



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

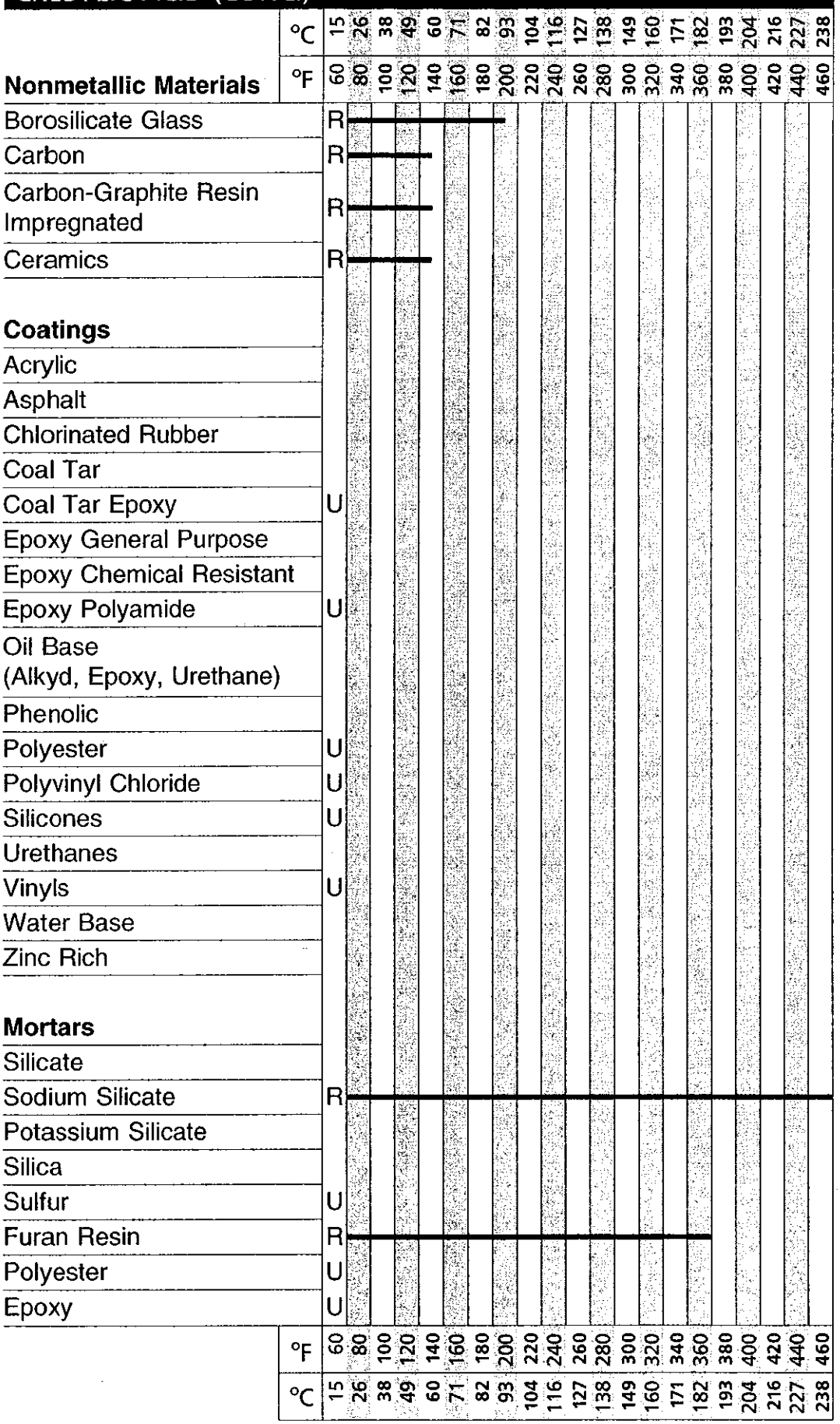
R = Resistant

U = Unsatisfactory

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CRESYLIC ACID (CONC.)



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CRESYLIC ACID (CONC.)

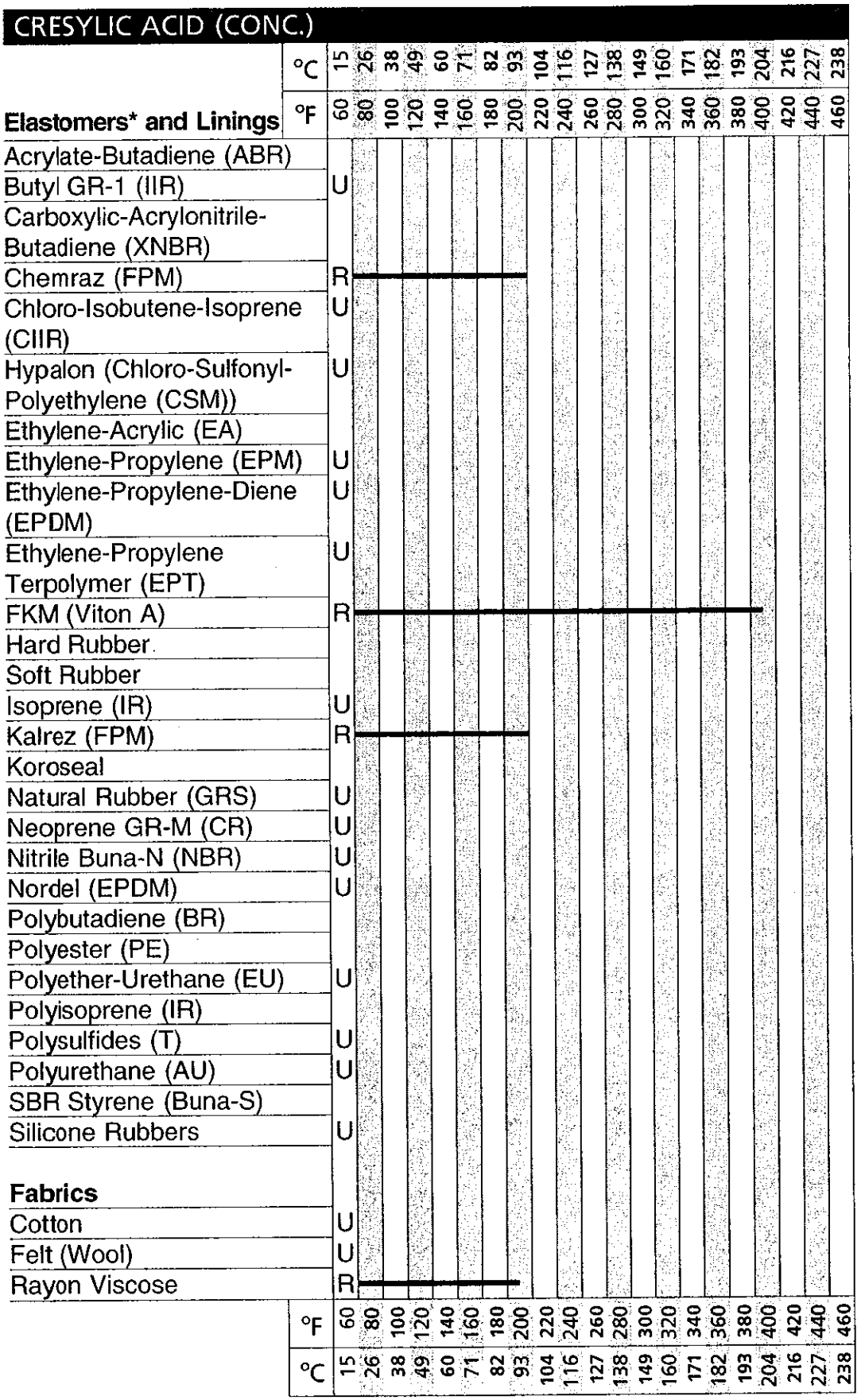
Plastics	°C	°F
ABS	U	
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)	R	
CPVC	U	
E-CTFE (Halar)	R	
Epoxy	U	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)	R	
Noryl		
Nylon 6	U	
Nylon 11	U	
Nylon 66	U	
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	U	
Halogenated	U	
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	U	
Terephthalate (PET)	R	
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)	U	
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1	U	
PVC Type 2	U	
PVDF (Kynar)	R	
Ryton		
TFE (Teflon)	R	
Vinyl Ester	U	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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CRESYLIC ACID (CONC.)



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CROTON ALDEHYDE

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																												
Aluminum	1		G																									
Aluminum Bronze																												
Brass			G																									
Bronze			G																									
Galv. Steel			E																									
Columbium (Niobium)																												
Copper			G																									
Hastelloy B/B-2			G																									
Hastelloy C/C-276			G																									
Hastelloy D																												
Hastelloy G/G-3																												
High Silicon Iron			G																									
Inconel 600/625			G																									
Incolloy 800/825																												
Lead																												
Monel 400			G																									
Naval Bronze																												
Nickel 200/201			G																									
Ni-Resist																												
Stainless Steels																												
Type 304/347	83%		E																									
Type 316/316 L	83%		E																									
Type 400 series																												
Type 904-L																												
17-4 PH																												
20 Cb 3			G																									
E-Bright 26-1																												
Silicon Bronze																												
Silicon Copper																												
Stellite																												
Tantalum			G																									
Titanium																												
Zirconium			G																									
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

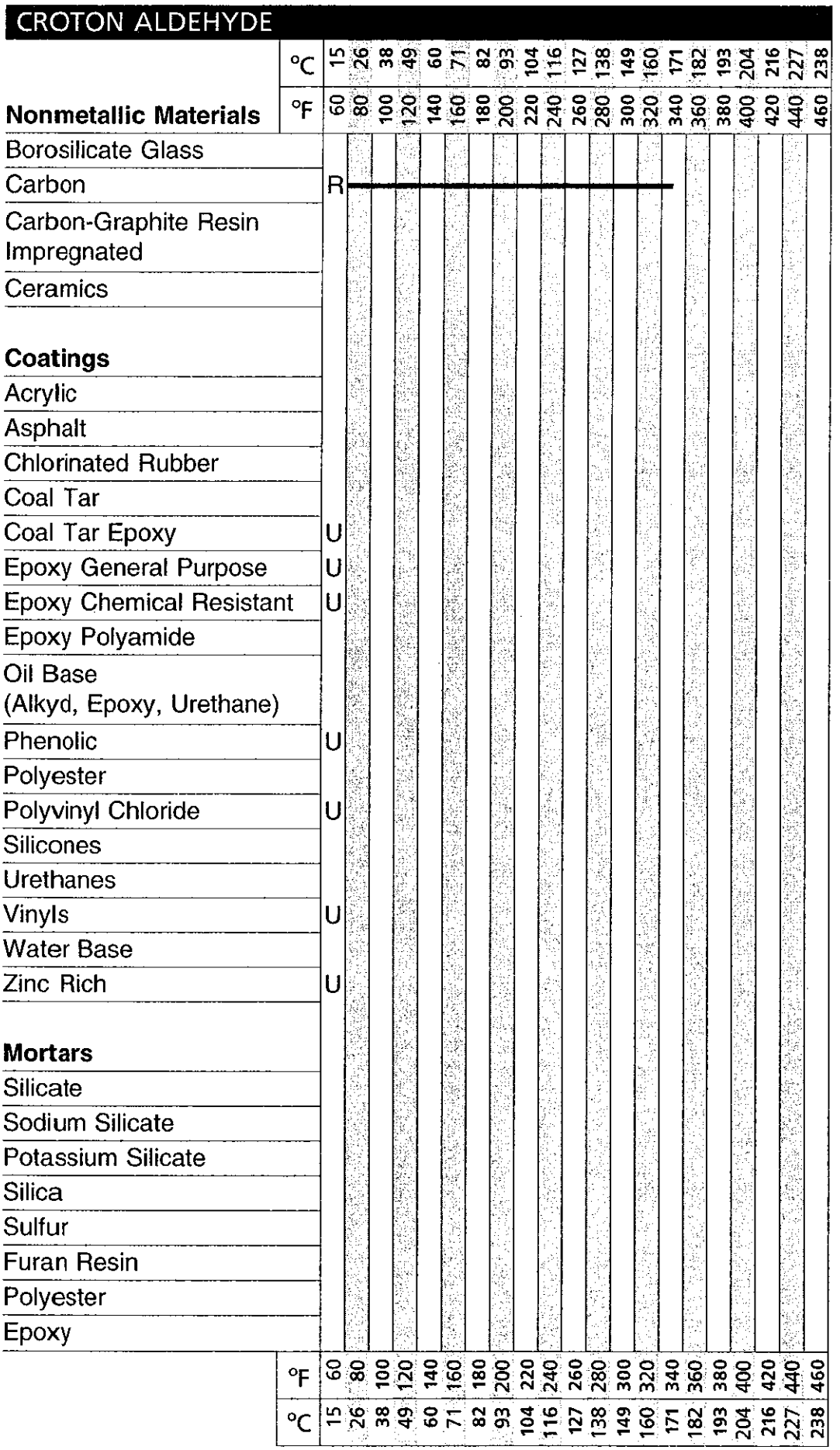
R = Resistant

U = Unsatisfactory

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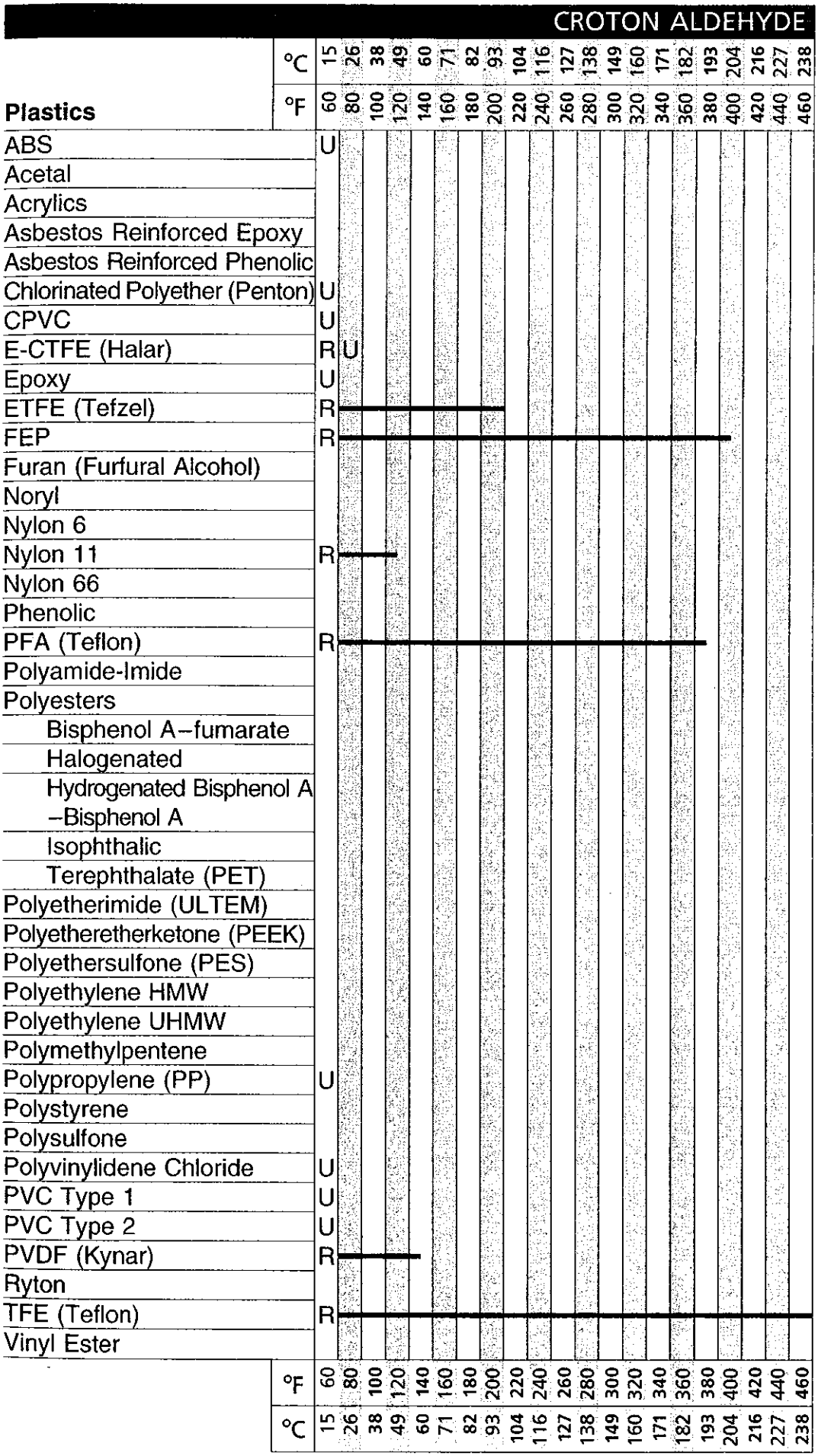
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CROTON ALDEHYDE



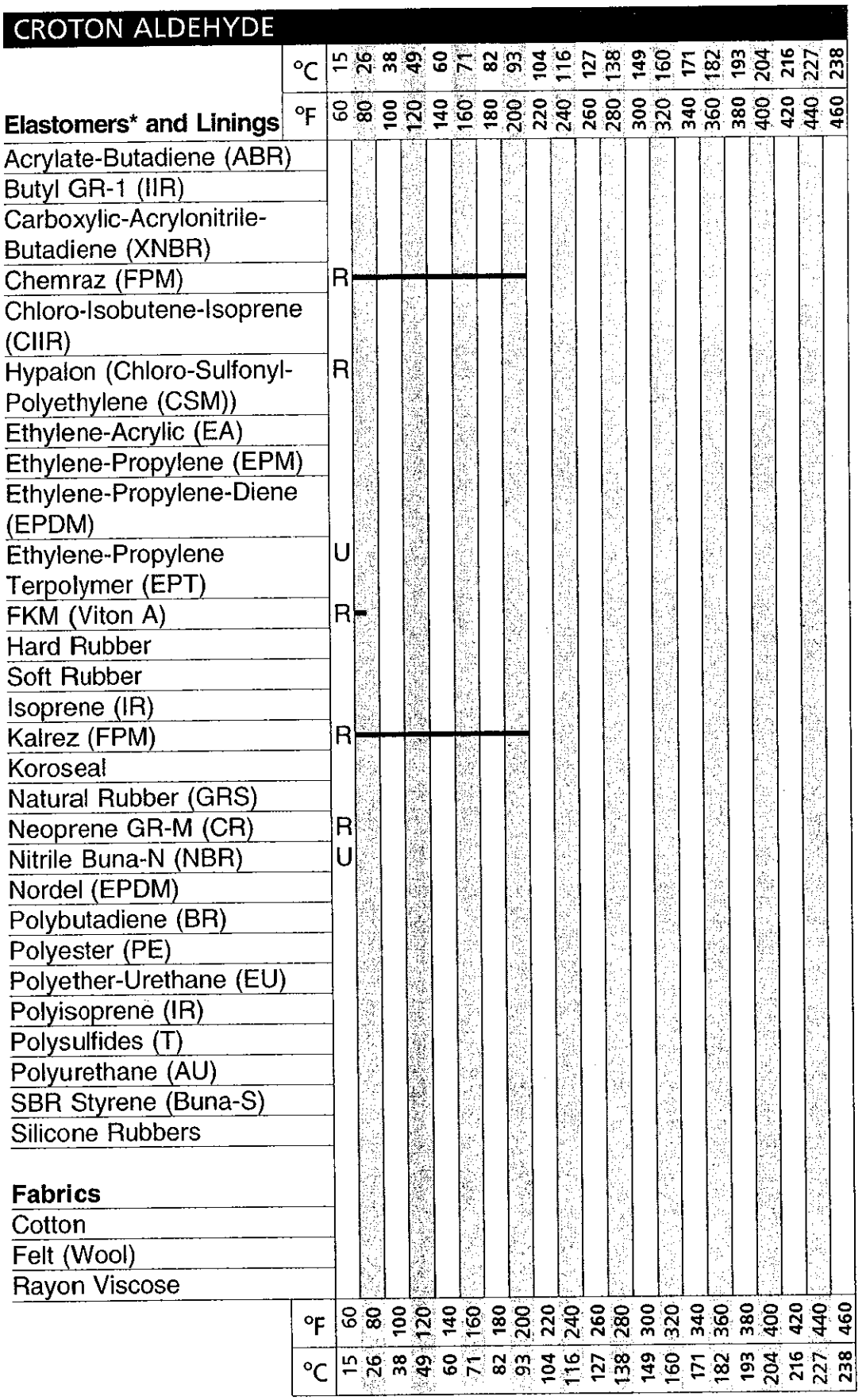
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CROTON ALDEHYDE



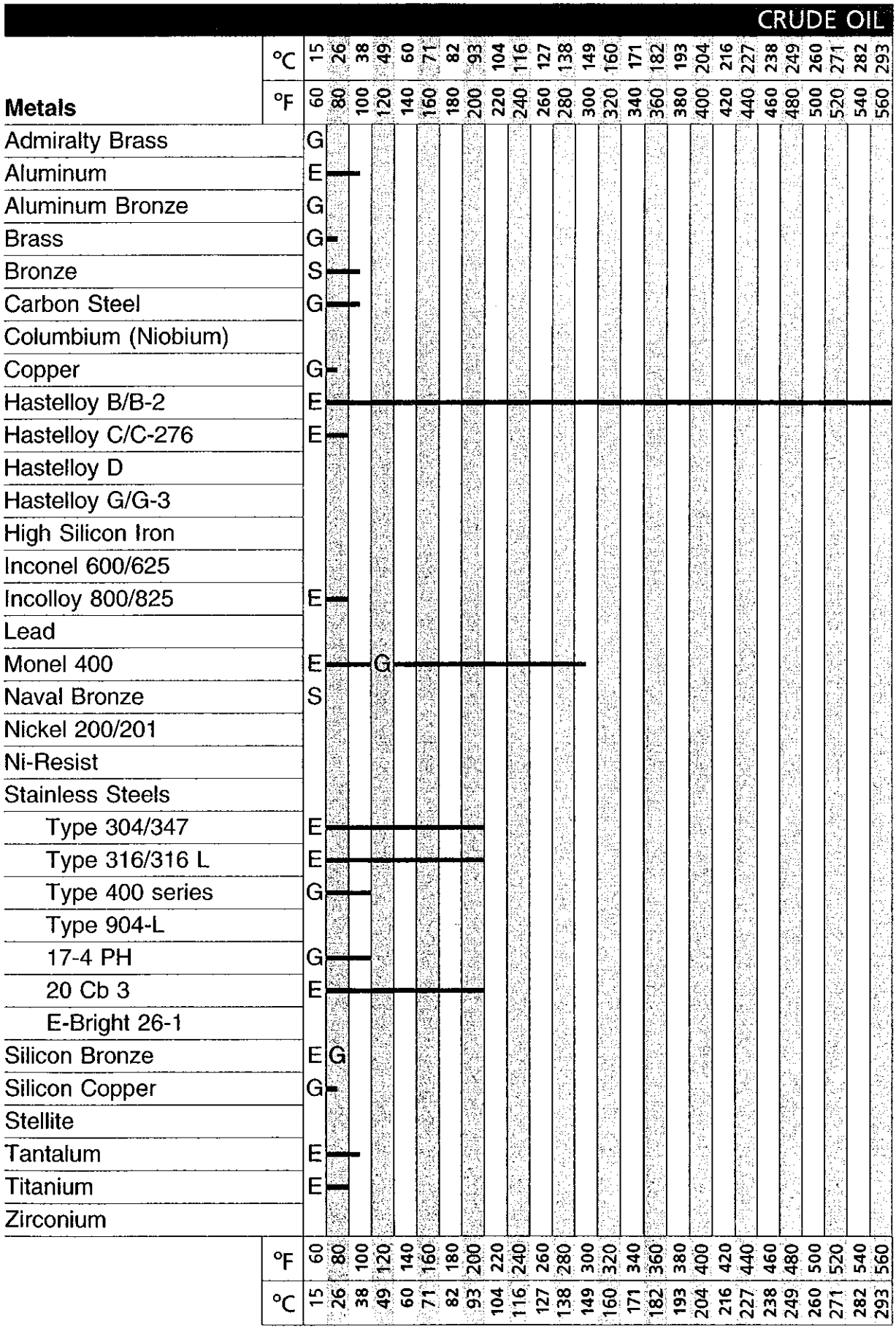
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CROTON ALDEHYDE



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

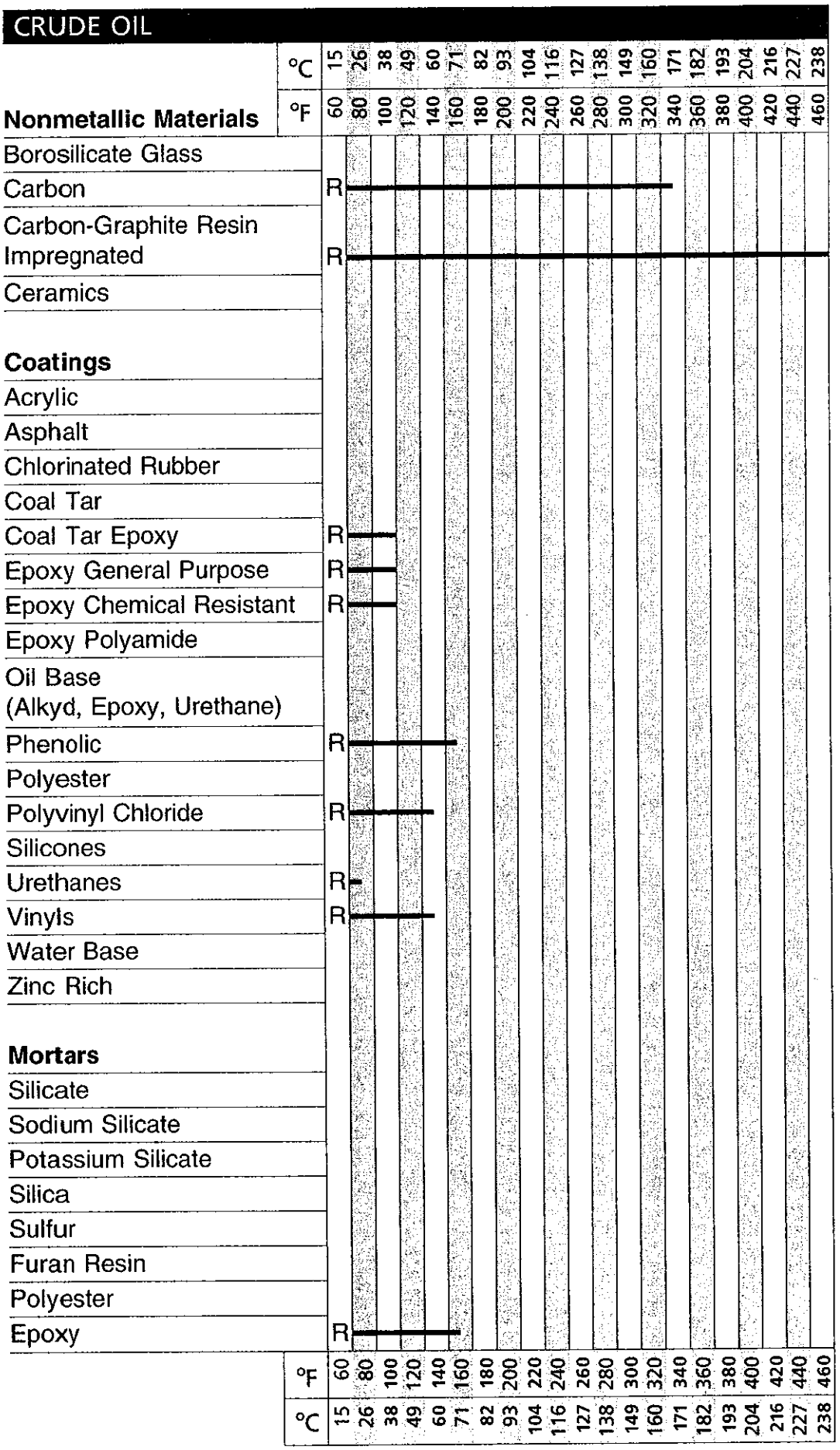
R = Resistant

U = Unsatisfactory

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CRUDE OIL



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CRUDE OIL

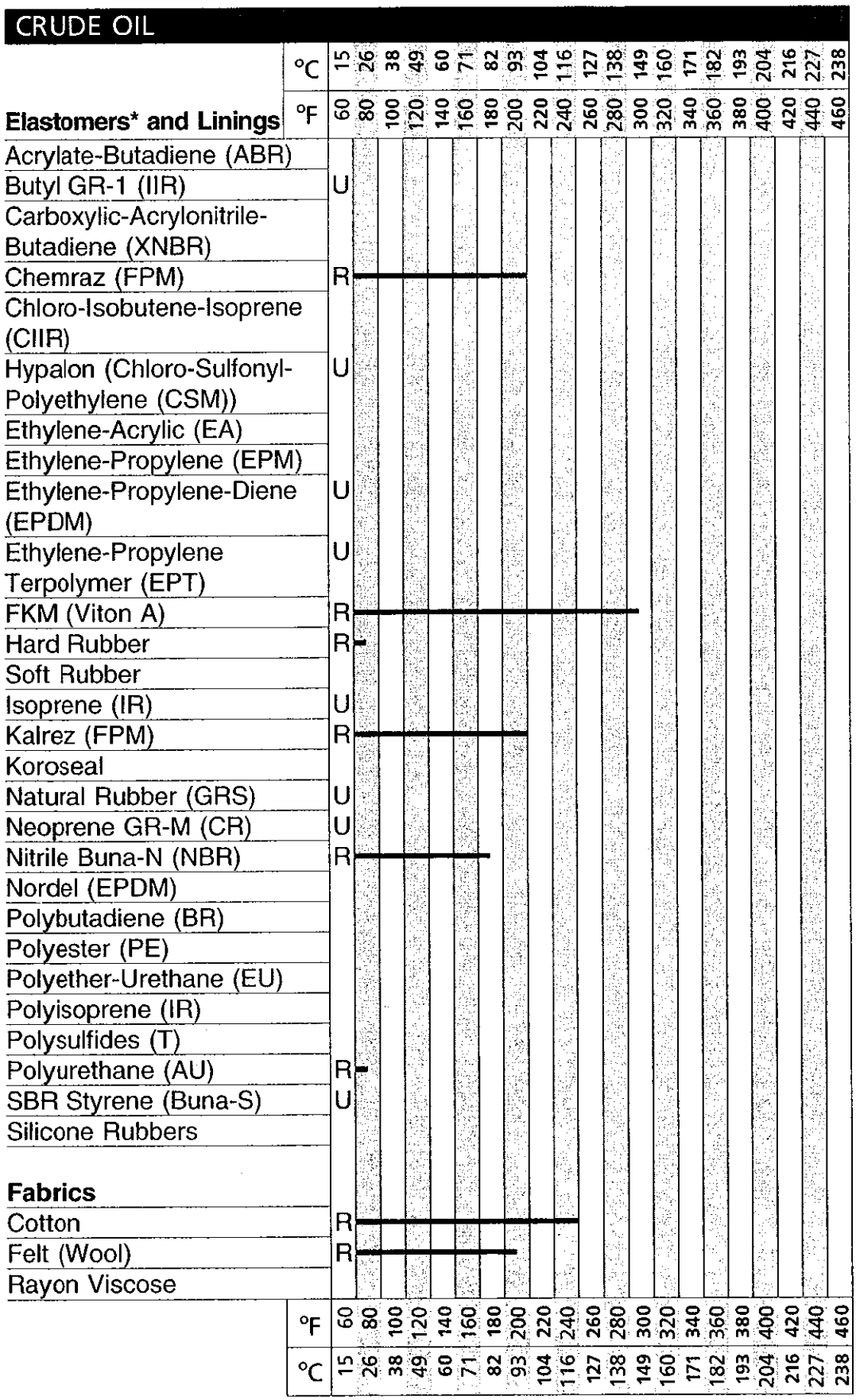
Plastics	°C	°F
ABS	R	
Acetal	R	
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)	R	
CPVC	R	
E-CTFE (Halar)	R	
Epoxy	R	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)		
Noryl	U	
Nylon 6	R	
Nylon 11	R	
Nylon 66	R	
Phenolic		
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	R	
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	R	
Terephthalate (PET)	R	
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)	R	
Polyethersulfone (PES)		
Polyethylene HMW	U	
Polyethylene UHMW	R	
Polymethylpentene		
Polypropylene (PP)	R	
Polystyrene		
Polysulfone		
Polyvinylidene Chloride	R	
PVC Type 1	R	
PVC Type 2	R	
PVDF (Kynar)	R	
Ryton	R	
TFE (Teflon)	R	
Vinyl Ester	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

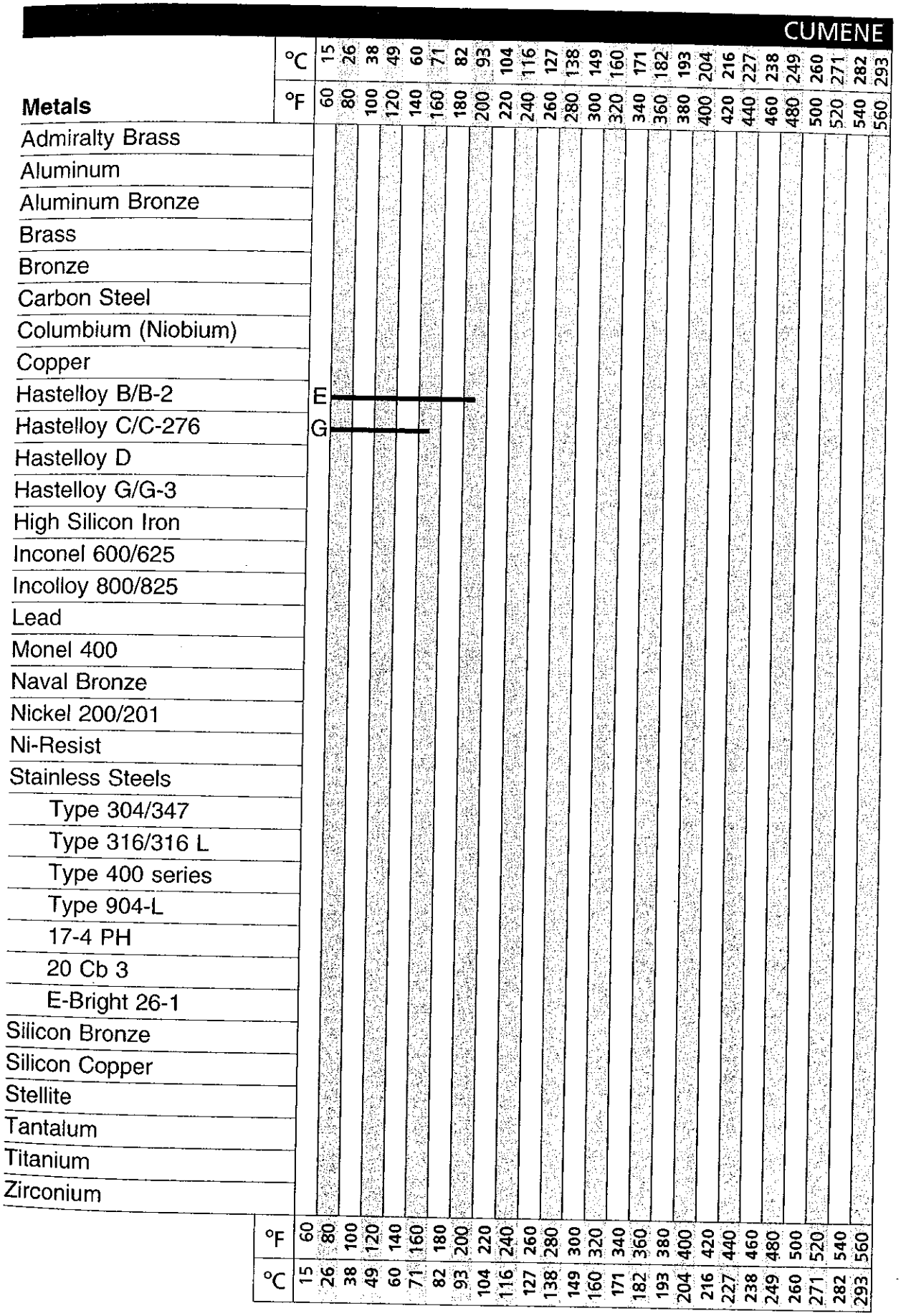
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CRUDE OIL



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

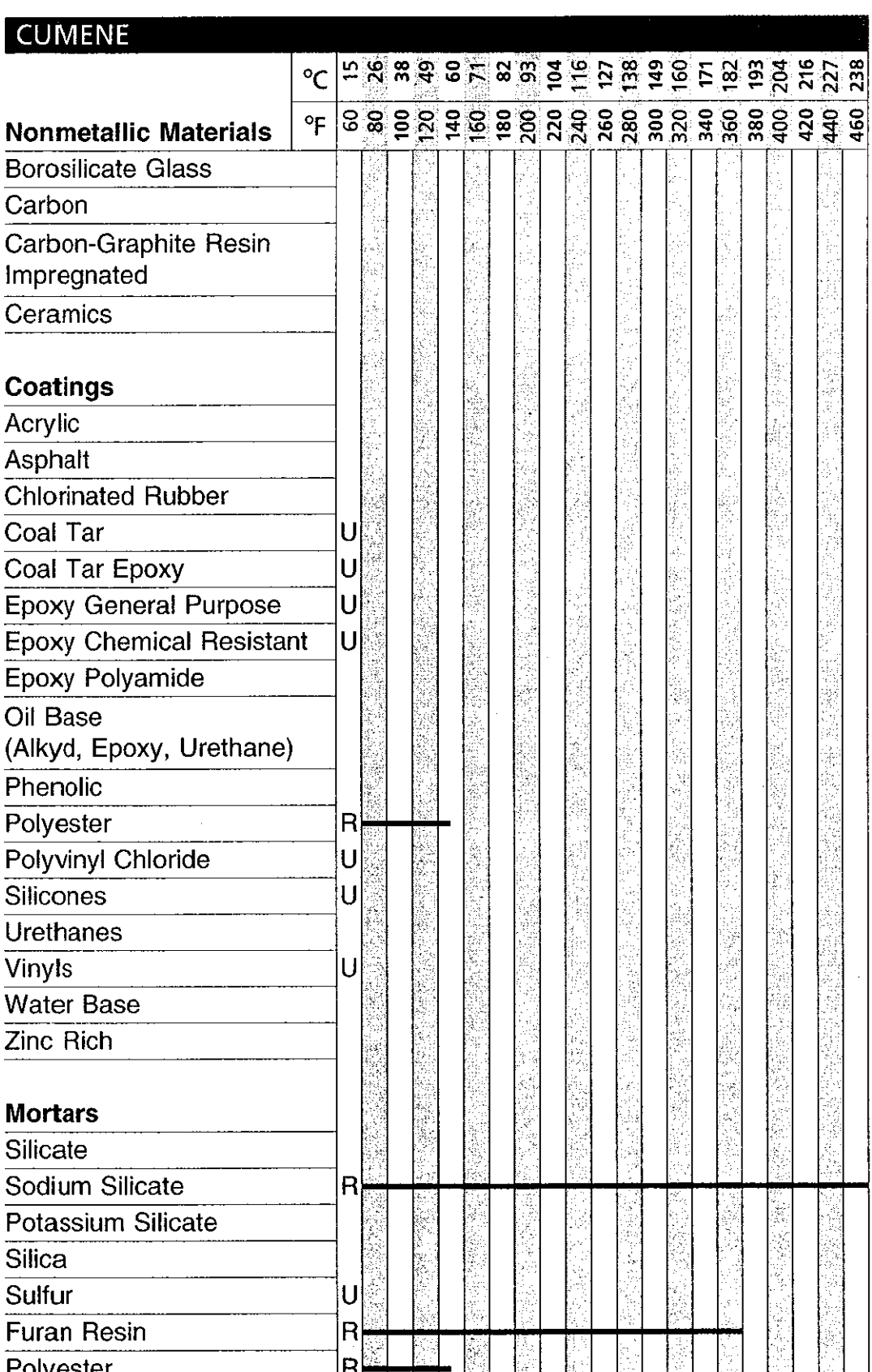
R = Resistant

U = Unsatisfactory

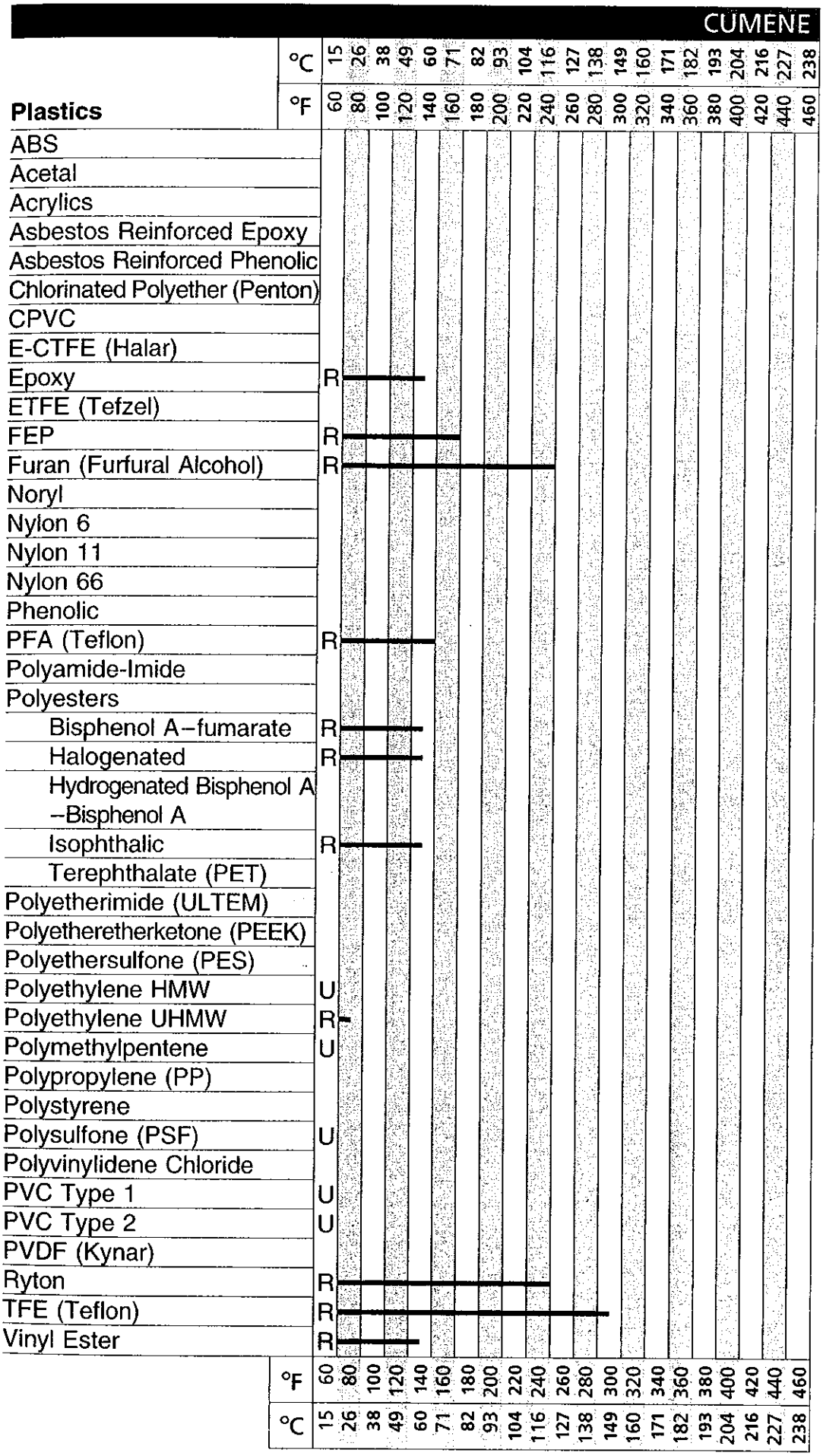
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CUMENE



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CUMENE

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	U																					
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)	U																					
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)	R																					
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)	R																					
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)	U																					
Nitrile Buna-N (NBR)	U																					
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers	U																					
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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CUPRIC CHLORIDE 5%

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																												
Aluminum			U																									
Aluminum Bronze																												
Brass																												
Bronze																												
Carbon Steel			U																									
Columbium (Niobium)			E																									
Copper			S			U																						
Hastelloy B/B-2			E																									
Hastelloy C/C-276			G																									
Hastelloy D																												
Hastelloy G/G-3																												
High Silicon Iron																												
Inconel 600/625			U																									
Incolloy 800/825			U																									
Lead																												
Monel 400			U																									
Naval Bronze			U																									
Nickel 200/201			U																									
Ni-Resist																												
Stainless Steels																												
Type 304/347			U																									
Type 316/316 L	1		U																									
Type 410			U																									
Type 430																												
Type 317/317 L			U																									
20 Cb 3			G																									
Type 321			U																									
Silicon Bronze																												
Silicon Copper			U																									
Stellite																												
Tantalum			E																									
Titanium			E																									
Zirconium			U																									
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

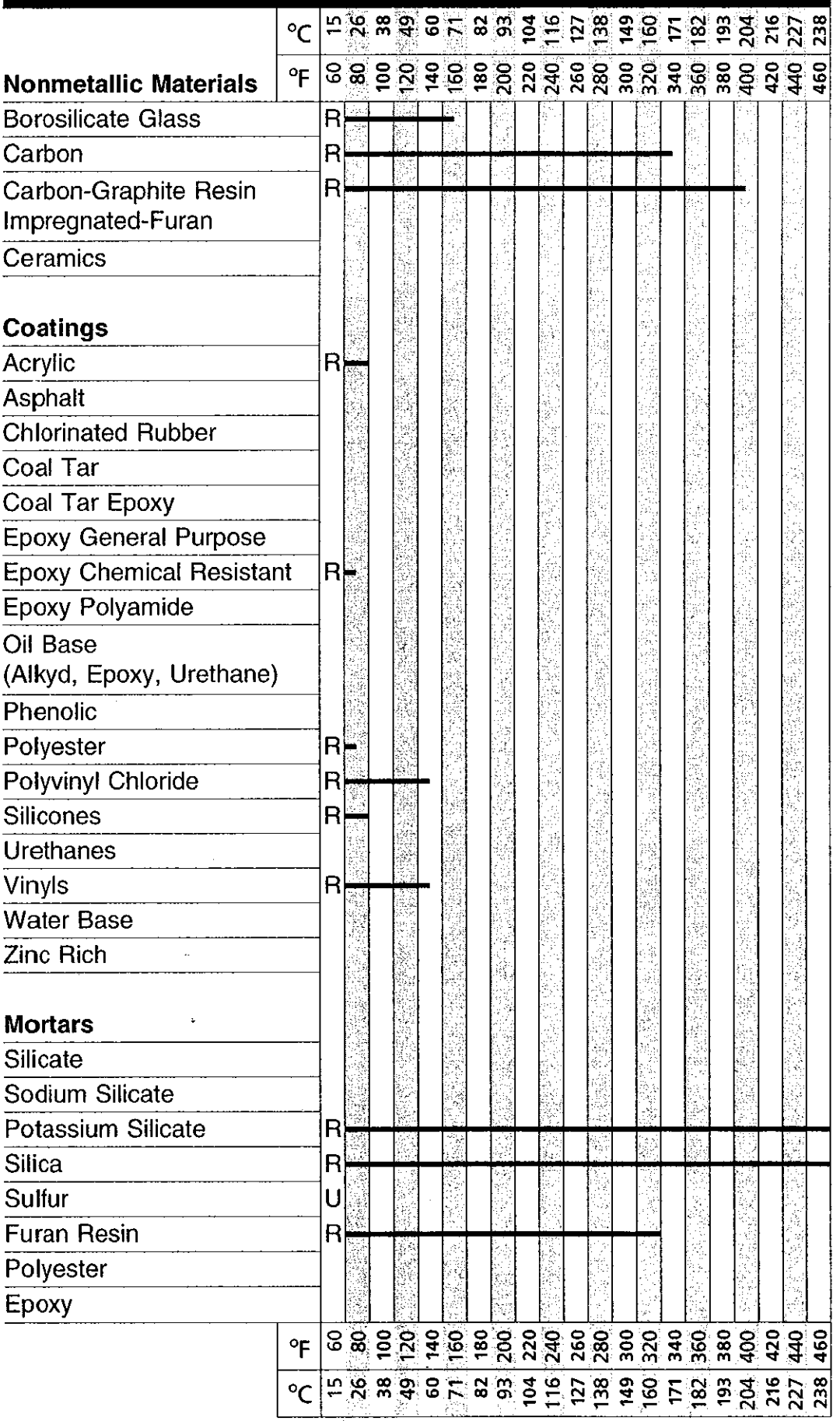
R = Resistant

U = Unsatisfactory

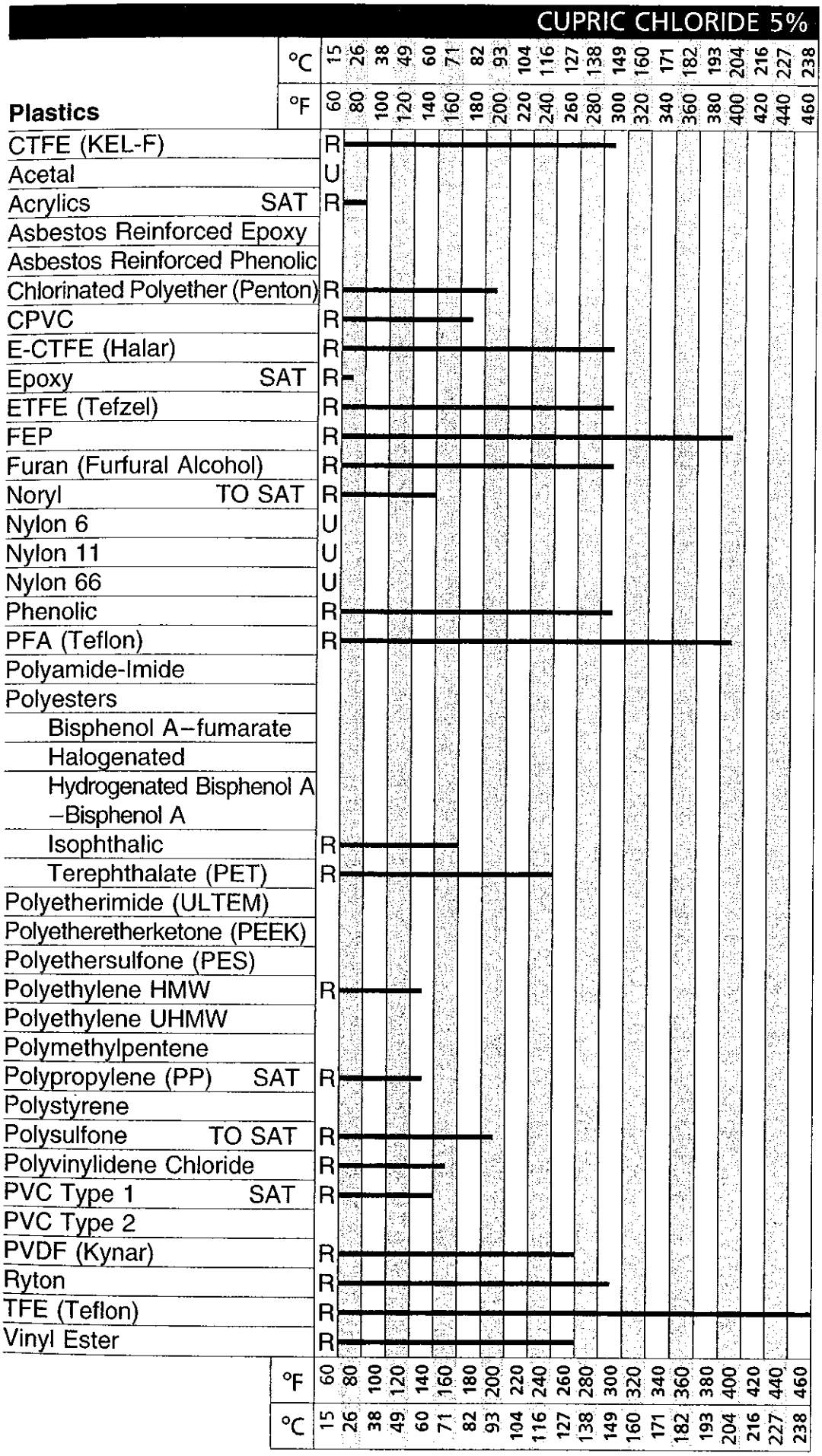
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CUPRIC CHLORIDE 5%

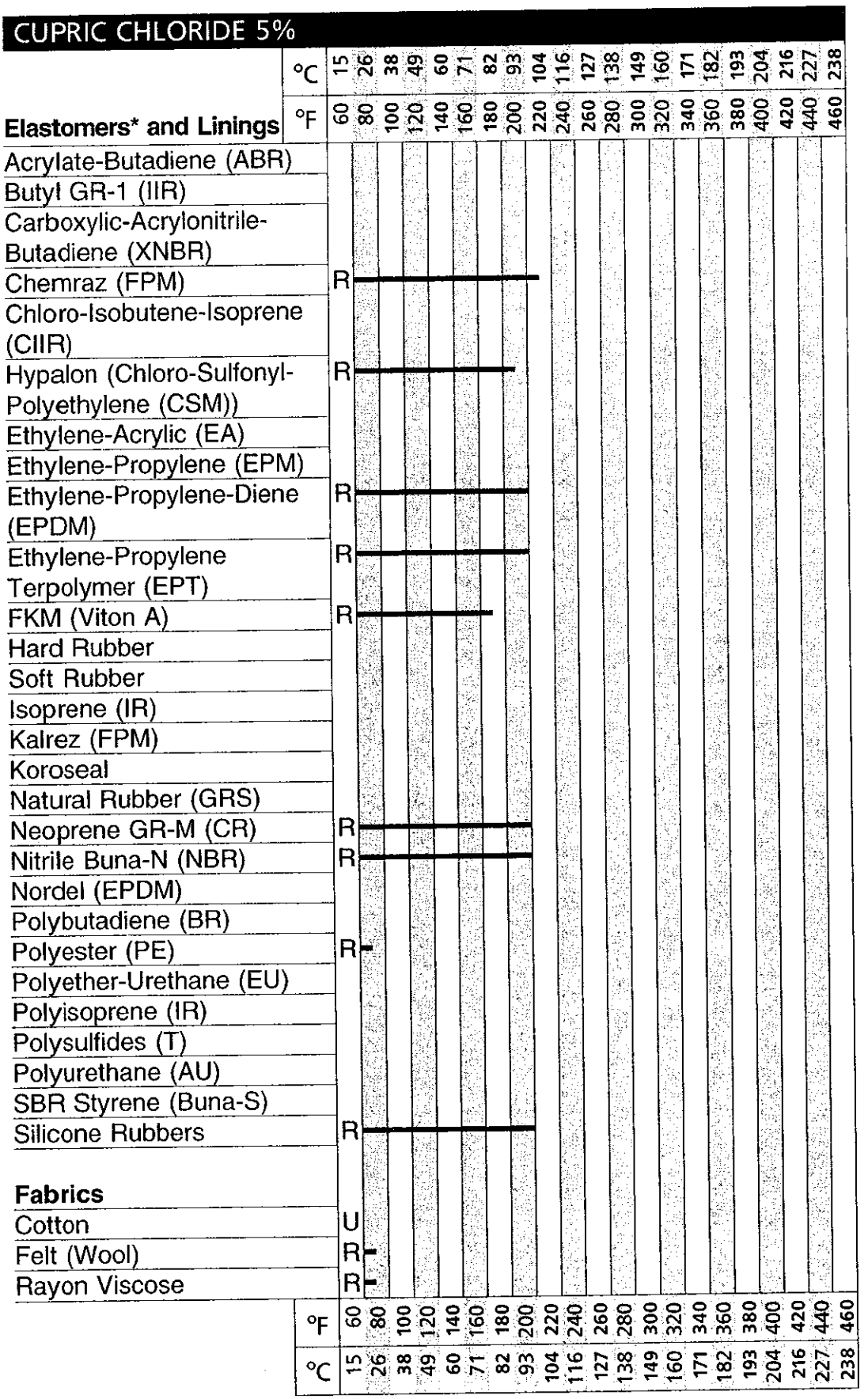


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CUPRIC CHLORIDE 5%



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CUPRIC CHLORIDE 50%

Metals	°C	°F	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F		60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																												
Aluminum																												
Aluminum Bronze																												
Brass																												
Bronze																												
Carbon Steel																												
Columbium (Niobium)																												
Copper																												
Hastelloy B/B-2			G																									
Hastelloy C/C-276			G																									
Hastelloy D																												
Hastelloy G/G-3																												
High Silicon Iron																												
Inconel 600/625			U																									
Incolloy 800/825			U																									
Lead																												
Monel 400			U																									
Naval Bronze																												
Nickel 200/201																												
Ni-Resist																												
Stainless Steels																												
Type 304/347			U																									
Type 316/316 L			U																									
Type 410			U																									
Type 430			U																									
Type 317/317 L			U																									
20 Cb 3			U																									
Type 321			U																									
Silicon Bronze																												
Silicon Copper																												
Stellite																												
Tantalum			E																									
Titanium			E																									
Zirconium 20–50%			G																									
	°F		60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C		15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

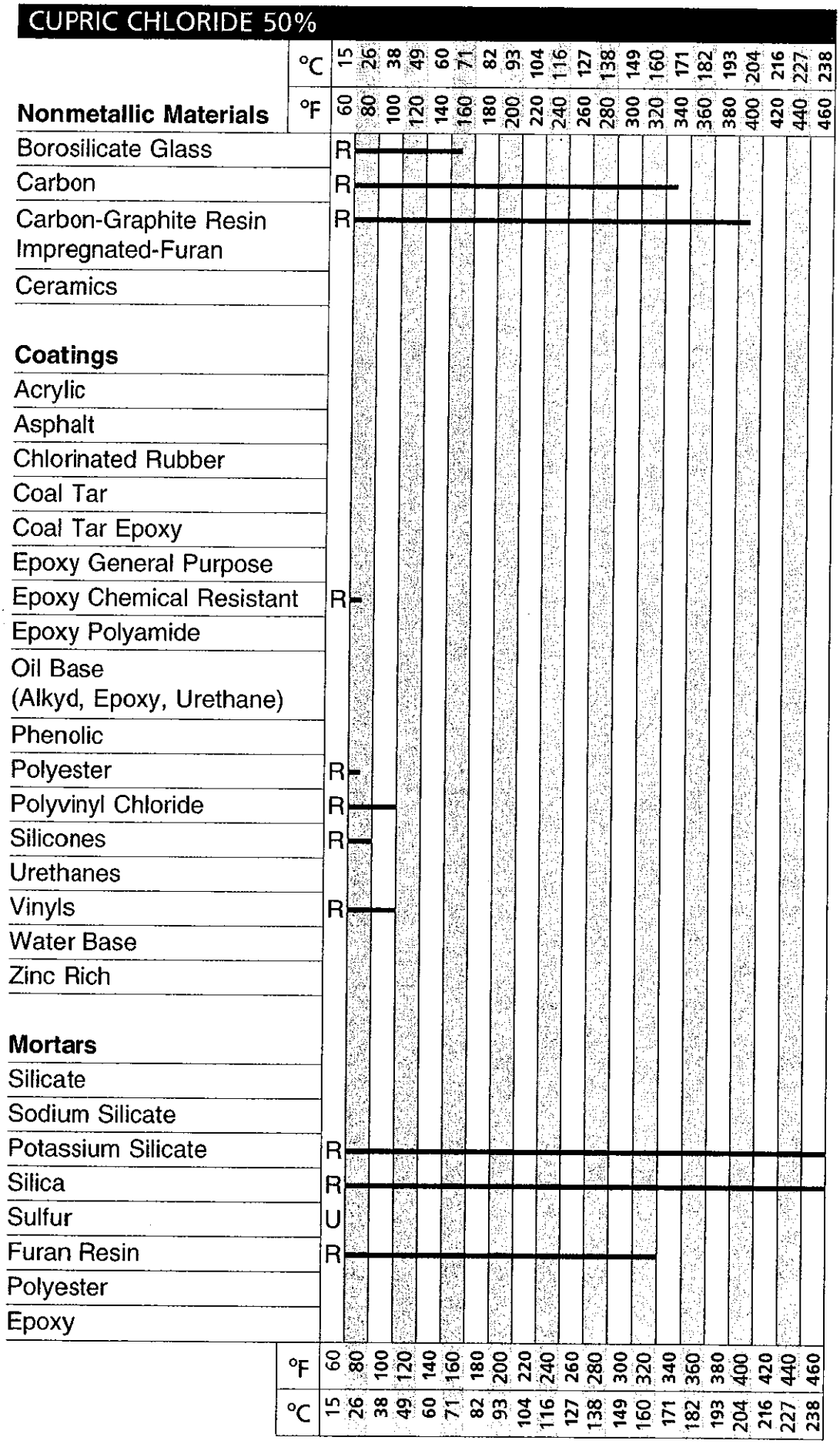
R = Resistant

U = Unsatisfactory

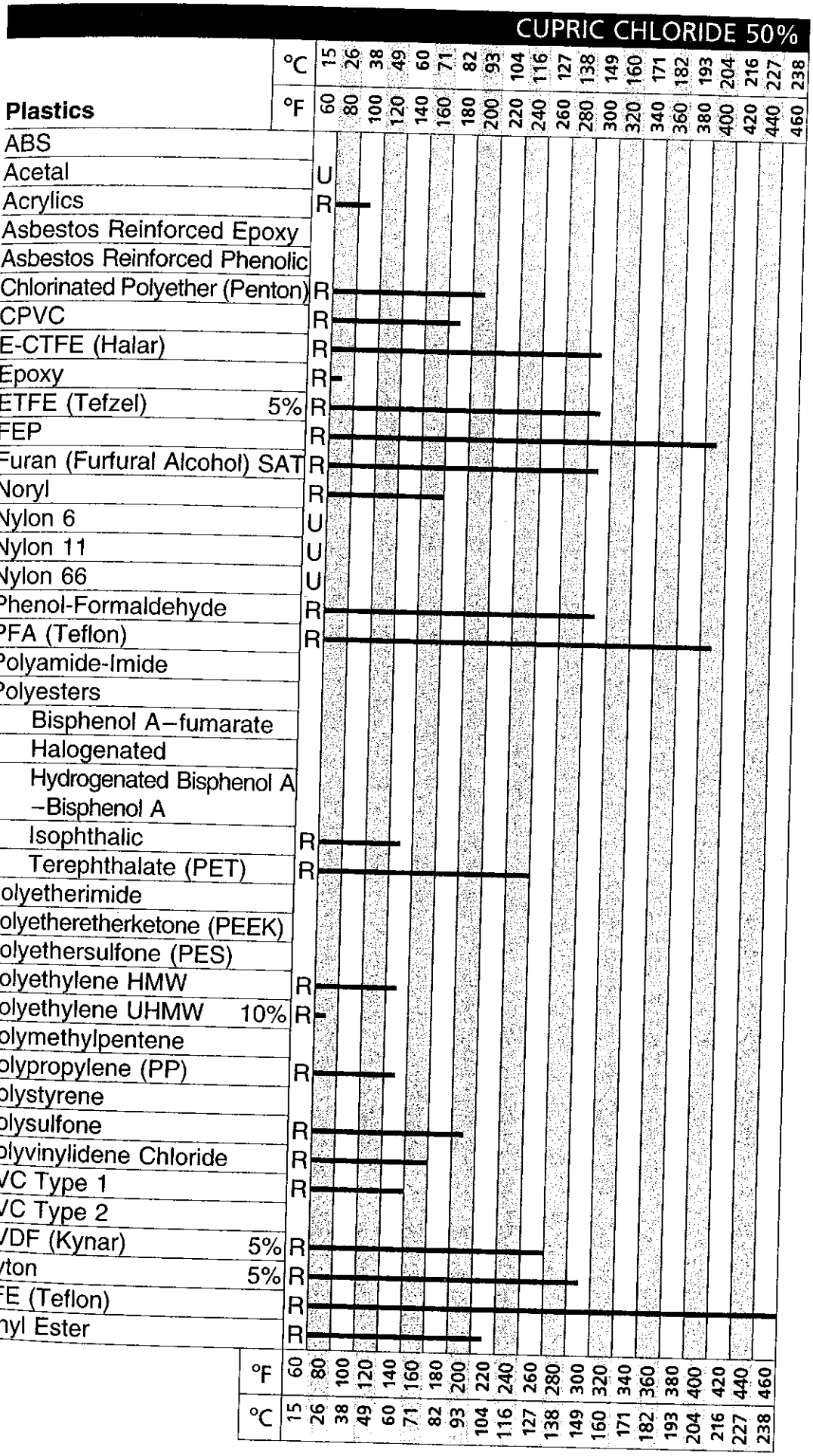
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CUPRIC CHLORIDE 50%

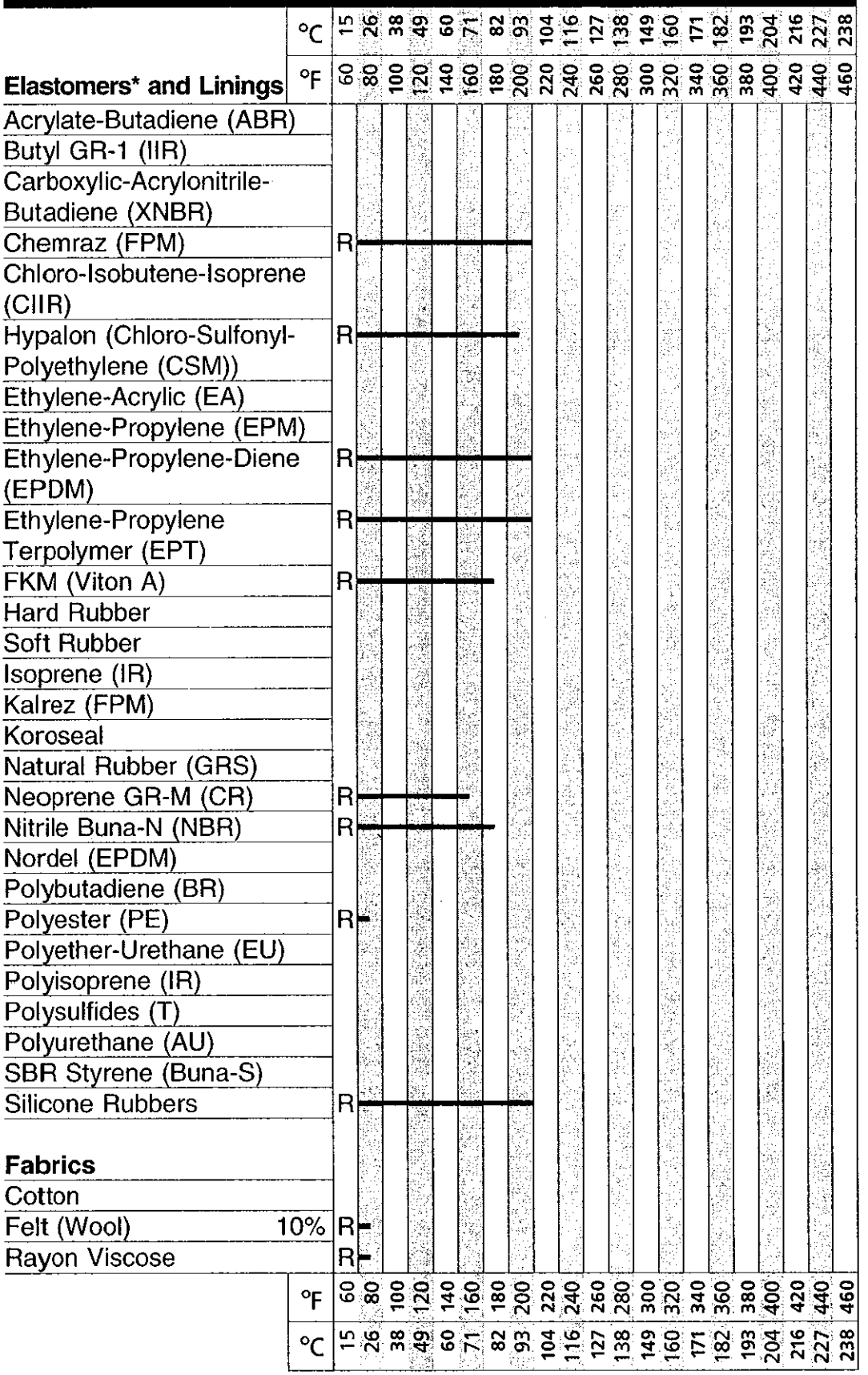


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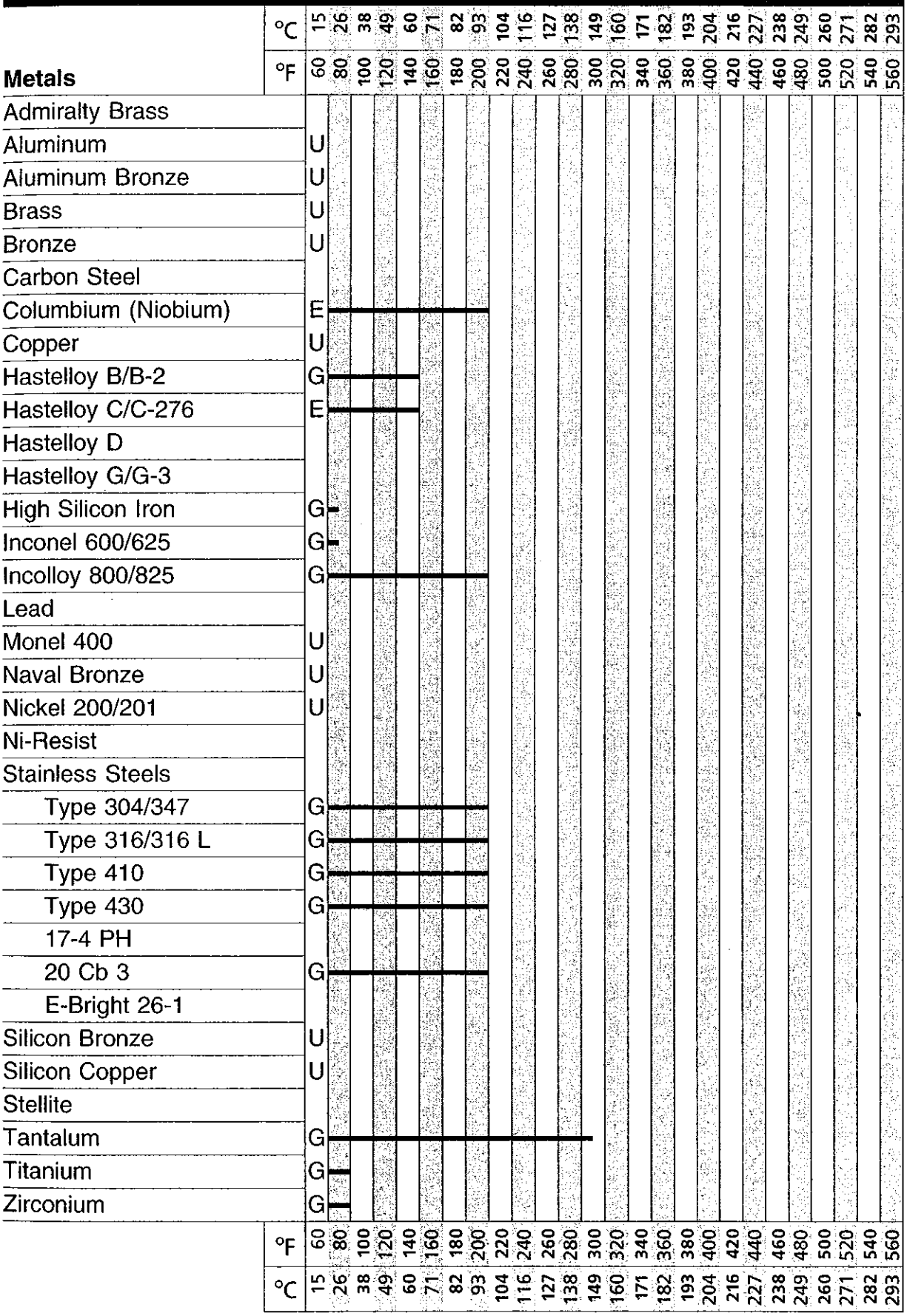
CUPRIC CHLORIDE 50%



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CUPRIC CYANIDE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

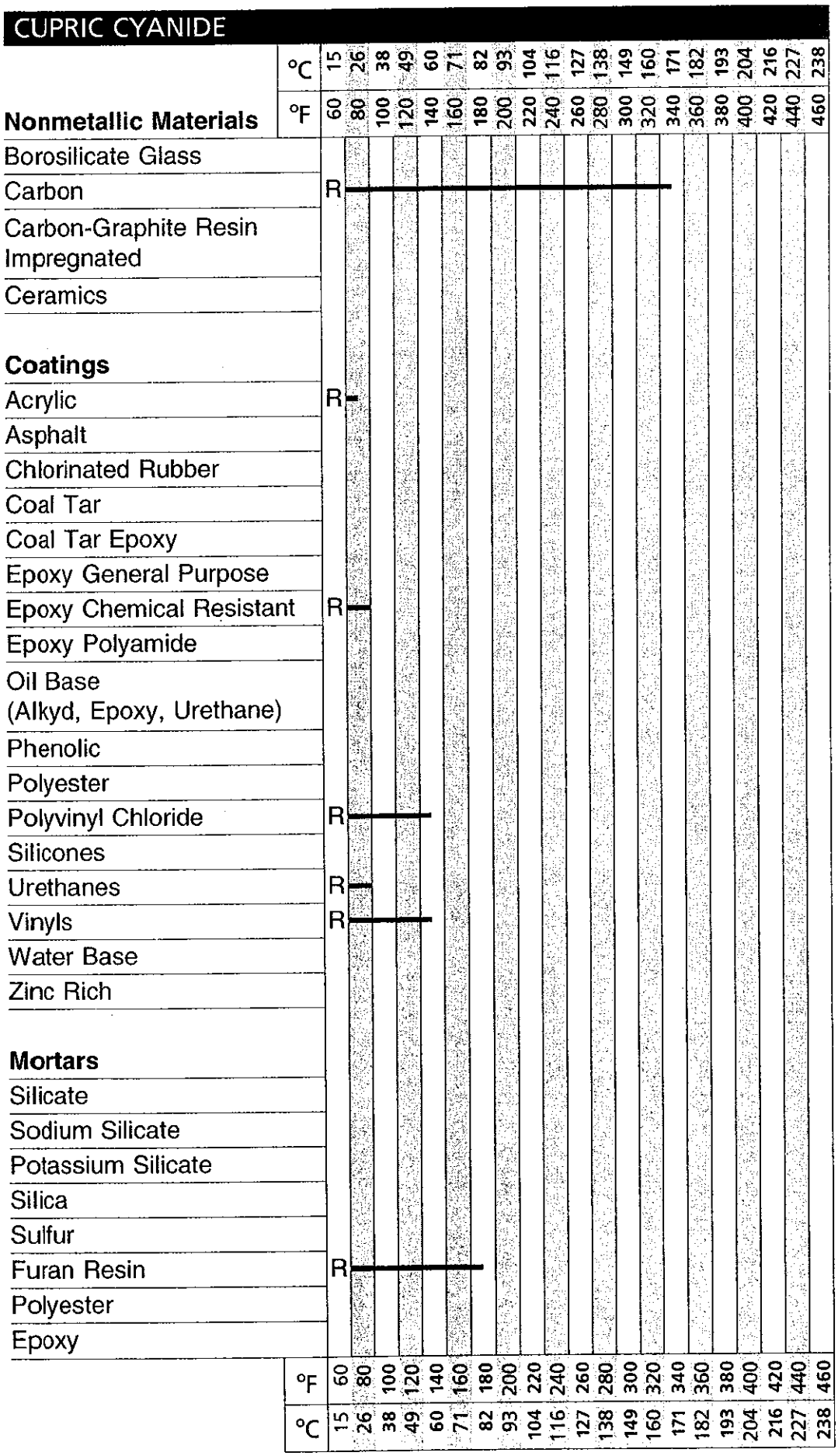
R = Resistant

U = Unsatisfactory

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CUPRIC CYANIDE



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CUPRIC CYANIDE

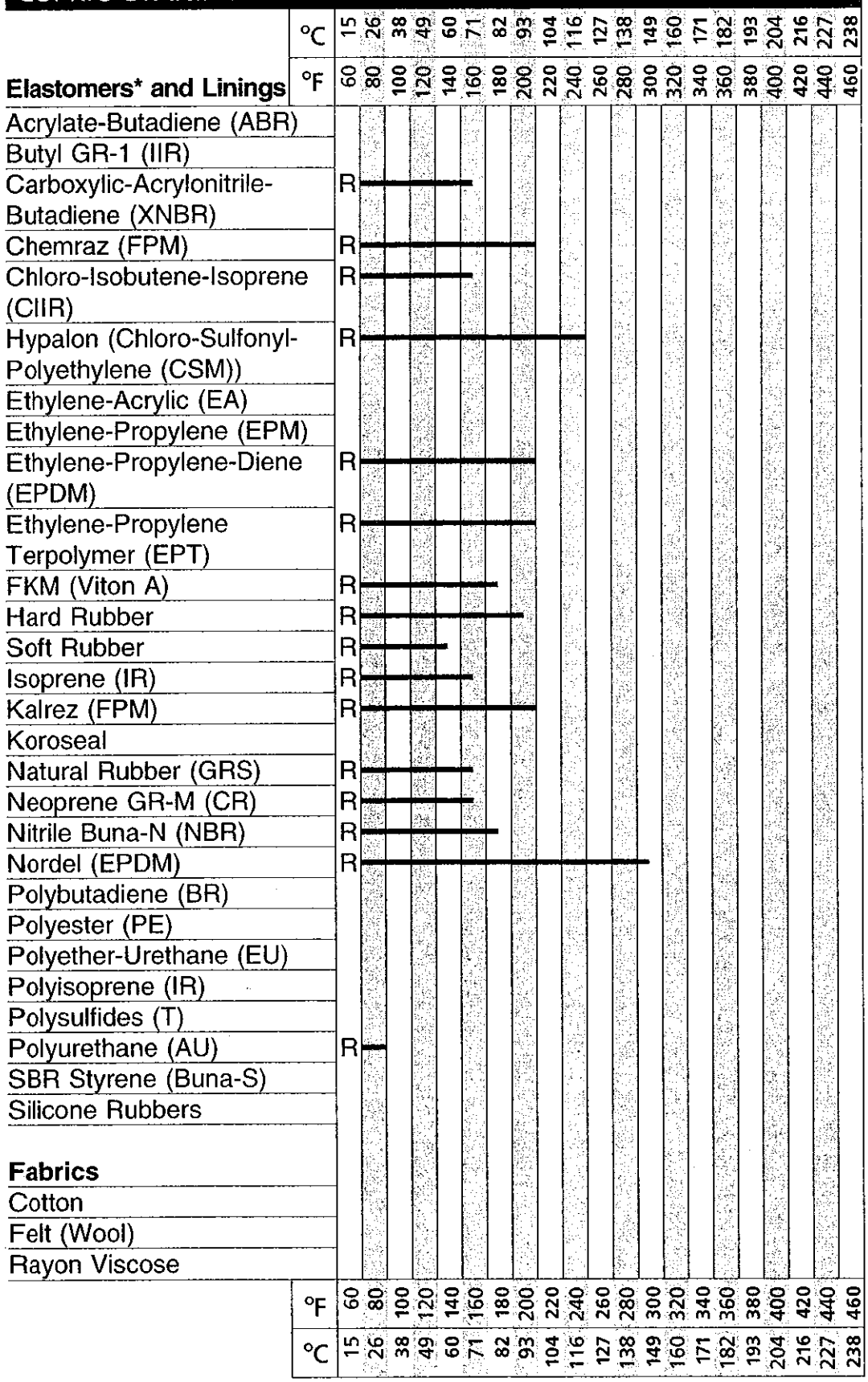
Plastics	
ABS	R
Acetal	
Acrylics	R
Polyurethane (PU)	R
Asbestos Reinforced Phenolic	
Chlorinated Polyether (Penton) 10%	R
CPVC	R
E-CTFE (Halar)	R
Epoxy	R U
ETFE (Tefzel)	R
FEP	R
Furan (Furfural Alcohol)	R
Noryl	R
Nylon 6	R
Nylon 11	
Nylon 66	R
Phenolic	
PFA (Teflon)	R
Polyamide-Imide	
Polyesters	
Bisphenol A–fumarate	R
Halogenated	R
Hydrogenated Bisphenol A –Bisphenol A	R
Isophthalic	R
Terephthalate (PET)	R
Polyetherimide (ULTEM)	
Polyetheretherketone (PEEK)	
Polyethersulfone (PES)	
Polyethylene HMW	R
Polyethylene UHMW	R
Polymethylpentene	
Polypropylene (PP) 10%	R
Polystyrene	
Polysulfone	R
Polyvinylidene Chloride 10%	R
PVC Type 1	R
PVC Type 2	R
PVDF (Kynar) 10%	R
Ryton ALL	R
TFE (Teflon)	R
Vinyl Ester ALL	R

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

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CUPRIC CYANIDE



*See also Nylon 11 under PLASTICS

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CUPRIC FLUORIDE

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass		U																									
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L																											
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum		U																									
Titanium		U																									
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

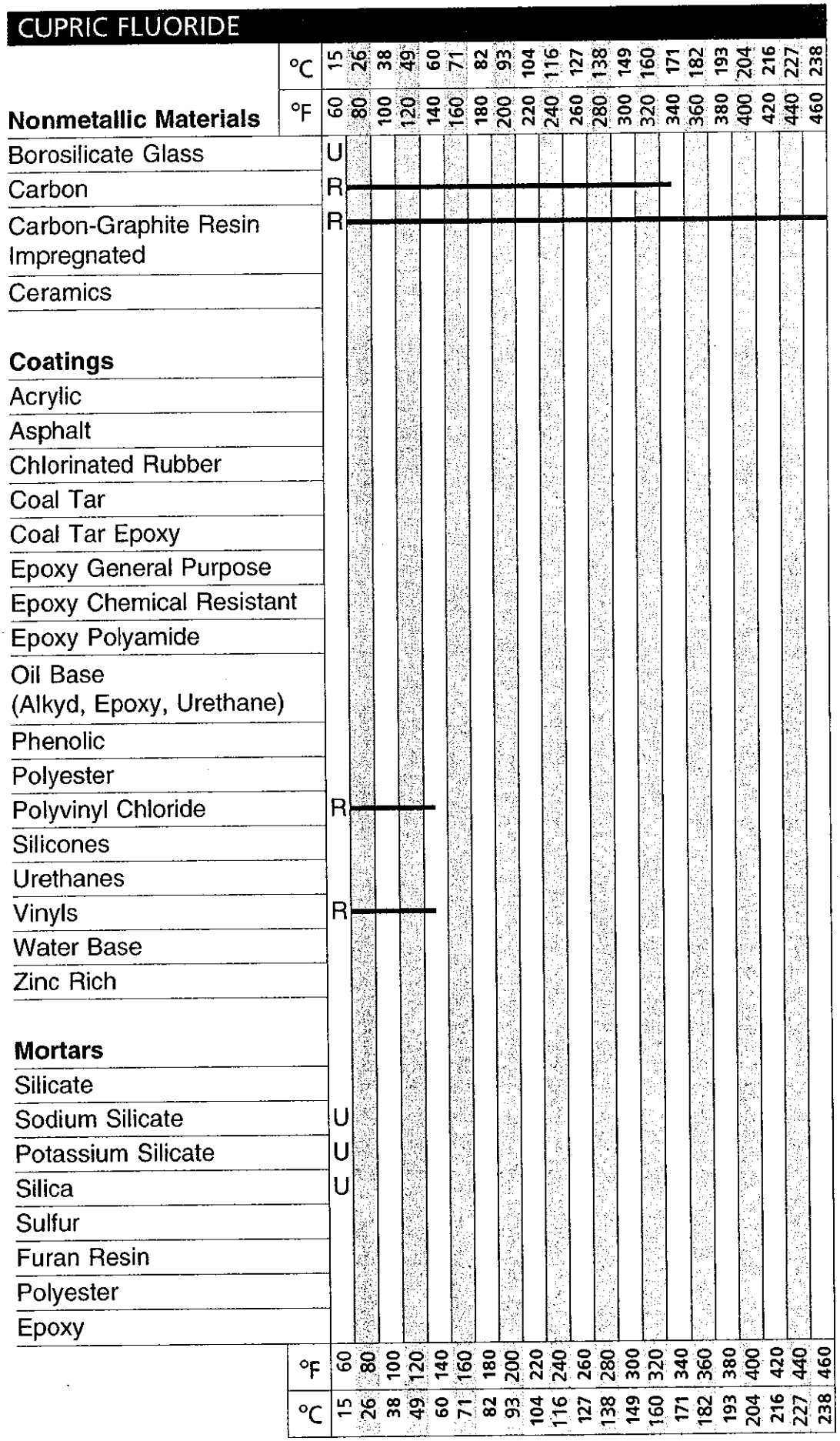
R = Resistant

U = Unsatisfactory

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CUPRIC FLUORIDE



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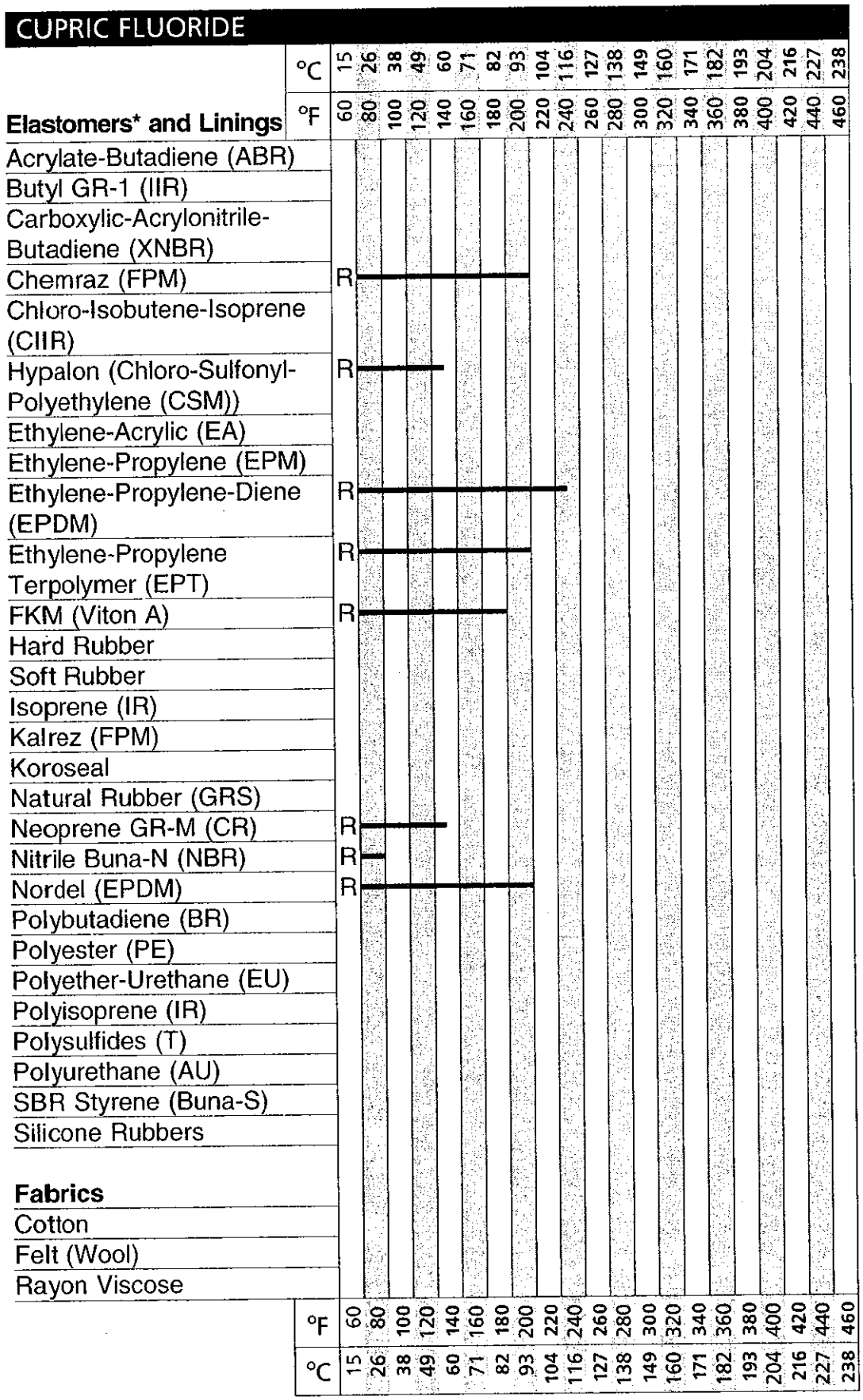
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CUPRIC FLUORIDE

Plastics		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS	2%		R																				
Acetal																							
Acrylics																							
Asbestos Reinforced Epoxy																							
Asbestos Reinforced Phenolic																							
Chlorinated Polyether (Penton)			R																				
CPVC			R																				
E-CTFE (Halar)			R																				
Epoxy			R																				
ETFE (Tefzel)			R																				
FEP			R																				
Furan (Furfural Alcohol)																							
Noryl			R																				
Nylon 6																							
Nylon 11																							
Nylon 66																							
Phenolic																							
PFA (Teflon)			R																				
Polyamide-Imide																							
Polyesters																							
Bisphenol A–fumarate			R																				
Halogenated			R																				
Hydrogenated Bisphenol A –Bisphenol A																							
Isophthalic			R	U																			
Terephthalate (PET)																							
Polyetherimide (ULTEM)																							
Polyetheretherketone (PEEK)																							
Polyethersulfone (PES)																							
Polyethylene HMW			R																				
Polyethylene UHMW			R																				
Polymethylpentene																							
Polypropylene (PP)			R																				
Polystyrene																							
Polysulfone																							
Polyvinylidene Chloride			R																				
PVC Type 1			R																				
PVC Type 2			R																				
PVDF (Kynar)			R																				
Ryton																							
TFE (Teflon)			R																				
Vinyl Ester			R																				
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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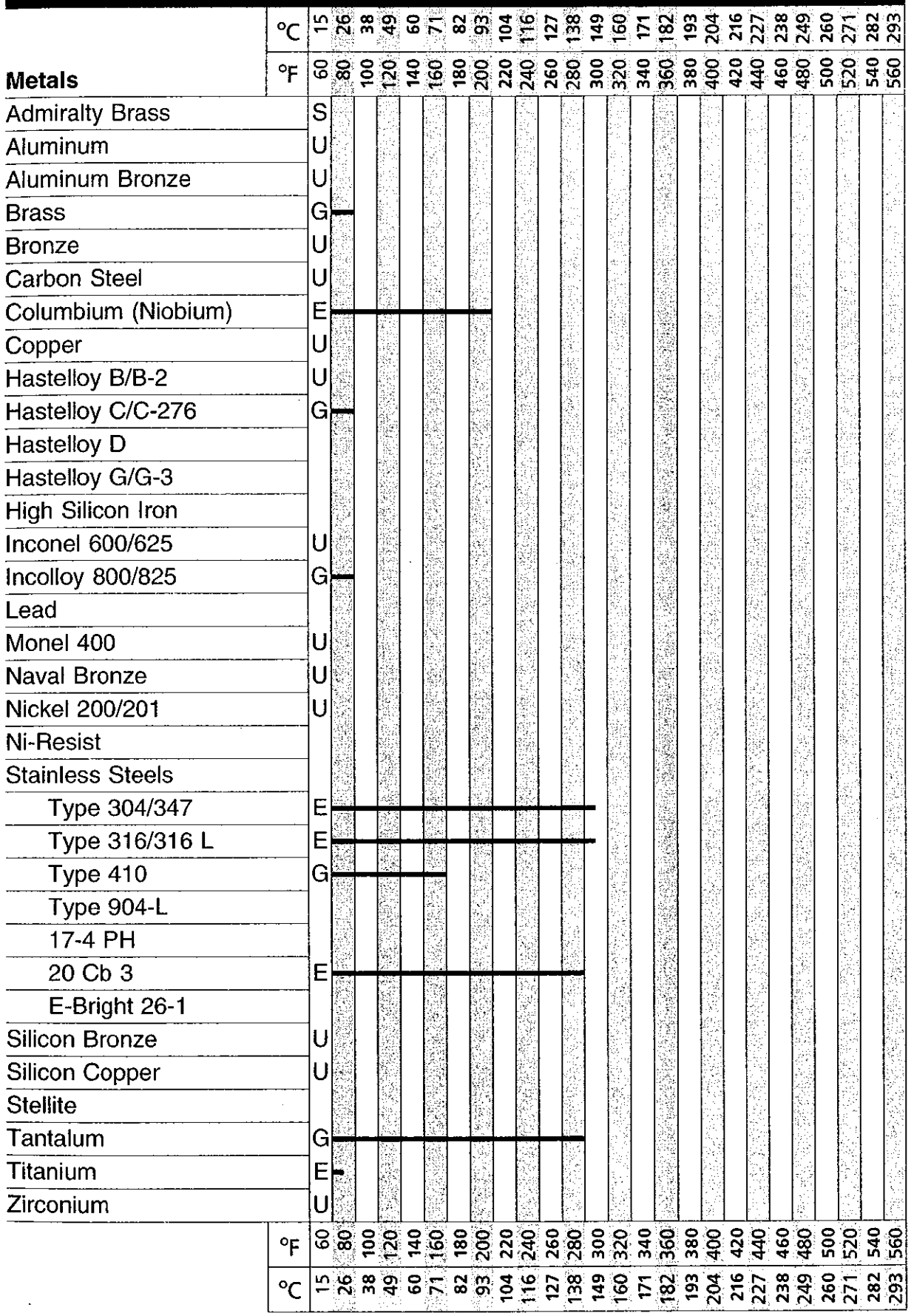
CUPRIC FLUORIDE



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CUPRIC NITRATE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

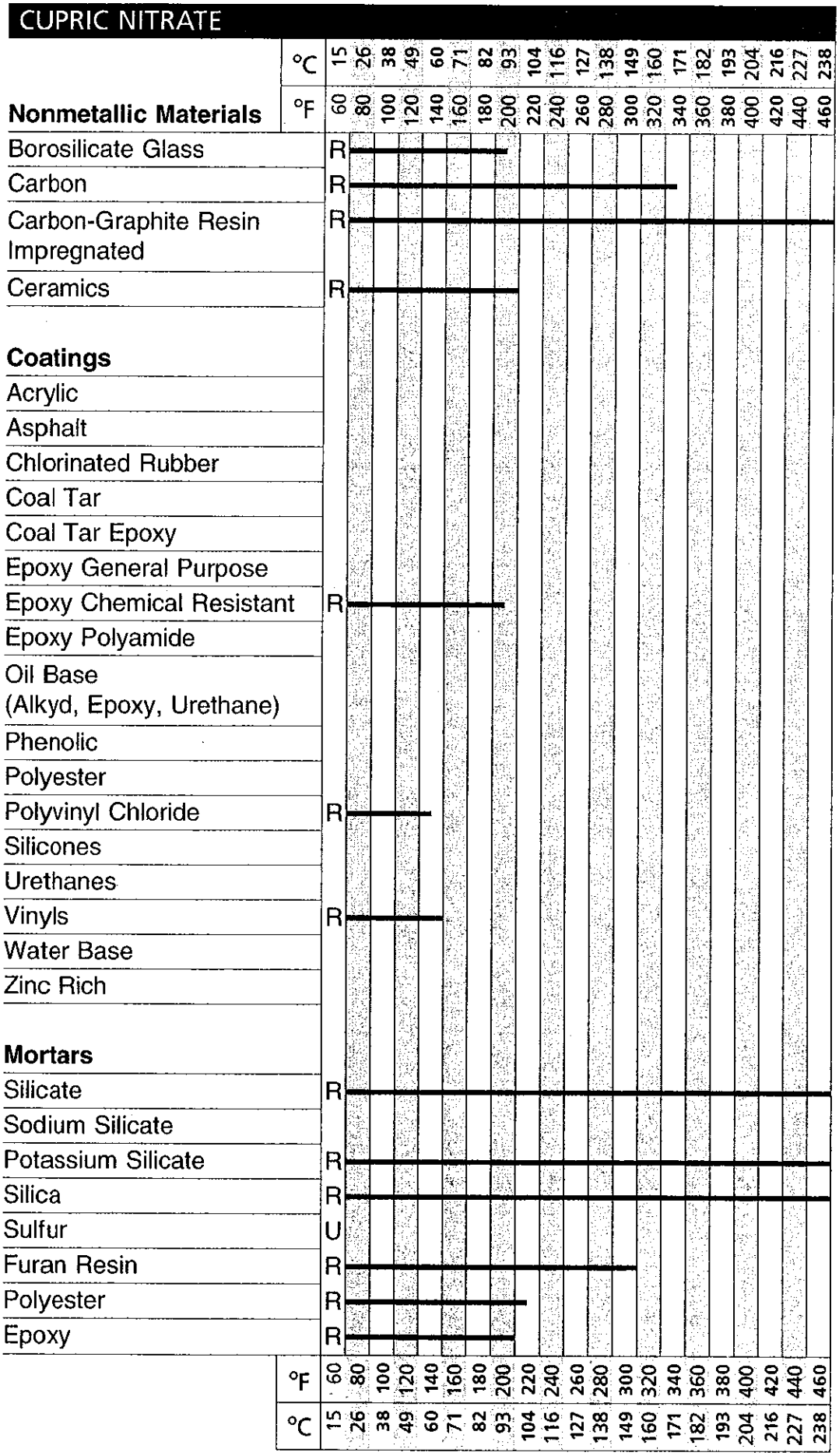
R = Resistant

U = Unsatisfactory

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CUPRIC NITRATE



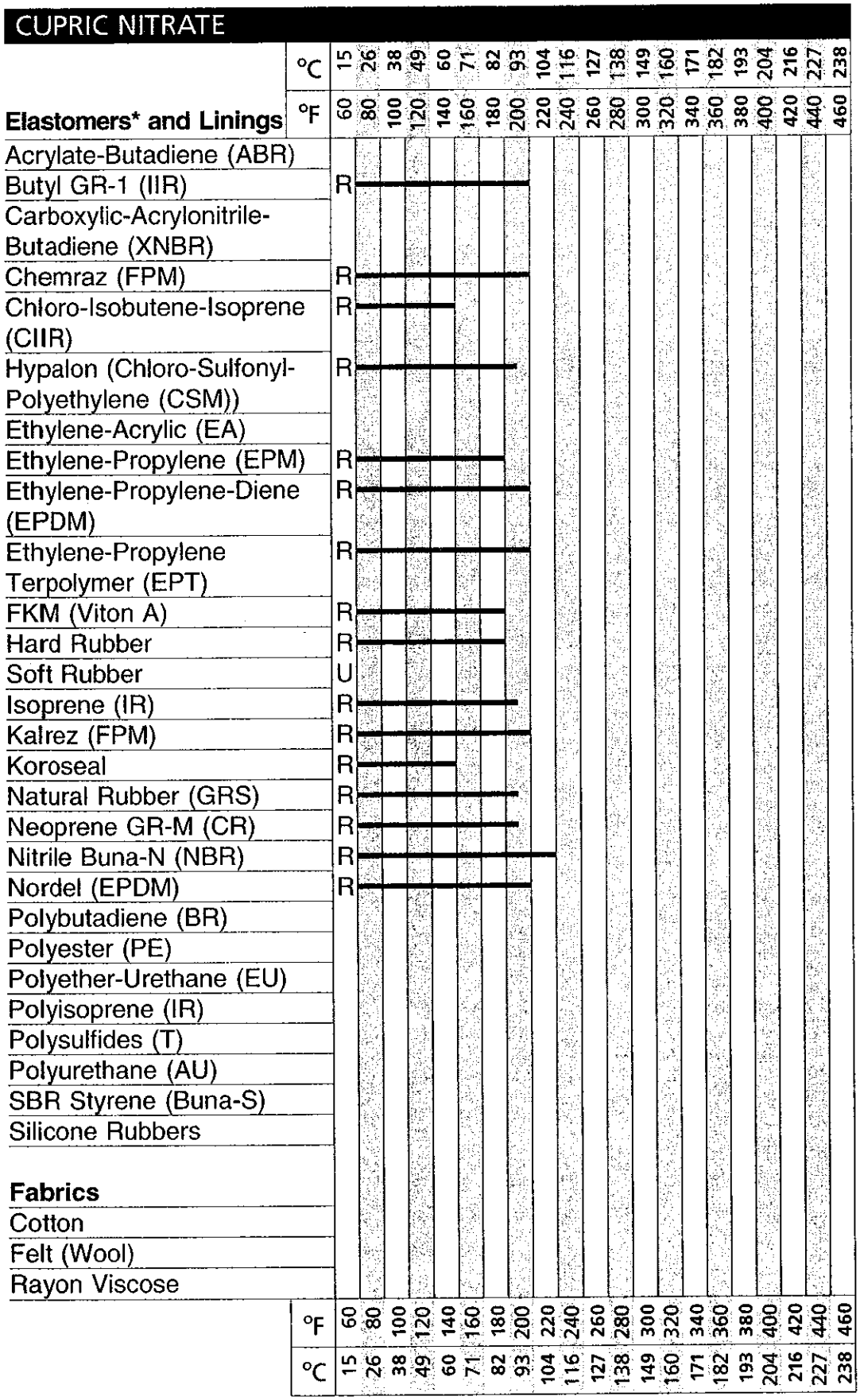
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CUPRIC NITRATE

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS		R																				
Acetal		U																				
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)		R																				
CPVC		R																				
E-CTFE (Halar)		R																				
Epoxy		R																				
ETFE (Tefzel)		R																				
FEP		R																				
Furan (Furfural Alcohol)		R																				
Noryl		R																				
Nylon 6		U																				
Nylon 11		U																				
Nylon 66		U																				
Phenolic																						
PFA (Teflon)		R																				
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate		R																				
Halogenated		R																				
Hydrogenated Bisphenol A –Bisphenol A		R																				
Isophthalic		R																				
Terephthalate (PET)		R																				
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW		R																				
Polyethylene UHMW		R																				
Polymethylpentene																						
Polypropylene (PP)		R																				
Polystyrene																						
Polysulfone		R																				
Polyvinylidene Chloride		R																				
PVC Type 1		R																				
PVC Type 2		R																				
PVDF (Kynar)		R																				
Ryton																						
TFE (Teflon)		R																				
Vinyl Ester		R																				
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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CUPRIC NITRATE



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CUPRIC SULFATE

Metals	°F	°C
Admiralty Brass	G	
Aluminum	U	
Aluminum Bronze	U	
Brass	U	
Bronze	U	
Carbon Steel	U	
Columbium (Niobium)	E	
Copper	U	
Hastelloy B/B-2	G	
Hastelloy C/C-276	E	
Hastelloy D	G	
Hastelloy G/G-3		
High Silicon Iron	E	
Inconel 600/625	G	S
Incolloy 800/825	G	
Lead	G	
Monel 400	S	
Naval Bronze	U	
Nickel 200/201	S	
Galv. Stl.	U	
Stainless Steels		
Type 304/347	9 G	
Type 316/316 L	G	
Type 410	G	
Type 430	G	
17-4 PH	G	
20 Cb 3	G	
Type 317/317 L	G	
Silicon Bronze	U	
Silicon Copper	U	
Type 321	G	
Tantalum	E	
Titanium	E	
Zirconium	E	

°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

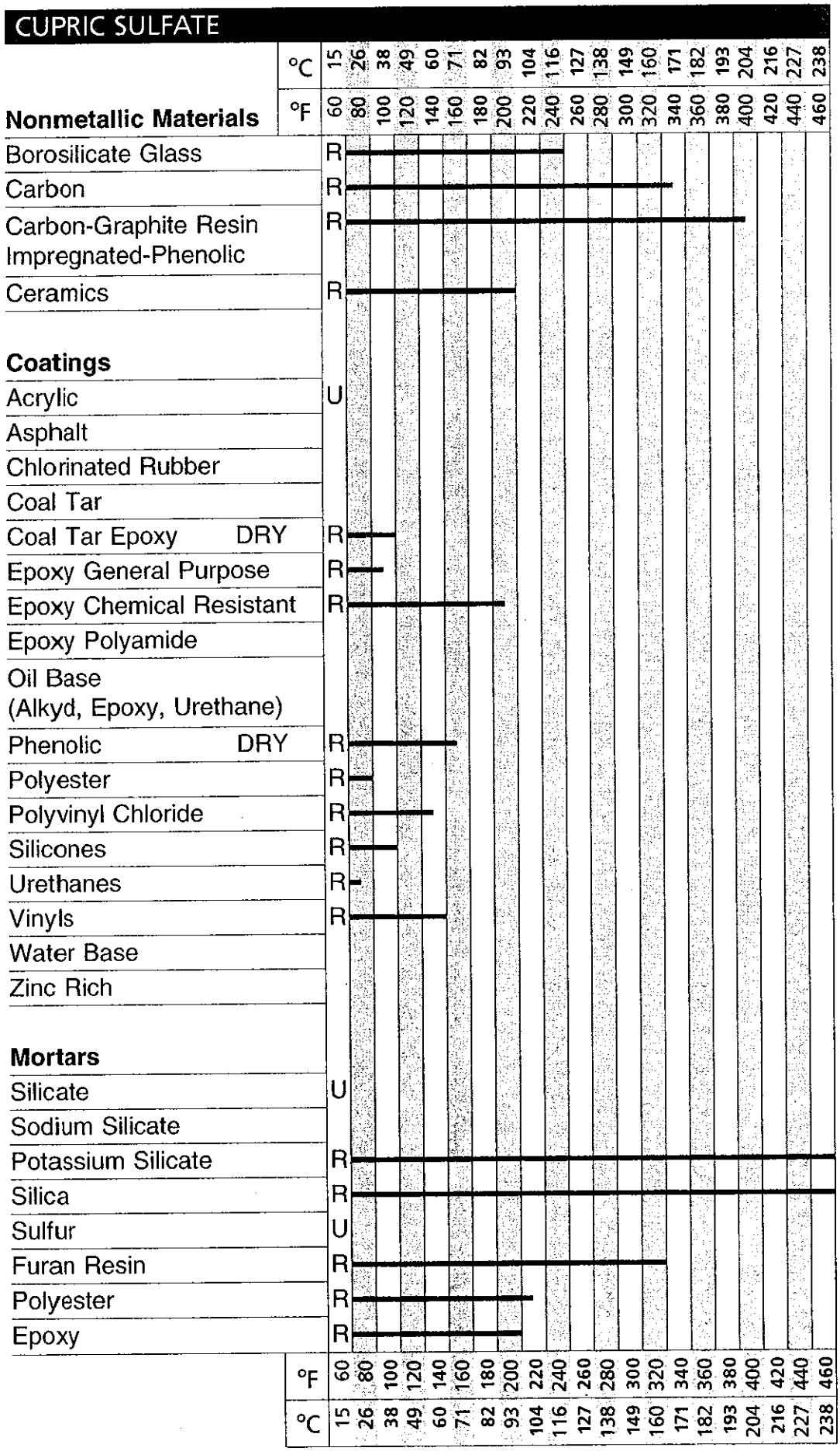
R = Resistant

U = Unsatisfactory

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CUPRIC SULFATE

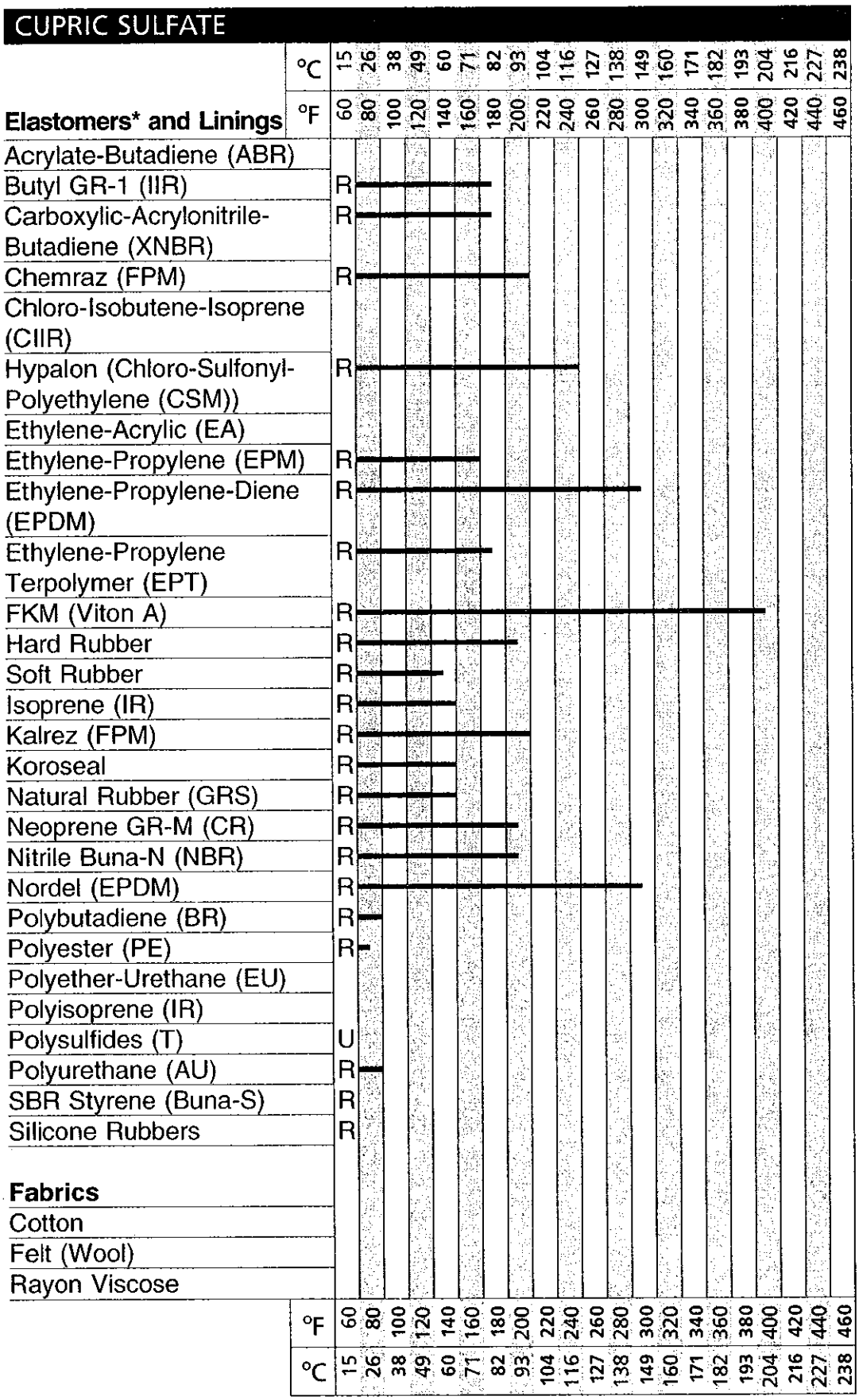
Plastics	°C	°F
ABS	R	
Acetal	U	
Acrylics	U	
Asbestos Reinforced Epoxy	R	
Asbestos Reinforced Phenolic	R	
Chlorinated Polyether (Penton)	R	
CPVC	R	
E-CTFE (Halar)	R	
Epoxy	R	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)	R	
Noryl	R	
Nylon 6	R	
Nylon 11		
Nylon 66	R	
Phenolic	R	
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	R	
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A	R	
Isophthalic	R	
Terephthalate (PET)	R	
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW	R	
Polymethylpentene	R	
Polypropylene (PP)	R	
Polystyrene	R	
Polysulfone (PSF)	R	
Polyvinylidene Chloride	R	
PVC Type 1	R	
PVC Type 2	R	
PVDF (Kynar)	R	
Ryton ALL	R	
TFE (Teflon)	R	
Vinyl Ester ALL	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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CUPRIC SULFATE



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CUPROUS CHLORIDE

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																												
Aluminum																												
Aluminum Bronze																												
Brass			U																									
Bronze			U																									
Carbon Steel																												
Columbium (Niobium)																												
Copper			U																									
Hastelloy B/B-2			U																									
Hastelloy C/C-276			E																									
Hastelloy D																												
Hastelloy G/G-3																												
High Silicon Iron																												
Inconel 600/625																												
Incolloy 800/825																												
Lead																												
Monel 400																												
Naval Bronze																												
Nickel 200/201																												
Ni-Resist																												
Stainless Steels																												
Type 304/347																												
Type 316/316 L			U																									
Type 400 series																												
Type 904-L																												
17-4 PH																												
20 Cb 3																												
E-Bright 26-1																												
Silicon Bronze																												
Silicon Copper																												
Stellite																												
Tantalum	50%	E																										
Titanium	50%	E																										
Zirconium																												
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

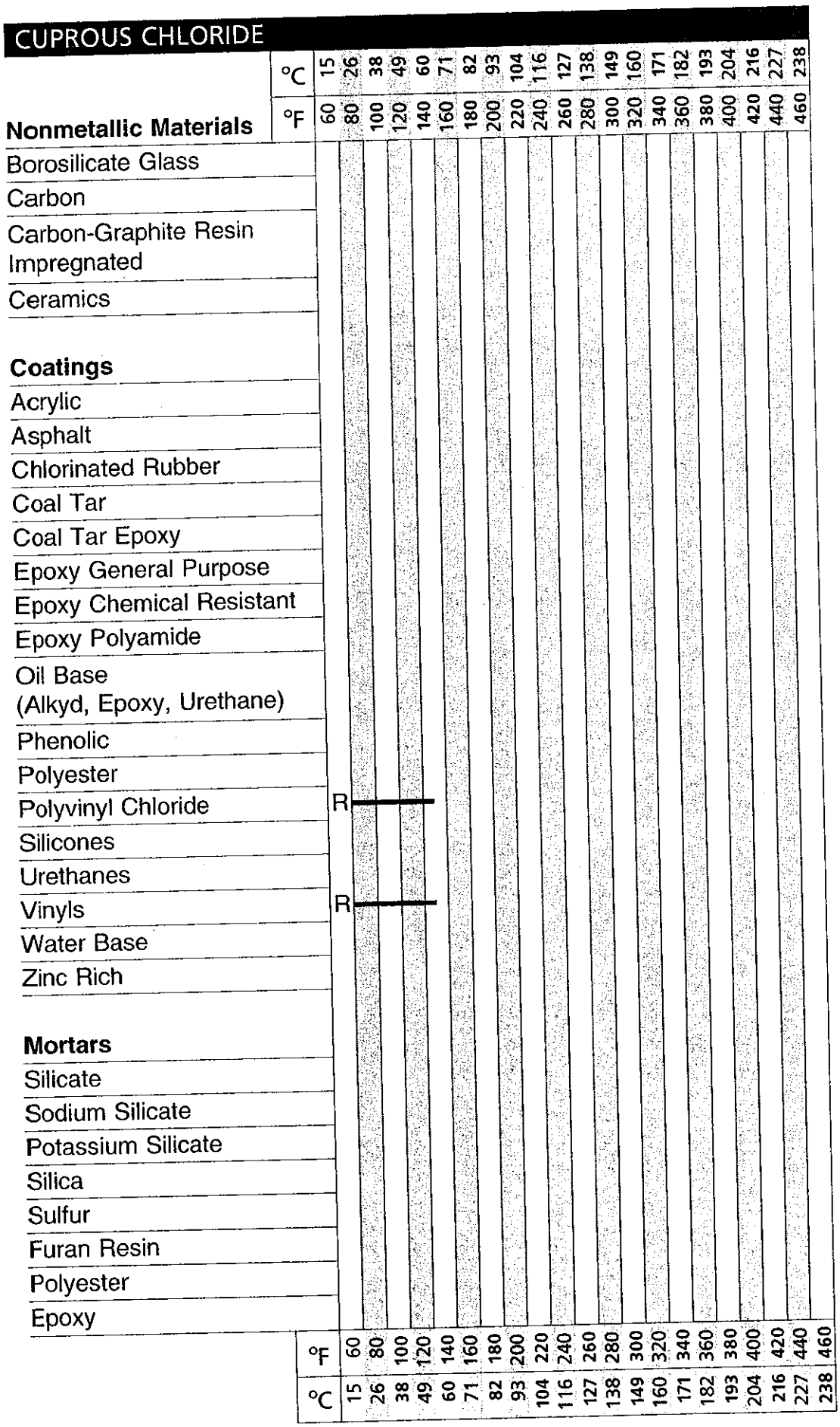
FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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CUPROUS CHLORIDE

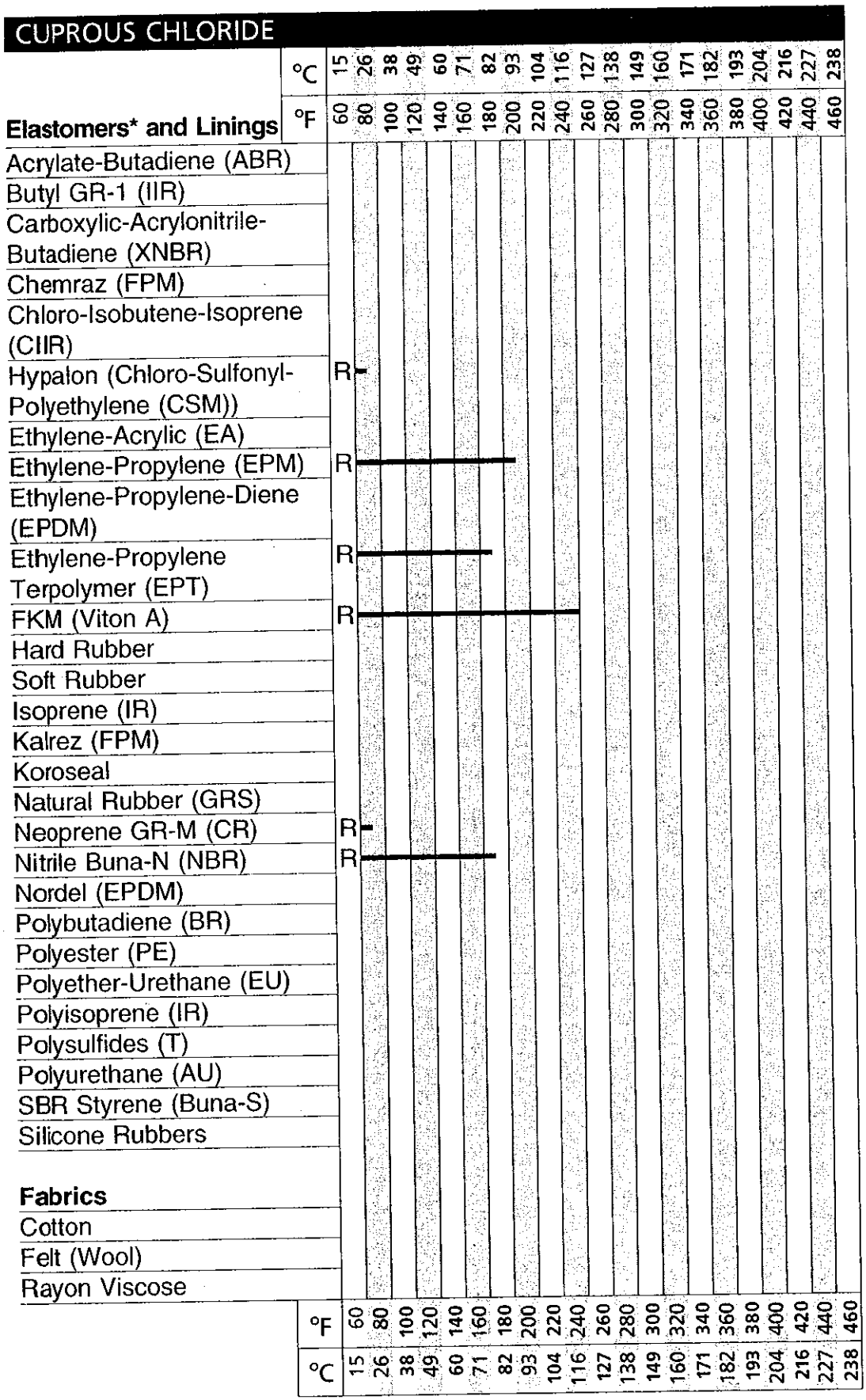
Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC	R	R
E-CTFE (Halar)	R	R
Epoxy		
ETFE (Tefzel)		
FEP		
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated		
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic		
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW	R	R
Polyethylene UHMW	R	R
Polymethylpentene		
Polypropylene (PP)	R	R
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1	R	R
PVC Type 2	R	R
PVDF (Kynar)	R	R
Ryton		
TFE (Teflon)	R	R
Vinyl Ester		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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CUPROUS CHLORIDE



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CYANOACETIC ACID

Metals	°F	°C
Admiralty Brass		
Aluminum		
Aluminum Bronze		
Brass	U	
Bronze	U	
Carbon Steel		
Columbium (Niobium)		
Copper	U	
Hastelloy B/B-2		
Hastelloy C/C-276		
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625		
Incolloy 800/825		
Lead		
Monel 400		
Naval Bronze		
Nickel 200/201		
Ni-Resist		
Stainless Steels		
Type 304/347		
Type 316/316 L		
Type 400 series		
Type 904-L		
17-4 PH		
20 Cb 3	G	
E-Bright 26-1		
Silicon Bronze		
Silicon Copper		
Stellite		
Tantalum	G	
Titanium	G	
Zirconium	G	

°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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CYANOACETIC ACID

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

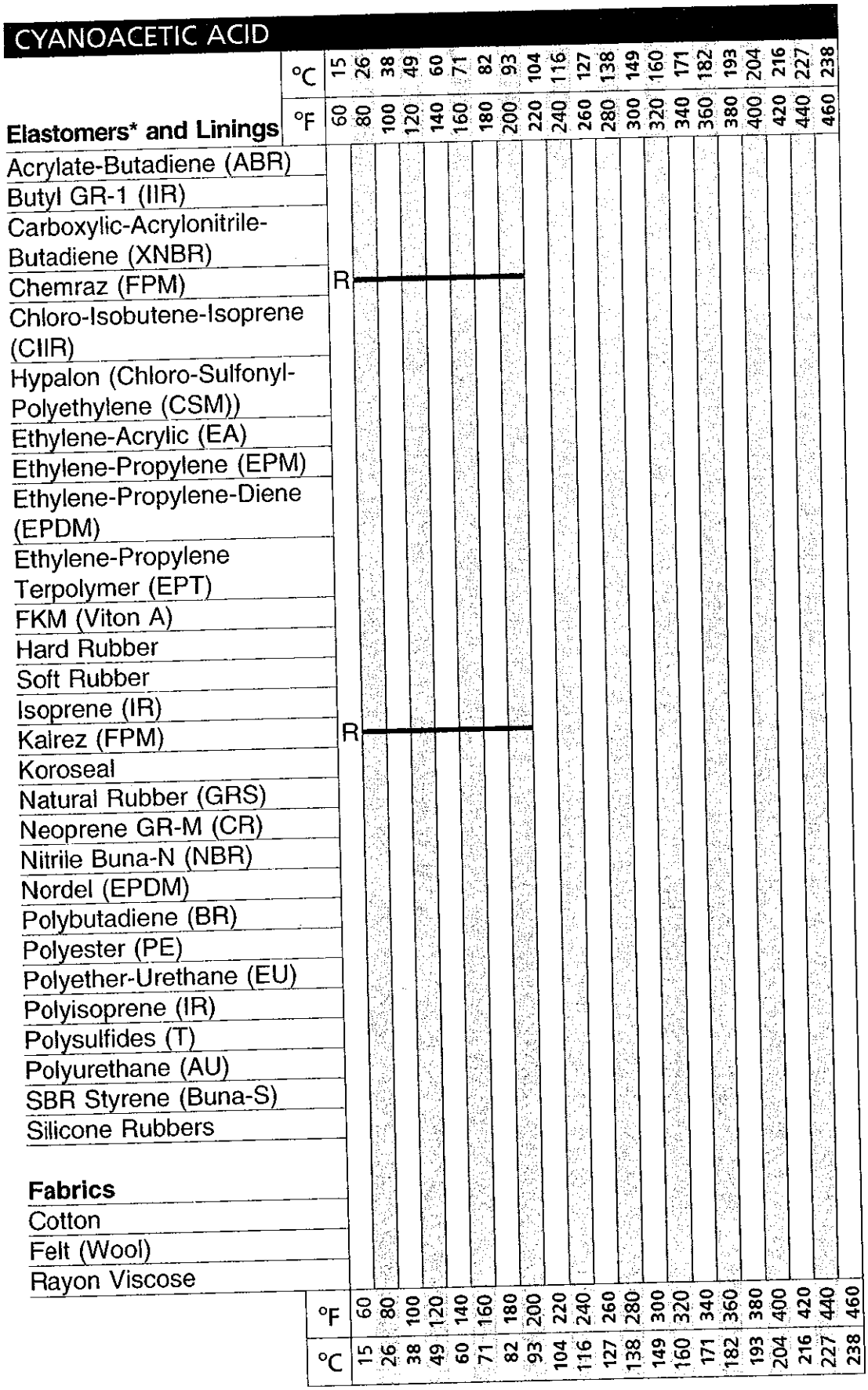
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CYANOACETIC ACID

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)																						
Epoxy																						
ETFE (Tefzel)																						
FEP	R																					
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)																						
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)																						
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride	R																					
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)																						
Ryton																						
TFE (Teflon)	R																					
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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CYANOACETIC ACID



*See also Nylon 11 under PLASTICS

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CYANOGEN GAS

Metals	°C	°F
Admiralty Brass		
Aluminum		
Aluminum Bronze		
Brass		
Bronze		
Carbon Steel		
Columbium (Niobium)		
Copper		
Hastelloy B/B-2		
Hastelloy C/C-276		
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625	G	
Incolloy 800/825		
Lead		
Monel 400	G	
Naval Bronze		
Nickel 200/201	G	
Ni-Resist		
Stainless Steels		
Type 304/347	G	
Type 316/316 L	G	
Type 400 series		
Type 904-L		
17-4 PH		
20 Cb 3		
E-Bright 26-1		
Silicon Bronze		
Silicon Copper		
Stellite		
Tantalum		
Titanium		
Zirconium		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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CYANOGEN GAS

	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
Nonmetallic Materials	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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CYANOGEN GAS

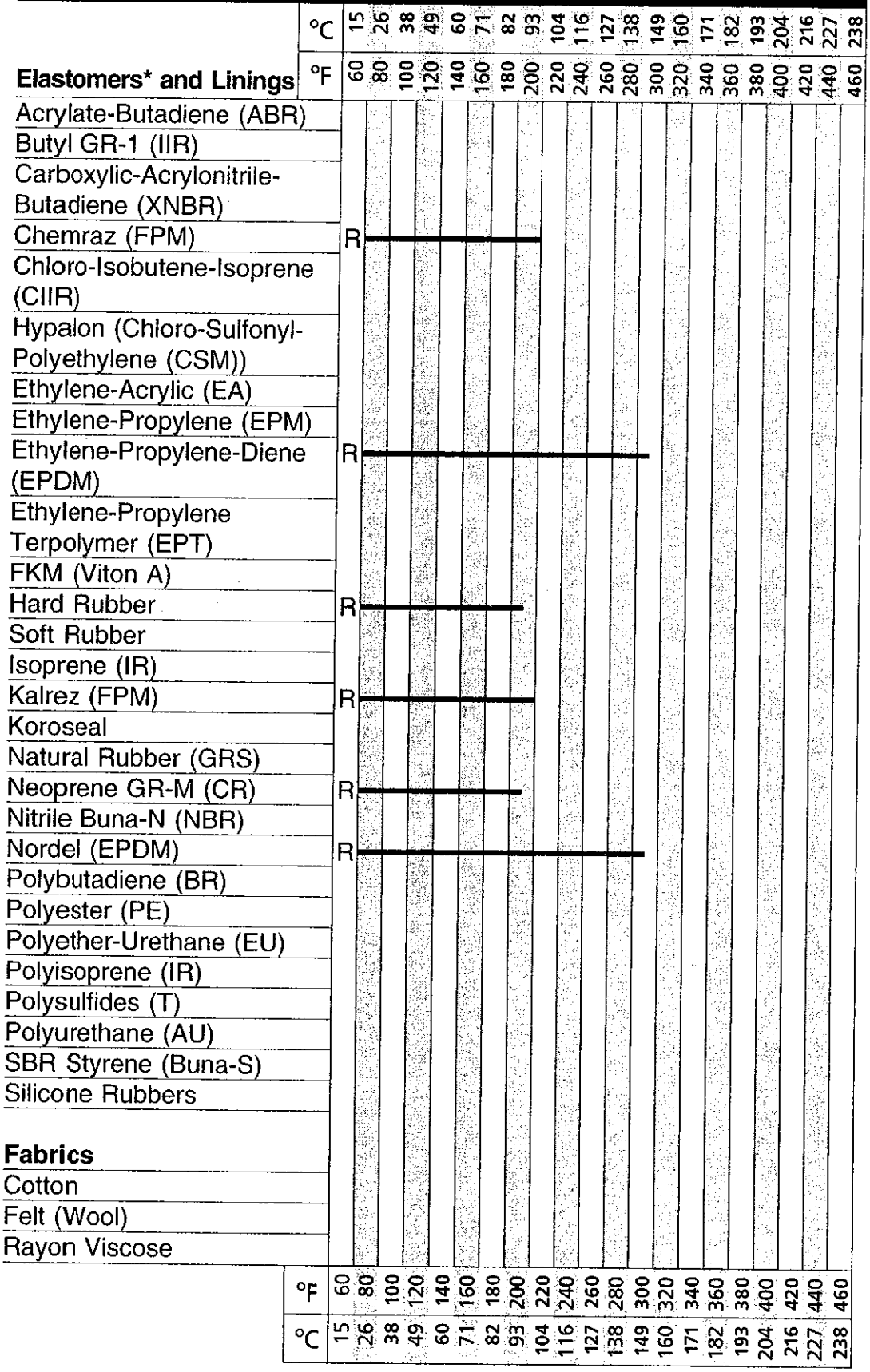
Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC		
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)		
FEP	R	
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated		
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic		
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)		
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1		
PVC Type 2		
PVDF (Kynar)		
Ryton		
TFE (Teflon)	R	
Vinyl Ester		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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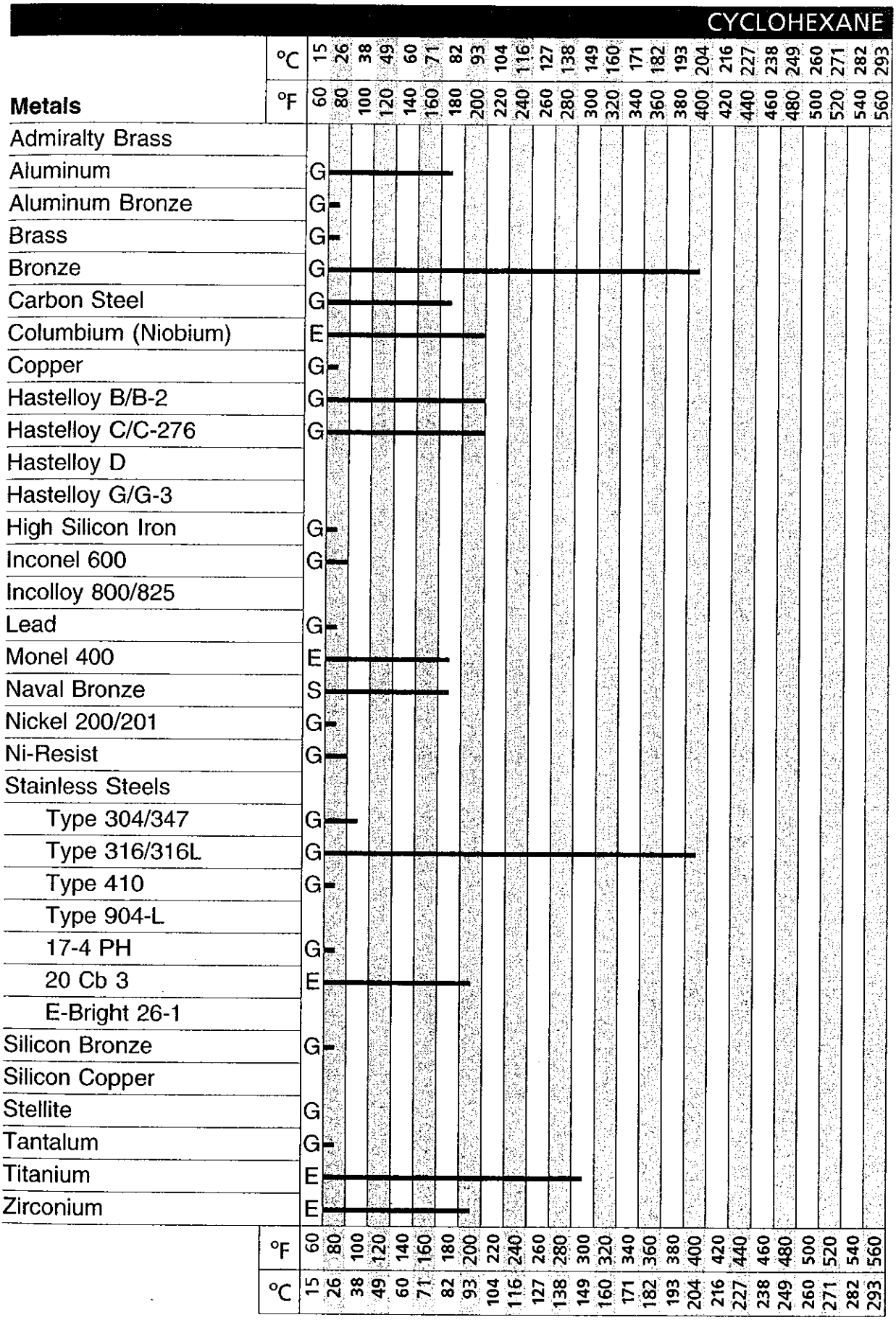
CYANOGEN GAS



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CYCLOHEXANE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

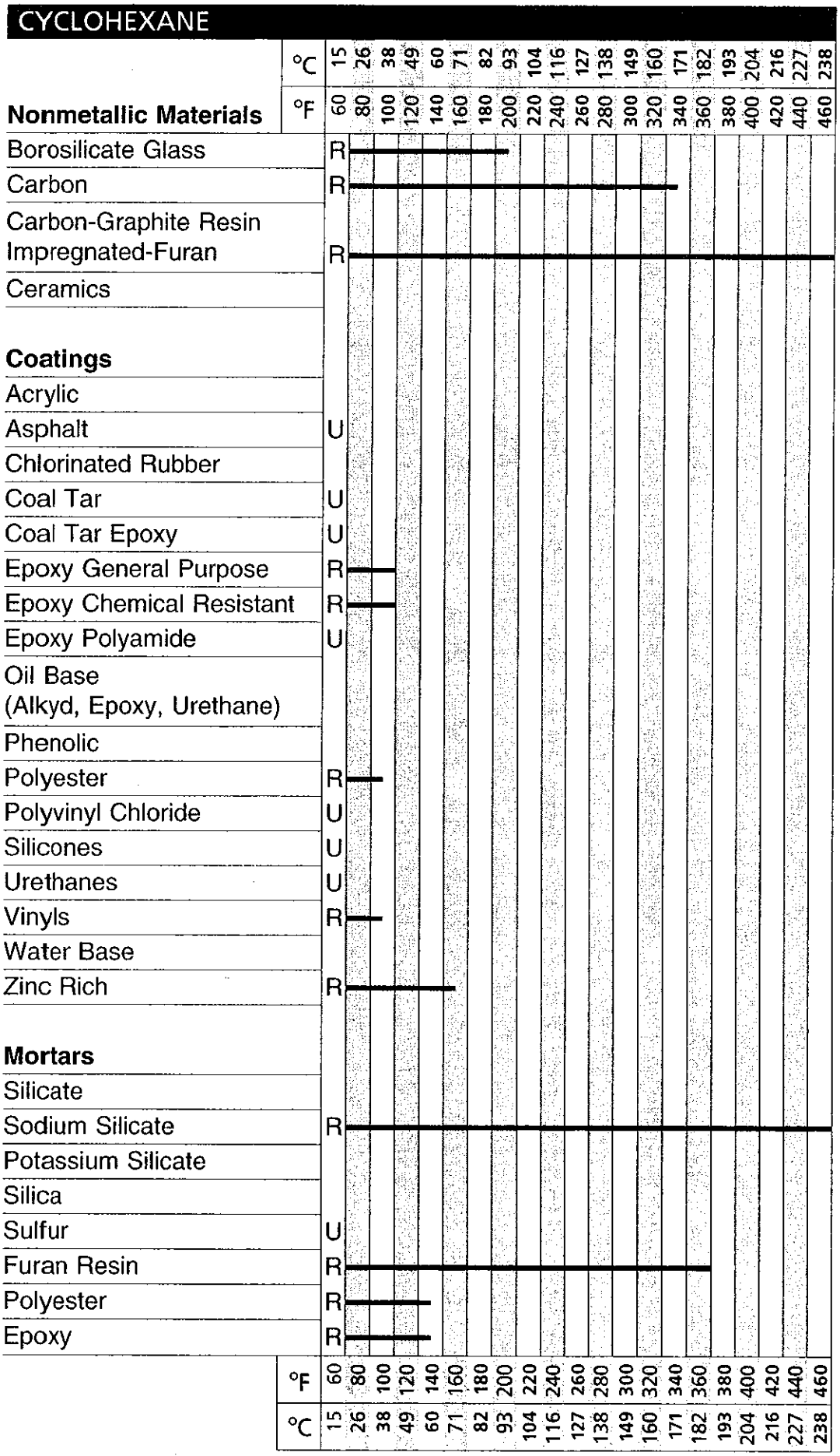
R = Resistant

U = Unsatisfactory

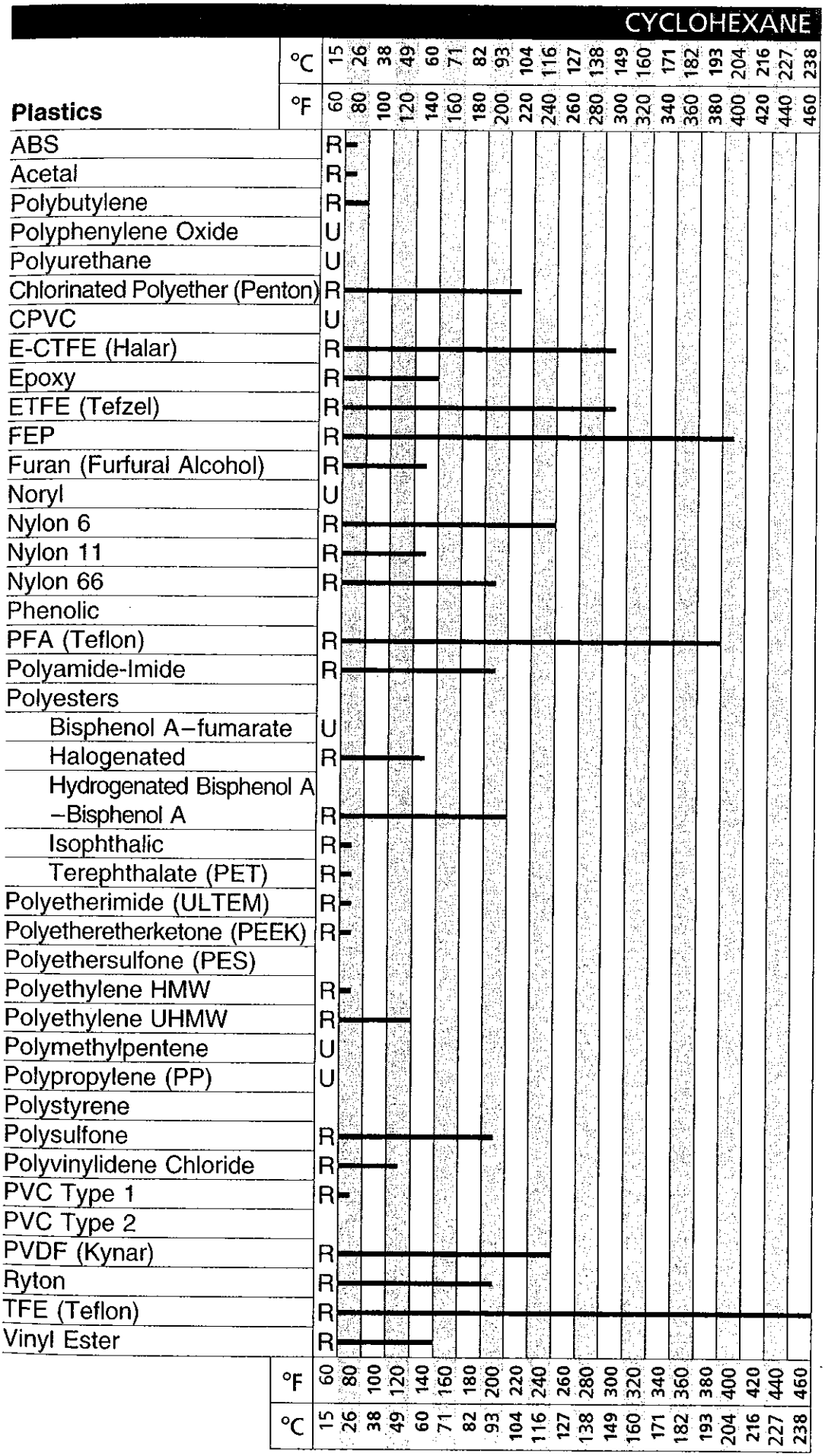
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CYCLOHEXANE

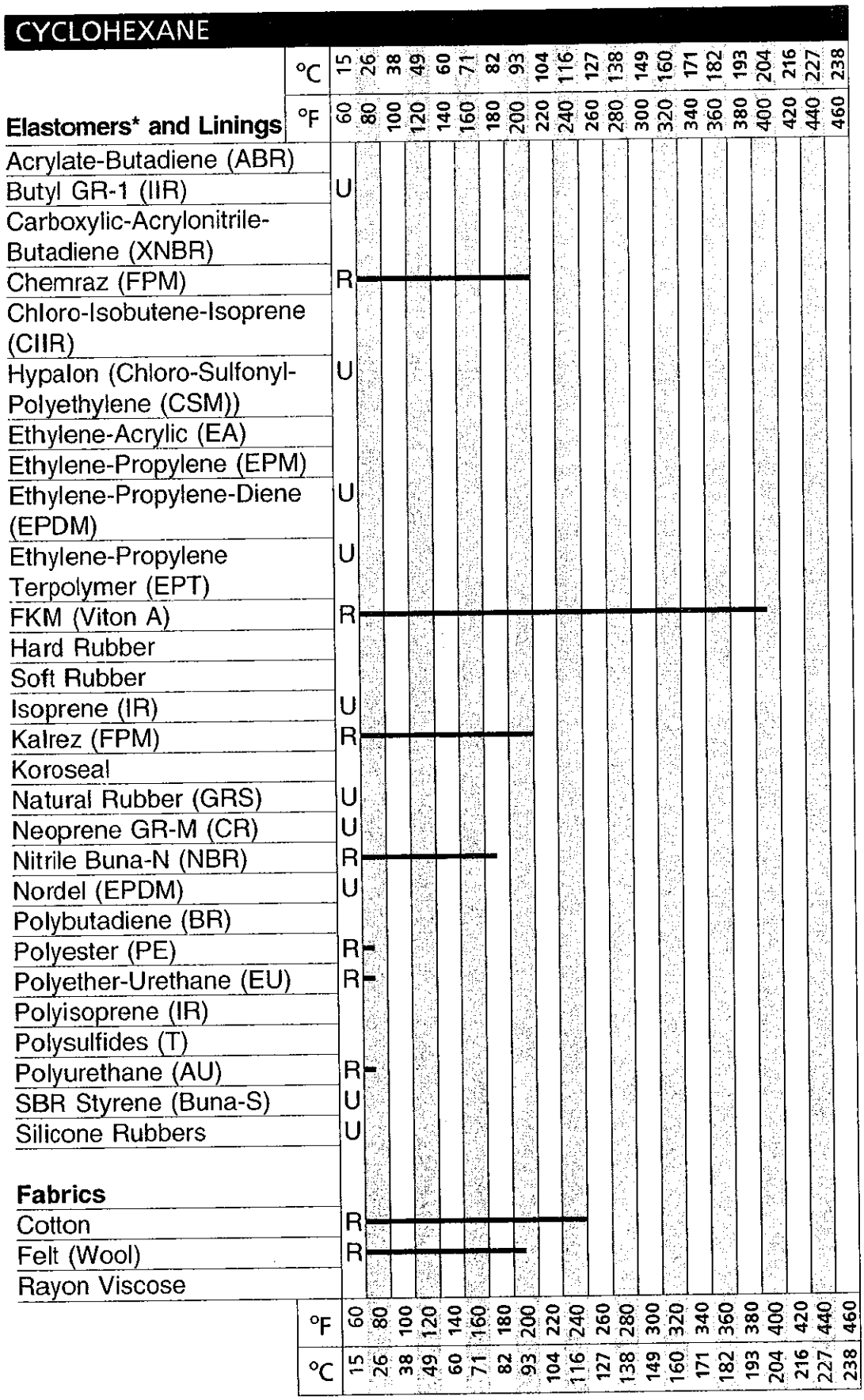


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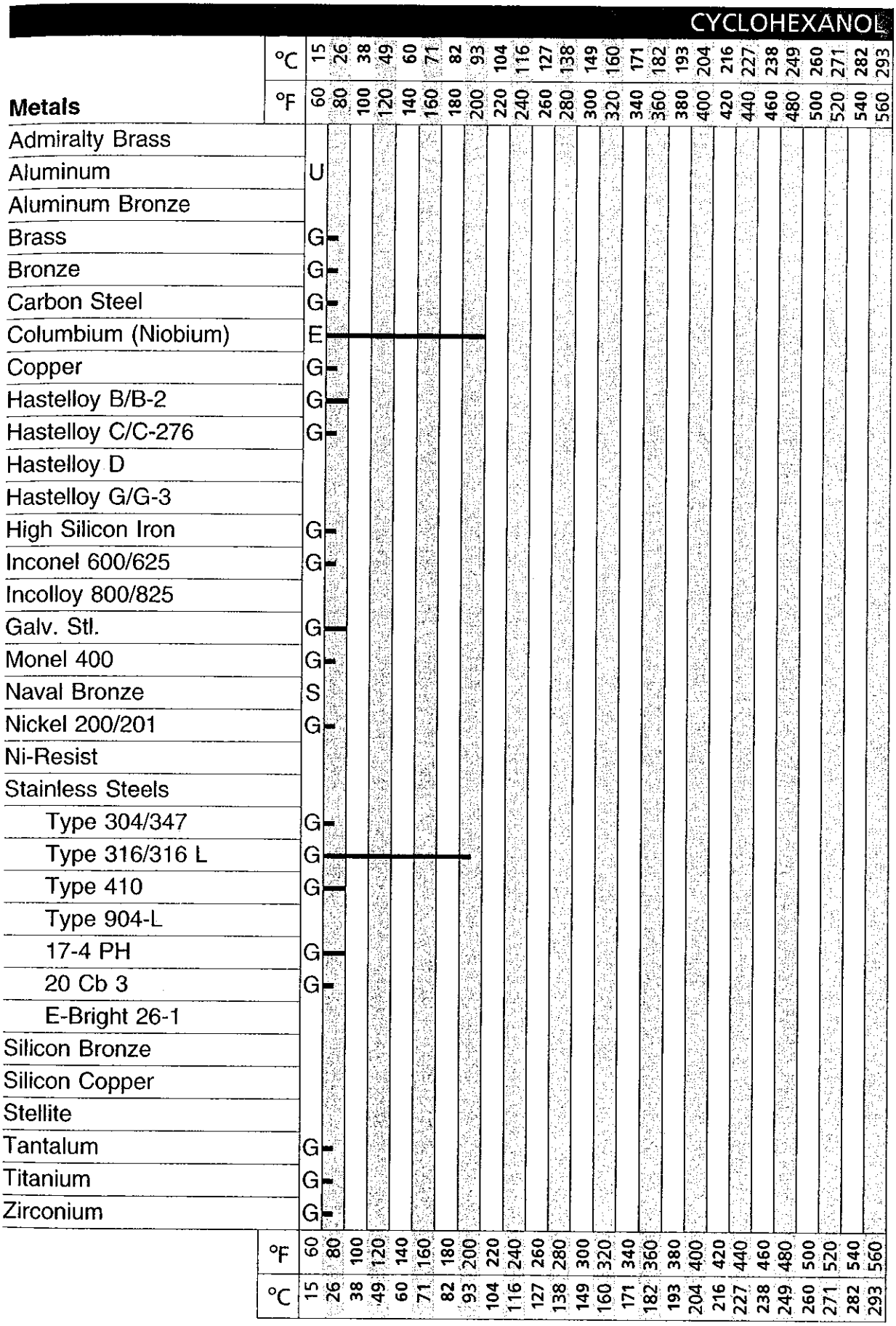
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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

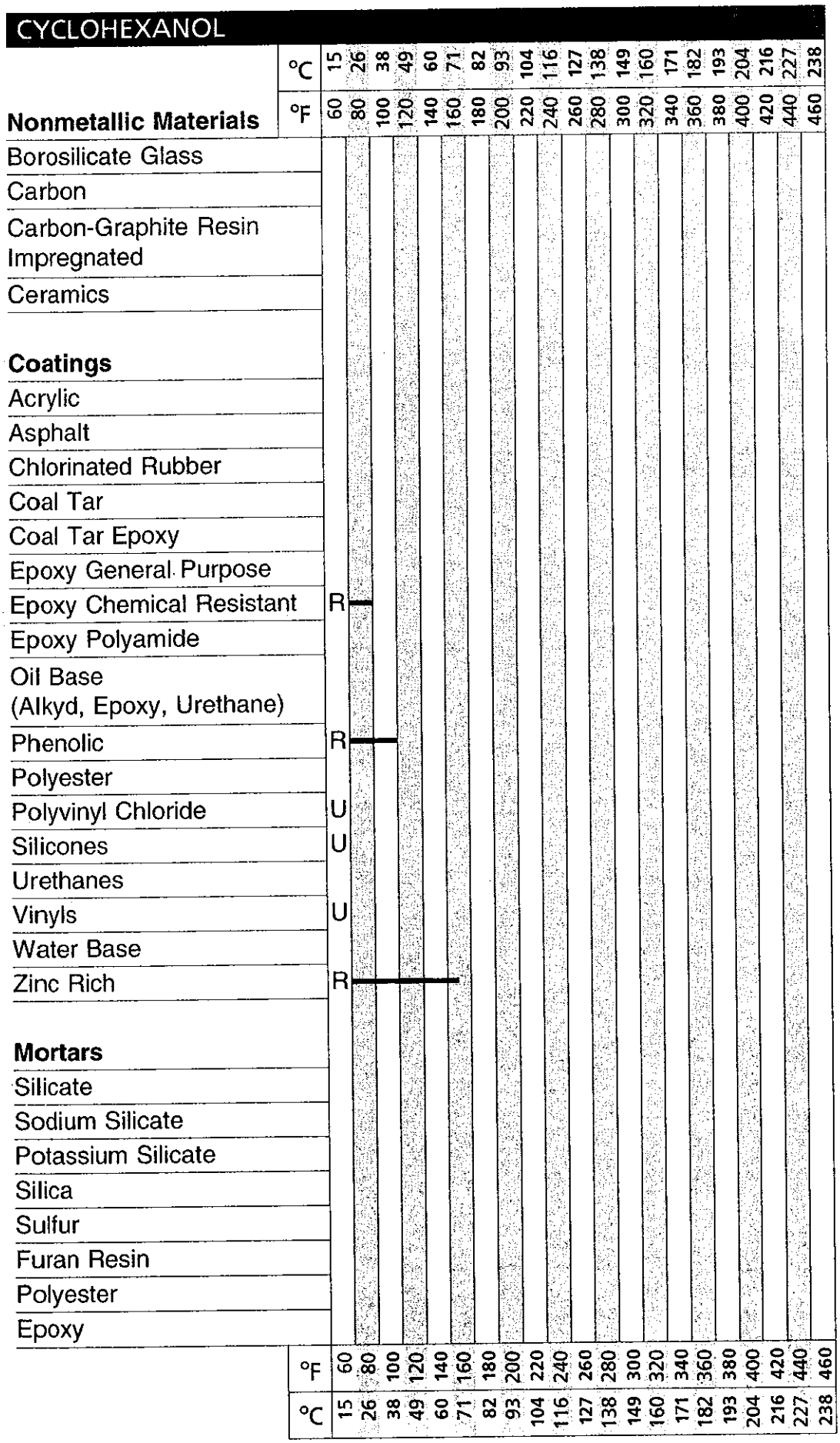
R = Resistant

U = Unsatisfactory

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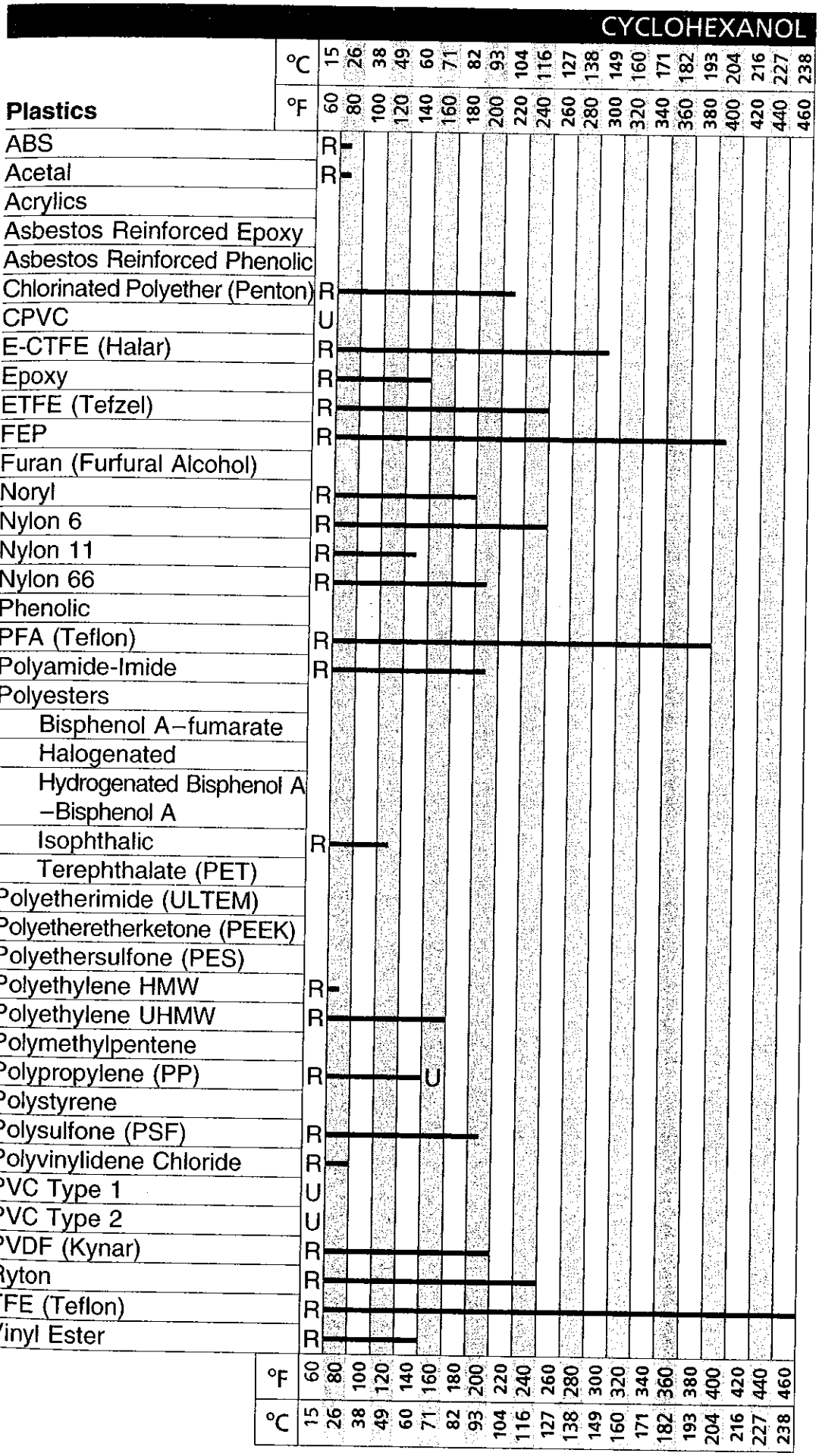
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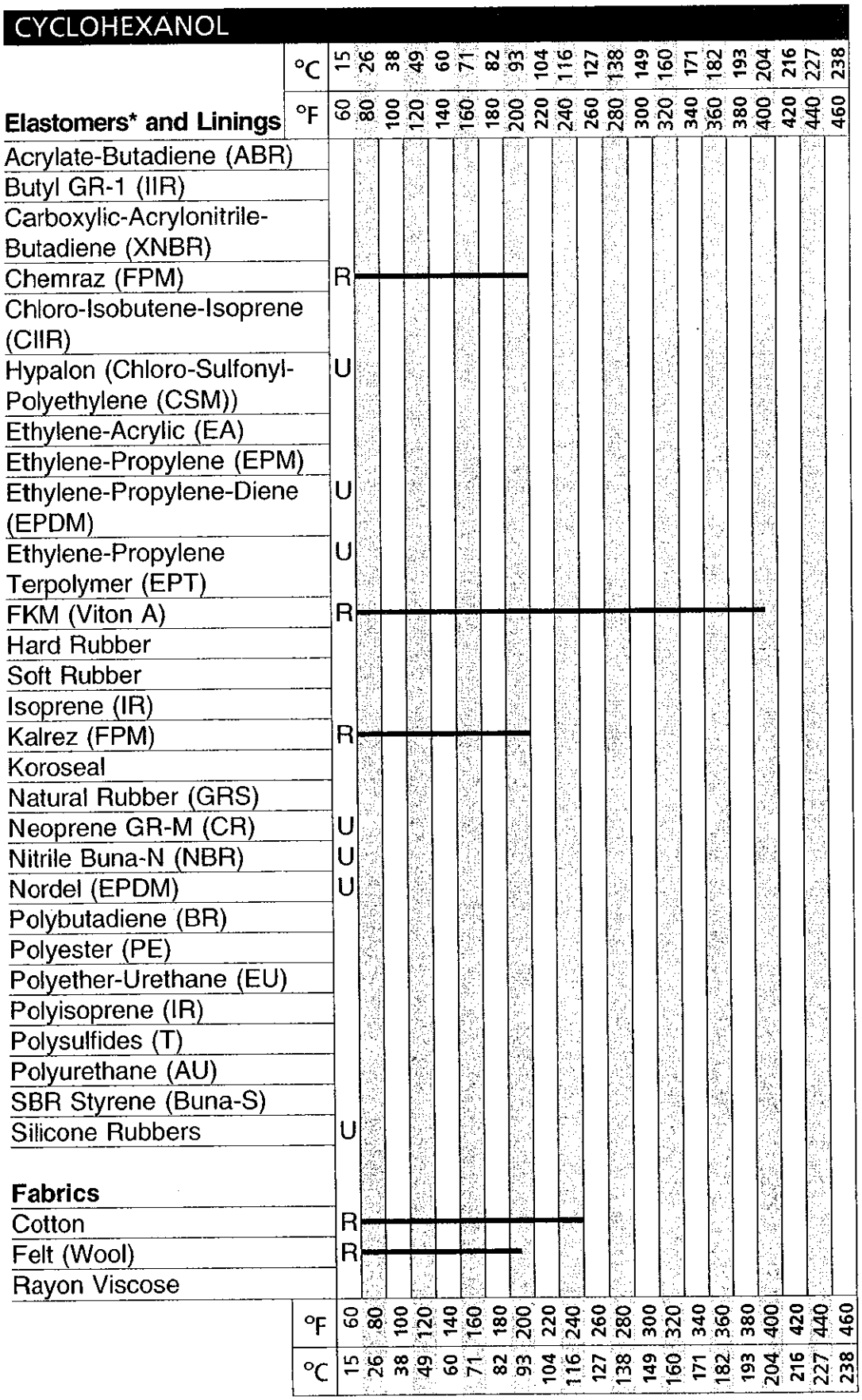
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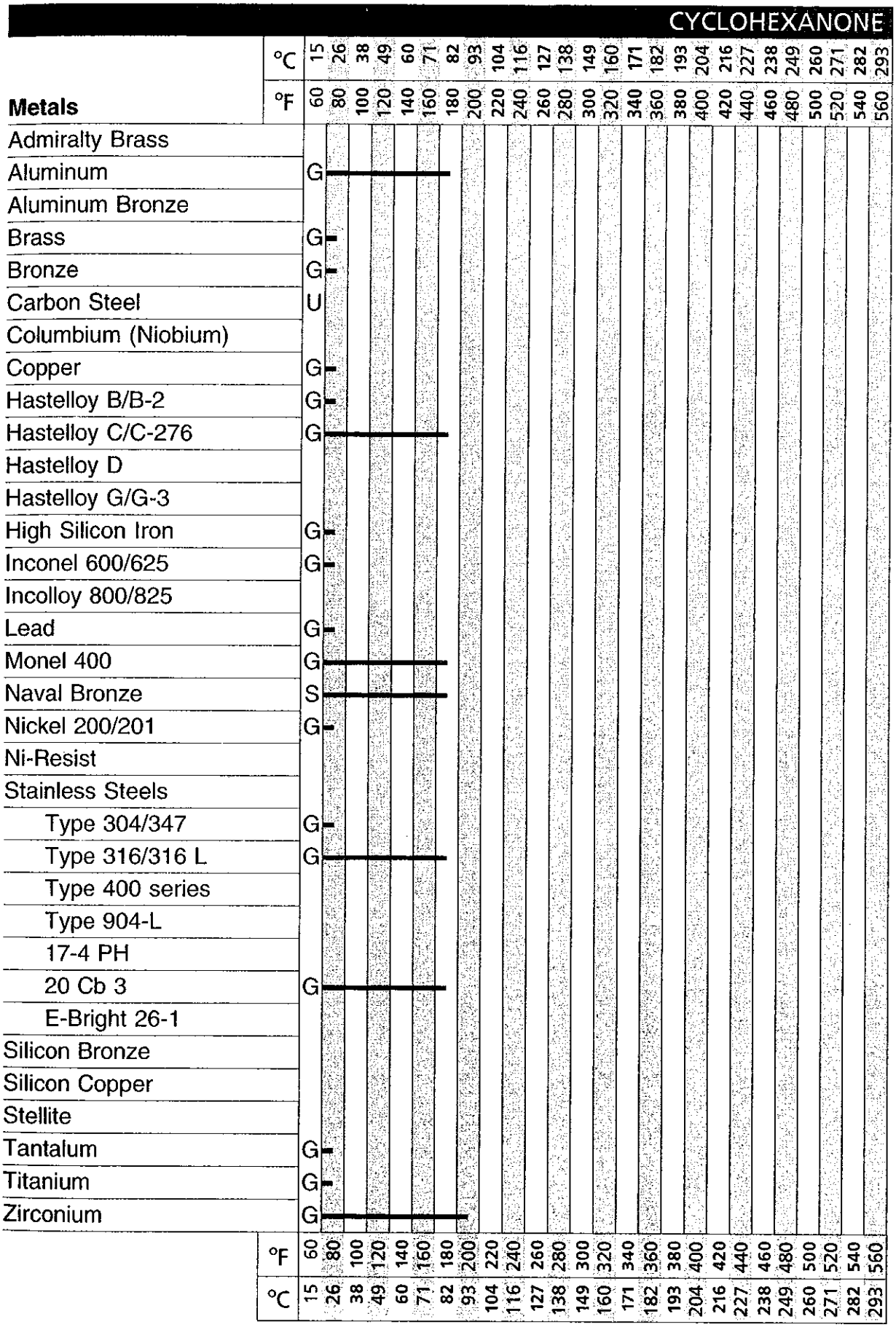
CYCLOHEXANOL



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CYCLOHEXANONE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

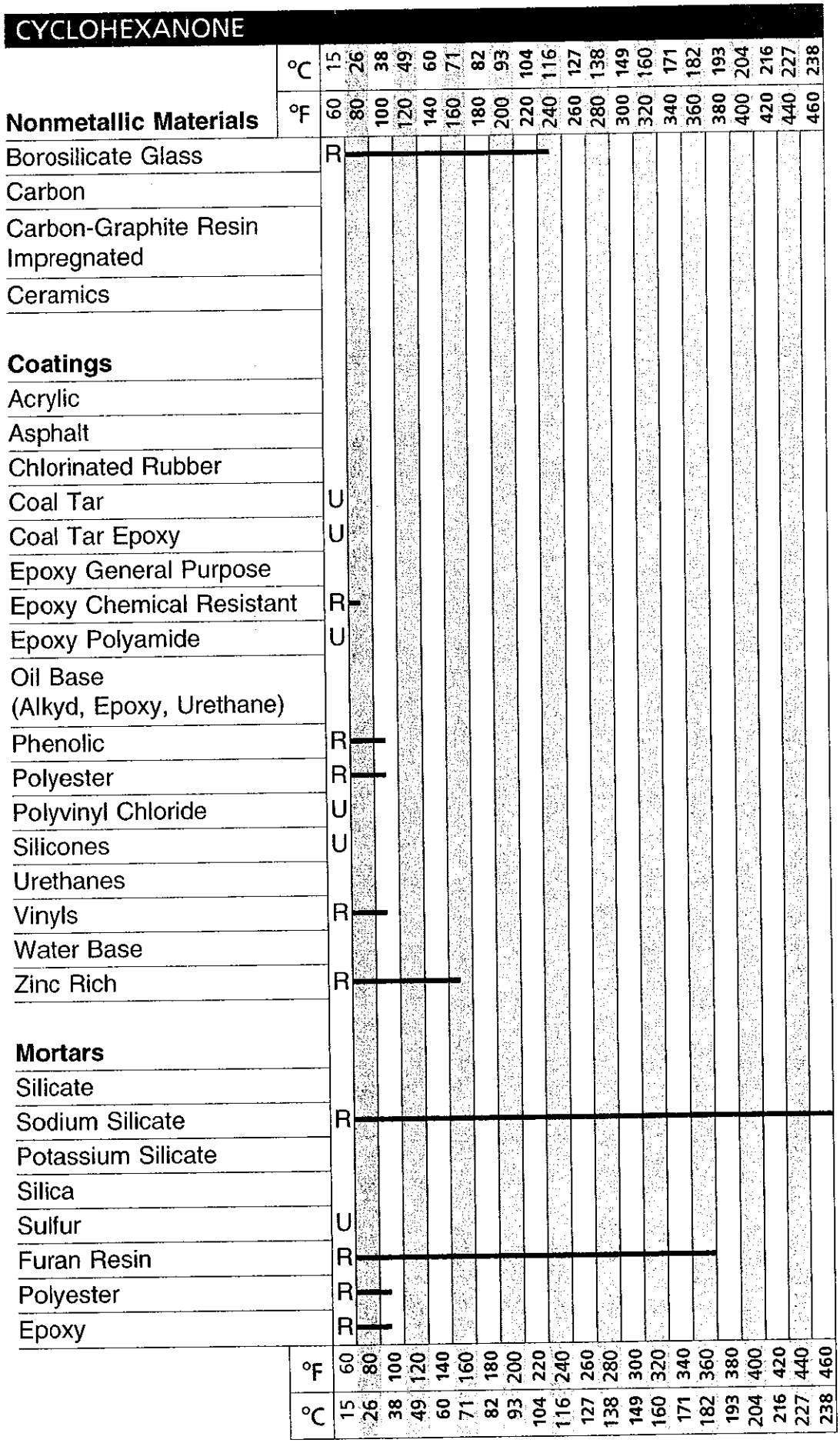
R = Resistant

U = Unsatisfactory

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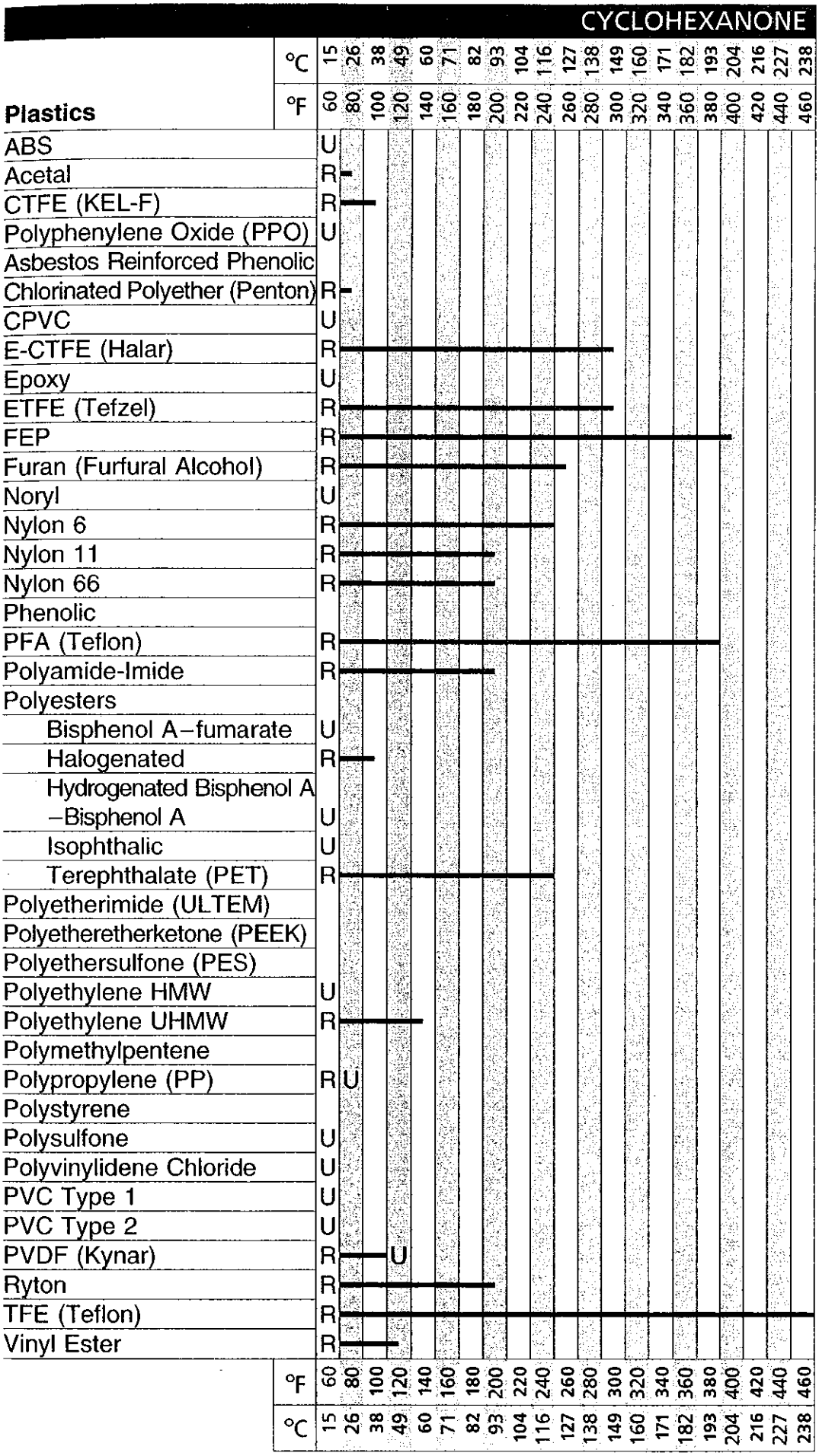
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CYCLOHEXANONE



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CYCLOHEXANONE

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)		U																				
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)		R																				
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))		U																				
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)		R	U																			
Ethylene-Propylene Terpolymer (EPT)		U																				
FKM (Viton A)		U																				
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)		U																				
Kalrez (FPM)		R																				
Koroseal																						
Natural Rubber (GRS)		U																				
Neoprene GR-M (CR)		U																				
Nitrile Buna-N (NBR)		U																				
Nordel (EPDM)		R																				
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers		U																				
Fabrics																						
Cotton		R																				
Felt (Wool)		R																				
Rayon Viscose		R																				
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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DDT (DICHLORODIPHENYL–TRICHLOROETHANE)

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Galv. Stl.		U																									
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347		G																									
Type 316/316 L		G																									
Type 400 series																											
Type 317/317 L		G																									
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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DDT (DICHLORODIPHENYL–TRICHLOROETHANE)

Nonmetallic Materials	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass	R																				
Carbon																					
Carbon-Graphite Resin Impregnated																					
Ceramics																					
Coatings																					
Acrylic																					
Asphalt																					
Chlorinated Rubber																					
Coal Tar																					
Coal Tar Epoxy																					
Epoxy General Purpose																					
Epoxy Chemical Resistant																					
Epoxy Polyamide																					
Oil Base (Alkyd, Epoxy, Urethane)																					
Phenolic																					
Polyester																					
Polyvinyl Chloride																					
Silicones																					
Urethanes																					
Vinyls																					
Water Base																					
Zinc Rich																					
Mortars																					
Silicate																					
Sodium Silicate																					
Potassium Silicate																					
Silica																					
Sulfur																					
Furan Resin																					
Polyester																					
Epoxy																					
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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DDT (DICHLORODIPHENYL–TRICHLOROETHANE)

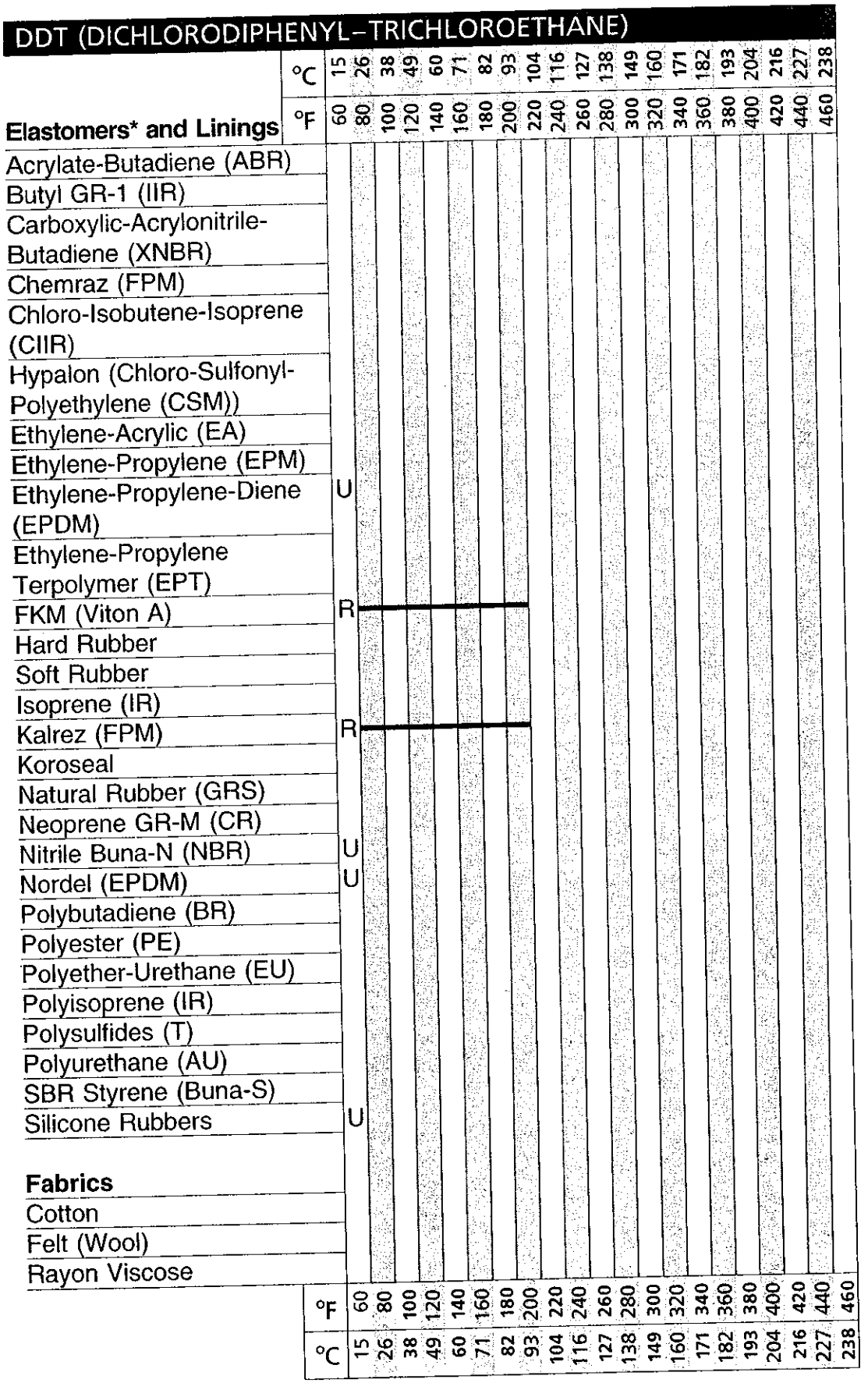
Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC		
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)	R	
FEP		
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated		
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic		
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)		
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1		
PVC Type 2		
PVDF (Kynar)		
Ryton		
TFE (Teflon)		
Vinyl Ester		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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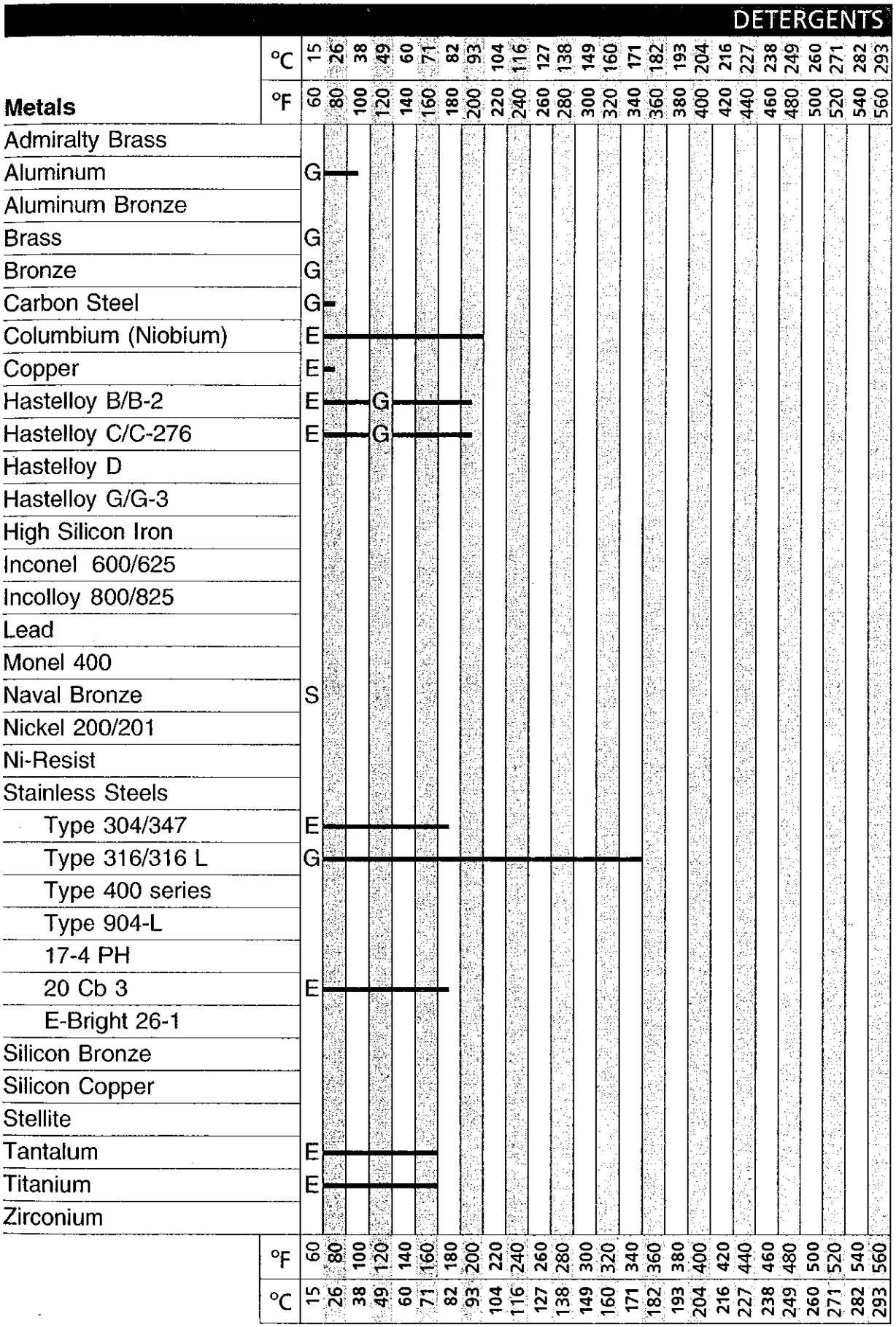
DDT (DICHLORODIPHENYL–TRICHLOROETHANE)



*See also Nylon 11 under PLASTICS

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

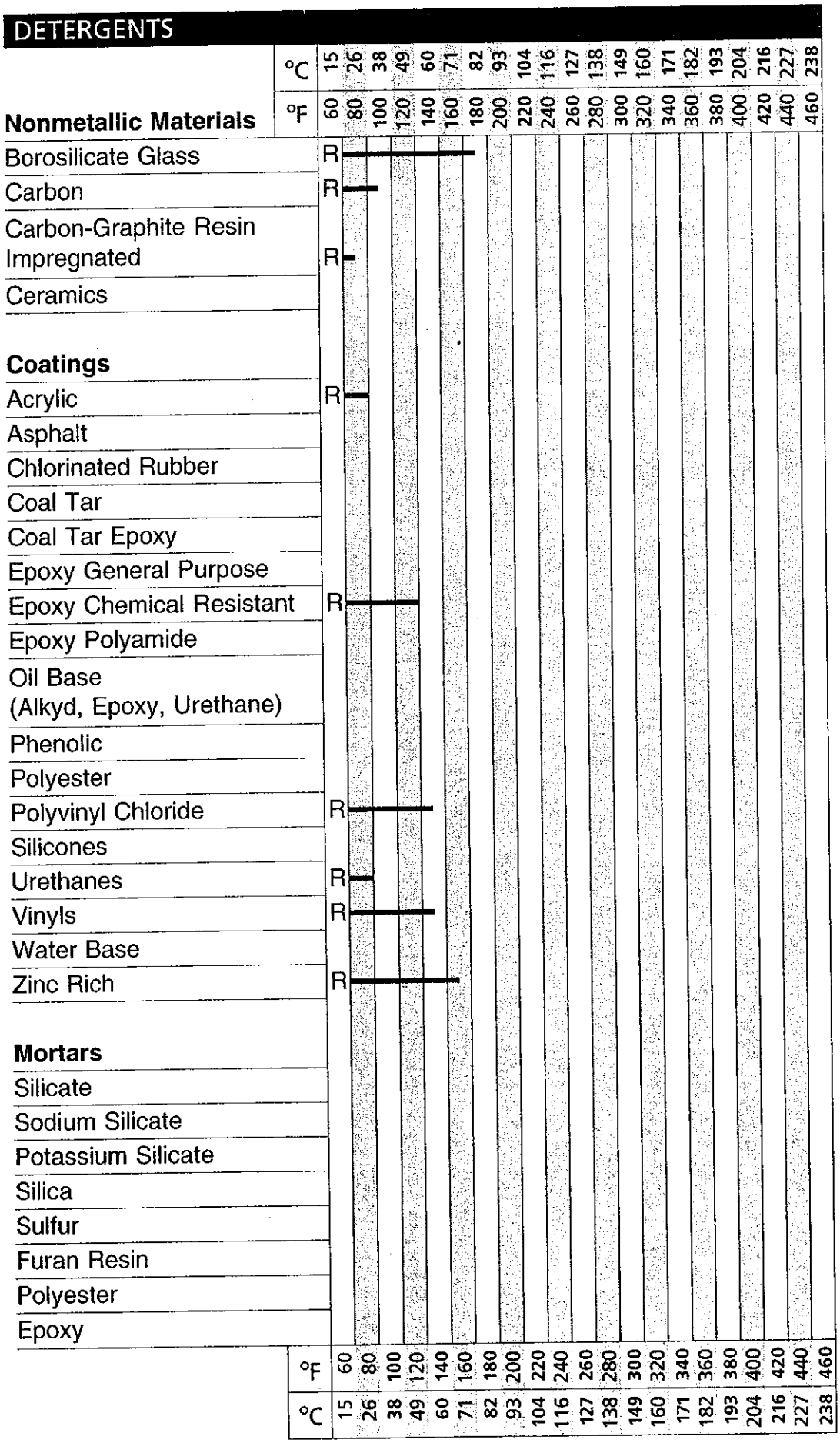
R = Resistant

U = Unsatisfactory

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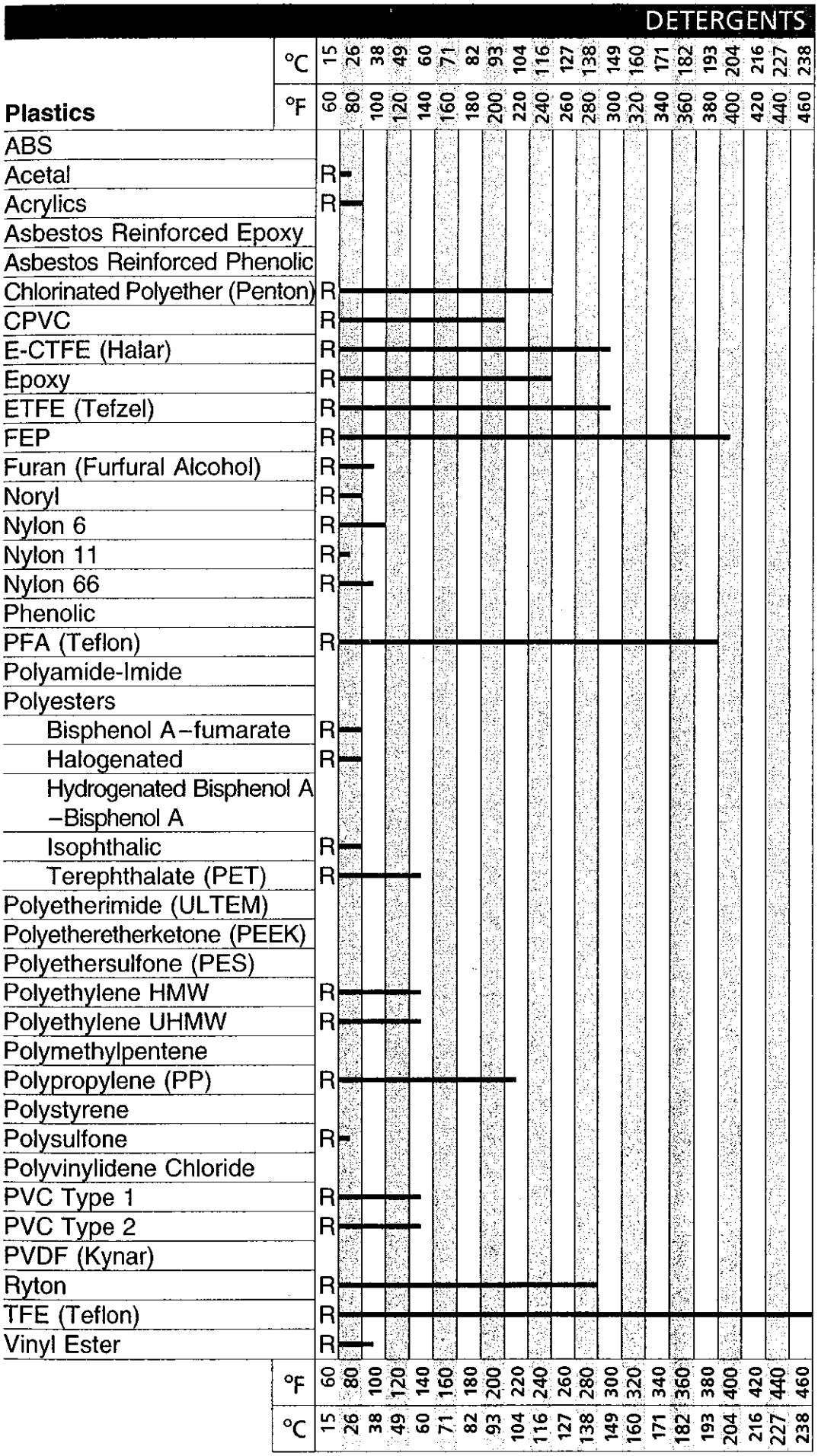
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DETERGENTS



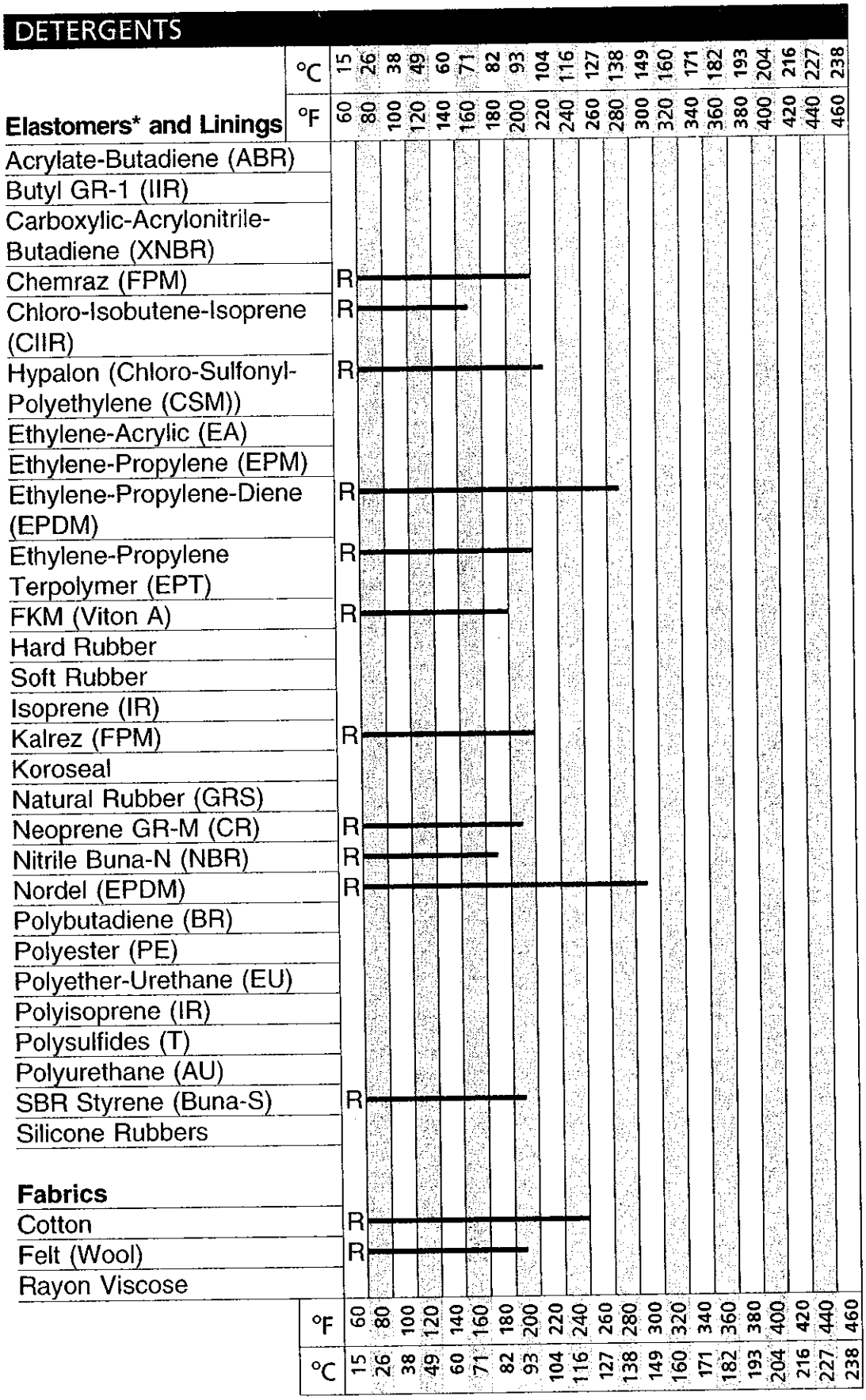
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DETERGENTS



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DETERGENT SOLUTION, HEAVY DUTY

Metals	°C	°F
Admiralty Brass		
Aluminum		
Aluminum Bronze	G	
Brass		
Bronze		
Carbon Steel		
Columbium (Niobium)		
Copper	G	
Hastelloy B/B-2		
Hastelloy C/C-276		
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625		
Incolloy 800/825		
Lead		
Monel 400		
Naval Bronze		
Nickel 200/201		
Ni-Resist		
Stainless Steels		
Type 304/347	E	
Type 316/316 L	E	
Type 400 series	G	
Type 904-L		
17-4 PH	G	
20 Cb 3	E	
E-Bright 26-1		
Silicon Bronze	G	
Silicon Copper		
Stellite	G	
Tantalum		
Titanium		
Zirconium		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

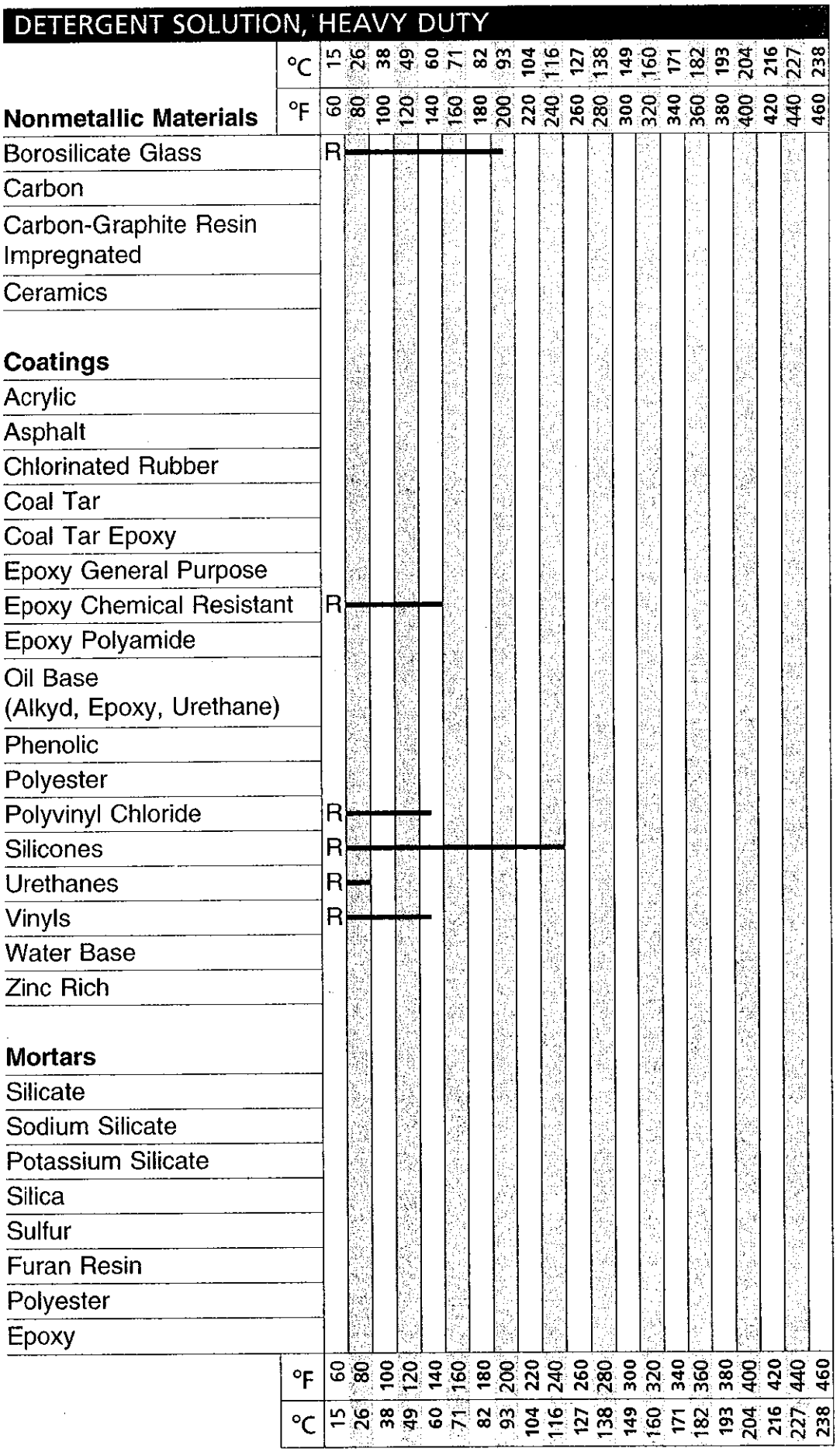
R = Resistant

U = Unsatisfactory

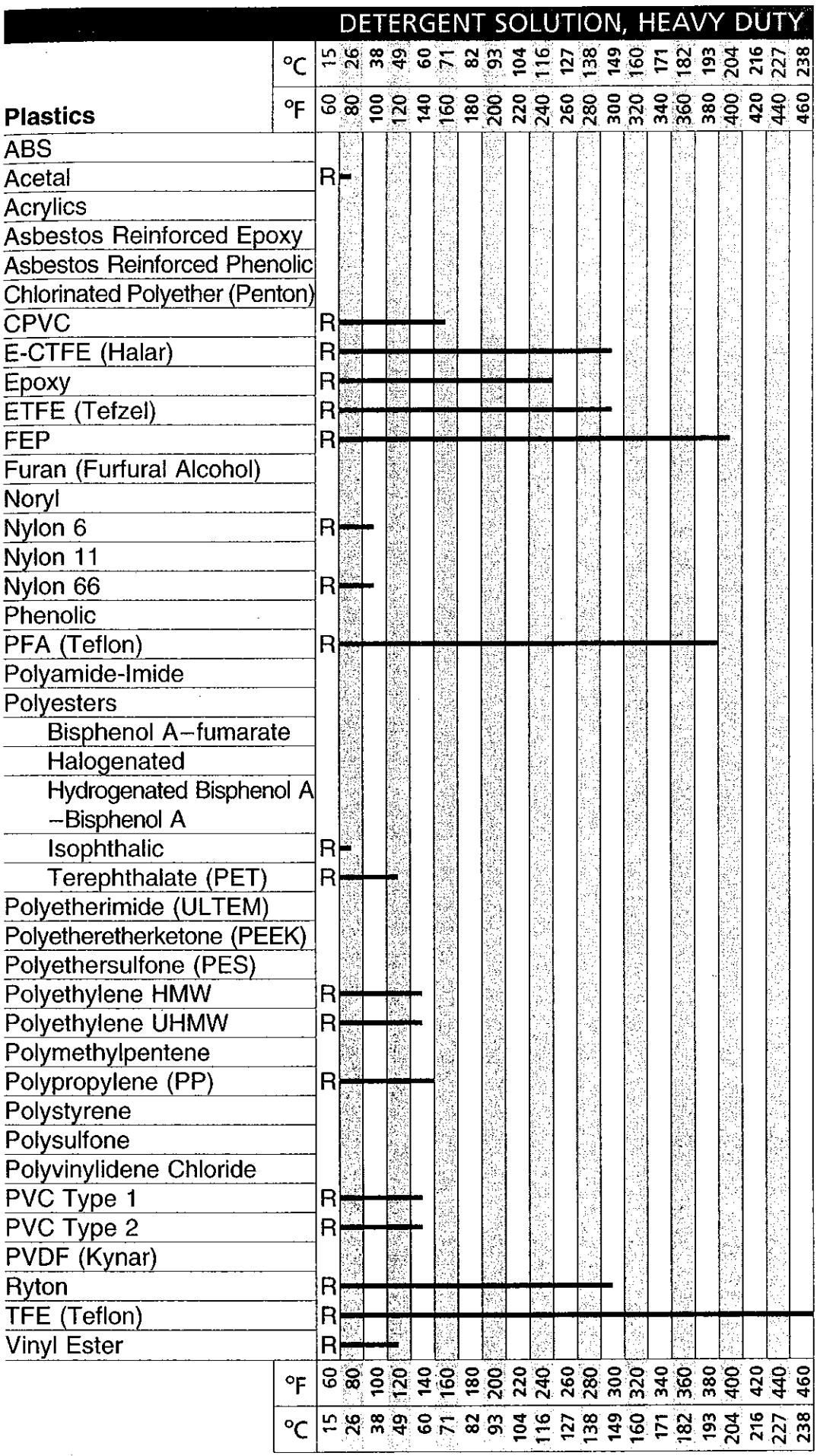
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DETERGENT SOLUTION, HEAVY DUTY

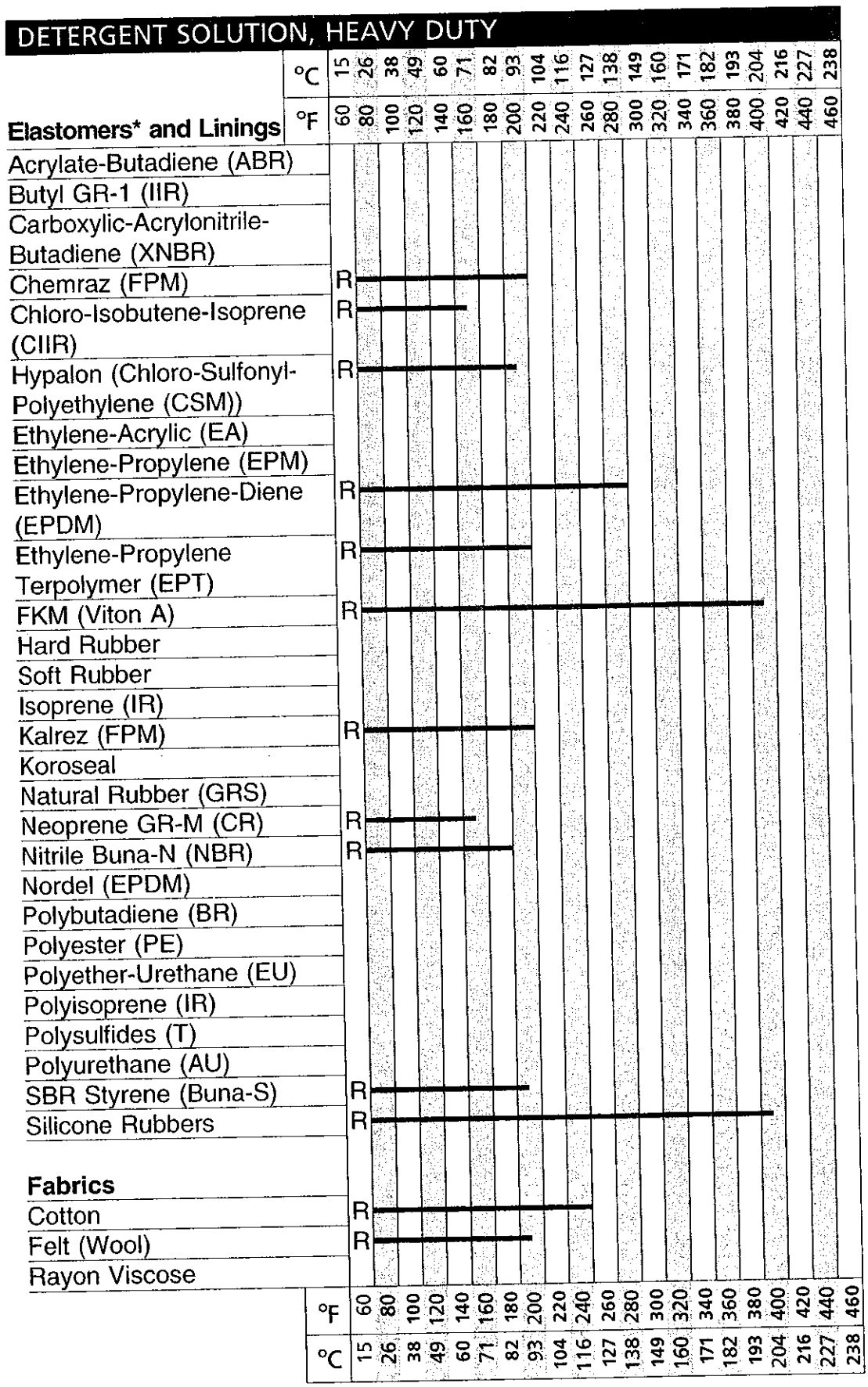


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DETERGENT SOLUTION, HEAVY DUTY



*See also Nylon 11 under PLASTICS

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Metals	°C	°F
Admiralty Brass		
Aluminum	G	
Aluminum Bronze	G	
Brass	G	
Bronze	G	
Carbon Steel		
Columbium (Niobium)		
Copper		
Hastelloy B/B-2		
Hastelloy C/C-276		
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625		
Incolloy 800/825		
Galv. Stl.	G	
Monel 400	G	
Naval Bronze		
Nickel 200/201	G	
Ni-Resist		
Stainless Steels		
Type 304/347		
Type 316/316 L	G	
Type 400 series		
Type 904-L		
17-4 PH	G	
20 Cb 3		
E-Bright 26-1		
Silicon Bronze		
Silicon Copper		
Stellite		
Tantalum	G	
Titanium		
Zirconium	U	

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

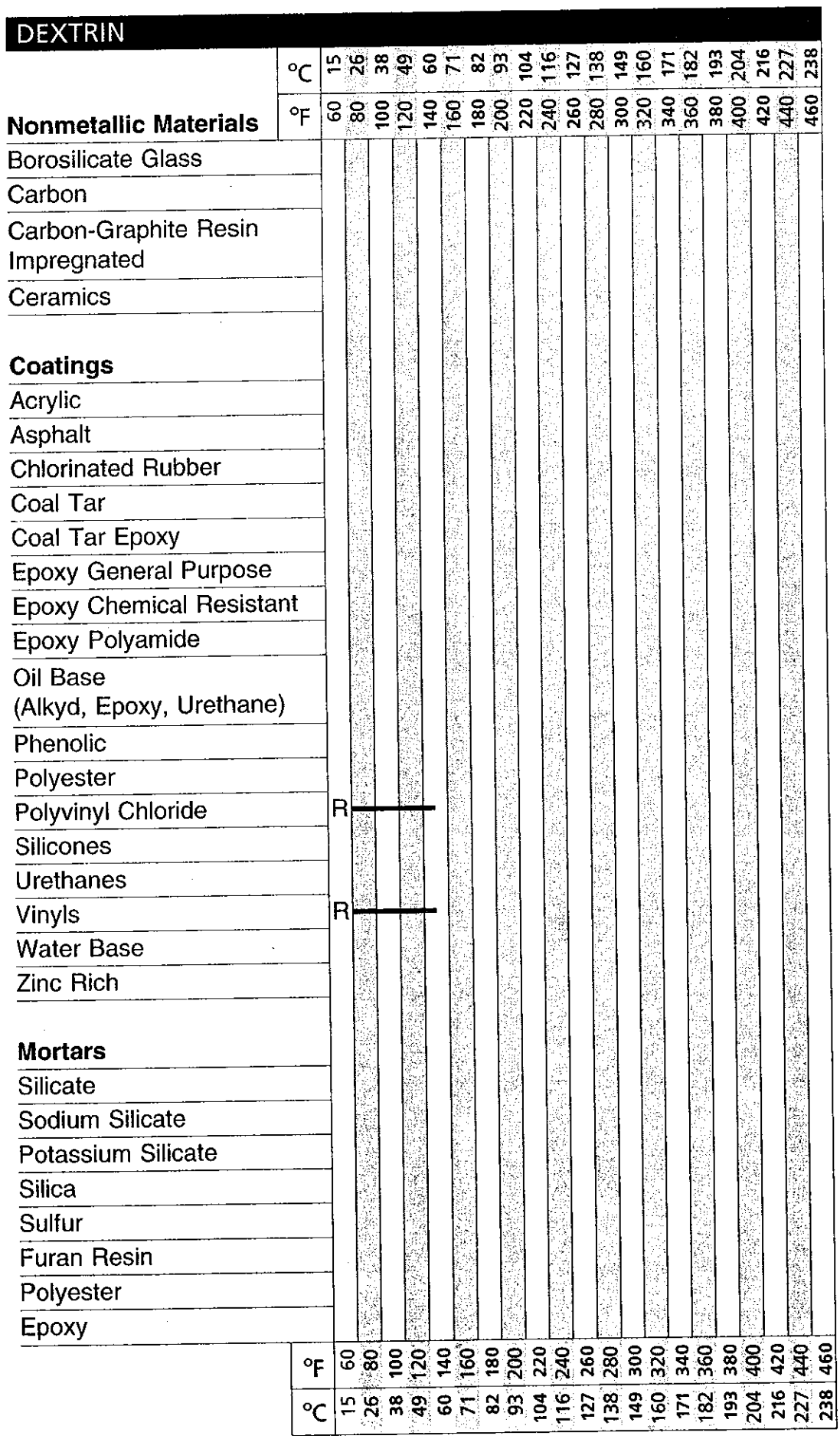
R = Resistant

U = Unsatisfactory

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DEXTRIN

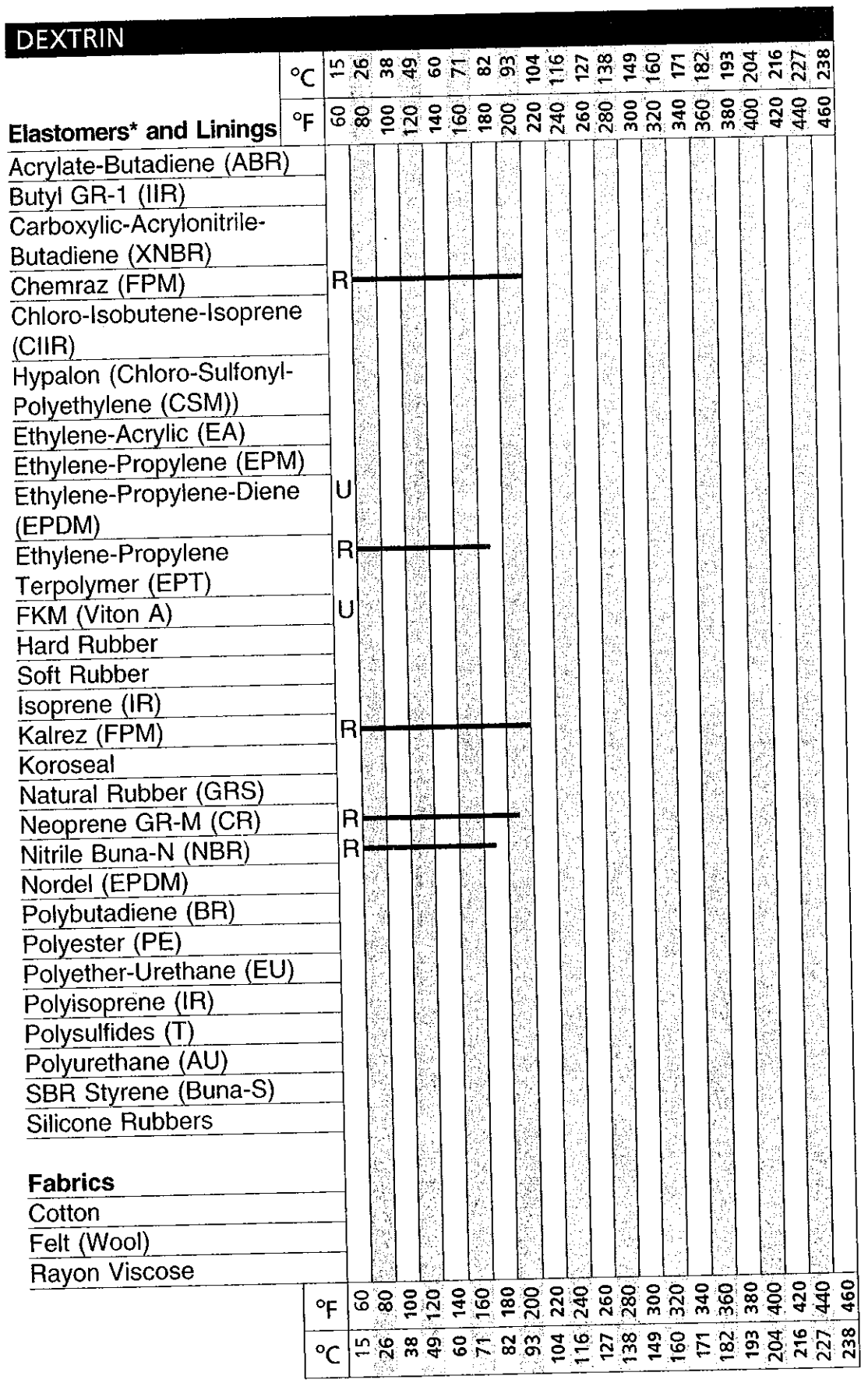


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Plastics	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS	R																				
Acetal																					
Acrylics																					
Asbestos Reinforced Epoxy																					
Asbestos Reinforced Phenolic																					
Chlorinated Polyether (Penton)	R																				
CPVC	R																				
E-CTFE (Halar)	R																				
Epoxy																					
ETFE (Tefzel)	R																				
FEP	R																				
Furan (Furfural Alcohol)																					
Noryl																					
Nylon 6																					
Nylon 11																					
Nylon 66																					
Phenolic																					
PFA (Teflon)	R																				
Polyamide-Imide																					
Polyesters																					
Bisphenol A–fumarate																					
Halogenated																					
Hydrogenated Bisphenol A –Bisphenol A																					
Isophthalic																					
Terephthalate (PET)																					
Polyetherimide (ULTEM)																					
Polyetheretherketone (PEEK)																					
Polyethersulfone (PES)																					
Polyethylene HMW	R																				
Polyethylene UHMW	R																				
Polymethylpentene																					
Polypropylene (PP)	R																				
Polystyrene																					
Polysulfone																					
Polyvinylidene Chloride																					
PVC Type 1	R																				
PVC Type 2	R																				
PVDF (Kynar)	R																				
Ryton																					
TFE (Teflon)	R																				
Vinyl Ester																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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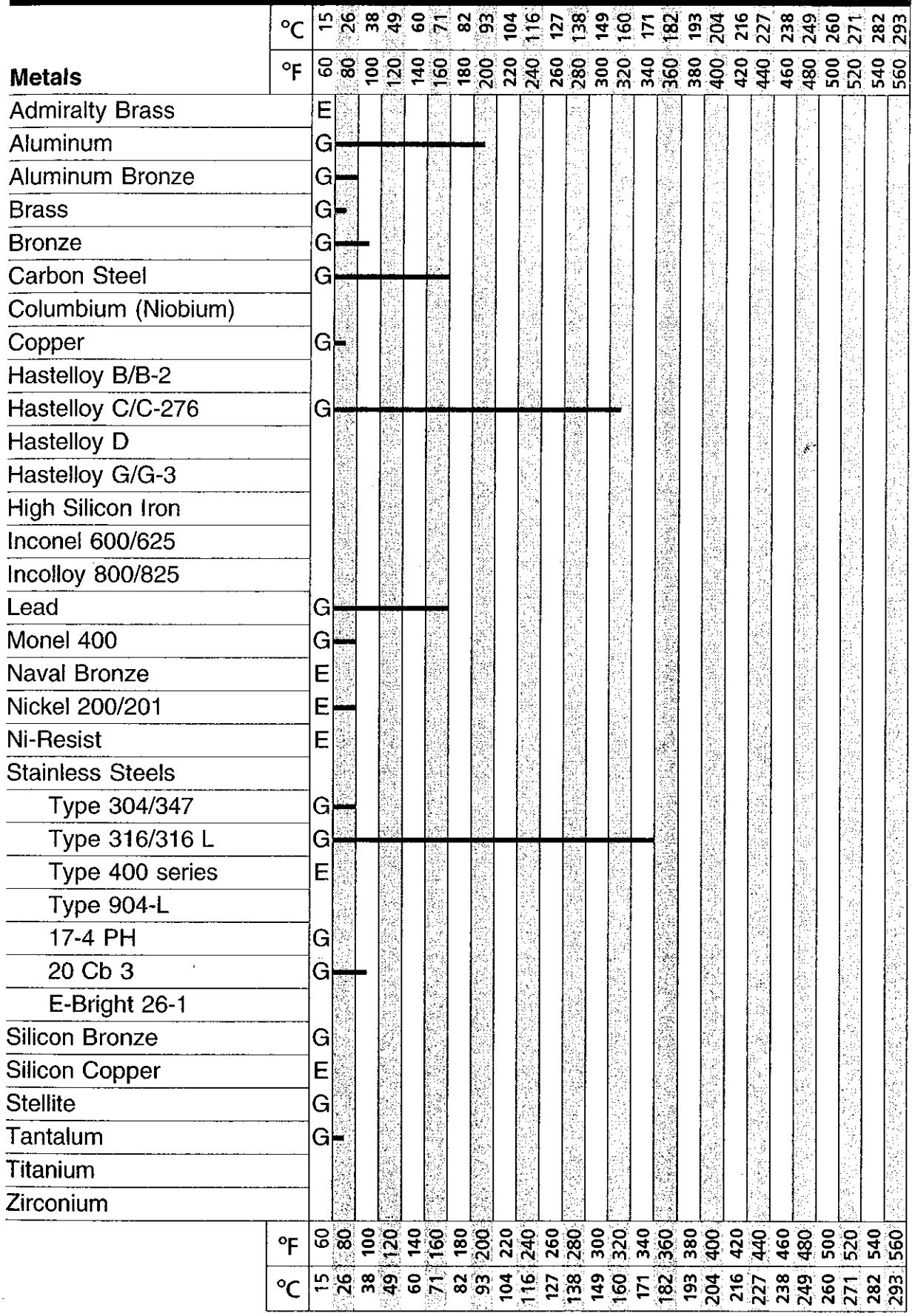
DEXTRIN



*See also Nylon 11 under PLASTICS

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

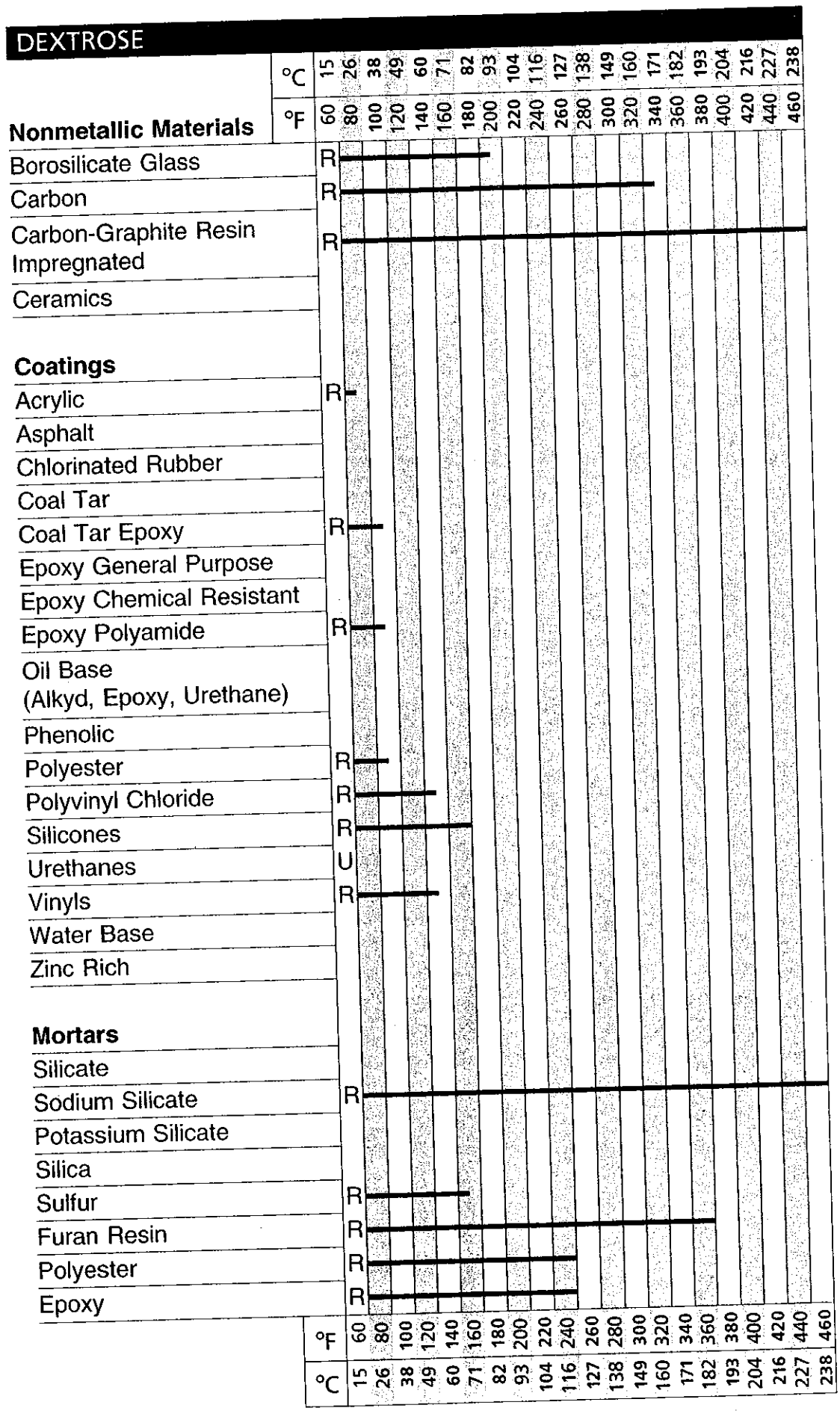
R = Resistant

U = Unsatisfactory

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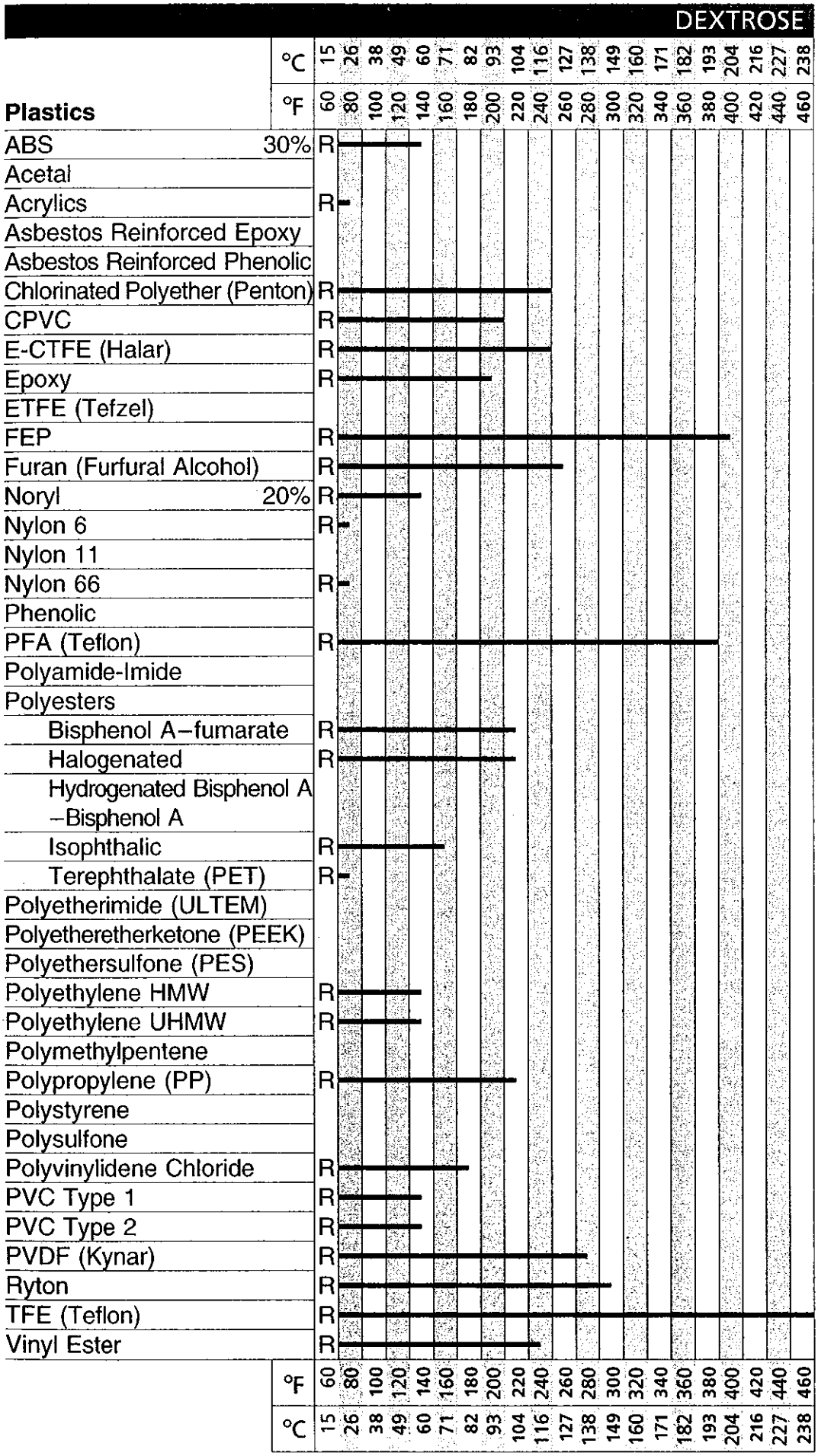
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DEXTROSE



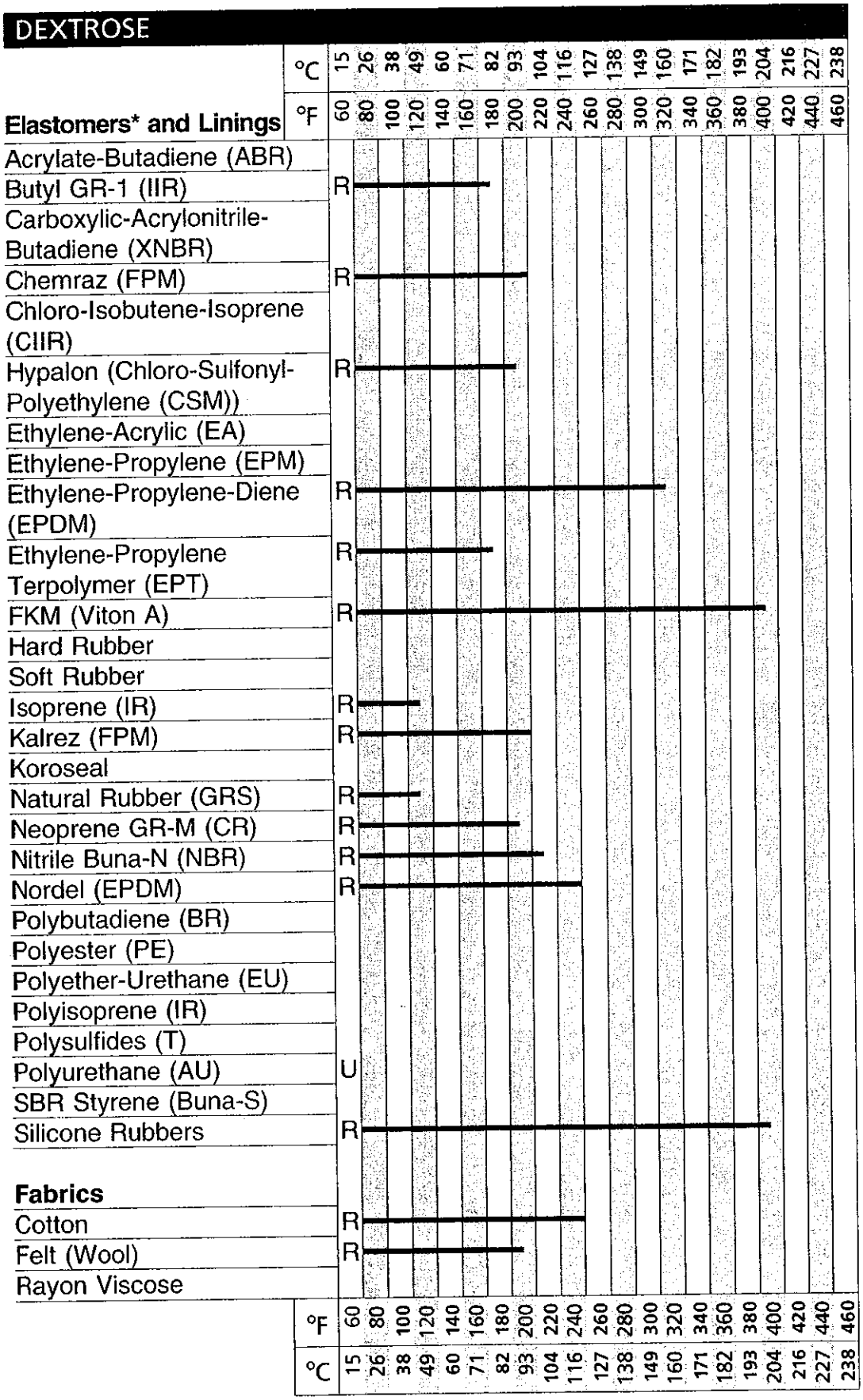
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DEXTROSE



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DEXTROSE

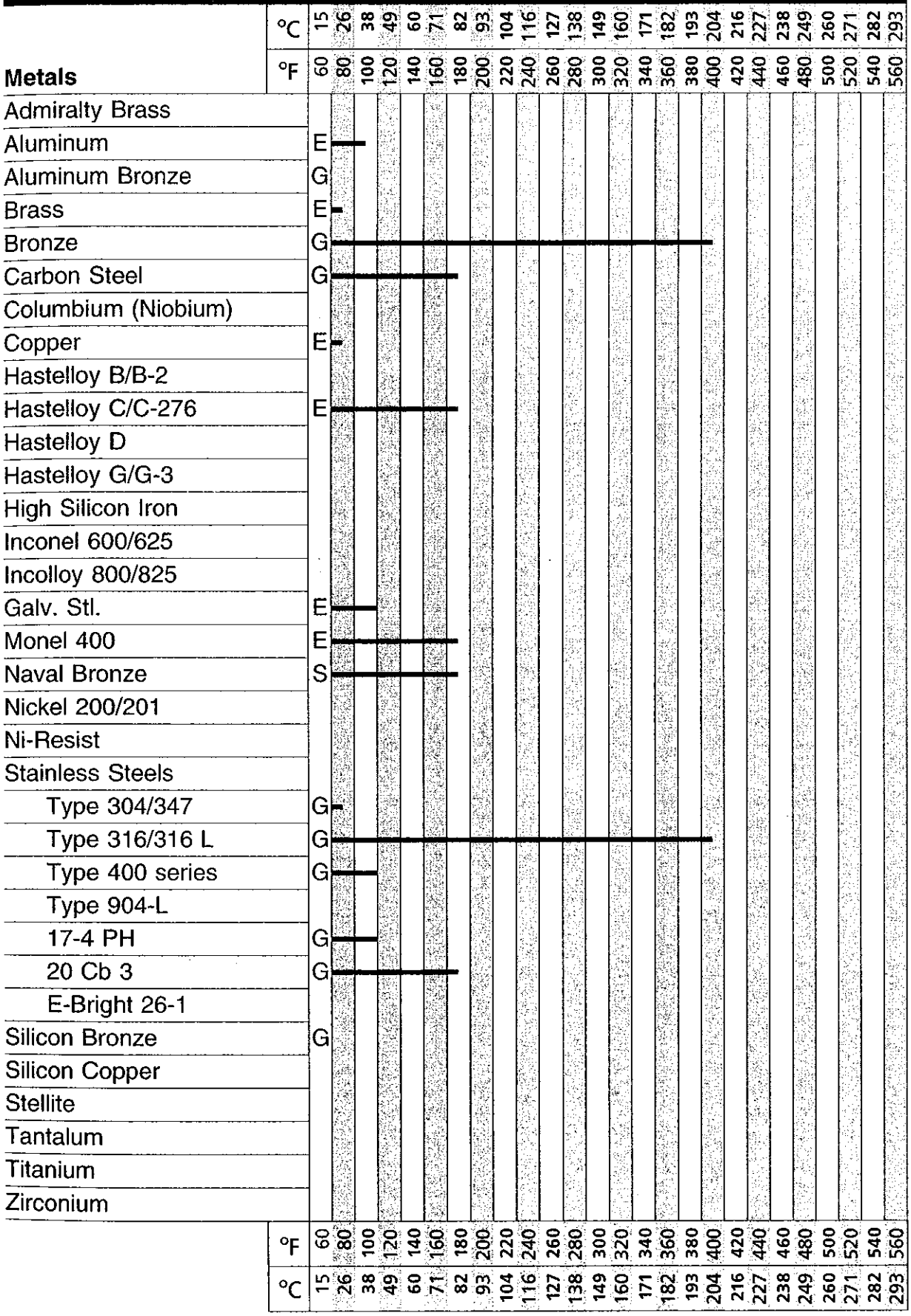


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DIACETONE ALCOHOL



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

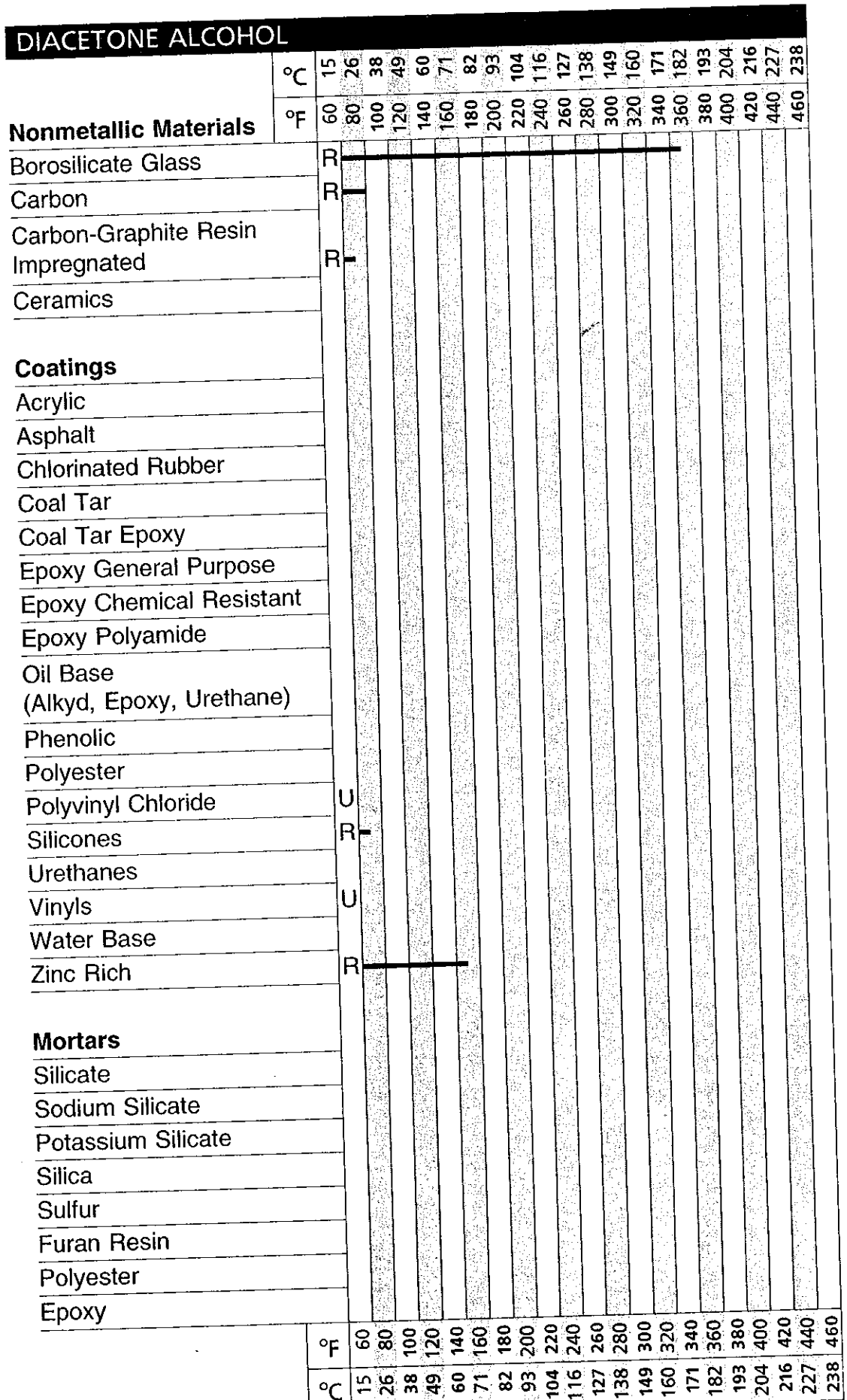
R = Resistant

U = Unsatisfactory

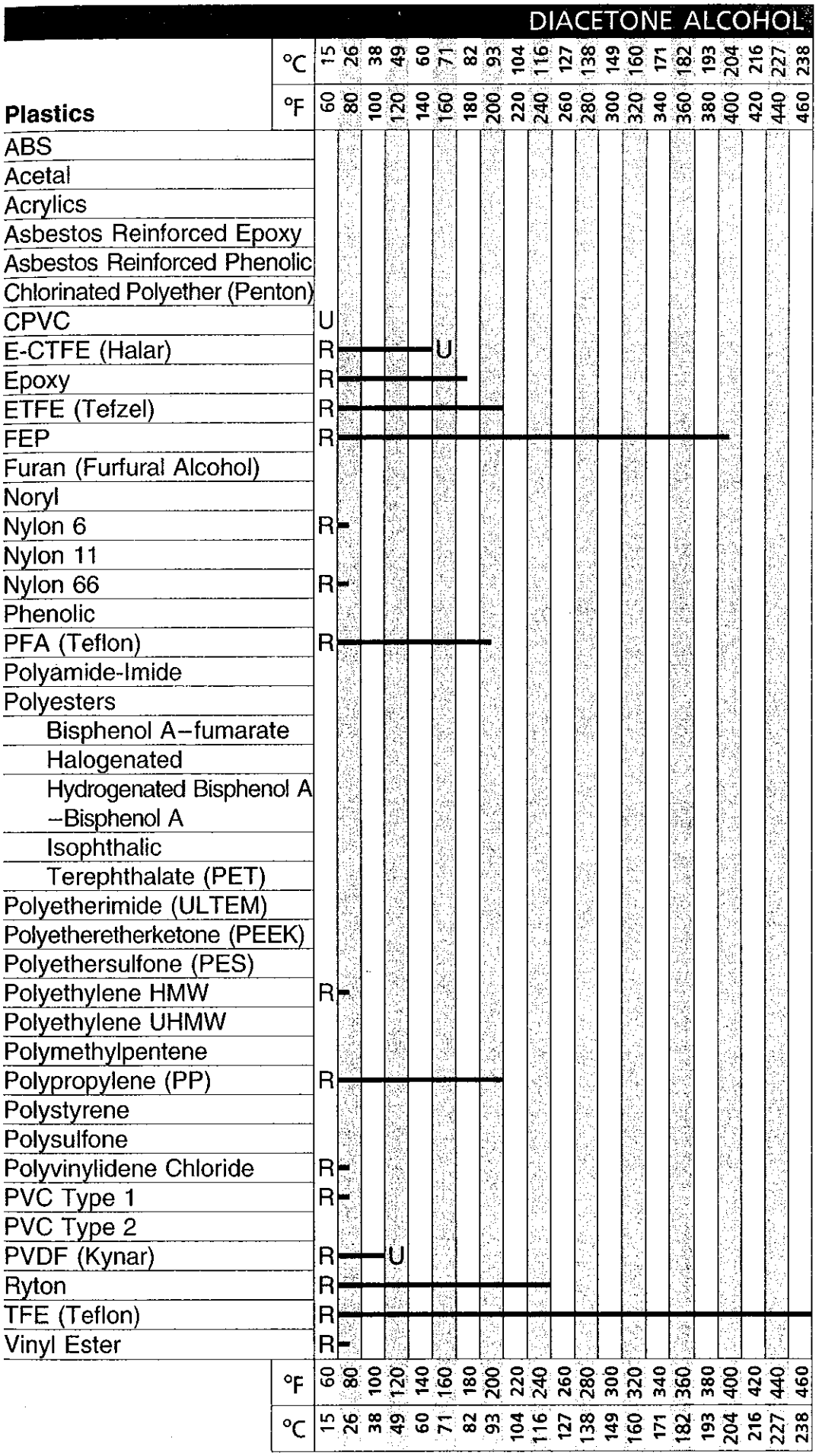
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DIACETONE ALCOHOL

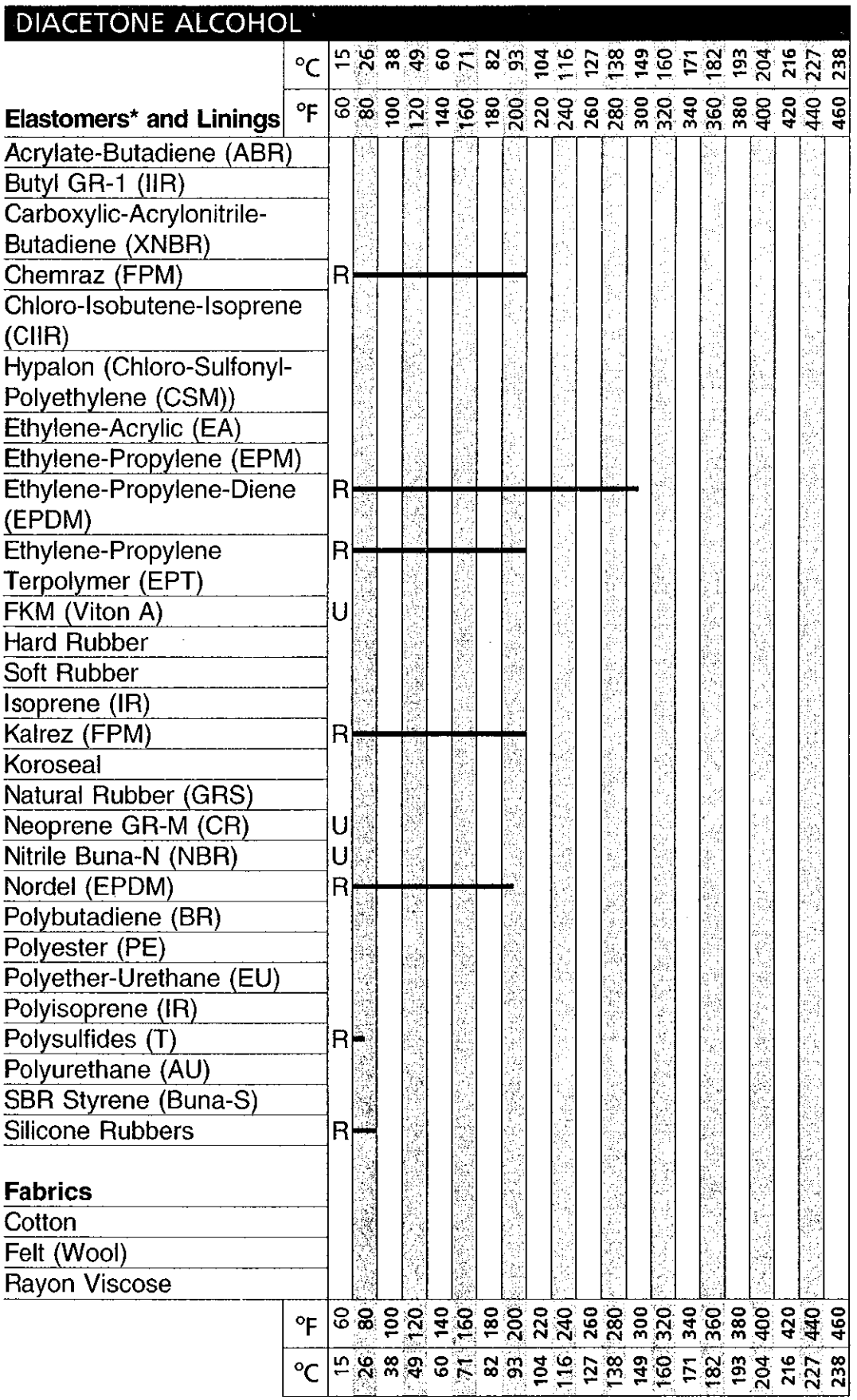


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DIACETONE ALCOHOL



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DIAMMONIUM PHOSPHATE

Metals	°C / °F	15 / 60	26 / 80	38 / 100	49 / 120	60 / 140	71 / 160	82 / 180	93 / 200	104 / 220	116 / 240	127 / 260	138 / 280	149 / 300	160 / 320	171 / 340	182 / 360	193 / 380	204 / 400	216 / 420	227 / 440	238 / 460	249 / 480	260 / 500	271 / 520	282 / 540	293 / 560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347	G	—	—	—	—																						
Type 316/316 L	G	—	—	—	—																						
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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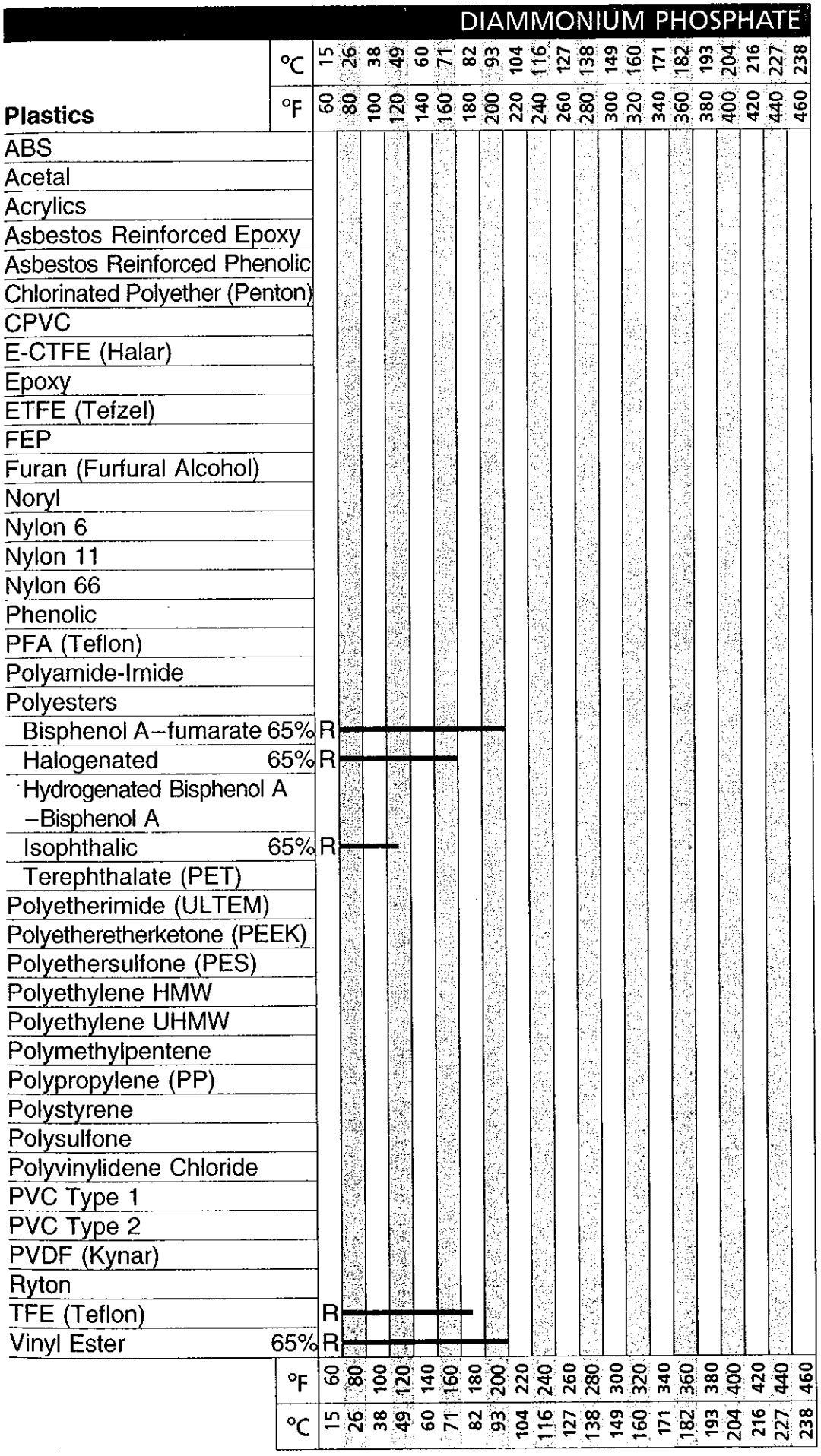
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DIAMMONIUM PHOSPHATE

	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Nonmetallic Materials																						
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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DIAMMONIUM PHOSPHATE

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)	R																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)																						
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)																						
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)																						
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)	R																					
Nitrile Buna-N (NBR)																						
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze	G																										
Carbon Steel	G																										
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Galv. Stl.	E																										
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist	G																										
Stainless Steels																											
Type 304/347	G																										
Type 316	G																										
Type 400 series																											
Type 317/317 L	G																										
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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DIAMYLAMINE

	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Nonmetallic Materials																						
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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DIAMYLAMINE

Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC		
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)		
FEP		
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated		
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic		
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)		
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1		
PVC Type 2		
PVDF (Kynar)		
Ryton		
TFE (Teflon)	R	
Vinyl Ester		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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DIAMYLAMINE

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)																						
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)																						
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)	R																					
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)																						
Nitrile Buna-N (NBR)	U																					
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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Metals	°C	°F
Admiralty Brass		
Aluminum		
Aluminum Bronze		
Brass		
Bronze		
Carbon Steel		
Columbium (Niobium)		
Copper		
Hastelloy B/B-2		
Hastelloy C/C-276		
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625		
Incolloy 800/825		
Lead		
Monel 400		
Naval Bronze		
Nickel 200/201		
Ni-Resist		
Stainless Steels		
Type 304/347		
Type 316/316 L	G	
Type 400 series		
Type 904-L		
17-4 PH		
20 Cb 3		
E-Bright 26-1		
Silicon Bronze		
Silicon Copper		
Stellite		
Tantalum		
Titanium		
Zirconium		

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

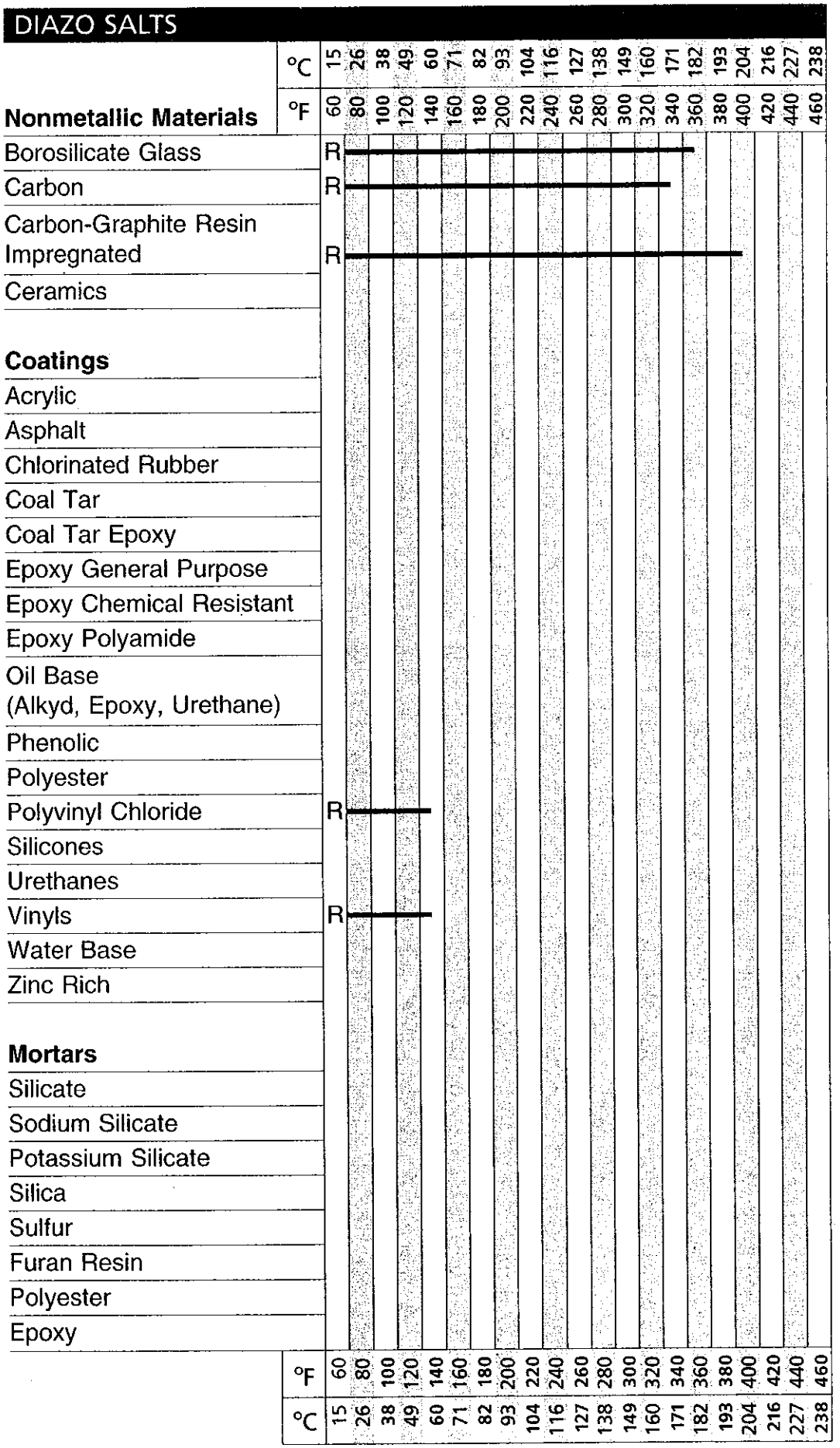
R = Resistant

U = Unsatisfactory

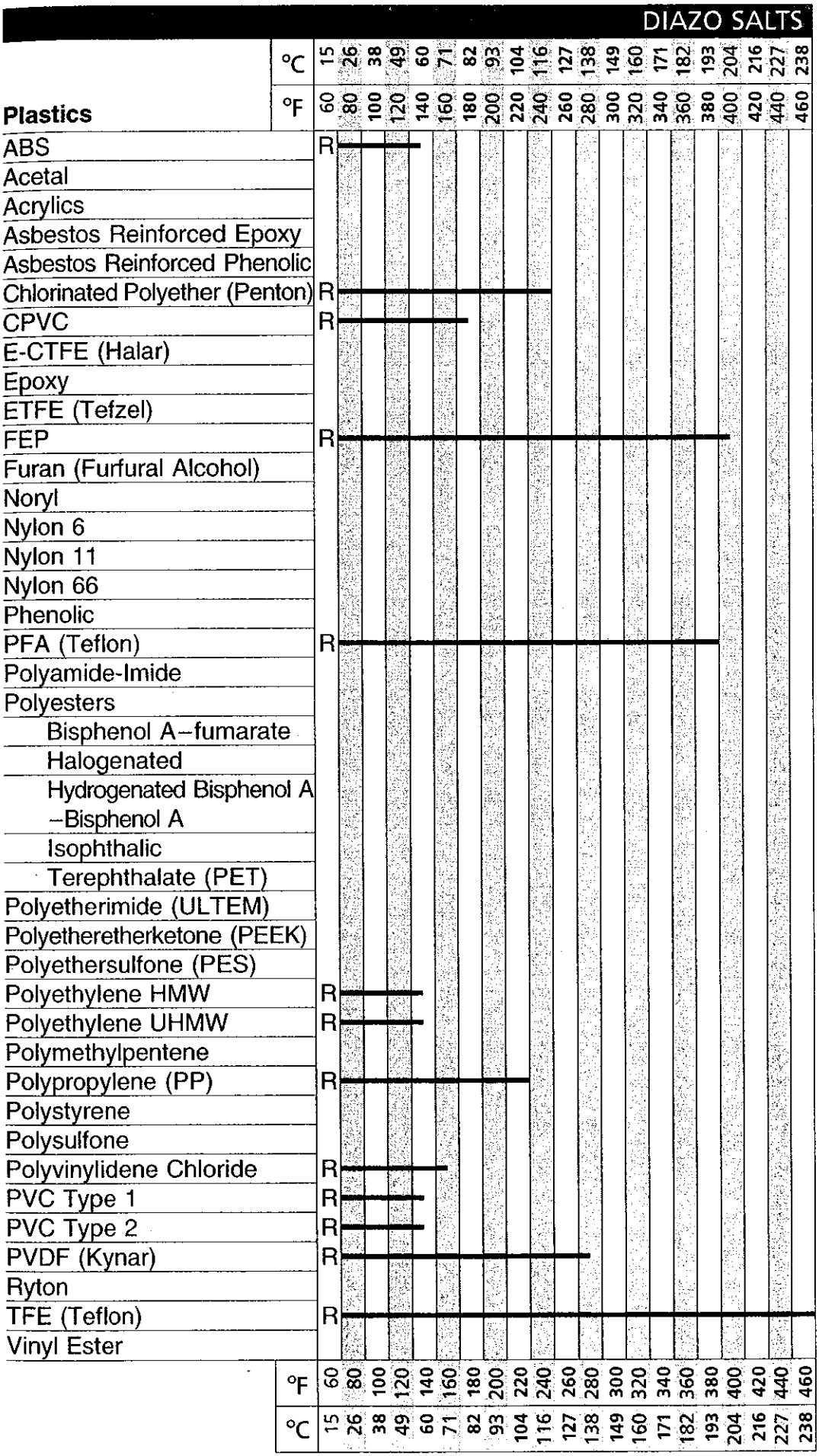
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DIAZO SALTS



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DIAZO SALTS

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)	R	—	—	—	—	—	—	—													
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																					
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)																					
Ethylene-Propylene Terpolymer (EPT)																					
FKM (Viton A)																					
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)																					
Kalrez (FPM)																					
Koroseal																					
Natural Rubber (GRS)																					
Neoprene GR-M (CR)																					
Nitrile Buna-N (NBR)																					
Nordel (EPDM)																					
Polybutadiene (BR)																					
Polyester (PE)																					
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers																					
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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DIBENZYL ETHER

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L																											
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

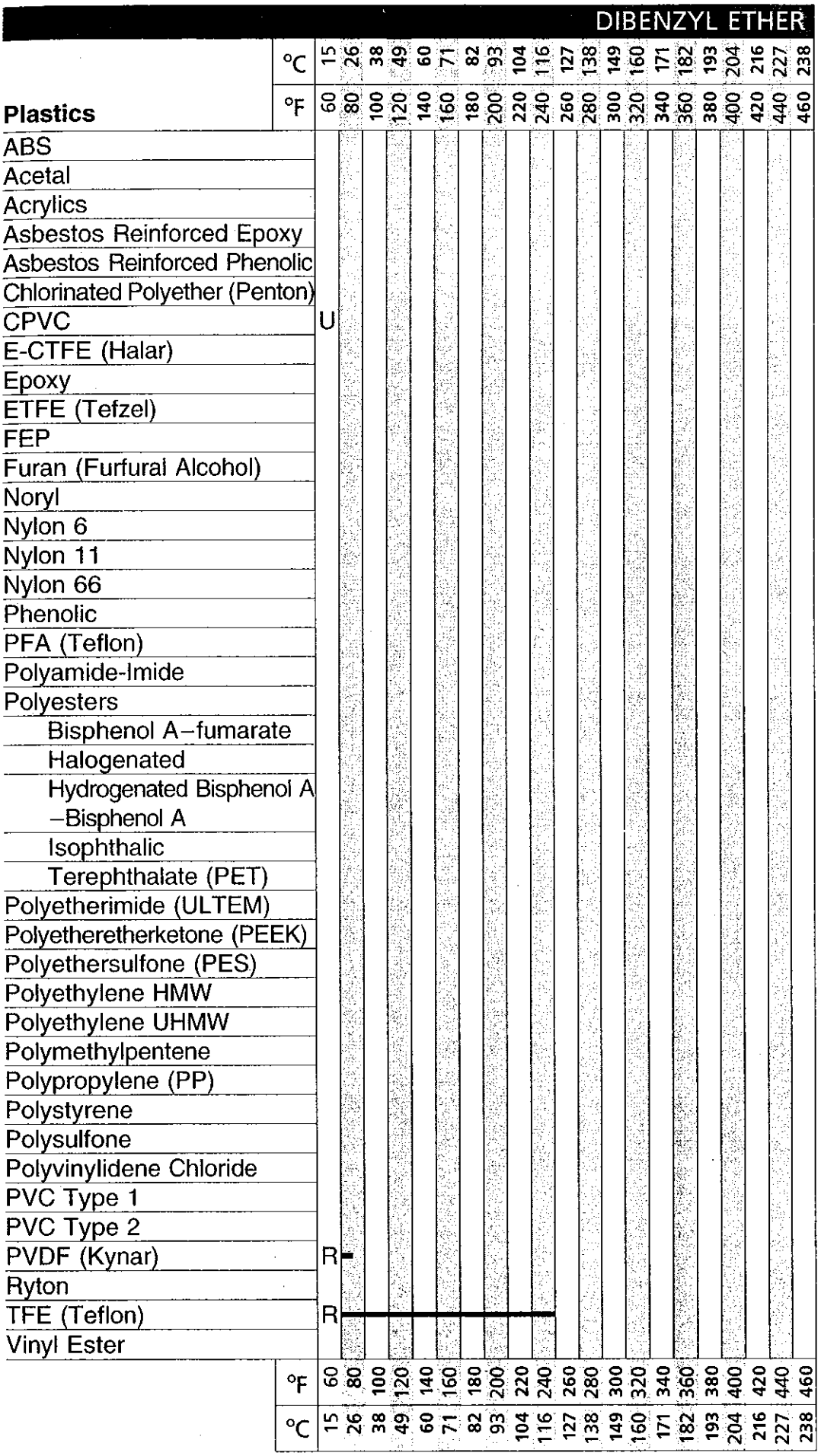
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DIBENZYL ETHER

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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DIBENZYL ETHER

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)																					
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	U																				
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)																					
Ethylene-Propylene Terpolymer (EPT)	U																				
FKM (Viton A)	U																				
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)	U																				
Kalrez (FPM)	R																				
Koroseal																					
Natural Rubber (GRS)	U																				
Neoprene GR-M (CR)	U																				
Nitrile Buna-N (NBR)	U																				
Nordel (EPDM)																					
Polybutadiene (BR)																					
Polyester (PE)																					
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers																					
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum		E																									
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel		E																									
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Galv. Stl.		E																									
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L		E																									
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

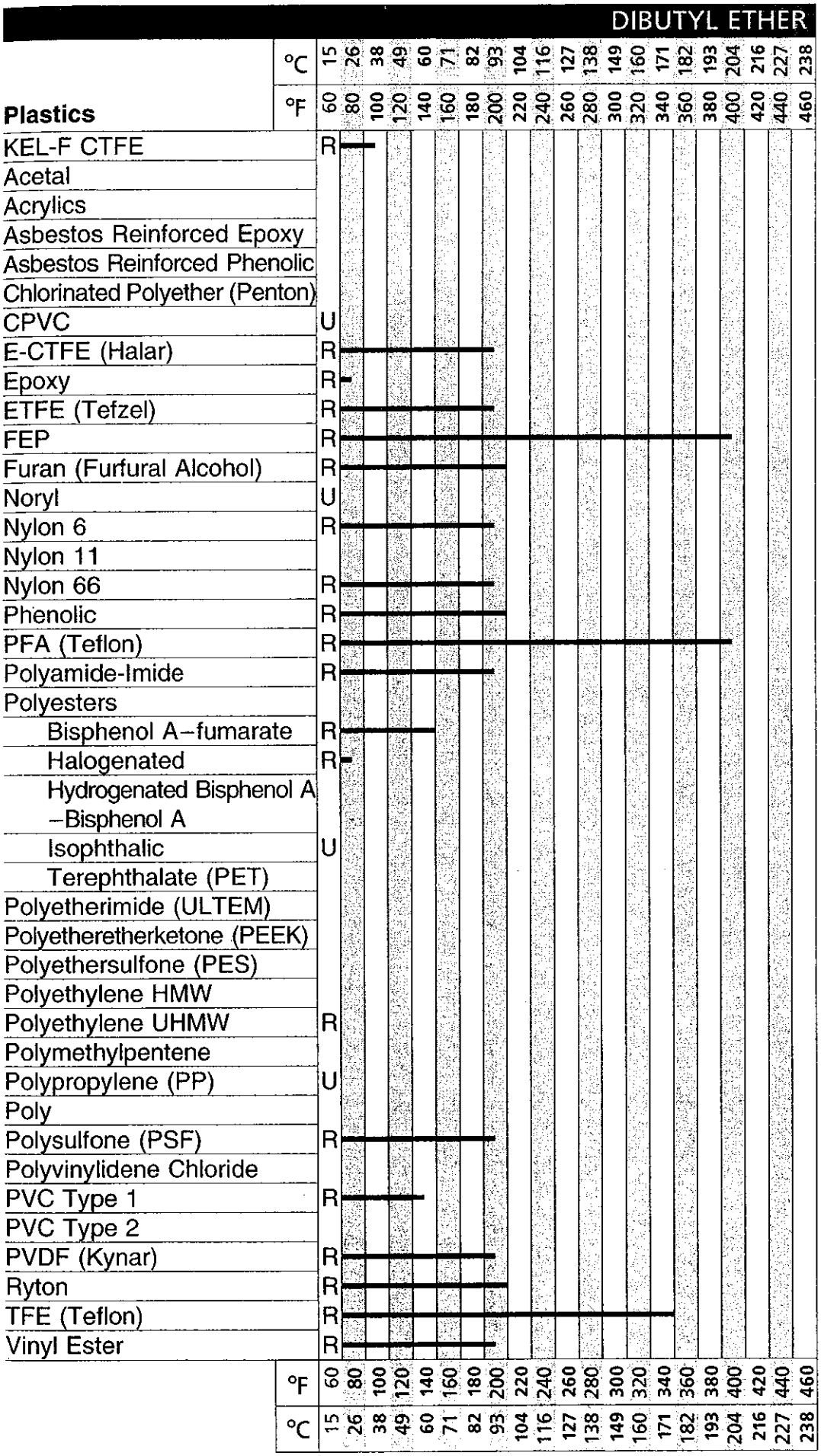
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DIBUTYL ETHER

Nonmetallic Materials	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
Borosilicate Glass																					
Carbon																					
Carbon-Graphite Resin Impregnated																					
Ceramics																					
Coatings																					
Acrylic																					
Asphalt																					
Chlorinated Rubber																					
Coal Tar																					
Coal Tar Epoxy	U																				
Epoxy General Purpose	R																				
Epoxy Chemical Resistant																					
Epoxy Polyamide	U																				
Oil Base (Alkyd, Epoxy, Urethane)																					
Phenolic																					
Polyester	R	—																			
Polyvinyl Chloride	R	—																			
Silicones	U																				
Urethanes																					
Vinyls	R	—																			
Water Base																					
Zinc Rich																					
Mortars																					
Silicate																					
Sodium Silicate	R																				
Potassium Silicate																					
Silica																					
Sulfur	U																				
Furan Resin	R															—					
Polyester	U																				
Epoxy	U																				
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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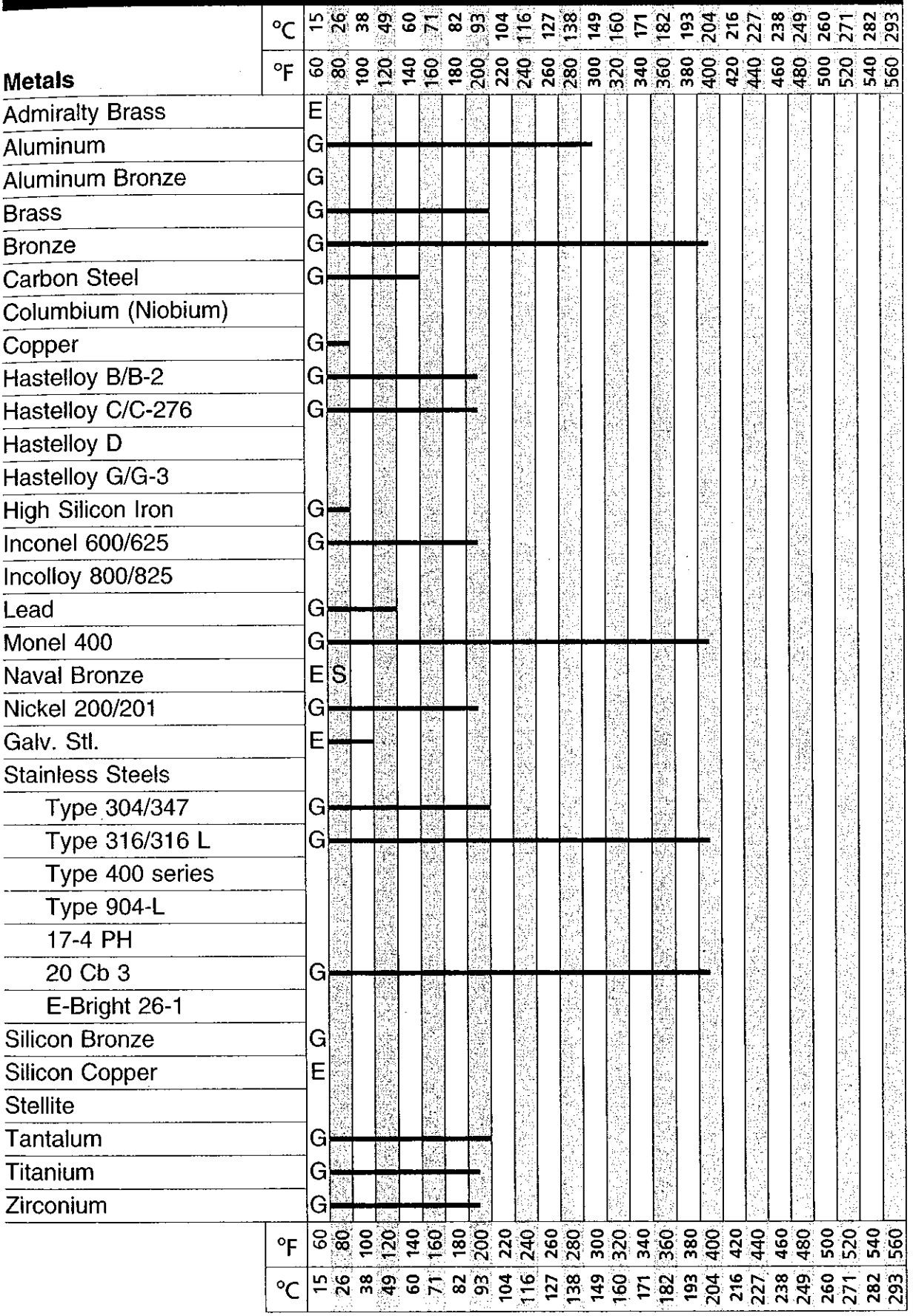
DIBUTYL ETHER

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)	R																				
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	U																				
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)	U																				
Ethylene-Propylene Terpolymer (EPT)	U																				
FKM (Viton A)	U																				
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)																					
Kalrez (FPM)	R																				
Koroseal																					
Natural Rubber (GRS)																					
Neoprene GR-M (CR)	U																				
Nitrile Buna-N (NBR)	U																				
Nordel (EPDM)																					
Polybutadiene (BR)																					
Polyester (PE)																					
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers	U																				
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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DIBUTYL PHTHALATE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

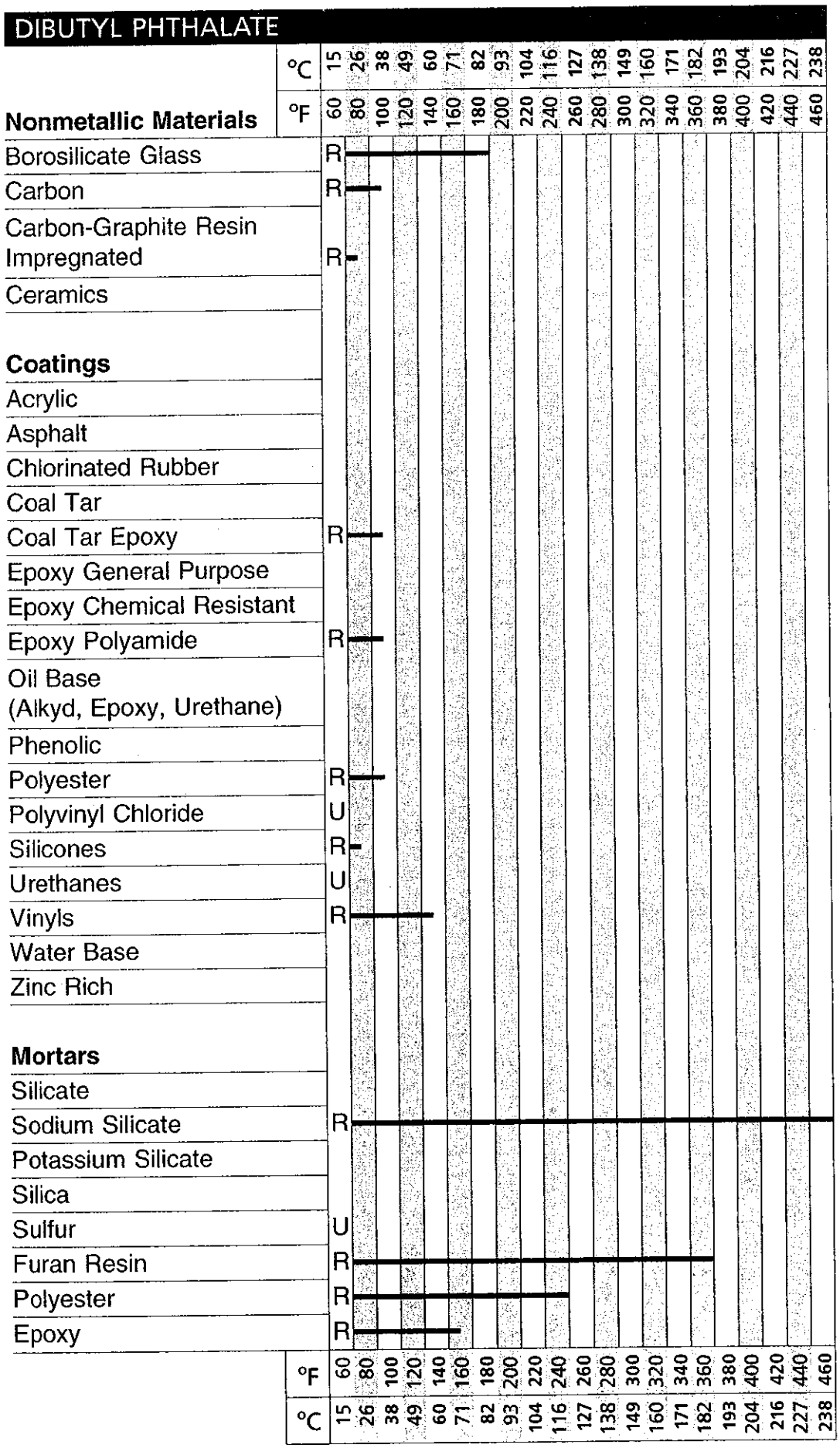
R = Resistant

U = Unsatisfactory

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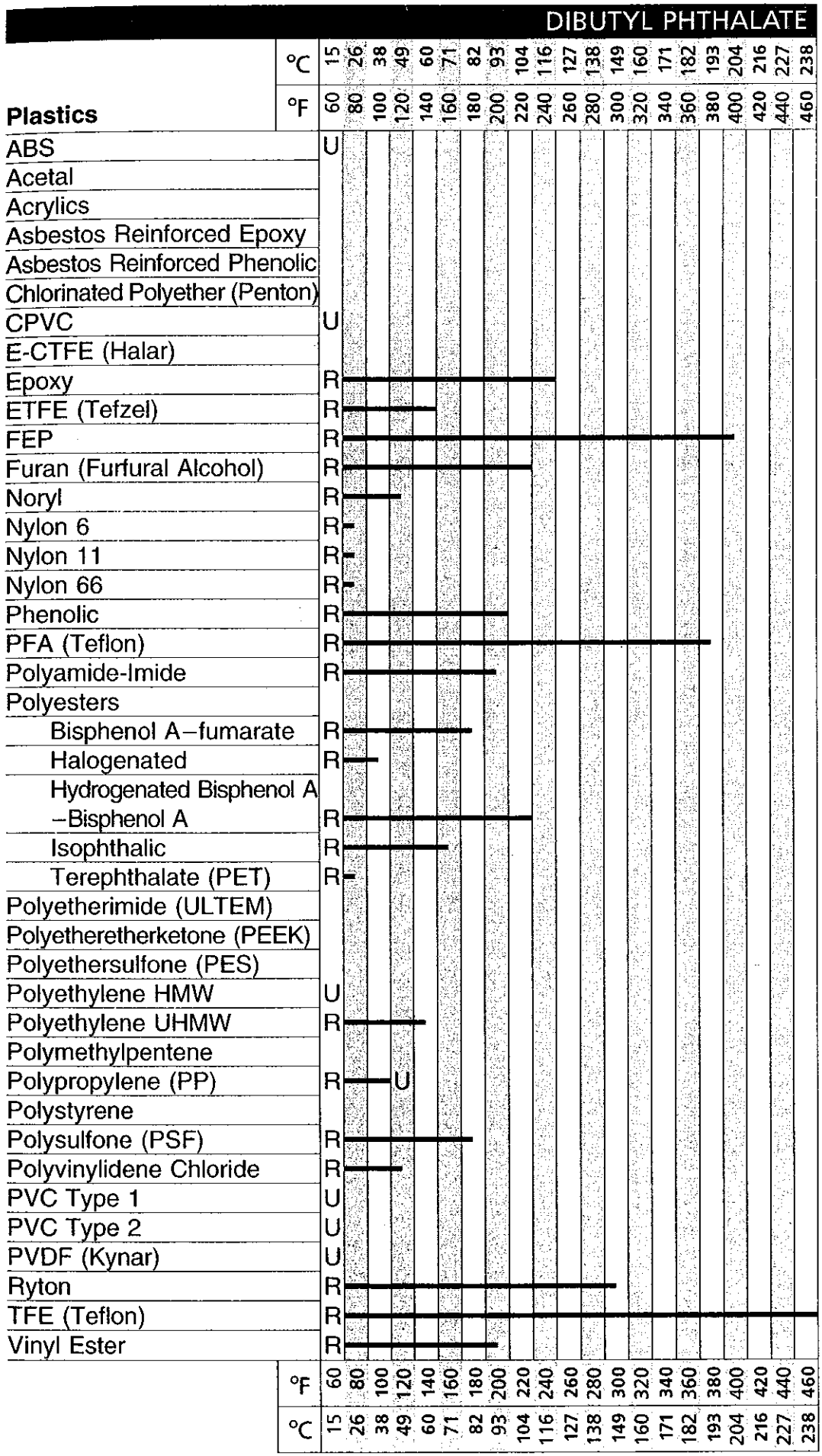
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DIBUTYL PHTHALATE



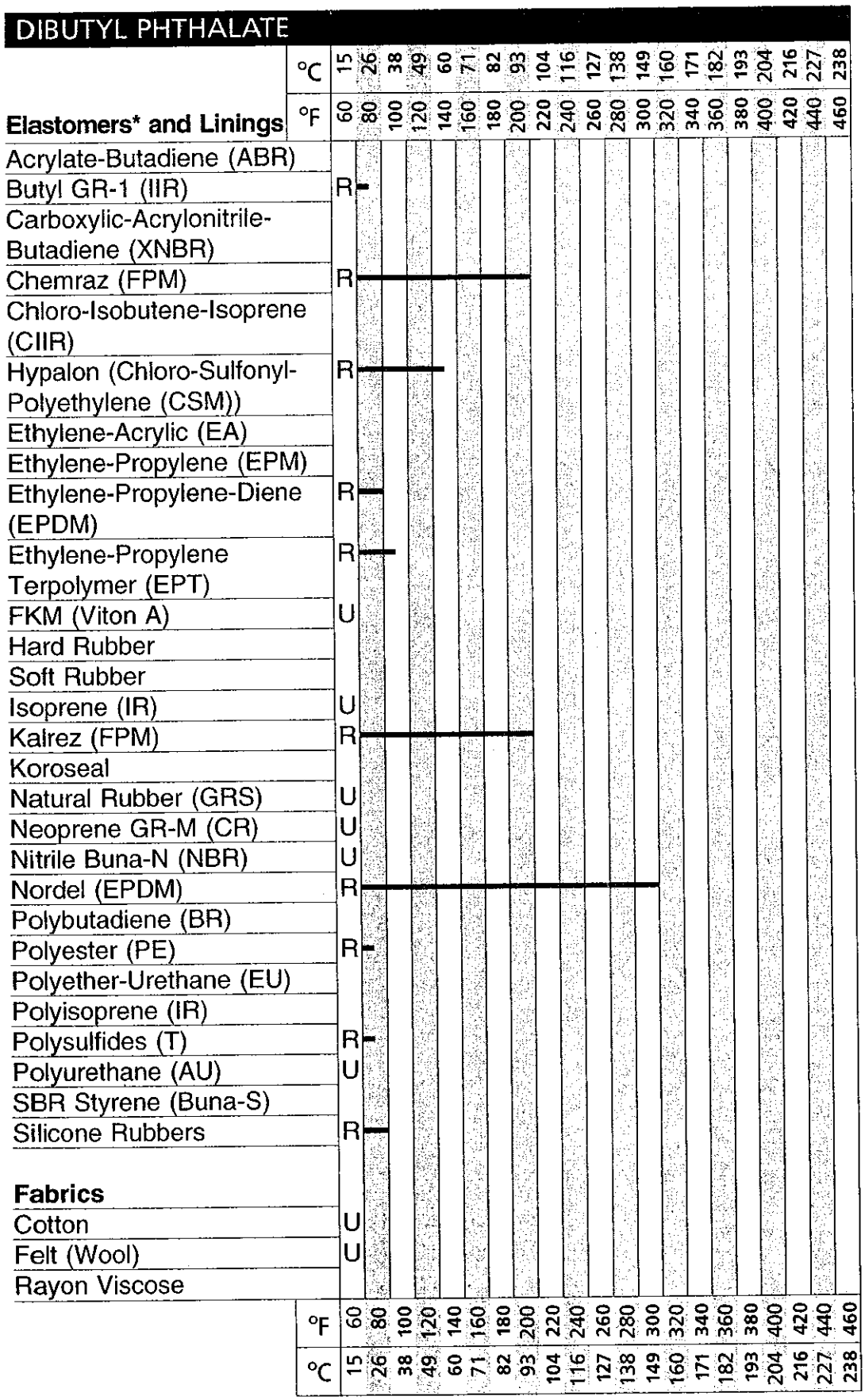
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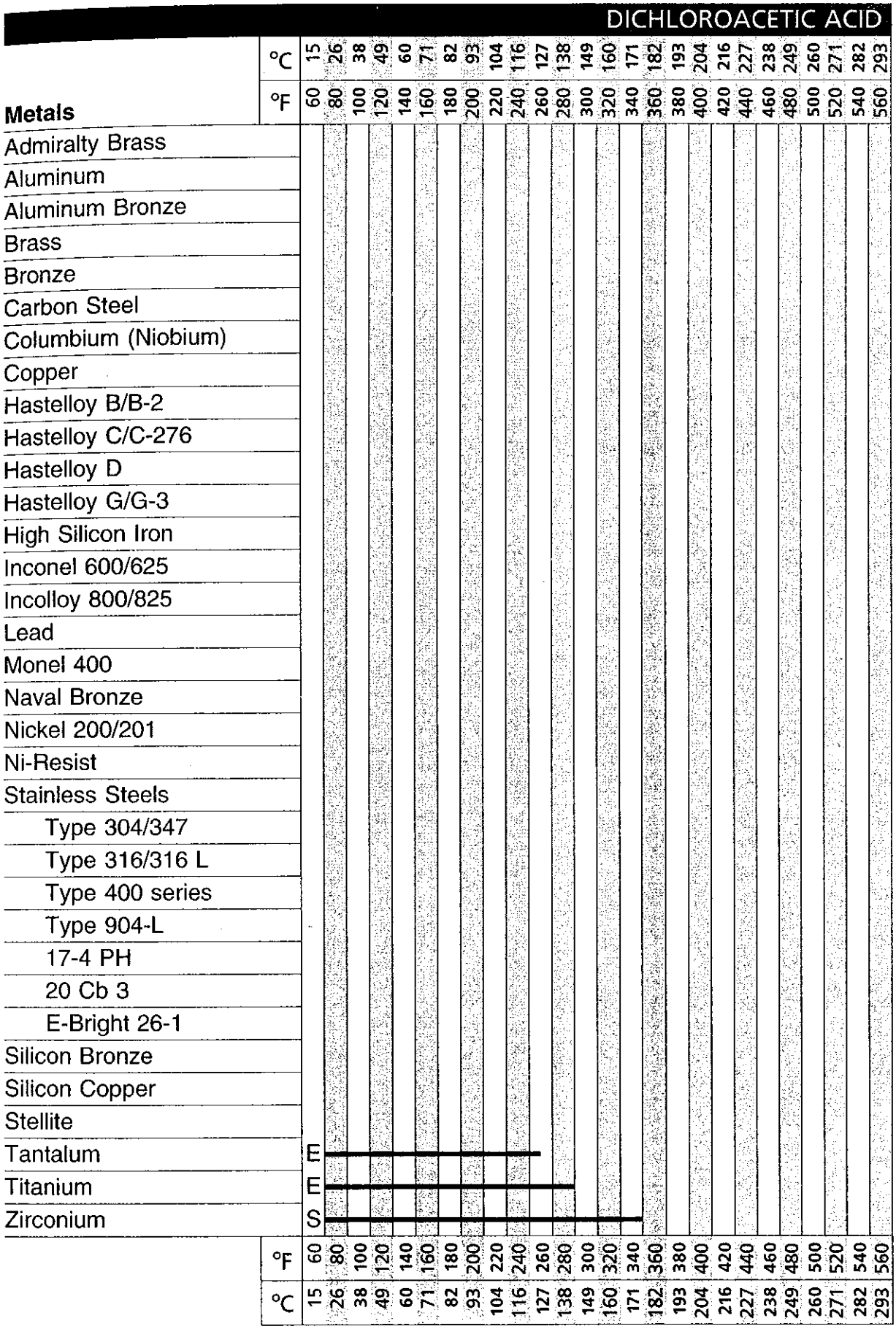
DIBUTYL PHTHALATE



*See also Nylon 11 under PLASTICS

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DICHLOROACETIC ACID



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

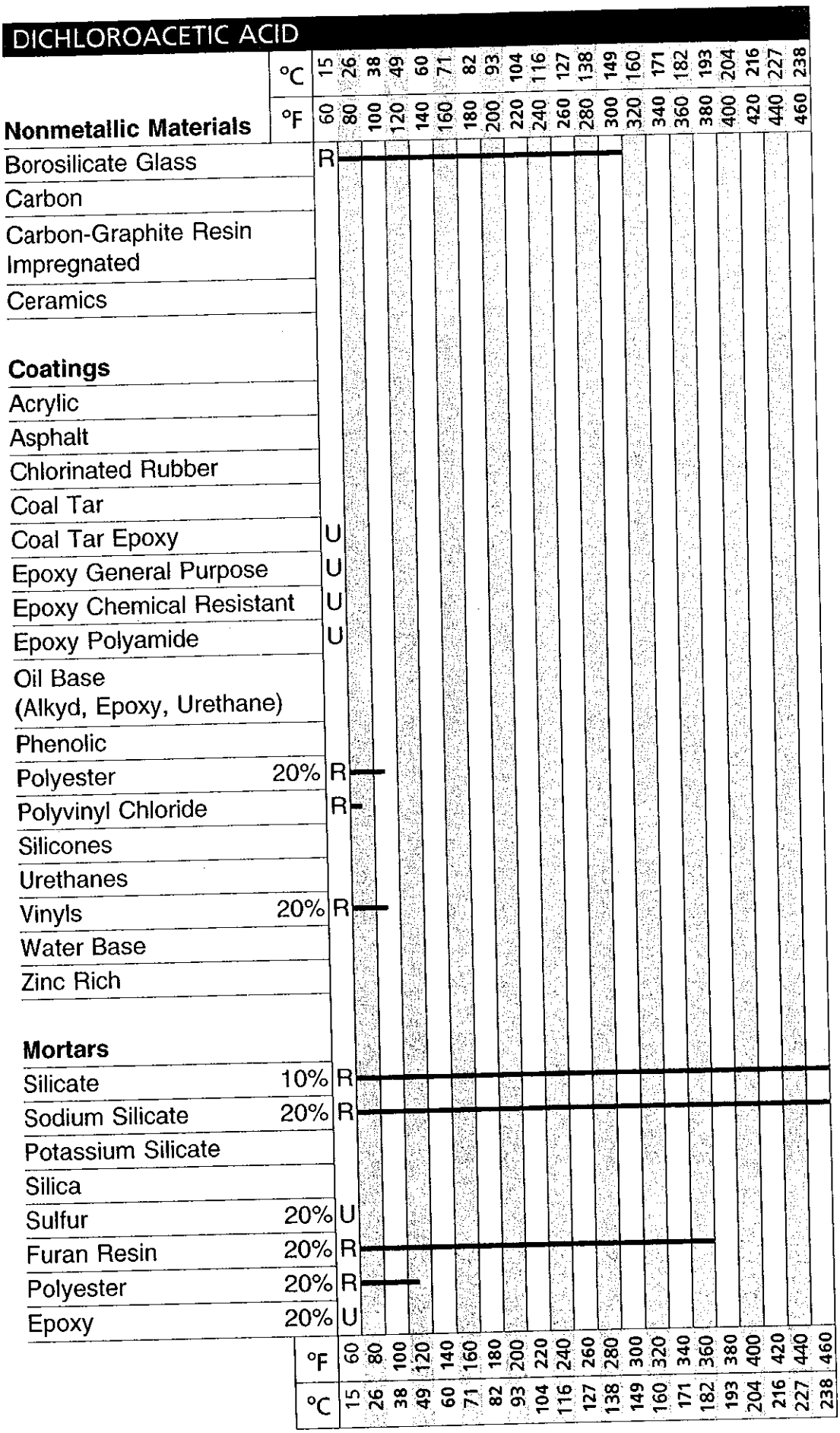
R = Resistant

U = Unsatisfactory

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DICHLOROACETIC ACID



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DICHLOROACETIC ACID

Plastics		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS			U																				
Acetal																							
Acrylics																							
Asbestos Reinforced Epoxy																							
Asbestos Reinforced Phenolic																							
Chlorinated Polyether (Penton)																							
CPVC	20%		R																				
E-CTFE (Halar)																							
Epoxy			U																				
ETFE (Tefzel)			R																				
FEP			R																				
Furan (Furfural Alcohol)			U																				
Noryl																							
Nylon 6			U																				
Nylon 11																							
Nylon 66			U																				
Phenolic																							
PFA (Teflon)			R																				
Polyamide-Imide																							
Polyesters																							
Bisphenol A–fumarate			R																				
Halogenated			R																				
Hydrogenated Bisphenol A –Bisphenol A																							
Isophthalic			U																				
Terephthalate (PET)			R																				
Polyetherimide (ULTEM)																							
Polyetheretherketone (PEEK)																							
Polyethersulfone (PES)																							
Polyethylene HMW																							
Polyethylene UHMW			R																				
Polymethylpentene																							
Polypropylene (PP)			R																				
Polystyrene																							
Polysulfone																							
Polyvinylidene Chloride			R																				
PVC Type 1			R																				
PVC Type 2			R																				
PVDF (Kynar)			R																				
Ryton																							
TFE (Teflon)			R																				
Vinyl Ester			R																				
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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DICHLOROACETIC ACID

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)	R																				
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																					
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)																					
Ethylene-Propylene Terpolymer (EPT)																					
FKM (Viton A)																					
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)																					
Kalrez (FPM)	R																				
Koroseal	U																				
Natural Rubber (GRS)																					
Neoprene GR-M (CR)	U																				
Nitrile Buna-N (NBR)																					
Nordel (EPDM)																					
Polybutadiene (BR)																					
Polyester (PE)																					
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers																					
Fabrics																					
Cotton	U																				
Felt (Wool)	U																				
Rayon Viscose																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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DICHLOROBENZENE

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum		G																									
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel		G																									
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2		E																									
Hastelloy C/C-276		E																									
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347		G																									
Type 316/316 L		G																									
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

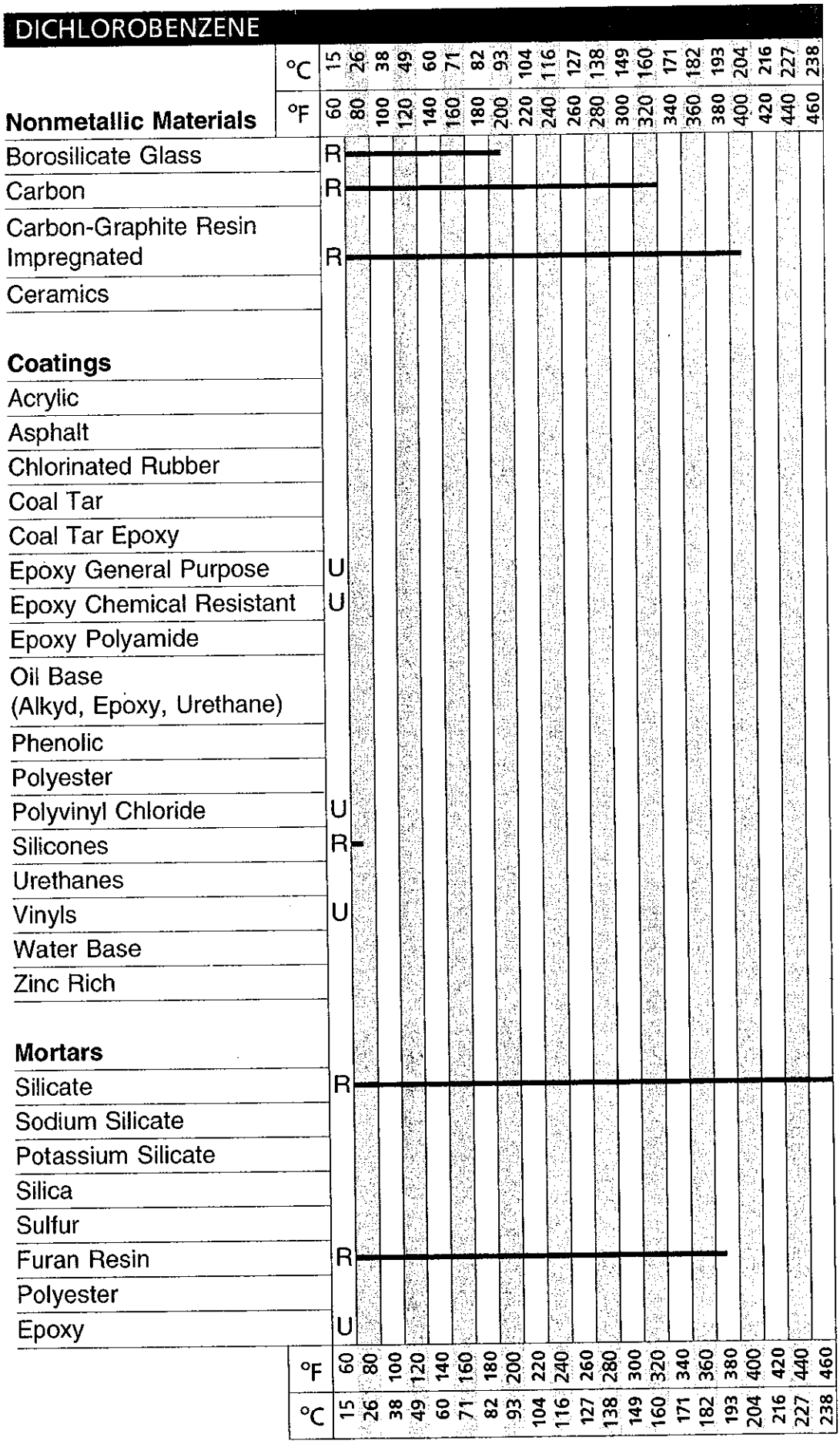
R = Resistant

U = Unsatisfactory

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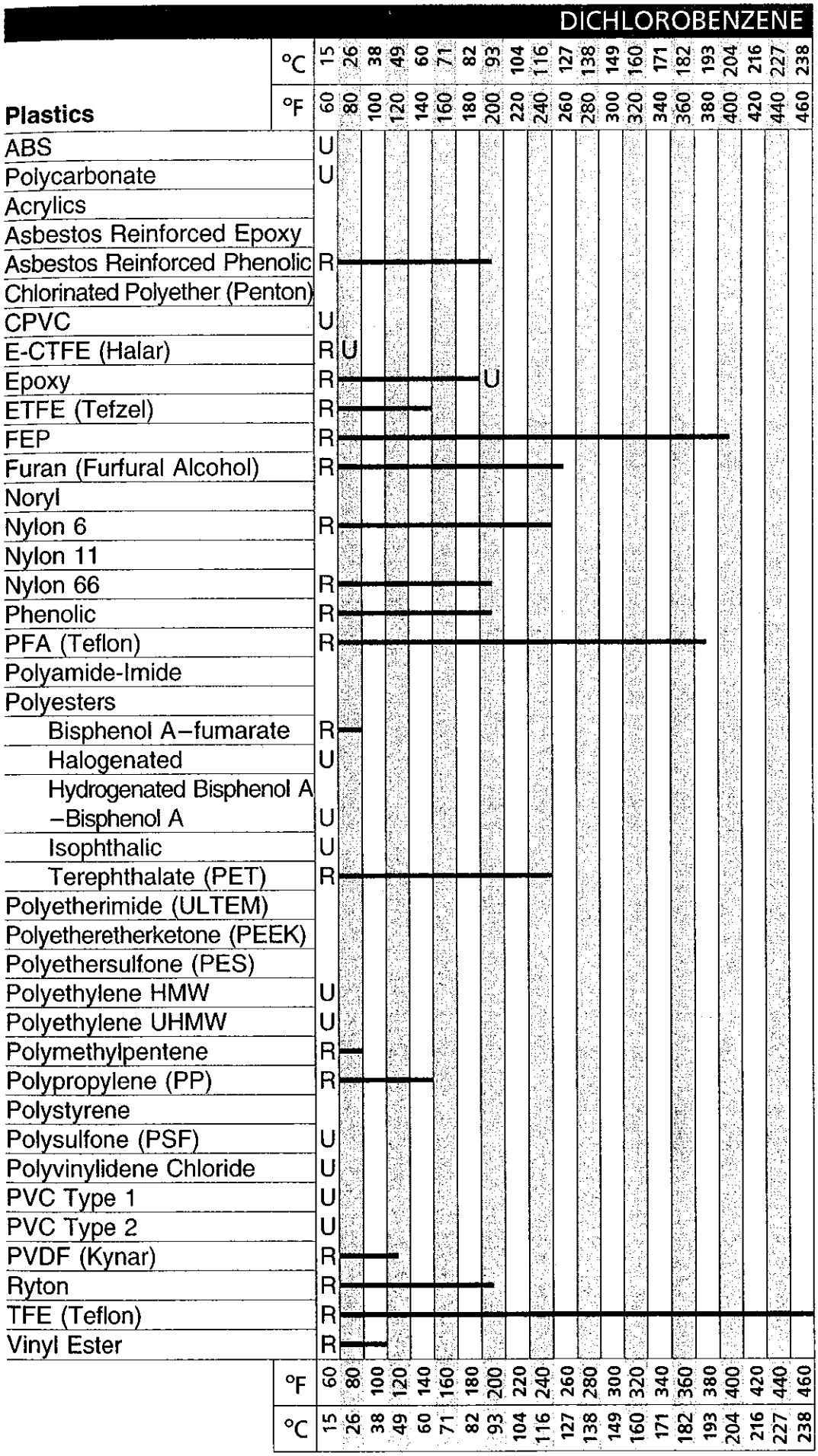
DICHLOROBENZENE



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DICHLOROBENZENE



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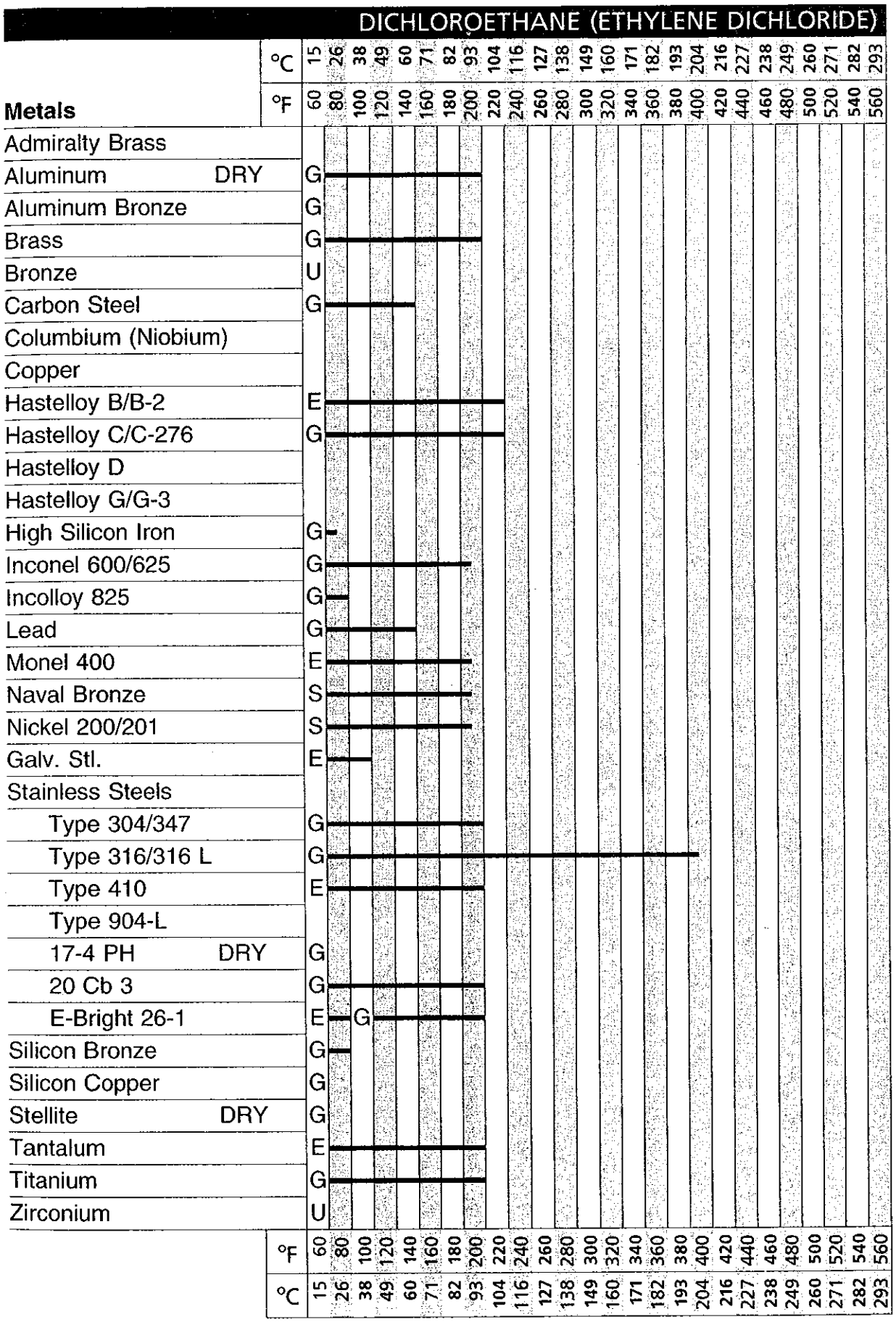
DICHLOROBENZENE

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)	R																				
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	U																				
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)	U																				
Ethylene-Propylene Terpolymer (EPT)	U																				
FKM (Viton A)	R																				
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)	U																				
Kalrez (FPM)	R																				
Koroseal																					
Natural Rubber (GRS)	U																				
Neoprene GR-M (CR)	U																				
Nitrile Buna-N (NBR)	U																				
Nordel (EPDM)	U																				
Polybutadiene (BR)																					
Polyester (PE)																					
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Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers	R																				
Fabrics																					
Cotton	U																				
Felt (Wool)	U																				
Rayon Viscose																					
°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	
°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	

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DICHLOROETHANE (ETHYLENE DICHLORIDE)



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

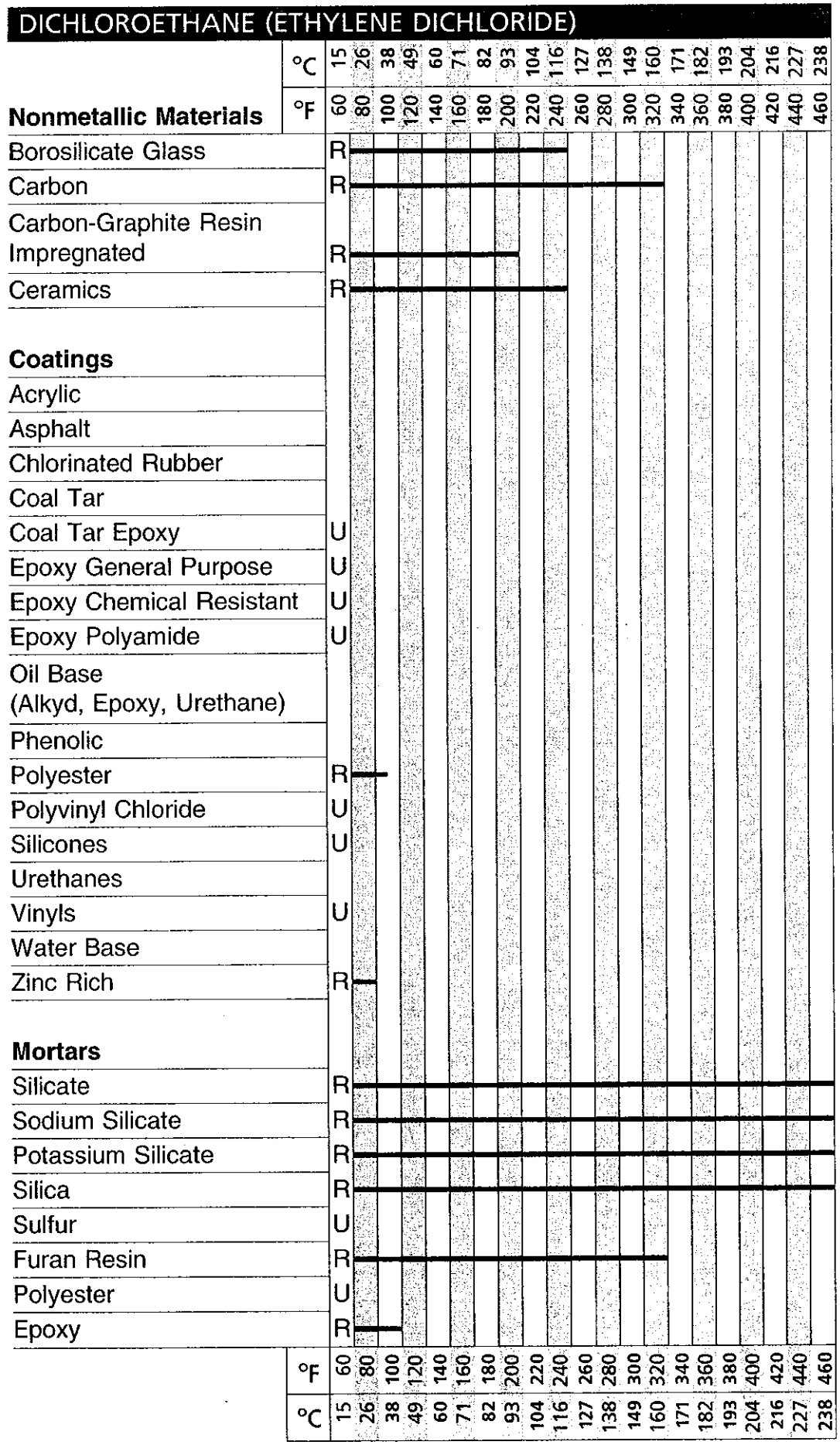
R = Resistant

U = Unsatisfactory

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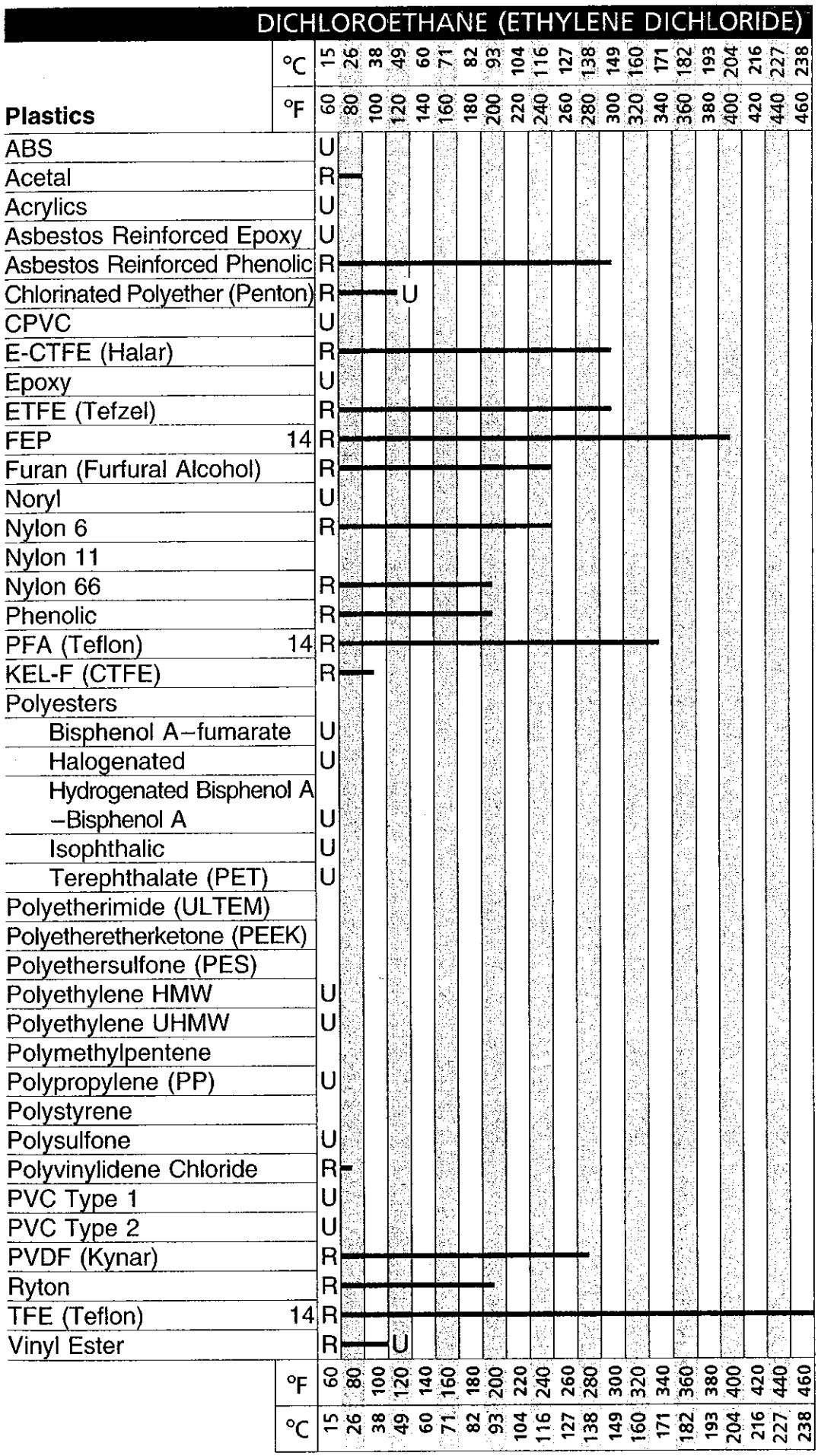
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DICHLOROETHANE (ETHYLENE DICHLORIDE)



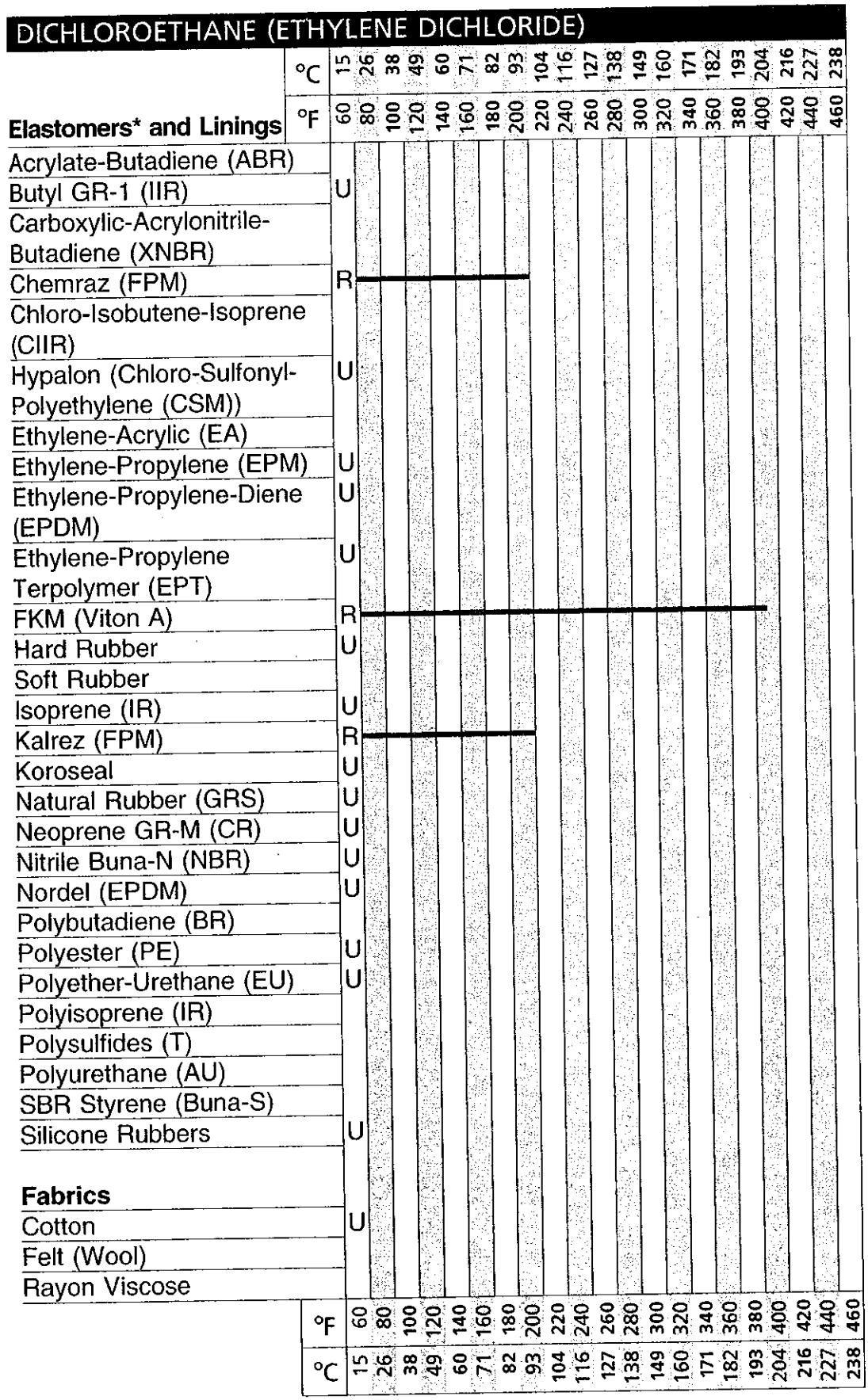
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DICHLOROETHANE (ETHYLENE DICHLORIDE)



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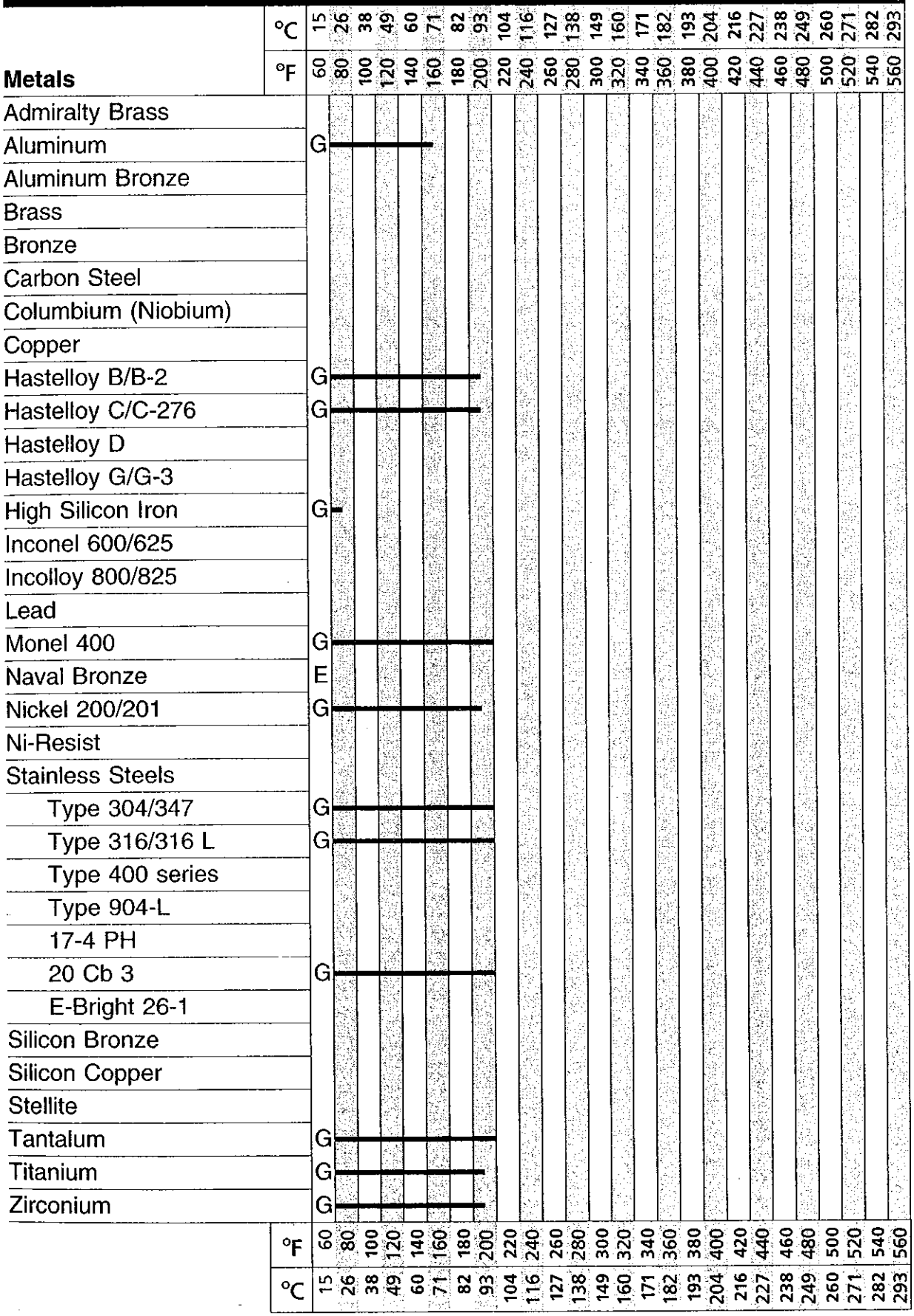
DICHLOROETHANE (ETHYLENE DICHLORIDE)



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

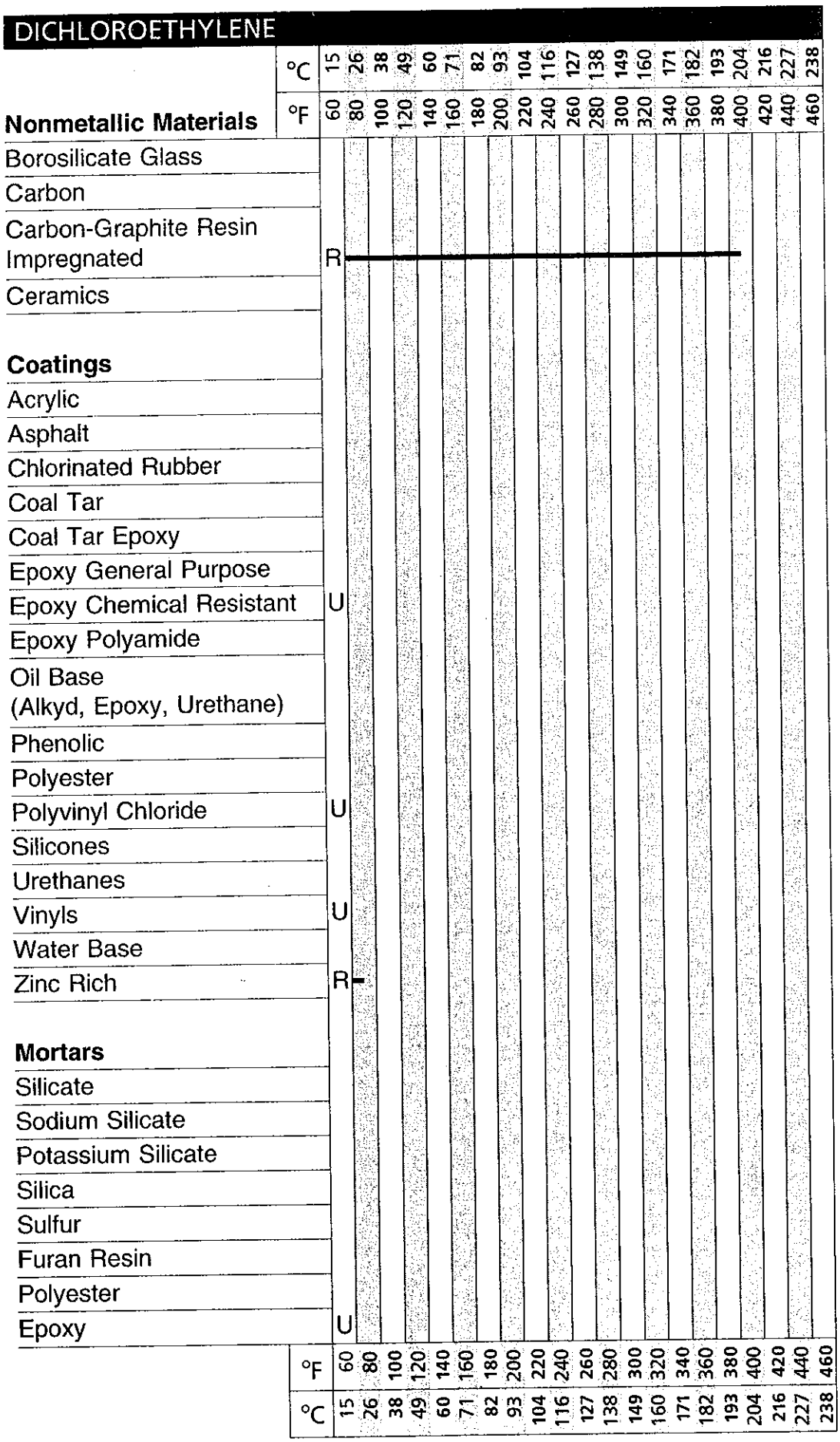
R = Resistant

U = Unsatisfactory

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DICHLOROETHYLENE



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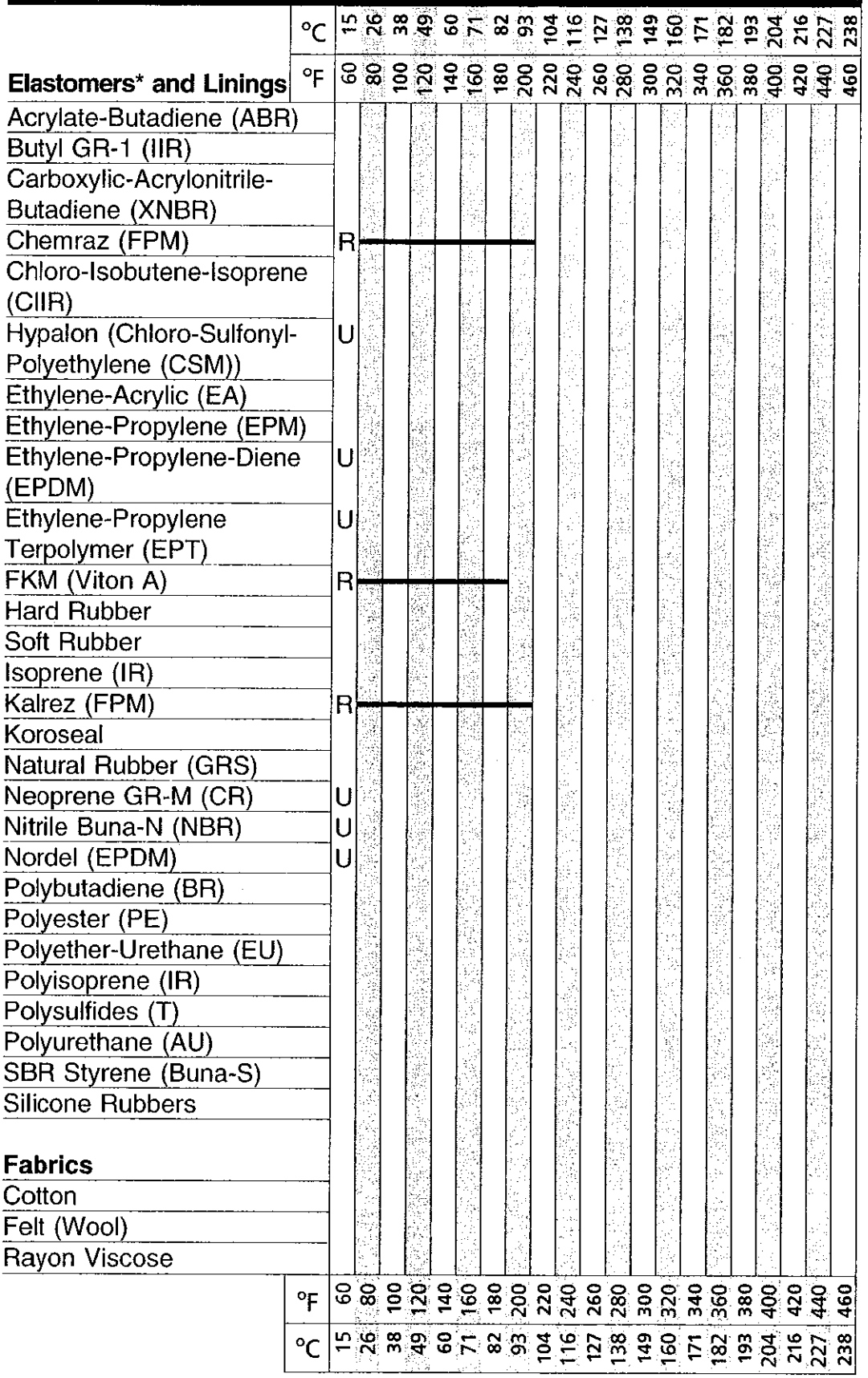
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DICHLOROETHYLENE

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS		U																				
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC		U																				
E-CTFE (Halar)		R	U																			
Epoxy		R	U																			
ETFE (Tefzel)		R	—	—	—	—																
FEP		R	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
Furan (Furfural Alcohol)																						
Noryl		U																				
Nylon 6		R	—																			
Nylon 11		R	—																			
Nylon 66		R	—																			
Phenolic																						
PFA (Teflon)		R	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate		U																				
Halogenated		U																				
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic		U																				
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)		U																				
Polyethylene HMW																						
Polyethylene UHMW		U																				
Polymethylpentene																						
Polypropylene (PP)		R	—	—	—	—	—	—														
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1		U																				
PVC Type 2		U																				
PVDF (Kynar)		R	—	—	—	—	—	—	—	—												
Ryton		R	—	—	—	—	—	—	—													
TFE (Teflon)		R	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vinyl Ester		U																				
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

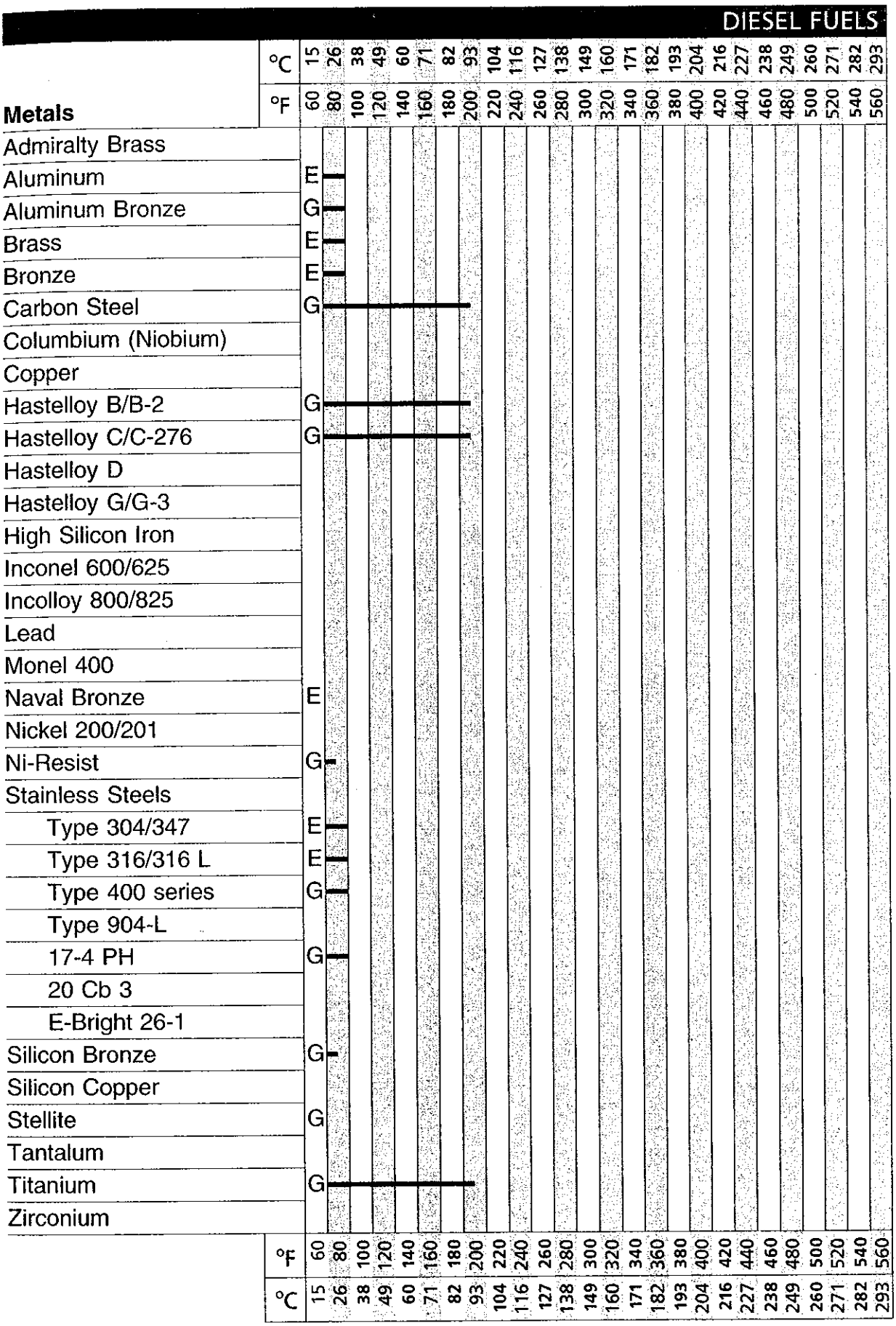
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DICHLOROETHYLENE



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

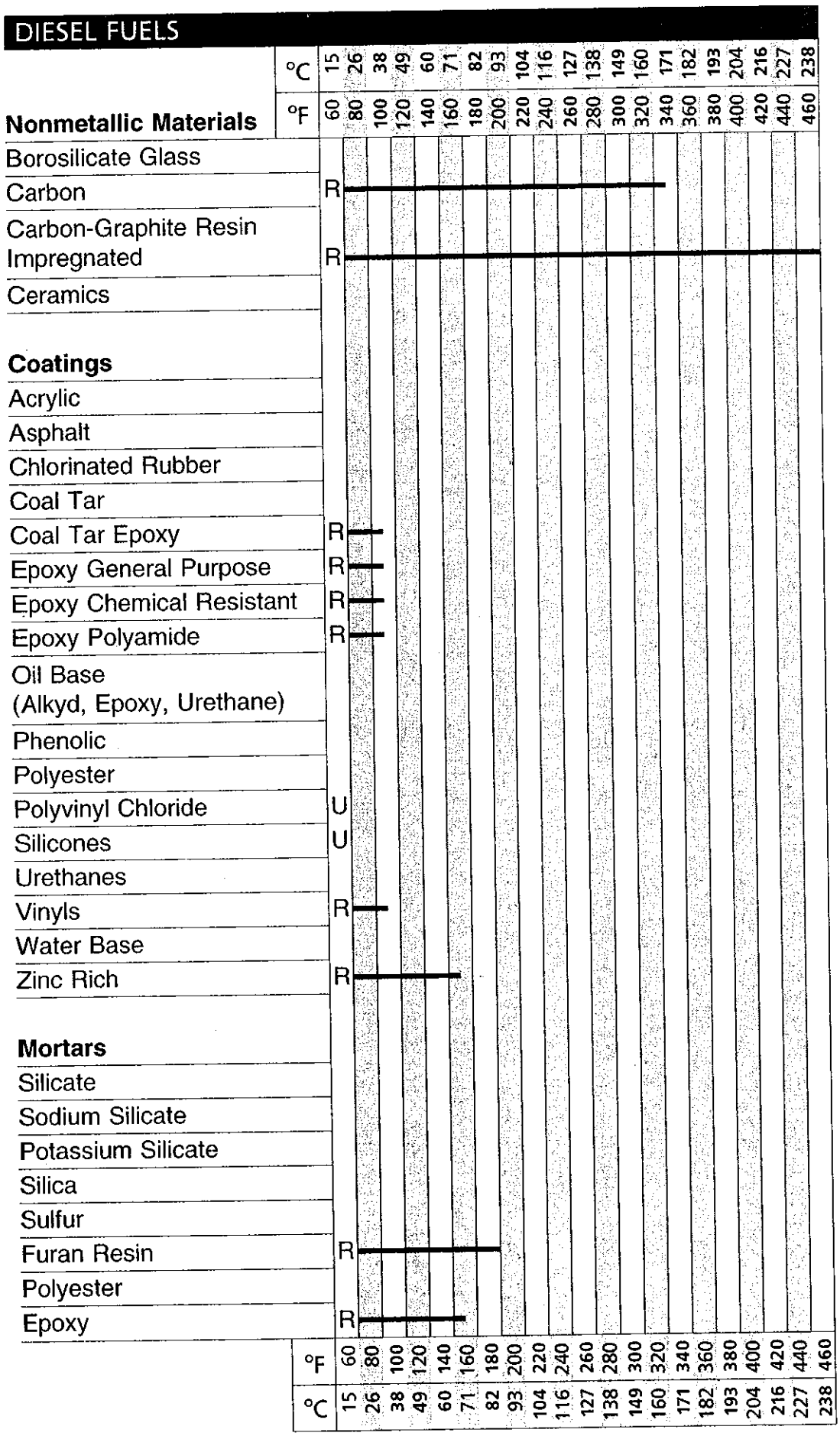
R = Resistant

U = Unsatisfactory

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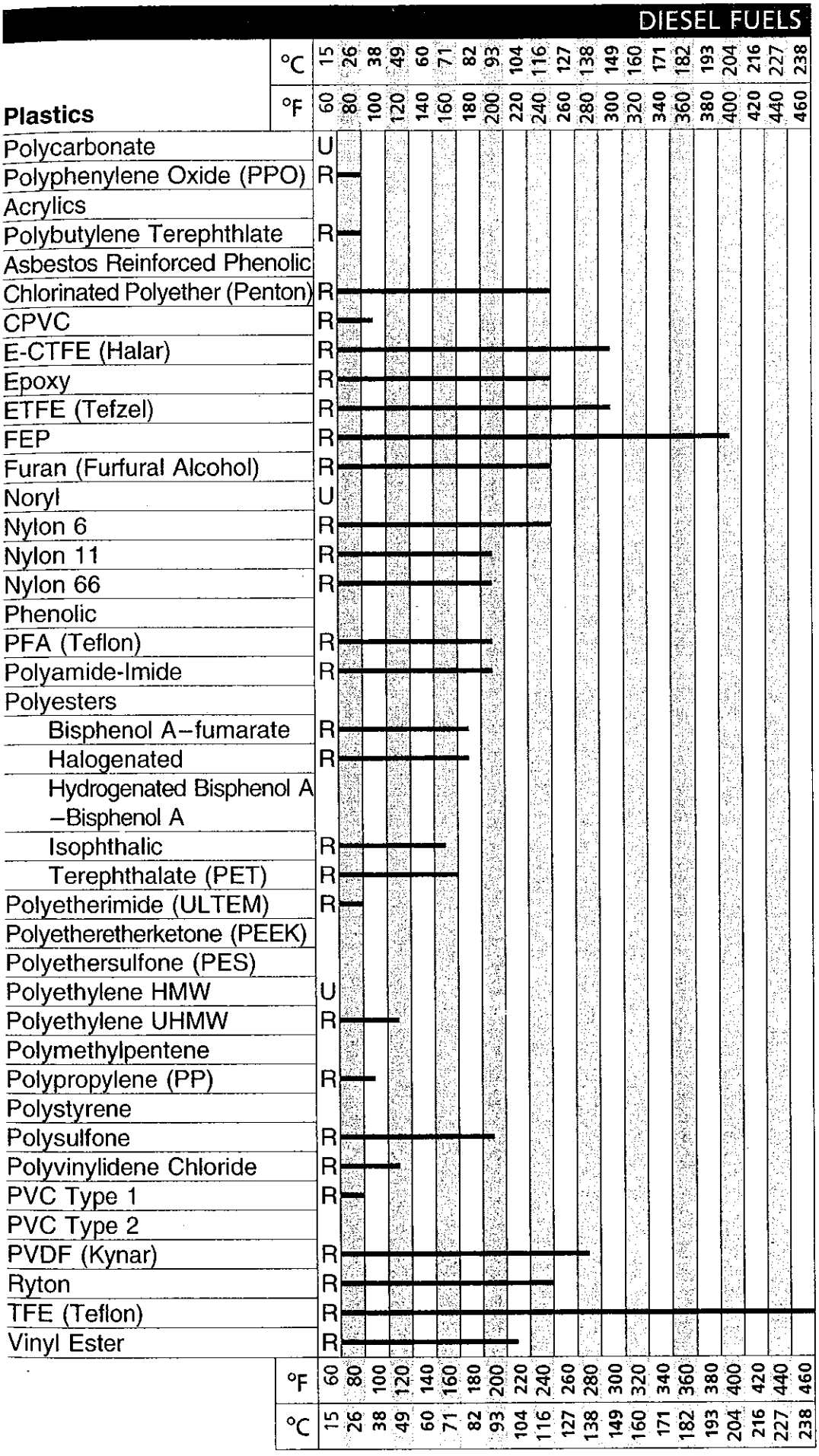
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DIESEL FUELS



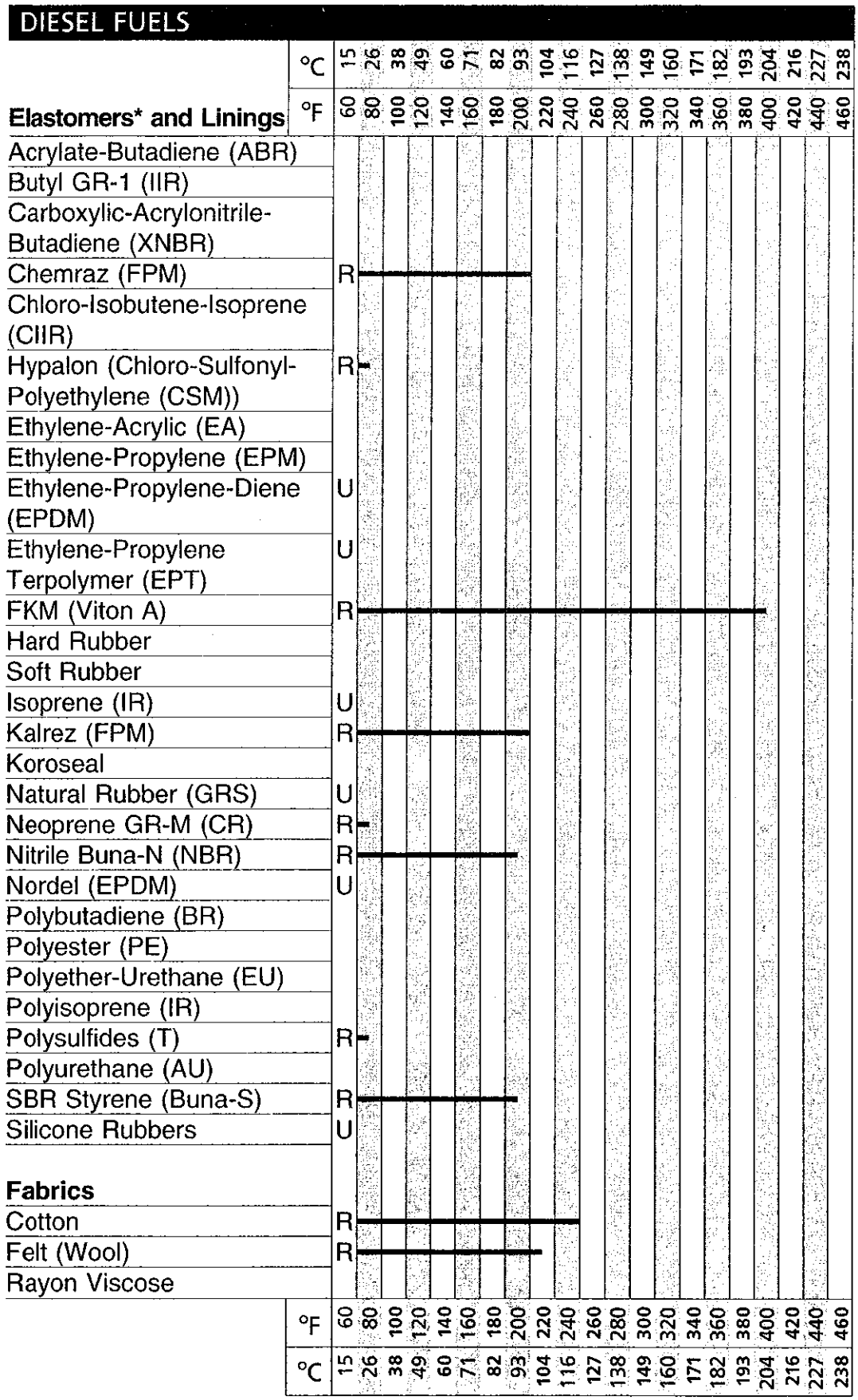
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DIESEL FUELS



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DIETHANOLAMINE

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass		G																									
Aluminum		E																									
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel		E																									
Columbium (Niobium)																											
Copper		G																									
Hastelloy B/B-2		E																									
Hastelloy C/C-276		E																									
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625		E																									
Incolloy 800/825																											
Galv. Stl.		U																									
Monel 400		E																									
Naval Bronze		G																									
Nickel 200/201		E																									
Ni-Resist	15%	E																									
Stainless Steels																											
Type 304/347		E																									
Type 316/316 L		E																									
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3		E																									
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper		G																									
Stellite																											
Tantalum		E																									
Titanium		E																									
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

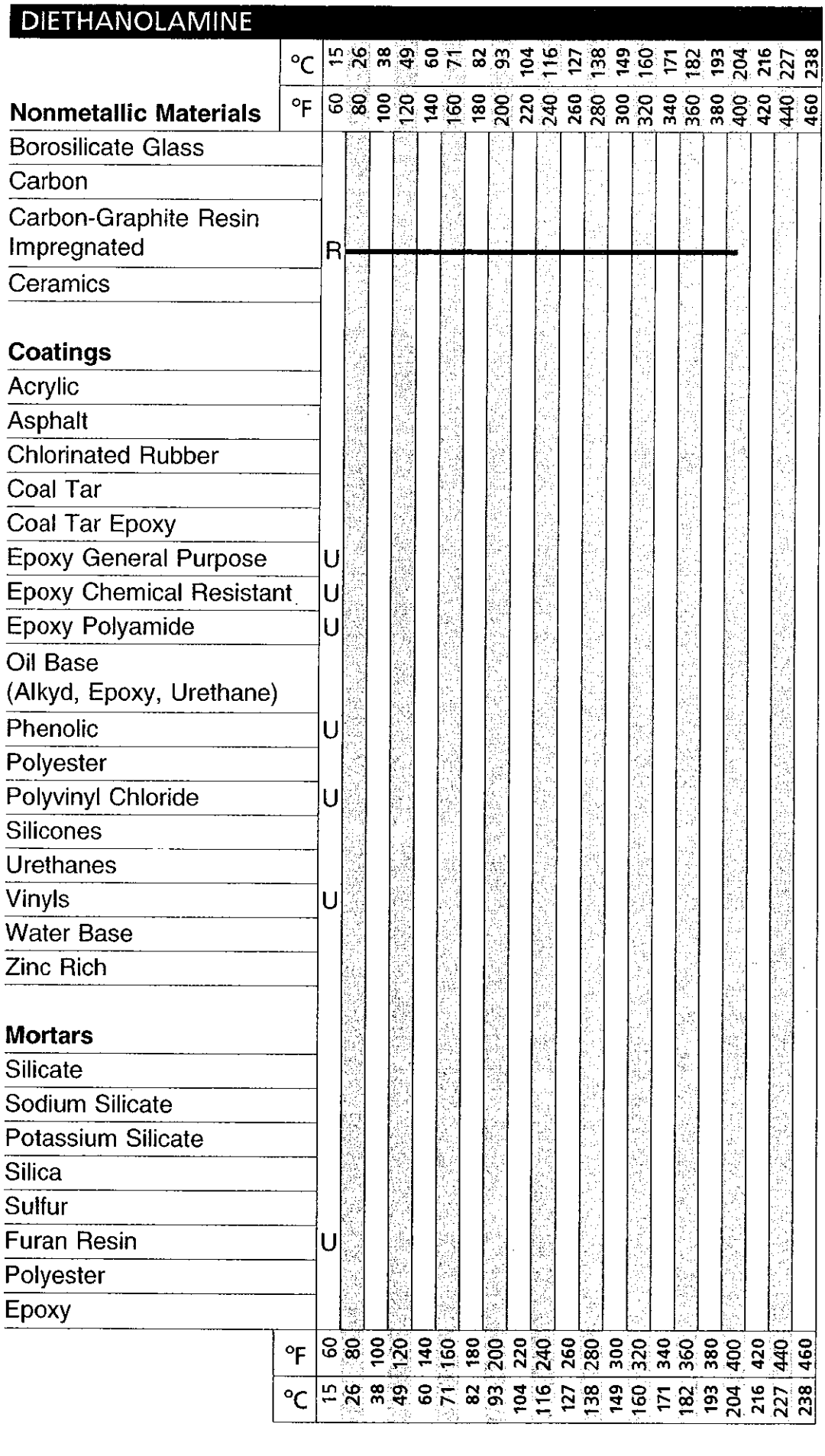
R = Resistant

U = Unsatisfactory

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DIETHANOLAMINE



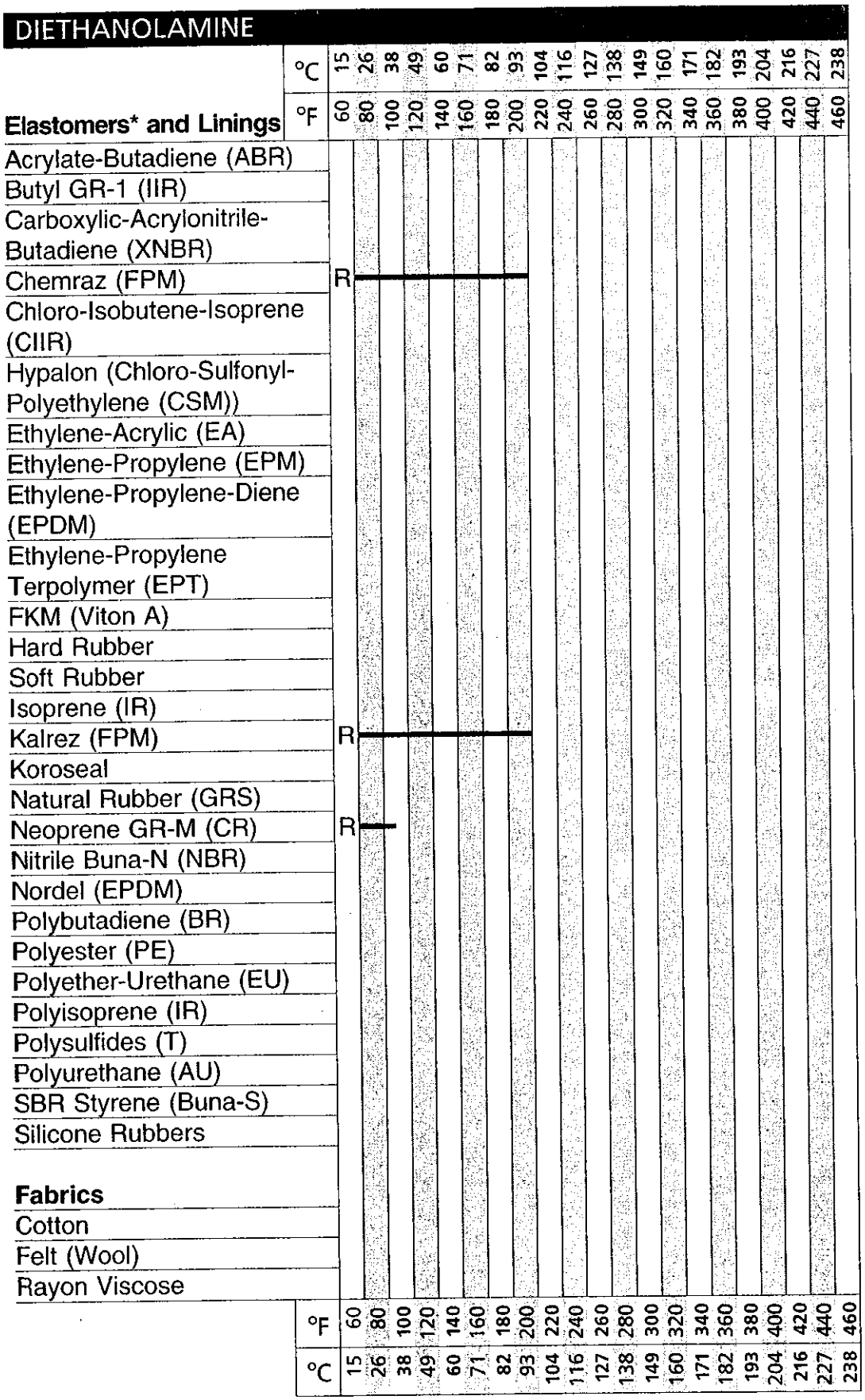
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DIETHANOLAMINE

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC	U																					
E-CTFE (Halar)	R	U																				
Epoxy	U																					
ETFE (Tefzel)																						
FEP	R																					
Furan (Furfural Alcohol)	U																					
Noryl	R																					
Nylon 6	R																					
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Nylon 66	R																					
Phenolic	U																					
PFA (Teflon)	R																					
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate	R																					
Halogenated	R																					
Hydrogenated Bisphenol A –Bisphenol A																						
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Terephthalate (PET)	R																					
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)	R																					
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride	U																					
PVC Type 1	U																					
PVC Type 2	U																					
PVDF (Kynar)	U																					
Ryton																						
TFE (Teflon)	R																					
Vinyl Ester	R																					
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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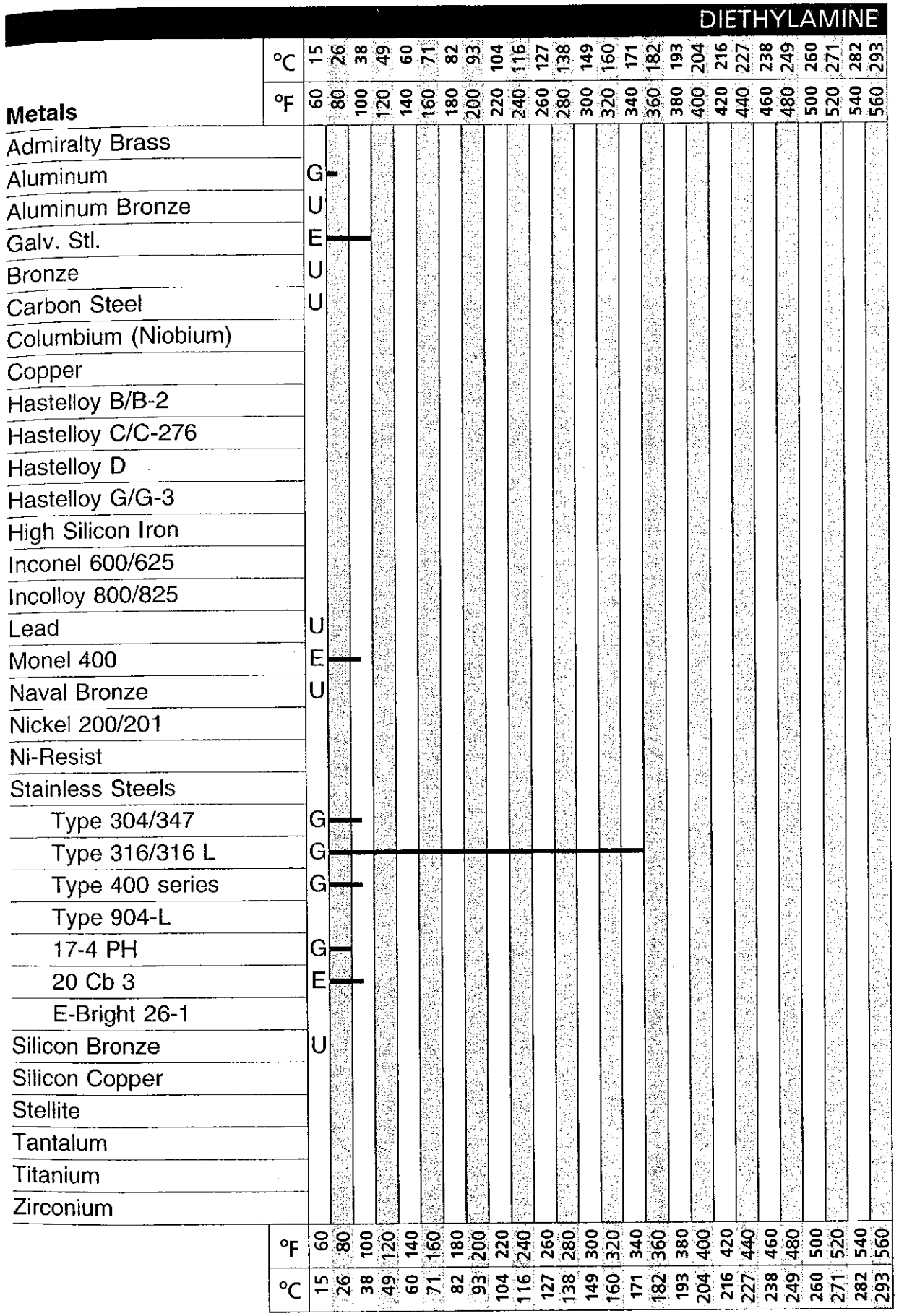
DIETHANOLAMINE



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DIETHYLAMINE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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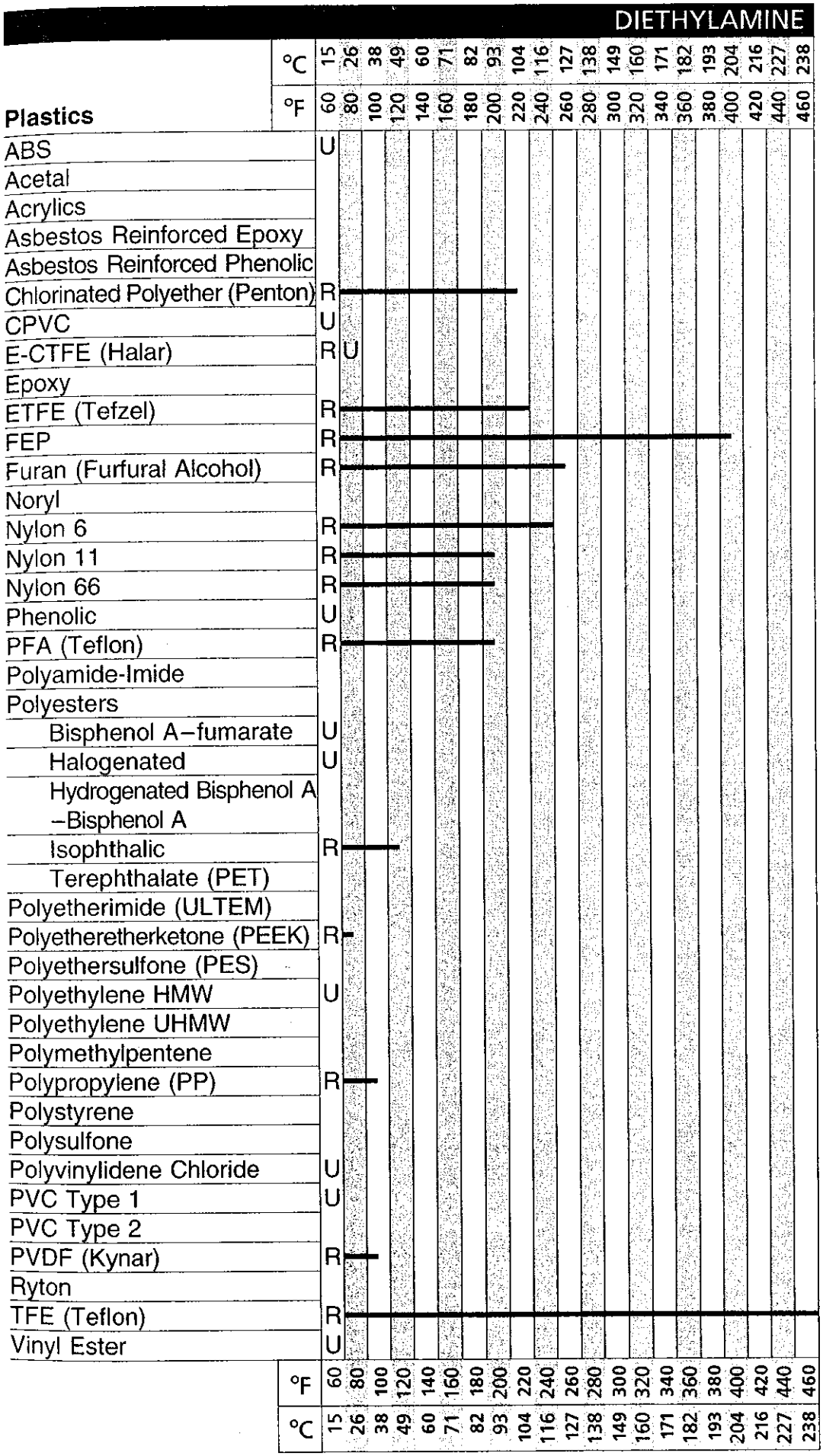
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DIETHYLAMINE

Nonmetallic Materials	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass	R																				
Carbon	R																				
Carbon-Graphite Resin Impregnated	R																				
Ceramics																					
Coatings																					
Acrylic																					
Asphalt																					
Chlorinated Rubber																					
Coal Tar																					
Coal Tar Epoxy	U																				
Epoxy General Purpose	R																				
Epoxy Chemical Resistant	R																				
Epoxy Polyamide	U																				
Oil Base (Alkyd, Epoxy, Urethane)																					
Phenolic																					
Polyester	U																				
Polyvinyl Chloride	U																				
Silicones																					
Urethanes																					
Vinyls	U																				
Water Base																					
Zinc Rich																					
Mortars																					
Silicate																					
Sodium Silicate																					
Potassium Silicate	R																				
Silica	R																				
Sulfur	U																				
Furan Resin	R																				
Polyester	U																				
Epoxy	U																				
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

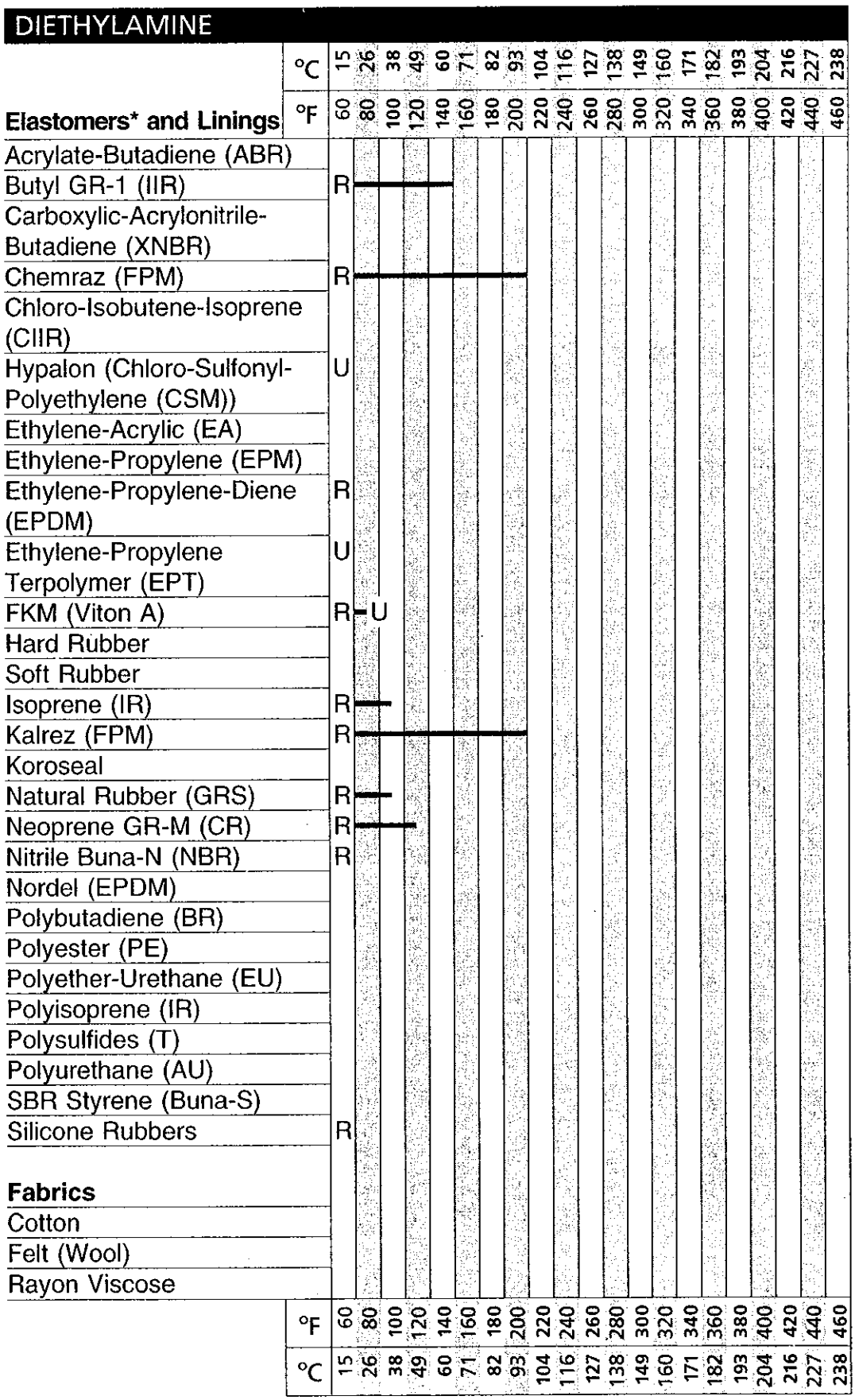
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DIETHYLAMINE



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DIETHYLAMINE



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Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L																											
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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DIETHYL BENZENE

Nonmetallic Materials	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																					
Carbon																					
Carbon-Graphite Resin Impregnated																					
Ceramics																					
Coatings																					
Acrylic																					
Asphalt																					
Chlorinated Rubber																					
Coal Tar																					
Coal Tar Epoxy																					
Epoxy General Purpose																					
Epoxy Chemical Resistant																					
Epoxy Polyamide																					
Oil Base (Alkyd, Epoxy, Urethane)																					
Phenolic																					
Polyester																					
Polyvinyl Chloride	U																				
Silicones	U																				
Urethanes																					
Vinyls	U																				
Water Base																					
Zinc Rich																					
Mortars																					
Silicate																					
Sodium Silicate																					
Potassium Silicate																					
Silica																					
Sulfur																					
Furan Resin																					
Polyester																					
Epoxy																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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DIETHYL BENZENE

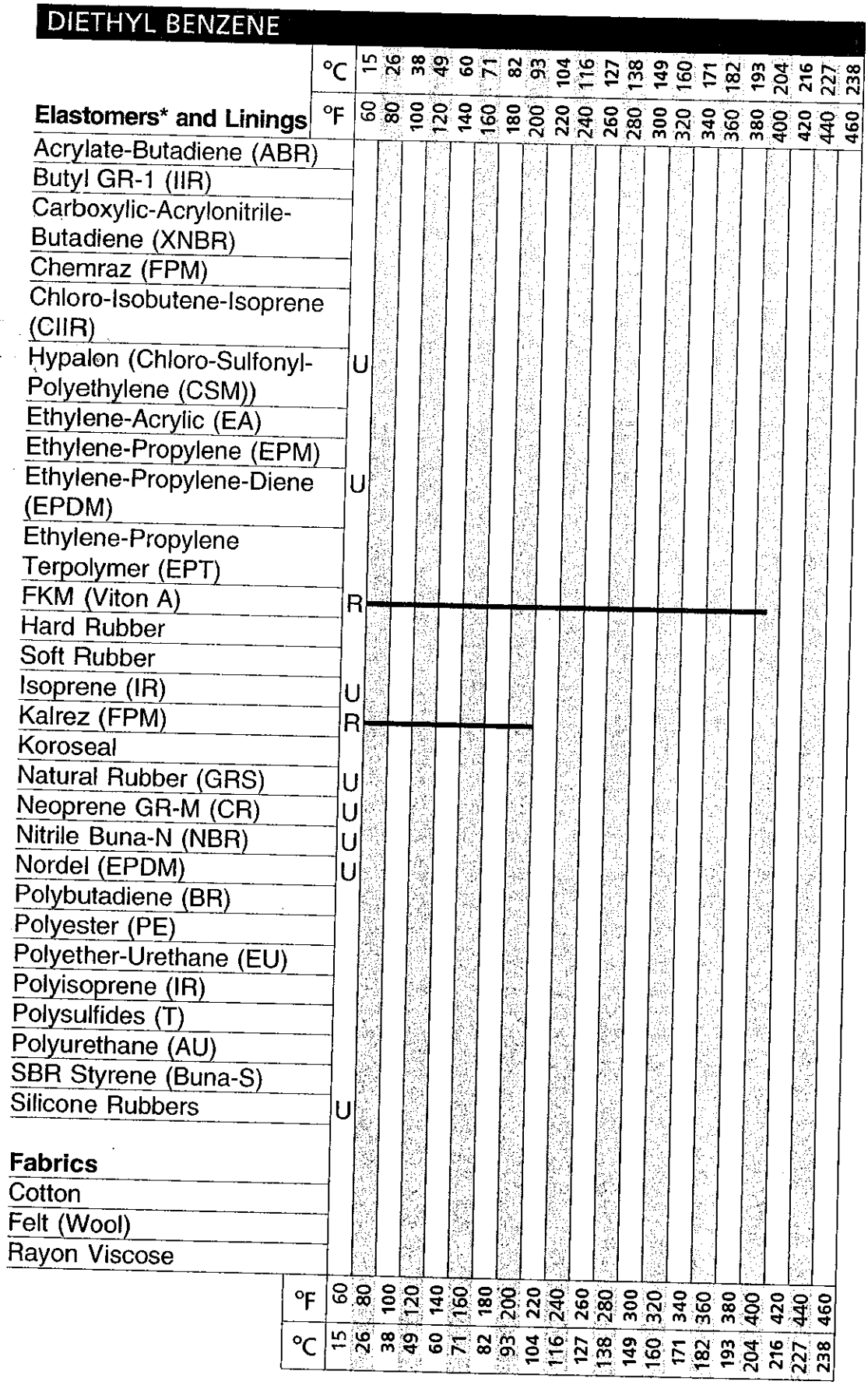
Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC	U	
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)	R	
FEP		
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	U	
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	U	
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)		
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1	U	
PVC Type 2	U	
PVDF (Kynar)		
Ryton		
TFE (Teflon)	R	
Vinyl Ester	R	

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460

کتابخانه

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DIETHYL BENZENE



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Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347	G	G	G	G	G	G	G	G	G																		
Type 316/316 L																											
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

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R = Resistant

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DIETHYL CELLOSOLVE

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon		R																				
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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DIETHYL CELLOSOLVE

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)	R																					
CPVC																						
E-CTFE (Halar)	R																					
Epoxy																						
ETFE (Tefzel)	R																					
FEP	R																					
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)	R																					
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)	R																					
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)	R																					
Ryton																						
TFE (Teflon)	R																					
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

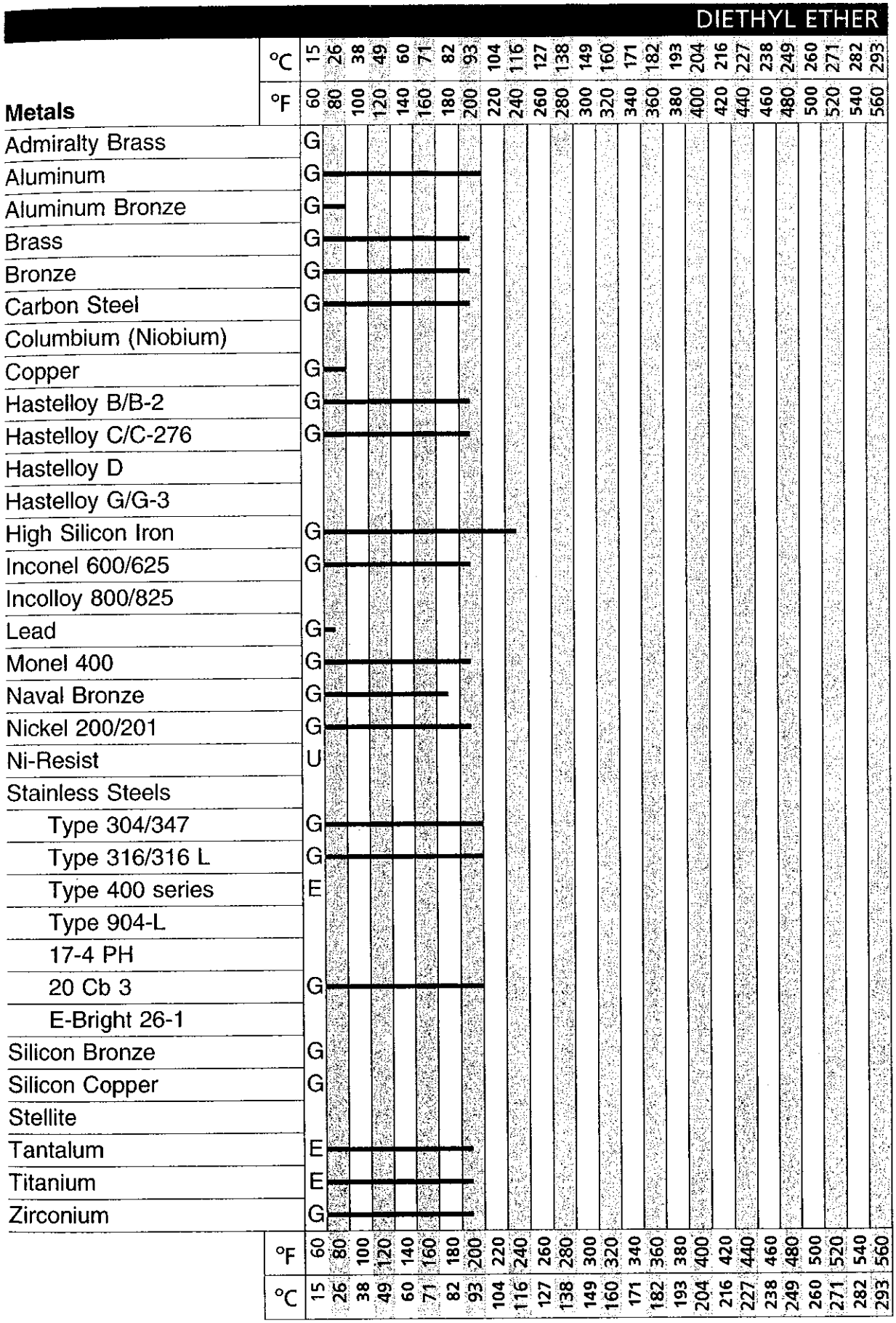
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DIETHYL CELLOSOLVE

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)	U																					
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)																						
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)																						
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)	R	—																				
Nitrile Buna-N (NBR)	R	—			—																	
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

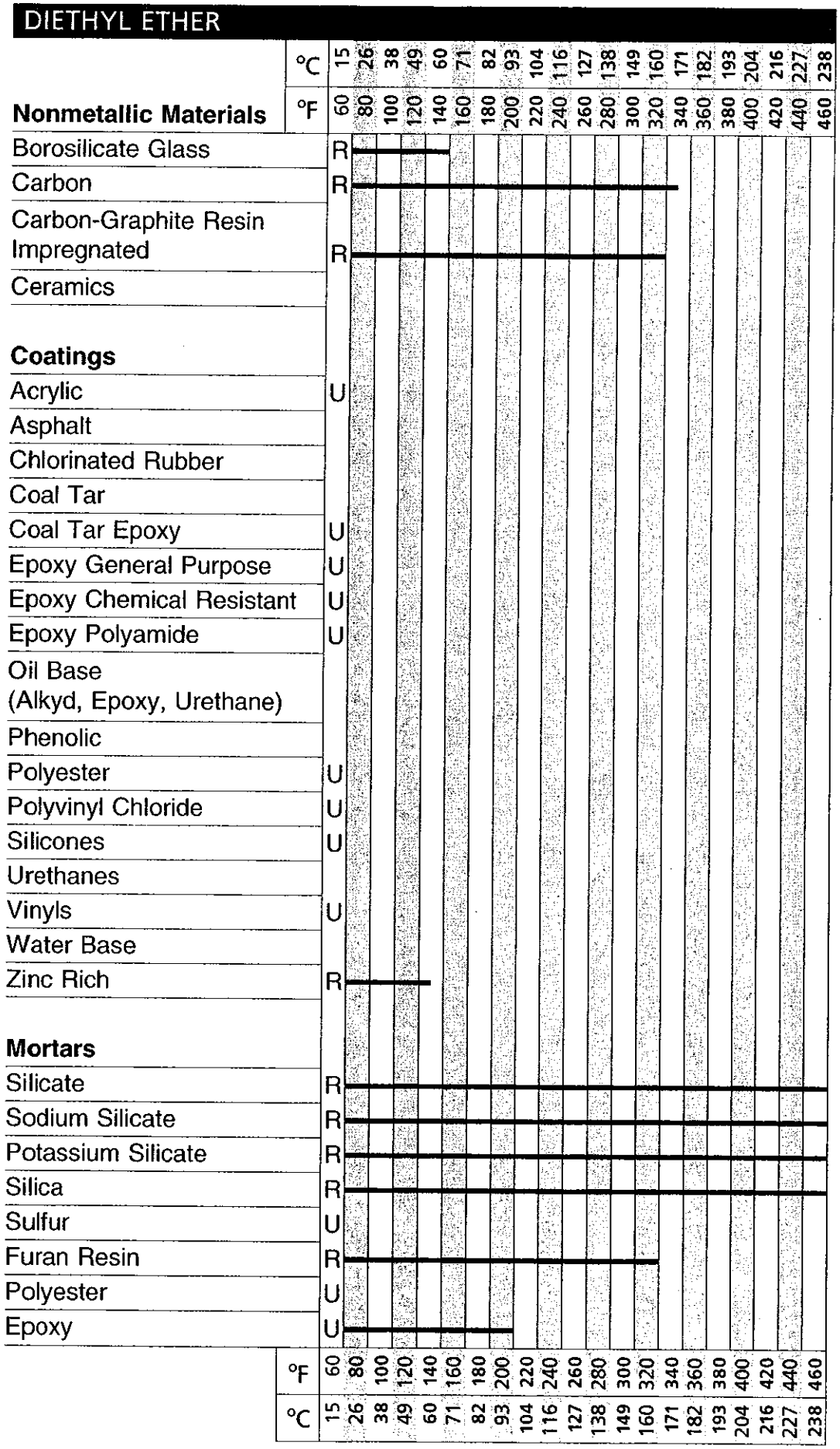
R = Resistant

U = Unsatisfactory

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DIETHYL ETHER



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DIETHYL ETHER

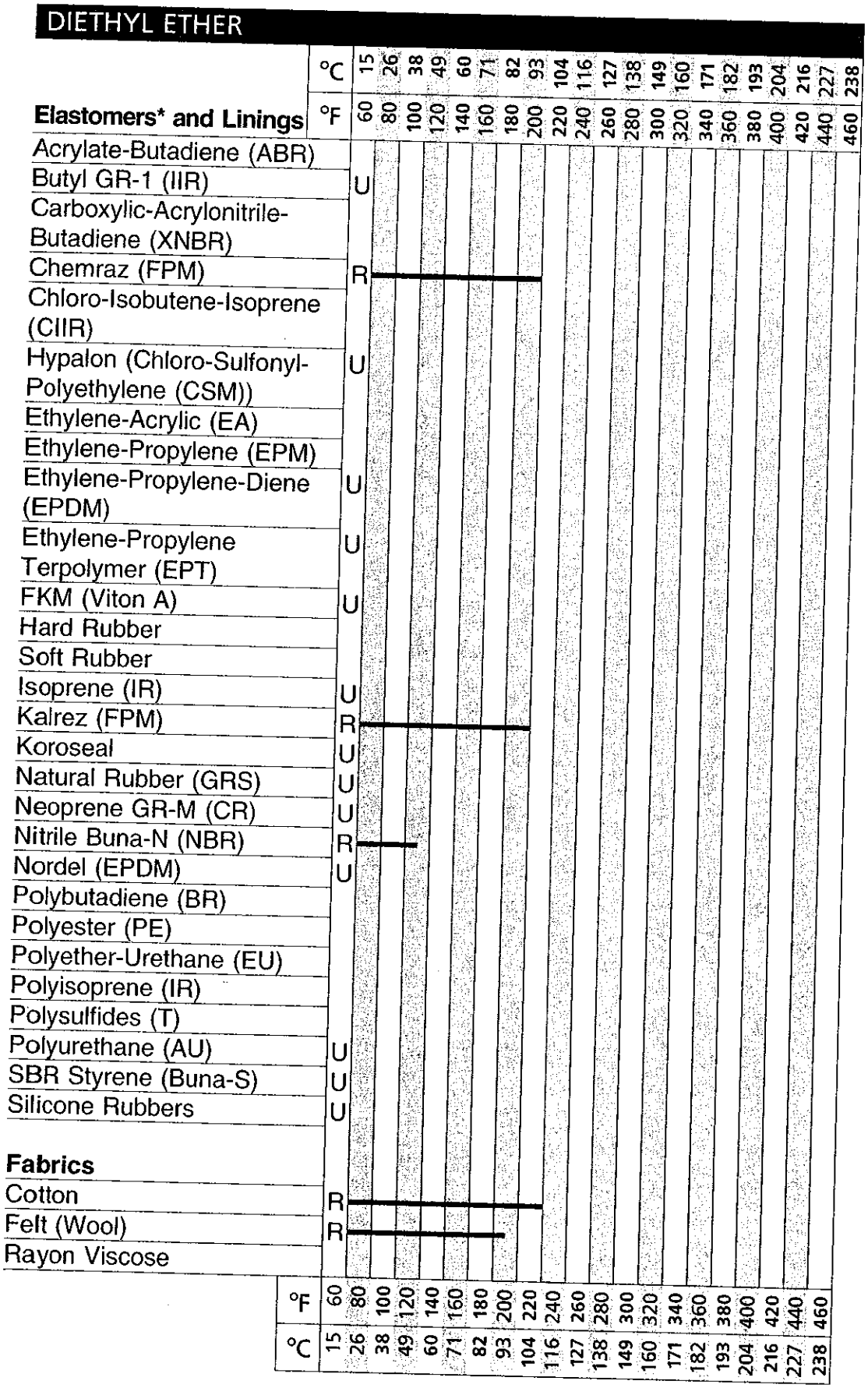
Plastics	°C	°F
ABS	U	
Acetal	R	
Acrylics	U	
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)	R	
CPVC	U	
E-CTFE (Halar)	R	
Epoxy	U	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)	R	
Noryl	U	
Nylon 6	R	
Nylon 11	R	
Nylon 66	R	
Phenolic		
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	U	
Halogenated	U	
Hydrogenated Bisphenol A –Bisphenol A	U	
Isophthalic	U	
Terephthalate (PET)	R	
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)	R	
Polyethersulfone (PES)		
Polyethylene HMW	U	
Polyethylene UHMW	U	
Polymethylpentene	U	
Polypropylene (PP)	R	U
Polystyrene	U	
Polysulfone	U	
Polyvinylidene Chloride	U	
PVC Type 1	U	
PVC Type 2	U	
PVDF (Kynar)	R	U
Ryton	R	
TFE (Teflon)	R	
Vinyl Ester	U	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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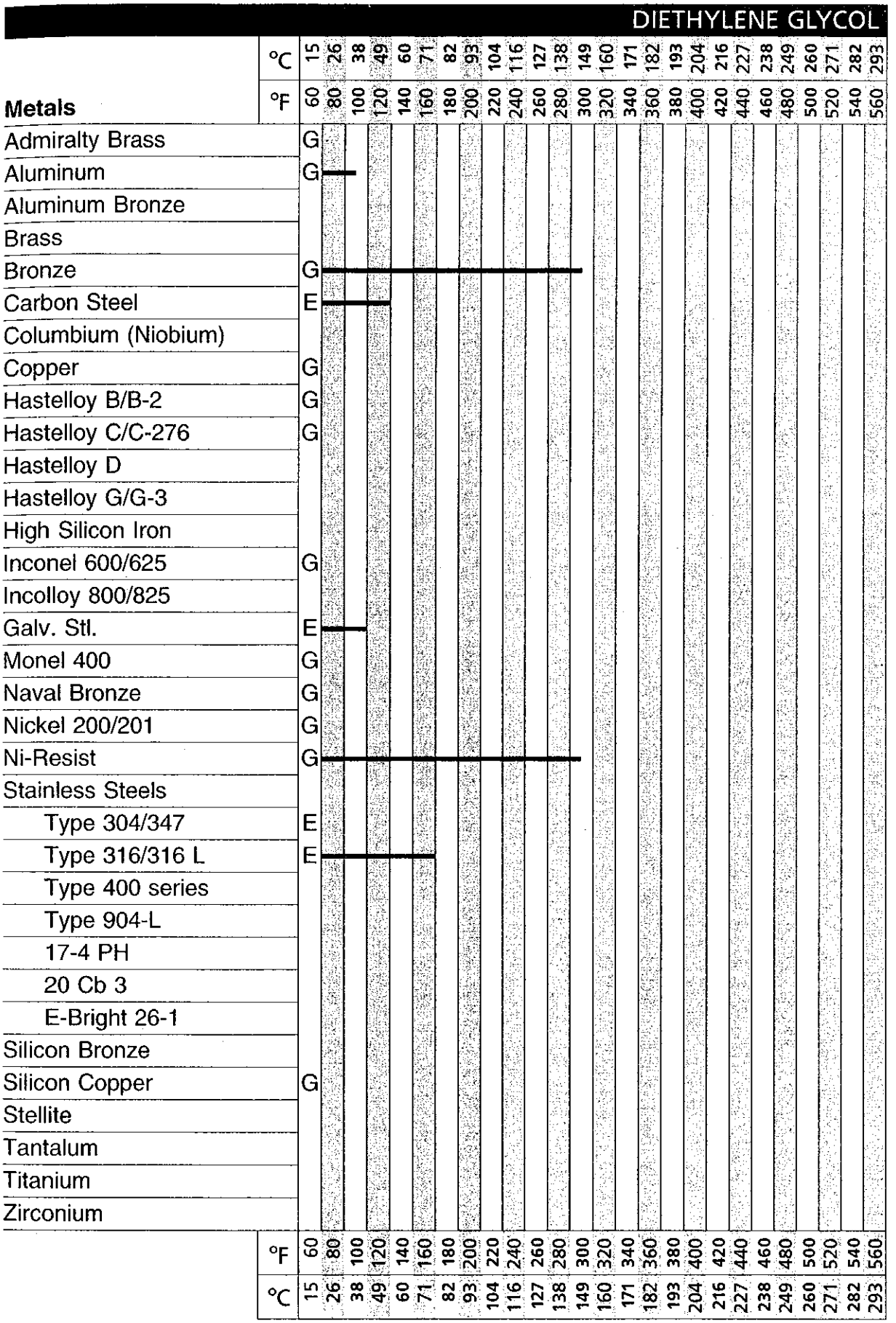
DIETHYL ETHER



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DIETHYLENE GLYCOL



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

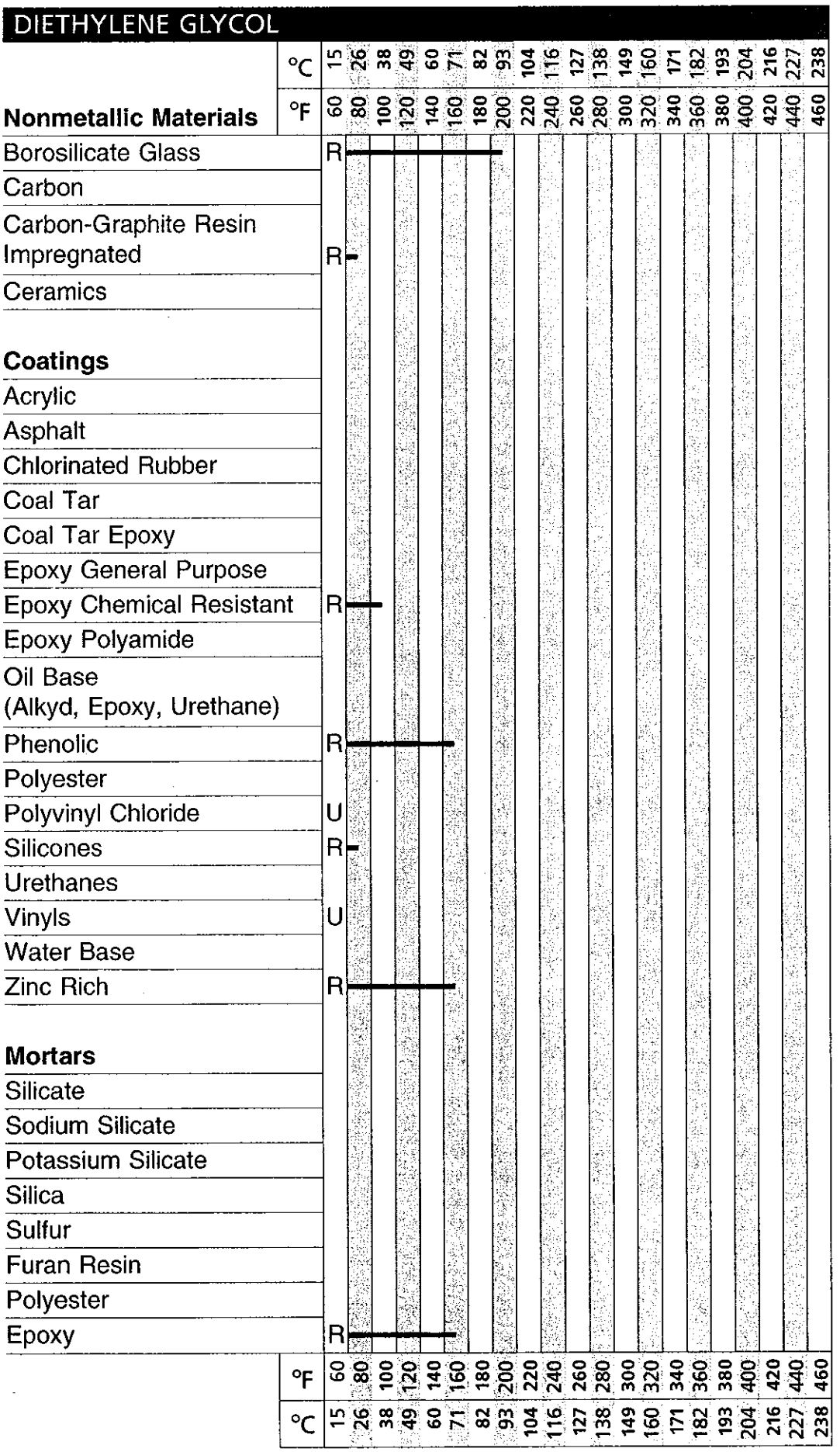
R = Resistant

U = Unsatisfactory

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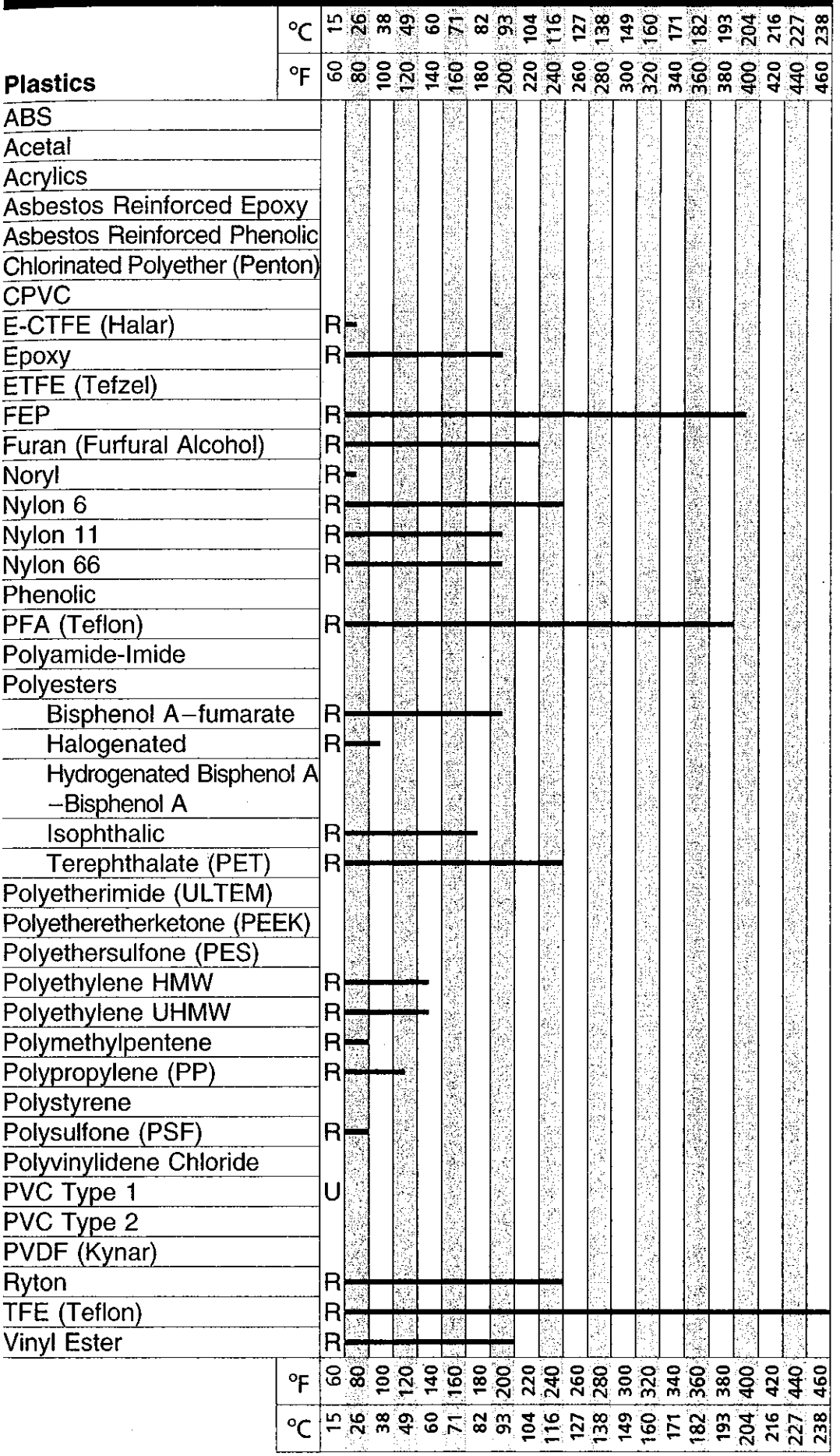
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DIETHYLENE GLYCOL



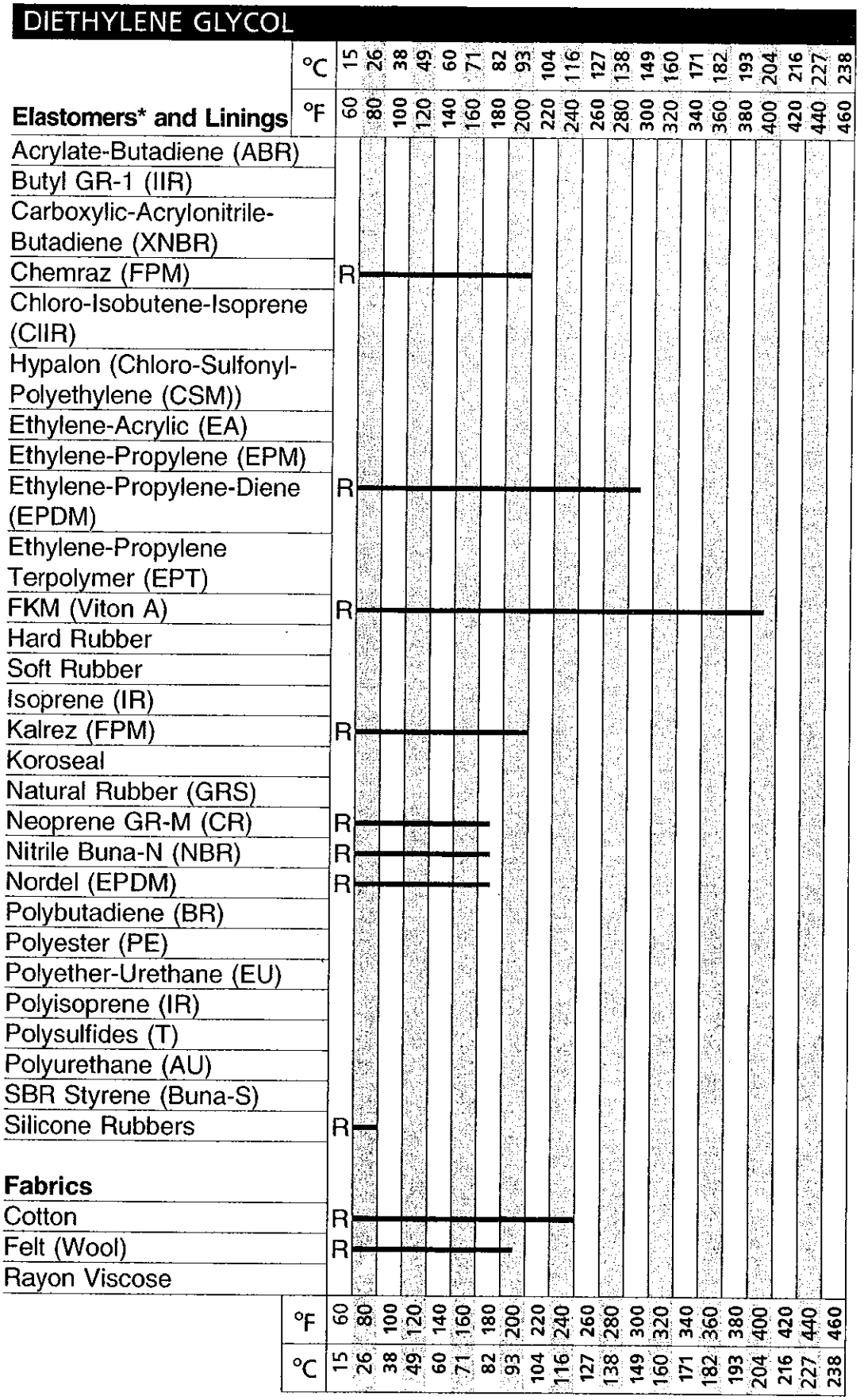
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DIETHYLENE GLYCOL



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DIETHYLENE GLYCOL



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DIETHYLENE TRIAMINE

Metals	°C	°F
Admiralty Brass		
Aluminum	G	
Aluminum Bronze		
Brass	U	
Bronze	U	
Carbon Steel		
Columbium (Niobium)		
Copper	U	
Hastelloy B/B-2		
Hastelloy C/C-276		
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625		
Incolloy 800/825		
Galv. Stl.	E	
Monel 400		
Naval Bronze		
Nickel 200/201		
Ni-Resist		
Stainless Steels		
Type 304/347		
Type 316/316 L		
Type 400 series		
Type 904-L		
17-4 PH		
20 Cb 3		
E-Bright 26-1		
Silicon Bronze		
Silicon Copper		
Stellite		
Tantalum	G	
Titanium	E	
Zirconium		

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

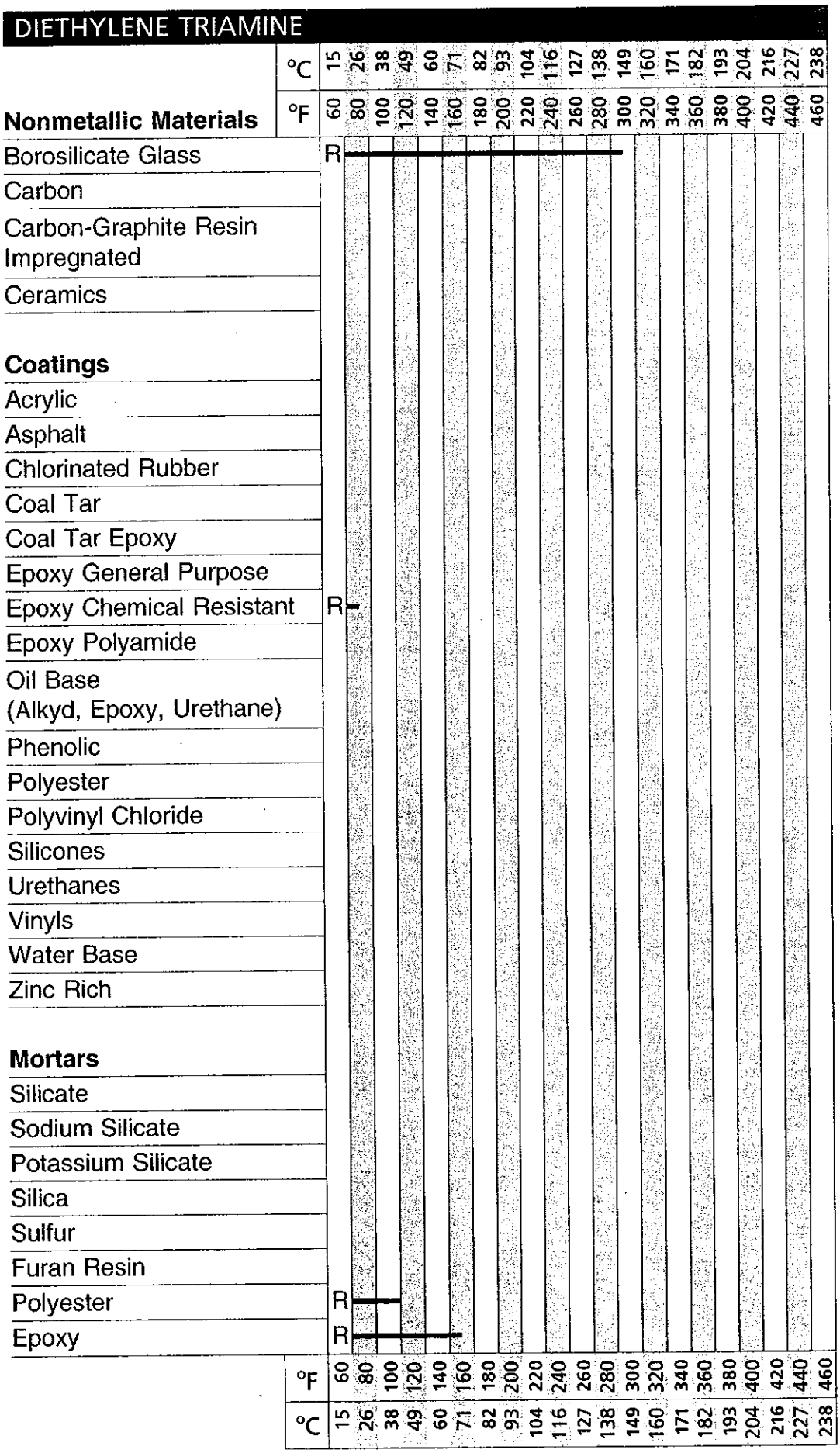
R = Resistant

U = Unsatisfactory

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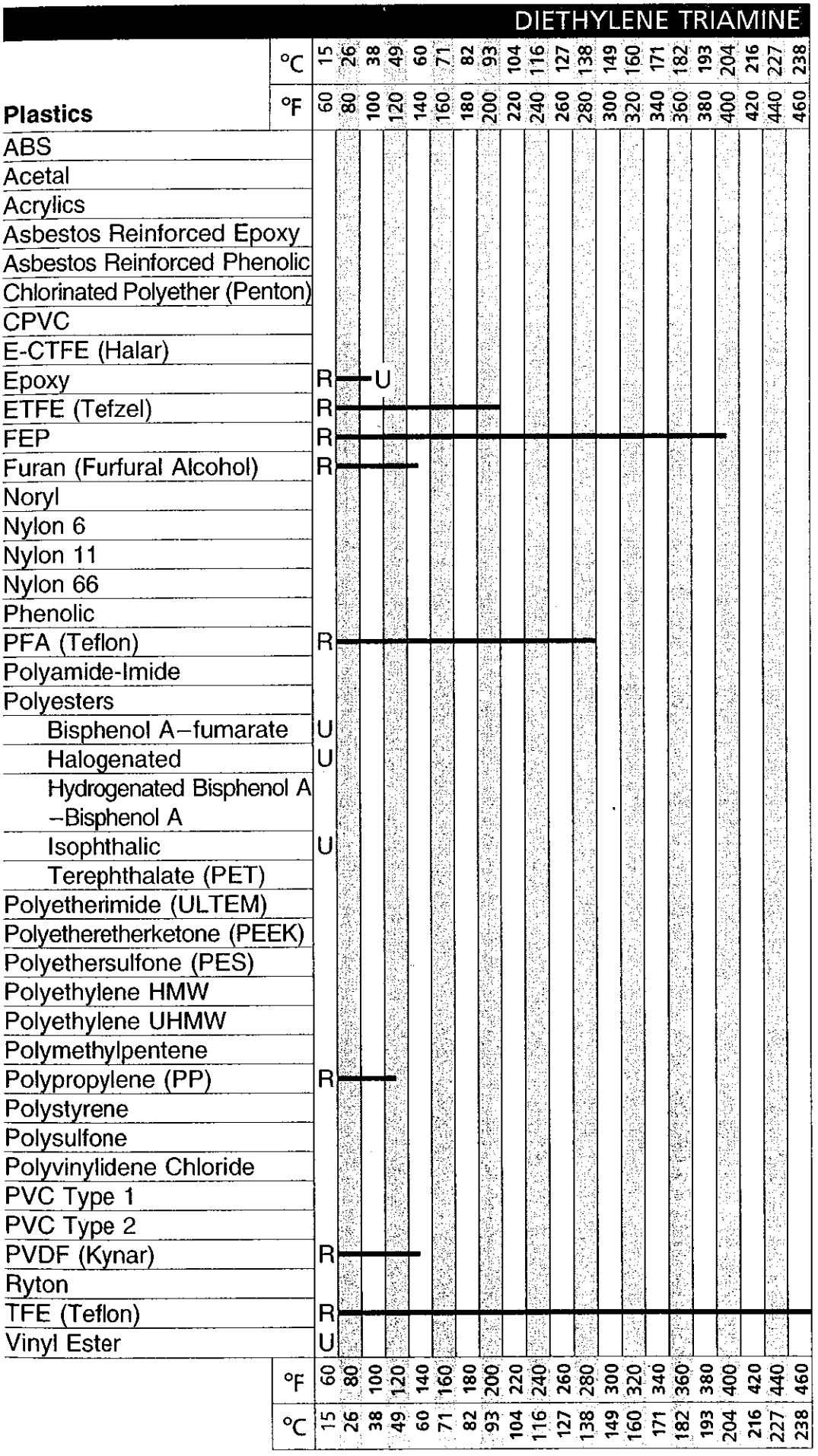
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DIETHYLENE TRIAMINE



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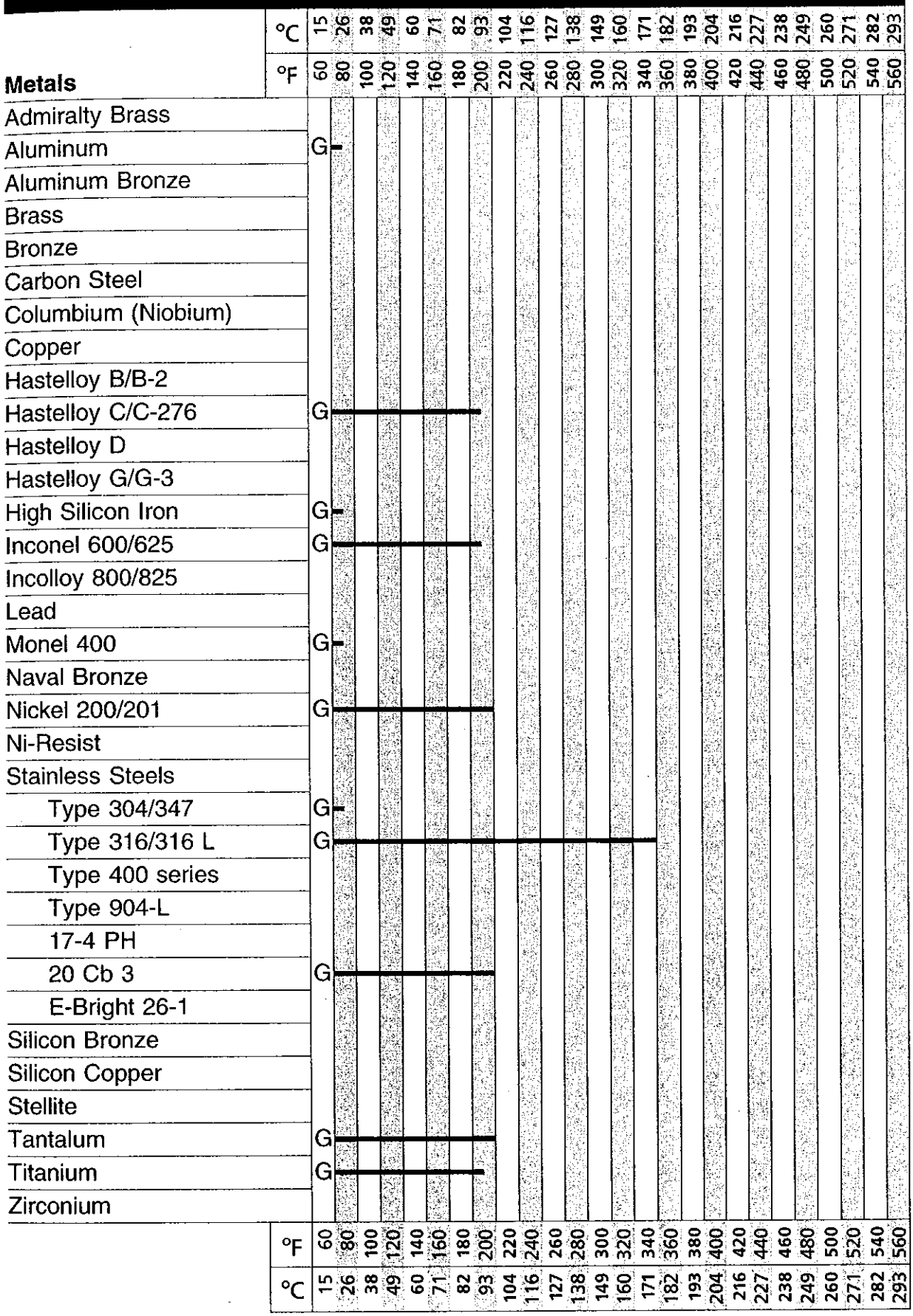
DIETHYLENE TRIAMINE

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)	R																				
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																					
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)																					
Ethylene-Propylene Terpolymer (EPT)																					
FKM (Viton A)																					
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)																					
Kalrez (FPM)	R																				
Koroseal																					
Natural Rubber (GRS)																					
Neoprene GR-M (CR)																					
Nitrile Buna-N (NBR)																					
Nordel (EPDM)																					
Polybutadiene (BR)																					
Polyester (PE)																					
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers																					
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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DIGLYCOLIC ACID



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

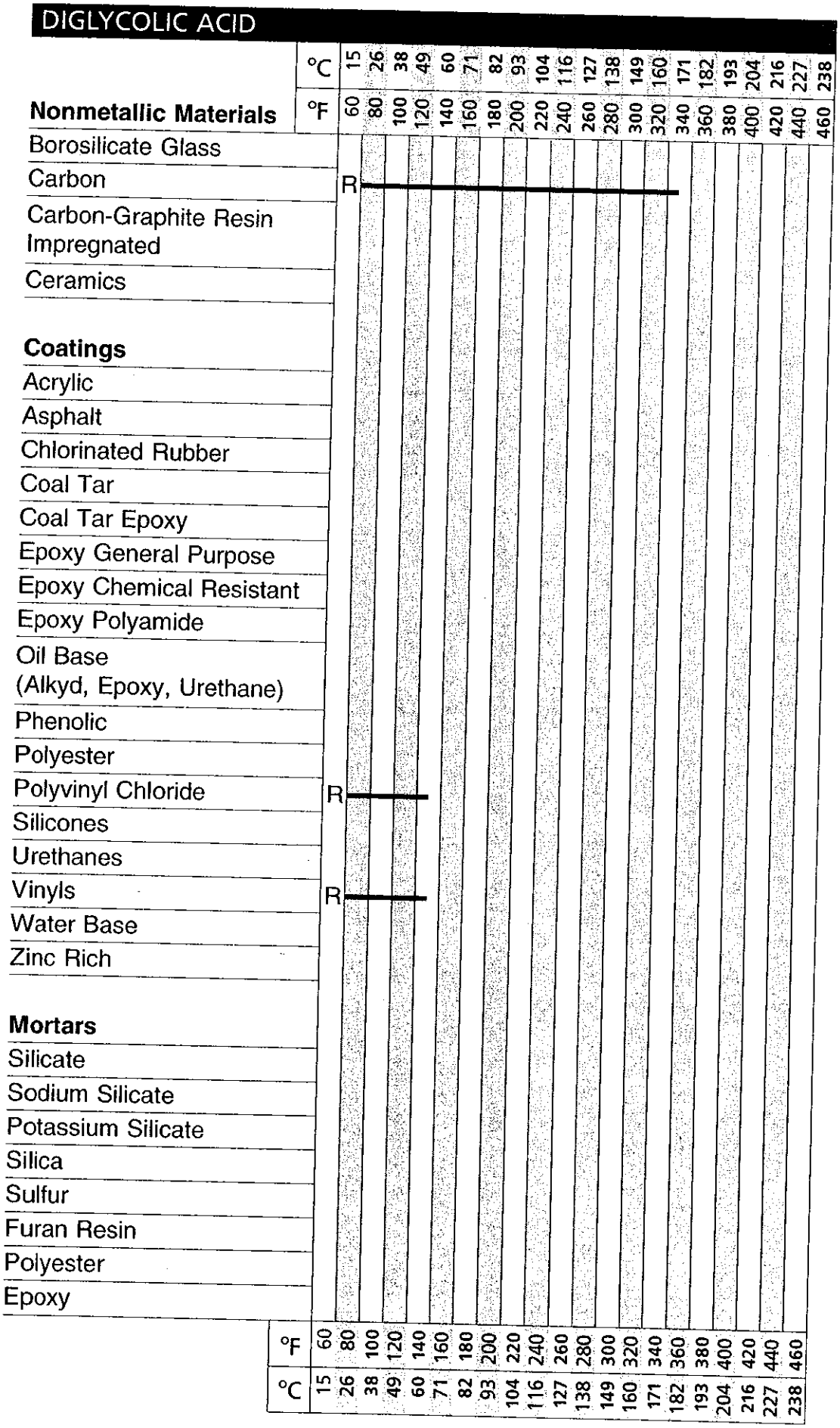
R = Resistant

U = Unsatisfactory

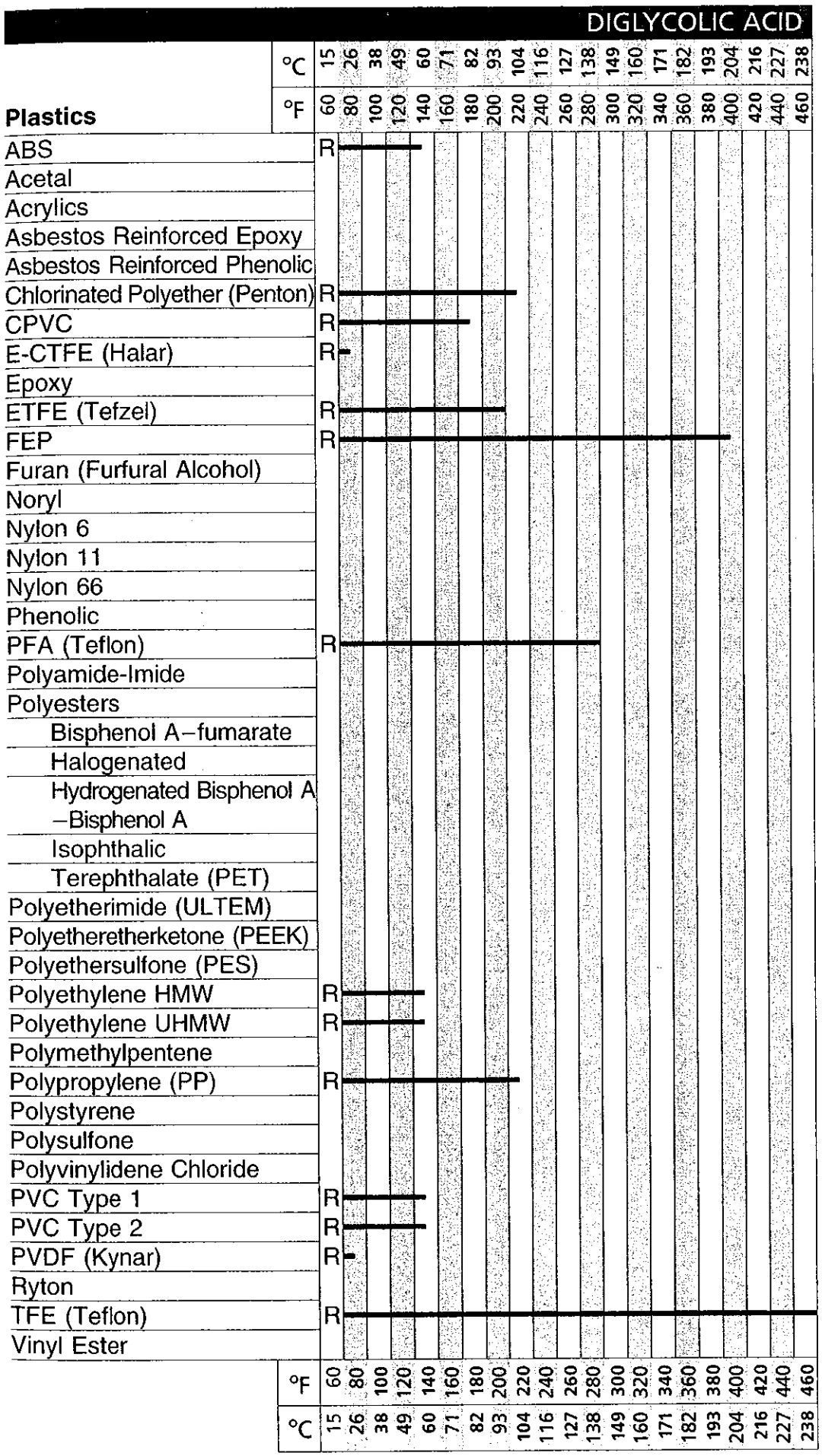
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DIGLYCOLIC ACID

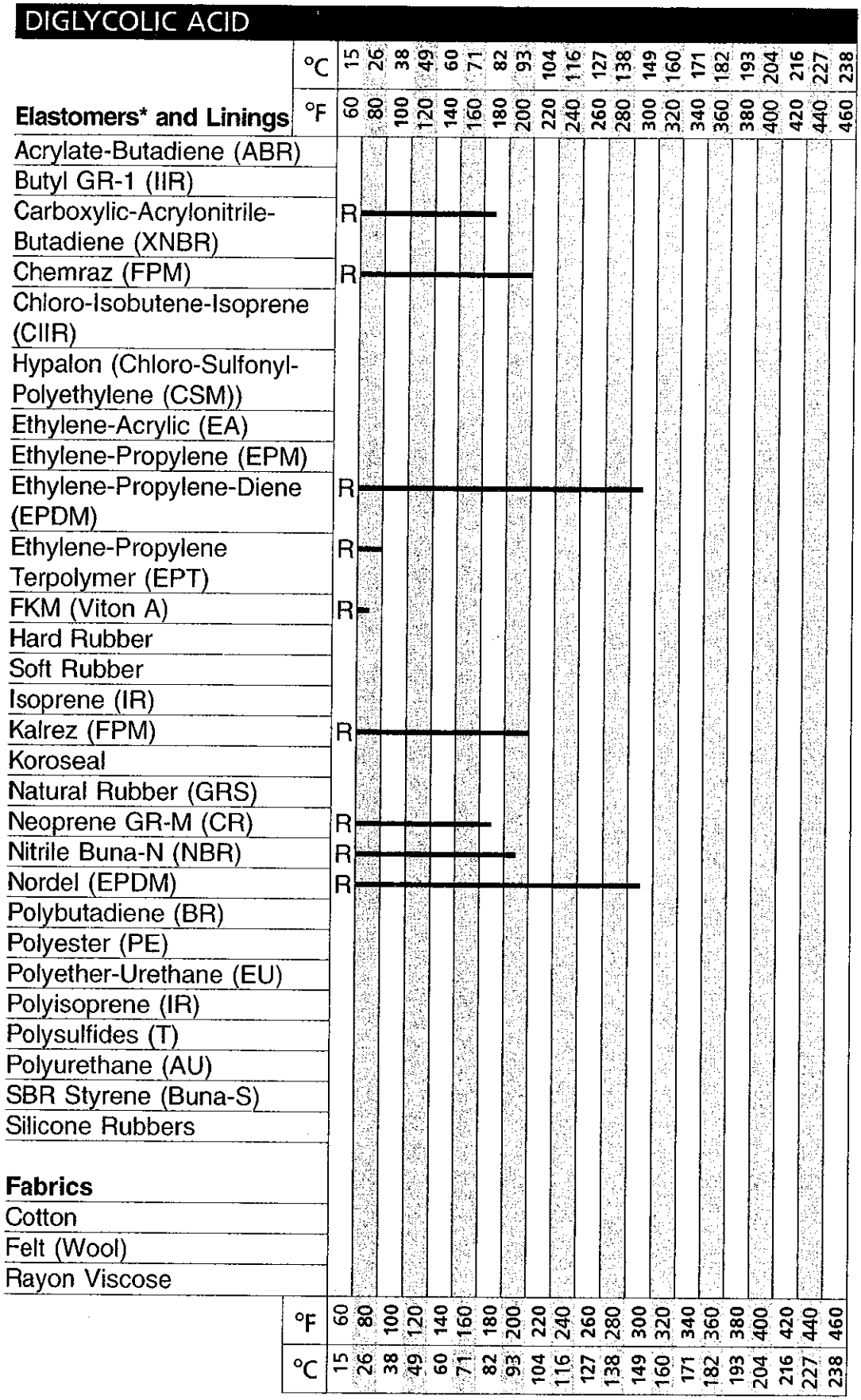


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DIGLYCOLIC ACID



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DIMETHYLAMINE

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass		U																									
Bronze		U																									
Carbon Steel																											
Columbium (Niobium)																											
Copper		U																									
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron		G																									
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347		G																									
Type 316/316 L																											
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum		G																									
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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DIMETHYLAMINE

Nonmetallic Materials	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass	R																				
Carbon																					
Carbon-Graphite Resin Impregnated																					
Ceramics																					
Coatings																					
Acrylic																					
Asphalt																					
Chlorinated Rubber																					
Coal Tar																					
Coal Tar Epoxy																					
Epoxy General Purpose	U																				
Epoxy Chemical Resistant	U																				
Epoxy Polyamide	U																				
Oil Base (Alkyd, Epoxy, Urethane)																					
Phenolic																					
Polyester																					
Polyvinyl Chloride																					
Silicones																					
Urethanes																					
Vinyls																					
Water Base																					
Zinc Rich																					
Mortars																					
Silicate																					
Sodium Silicate																					
Potassium Silicate																					
Silica																					
Sulfur																					
Furan Resin																					
Polyester																					
Epoxy																					
°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	
°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	

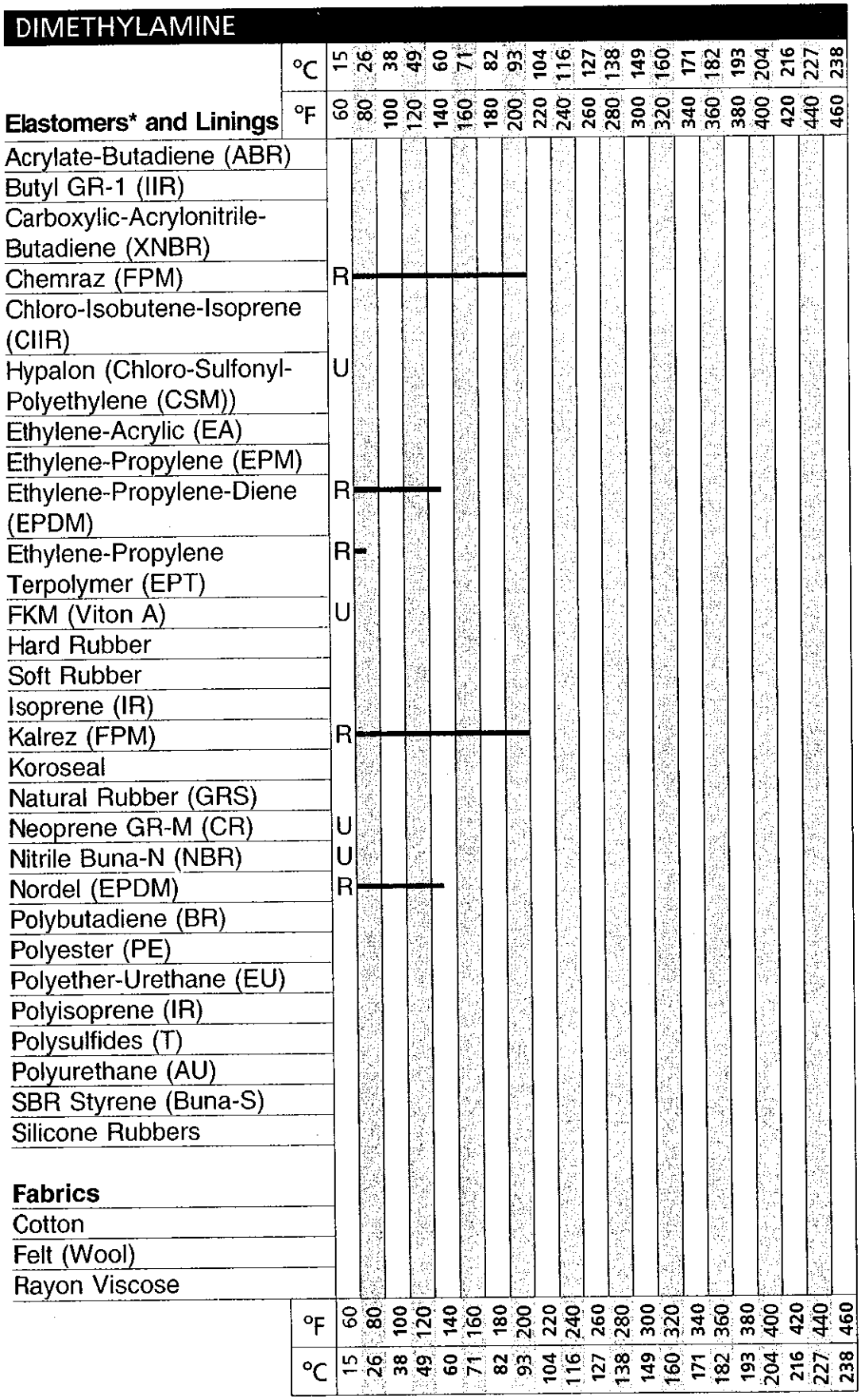
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DIMETHYLAMINE

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS		U																				
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)		R																				
CPVC		U																				
E-CTFE (Halar)		R	U																			
Epoxy		U																				
ETFE (Tefzel)		R																				
FEP		R																				
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)																						
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW		U																				
Polyethylene UHMW		U																				
Polymethylpentene																						
Polypropylene (PP)		R																				
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1		R																				
PVC Type 2		U																				
PVDF (Kynar)		R																				
Ryton																						
TFE (Teflon)		R																				
Vinyl Ester		R																				
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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DIMETHYLAMINE



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DIMETHYLAMINE AQUEOUS

Metals	°C / °F
Admiralty Brass	
Aluminum	
Aluminum Bronze	
Brass	
Bronze	
Carbon Steel	
Columbium (Niobium)	
Copper	
Hastelloy B/B-2	
Hastelloy C/C-276	
Hastelloy D	
Hastelloy G/G-3	
High Silicon Iron	
Inconel 600/625	
Incolloy 800/825	
Lead	
Monel 400	
Naval Bronze	
Nickel 200/201	
Ni-Resist	
Stainless Steels	
Type 304/347	
Type 316/316 L	
Type 400 series	
Type 904-L	
17-4 PH	
20 Cb 3	
E-Bright 26-1	
Silicon Bronze	
Silicon Copper	
Stellite	
Tantalum	
Titanium	
Zirconium	

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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DIMETHYLAMINE AQUEOUS

Nonmetallic Materials	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass	R																				
Carbon																					
Carbon-Graphite Resin Impregnated																					
Ceramics																					
Coatings																					
Acrylic																					
Asphalt																					
Chlorinated Rubber																					
Coal Tar																					
Coal Tar Epoxy																					
Epoxy General Purpose	U																				
Epoxy Chemical Resistant	U																				
Epoxy Polyamide																					
Oil Base (Alkyd, Epoxy, Urethane)																					
Phenolic																					
Polyester																					
Polyvinyl Chloride	U																				
Silicones																					
Urethanes																					
Vinyls	U																				
Water Base																					
Zinc Rich																					
Mortars																					
Silicate																					
Sodium Silicate																					
Potassium Silicate																					
Silica																					
Sulfur																					
Furan Resin																					
Polyester																					
Epoxy																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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DIMETHYLAMINE AQUEOUS

Plastics	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																					
Acetal																					
Acrylics																					
Asbestos Reinforced Epoxy																					
Asbestos Reinforced Phenolic																					
Chlorinated Polyether (Penton)	R	R	R	R	R	R	R	R													
CPVC	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
E-CTFE (Halar)																					
Epoxy	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
ETFE (Tefzel)	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
FEP	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Furan (Furfural Alcohol)																					
Noryl																					
Nylon 6																					
Nylon 11																					
Nylon 66																					
Phenolic																					
PFA (Teflon)	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Polyamide-Imide																					
Polyesters																					
Bisphenol A–fumarate																					
Halogenated	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Hydrogenated Bisphenol A –Bisphenol A																					
Isophthalic																					
Terephthalate (PET)																					
Polyetherimide (ULTEM)																					
Polyetheretherketone (PEEK)																					
Polyethersulfone (PES)																					
Polyethylene HMW																					
Polyethylene UHMW																					
Polymethylpentene																					
Polypropylene (PP)	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Polystyrene																					
Polysulfone																					
Polyvinylidene Chloride																					
PVC Type 1	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
PVC Type 2	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
PVDF (Kynar)	R	R	R	R	R	C															
Ryton																					
TFE (Teflon)	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Vinyl Ester																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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DIMETHYLAMINE AQUEOUS

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)	R																				
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																					
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)																					
Ethylene-Propylene Terpolymer (EPT)																					
FKM (Viton A)	U																				
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)																					
Kalrez (FPM)	R																				
Koroseal	U																				
Natural Rubber (GRS)																					
Neoprene GR-M (CR)																					
Nitrile Buna-N (NBR)																					
Nordel (EPDM)																					
Polybutadiene (BR)																					
Polyester (PE)																					
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers																					
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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DIMETHYL ANILINE

Metals	°C	°F
Admiralty Brass		
Aluminum		
Aluminum Bronze		
Brass		
Bronze		
Carbon Steel		
Columbium (Niobium)		
Copper		
Hastelloy B/B-2		
Hastelloy C/C-276		
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625		
Incolloy 800/825		
Lead		
Monel 400		
Naval Bronze		
Nickel 200/201		
Ni-Resist		
Stainless Steels		
Type 304/347		
Type 316/316 L		
Type 400 series		
Type 904-L		
17-4 PH		
20 Cb 3		
E-Bright 26-1		
Silicon Bronze		
Silicon Copper		
Stellite		
Tantalum		
Titanium		
Zirconium		

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

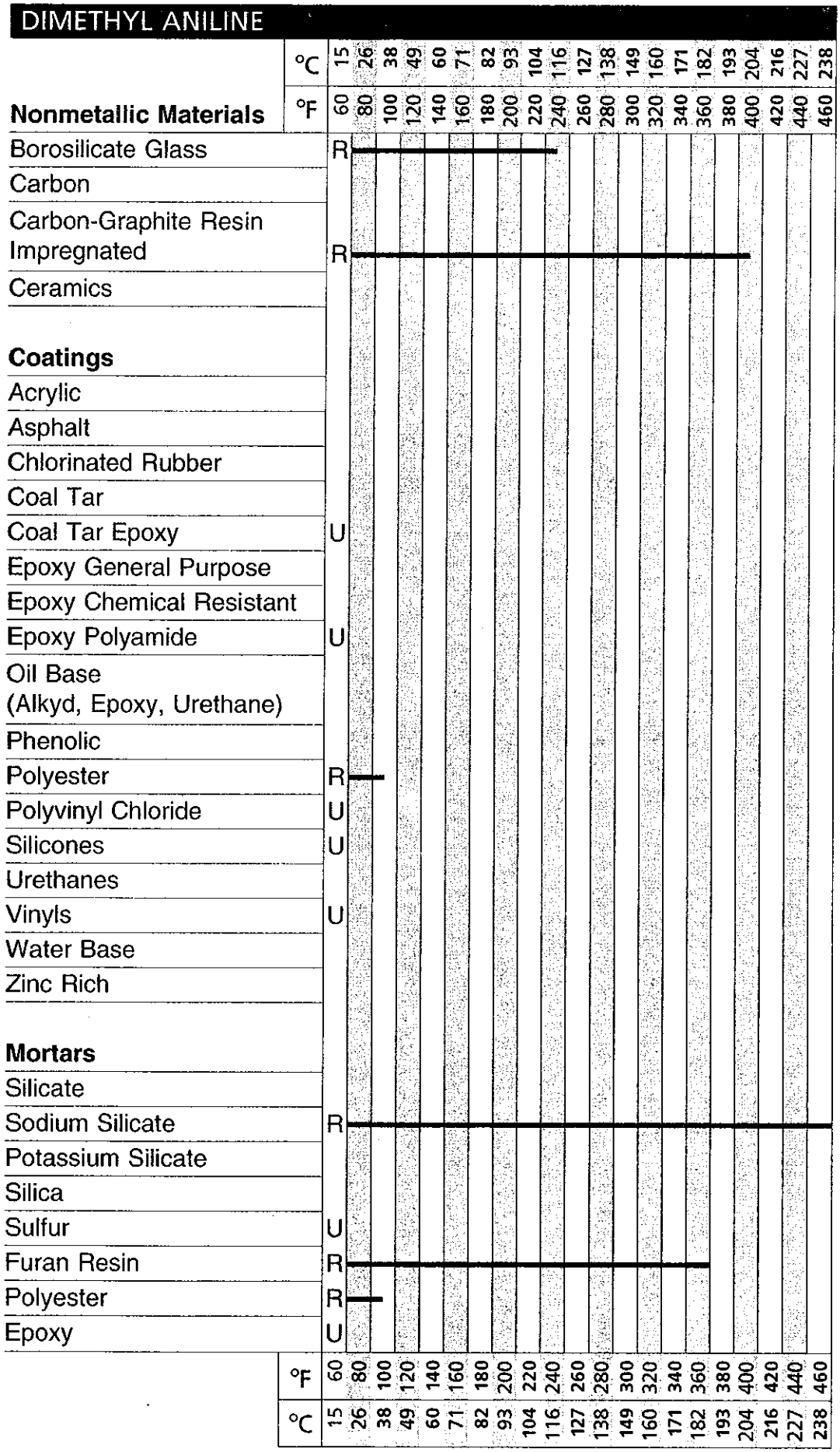
R = Resistant

U = Unsatisfactory

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DIMETHYL ANILINE



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DIMETHYL ANILINE

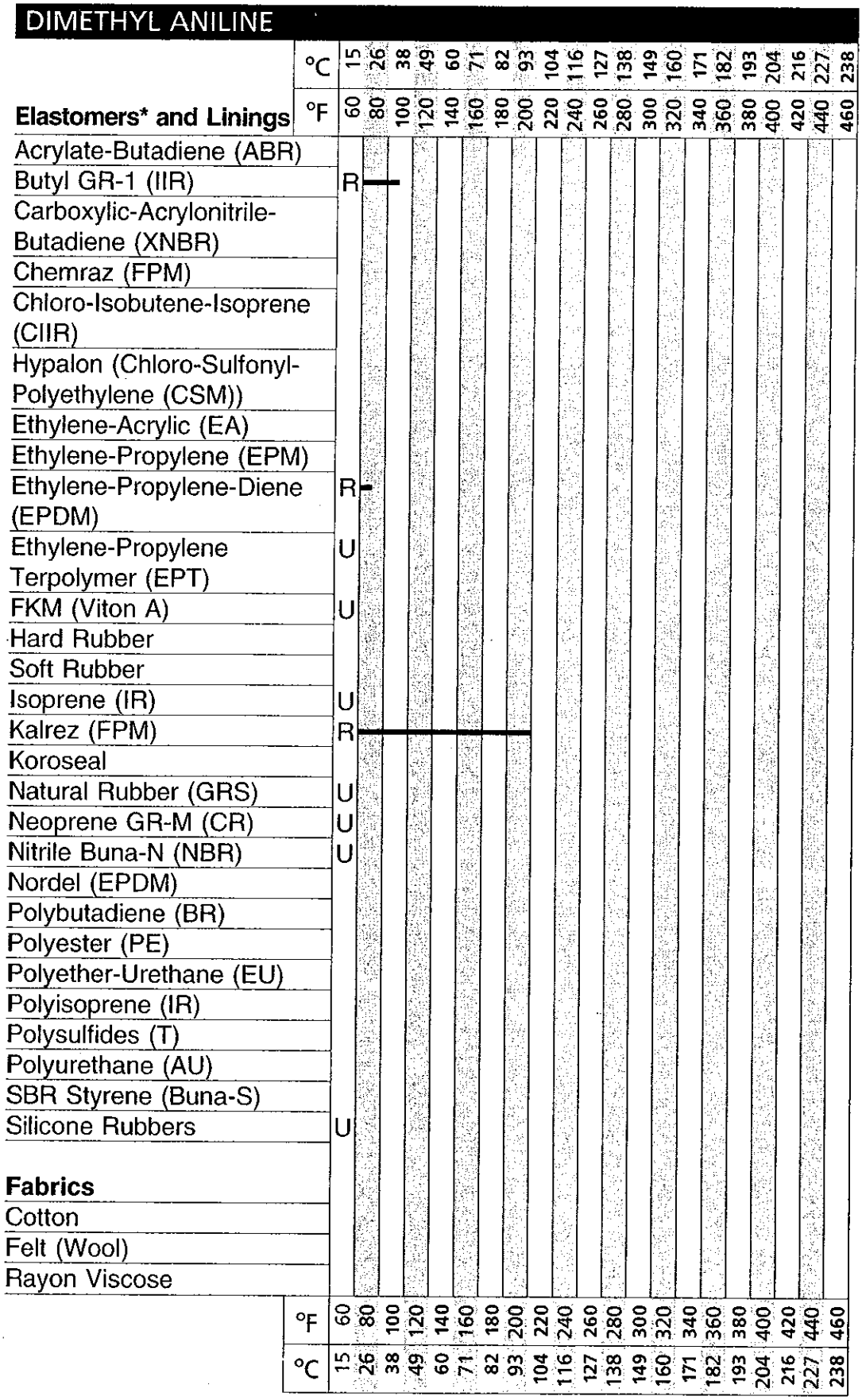
Plastics	°C	°F
ABS	U	
KEL-F (CTFE)	R	
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)	R	
CPVC	U	
E-CTFE (Halar)	R	
Epoxy		
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)	R	
Noryl	U	
Nylon 6	R	
Nylon 11	R	
Nylon 66	R	
Phenolic		
PFA (Teflon)	R	
Polyamide-Imide	R	
Polyesters		
Bisphenol A–fumarate	R	
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic		
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW	R	
Polymethylpentene		
Polypropylene (PP)	R	
Polystyrene		
Polysulfone	U	
Polyvinylidene Chloride		
PVC Type 1	U	
PVC Type 2	U	
PVDF (Kynar)	R	U
Ryton	R	
TFE (Teflon)	R	
Vinyl Ester		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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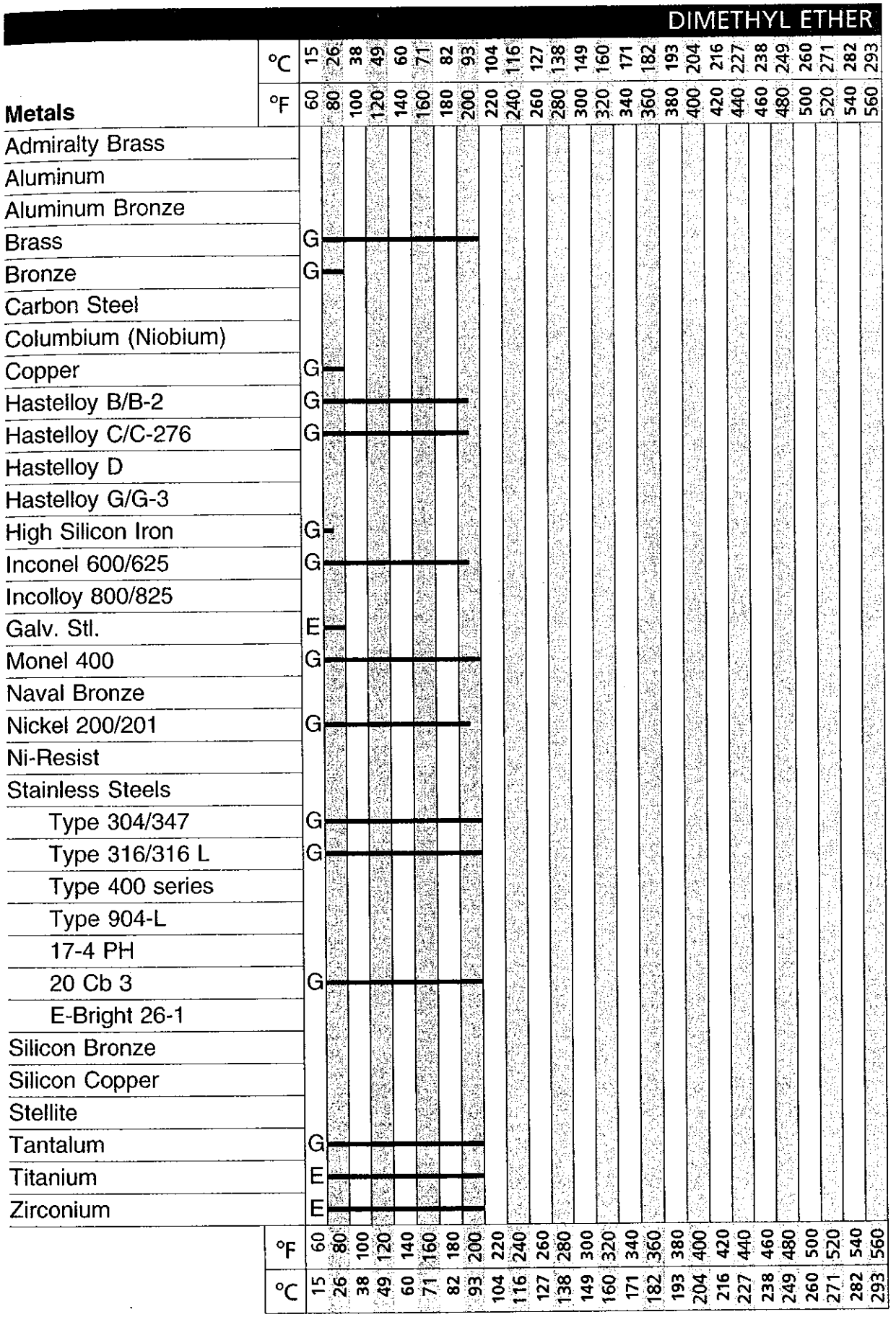
DIMETHYL ANILINE



*See also Nylon 11 under PLASTICS

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DIMETHYL ETHER



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

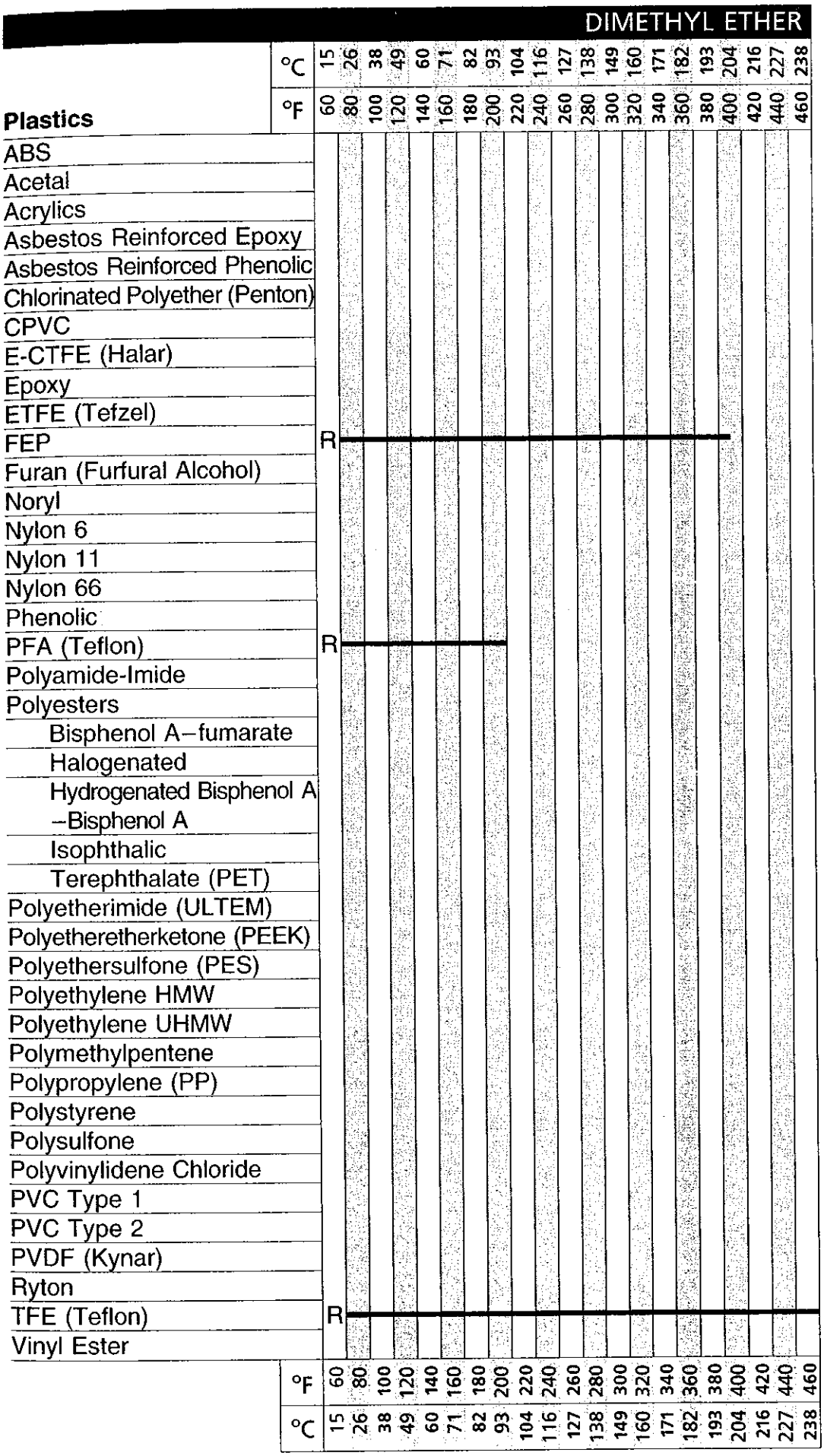
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DIMETHYL ETHER

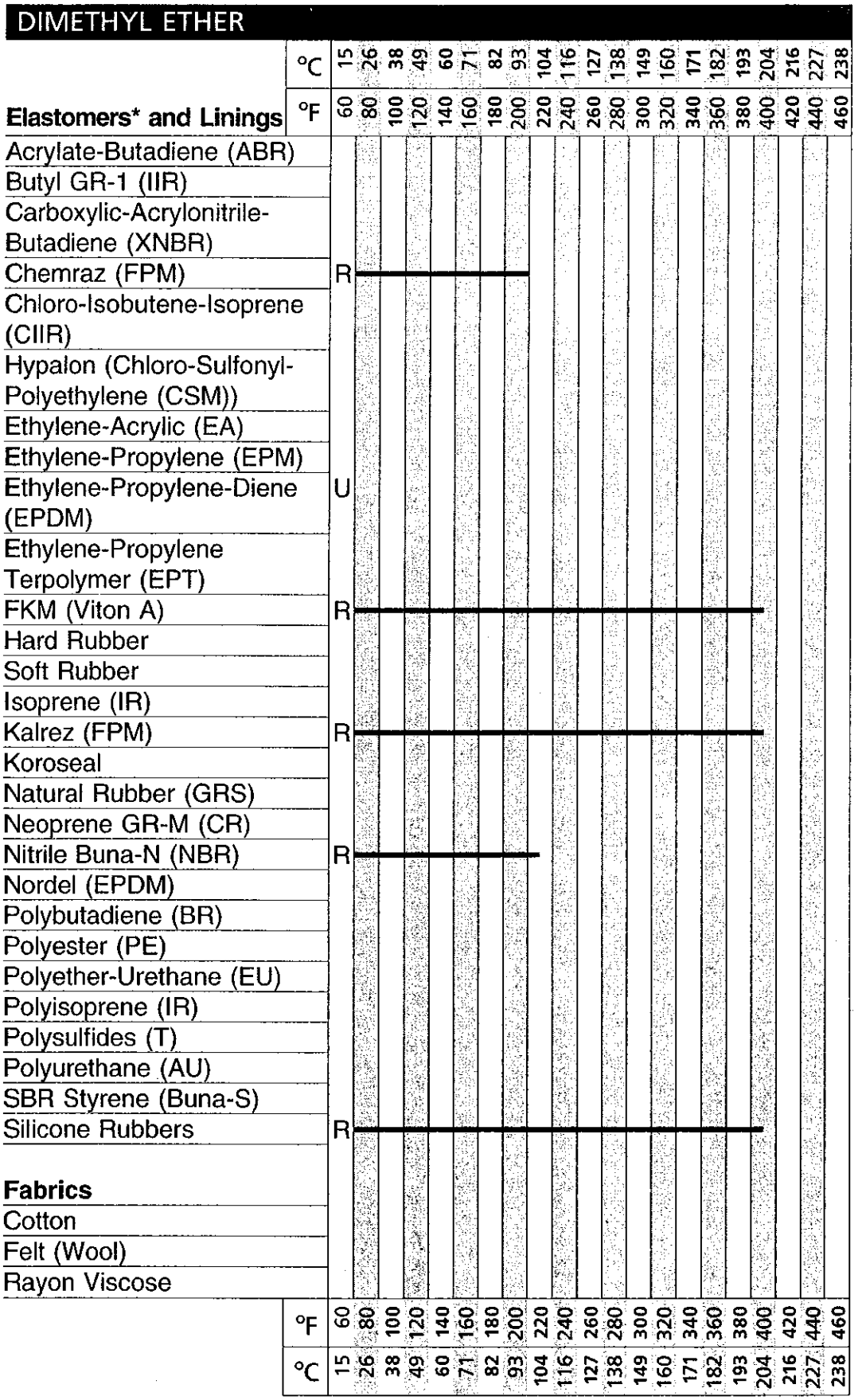
Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones		R	—	—	—																	
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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DIMETHYL ETHER



*See also Nylon 11 under PLASTICS

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DIMETHYL FORMAMIDE

Metals	°C	°F
Admiralty Brass		
Aluminum	E	
Aluminum Bronze		
Brass		
Bronze		
Carbon Steel	U	
Columbium (Niobium)		
Copper		
Hastelloy B/B-2		
Hastelloy C/C-276		
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625		
Incolloy 800/825		
Lead		
Monel 400	G	
Naval Bronze		
Nickel 200/201		
Ni-Resist		
Stainless Steels		
Type 304/347	E	
Type 316/316 L	G	
Type 400 series		
Type 904-L		
17-4 PH		
20 Cb 3		
E-Bright 26-1		
Silicon Bronze		
Silicon Copper		
Stellite		
Tantalum		
Titanium		
Zirconium		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

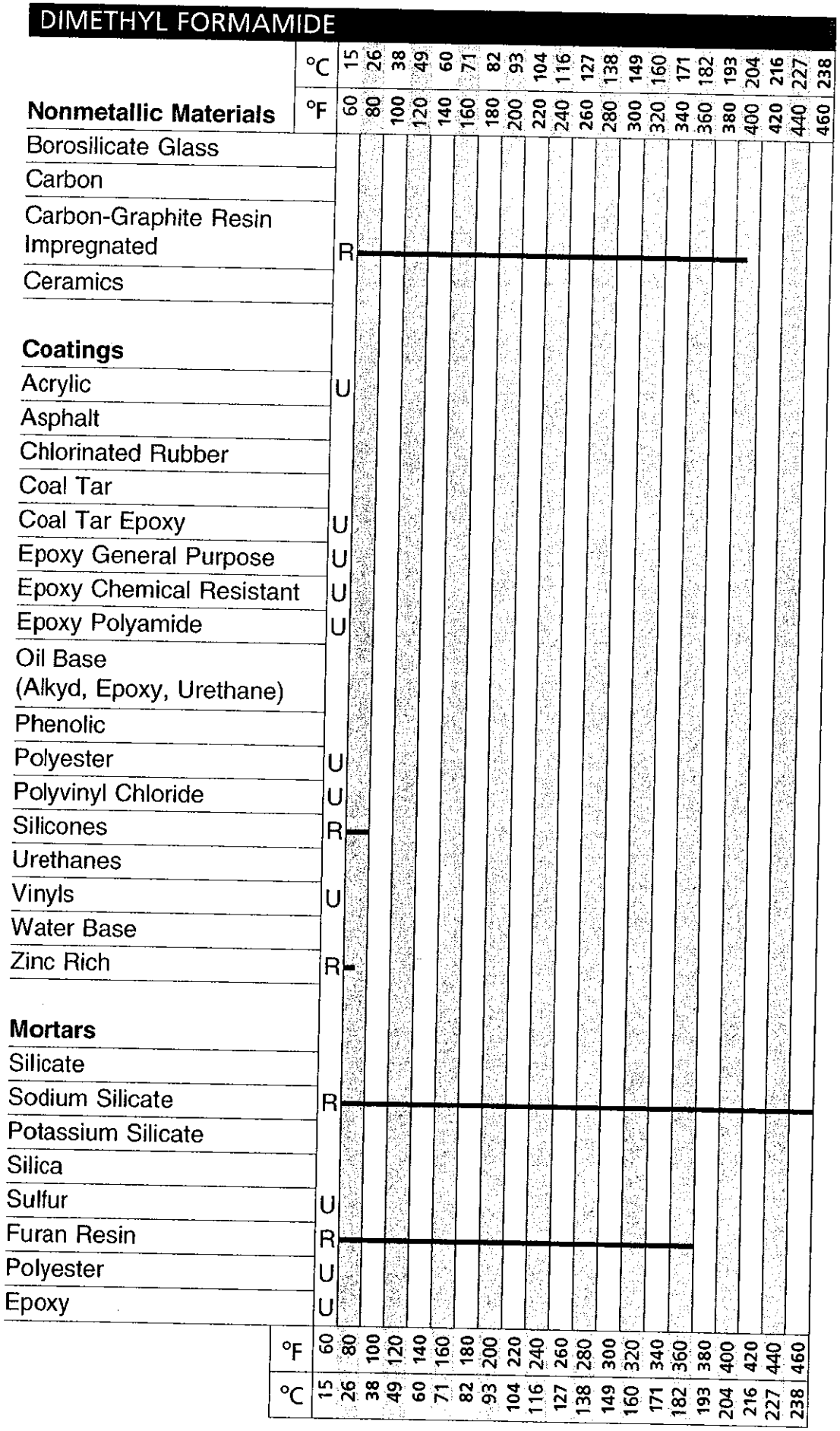
R = Resistant

U = Unsatisfactory

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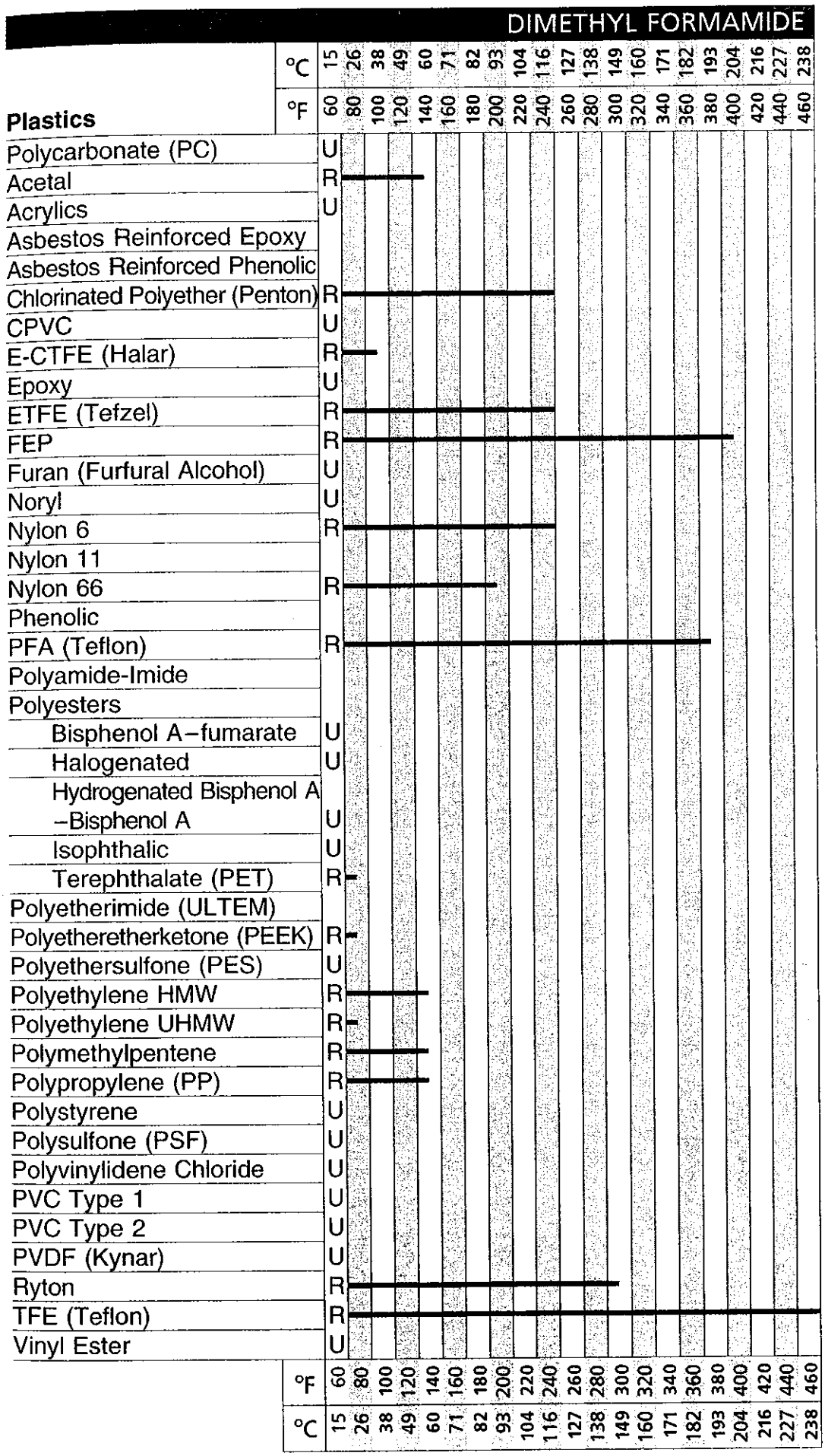
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DIMETHYL FORMAMIDE



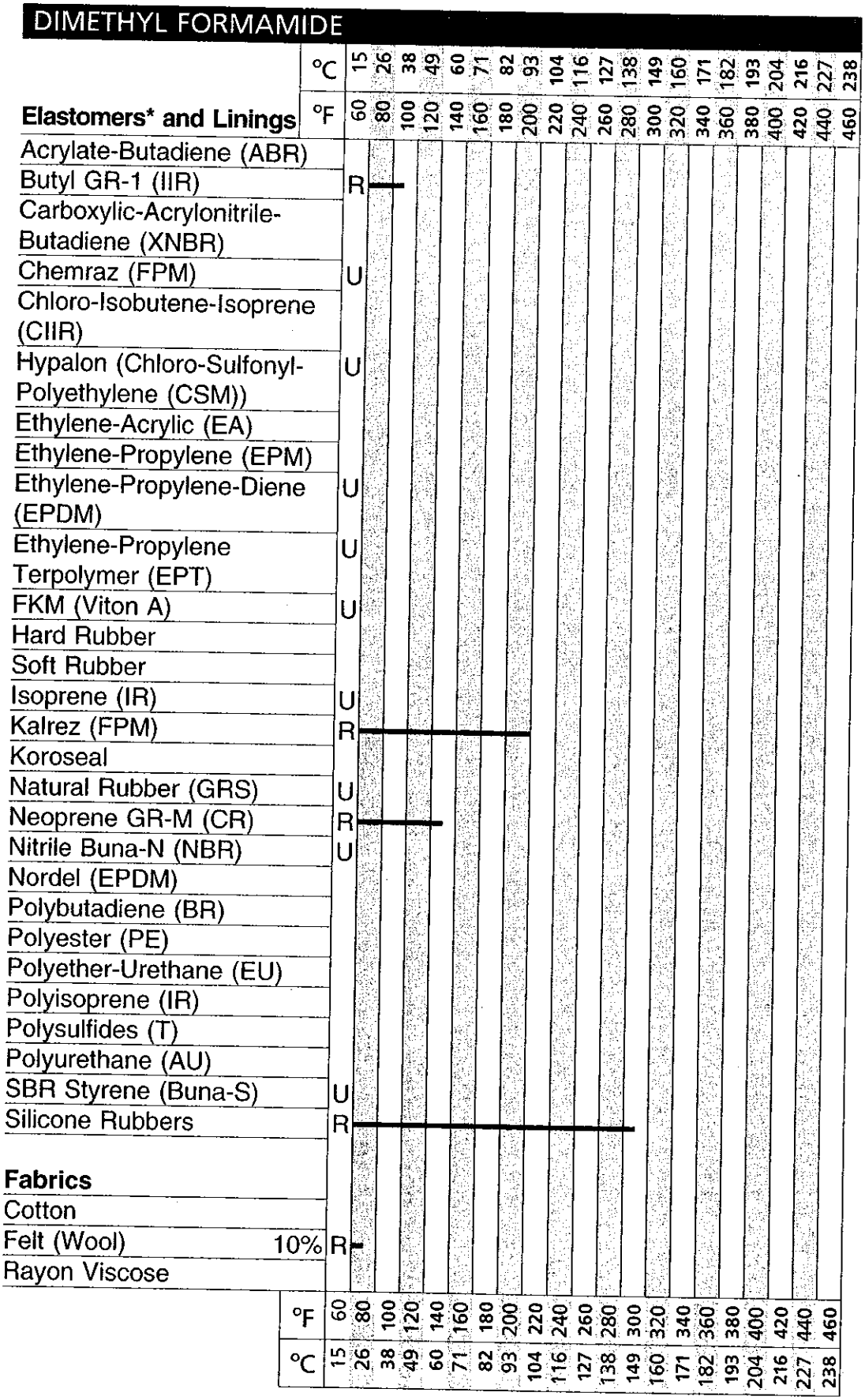
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DIMETHYL FORMAMIDE



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DIMETHYL FORMAMIDE



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DIMETHYL PHTHALATE

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum		E																									
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel		E																									
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347		E																									
Type 316/316 L		E																									
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

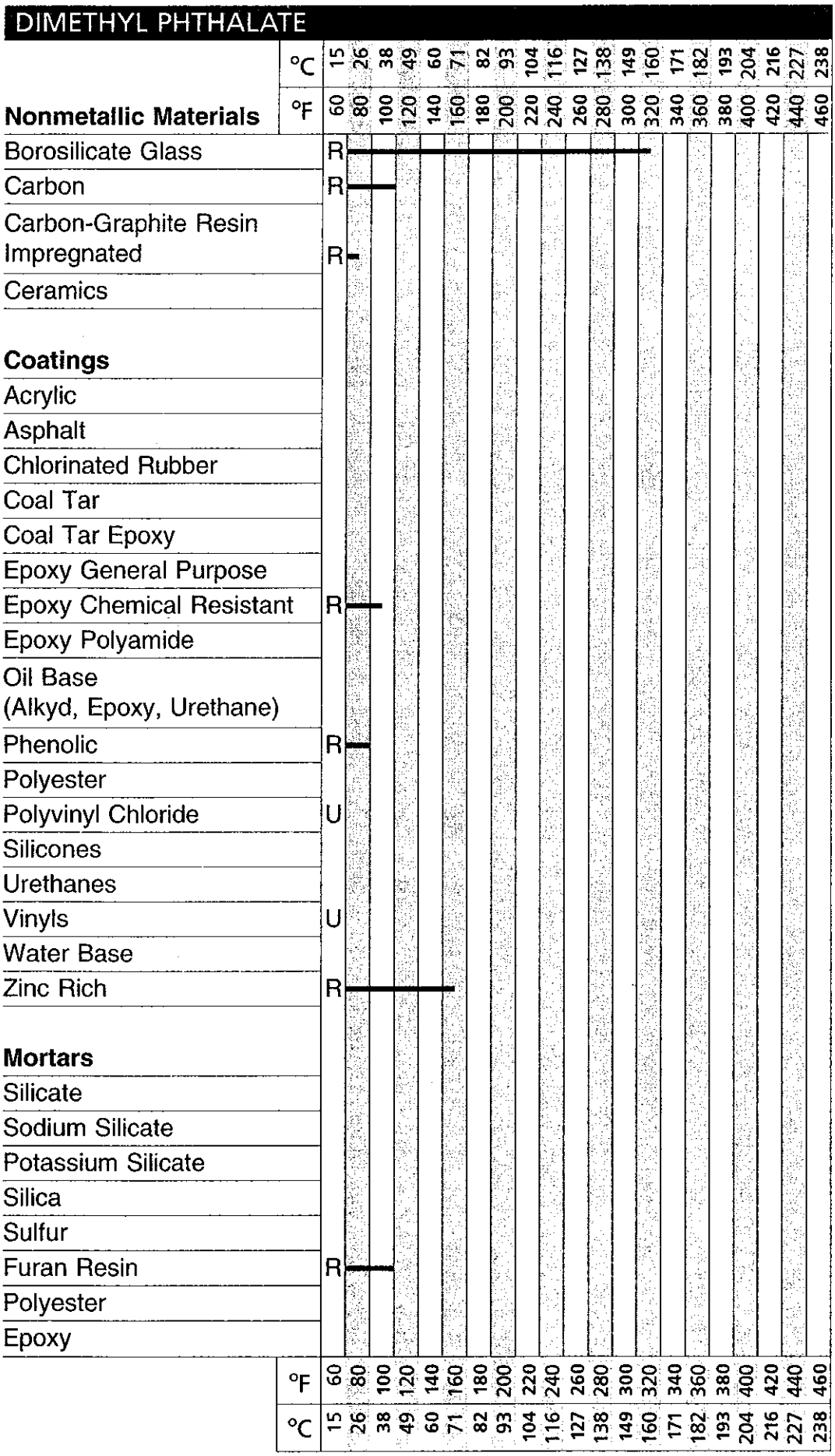
R = Resistant

U = Unsatisfactory

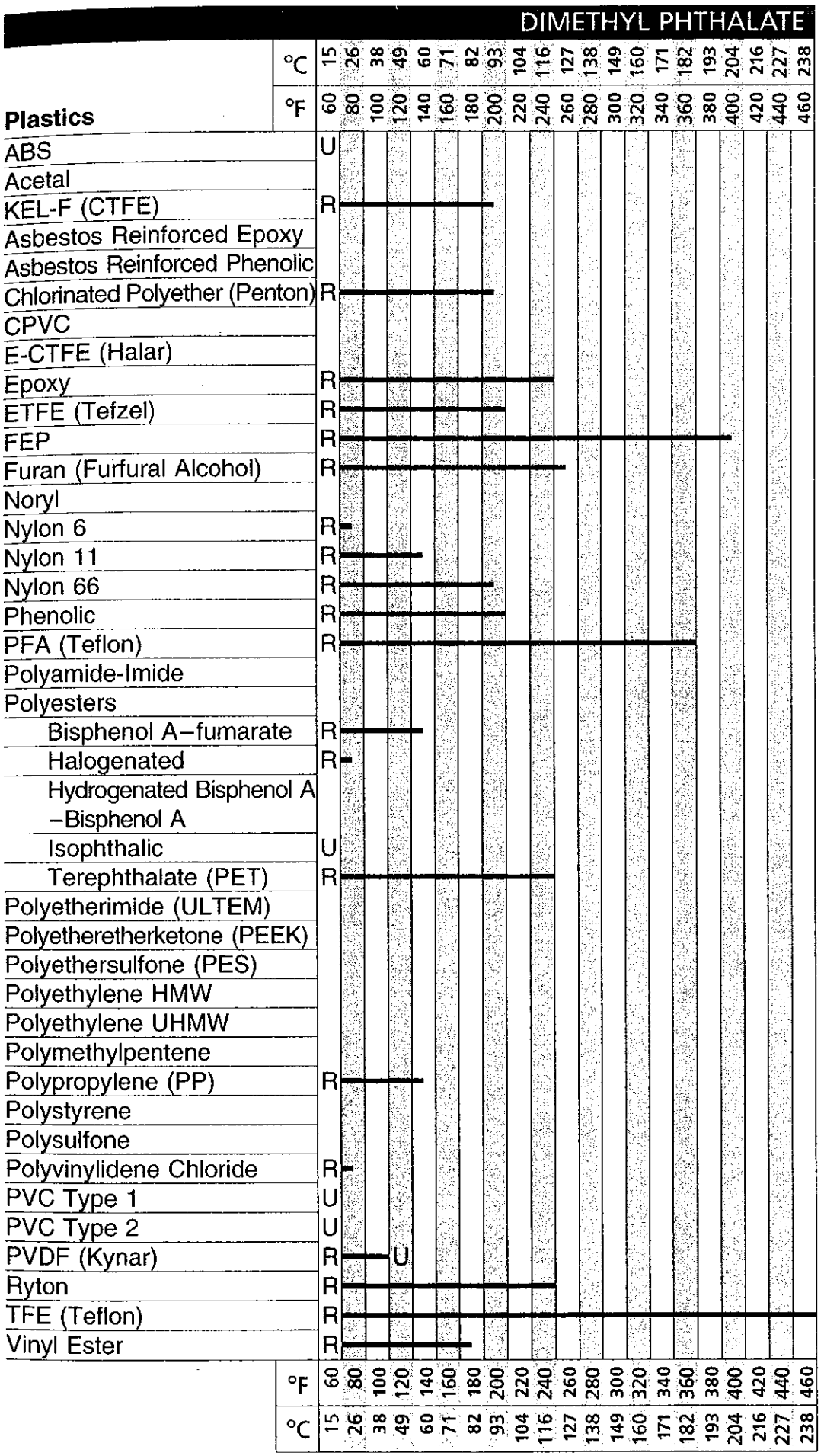
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DIMETHYL PHTHALATE



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DIMETHYL PHTHALATE

Elastomers* and Linings	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)	R																				
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	U																				
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)	R																				
Ethylene-Propylene Terpolymer (EPT)	U																				
FKM (Viton A)	R																				
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)	U																				
Kalrez (FPM)	R																				
Koroseal																					
Natural Rubber (GRS)	U																				
Neoprene GR-M (CR)	U																				
Nitrile Buna-N (NBR)	U																				
Nordel (EPDM)																					
Polybutadiene (BR)																					
Polyester (PE)																					
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers																					
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
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High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L																											
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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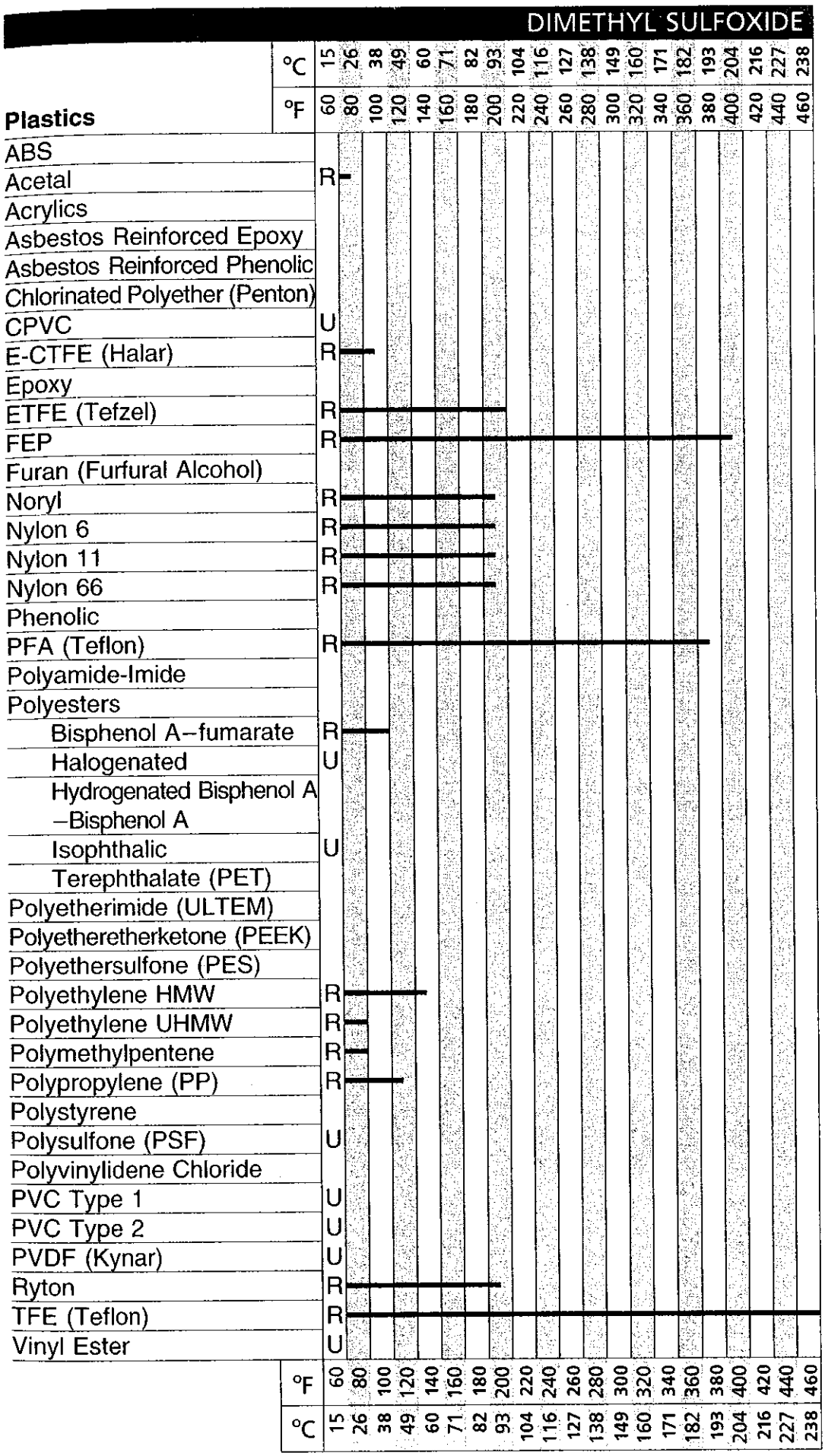
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DIMETHYL SULFOXIDE

Nonmetallic Materials	°C	°F
Borosilicate Glass		
Carbon		
Carbon-Graphite Resin Impregnated		
Ceramics		
Coatings		
Acrylic		
Asphalt		
Chlorinated Rubber		
Coal Tar		
Coal Tar Epoxy	U	
Epoxy General Purpose		
Epoxy Chemical Resistant		
Epoxy Polyamide	U	
Oil Base (Alkyd, Epoxy, Urethane)		
Phenolic		
Polyester	U	
Polyvinyl Chloride	U	
Silicones		
Urethanes		
Vinyls	U	
Water Base		
Zinc Rich		
Mortars		
Silicate		
Sodium Silicate	R	
Potassium Silicate		
Silica		
Sulfur	U	
Furan Resin	R	
Polyester	U	
Epoxy	U	

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460

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DIMETHYL SULFOXIDE

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)	R																				
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																					
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)																					
Ethylene-Propylene Terpolymer (EPT)																					
FKM (Viton A)																					
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)																					
Kalrez (FPM)	R																				
Koroseal																					
Natural Rubber (GRS)																					
Neoprene GR-M (CR)																					
Nitrile Buna-N (NBR)																					
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Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers																					
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	
°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	

*See also Nylon 11 under PLASTICS

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DINITROCHLOROBENZOL, MELTED

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
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Columbium (Niobium)																											
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Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347		G																									
Type 316/316 L		G																									
Type 400 series																											
Type 317/317 L		G																									
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

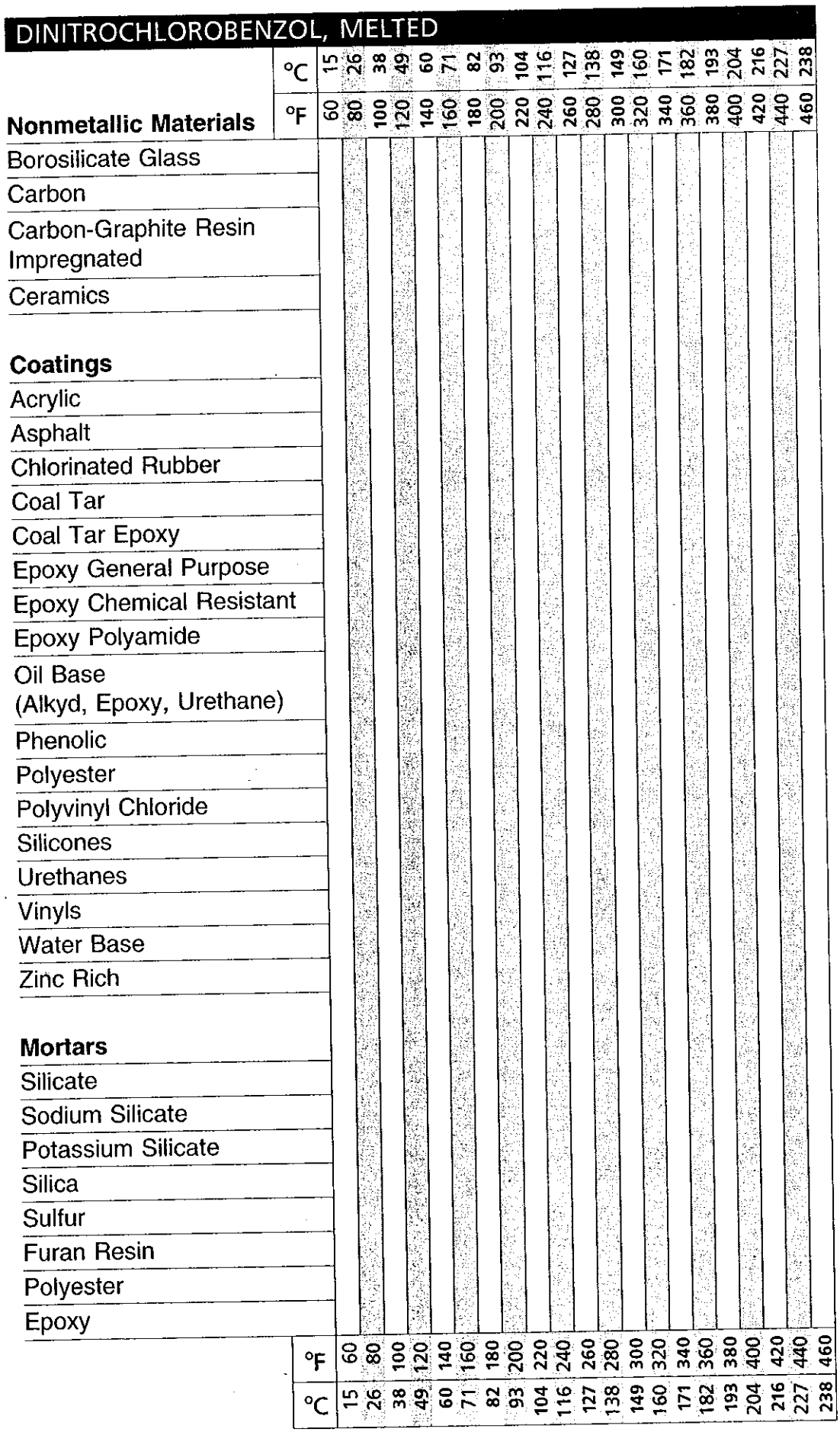
R = Resistant

U = Unsatisfactory

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DINITROCHLOROBENZOL, MELTED



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DINITROCHLOROBENZOL, MELTED

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)																						
Epoxy																						
ETFE (Tefzel)																						
FEP																						
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)																						
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A																						
–Bisphenol A VAPOR																						
Isophthalic VAPOR																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)																						
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)																						
Ryton																						
TFE (Teflon)																						
Vinyl Ester VAPOR																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

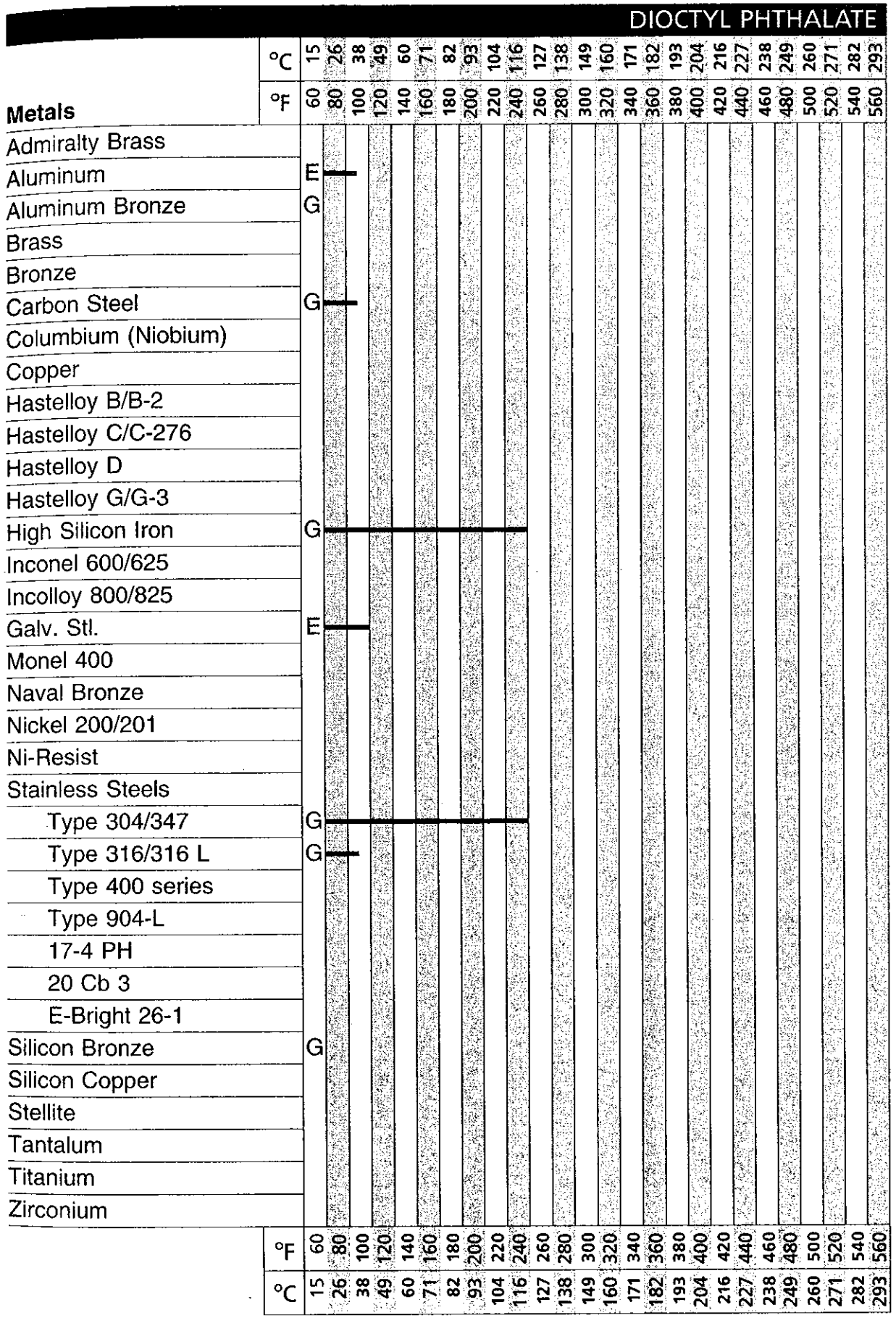
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DINITROCHLOROBENZOL, MELTED

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR) TO 10%																					
Chemraz (FPM)																					
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																					
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)																					
Ethylene-Propylene Terpolymer (EPT)																					
FKM (Viton A)																					
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)																					
Kalrez (FPM)	R	R	R	R	R	R	R	R													
Koroseal																					
Natural Rubber (GRS)																					
Neoprene GR-M (CR)																					
Nitrile Buna-N (NBR)																					
Nordel (EPDM)																					
Polybutadiene (BR)																					
Polyester (PE)																					
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers																					
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

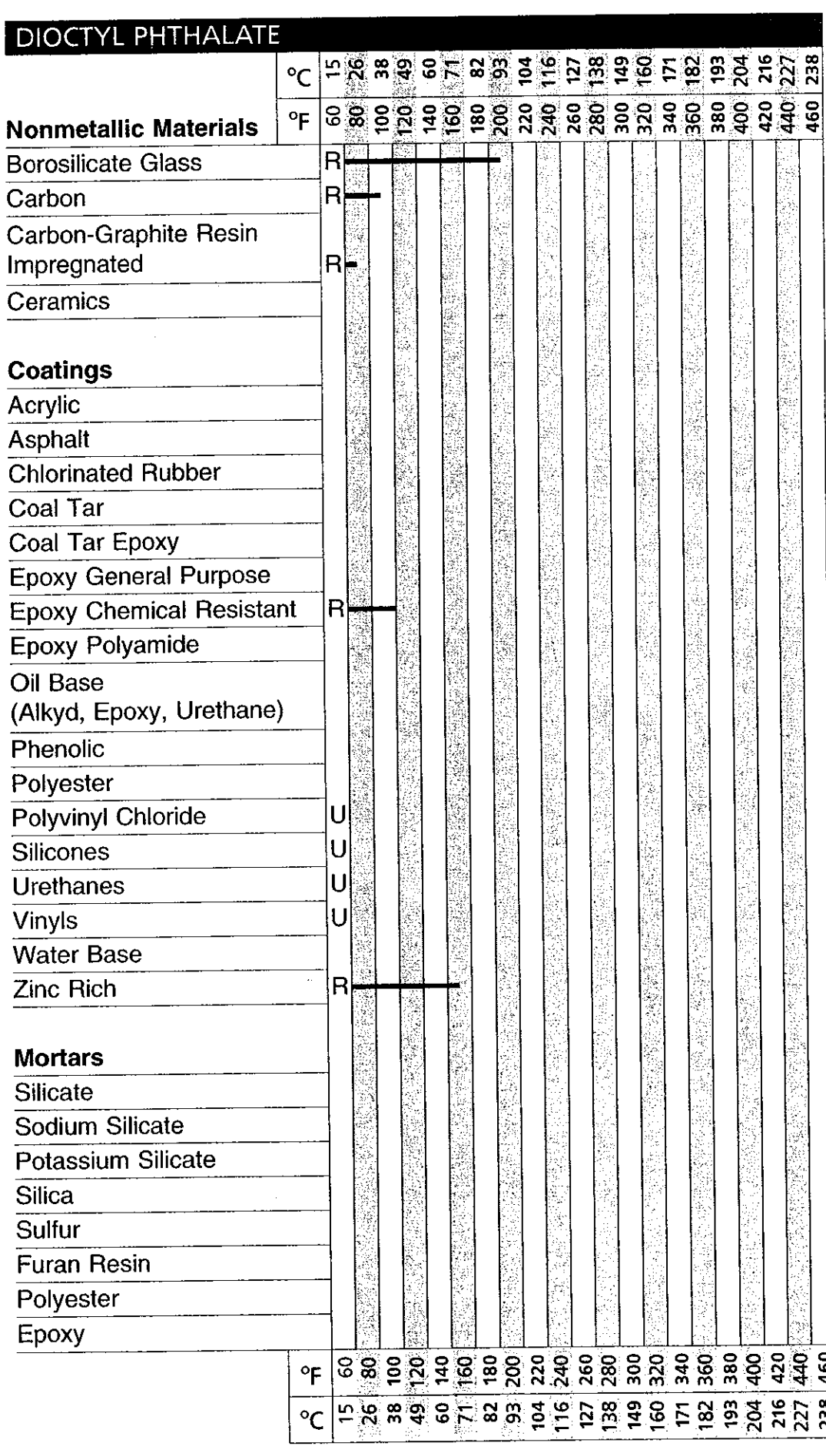
R = Resistant

U = Unsatisfactory

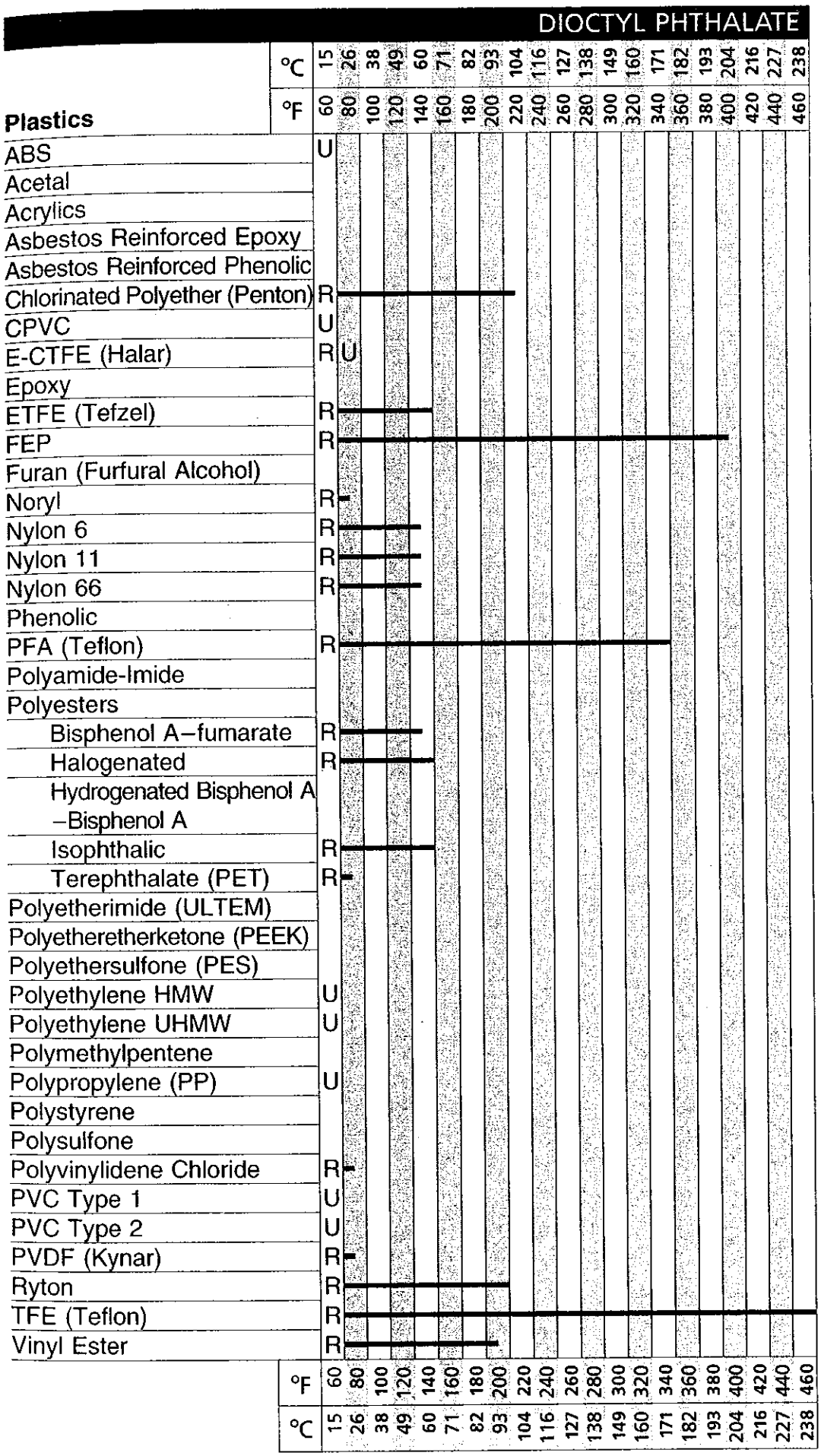
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DIOCTYL PHTHALATE

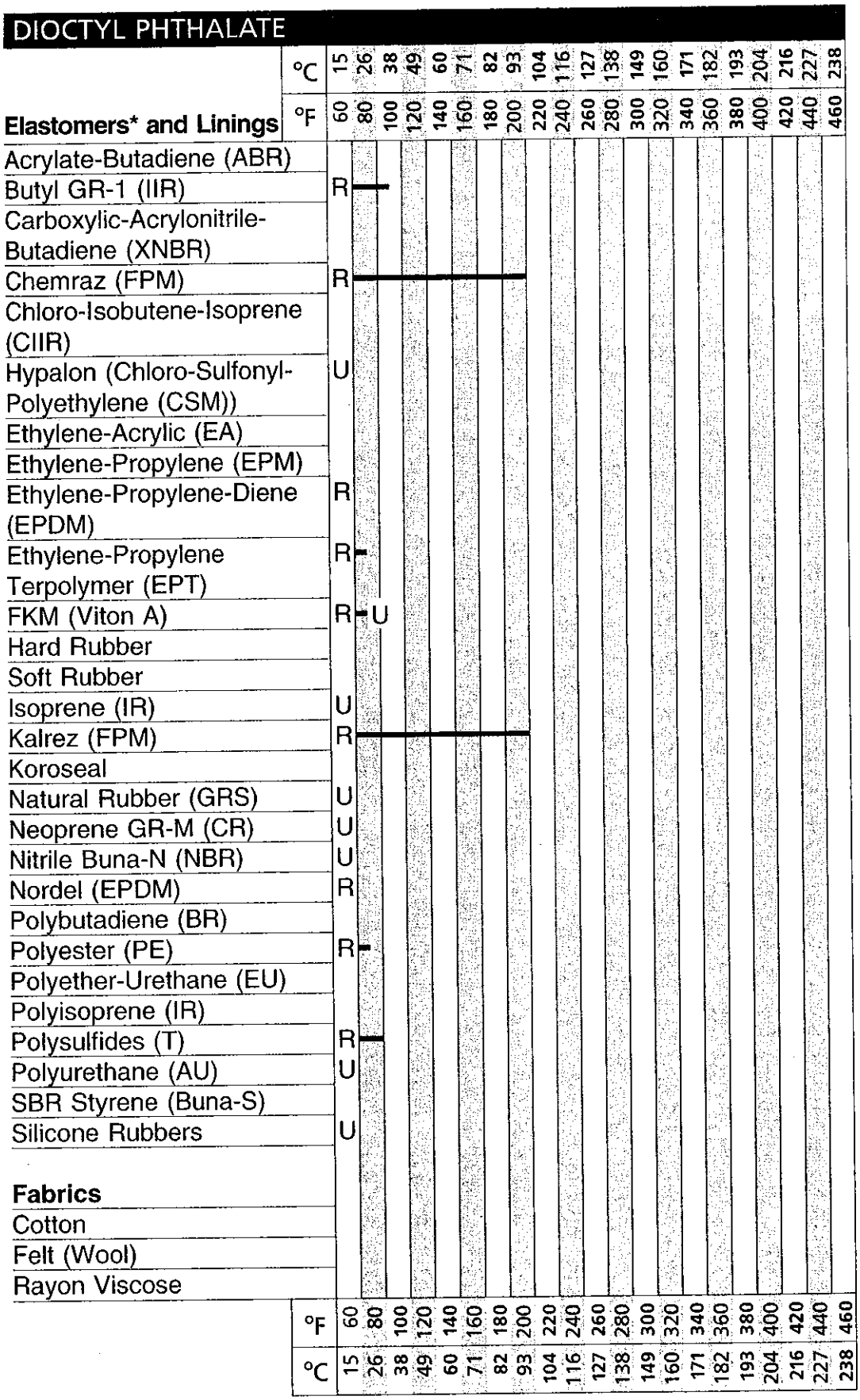


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DIOCTYL PHTHALATE



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Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L																											
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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DIOCTYL SEBACATE

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass		U																				
Carbon		U																				
Carbon-Graphite Resin Impregnated		U																				
Ceramics		U																				
Coatings																						
Acrylic		U																				
Asphalt		U																				
Chlorinated Rubber		U																				
Coal Tar		U																				
Coal Tar Epoxy		U																				
Epoxy General Purpose		U																				
Epoxy Chemical Resistant		U																				
Epoxy Polyamide		U																				
Oil Base (Alkyd, Epoxy, Urethane)		U																				
Phenolic		U																				
Polyester		U																				
Polyvinyl Chloride		U																				
Silicones		U																				
Urethanes		U																				
Vinyls		U																				
Water Base		U																				
Zinc Rich		U																				
Mortars																						
Silicate		U																				
Sodium Silicate		U																				
Potassium Silicate		U																				
Silica		U																				
Sulfur		U																				
Furan Resin		U																				
Polyester		U																				
Epoxy		U																				
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

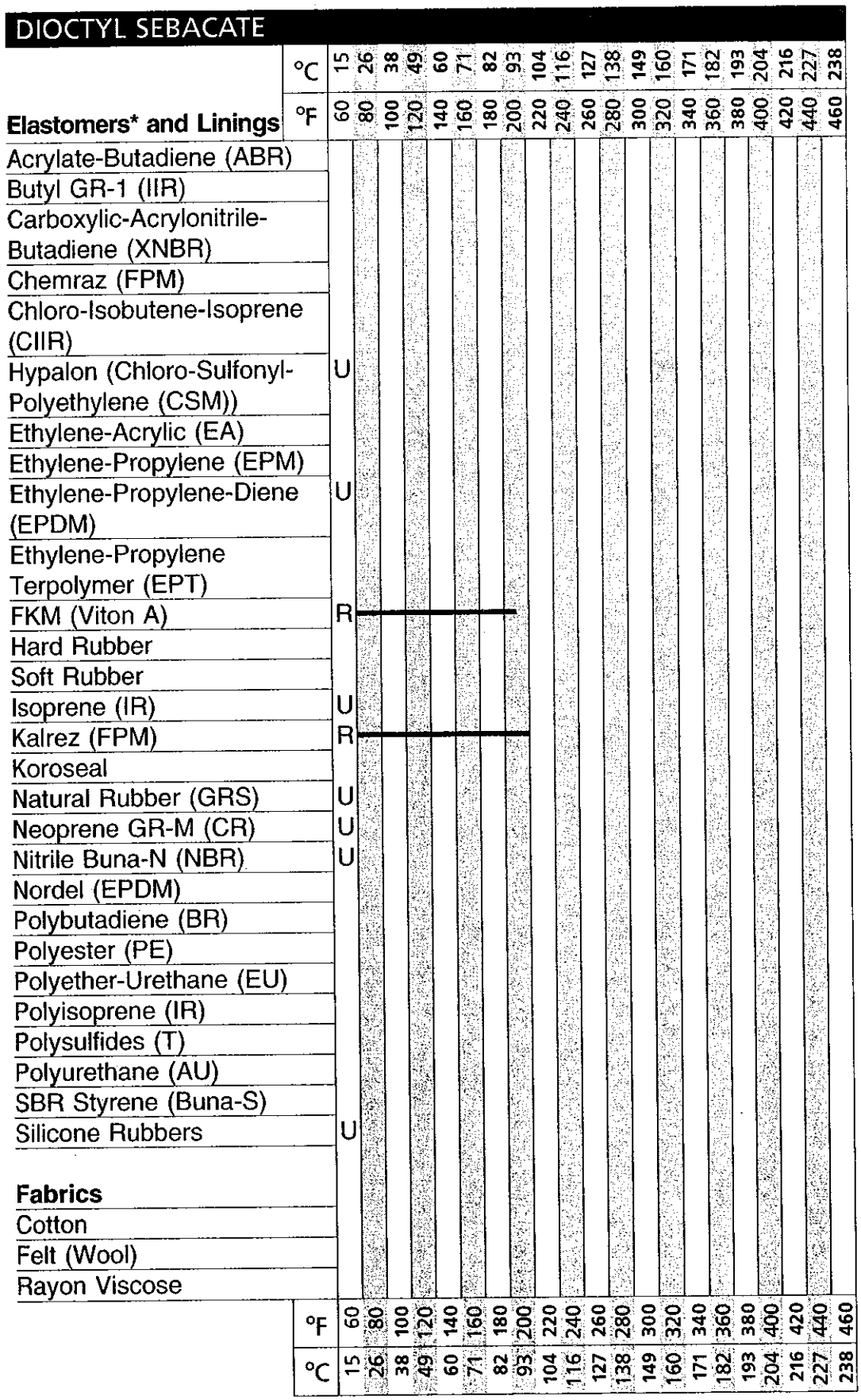
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DIOCTYL SEBACATE

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)																						
Epoxy																						
ETFE (Tefzel)																						
FEP																						
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)																						
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)																						
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)																						
Ryton																						
TFE (Teflon)		R																				
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

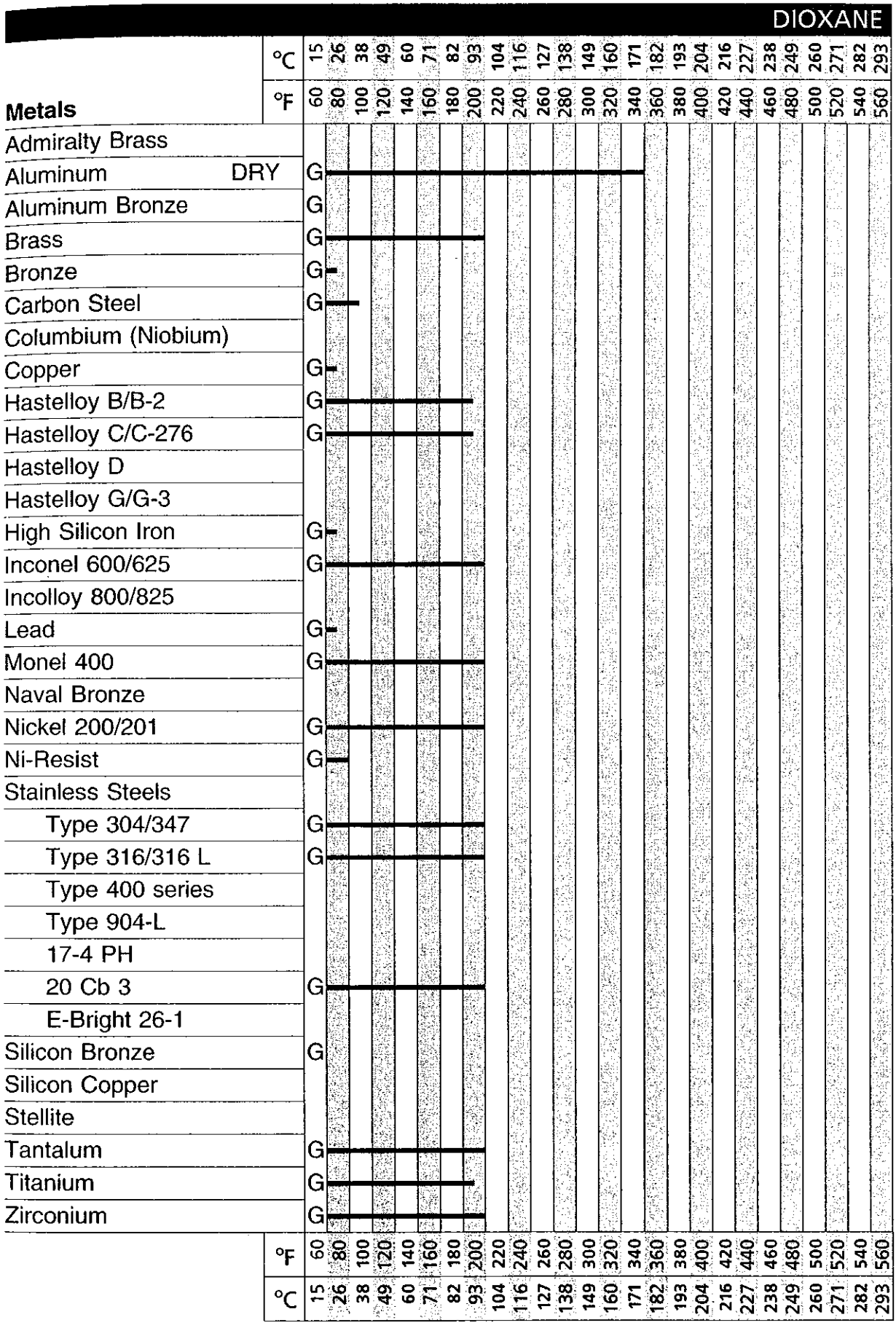
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DIOCTYL SEBACATE



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

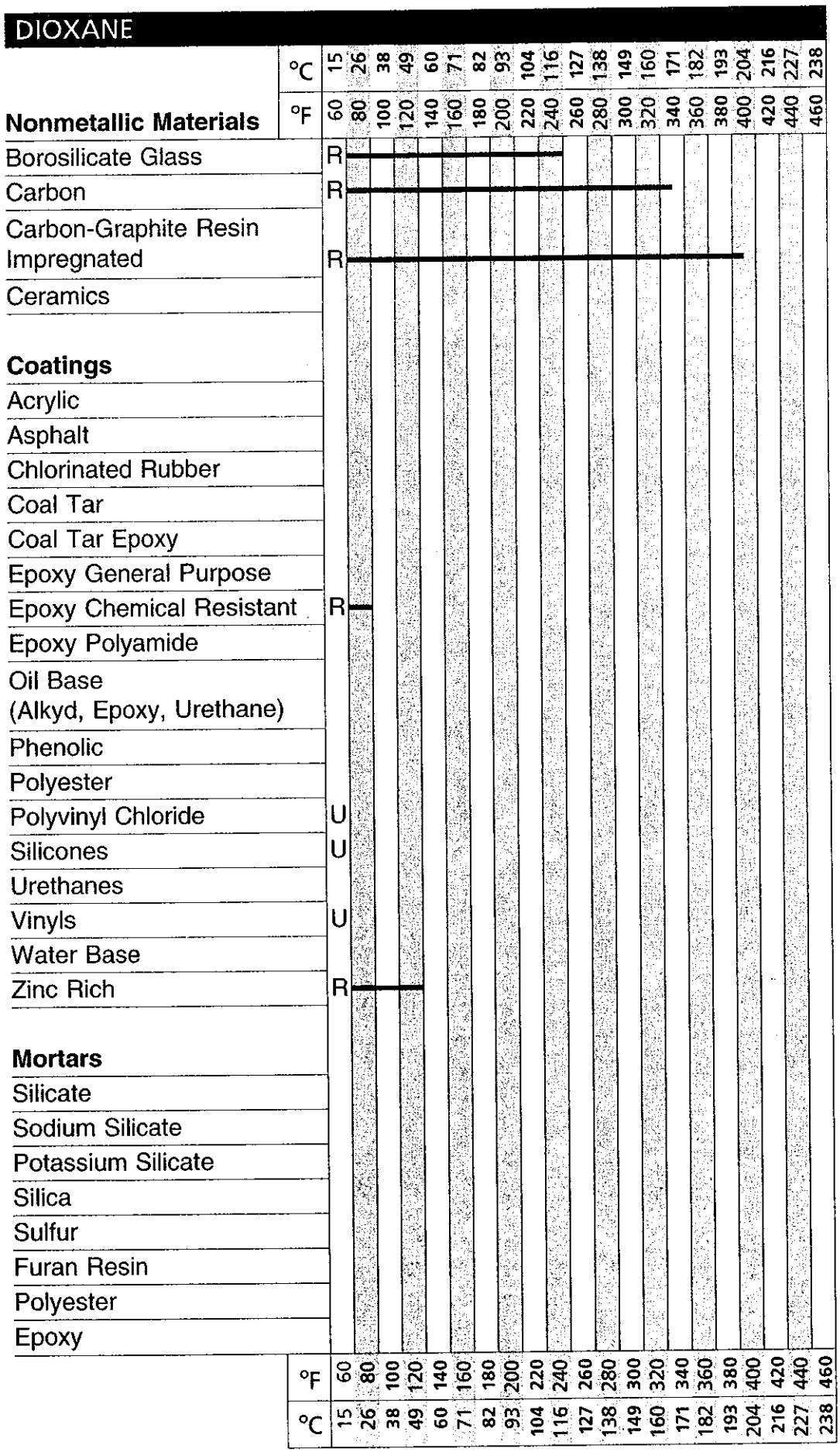
R = Resistant

U = Unsatisfactory

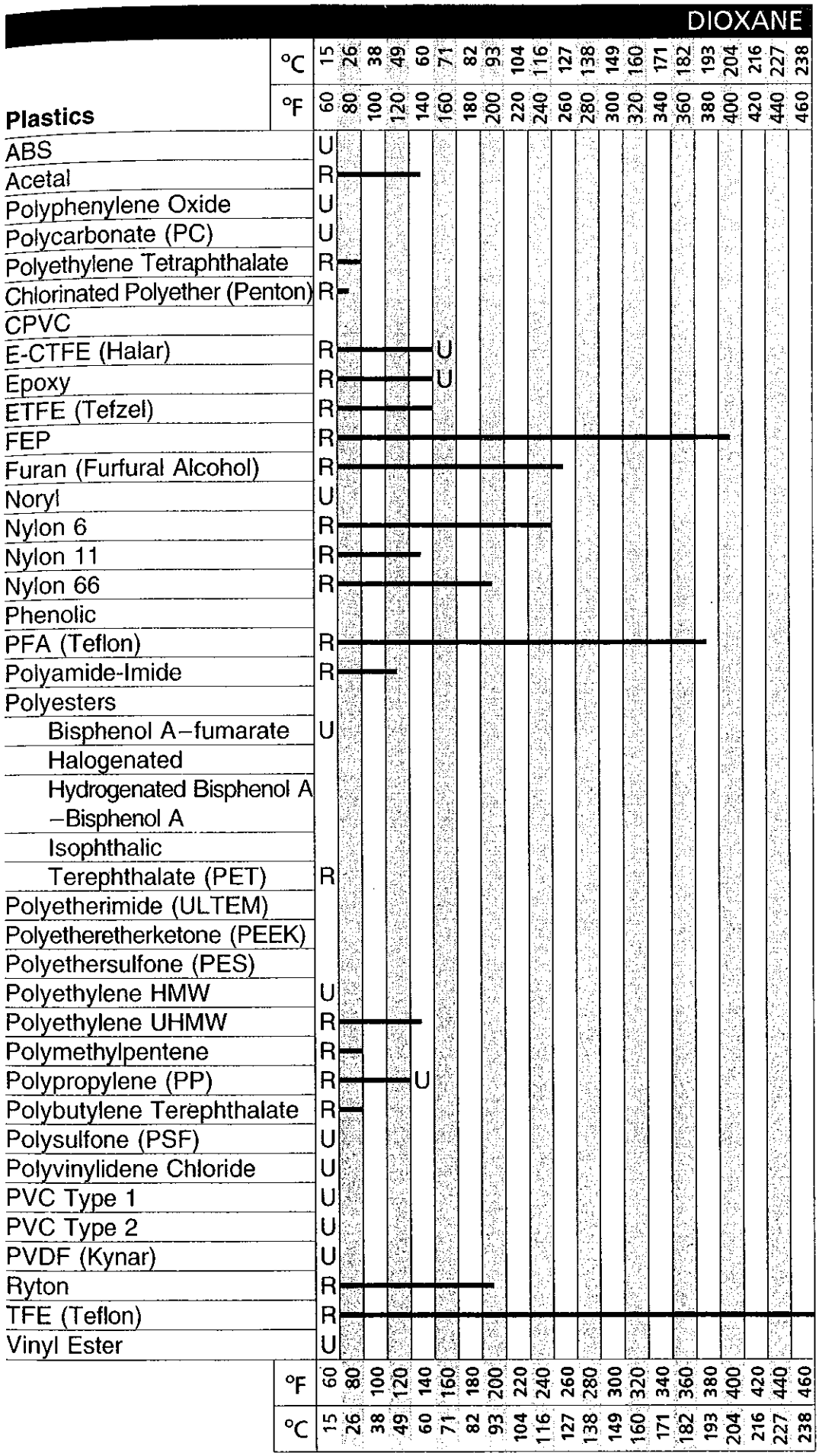
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DIOXANE

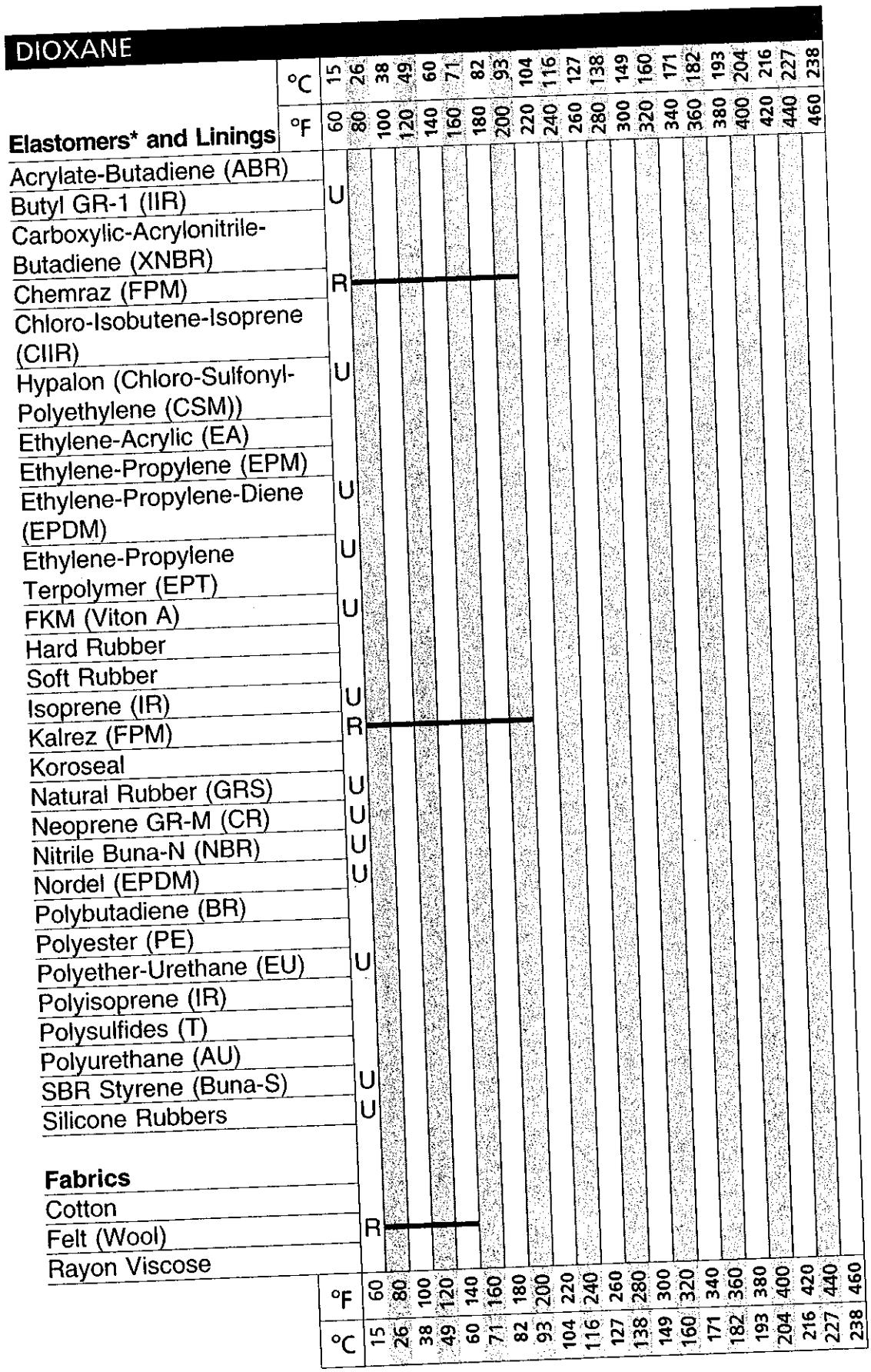


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DIOXANE



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Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L	G	—	—	—	—																						
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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DIPENTENE

Nonmetallic Materials	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																					
Carbon																					
Carbon-Graphite Resin Impregnated																					
Ceramics																					
Coatings																					
Acrylic																					
Asphalt																					
Chlorinated Rubber																					
Coal Tar																					
Coal Tar Epoxy																					
Epoxy General Purpose																					
Epoxy Chemical Resistant																					
Epoxy Polyamide																					
Oil Base (Alkyd, Epoxy, Urethane)																					
Phenolic																					
Polyester																					
Polyvinyl Chloride																					
Silicones	U																				
Urethanes																					
Vinyls																					
Water Base																					
Zinc Rich																					
Mortars																					
Silicate																					
Sodium Silicate																					
Potassium Silicate																					
Silica																					
Sulfur																					
Furan Resin																					
Polyester																					
Epoxy																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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DIPENTENE

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)																						
Epoxy																						
ETFE (Tefzel)																						
FEP																						
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)																						
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
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Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)																						
Ryton																						
TFE (Teflon)		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Vinyl Ester		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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DIPENTENE

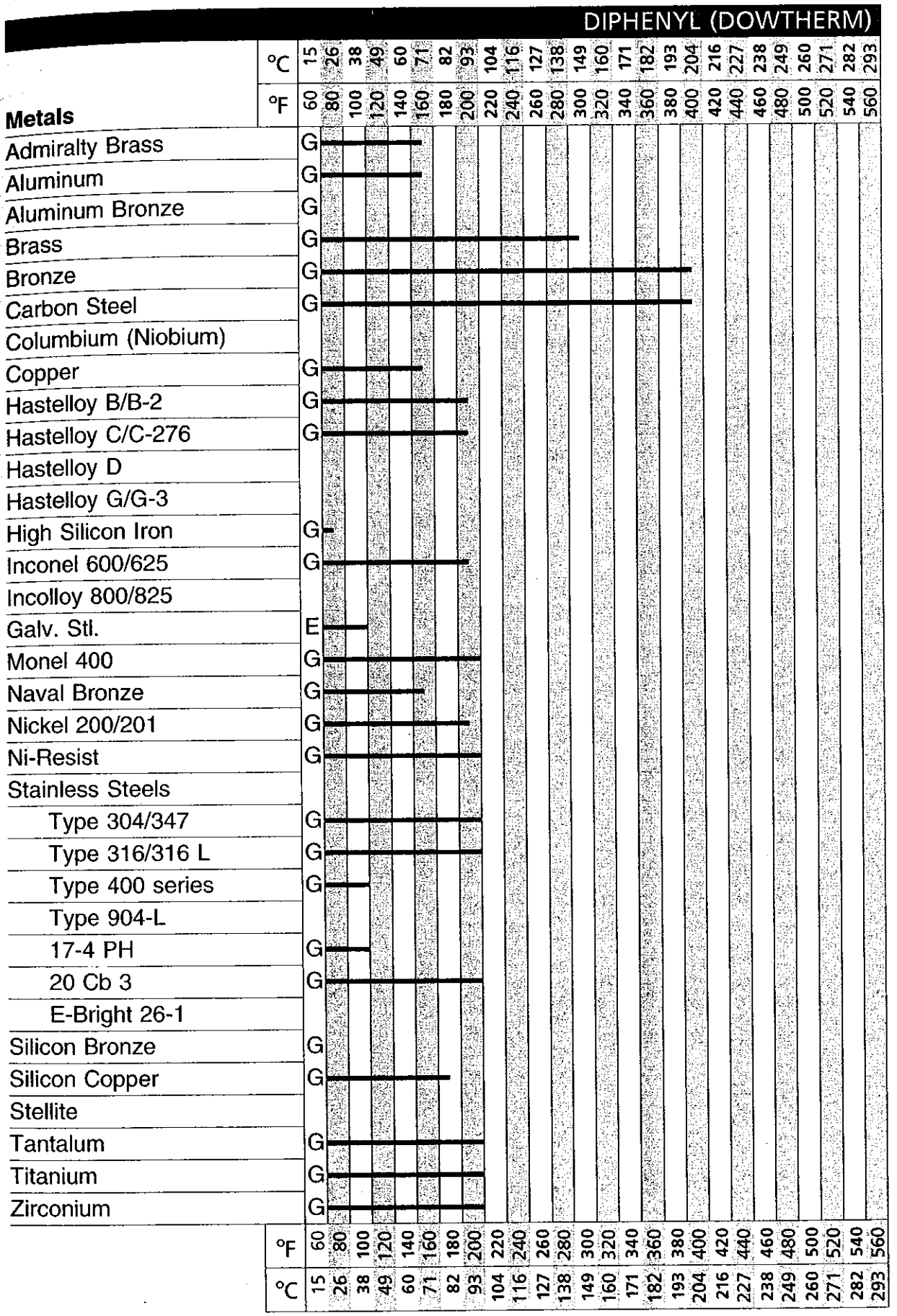
Elastomers* and Linings	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)																					
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	U																				
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)	U																				
Ethylene-Propylene Terpolymer (EPT)																					
FKM (Viton A)	R																				
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)	U																				
Kalrez (FPM)	R																				
Koroseal																					
Natural Rubber (GRS)	U																				
Neoprene GR-M (CR)	U																				
Nitrile Buna-N (NBR)	U																				
Nordel (EPDM)																					
Polybutadiene (BR)																					
Polyester (PE)																					
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers	U																				
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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DIPHENYL (DOWTHERM)



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

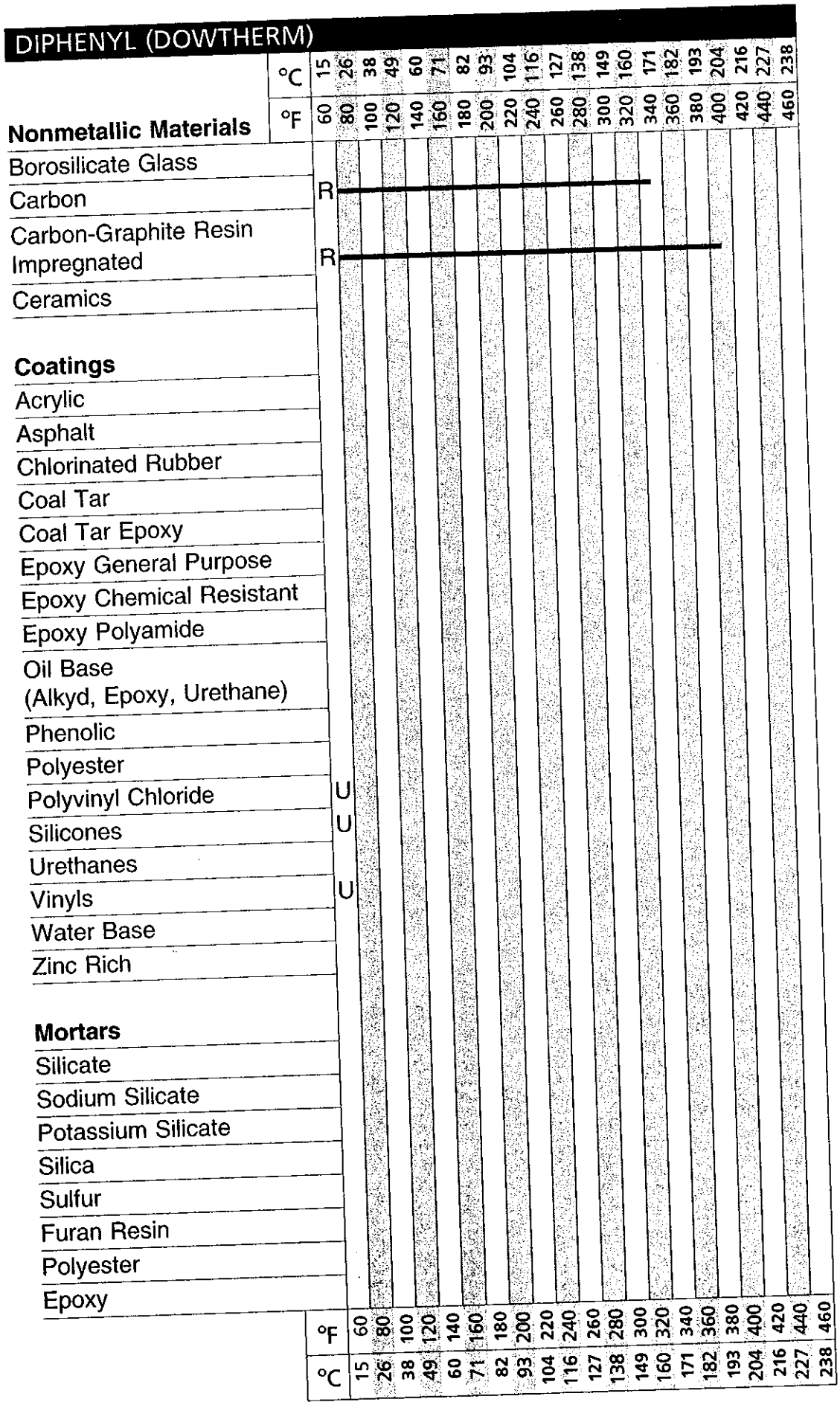
R = Resistant

U = Unsatisfactory

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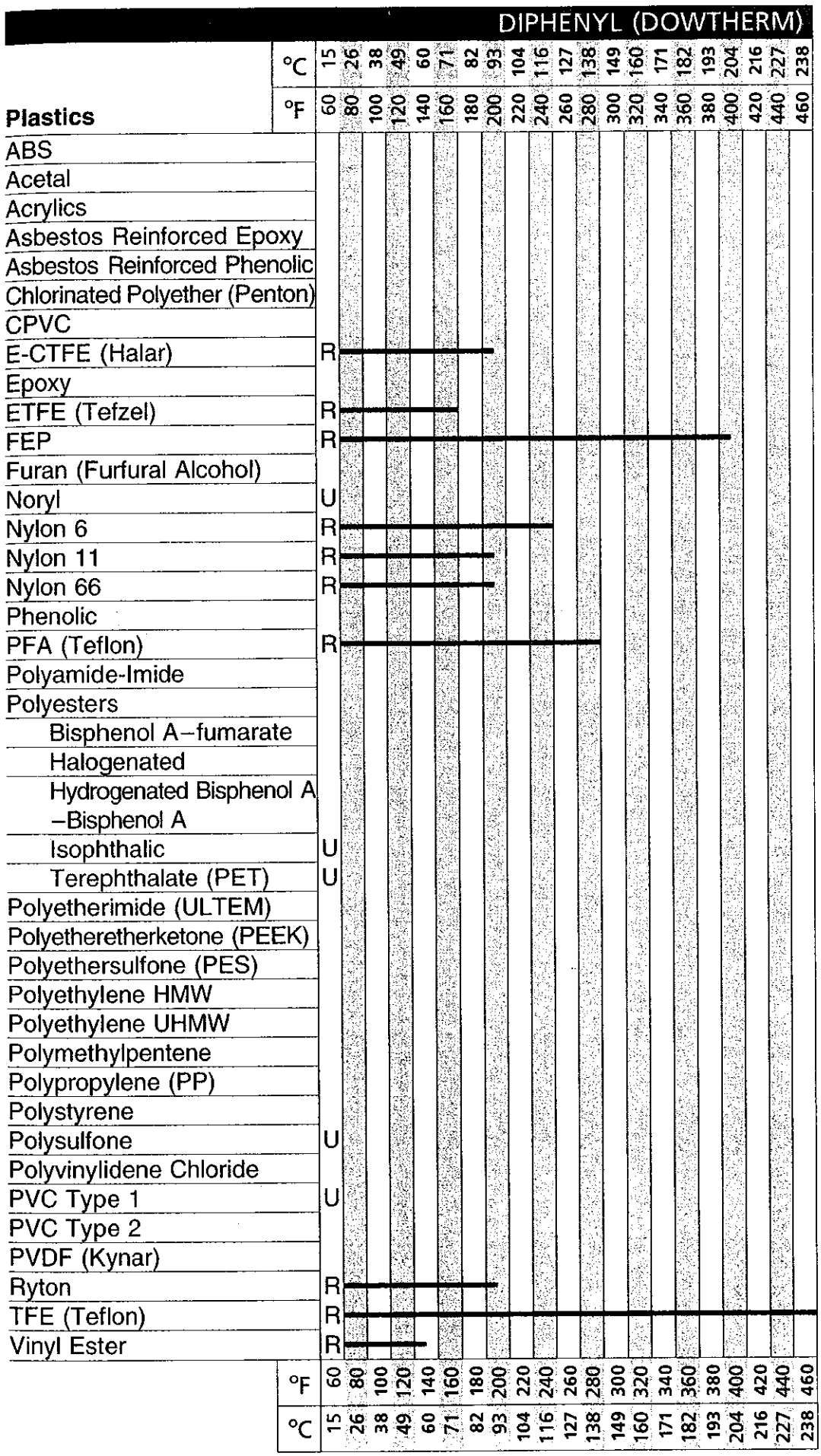
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DIPHENYL (DOWTHERM)



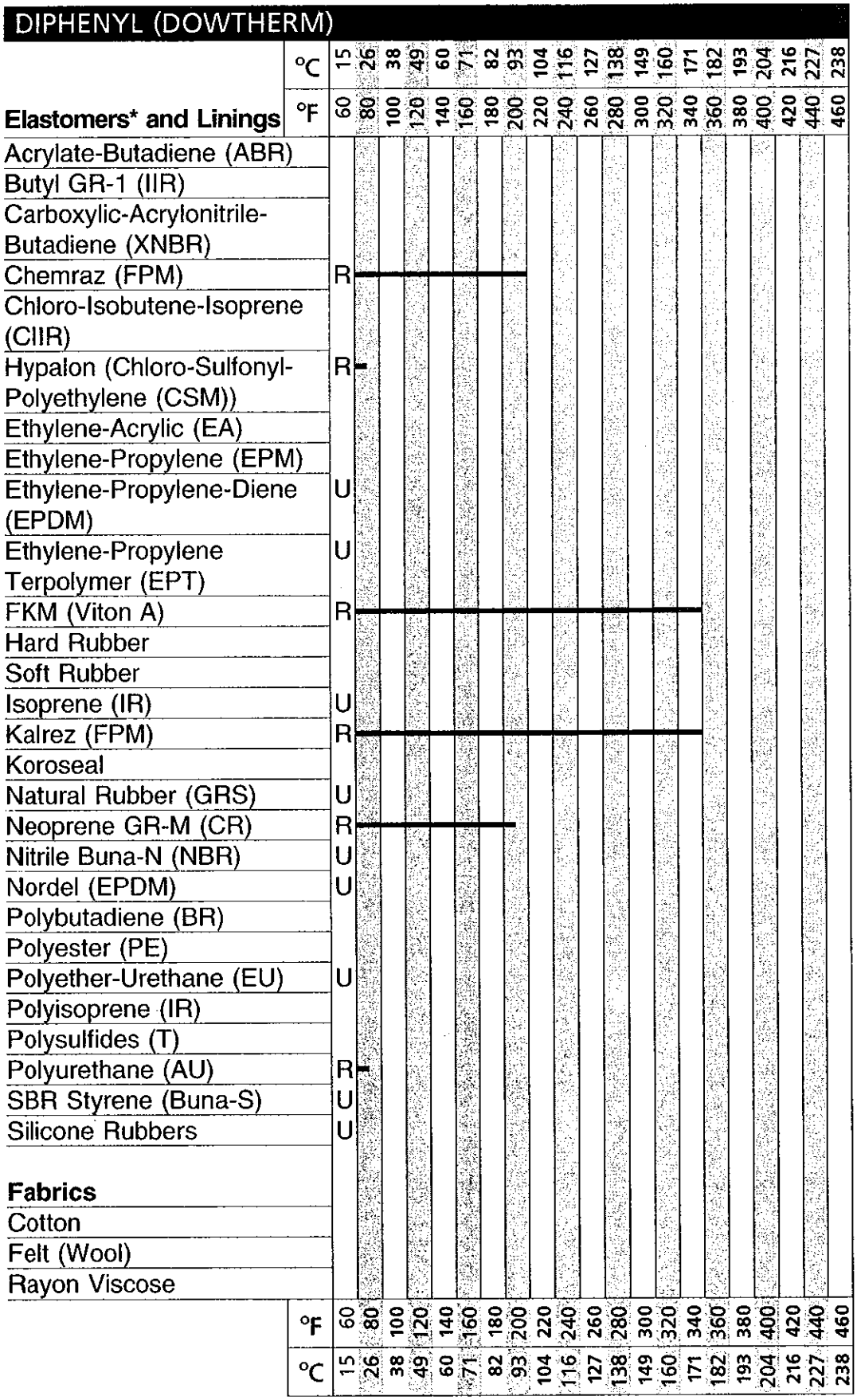
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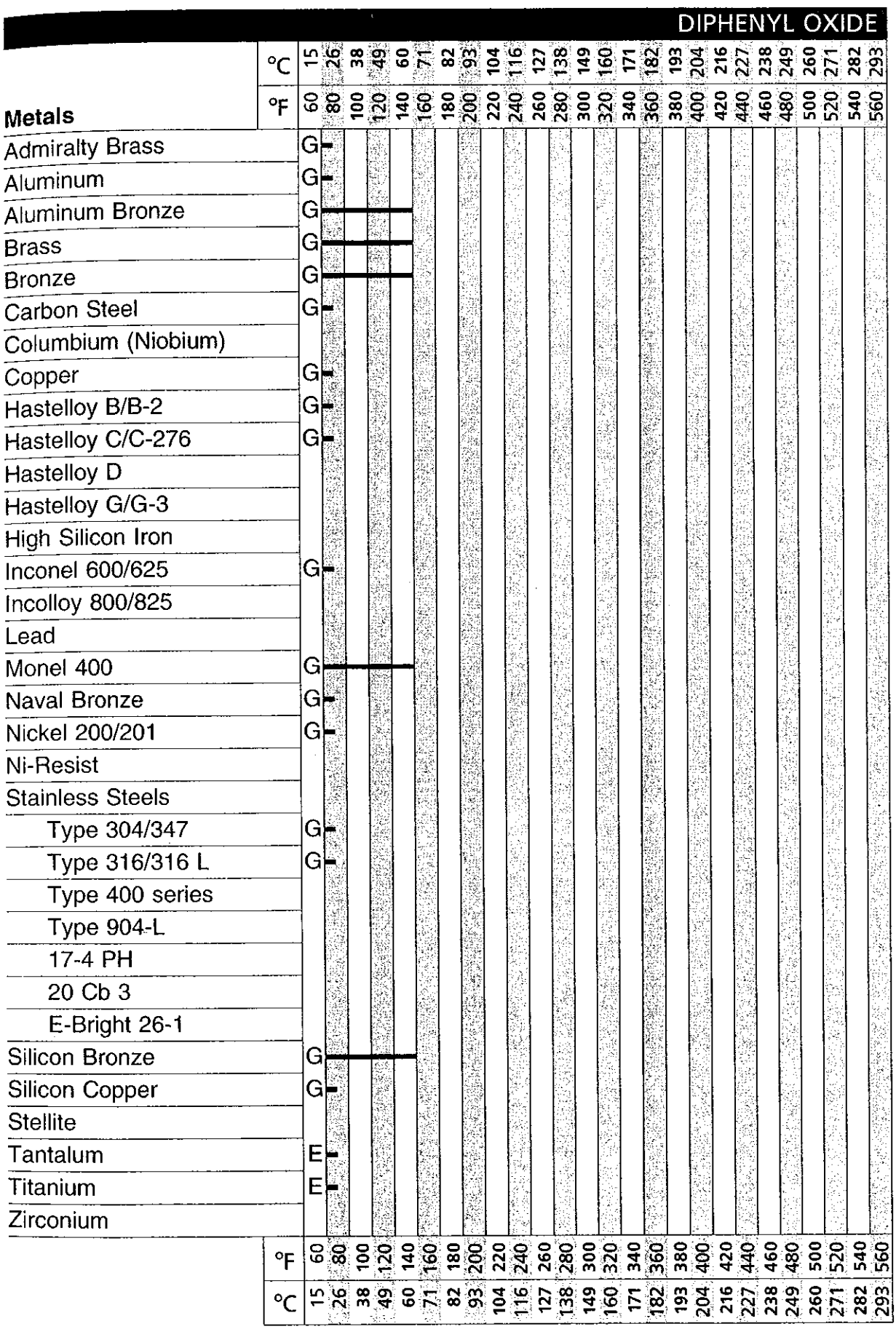
DIPHENYL (DOWTHERM)



*See also Nylon 11 under PLASTICS

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DIPHENYL OXIDE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

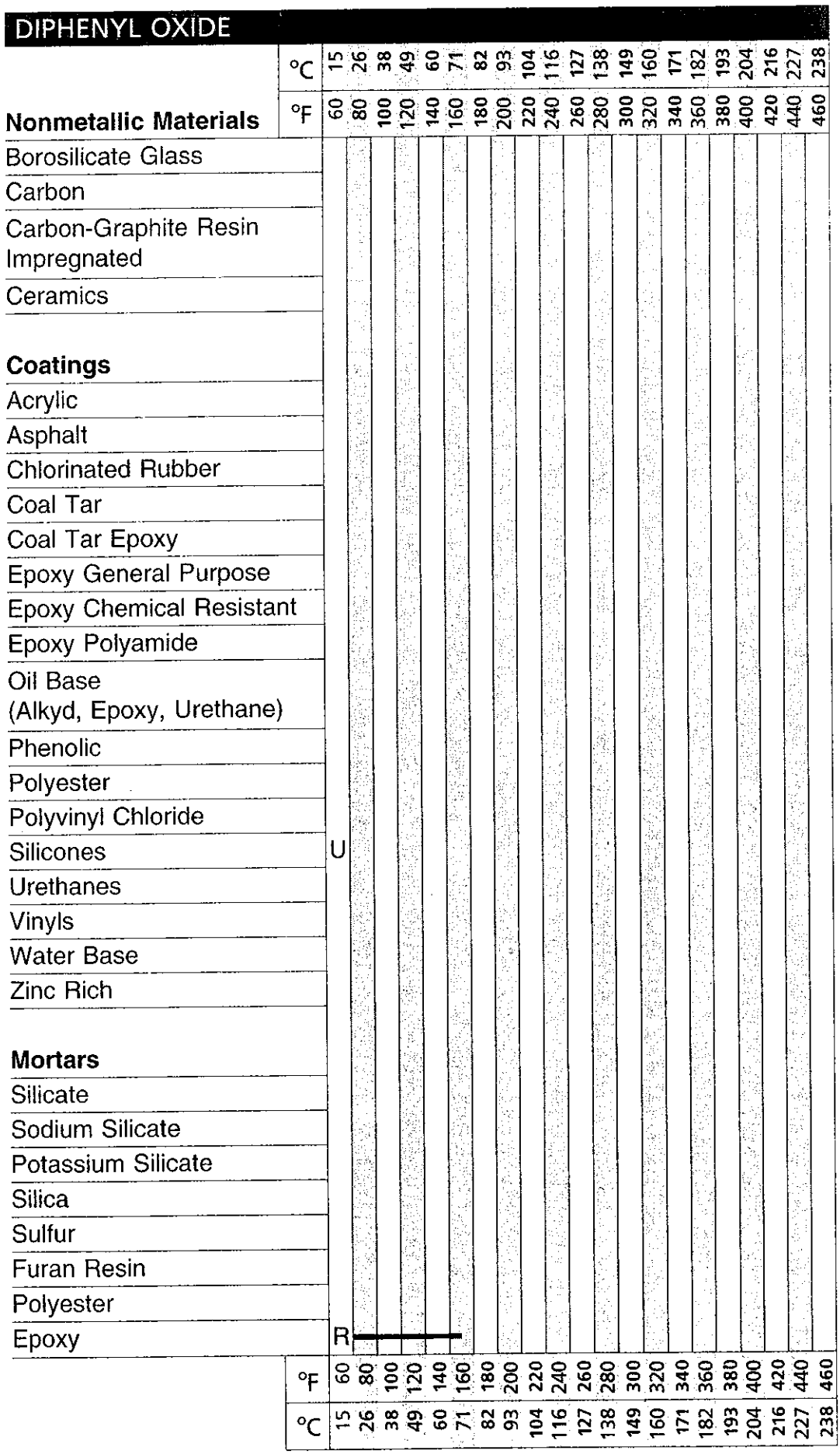
R = Resistant

U = Unsatisfactory

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DIPHENYL OXIDE



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DIPHENYL OXIDE

Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC		
E-CTFE (Halar)		
Epoxy	R	
ETFE (Tefzel)	R	
FEP		
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated		
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	U	
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)	R	
Polystyrene		
Polysulfone		
Polyvinylidene Chloride	U	
PVC Type 1		
PVC Type 2		
PVDF (Kynar)	R	
Ryton		
TFE (Teflon)	R	
Vinyl Ester	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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DIPHENYL OXIDE

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	U																					
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)	R																					
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)	R																					
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)	U																					
Kalrez (FPM)	R																					
Koroseal																						
Natural Rubber (GRS)	U																					
Neoprene GR-M (CR)	U																					
Nitrile Buna-N (NBR)	U																					
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers	U																					
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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DISODIUM PHOSPHATE

Metals	°C	°F
Admiralty Brass		
Aluminum		
Aluminum Bronze		
Brass	S	
Bronze	S	
Carbon Steel	E	
Columbium (Niobium)		
Copper		
Hastelloy B/B-2		
Hastelloy C/C-276		
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625		
Incolloy 800/825		
Lead		
Monel 400		
Naval Bronze		
Nickel 200/201		
Ni-Resist		
Stainless Steels		
Type 304/347		
Type 316/316 L	E	
Type 400 series		
Type 904-L		
17-4 PH		
20 Cb 3	G	
E-Bright 26-1		
Silicon Bronze	S	
Silicon Copper		
Stellite		
Tantalum		
Titanium		
Zirconium		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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DISODIUM PHOSPHATE

Nonmetallic Materials	°C	°F
Borosilicate Glass		
Carbon		
Carbon-Graphite Resin Impregnated		
Ceramics		
Coatings		
Acrylic		
Asphalt		
Chlorinated Rubber		
Coal Tar		
Coal Tar Epoxy		
Epoxy General Purpose		
Epoxy Chemical Resistant		
Epoxy Polyamide		
Oil Base (Alkyd, Epoxy, Urethane)		
Phenolic		
Polyester		
Polyvinyl Chloride	R	
Silicones		
Urethanes		
Vinyls	R	
Water Base		
Zinc Rich		
Mortars		
Silicate		
Sodium Silicate		
Potassium Silicate		
Silica		
Sulfur		
Furan Resin		
Polyester		
Epoxy		

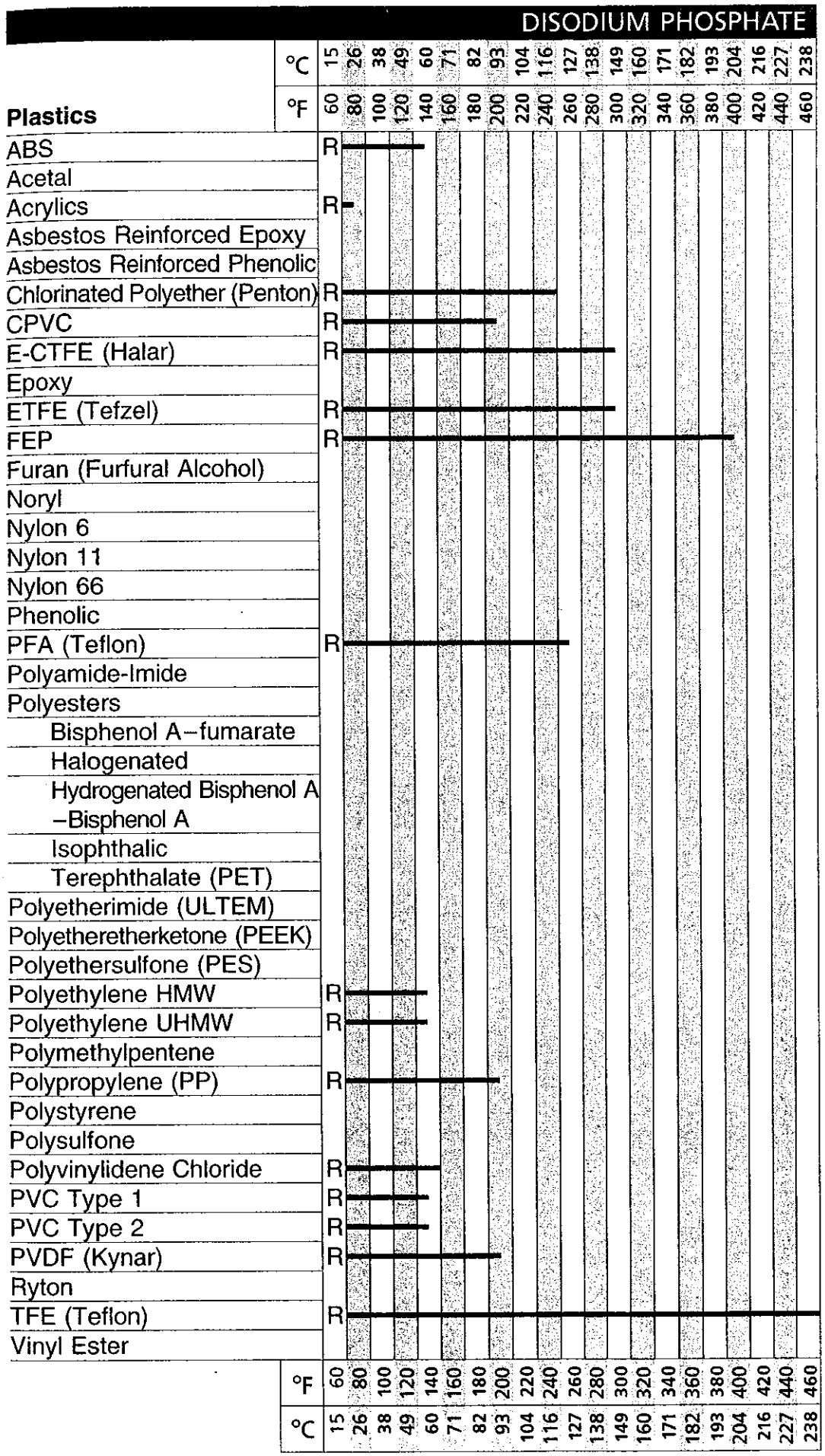
°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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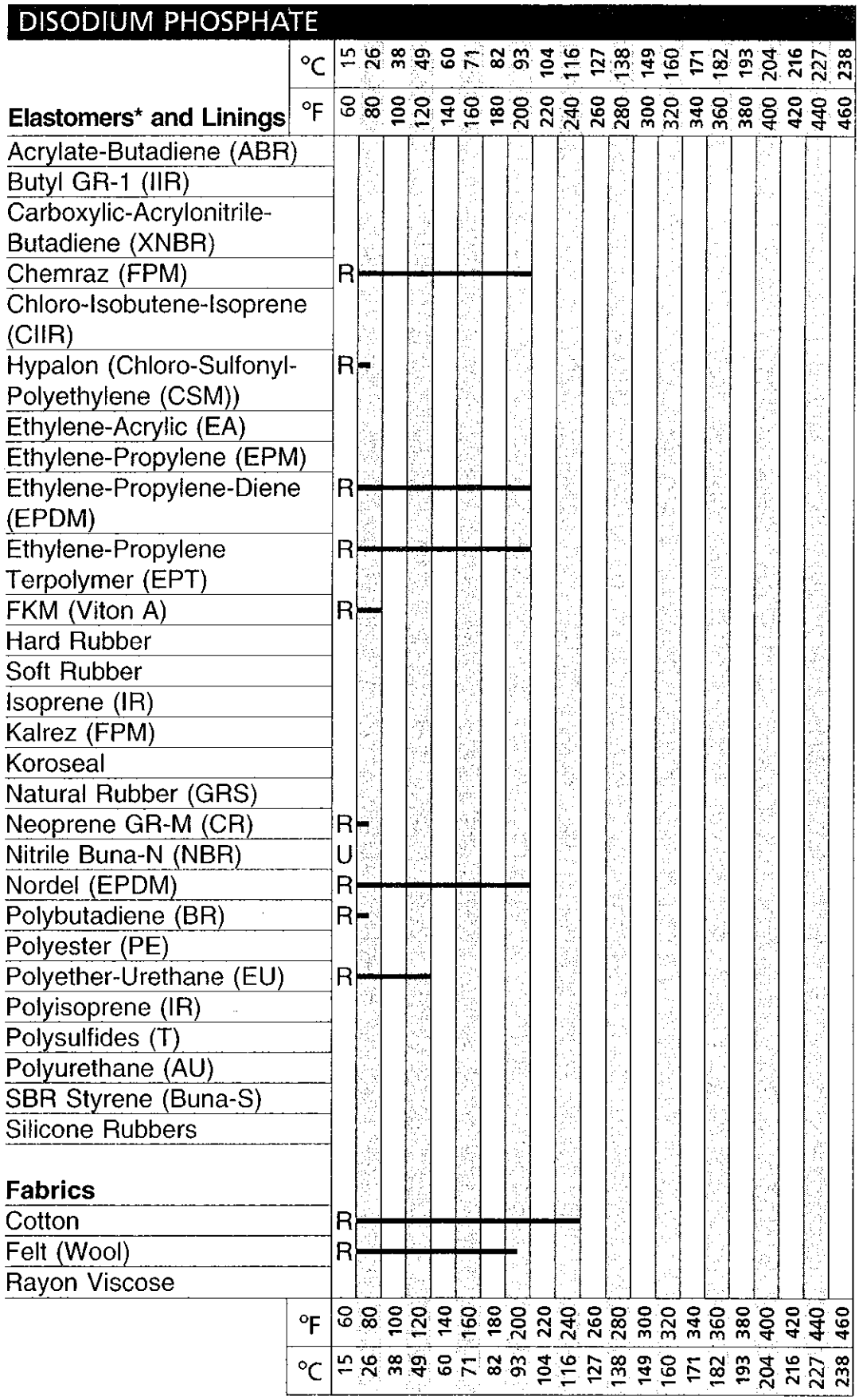
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DISODIUM PHOSPHATE



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DISODIUM PHOSPHATE



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EPICHLORHYDRIN

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																												
Aluminum			G																									
Aluminum Bronze																												
Galv. Stl.			E																									
Bronze																												
Carbon Steel			G																									
Columbium (Niobium)																												
Copper																												
Hastelloy B/B-2			E																									
Hastelloy C/C-276			E																									
Hastelloy D																												
Hastelloy G/G-3																												
High Silicon Iron			G																									
Inconel 600/625			G																									
Incolloy 800/825																												
Lead			G																									
Monel 400			G																									
Naval Bronze																												
Nickel 200/201			G																									
Ni-Resist																												
Stainless Steels																												
Type 304/347	1		G																									
Type 316/316 L			G																									
Type 400 series																												
Type 904-L																												
17-4 PH																												
20 Cb 3			G																									
E-Bright 26-1																												
Silicon Bronze																												
Silicon Copper																												
Stellite																												
Tantalum			G																									
Titanium																												
Zirconium																												
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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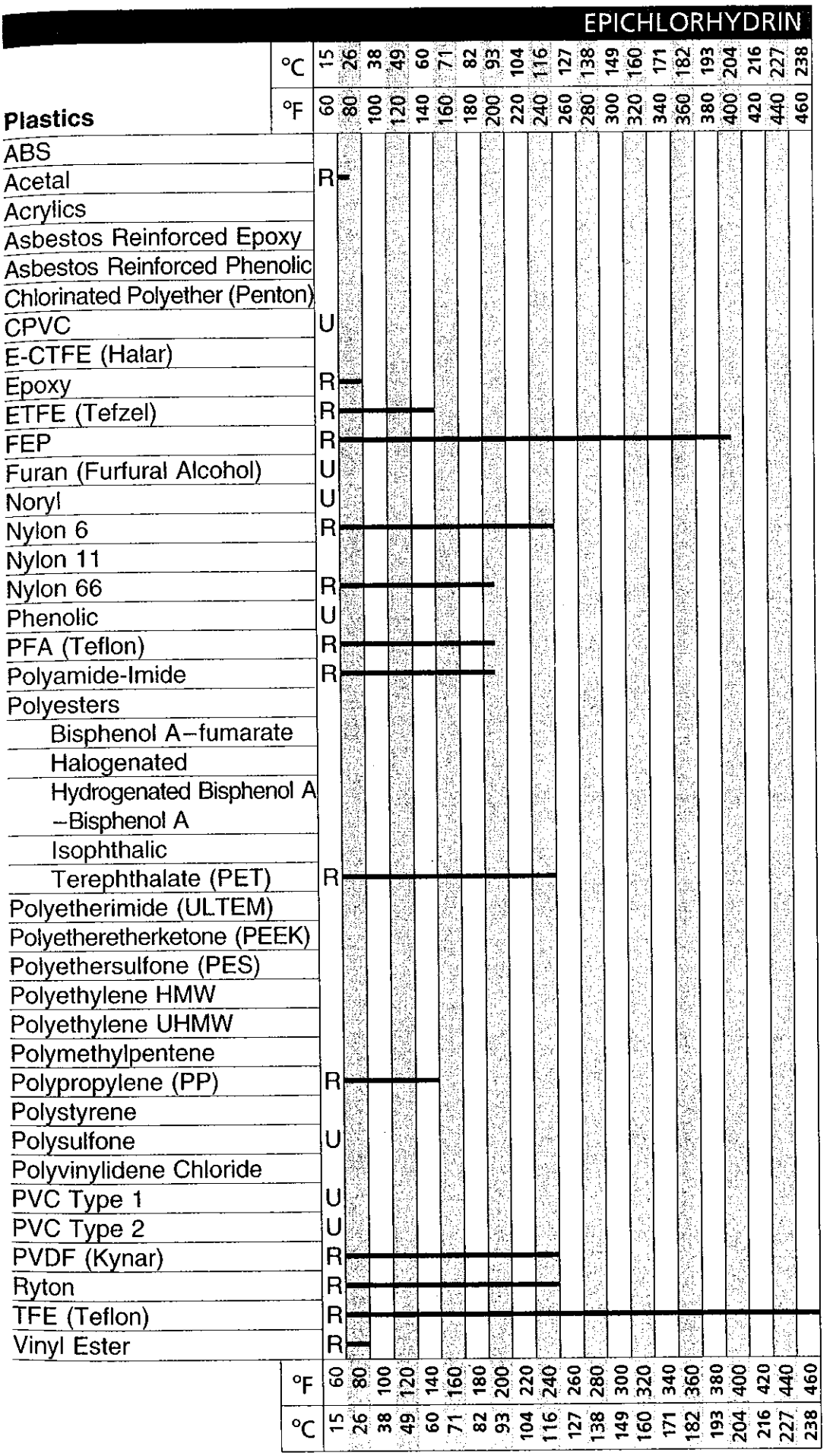
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EPICHLORHYDRIN

Nonmetallic Materials	°C 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238
	°F 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460
Borosilicate Glass	R
Carbon	R
Carbon-Graphite Resin Impregnated	R
Ceramics	
Coatings	
Acrylic	
Asphalt	
Chlorinated Rubber	
Coal Tar	
Coal Tar Epoxy	U
Epoxy General Purpose	U
Epoxy Chemical Resistant	U
Epoxy Polyamide	
Oil Base (Alkyd, Epoxy, Urethane)	
Phenolic	U
Polyester	
Polyvinyl Chloride	U
Silicones	U
Urethanes	
Vinyls	
Water Base	
Zinc Rich	R
Mortars	
Silicate	
Sodium Silicate	
Potassium Silicate	
Silica	
Sulfur	
Furan Resin	
Polyester	
Epoxy	
	°F 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460
	°C 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

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EPICHLORHYDRIN



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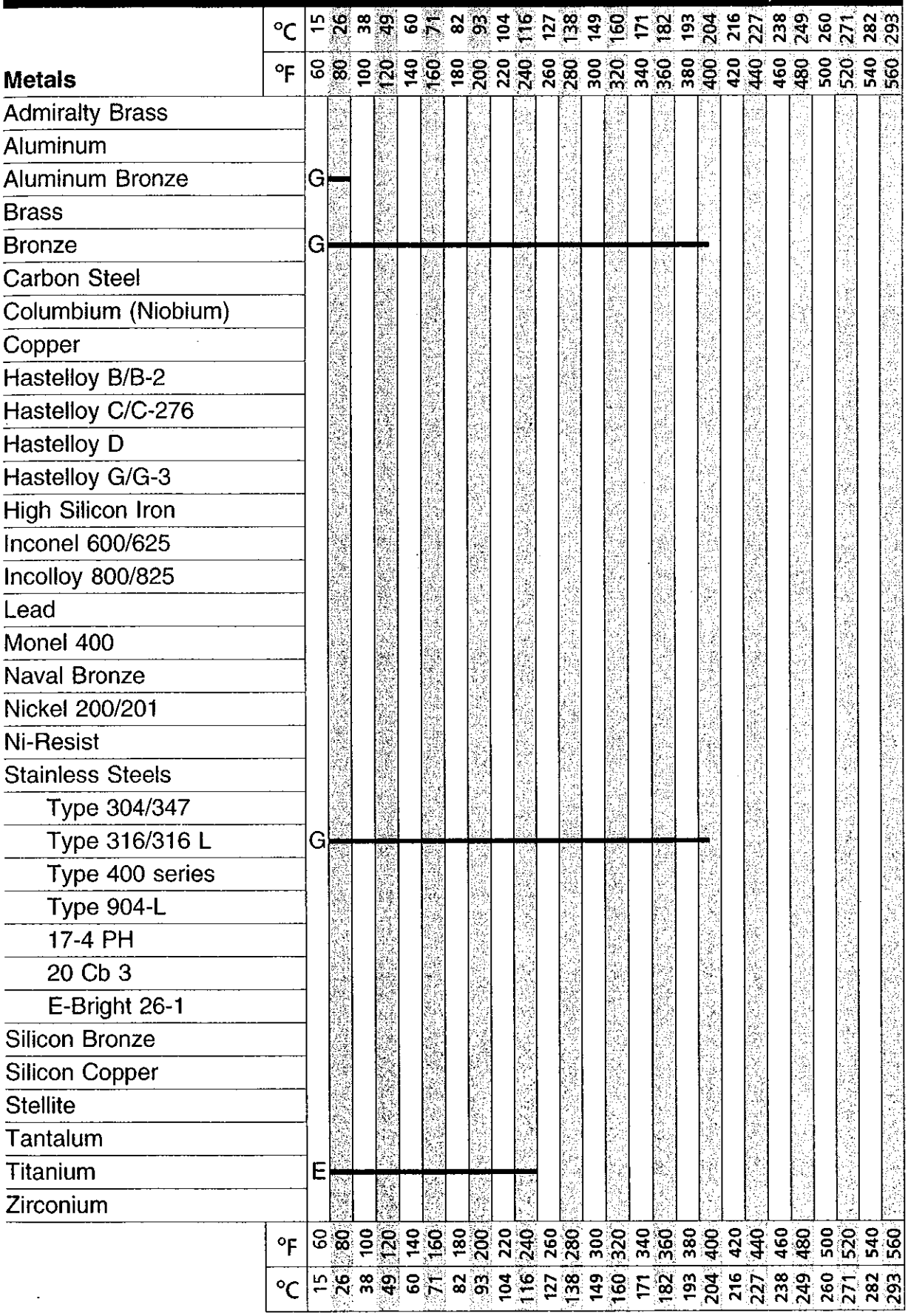
EPICHLORHYDRIN

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)	U																				
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)	R	—	—	—	—	—	—	—													
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																					
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)	U																				
Ethylene-Propylene Terpolymer (EPT)	U																				
FKM (Viton A)	U																				
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)	U																				
Kalrez (FPM)	R	—	—	—	—	—	—	—													
Koroseal																					
Natural Rubber (GRS)	U																				
Neoprene GR-M (CR)	U																				
Nitrile Buna-N (NBR)	U																				
Nordel (EPDM)	U																				
Polybutadiene (BR)																					
Polyester (PE)	U																				
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers	U																				
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

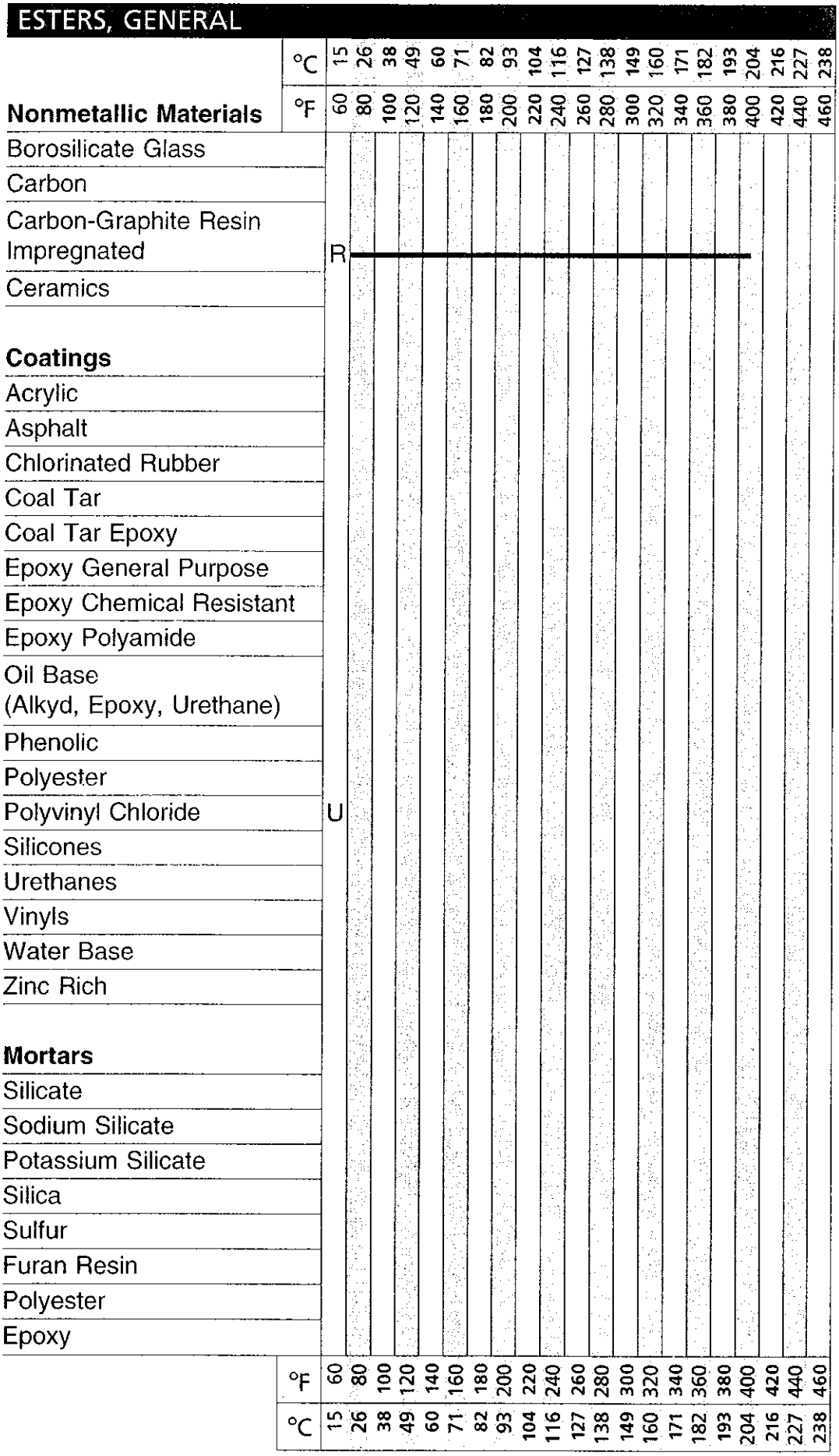
R = Resistant

U = Unsatisfactory

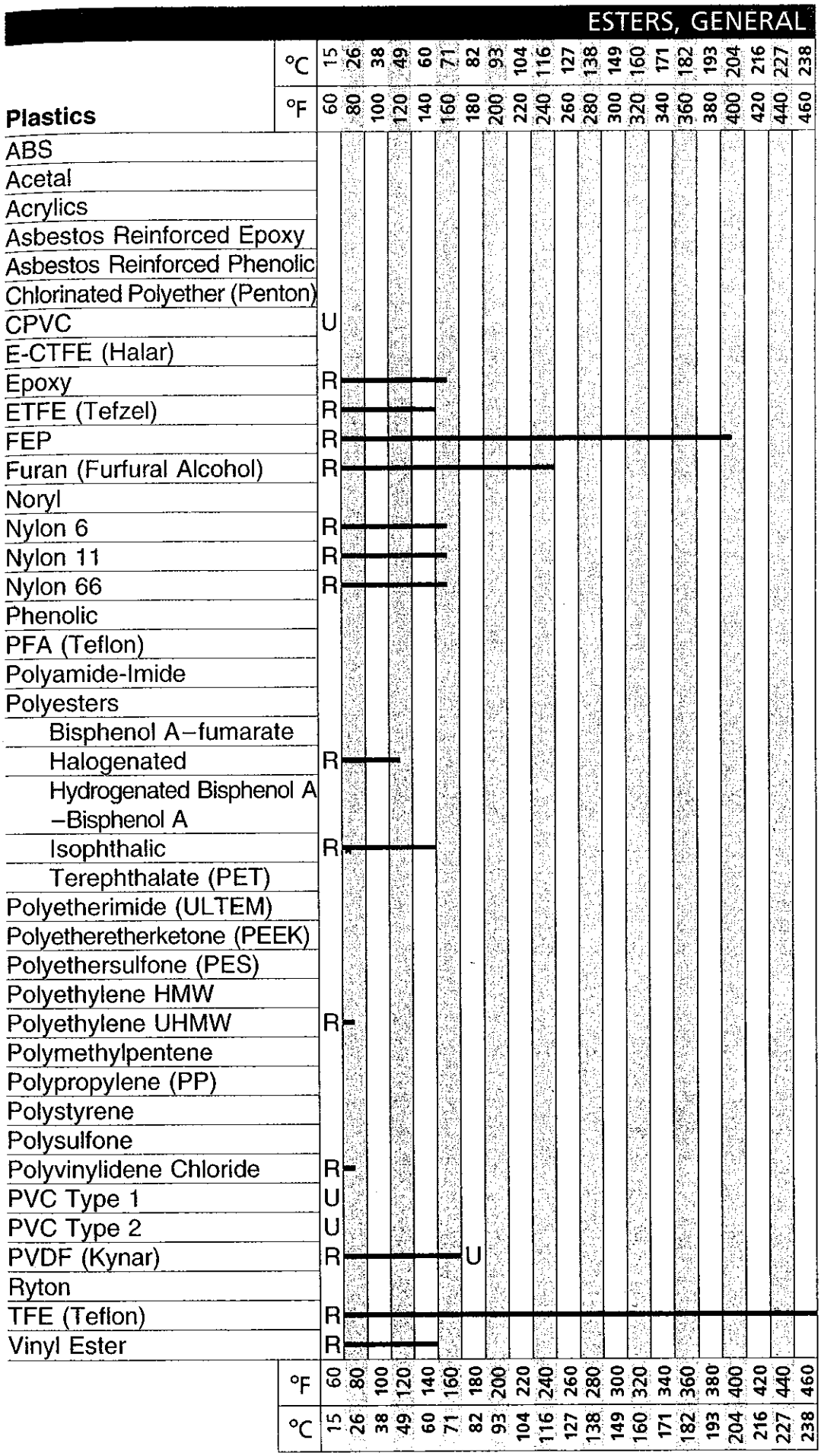
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ESTERS, GENERAL

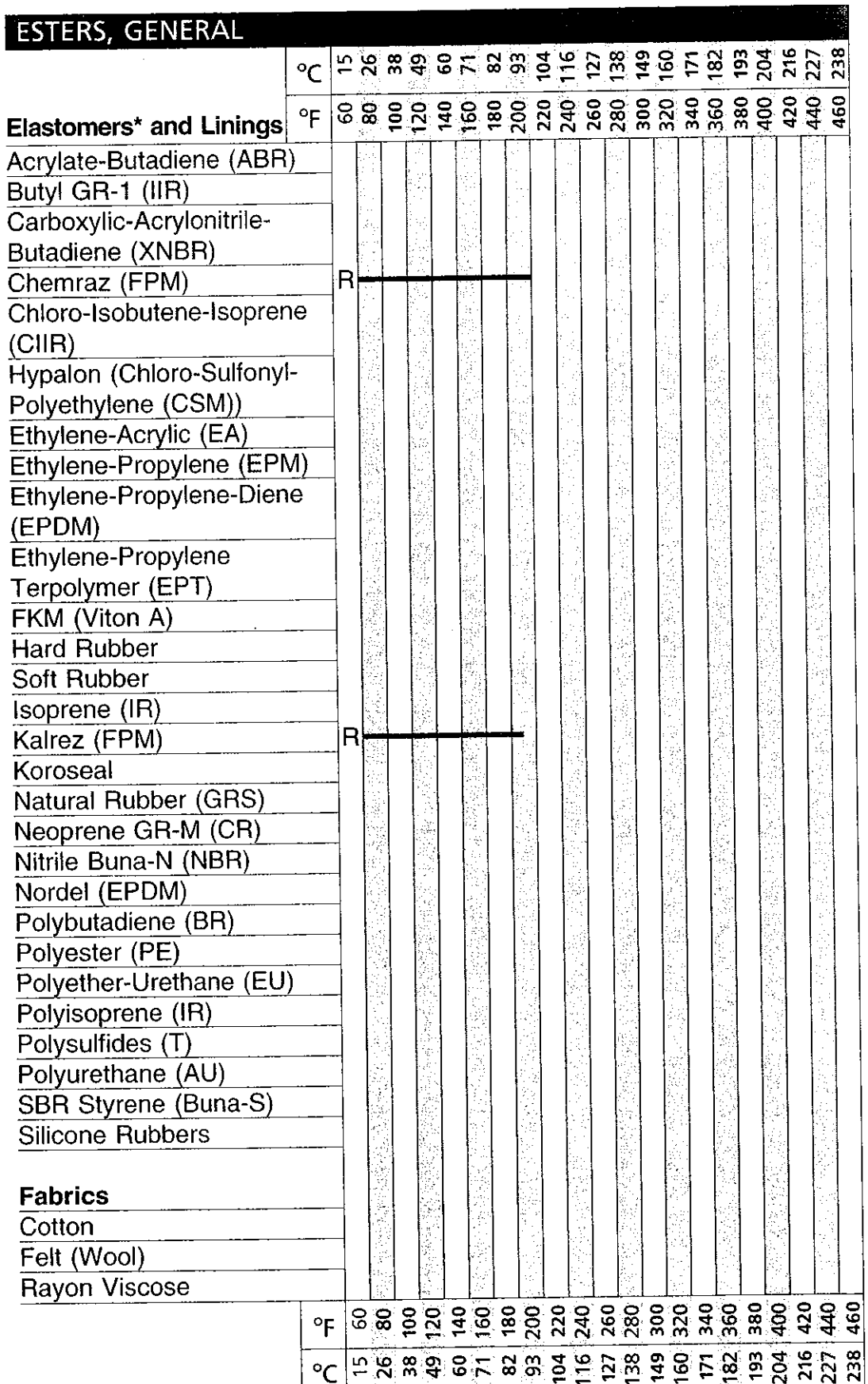


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ESTERS, GENERAL



*See also Nylon 11 under PLASTICS

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ETHANE

Metals	°C	°F
Admiralty Brass		
Aluminum	G	
Aluminum Bronze		
Brass		
Bronze	G	
Carbon Steel	G	
Columbium (Niobium)		
Copper		
Hastelloy B/B-2		
Hastelloy C/C-276		
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625		
Incolloy 800/825		
Galv. Stl.	E	
Monel 400		
Naval Bronze		
Nickel 200/201		
Ni-Resist		
Stainless Steels		
Type 304/347		
Type 316/316 L	E	
Type 400 series		
Type 904-L		
17-4 PH		
20 Cb 3		
E-Bright 26-1		
Silicon Bronze		
Silicon Copper		
Stellite		
Tantalum		
Titanium		
Zirconium		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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ETHANE

	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
Nonmetallic Materials	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated	R																					
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones	U																					
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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ETHANE

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)																						
Epoxy																						
ETFE (Tefzel)																						
FEP																						
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)																						
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)	U																					
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)																						
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride	U																					
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)																						
Ryton																						
TFE (Teflon)	R																					
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

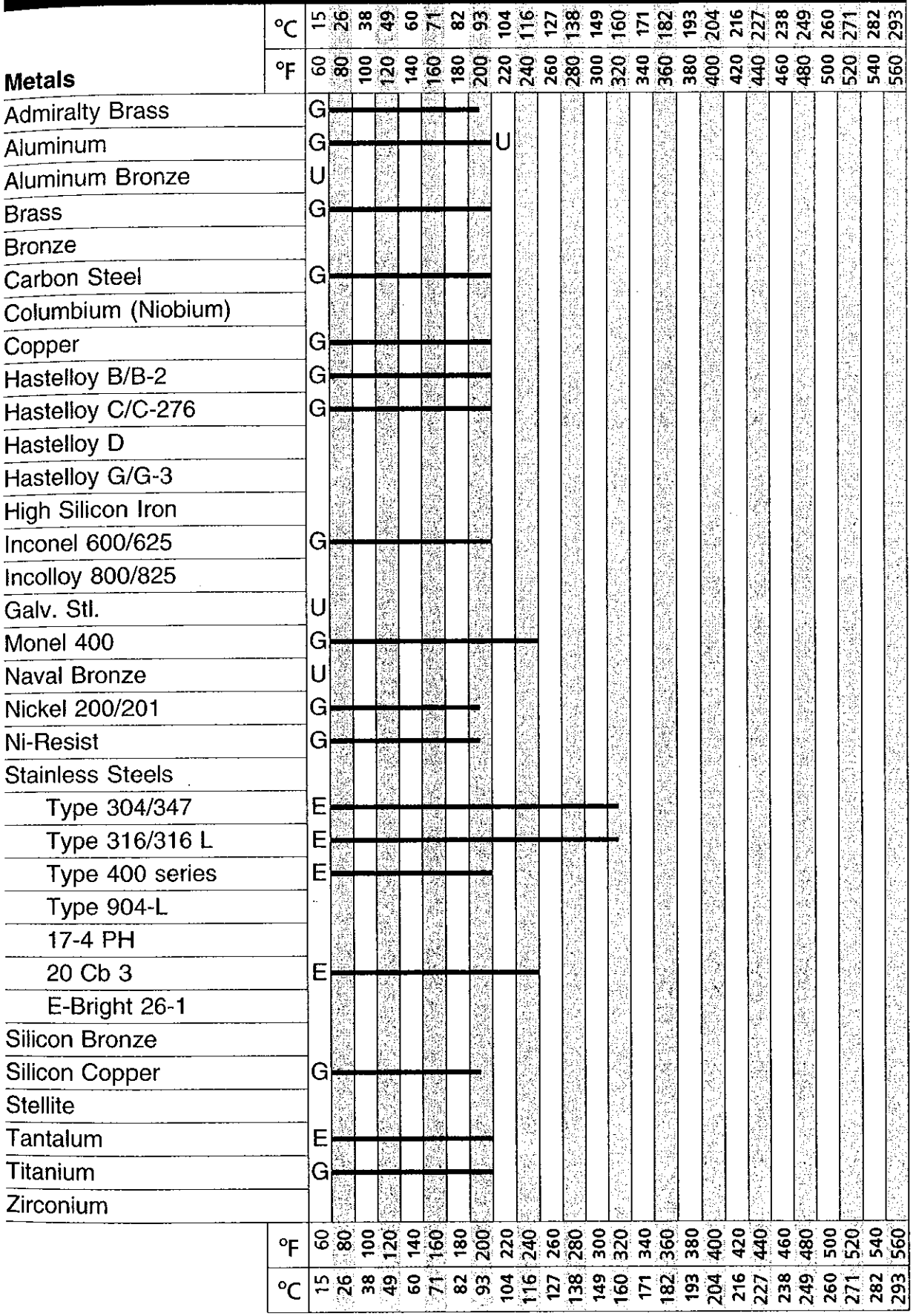
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ETHANE

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)																					
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																					
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)	U																				
Ethylene-Propylene Terpolymer (EPT)																					
FKM (Viton A)	R																				
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)	U																				
Kalrez (FPM)	R																				
Koroseal																					
Natural Rubber (GRS)	U																				
Neoprene GR-M (CR)																					
Nitrile Buna-N (NBR)	R																				
Nordel (EPDM)	U																				
Polybutadiene (BR)																					
Polyester (PE)																					
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers	U																				
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

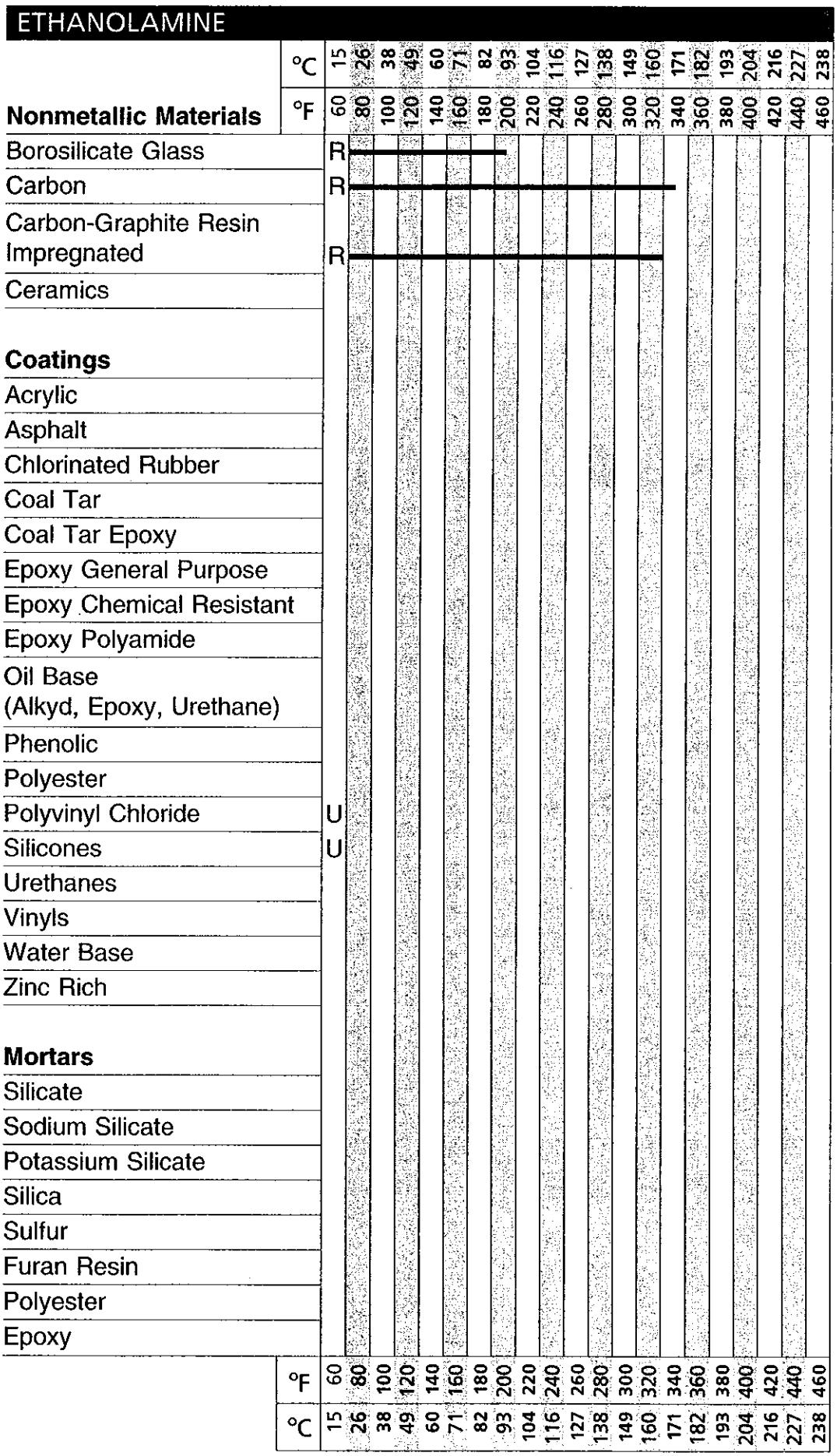
R = Resistant

U = Unsatisfactory

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ETHANOLAMINE



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ETHANOLAMINE

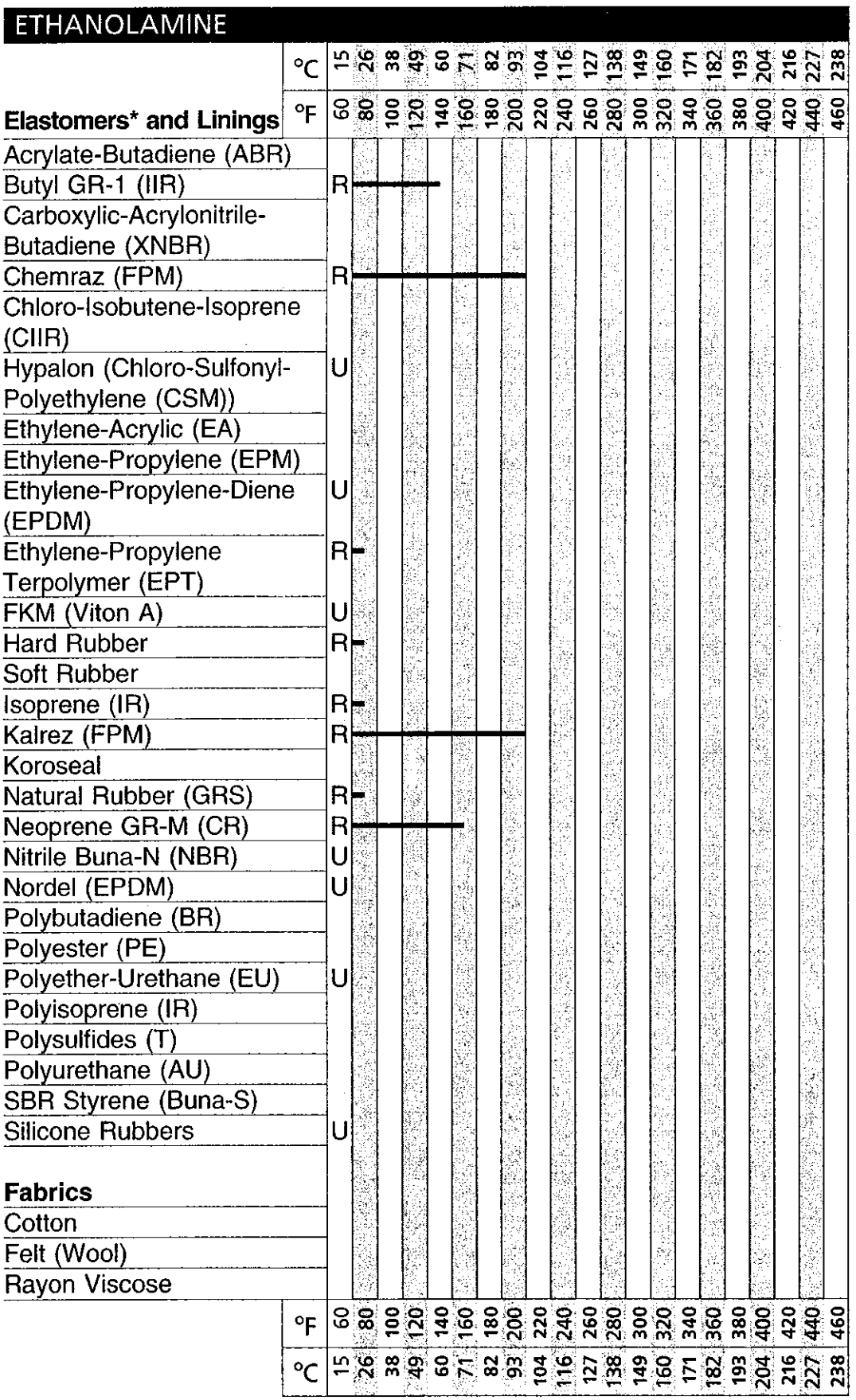
Plastics	°C	°F
ABS		
Acetal	U	
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)	R	
CPVC	U	
E-CTFE (Halar)	U	
Epoxy	R	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)	U	
Noryl	R	
Nylon 6	R	
Nylon 11	R	
Nylon 66	R	
Phenolic		
PFA (Teflon)	R	
Polyamide-Imide	U	
Polyesters		
Bisphenol A–fumarate	R	
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	U	
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)	R	
Polystyrene		
Polysulfone	R	
Polyvinylidene Chloride		
PVC Type 1	U	
PVC Type 2	U	
PVDF (Kynar)	U	
Ryton	R	
TFE (Teflon)	R	
Vinyl Ester	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

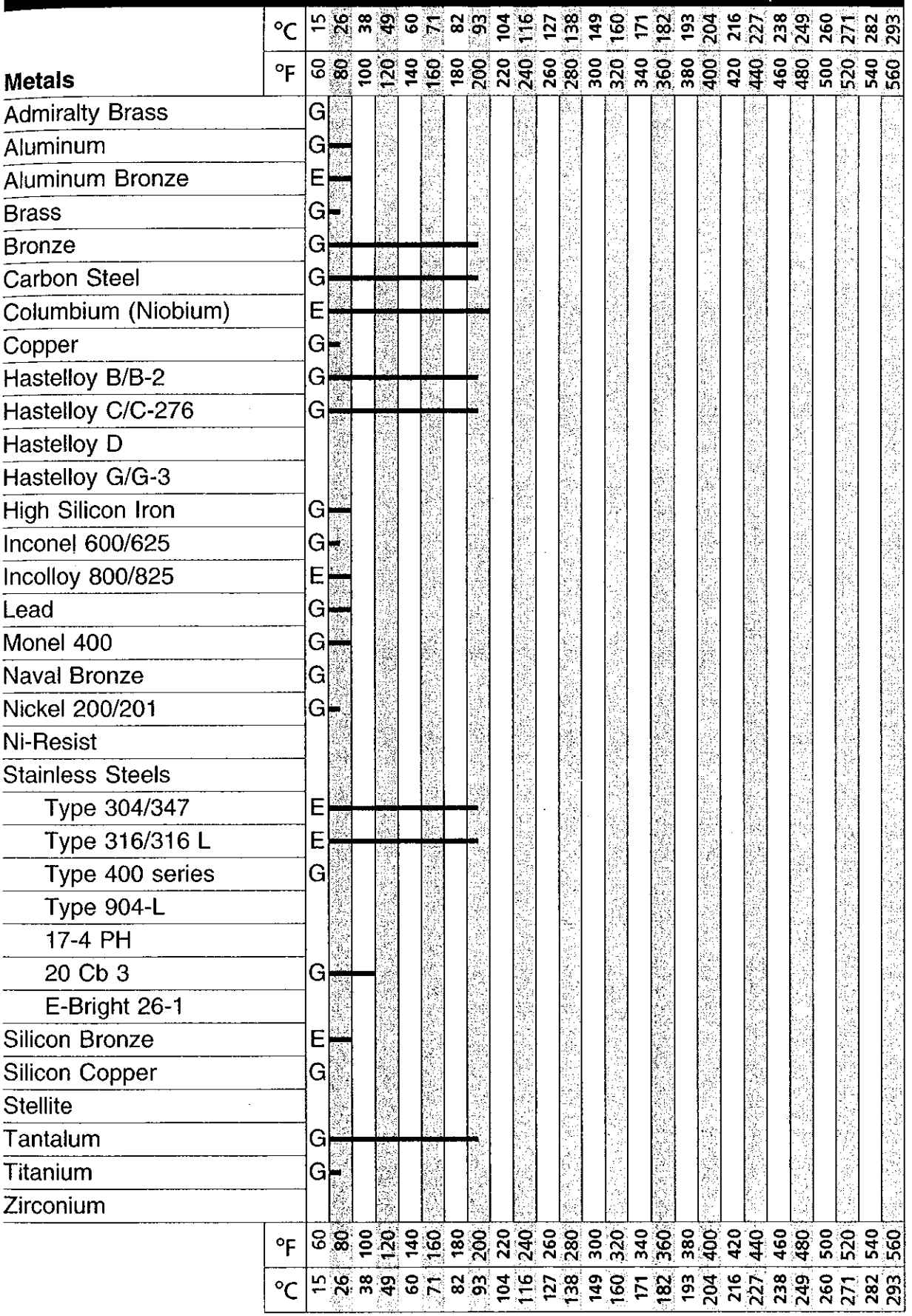
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ETHANOLAMINE



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

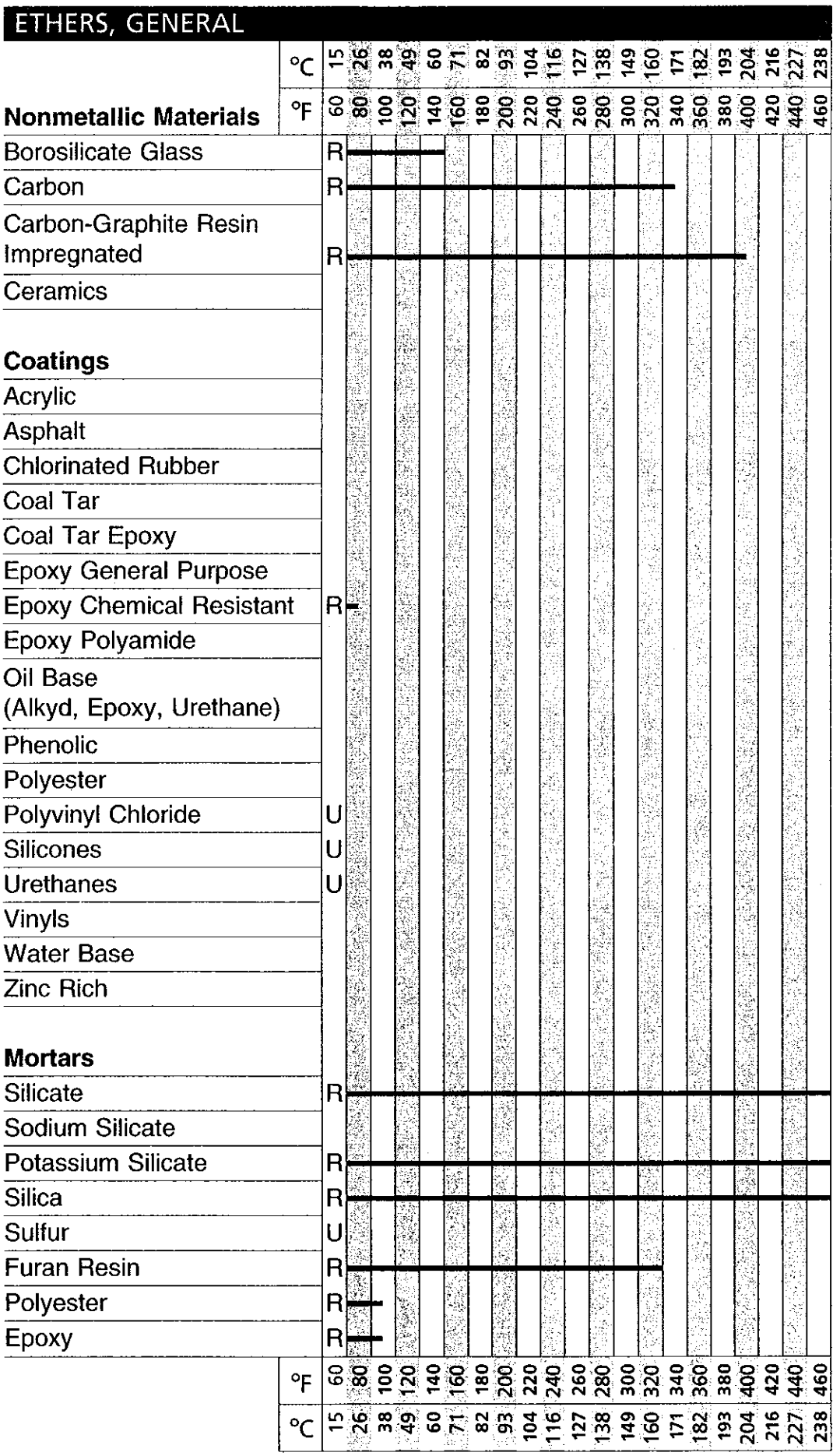
R = Resistant

U = Unsatisfactory

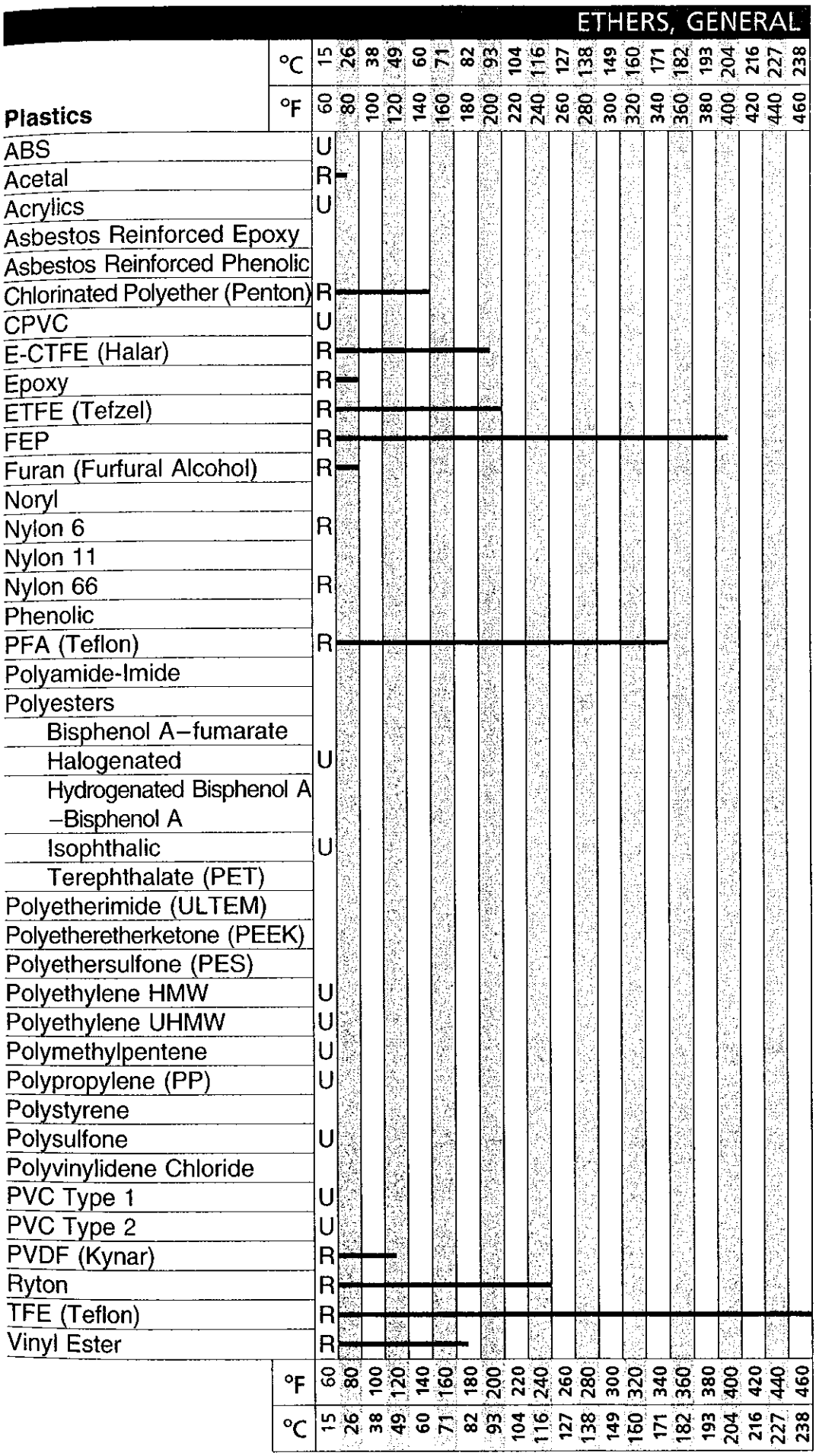
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ETHERS, GENERAL

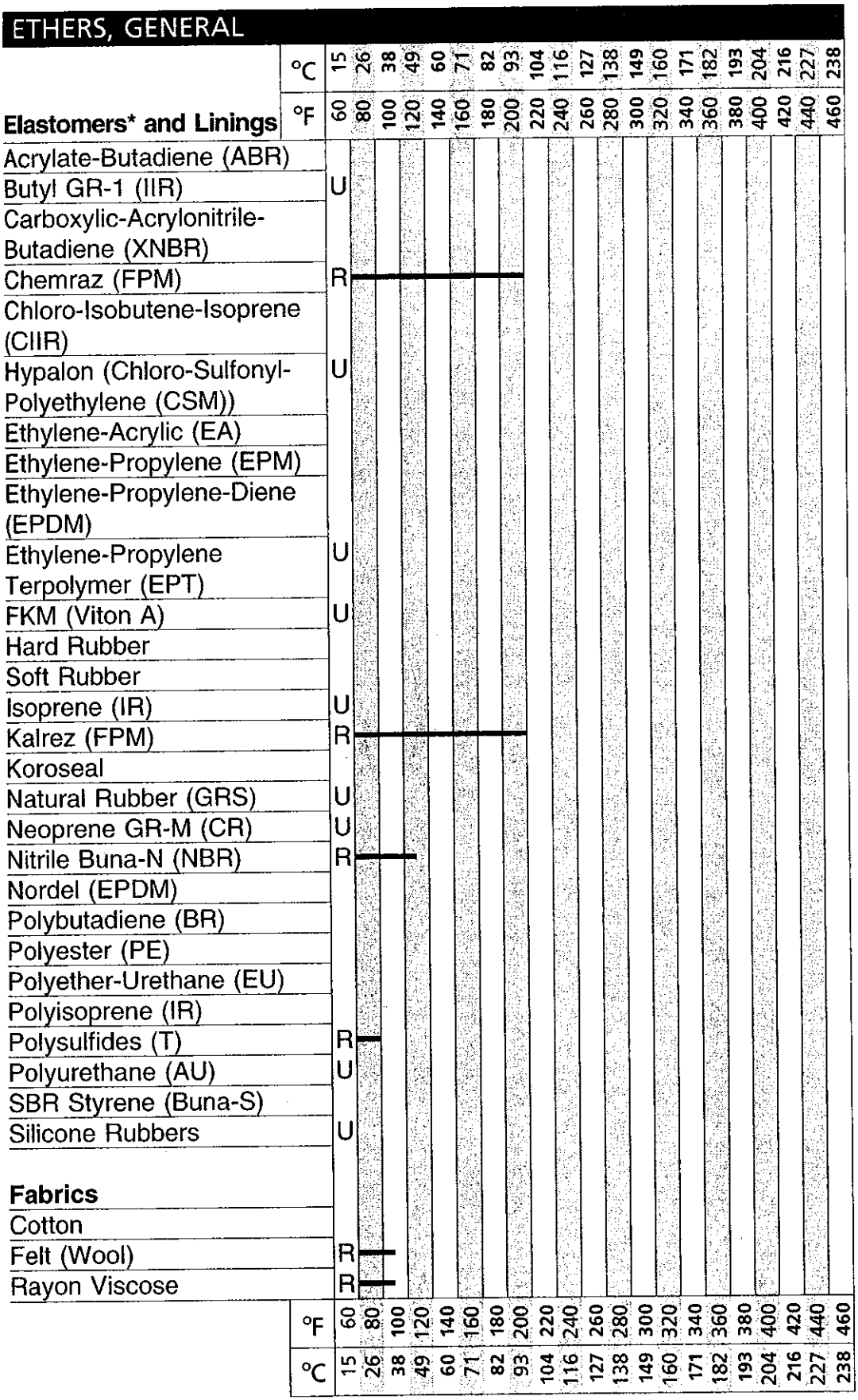


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ETHERS, GENERAL

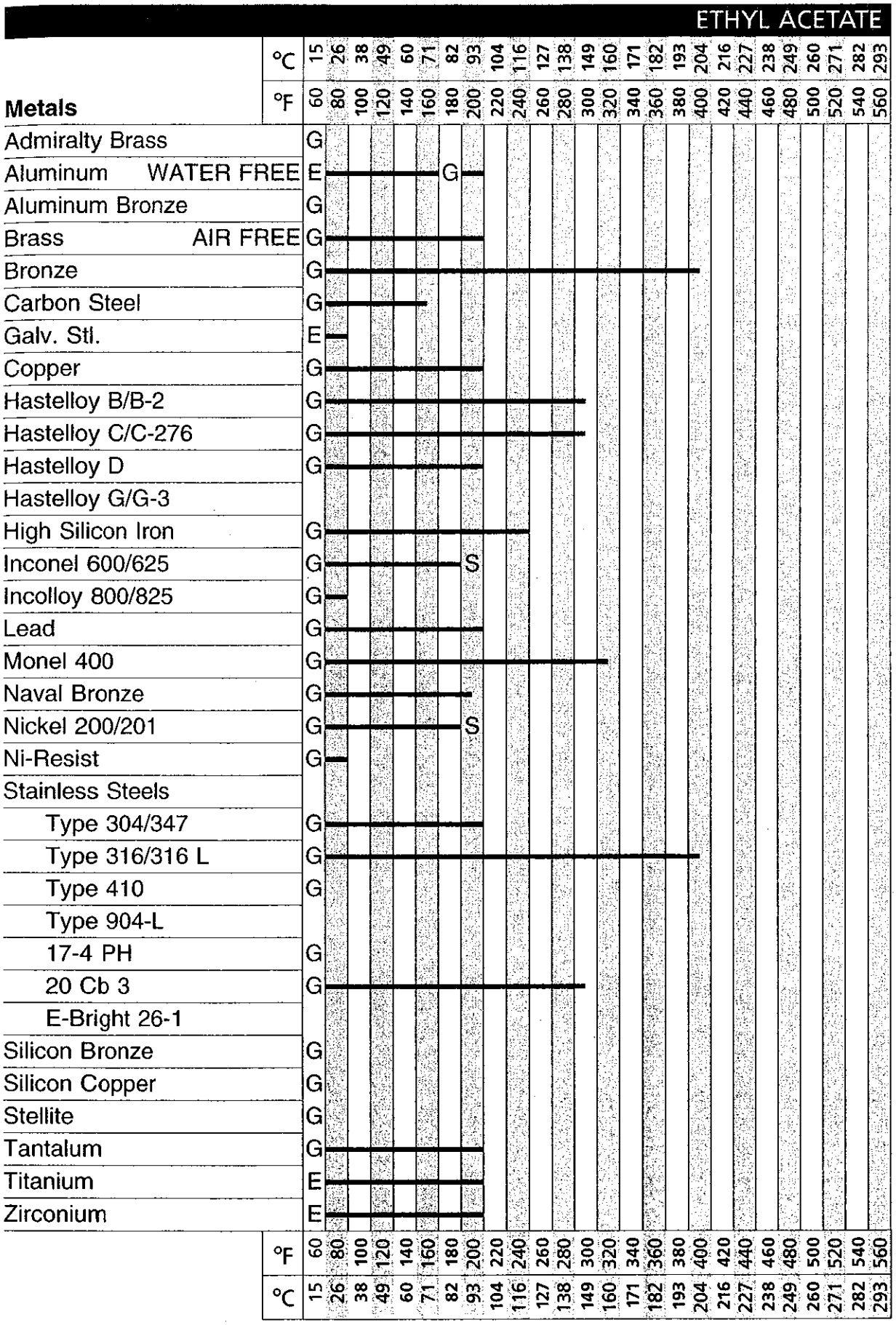


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ETHYL ACETATE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

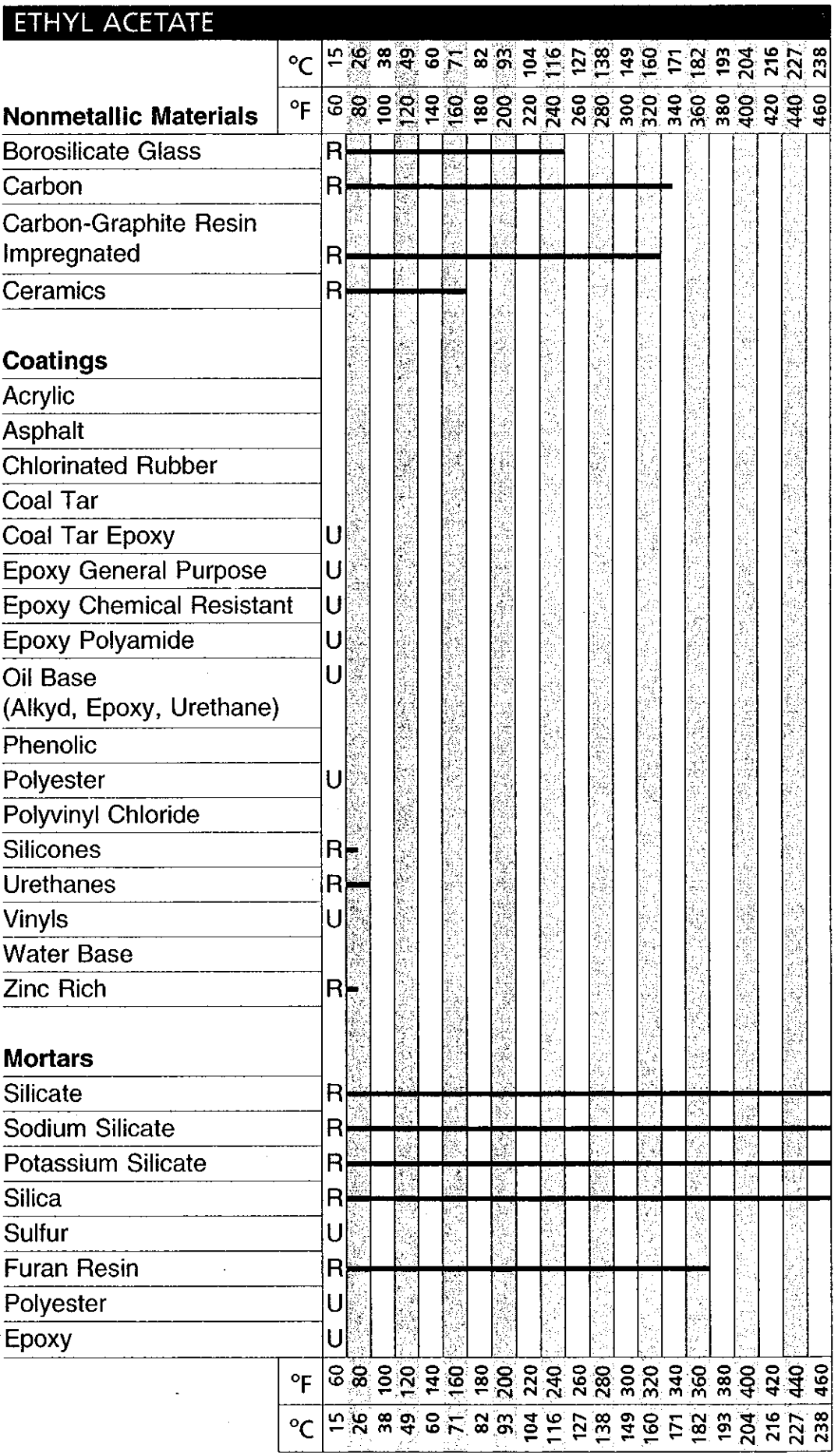
R = Resistant

U = Unsatisfactory

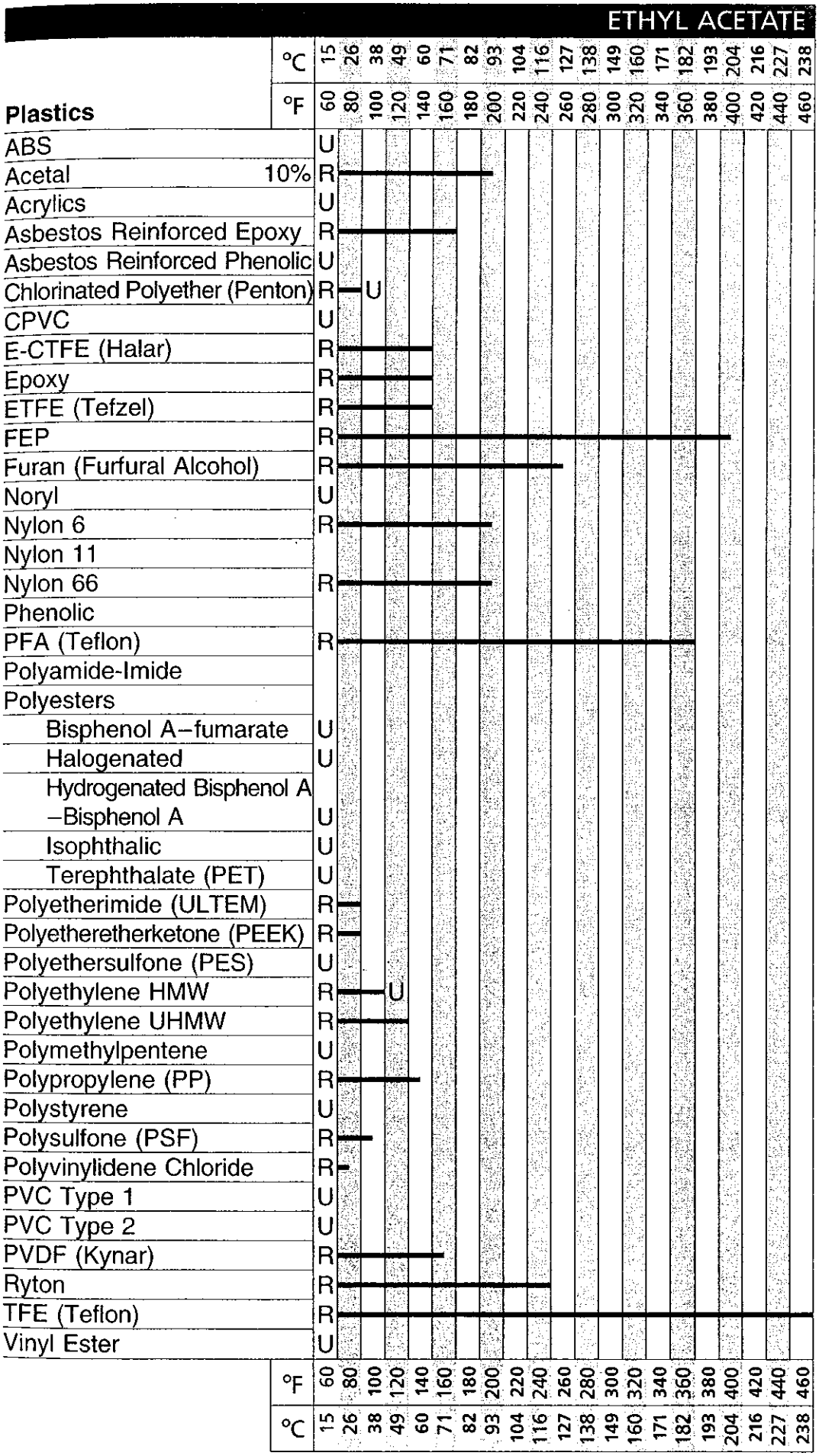
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ETHYL ACETATE

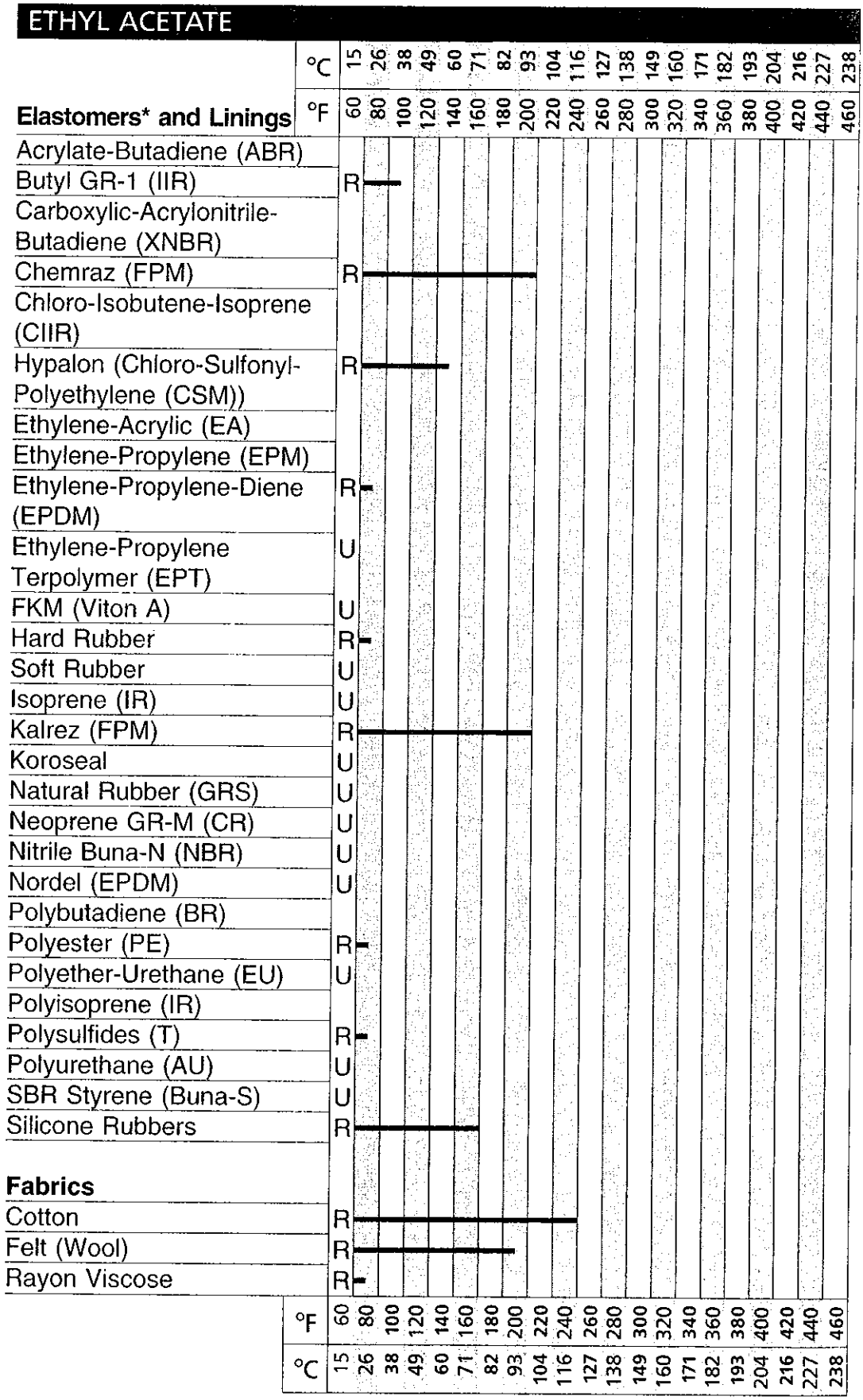


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ETHYL ACETATE



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ETHYL ACETOACETATE

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum		G																									
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel		G																									
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L		G																									
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum		G																									
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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ETHYL ACETOACETATE

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass		R																				
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride		U																				
Silicones		U																				
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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ETHYL ACETOACETATE

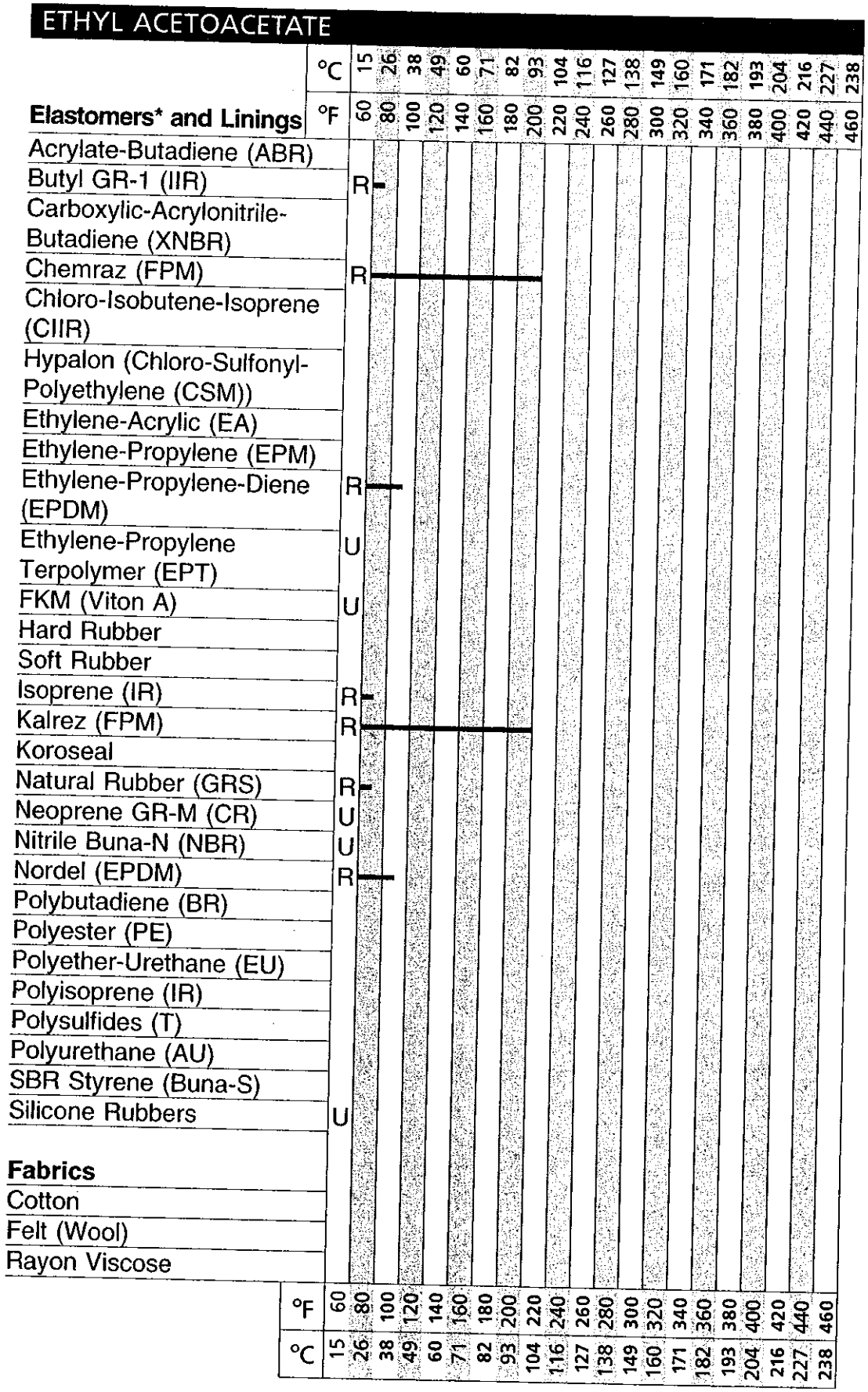
Plastics	°C	°F
ABS	U	
Acetal		
Acrylics		
Asbestos Reinforced Epoxy	R	
Asbestos Reinforced Phenolic	R	
Chlorinated Polyether (Penton)	R	
CPVC	R	
E-CTFE (Halar)	R	
Epoxy		
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic		
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)	U	
Polystyrene		
Polysulfone		
Polyvinylidene Chloride	U	
PVC Type 1	U	
PVC Type 2	U	
PVDF (Kynar)	R	U
Ryton	R	
TFE (Teflon)	R	
Vinyl Ester	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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ETHYL ACETOACETATE



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ETHYL ACRYLATE

Metals	°C	°F
Admiralty Brass		
Aluminum	G	
Aluminum Bronze	G	
Brass		
Bronze		
Carbon Steel	G	
Columbium (Niobium)		
Copper		
Hastelloy B/B-2		
Hastelloy C/C-276	E	
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625		
Incolloy 800/825		
Galv. Stl.	G	
Monel 400	G	
Naval Bronze	G	
Nickel 200/201		
Ni-Resist		
Stainless Steels		
Type 304/347	G	
Type 316/316 L	G	
Type 400 series	G	
Type 904-L		
17-4 PH	G	
20 Cb 3	G	
E-Bright 26-1		
Silicon Bronze	G	
Silicon Copper		
Stellite		
Tantalum	G	
Titanium		
Zirconium		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

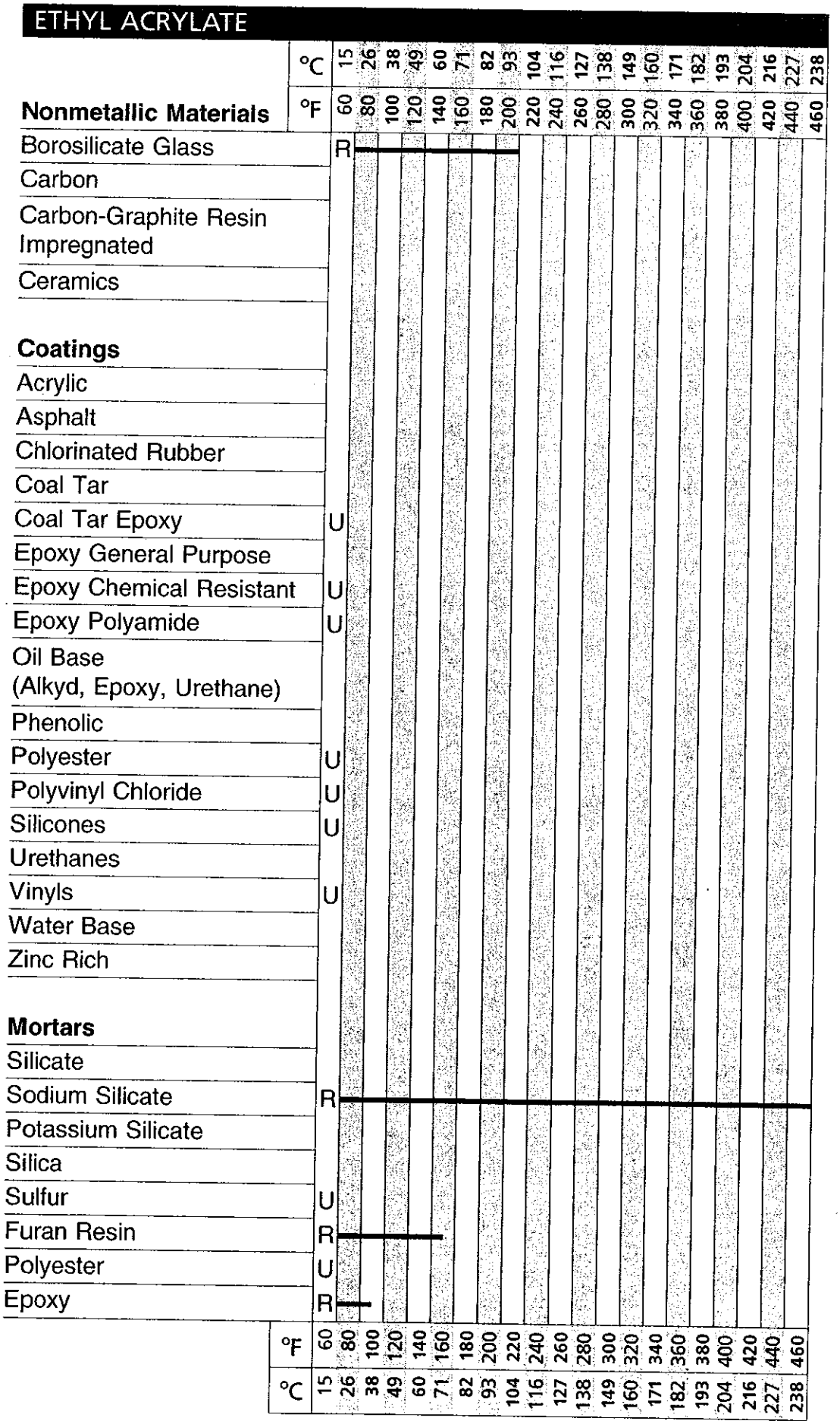
R = Resistant

U = Unsatisfactory

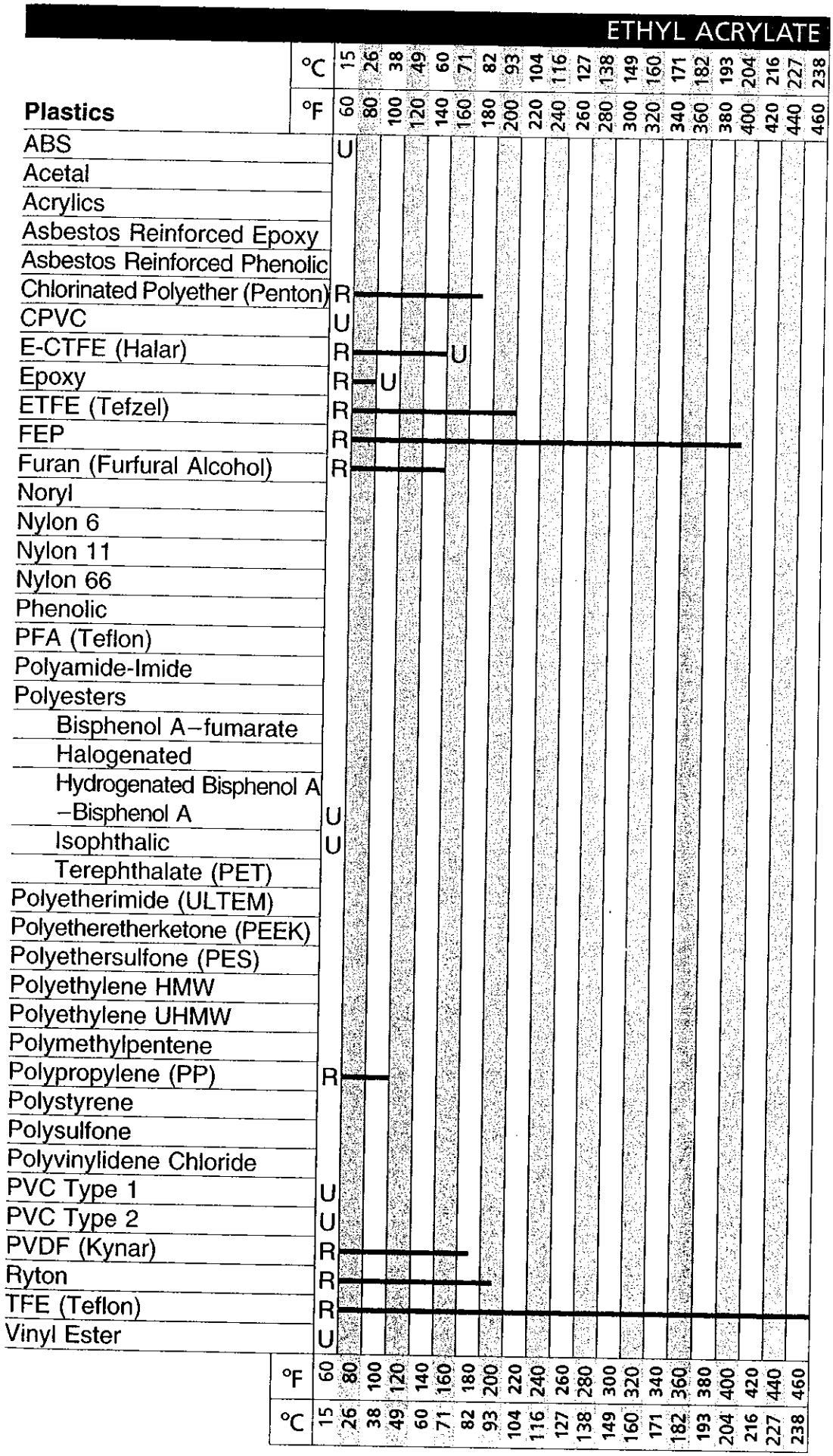
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ETHYL ACRYLATE

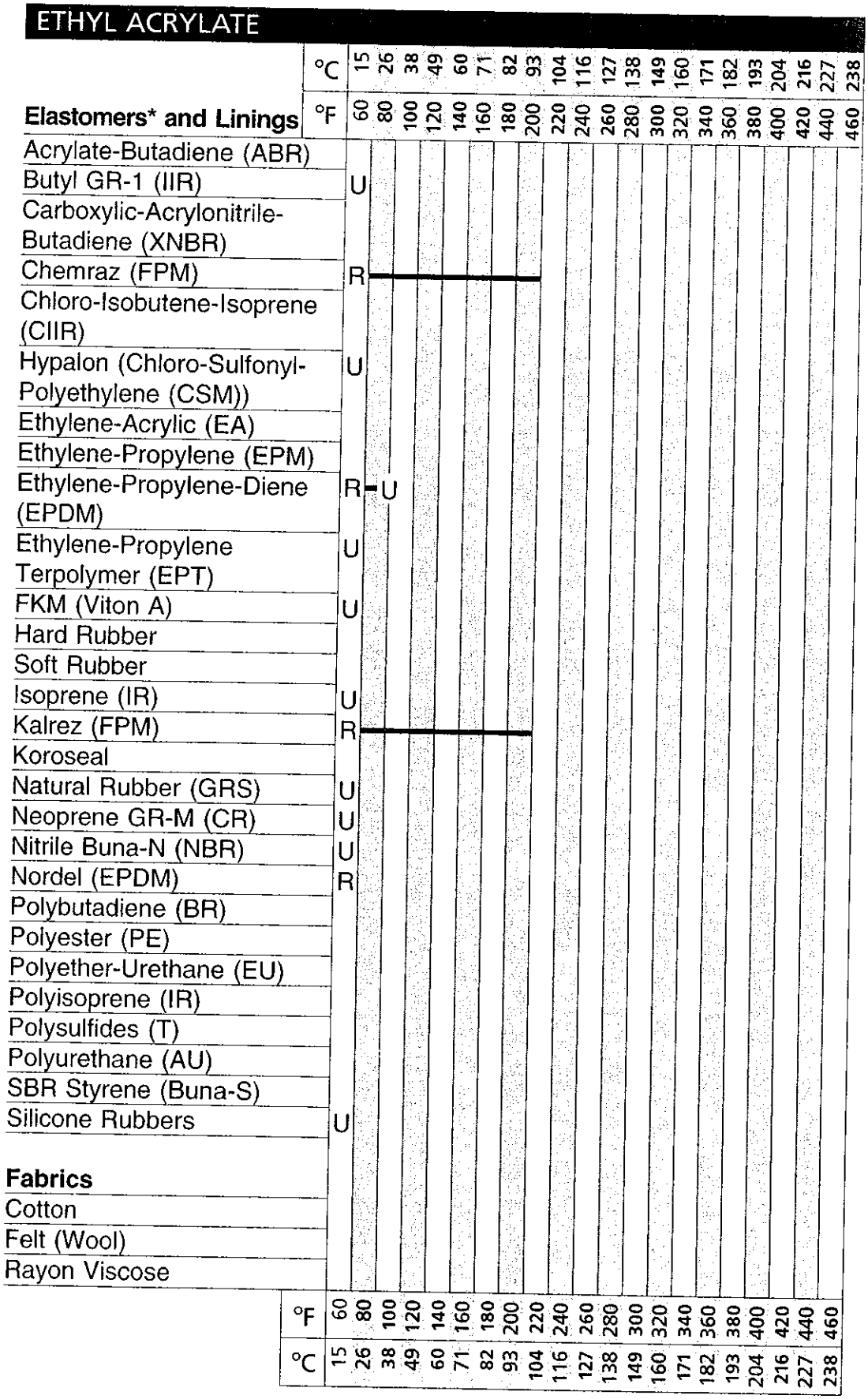


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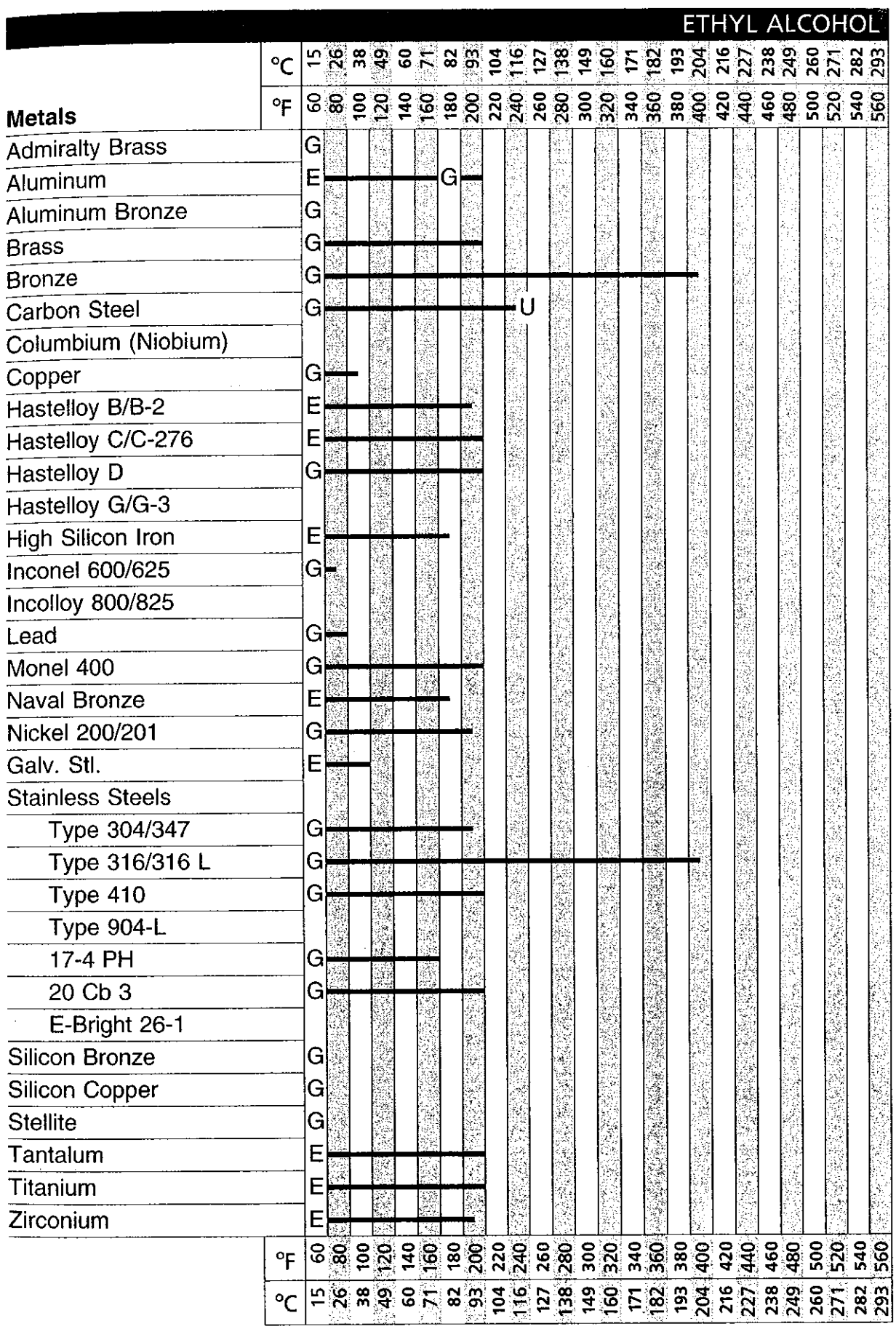
ETHYL ACRYLATE



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ETHYL ALCOHOL



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

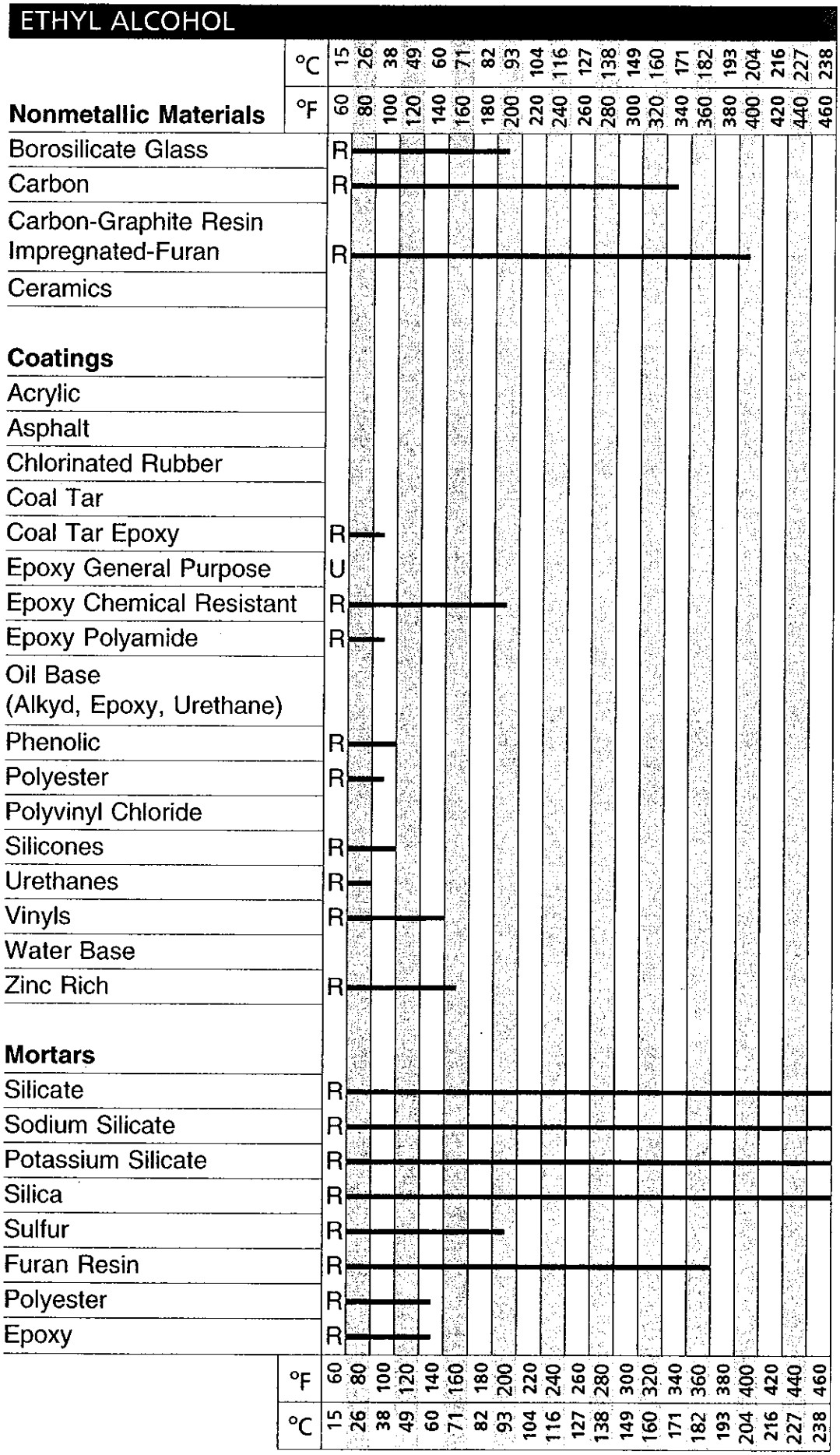
R = Resistant

U = Unsatisfactory

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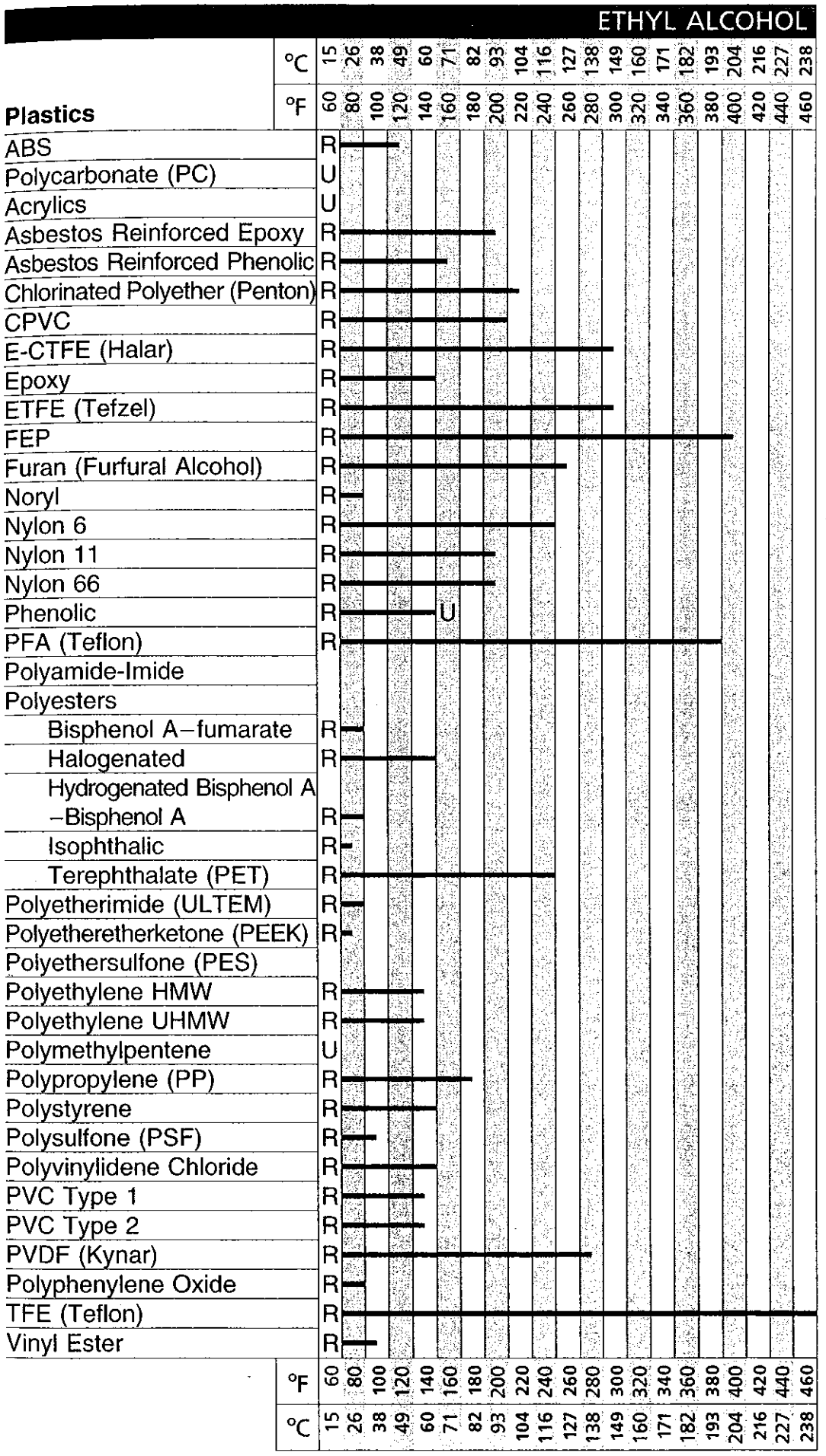
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ETHYL ALCOHOL



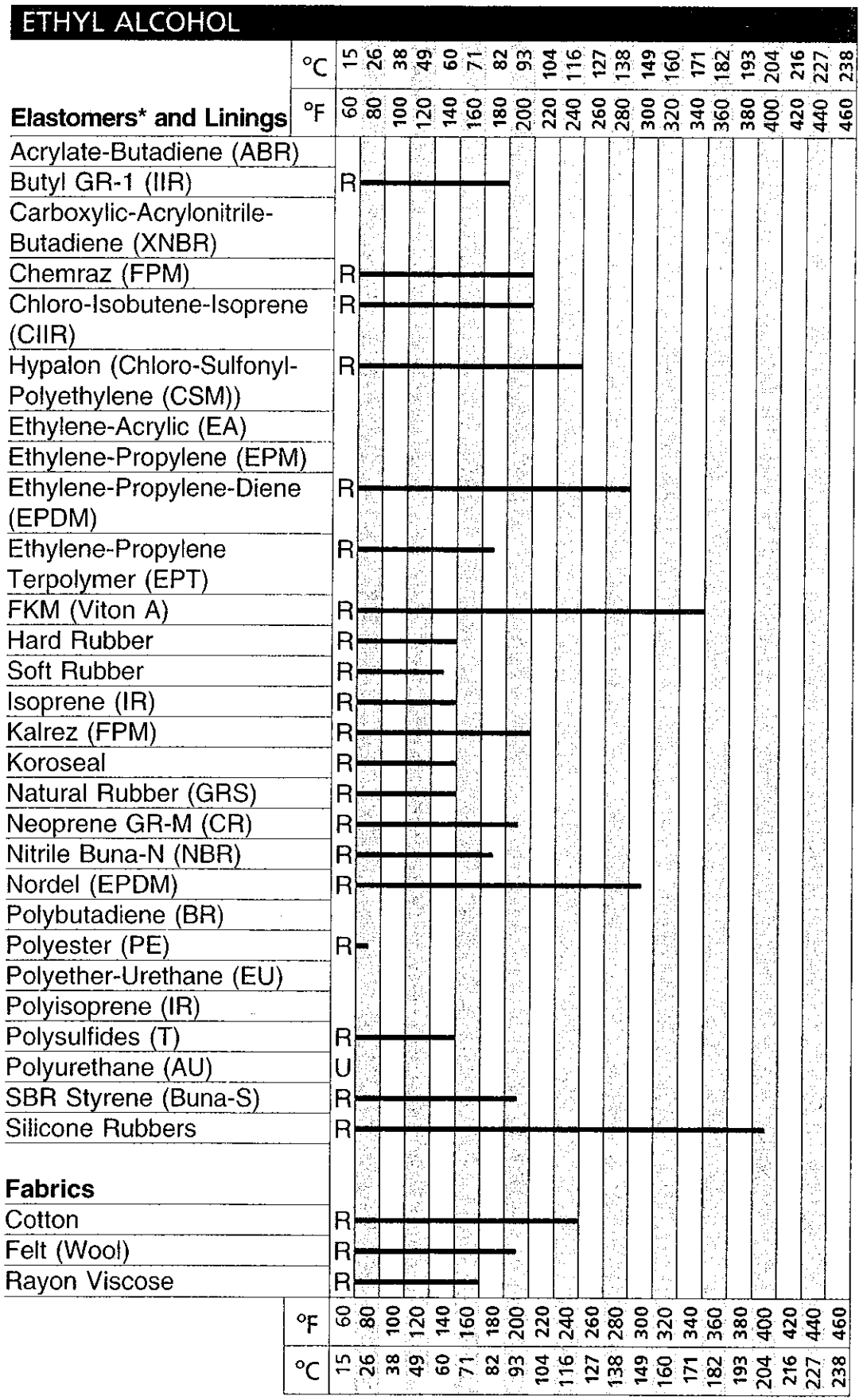
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ETHYL ALCOHOL



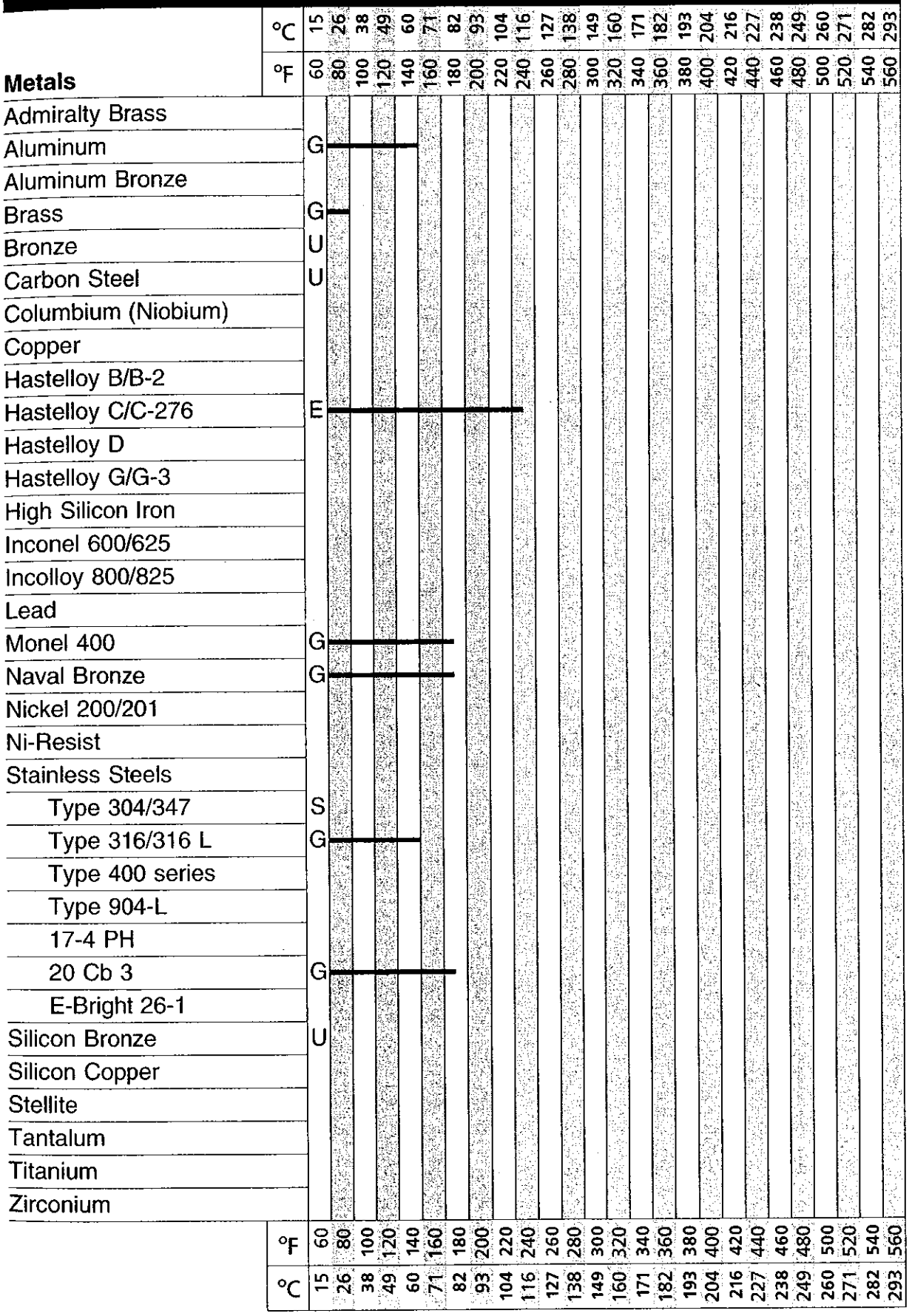
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ETHYL ALCOHOL



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FOR METALS

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S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

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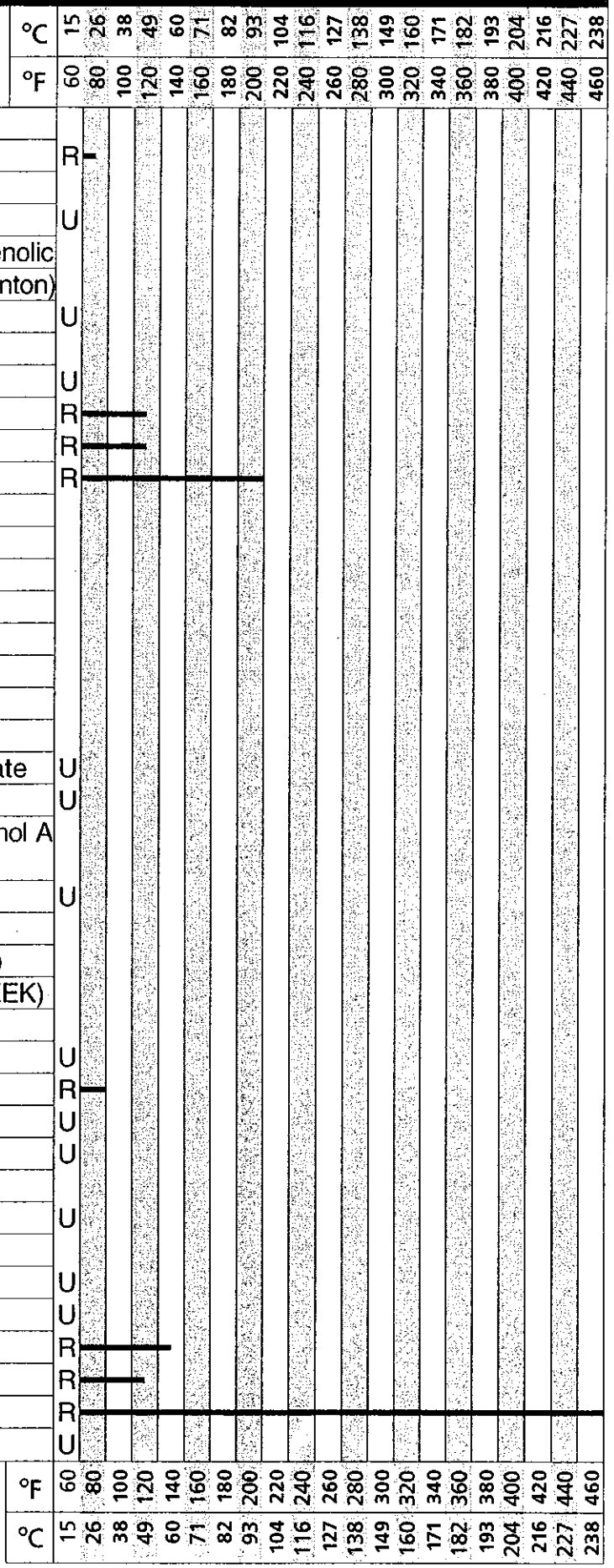
ETHYL BENZENE

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass		R																				
Carbon																						
Carbon-Graphite Resin Impregnated		R																				
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose		U																				
Epoxy Chemical Resistant		U																				
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic		R																				
Polyester																						
Polyvinyl Chloride		U																				
Silicones		U																				
Urethanes																						
Vinyls		R																				
Water Base																						
Zinc Rich		R																				
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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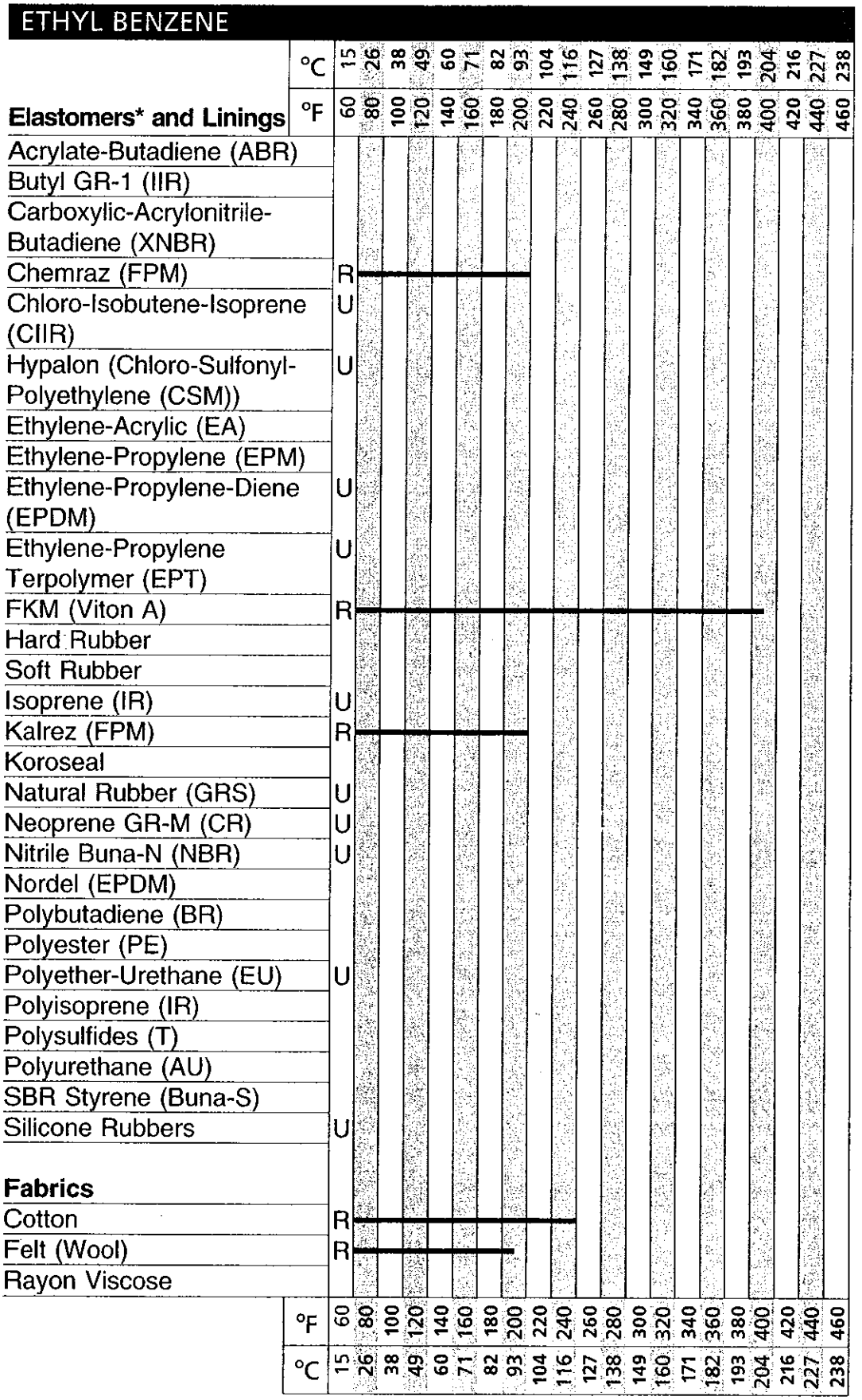
ETHYL BENZENE

Plastics	
ABS	
Acetal	R
Acrylics	
Polycarbonate (PC)	U
Asbestos Reinforced Phenolic	
Chlorinated Polyether (Penton)	
CPVC	U
E-CTFE (Halar)	
Epoxy	U
ETFE (Tefzel)	R
FEP	R
Furan (Furfural Alcohol)	R
Noryl	
Nylon 6	
Nylon 11	
Nylon 66	
Phenolic	
PFA (Teflon)	
Polyamide-Imide	
Polyesters	
Bisphenol A–fumarate	U
Halogenated	U
Hydrogenated Bisphenol A –Bisphenol A	
Isophthalic	U
Terephthalate (PET)	
Polyetherimide (ULTEM)	
Polyetheretherketone (PEEK)	
Polyethersulfone (PES)	
Polyethylene HMW	U
Polyethylene UHMW	R
Polymethylpentene	U
Polypropylene (PP)	U
Polystyrene	
Polysulfone (PSF)	U
Polyvinylidene Chloride	
PVC Type 1	U
PVC Type 2	U
PVDF (Kynar)	R
Ryton	R
TFE (Teflon)	R
Vinyl Ester	U



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ETHYL BENZENE



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ETHYL BUTYRATE

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																												
Aluminum			G	—																								
Aluminum Bronze																												
Brass																												
Bronze																												
Carbon Steel			G	—	—	—	—	—	—																			
Columbium (Niobium)																												
Copper																												
Hastelloy B/B-2	DRY																											
Hastelloy C/C-276																												
Hastelloy D																												
Hastelloy G/G-3																												
High Silicon Iron																												
Inconel 600/625																												
Incolloy 800/825																												
Lead																												
Monel 400																												
Naval Bronze																												
Nickel 200/201																												
Ni-Resist																												
Stainless Steels																												
Type 304/347																												
Type 316/316 L			G	—	—	—	—	—	—																			
Type																												
Type 904-L																												
17-4 PH																												
20 Cb 3																												
E-Bright 26-1																												
Silicon Bronze																												
Silicon Copper																												
Stellite																												
Tantalum																												
Titanium																												
Zirconium																												
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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ETHYL BUTYRATE

Nonmetallic Materials	°C 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238
	°F 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460
Borosilicate Glass	R
Carbon	
Carbon-Graphite Resin Impregnated	
Ceramics	
Coatings	
Acrylic	
Asphalt	
Chlorinated Rubber	
Coal Tar	
Coal Tar Epoxy	
Epoxy General Purpose	
Epoxy Chemical Resistant	
Epoxy Polyamide	
Oil Base (Alkyd, Epoxy, Urethane)	
Phenolic	
Polyester	
Polyvinyl Chloride	
Silicones	
Urethanes	
Vinyls	
Water Base	
Zinc Rich	
Mortars	
Silicate	
Sodium Silicate	
Potassium Silicate	
Silica	
Sulfur	
Furan Resin	
Polyester	
Epoxy	
	°F 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460
	°C 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

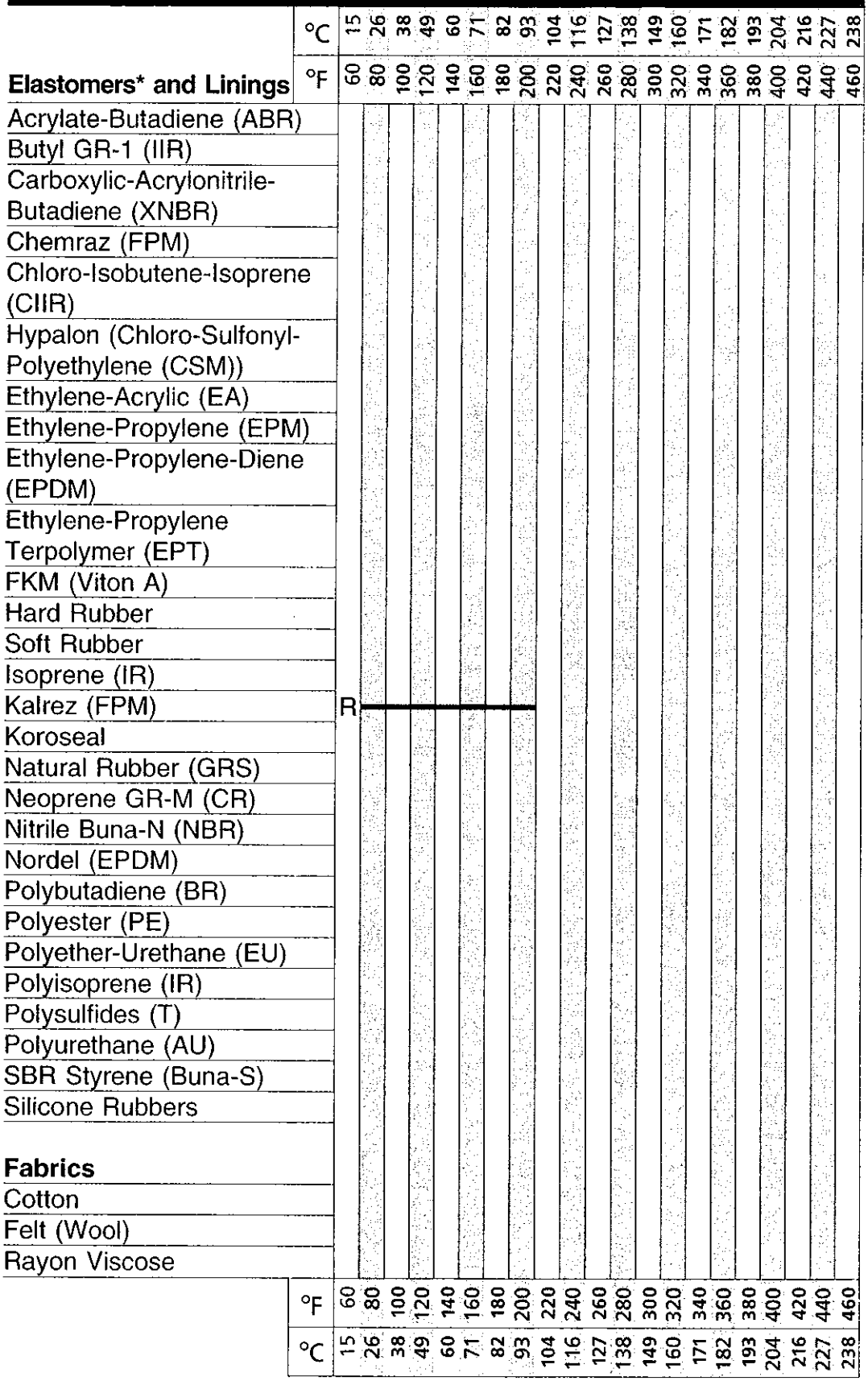
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ETHYL BUTYRATE

Plastics	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Polycarbonate	U																				
Acetal																					
Acrylics																					
Asbestos Reinforced Epoxy																					
Asbestos Reinforced Phenolic																					
Chlorinated Polyether (Penton)																					
CPVC																					
E-CTFE (Halar)																					
Epoxy																					
ETFE (Tefzel)	R																				
FEP	R																				
Furan (Furfural Alcohol)																					
Noryl																					
Nylon 6																					
Nylon 11																					
Nylon 66																					
Phenolic																					
PFA (Teflon)	R																				
Polyamide-Imide																					
Polyesters																					
-Bisphenol A–fumarate																					
-Halogenated																					
-Hydrogenated Bisphenol A																					
-Bisphenol A																					
-Isophthalic																					
-Terephthalate (PET)																					
Polyetherimide (ULTEM)																					
Polyetheretherketone (PEEK)																					
Polyethersulfone (PES)																					
Polyethylene HMW	U																				
Polyethylene UHMW	U																				
Polymethylpentene	R																				
Polypropylene (PP)	R																				
Polystyrene																					
Polysulfone	U																				
Polyvinylidene Chloride																					
RVC Type 1	U																				
PVC Type 2	U																				
PVDF (Kynar)																					
Ryton																					
TFE (Teflon)	R																				
Vinyl Ester																					
°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	
°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	

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ETHYL BUTYRATE



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ETHYL CHLORIDE

Metals		
Admiralty Brass		S
Aluminum	DRY	G
Aluminum Bronze	DRY	G
Brass	DRY	E
Bronze		G
Carbon Steel		G
Columbium (Niobium)		
Copper		G
Hastelloy B/B-2		G
Hastelloy C/C-276		G
Hastelloy D		G
Hastelloy G/G-3		
High Silicon Iron		G
Inconel 600/625	DRY	E
Incolloy 800/825		
Lead		G
Monel 400		G
Naval Bronze		G
Nickel 200/201	DRY	E
Ni-Resist	DRY	G
Stainless Steels		
Type 304/347	2	E
Type 316/316 L		E
Type 410	DRY	E
Type 904-L		
17-4 PH	DRY	G
20 Cb 3		E
E-Bright 26-1		
Silicon Bronze	DRY	G
Silicon Copper		G
Stellite	DRY	S
Tantalum		E
Titanium		E
Zirconium		E

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

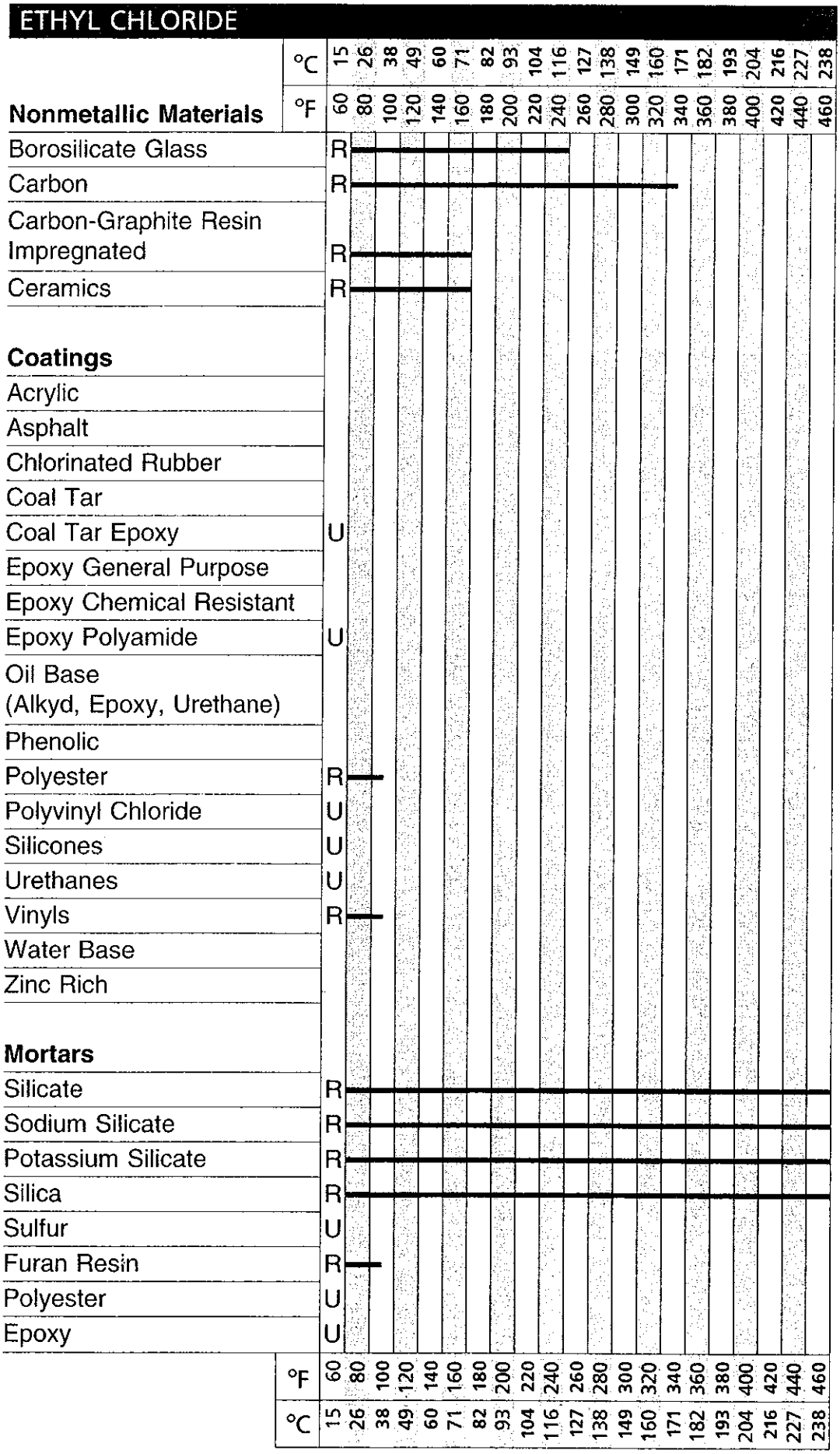
R = Resistant

U = Unsatisfactory

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ETHYL CHLORIDE



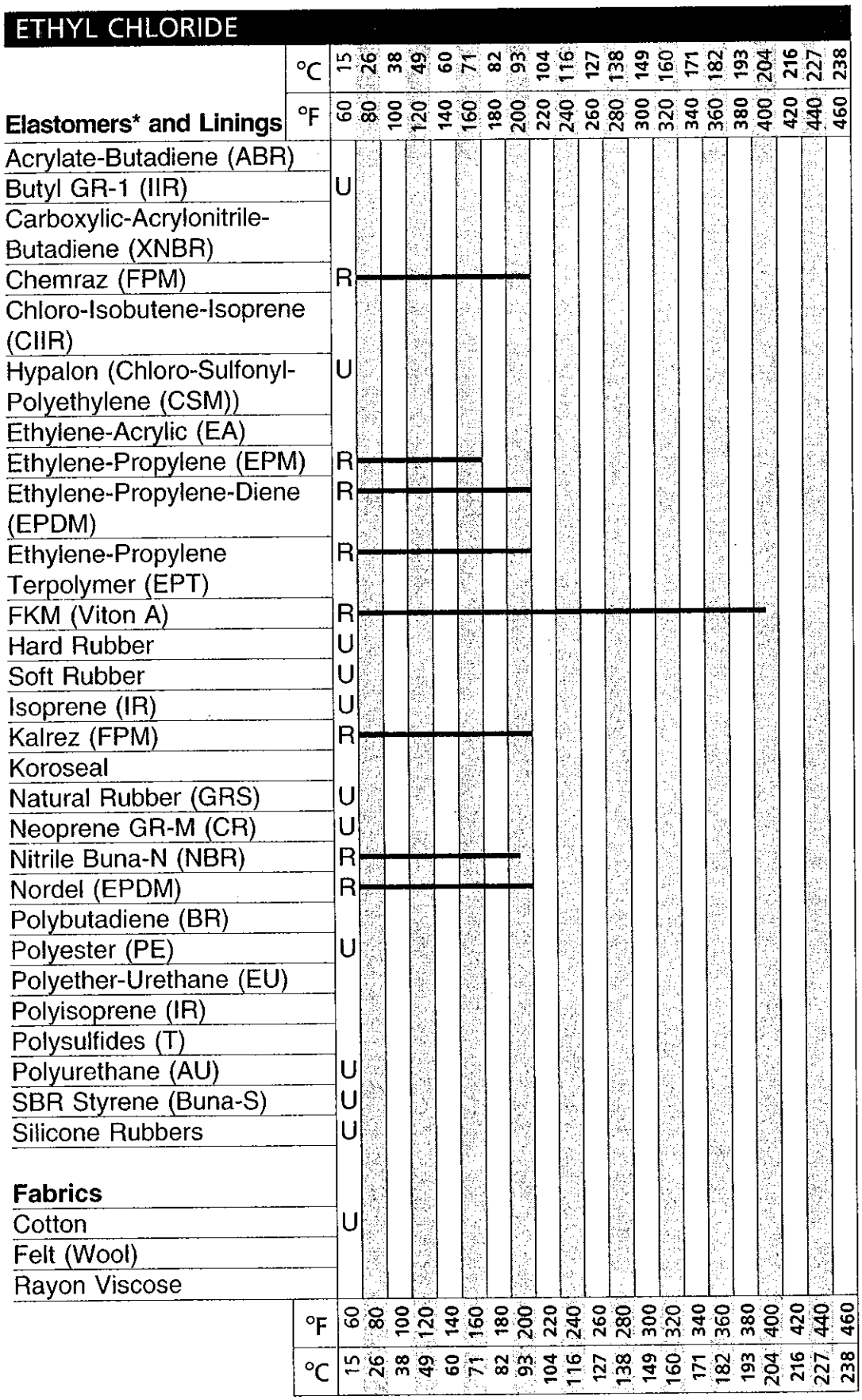
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ETHYL CHLORIDE

Plastics		°C	°F
ABS	U	15	60
Acetal	R	26	80
Acrylics	U	38	100
Asbestos Reinforced Epoxy		49	120
Asbestos Reinforced Phenolic		60	140
Chlorinated Polyether (Penton)	R	71	160
CPVC	U	82	180
E-CTFE (Halar)	R	93	200
Epoxy	R	104	220
ETFE (Tefzel)	R	116	240
FEP	R	127	260
Furan (Furfural Alcohol)	R	138	280
Noryl	U	149	300
Nylon 6	R	160	320
Nylon 11	R	171	340
Nylon 66	R	182	360
Phenolic	R	193	380
PFA (Teflon)	R	204	400
Polyamide-Imide	R	216	420
Polyesters		227	440
Bisphenol A–fumarate		238	460
Halogenated	R		
Hydrogenated Bisphenol A –Bisphenol A			
Isophthalic	U		
Terephthalate (PET)	R		
Polycarbonate (PC)	U		
Polyetheretherketone (PEEK)			
Polyethersulfone (PES)			
Polyethylene HMW	U		
Polyethylene UHMW	U		
Polymethylpentene	U		
Polypropylene (PP)	U		
Polystyrene			
Polysulfone (PSF)	U		
Polyvinylidene Chloride	U		
PVC Type 1	U		
PVC Type 2	U		
PVDF (Kynar)	R		
Ryton	R		
TFE (Teflon)	R		
Vinyl Ester	U		

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ETHYL CHLORIDE



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ETHYL CHLOROACETATE

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L																											
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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ETHYL CHLOROACETATE

Nonmetallic Materials	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																					
Carbon																					
Carbon-Graphite Resin Impregnated																					
Ceramics																					
Coatings																					
Acrylic																					
Asphalt																					
Chlorinated Rubber																					
Coal Tar																					
Coal Tar Epoxy																					
Epoxy General Purpose																					
Epoxy Chemical Resistant																					
Epoxy Polyamide																					
Oil Base (Alkyd, Epoxy, Urethane)																					
Phenolic																					
Polyester																					
Polyvinyl Chloride	U																				
Silicones																					
Urethanes																					
Vinyls																					
Water Base																					
Zinc Rich																					
Mortars																					
Silicate																					
Sodium Silicate																					
Potassium Silicate																					
Silica																					
Sulfur																					
Furan Resin																					
Polyester																					
Epoxy																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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ETHYL CHLOROACETATE

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)	R																					
Epoxy																						
ETFE (Tefzel)	R																					
FEP																						
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)																						
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A																						
–Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)	R																					
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride	R																					
PVC Type 1	U																					
PVC Type 2	U																					
PVDF (Kynar)	R																					
Ryton																						
TFE (Teflon)	R																					
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

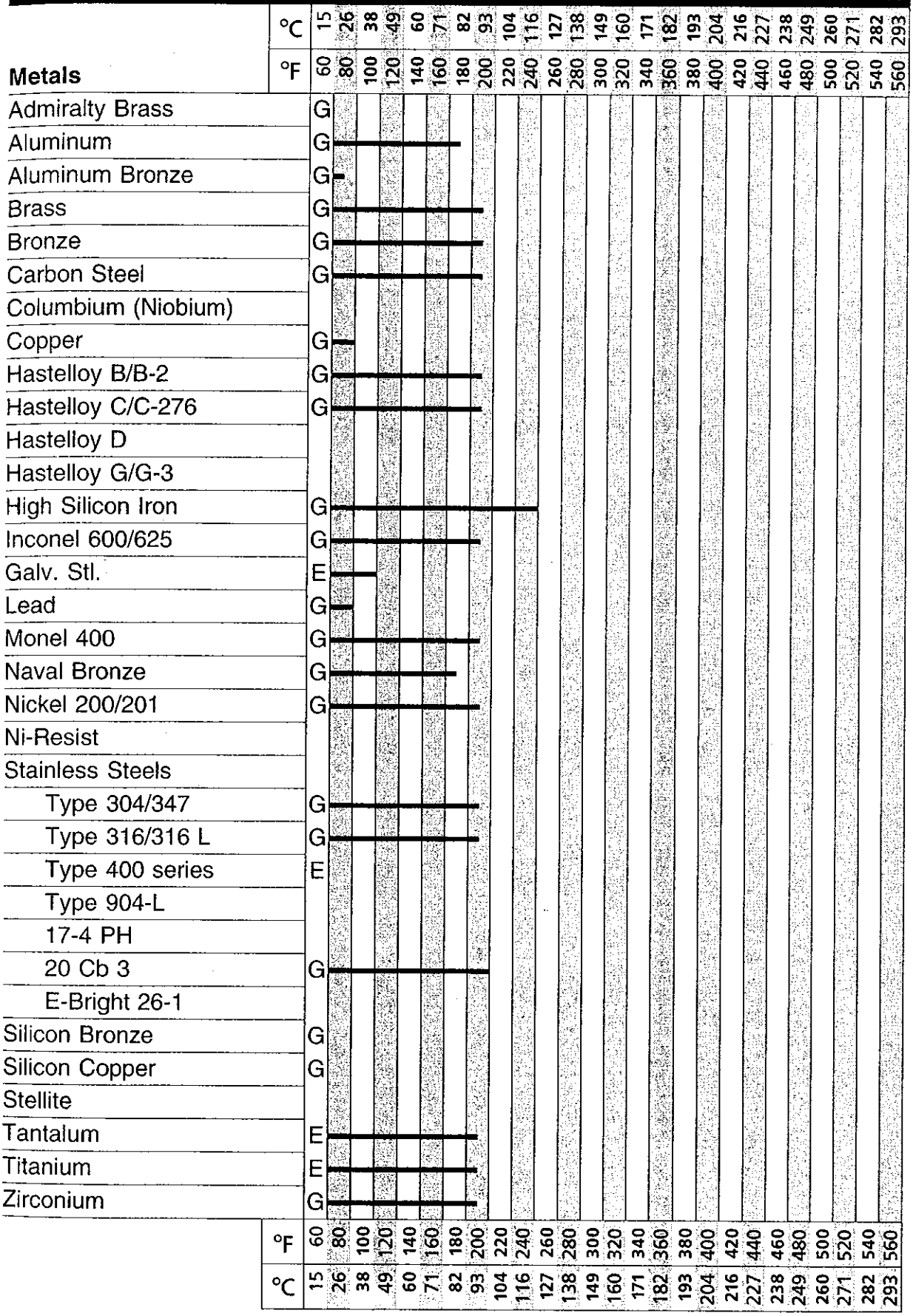
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ETHYL CHLOROACETATE

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)																						
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)																						
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)																						
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)																						
Nitrile Buna-N (NBR)																						
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

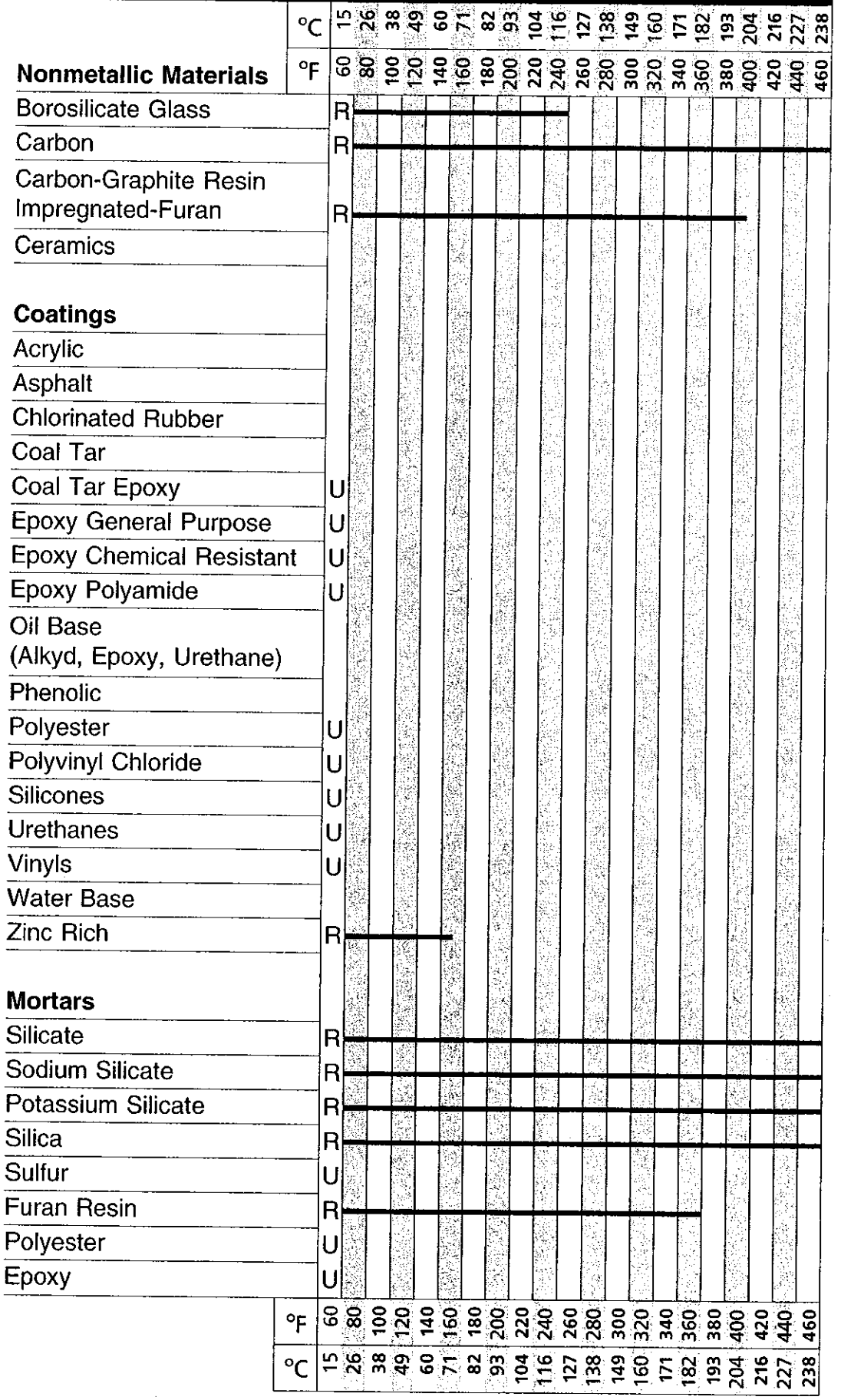
R = Resistant

U = Unsatisfactory

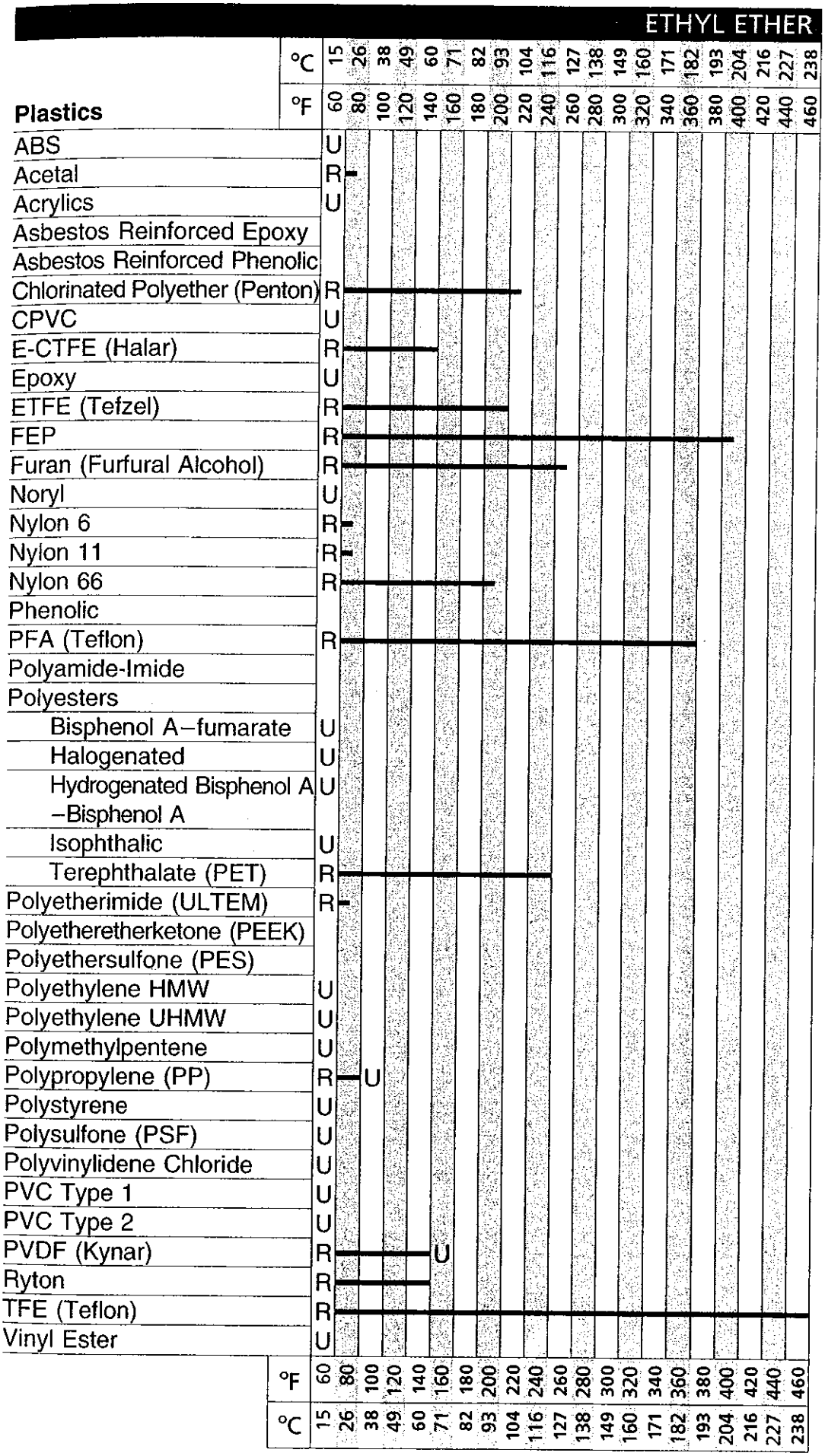
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ETHYL ETHER

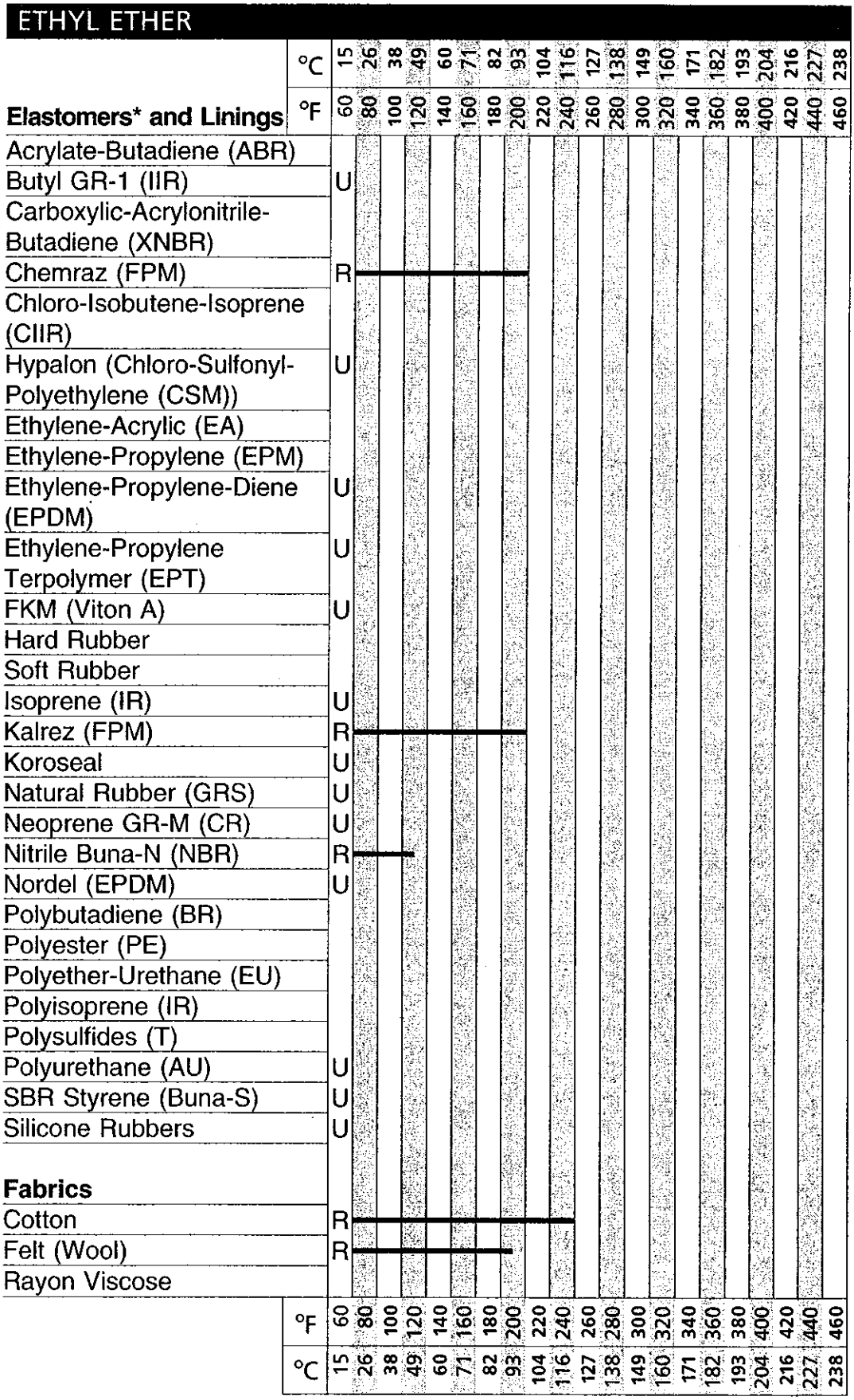


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ETHYL ETHER



*See also Nylon 11 under PLASTICS

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ETHYL FORMATE

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze	G																										
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L	G																										
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3	G																										
E-Bright 26-1																											
Silicon Bronze	G																										
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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ETHYL FORMATE

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

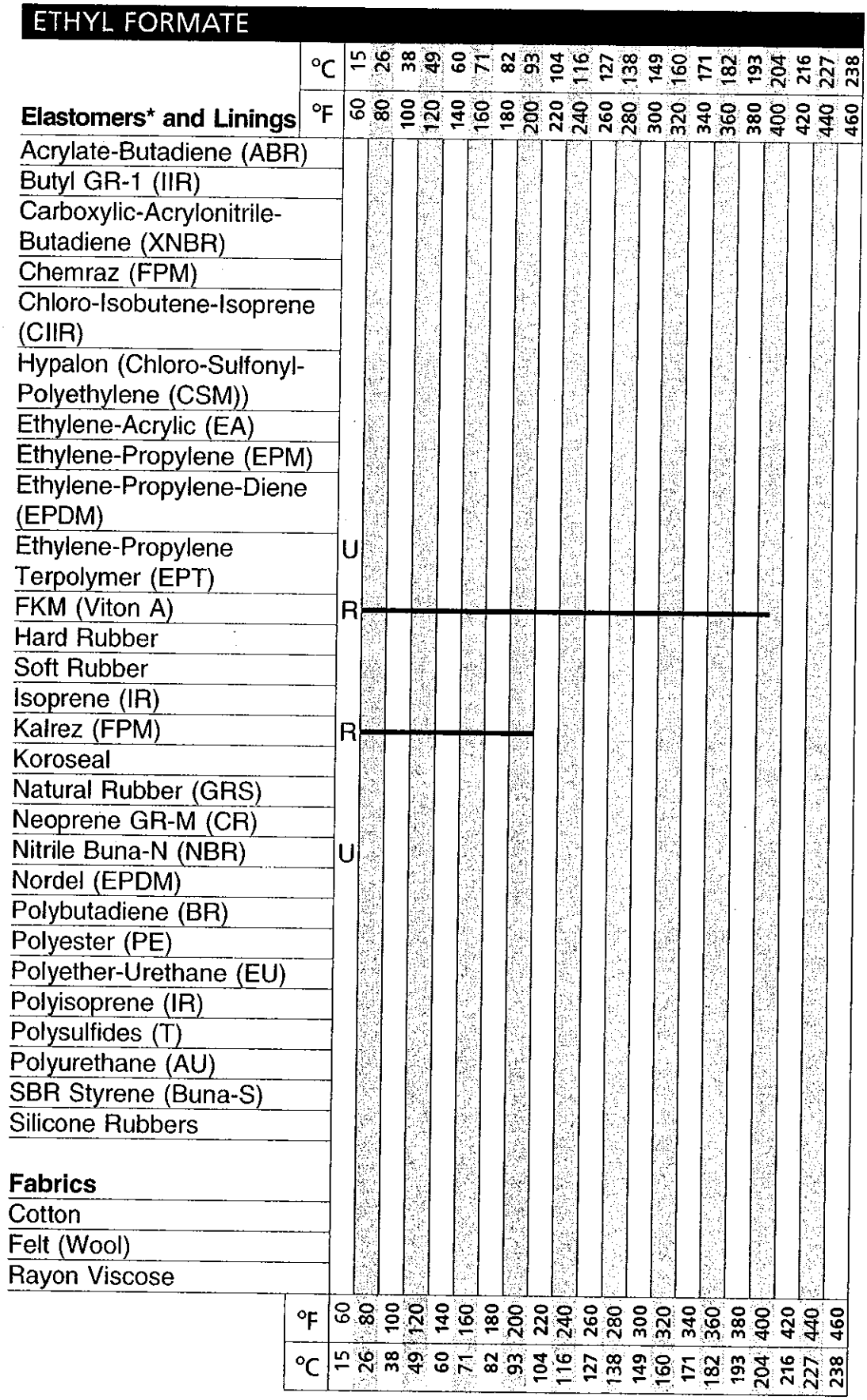
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ETHYL FORMATE

Plastics	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																					
Acetal																					
Acrylics																					
Asbestos Reinforced Epoxy																					
Asbestos Reinforced Phenolic																					
Chlorinated Polyether (Penton)																					
CPVC																					
E-CTFE (Halar)	R																				
Epoxy																					
ETFE (Tefzel)																					
FEP																					
Furan (Furfural Alcohol)																					
Noryl																					
Nylon 6																					
Nylon 11																					
Nylon 66																					
Phenolic																					
PFA (Teflon)																					
Polyamide-Imide																					
Polyesters																					
Bisphenol A–fumarate																					
Halogenated																					
Hydrogenated Bisphenol A –Bisphenol A																					
Isophthalic																					
Terephthalate (PET)																					
Polyetherimide (ULTEM)																					
Polyetheretherketone (PEEK)																					
Polyethersulfone (PES)																					
Polyethylene HMW																					
Polyethylene UHMW																					
Polymethylpentene																					
Polypropylene (PP)																					
Polystyrene																					
Polysulfone																					
Polyvinylidene Chloride																					
PVC Type 1																					
PVC Type 2																					
PVDF (Kynar)	R																				
Ryton																					
TFE (Teflon)																					
Vinyl Ester																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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ETHYL FORMATE



*See also Nylon 11 under PLASTICS

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2-ETHYL HEXANOL

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass		E																									
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Galv. Stl.																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L																											
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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2-ETHYL HEXANOL

Nonmetallic Materials
Borosilicate Glass
Carbon
Carbon-Graphite Resin Impregnated
Ceramics
Coatings
Acrylic
Asphalt
Chlorinated Rubber
Coal Tar
Coal Tar Epoxy
Epoxy General Purpose
Epoxy Chemical Resistant
Epoxy Polyamide
Oil Base (Alkyd, Epoxy, Urethane)
Phenolic
Polyester
Polyvinyl Chloride
Silicones
Urethanes
Vinyls
Water Base
Zinc Rich
Mortars
Silicate
Sodium Silicate
Potassium Silicate
Silica
Sulfur
Furan Resin
Polyester
Epoxy

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460

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2-ETHYL HEXANOL

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)	R																					
Epoxy																						
ETFE (Tefzel)																						
FEP																						
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)																						
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW	R																					
Polymethylpentene																						
Polypropylene (PP)																						
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)	R																					
Ryton																						
TFE (Teflon)	R																					
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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2-ETHYL HEXANOL

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	U																					
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)																						
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)	R																					
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)	R																					
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)	U																					
Nitrile Buna-N (NBR)	U																					
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	115	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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ETHYL MERCAPTAN

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel	G	G	G	G	G	G	G																				
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Galv. Stl.	G	G																									
Monel 400	G	G	G	G	G	G	G																				
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L	G	G	G	G	G	G	G																				
Type 400 series	E	E																									
Type 904-L																											
17-4 PH																											
20 Cb 3	G	G	G	G	G	G	G																				
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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ETHYL MERCAPTAN

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones		U																				
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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ETHYL MERCAPTAN

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)																						
Epoxy																						
ETFE (Tefzel)																						
FEP																						
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)																						
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
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Isophthalic																						
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Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
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Polymethylpentene																						
Polypropylene (PP)																						
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Polyvinylidene Chloride																						
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PVDF (Kynar)																						
Ryton																						
TFE (Teflon)																						
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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ETHYL MERCAPTAN

Elastomers* and Linings	°C 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238
	°F 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460
Acrylate-Butadiene (ABR)	
Butyl GR-1 (IIR)	
Carboxylic-Acrylonitrile-Butadiene (XNBR)	
Chemraz (FPM)	
Chloro-Isobutene-Isoprene (CIIR)	
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	U
Ethylene-Acrylic (EA)	
Ethylene-Propylene (EPM)	
Ethylene-Propylene-Diene (EPDM)	U
Ethylene-Propylene Terpolymer (EPT)	R
FKM (Viton A)	R
Hard Rubber	
Soft Rubber	
Isoprene (IR)	
Kalrez (FPM)	R
Koroseal	
Natural Rubber (GRS)	
Neoprene GR-M (CR)	
Nitrile Buna-N (NBR)	U
Nordel (EPDM)	U
Polybutadiene (BR)	
Polyester (PE)	
Polyether-Urethane (EU)	
Polyisoprene (IR)	
Polysulfides (T)	
Polyurethane (AU)	
SBR Styrene (Buna-S)	
Silicone Rubbers	U
Fabrics	
Cotton	
Felt (Wool)	
Rayon Viscose	

°F 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

°C 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

*See also Nylon 11 under PLASTICS

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ETHYL OXALATE

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
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Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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ETHYL OXALATE

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
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Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones	U																					
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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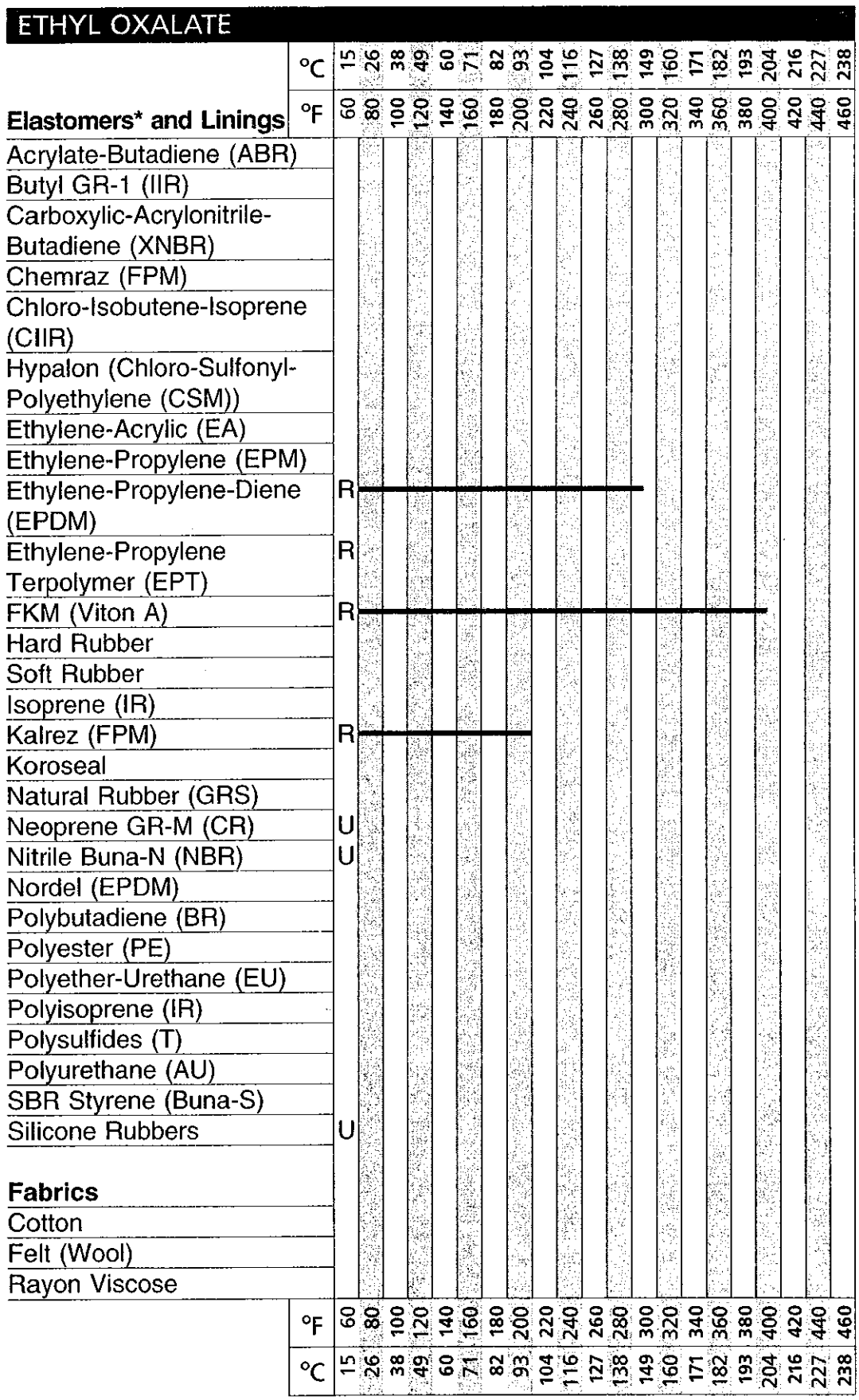
ETHYL OXALATE

Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC		
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)		
FEP		
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated		
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic		
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)		
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1		
PVC Type 2		
PVDF (Kynar)		
Ryton	R	60 80 100 120 140 160 180 200
TFE (Teflon)	R	60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460
Vinyl Ester	R	60 80 100

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

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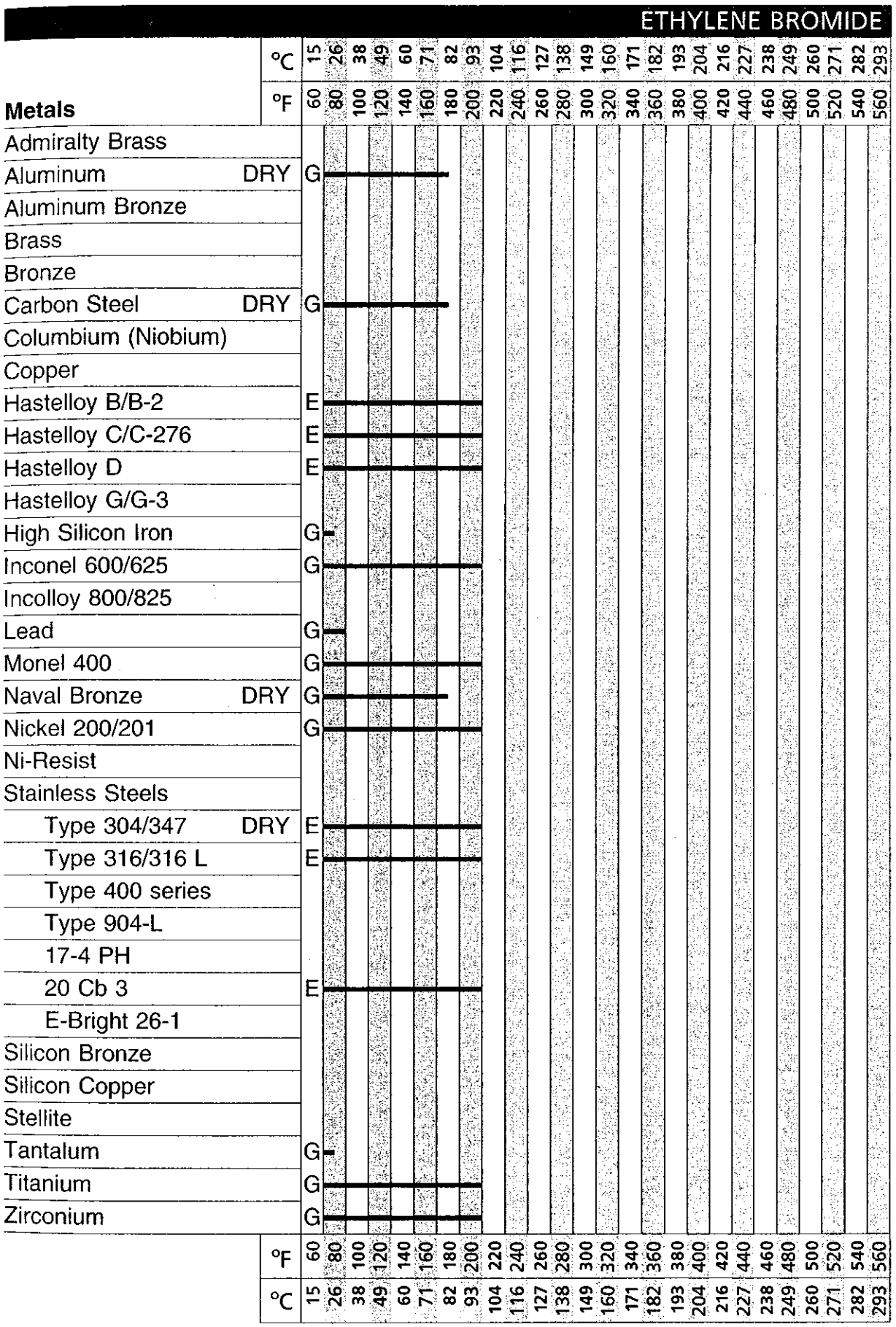
ETHYL OXALATE



*See also Nylon 11 under PLASTICS

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ETHYLENE BROMIDE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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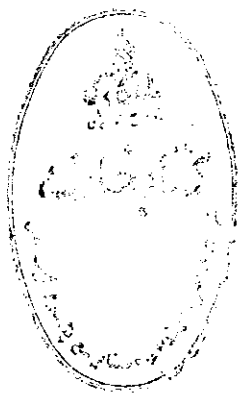
ETHYLENE BROMIDE

Nonmetallic Materials	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass	R																				
Carbon	R																				
Carbon-Graphite Resin Impregnated	R																				
Ceramics																					
Coatings																					
Acrylic																					
Asphalt																					
Chlorinated Rubber																					
Coal Tar																					
Coal Tar Epoxy																					
Epoxy General Purpose																					
Epoxy Chemical Resistant																					
Epoxy Polyamide																					
Oil Base (Alkyd, Epoxy, Urethane)																					
Phenolic																					
Polyester																					
Polyvinyl Chloride	U																				
Silicones																					
Urethanes																					
Vinyls	U																				
Water Base																					
Zinc Rich																					
Mortars																					
Silicate																					
Sodium Silicate																					
Potassium Silicate																					
Silica																					
Sulfur																					
Furan Resin																					
Polyester																					
Epoxy																					
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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ETHYLENE BROMIDE

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS		U																				
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)		R																				
CPVC		U																				
E-CTFE (Halar)		R																				
Epoxy																						
ETFE (Tefzel)		R																				
FEP		R																				
Furan (Furfural Alcohol)		U																				
Noryl																						
Nylon 6		R																				
Nylon 11		R																				
Nylon 66		R																				
Phenolic																						
PFA (Teflon)		R																				
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate		U																				
Halogenated		U																				
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)		R																				
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW		U																				
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)		U																				
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride		R																				
PVC Type 1		U																				
PVC Type 2		U																				
PVDF (Kynar)		R																				
Ryton																						
TFE (Teflon)		R																				
Vinyl Ester		U																				
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238



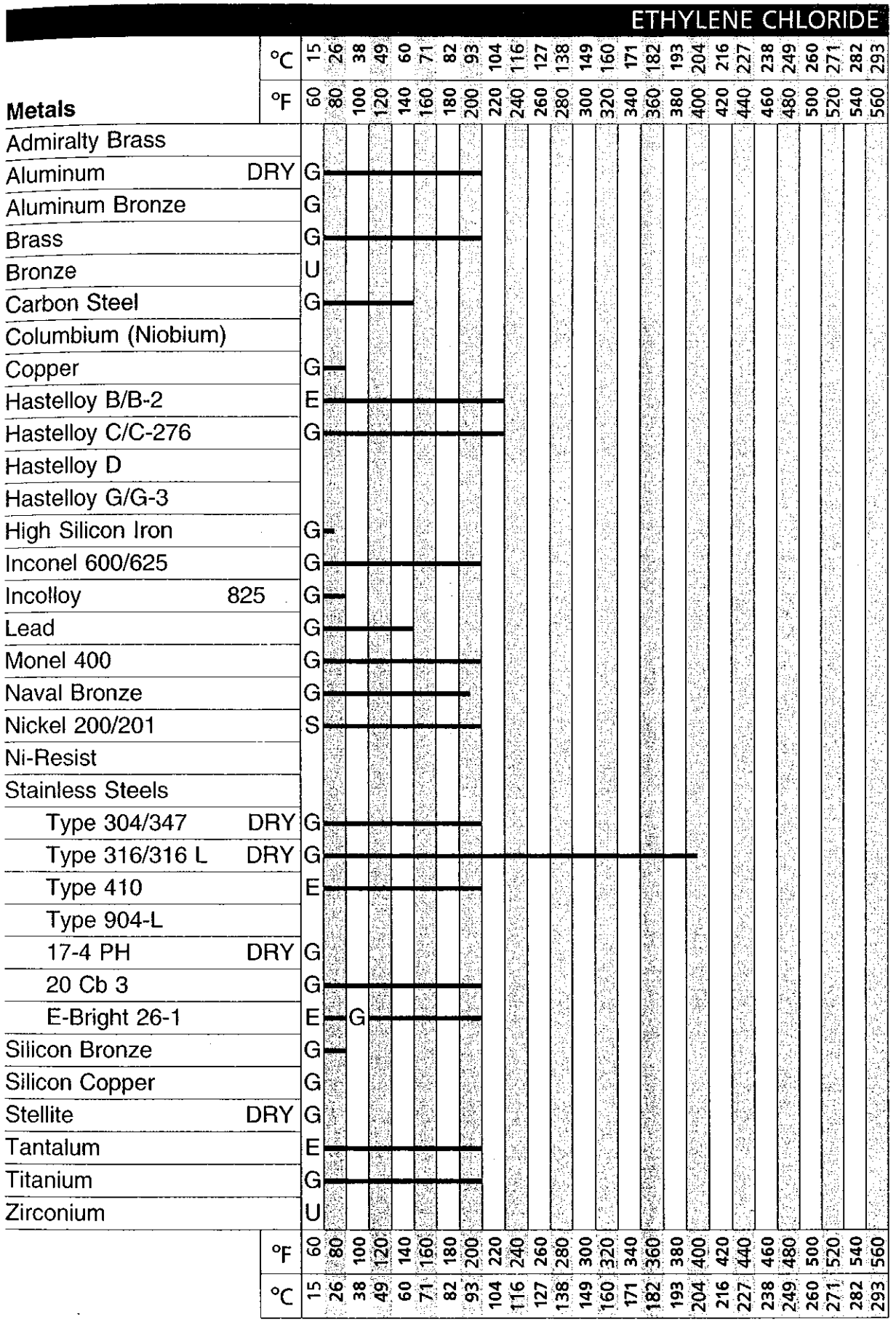
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ETHYLENE BROMIDE

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)		U																				
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)		R																				
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))		U																				
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)		U																				
Ethylene-Propylene Terpolymer (EPT)		U																				
FKM (Viton A)		R																				
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)		U																				
Kalrez (FPM)		R																				
Koroseal																						
Natural Rubber (GRS)		U																				
Neoprene GR-M (CR)		U																				
Nitrile Buna-N (NBR)		U																				
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

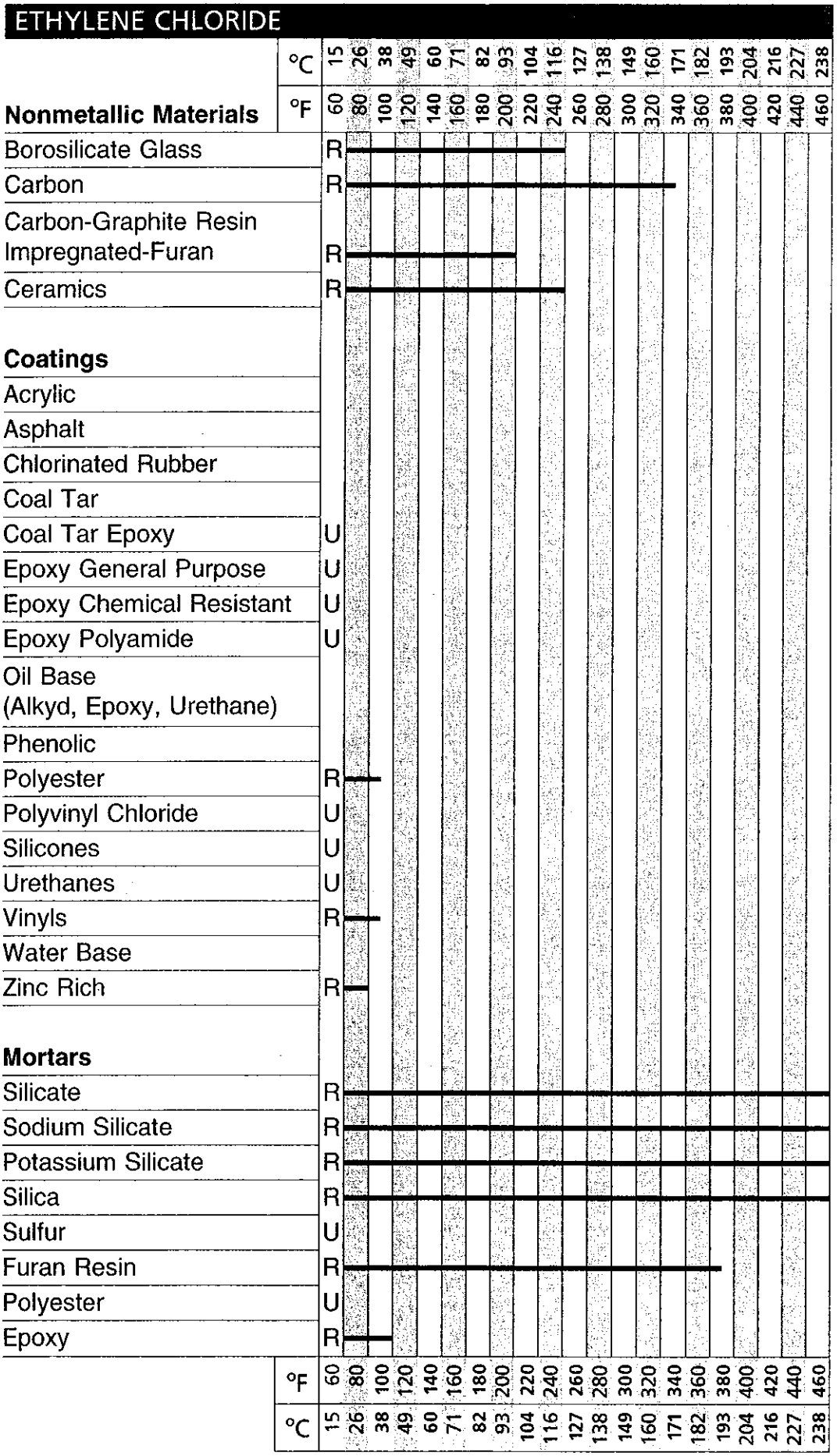
R = Resistant

U = Unsatisfactory

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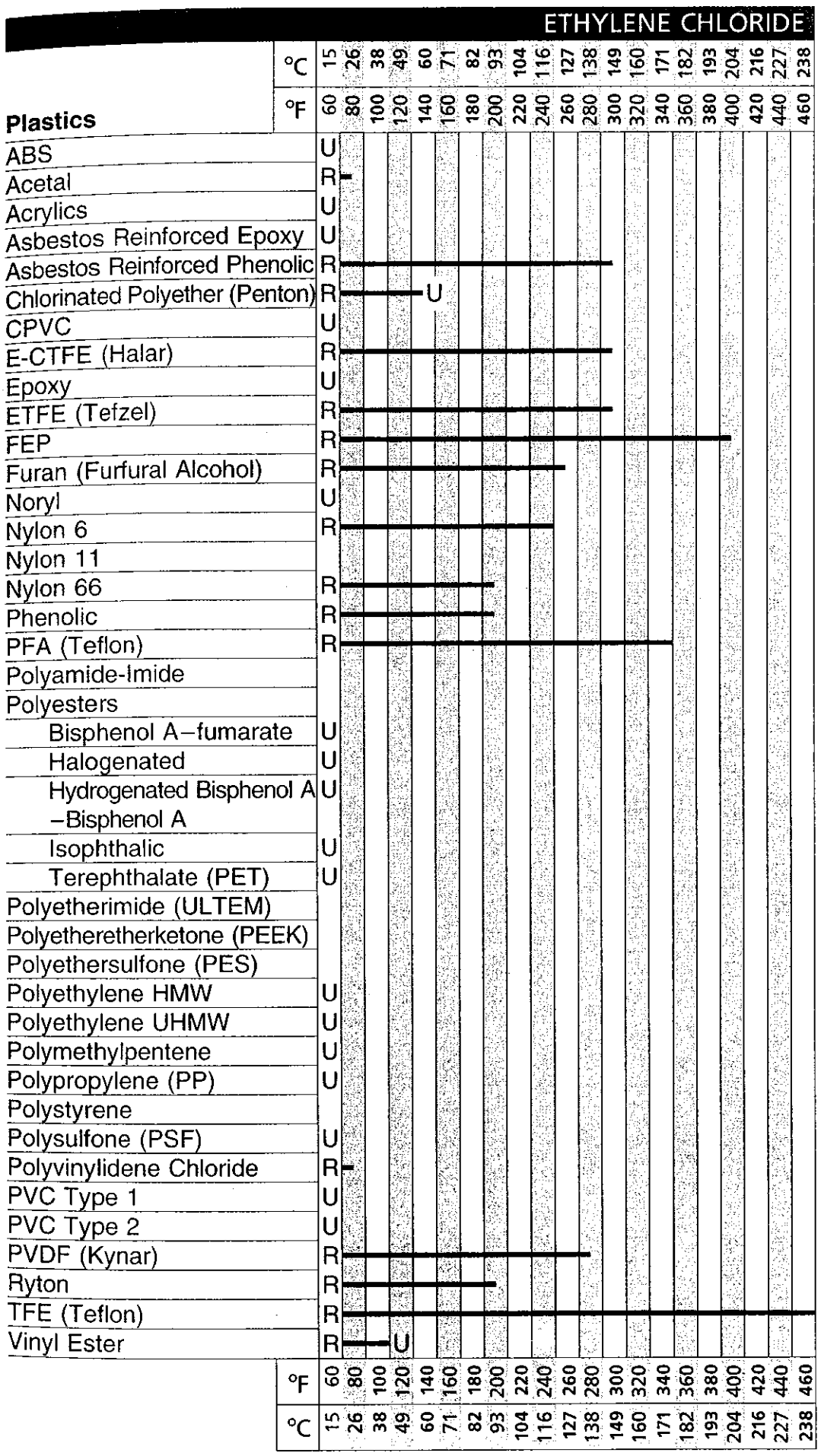
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ETHYLENE CHLORIDE



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ETHYLENE CHLORIDE



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ETHYLENE CHLORIDE

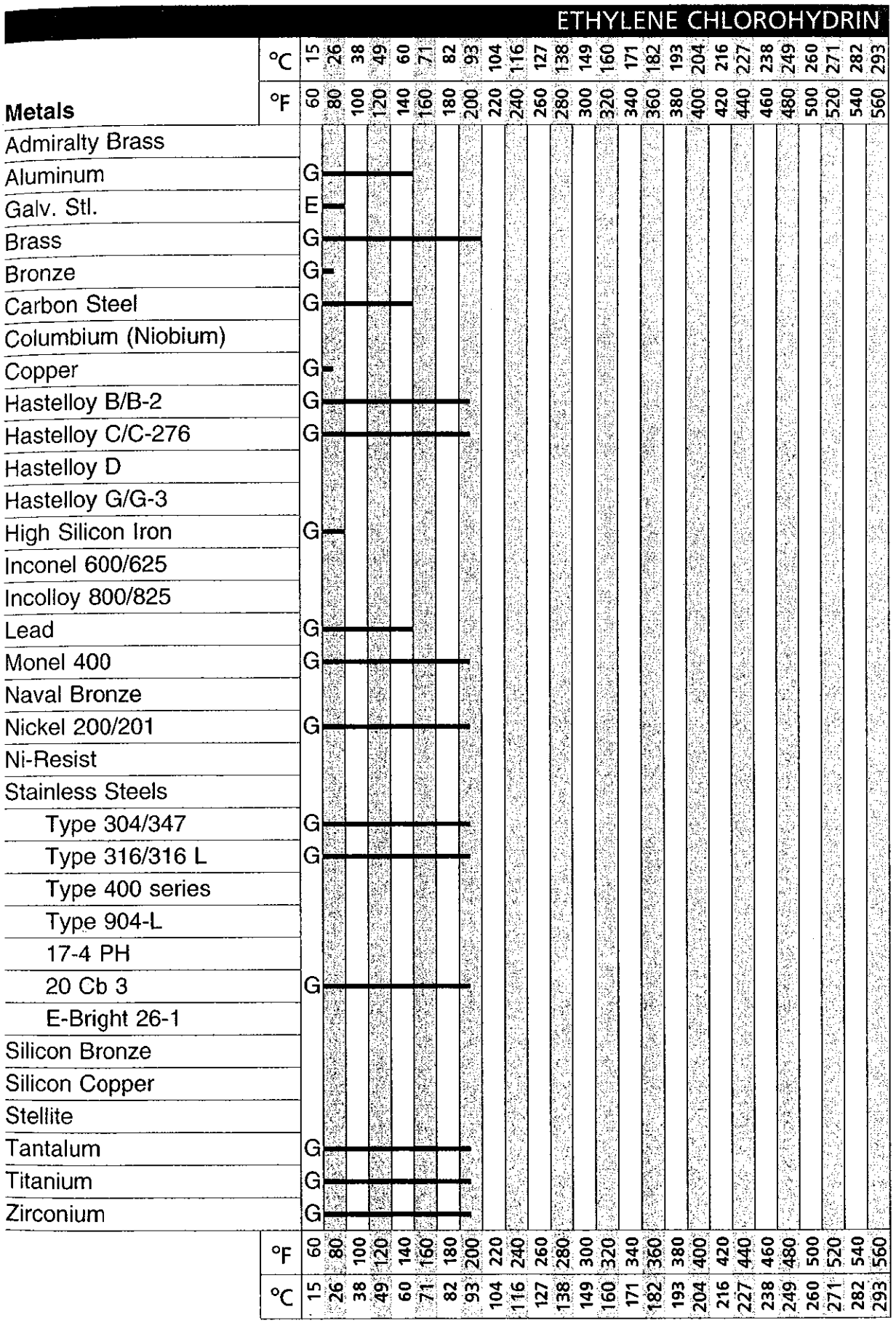
Elastomers* and Linings	°F	°C
Acrylate-Butadiene (ABR)		
Butyl GR-1 (IIR)	U	
Carboxylic-Acrylonitrile-Butadiene (XNBR)		
Chemraz (FPM)	R	
Chloro-Isobutene-Isoprene (CIIR)		
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	U	
Ethylene-Acrylic (EA)		
Ethylene-Propylene (EPM)	U	
Ethylene-Propylene-Diene (EPDM)	U	
Ethylene-Propylene Terpolymer (EPT)	U	
FKM (Viton A)	R	
Hard Rubber	U	
Soft Rubber		
Isoprene (IR)	U	
Kalrez (FPM)	R	
Koroseal	U	
Natural Rubber (GRS)	U	
Neoprene GR-M (CR)	U	
Nitrile Buna-N (NBR)	U	
Nordel (EPDM)	U	
Polybutadiene (BR)		
Polyester (PE)	U	
Polyether-Urethane (EU)	U	
Polyisoprene (IR)		
Polysulfides (T)	U	
Polyurethane (AU)	U	
SBR Styrene (Buna-S)		
Silicone Rubbers	U	
Fabrics		
Cotton	U	
Felt (Wool)		
Rayon Viscose		

°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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ETHYLENE CHLOROHYDRIN



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

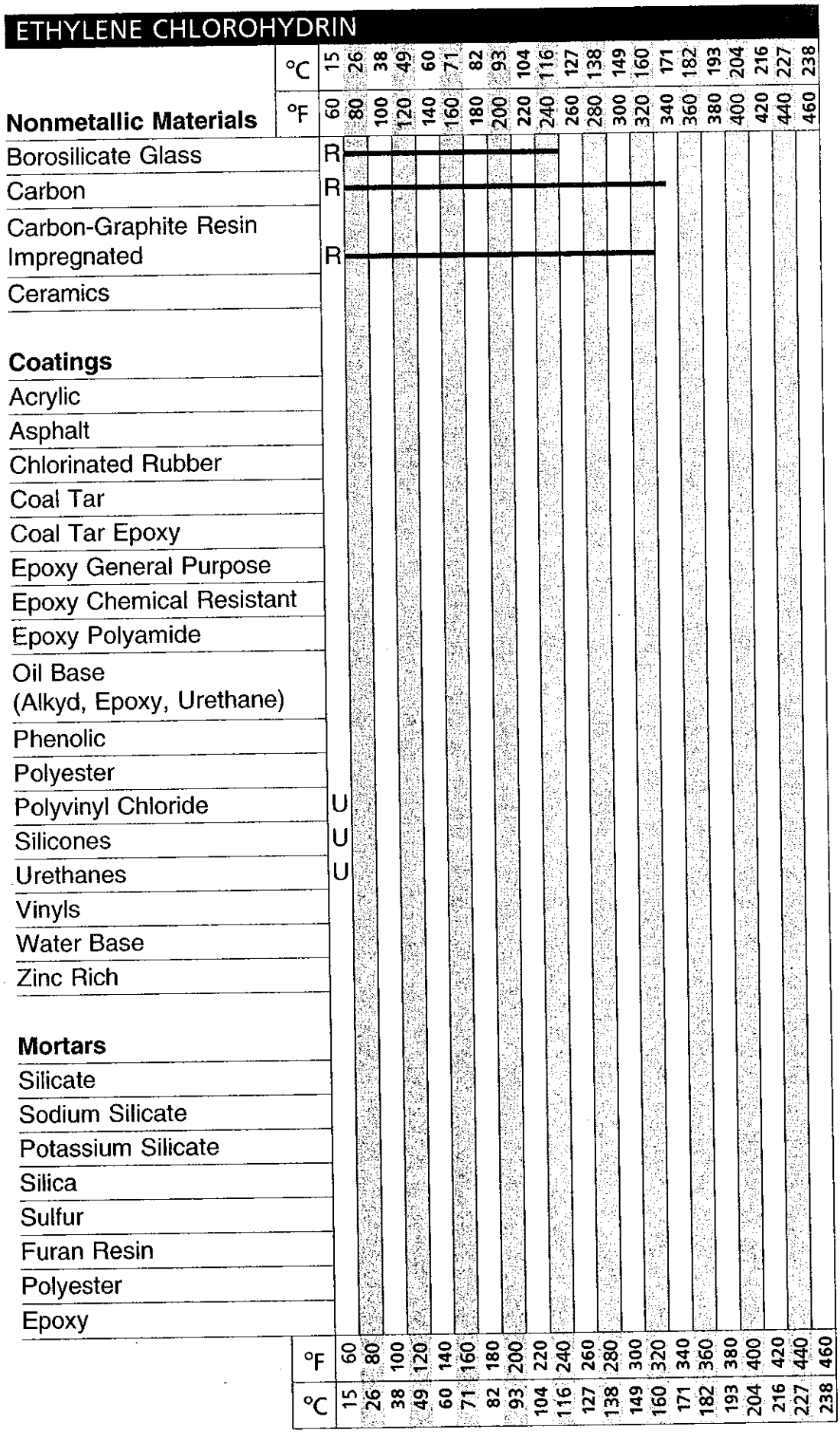
R = Resistant

U = Unsatisfactory

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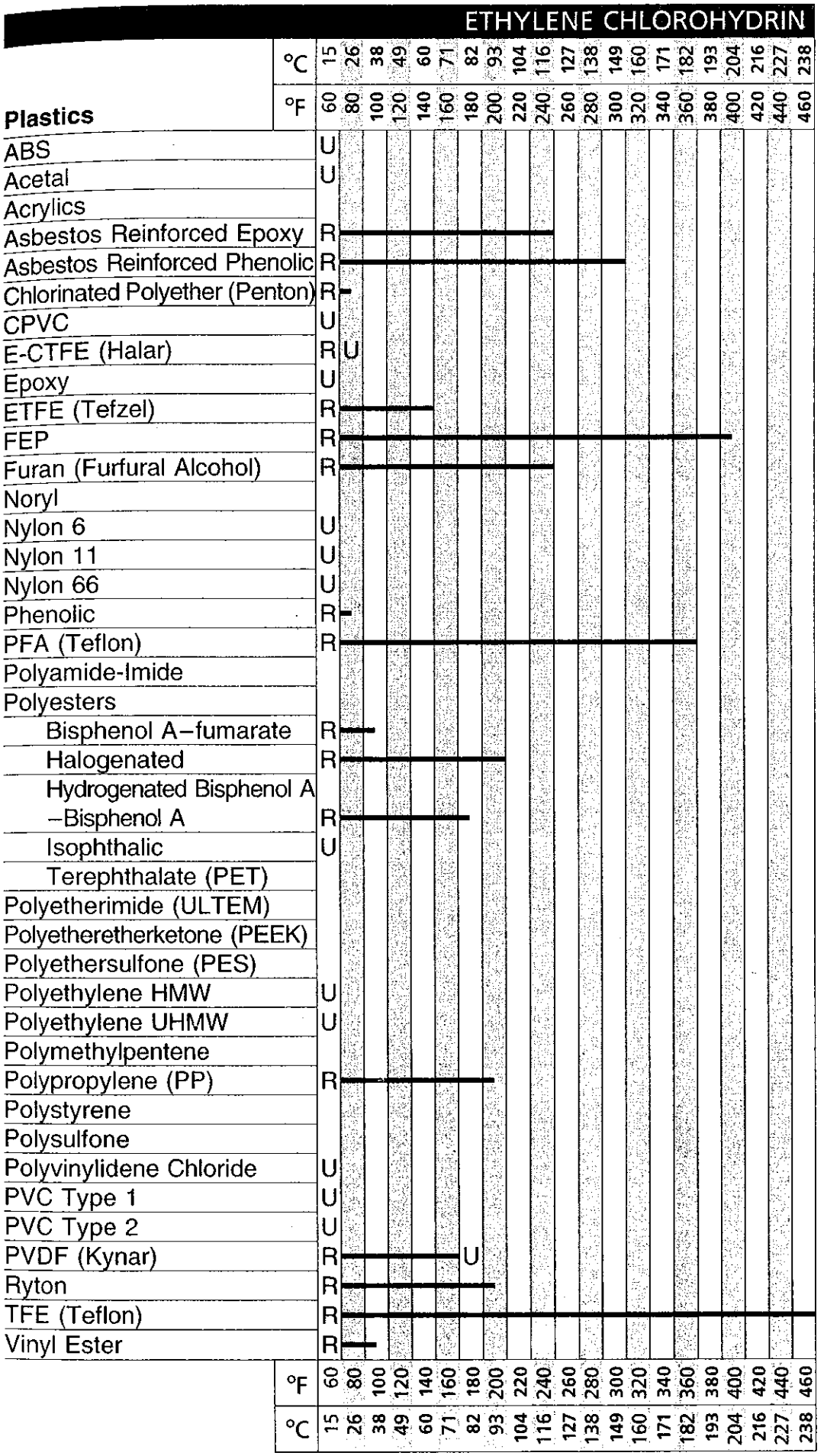
ETHYLENE CHLOROHYDRIN



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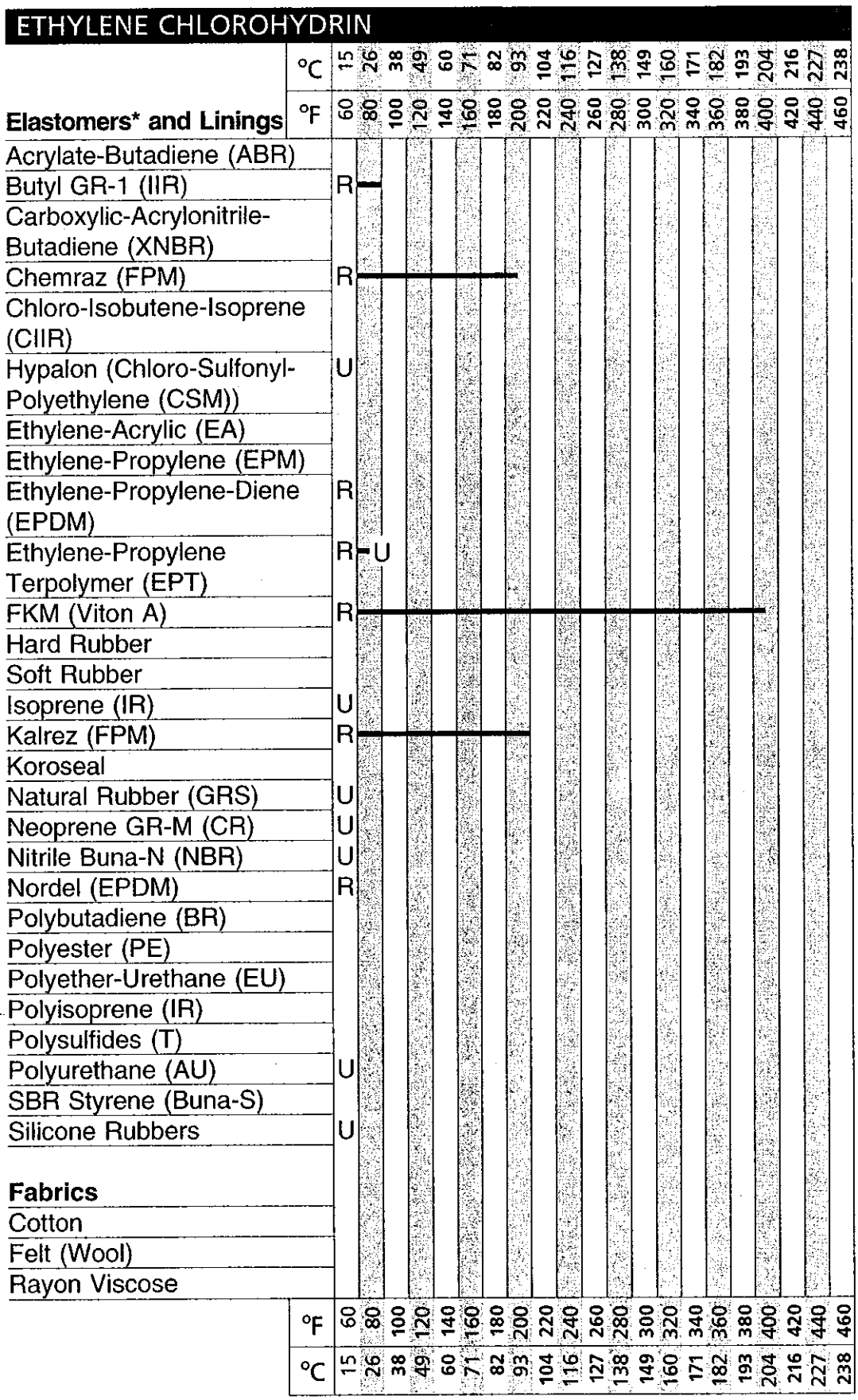
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ETHYLENE CHLOROHYDRIN



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ETHYLENE CHLOROHYDRIN



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ETHYLENE, DRY

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze DRY		G																									
Carbon Steel DRY		G																									
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Galv. Stl.		G																									
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316																											
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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ETHYLENE, DRY

Nonmetallic Materials
Borosilicate Glass
Carbon
Carbon-Graphite Resin Impregnated
Ceramics
Coatings
Acrylic
Asphalt
Chlorinated Rubber
Coal Tar
Coal Tar Epoxy
Epoxy General Purpose
Epoxy Chemical Resistant
Epoxy Polyamide
Oil Base (Alkyd, Epoxy, Urethane)
Phenolic
Polyester
Polyvinyl Chloride
Silicones
Urethanes
Vinyls
Water Base
Zinc Rich
Mortars
Silicate
Sodium Silicate
Potassium Silicate
Silica
Sulfur
Furan Resin
Polyester
Epoxy

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460

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ETHYLENE, DRY

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)																						
Epoxy																						
ETFE (Tefzel)																						
FEP																						
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)																						
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)																						
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)																						
Ryton																						
TFE (Teflon) DRY		R																				
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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ETHYLENE, DRY

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)	U																					
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)	R																					
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)	R																					
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)																						
Nitrile Buna-N (NBR) DRY	R																					
Nordel (EPDM)	U																					
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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ETHYLENE DIAMINE

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G									
Aluminum Bronze		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U									
Brass		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U									
Bronze		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G									
Carbon Steel		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G									
Columbium (Niobium)																											
Copper		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U									
Hastelloy B/B-2		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G									
Hastelloy C/C-276		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U									
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Galv. Stl.		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U									
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G									
Type 316/316 L		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G									
Type 400 series		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G									
Type 904-L																											
17-4 PH		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G									
20 Cb 3		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G									
E-Bright 26-1																											
Silicon Bronze		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U									
Silicon Copper																											
Stellite																											
Tantalum		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G									
Titanium		E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E									
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

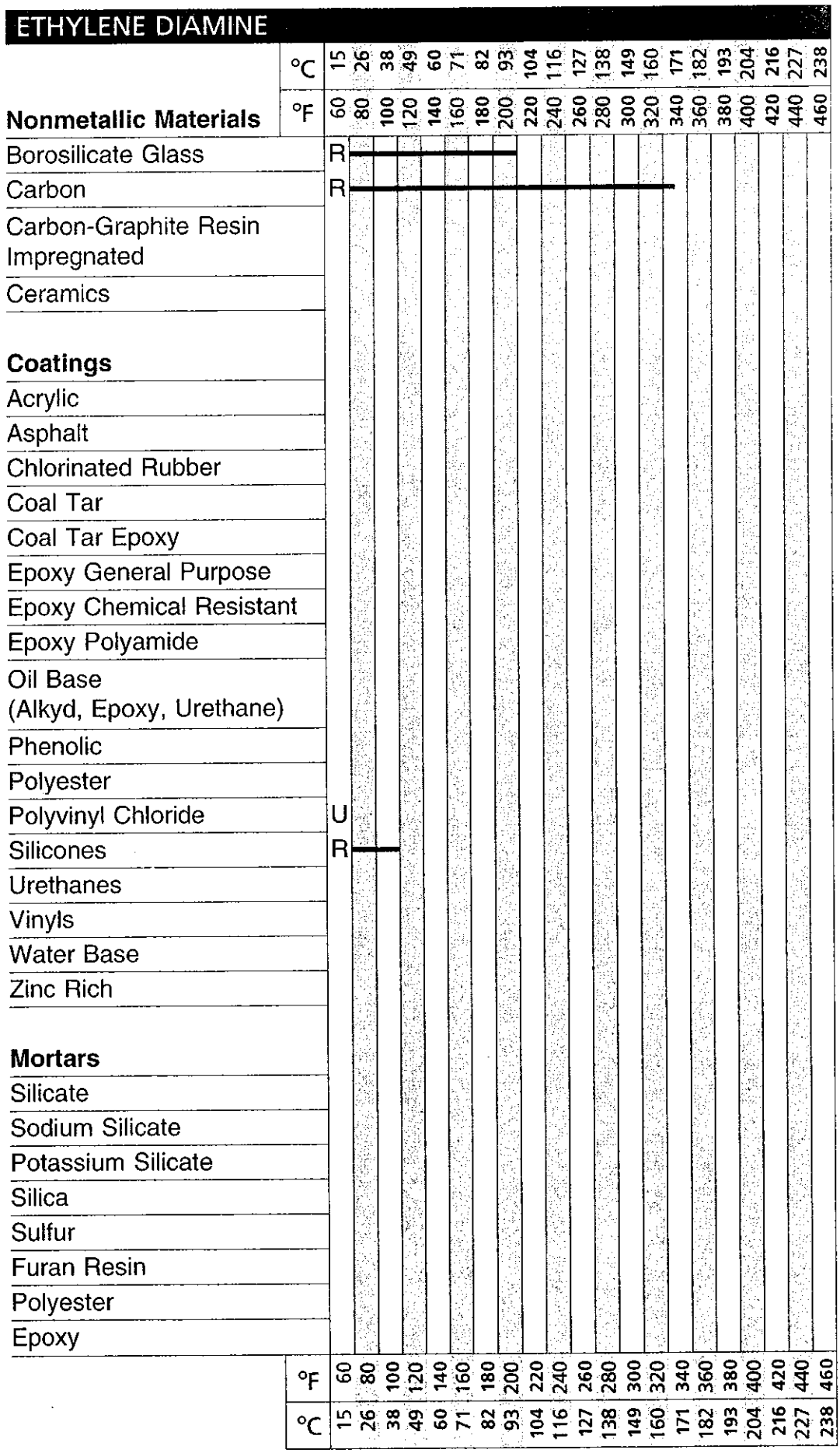
R = Resistant

U = Unsatisfactory

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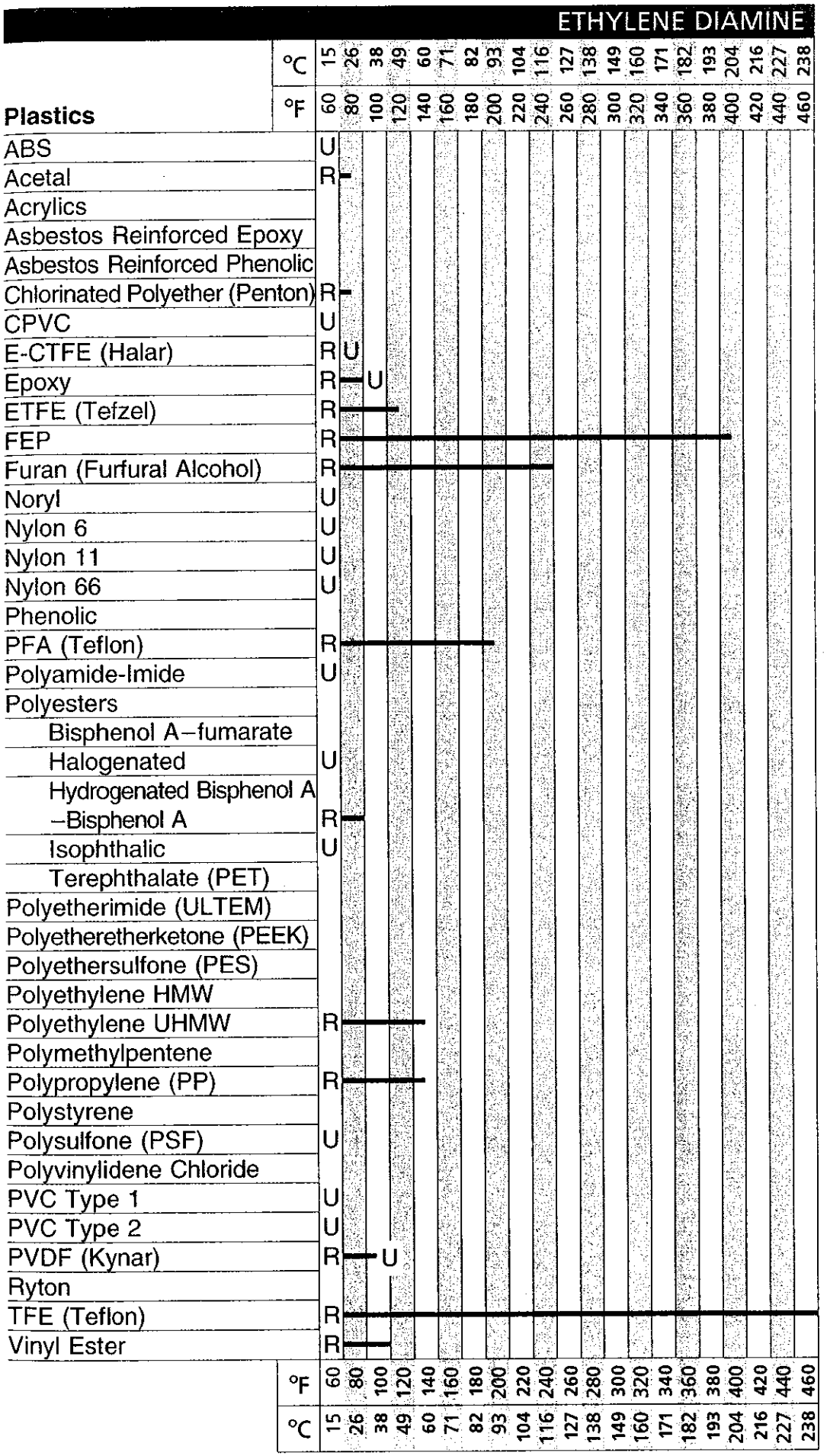
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ETHYLENE DIAMINE



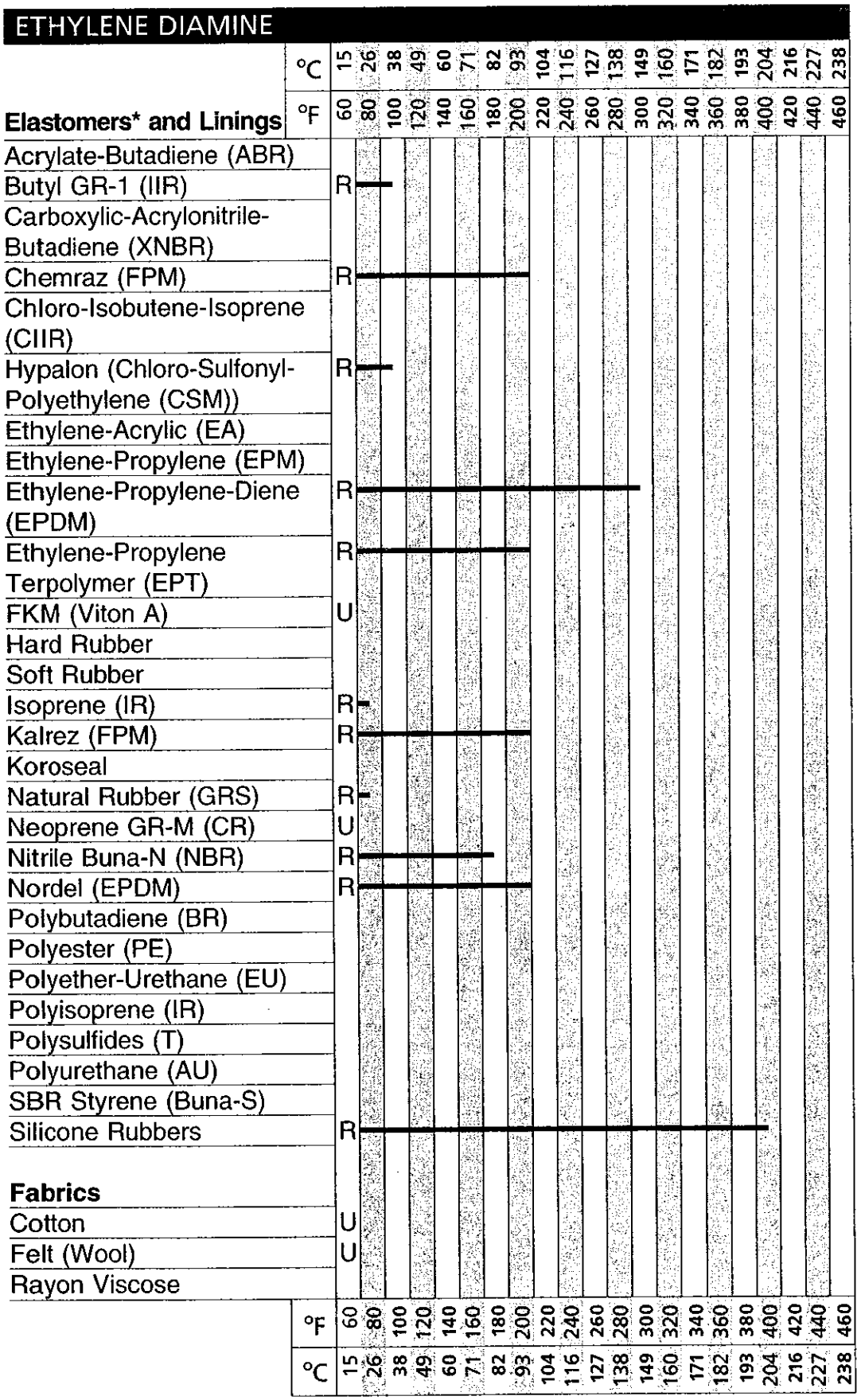
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ETHYLENE DIAMINE



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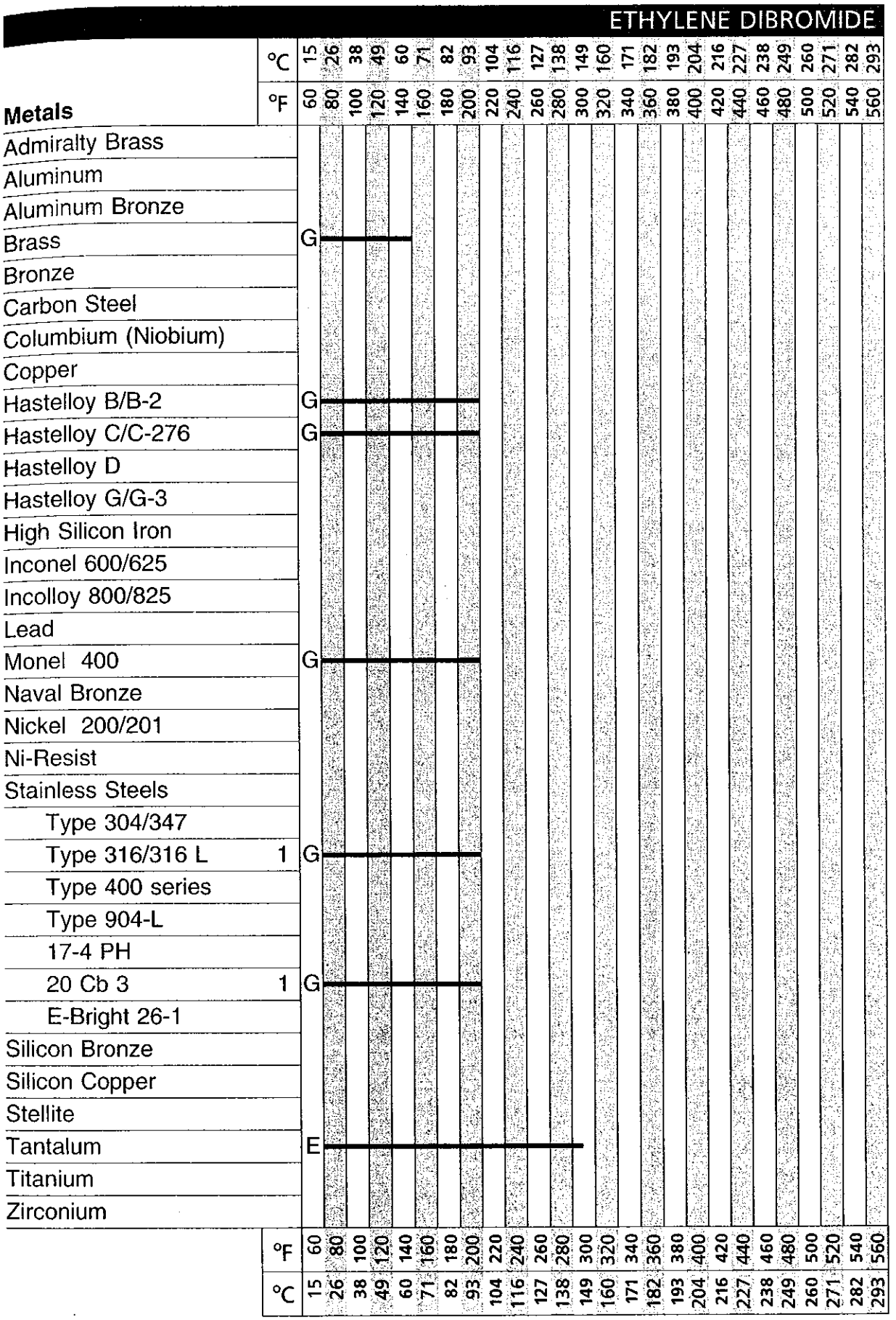
ETHYLENE DIAMINE



*See also Nylon 11 under PLASTICS

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ETHYLENE DIBROMIDE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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ETHYLENE DIBROMIDE

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass		R																				
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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ETHYLENE DIBROMIDE

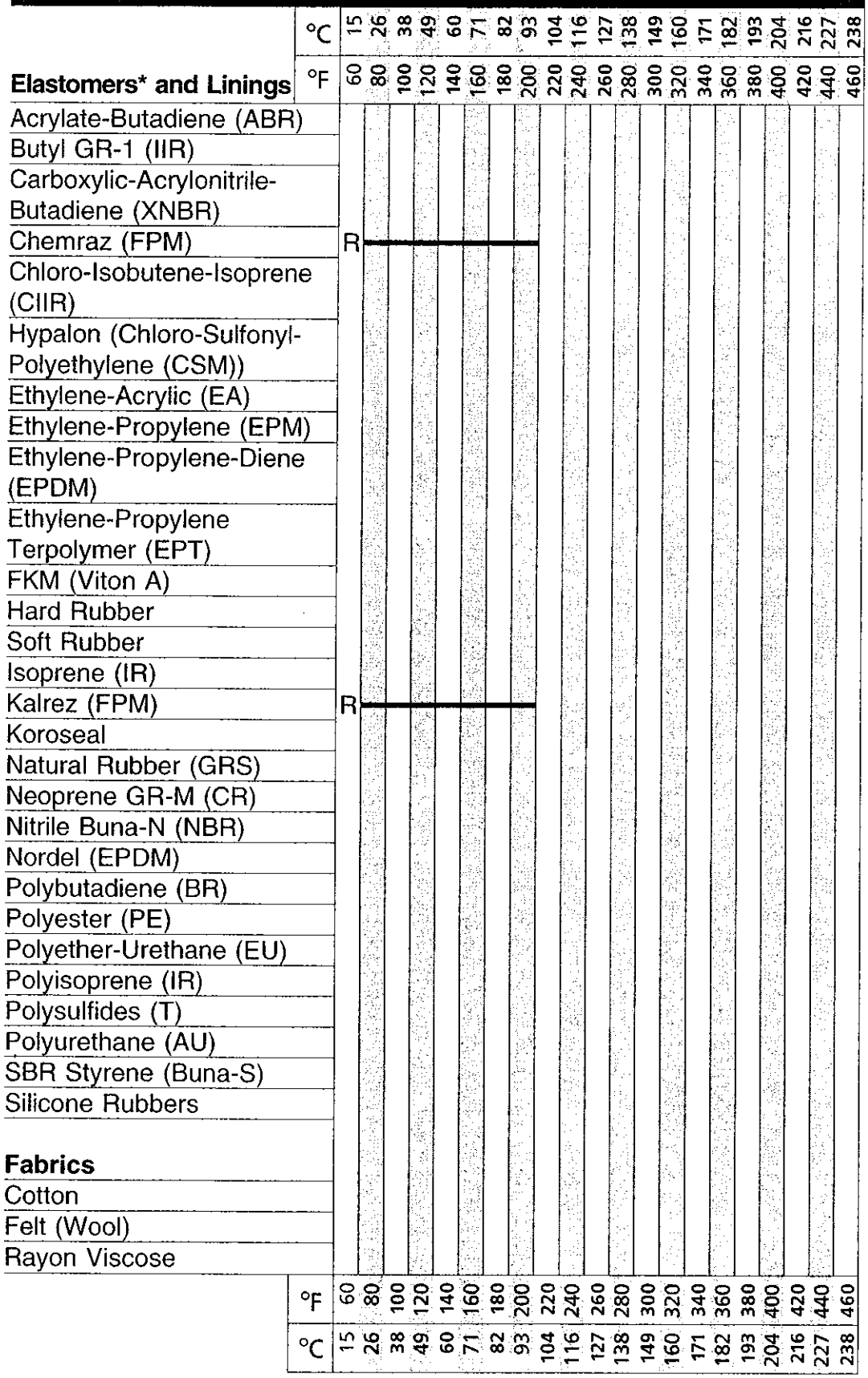
Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC	U	
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)		
FEP	R	
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	U	
Halogenated	U	
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	U	
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)	R	
Polystyrene		
Polysulfone		
Polyvinylidene Chloride	R	
PVC Type 1		
PVC Type 2		
PVDF (Kynar)	R	
Ryton		
TFE (Teflon)	R	
Vinyl Ester	U	

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

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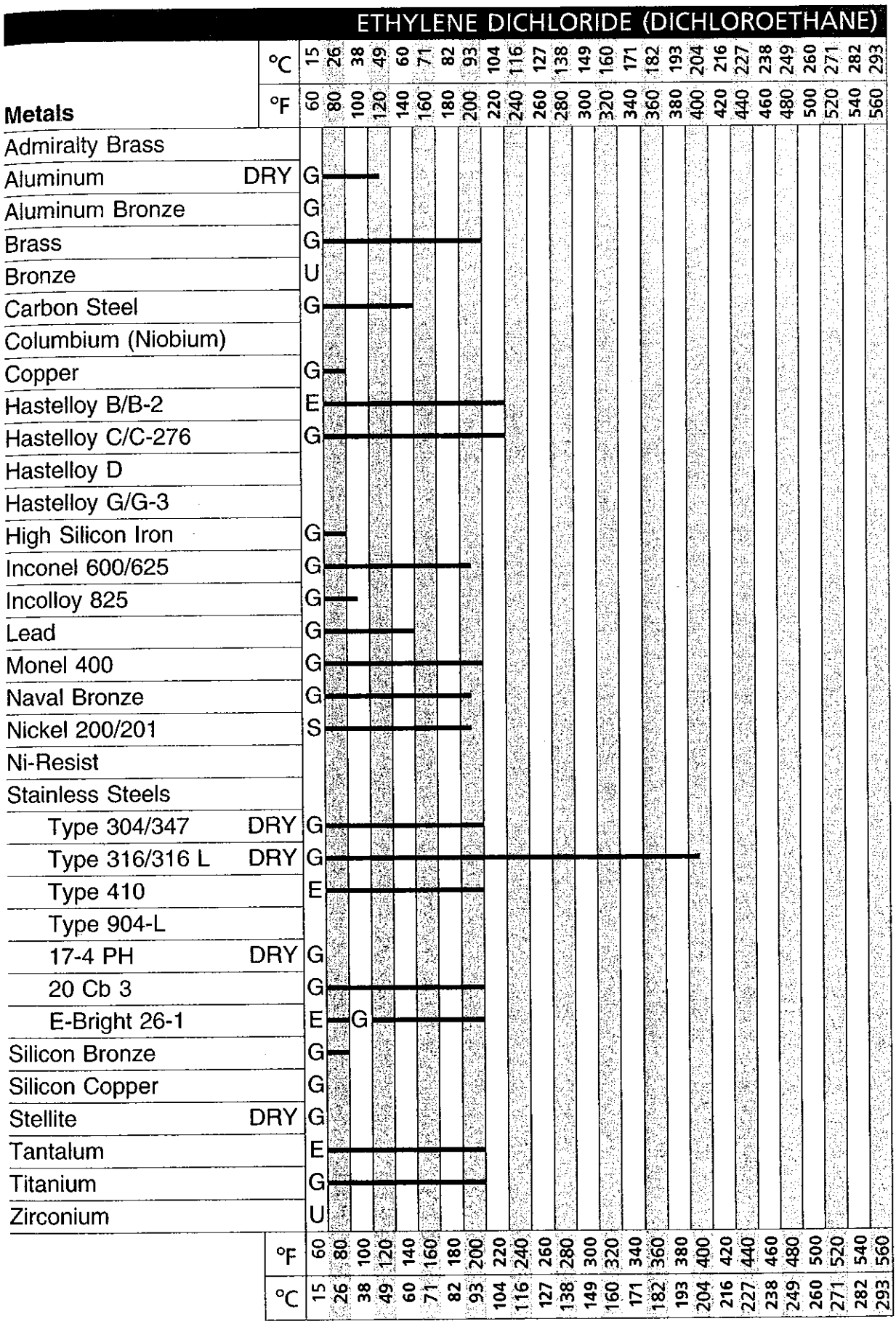
ETHYLENE DIBROMIDE



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ETHYLENE DICHLORIDE (DICHLOROETHANE)



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

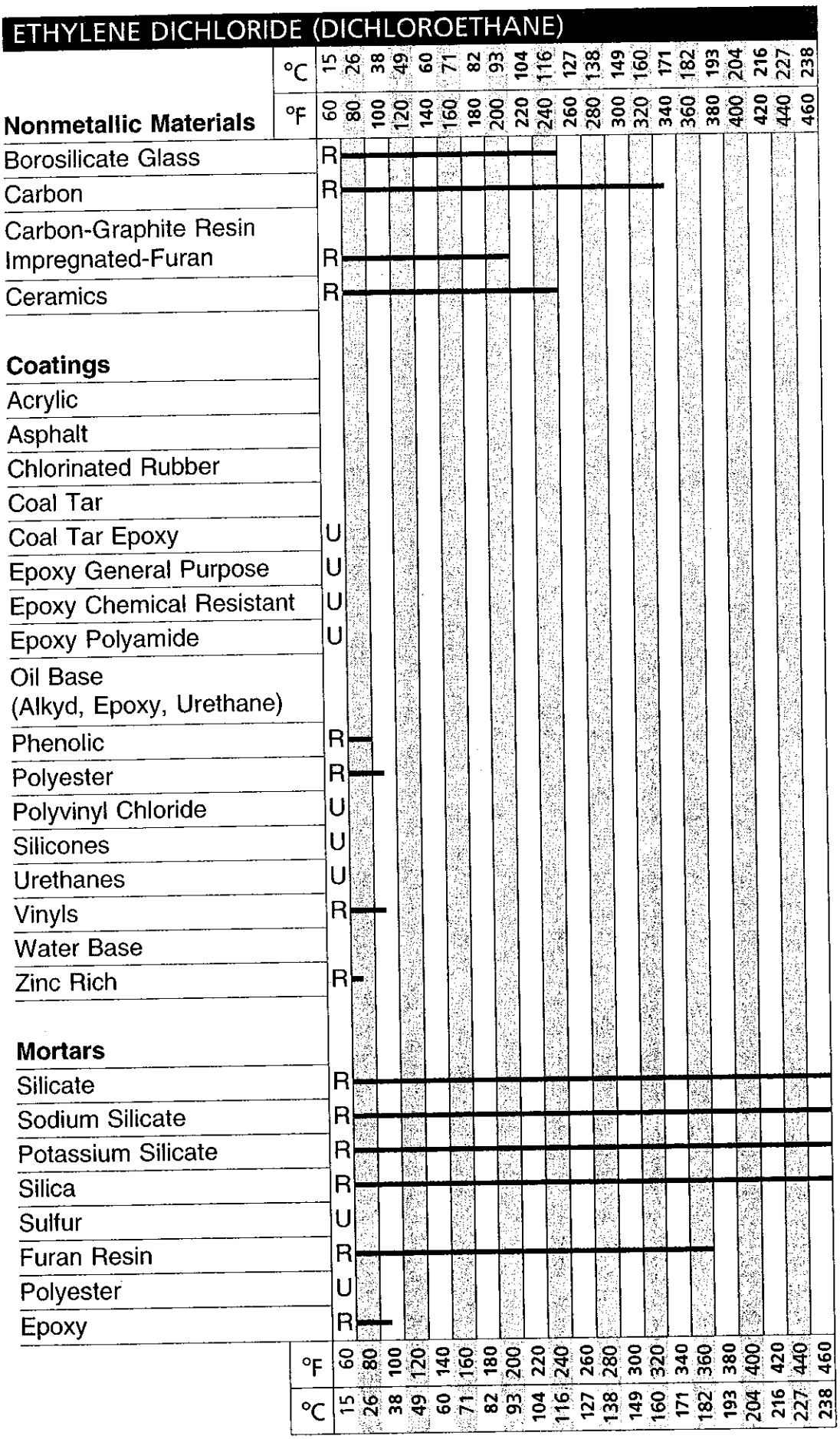
R = Resistant

U = Unsatisfactory

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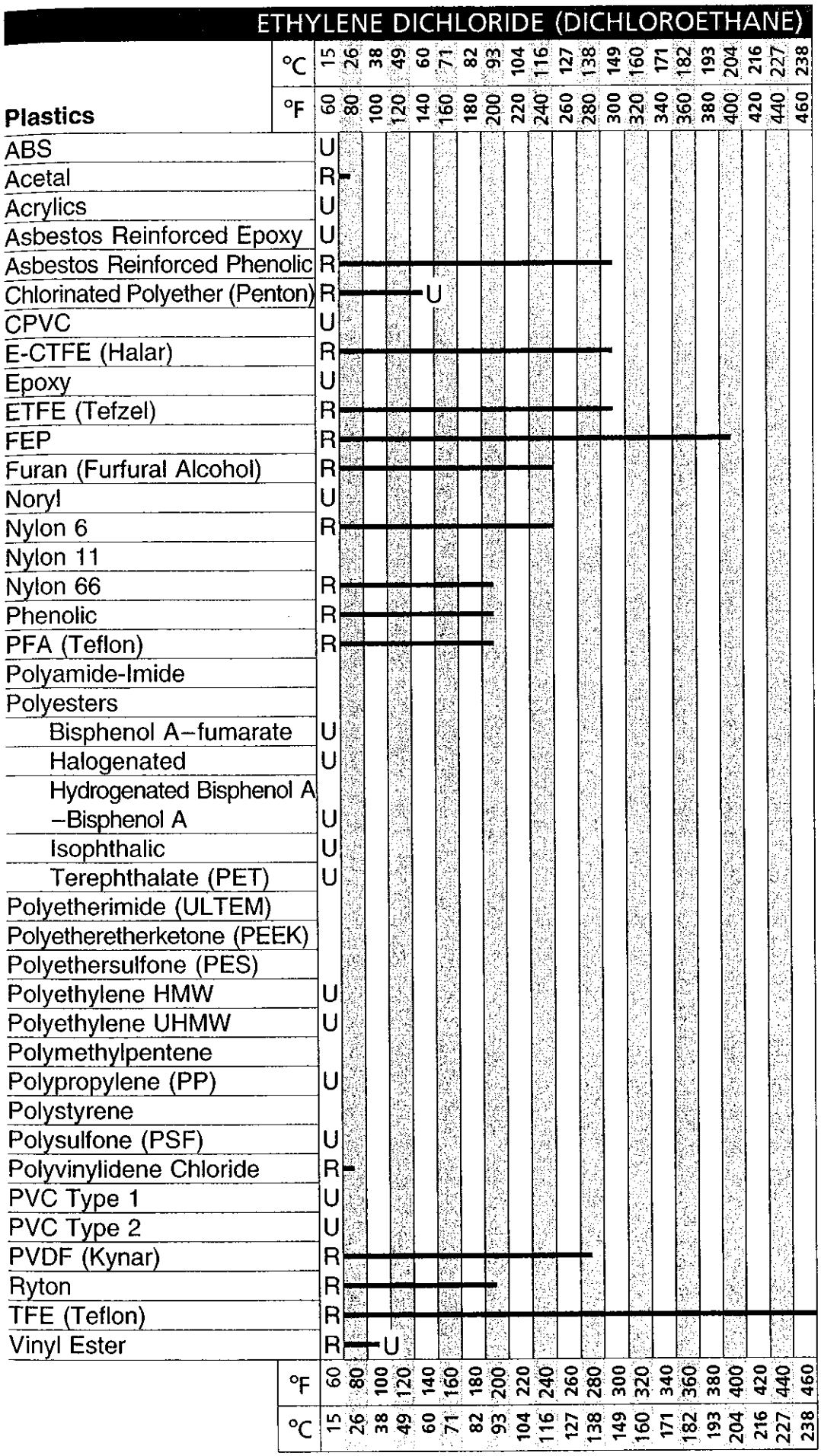
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ETHYLENE DICHLORIDE (DICHLOROETHANE)



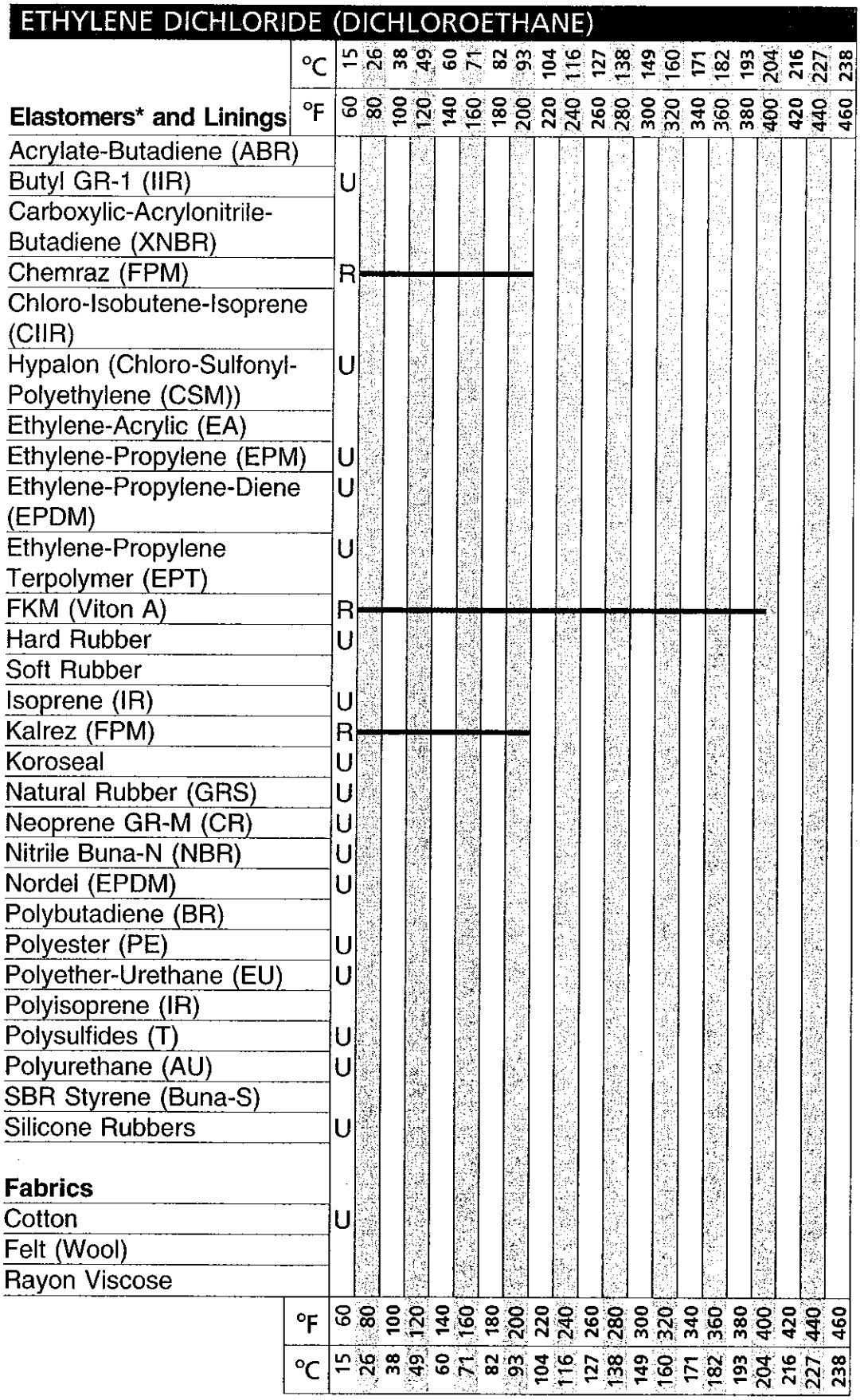
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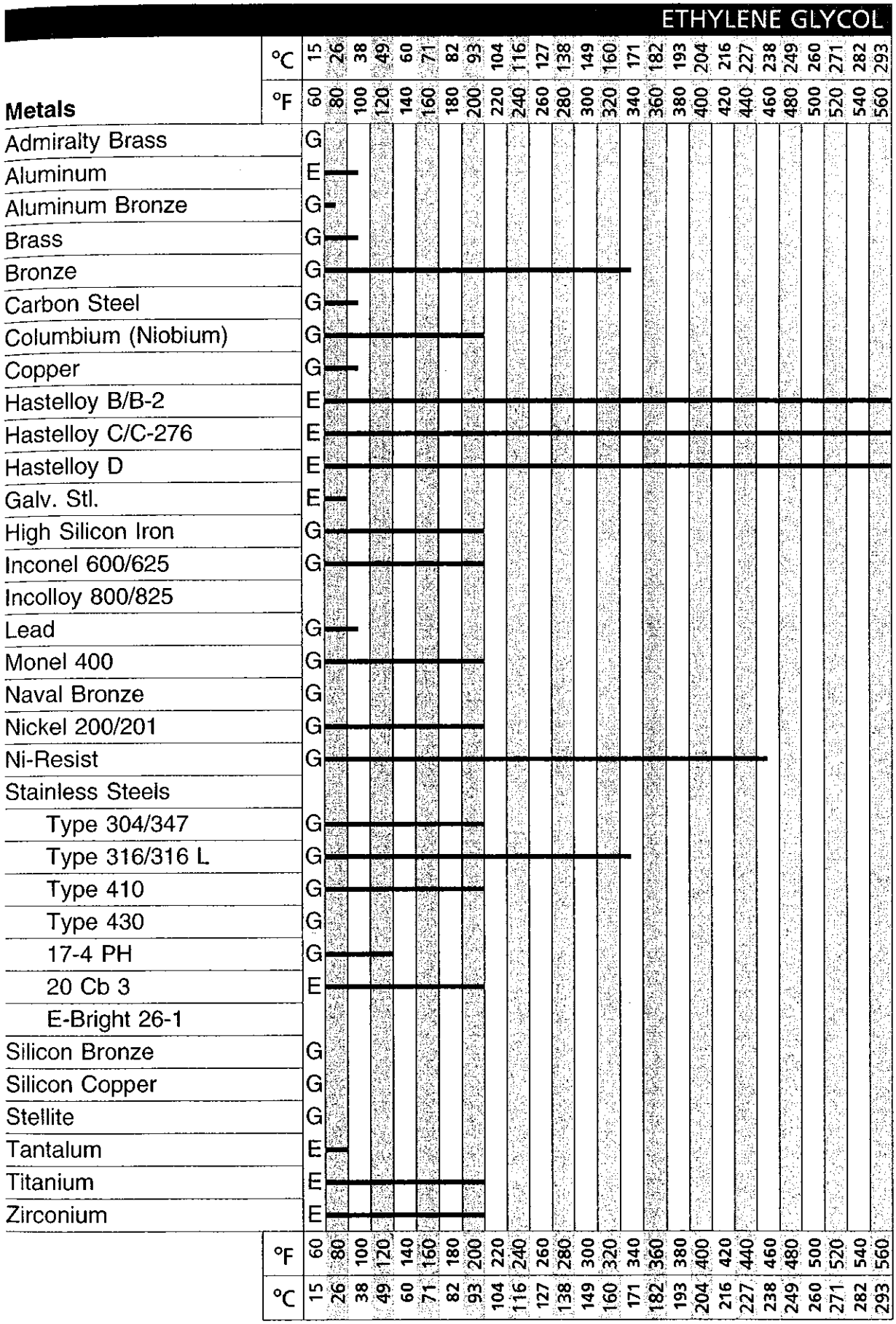
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ETHYLENE DICHLORIDE (DICHLOROETHANE)



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

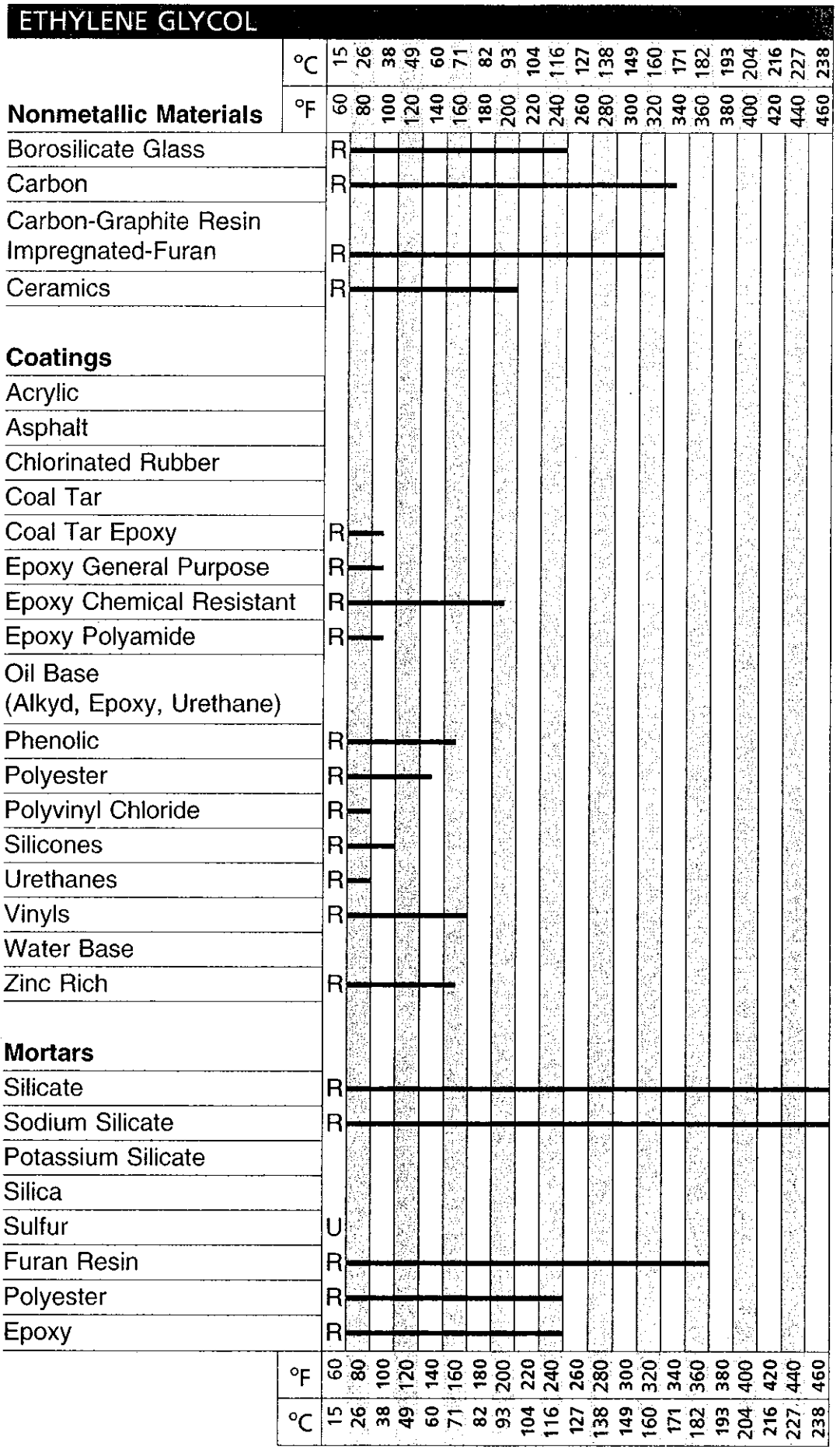
R = Resistant

U = Unsatisfactory

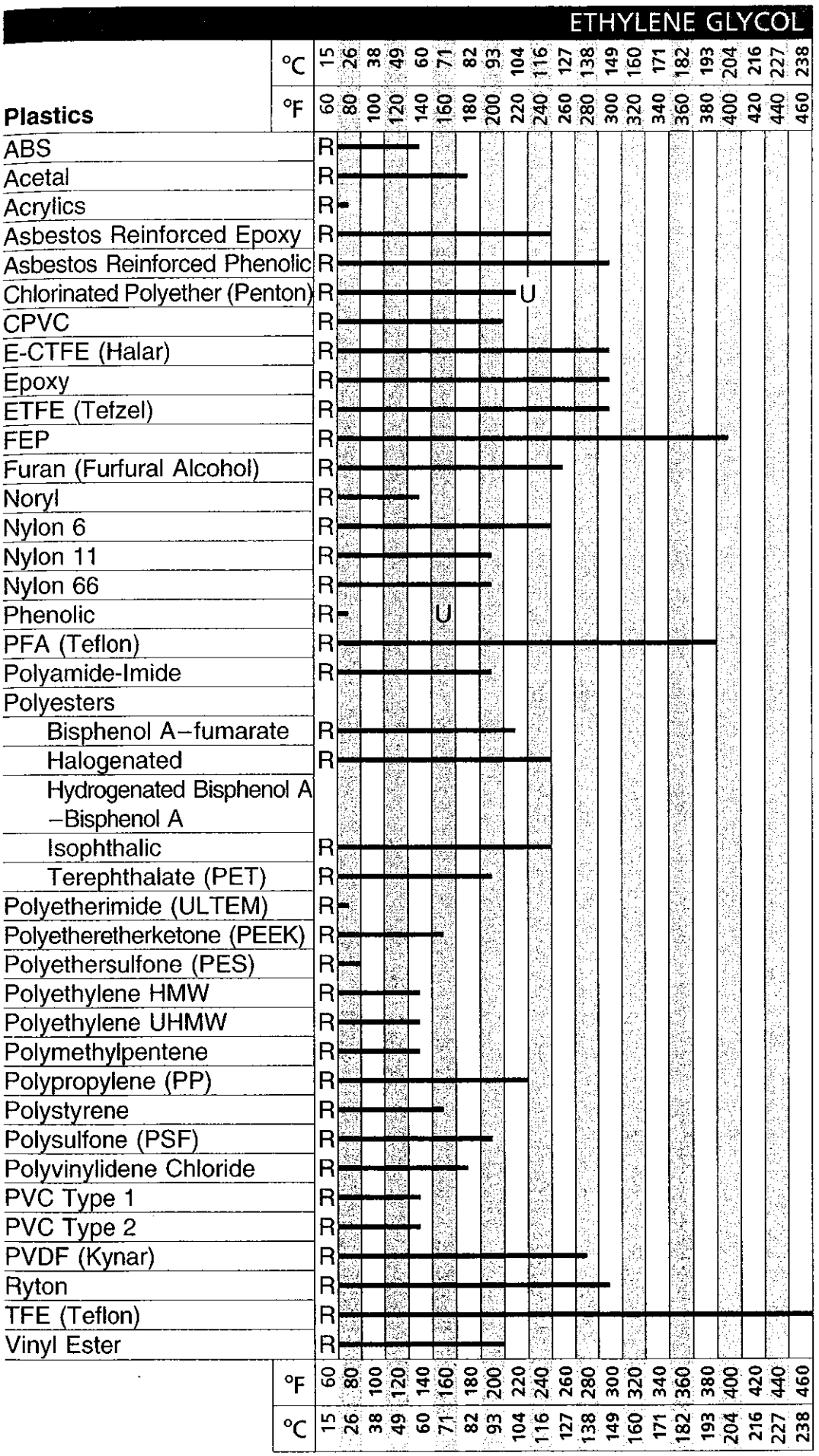
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ETHYLENE GLYCOL

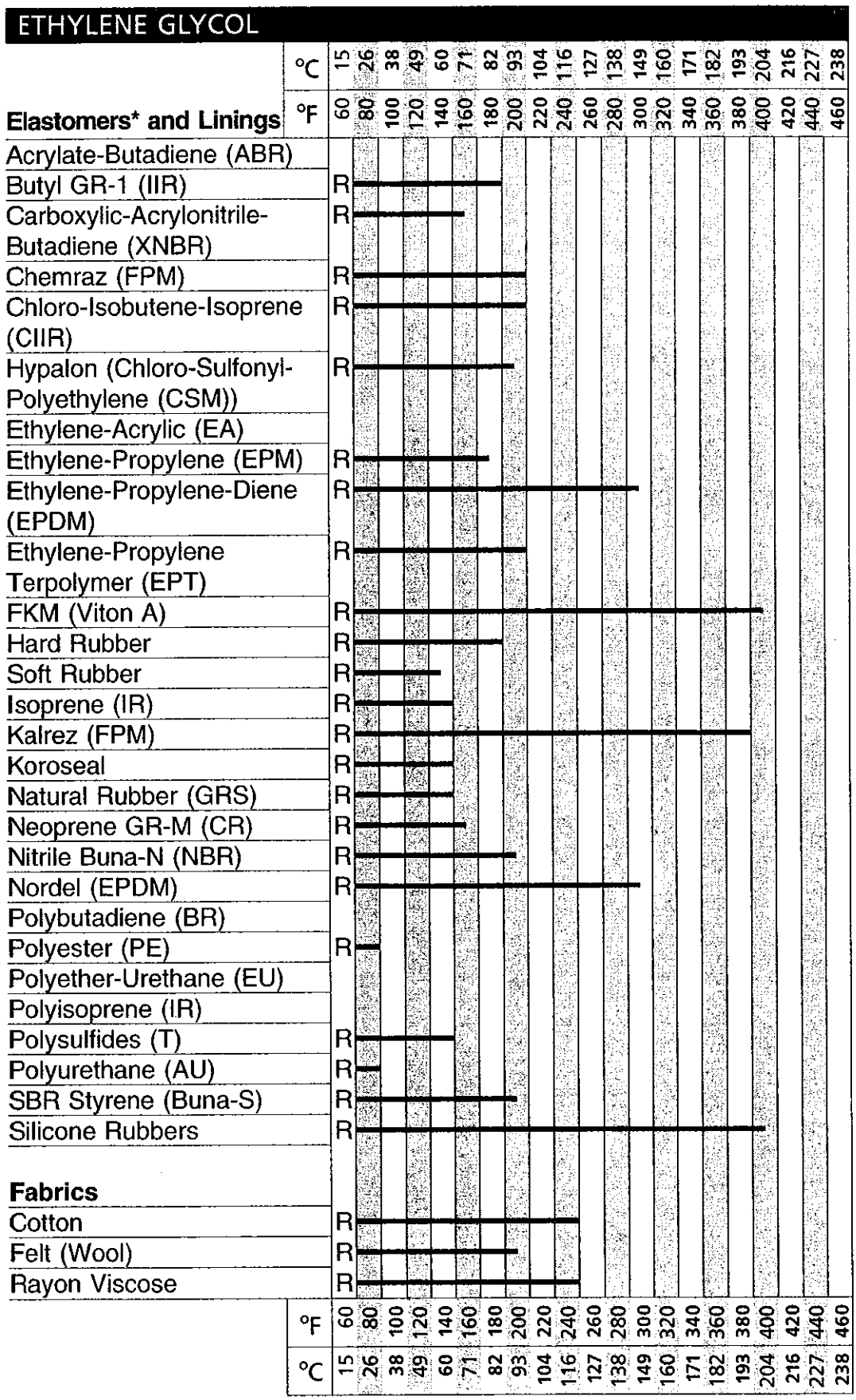


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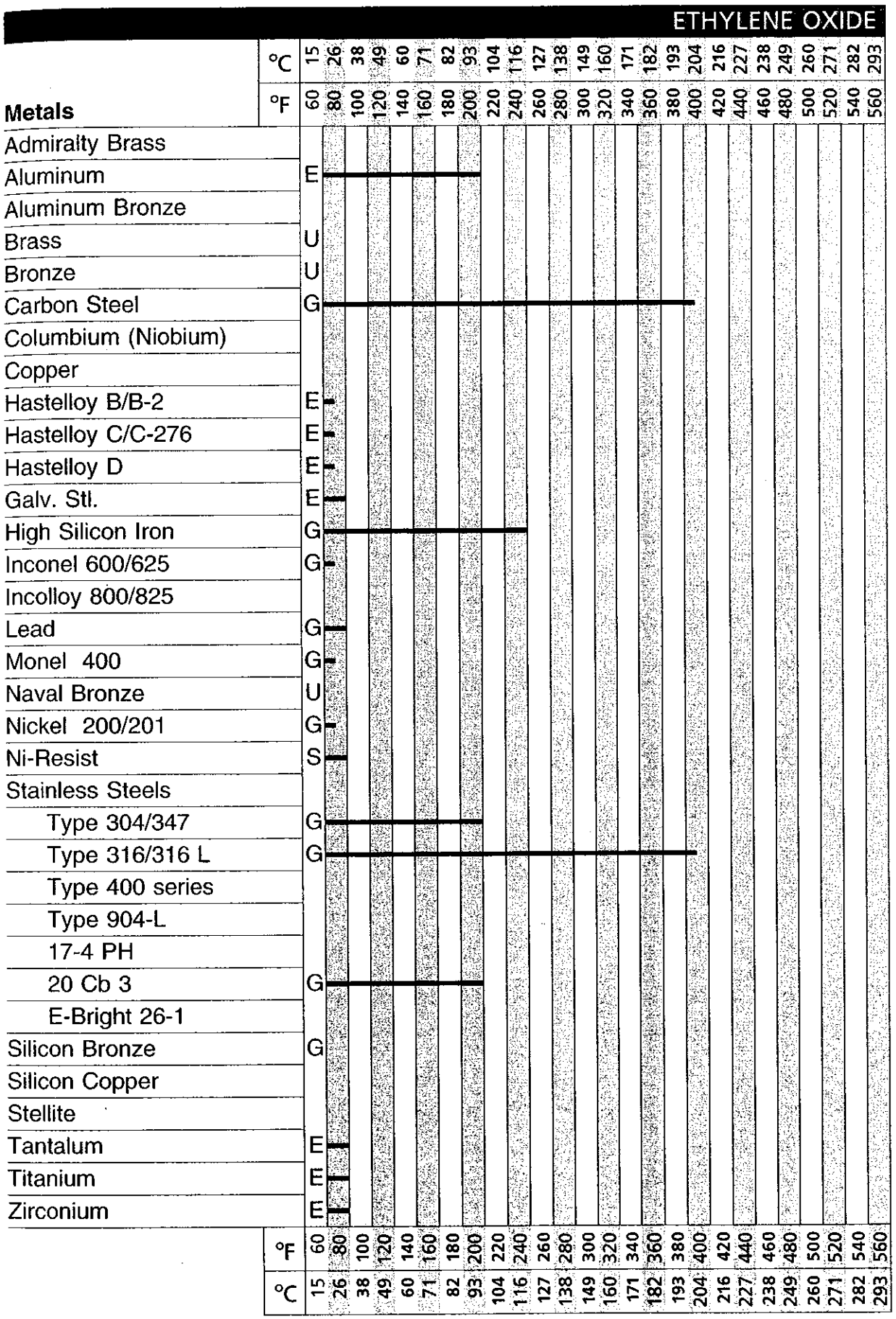
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ETHYLENE GLYCOL



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

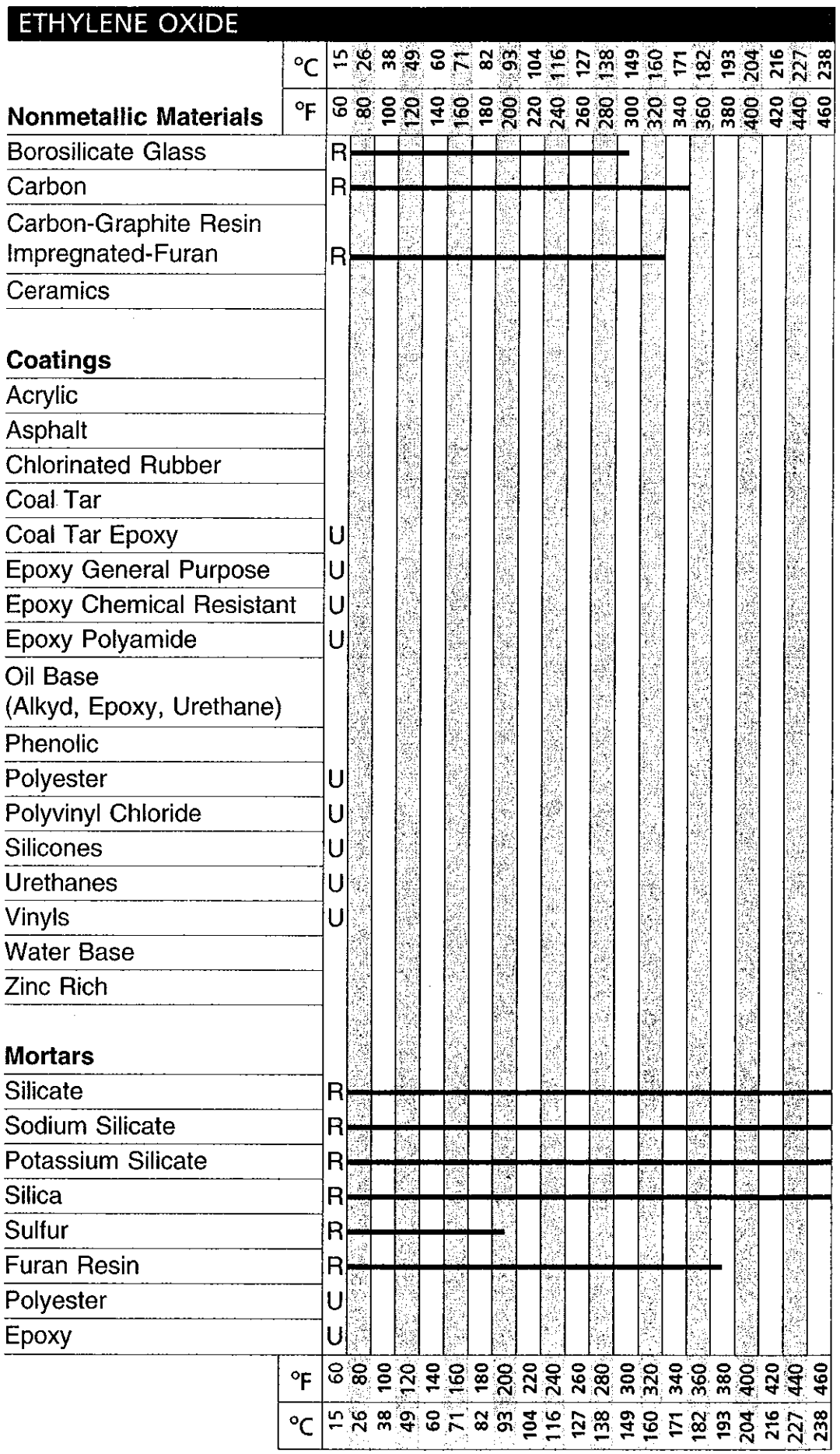
R = Resistant

U = Unsatisfactory

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ETHYLENE OXIDE



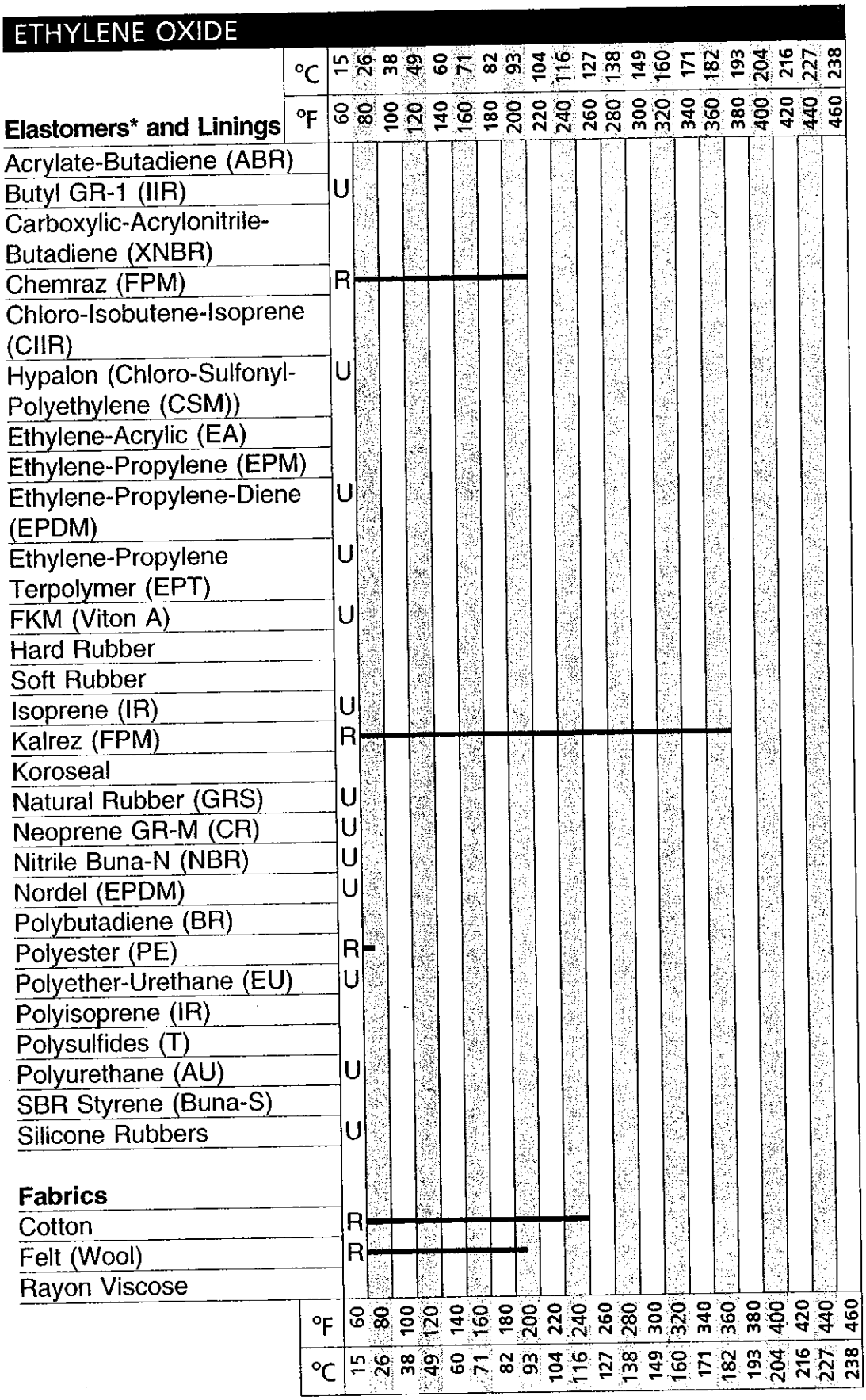
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ETHYLENE OXIDE

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS		U																				
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)		U																				
CPVC		U																				
E-CTFE (Halar)		R																				
Epoxy		U																				
ETFE (Tefzel)		R																				
FEP		R																				
Furan (Furfural Alcohol)		R																				
Noryl		R																				
Nylon 6		R																				
Nylon 11		R																				
Nylon 66		R																				
Phenolic																						
PFA (Teflon)		R																				
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated		U																				
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic		U																				
Terephthalate (PET)		R																				
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)		R																				
Polyethersulfone (PES)																						
Polyethylene HMW		R																				
Polyethylene UHMW																						
Polymethylpentene		U																				
Polypropylene (PP)		U																				
Polystyrene																						
Polysulfone (PSF)		R																				
Polyvinylidene Chloride		U																				
PVC Type 1		U																				
PVC Type 2		U																				
PVDF (Kynar)		R																				
Ryton																						
TFE (Teflon)		R																				
Vinyl Ester		U																				
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

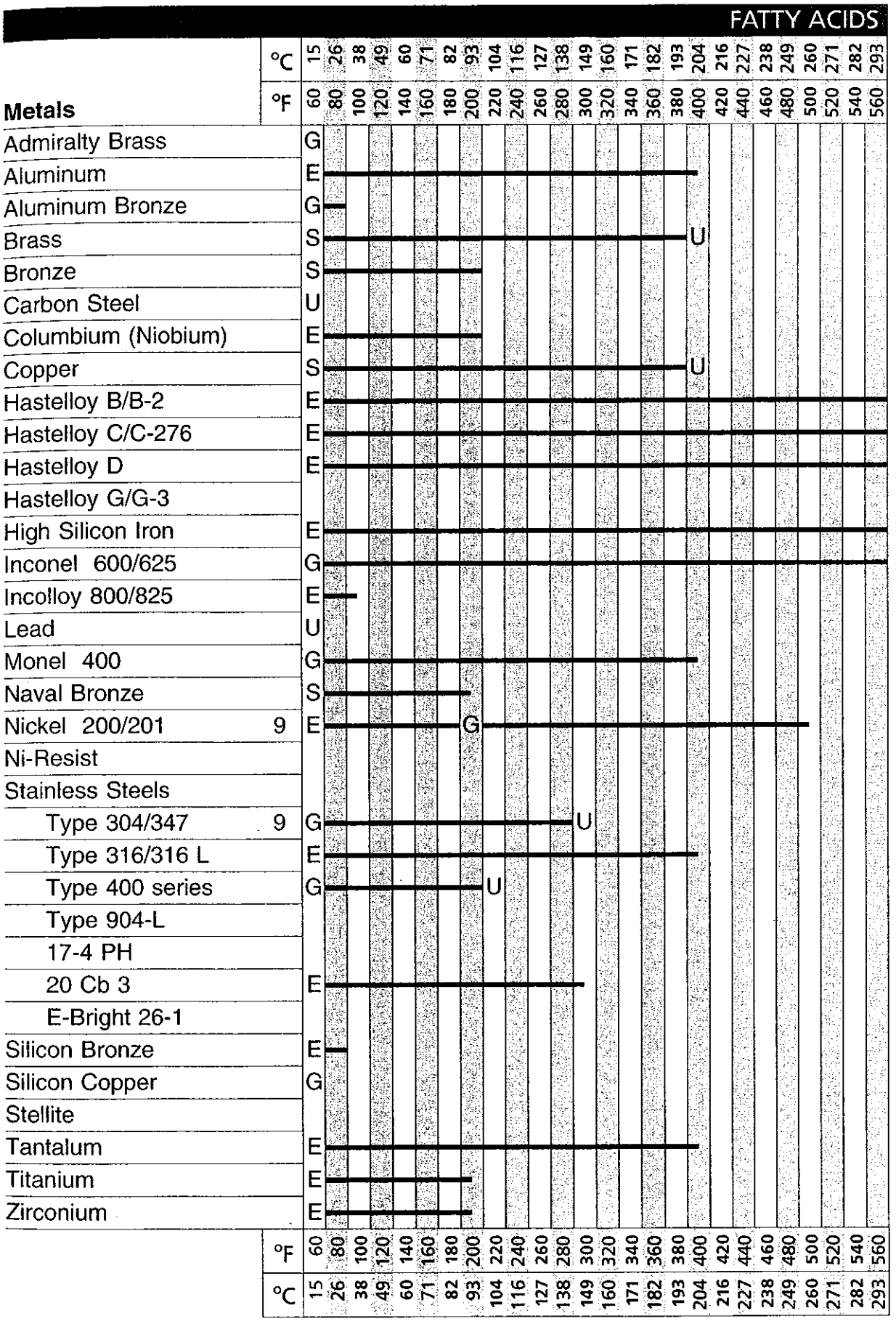
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ETHYLENE OXIDE



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

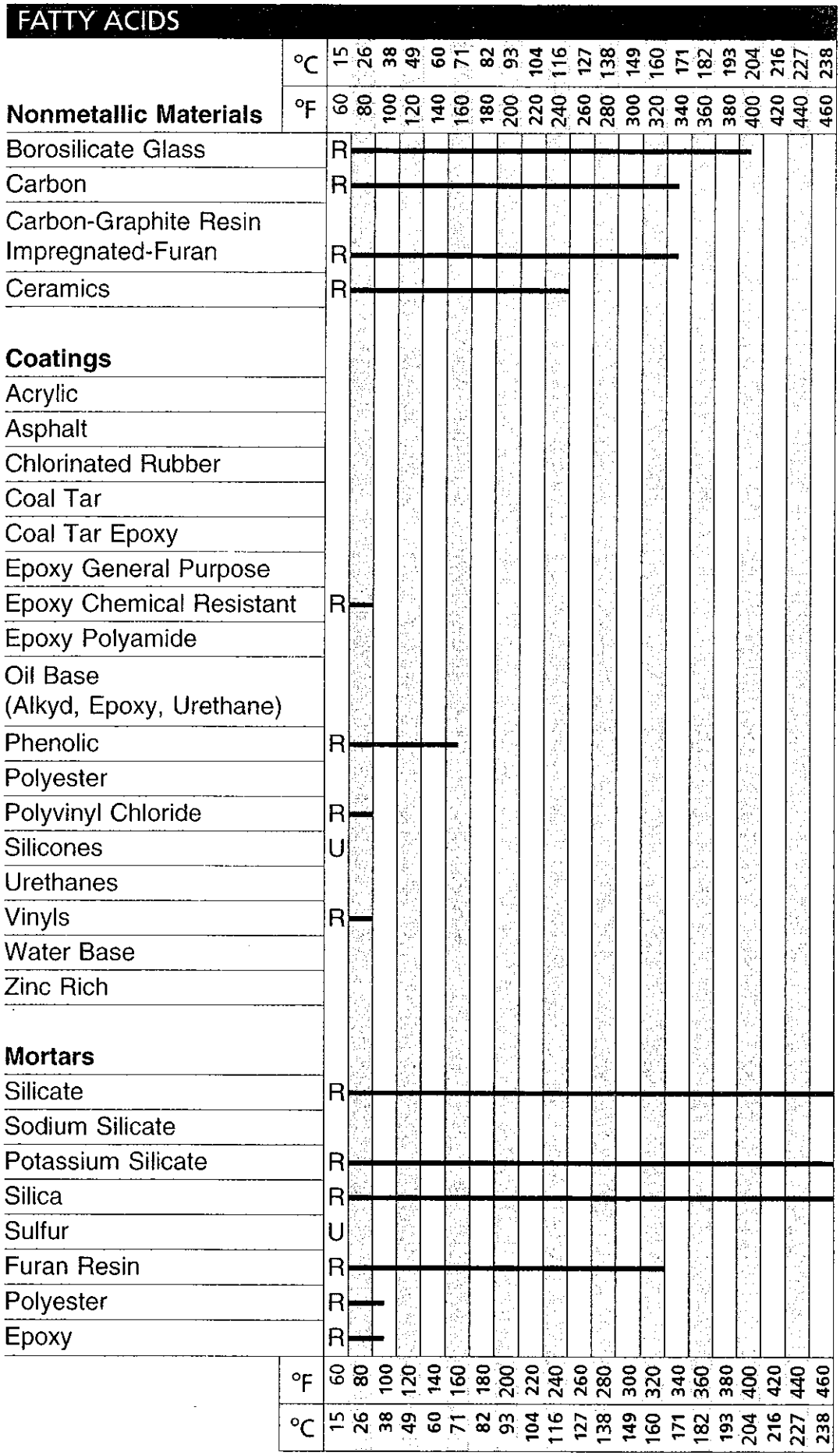
R = Resistant

U = Unsatisfactory

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FATTY ACIDS

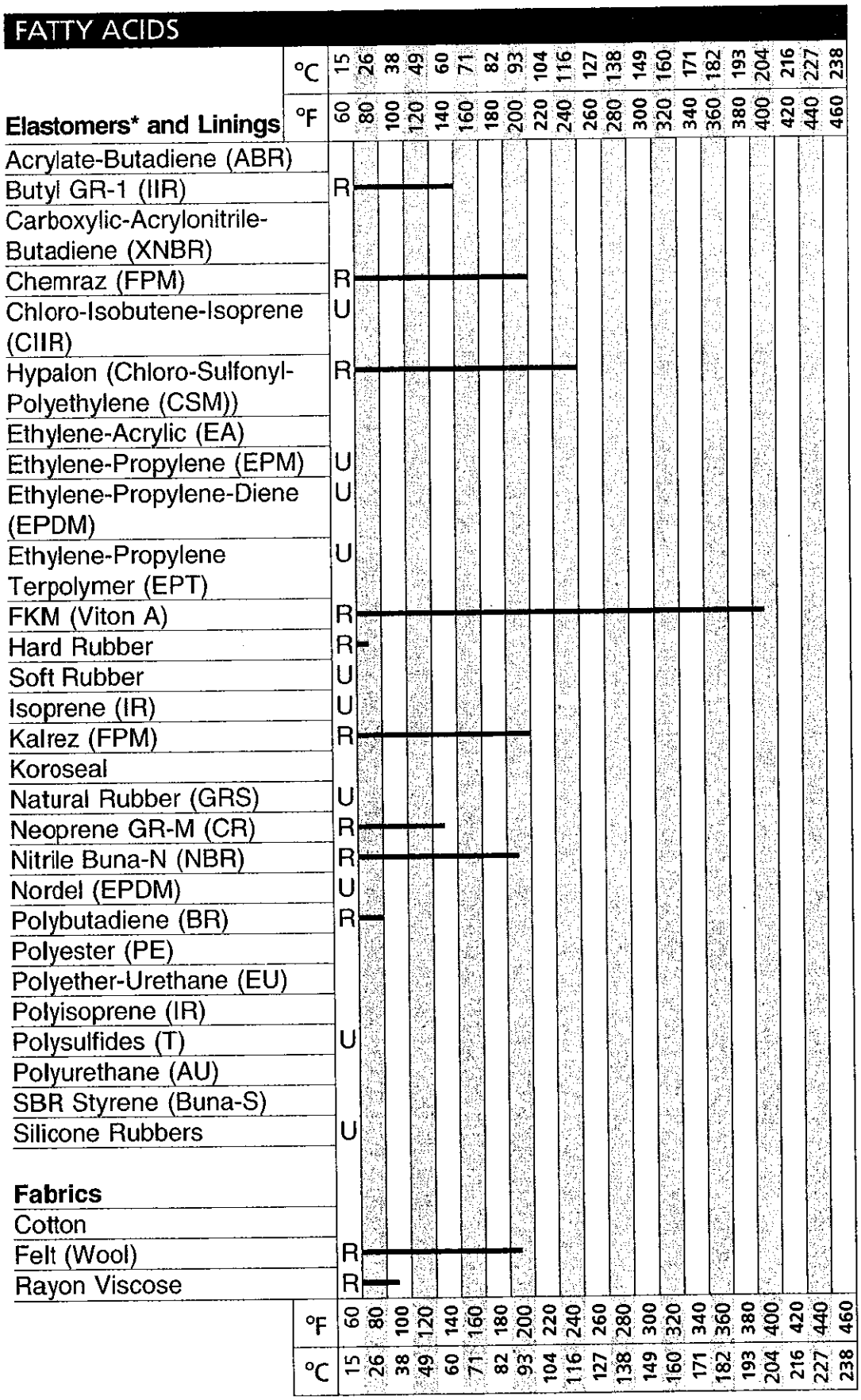


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Plastics	°C 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238
	°F 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460
ABS	R
Acetal	R
Acrylics	R
Asbestos Reinforced Epoxy	R
Asbestos Reinforced Phenolic	R
Chlorinated Polyether (Penton)	R
CPVC	R
E-CTFE (Halar)	R
Epoxy	R
ETFE (Tefzel)	R
FEP	R
Furan (Furfural Alcohol)	R
Noryl	R
Nylon 6	U
Nylon 11	R
Nylon 66	U
Phenolic	R
PFA (Teflon)	R
Polyamide-Imide	
Polyesters	
Bisphenol A–fumarate	R
Halogenated	R
Hydrogenated Bisphenol A –Bisphenol A	R
Isophthalic	R
Terephthalate (PET) ALL	R
Polyetherimide (ULTEM)	
Polyetheretherketone (PEEK)	
Polyethersulfone (PES)	
Polyethylene HMW	R
Polyethylene UHMW	R
Polymethylpentene	
Polypropylene (PP)	R
Polystyrene	R
Polysulfone	
Polyvinylidene Chloride	R
PVC Type 1	R
PVC Type 2	R
PVDF (Kynar)	R
Ryton	R
TFE (Teflon)	R
Vinyl Ester	R
	°F 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460
	°C 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

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FATTY ACIDS



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FERRIC ACETATE

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L																											
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

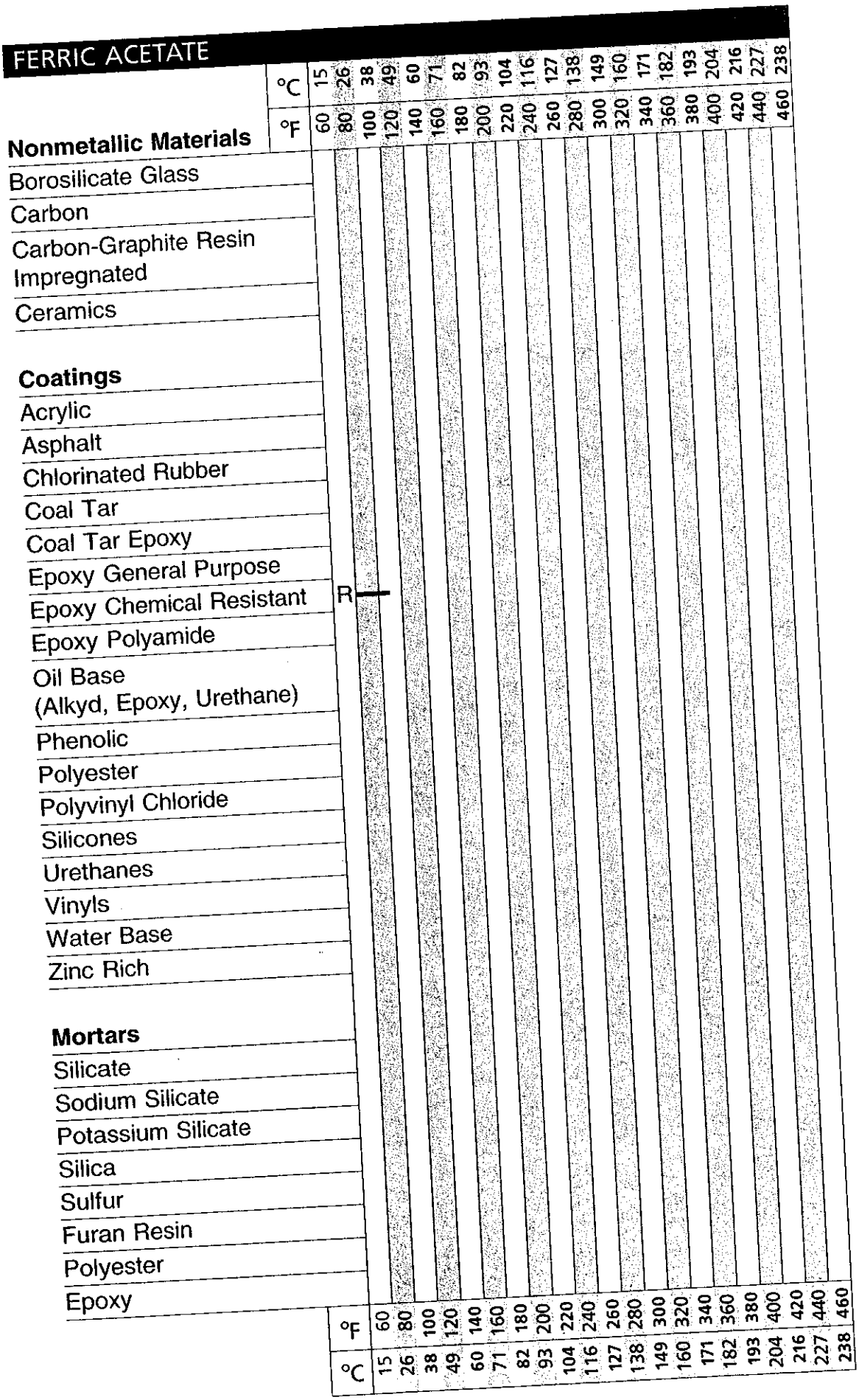
R = Resistant

U = Unsatisfactory

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FERRIC ACETATE



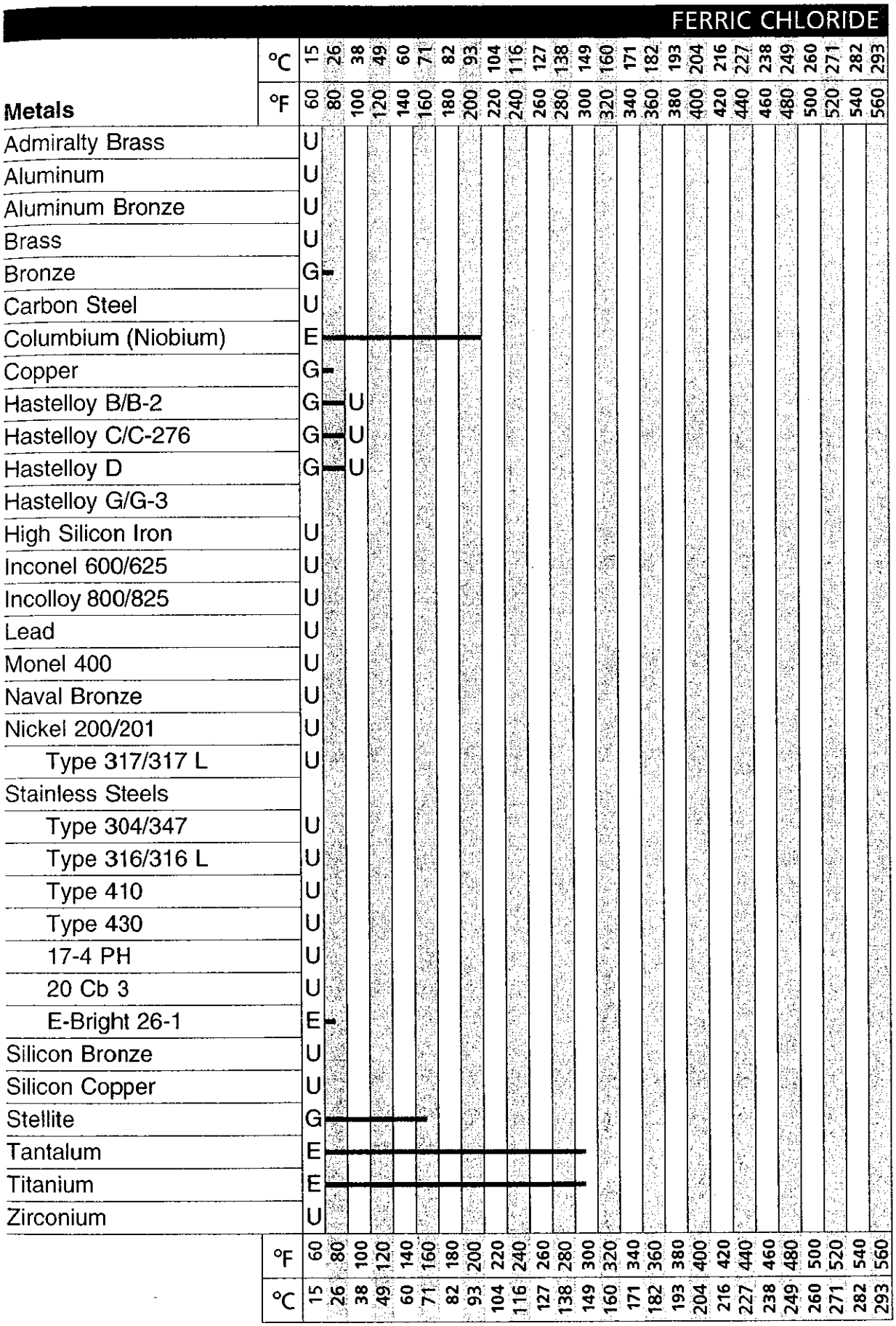
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FERRIC ACETATE

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)																						
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)																						
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)	R																					
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)																						
Nitrile Buna-N (NBR)																						
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

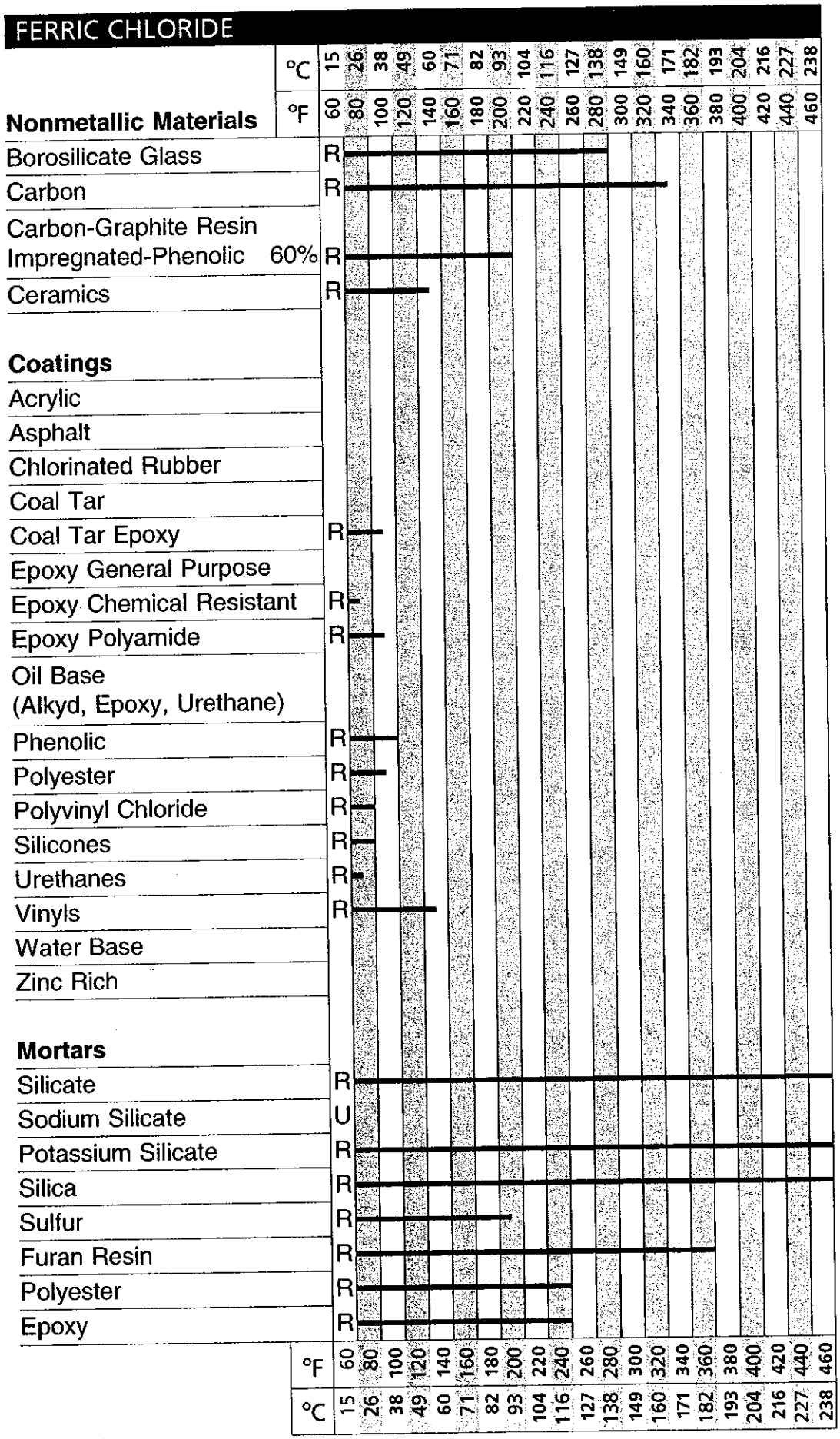
R = Resistant

U = Unsatisfactory

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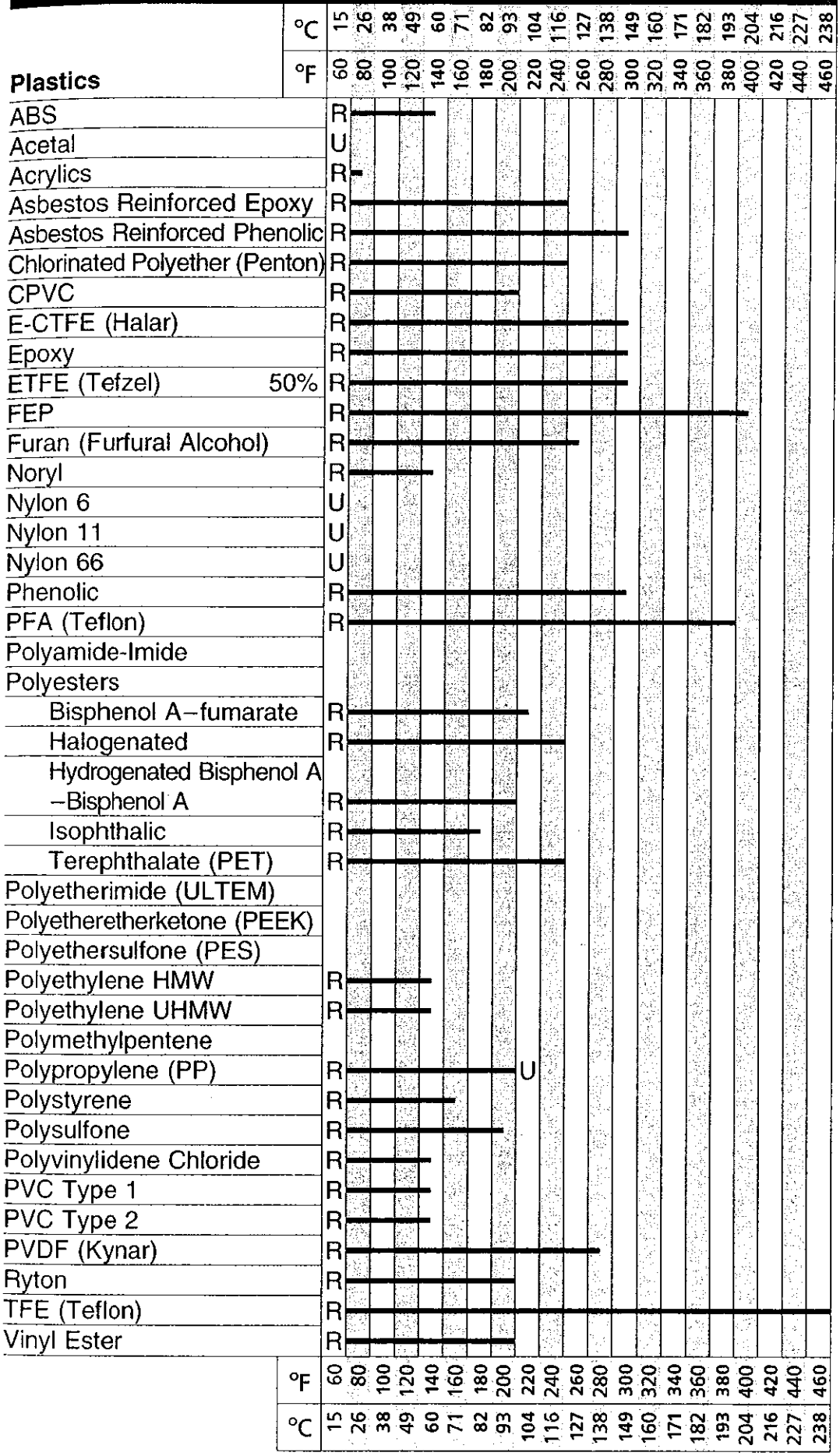
FERRIC CHLORIDE



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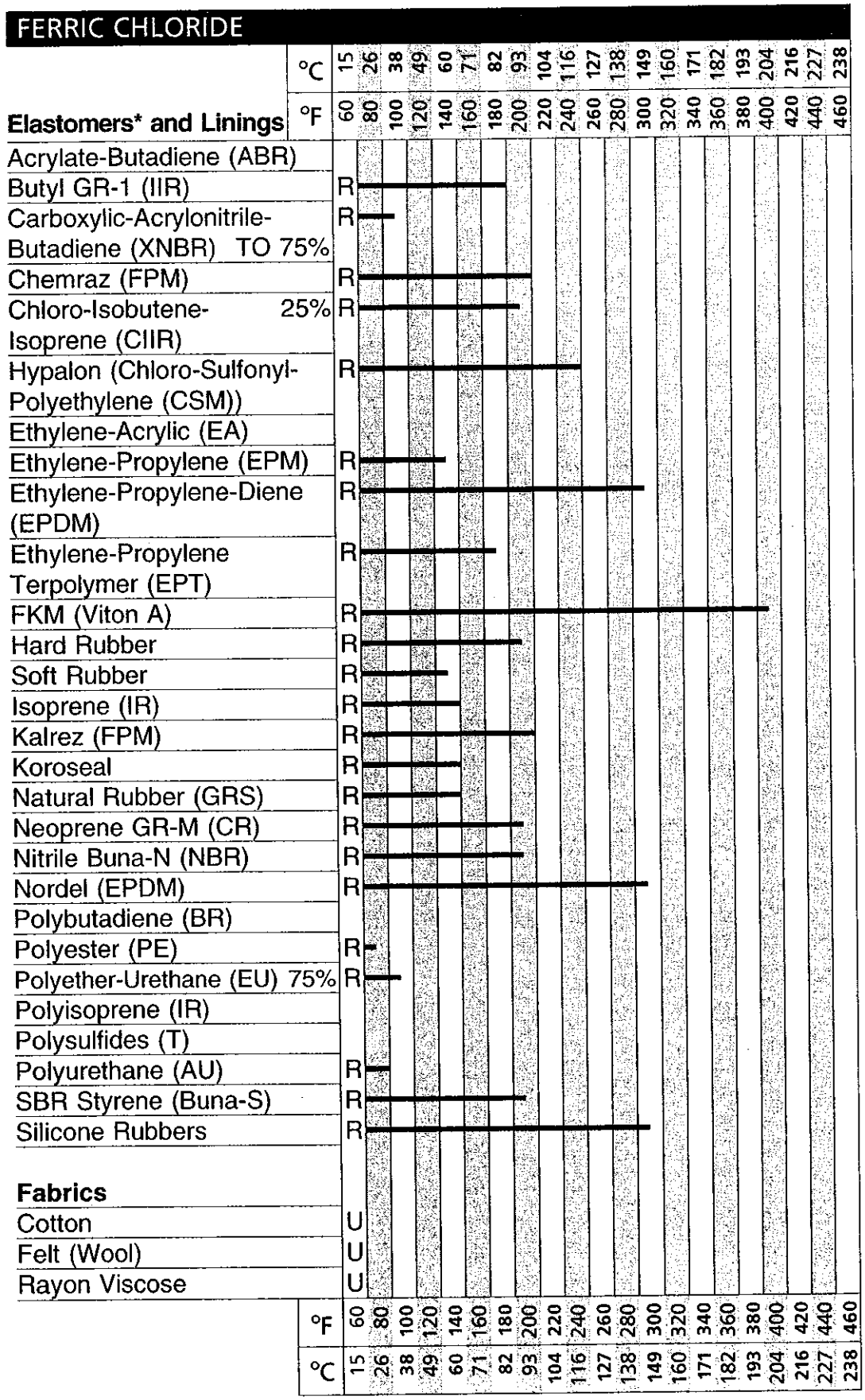
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FERRIC CHLORIDE



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FERRIC CHLORIDE



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FERRIC CHLORIDE 50% IN WATER

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass			U																									
Aluminum			U																									
Aluminum Bronze			U																									
Brass			U																									
Bronze			U																									
Carbon Steel			U																									
Columbium (Niobium)	10%		E																									
Copper			U																									
Hastelloy B/B-2			U																									
Hastelloy C/C-276	10%		G																									
Hastelloy D																												
Hastelloy G/G-3																												
High Silicon Iron																												
Inconel 600/625			S																									
Incolloy 800/825	5%		U																									
Lead			U																									
Monel 400			U																									
Naval Bronze			U																									
Nickel 200/201			U																									
Type 321			U																									
Stainless Steels																												
Type 304/347			U																									
Type 316/316 L			U																									
Type 410			U																									
Type 904-L	10%		G																									
Type 317/317 L			U																									
20 Cb 3			U																									
E-Bright 26-1			G																									
Silicon Bronze			U																									
Silicon Copper			U																									
Stellite																												
Tantalum			E																									
Titanium			E																									
Zirconium			U																									
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

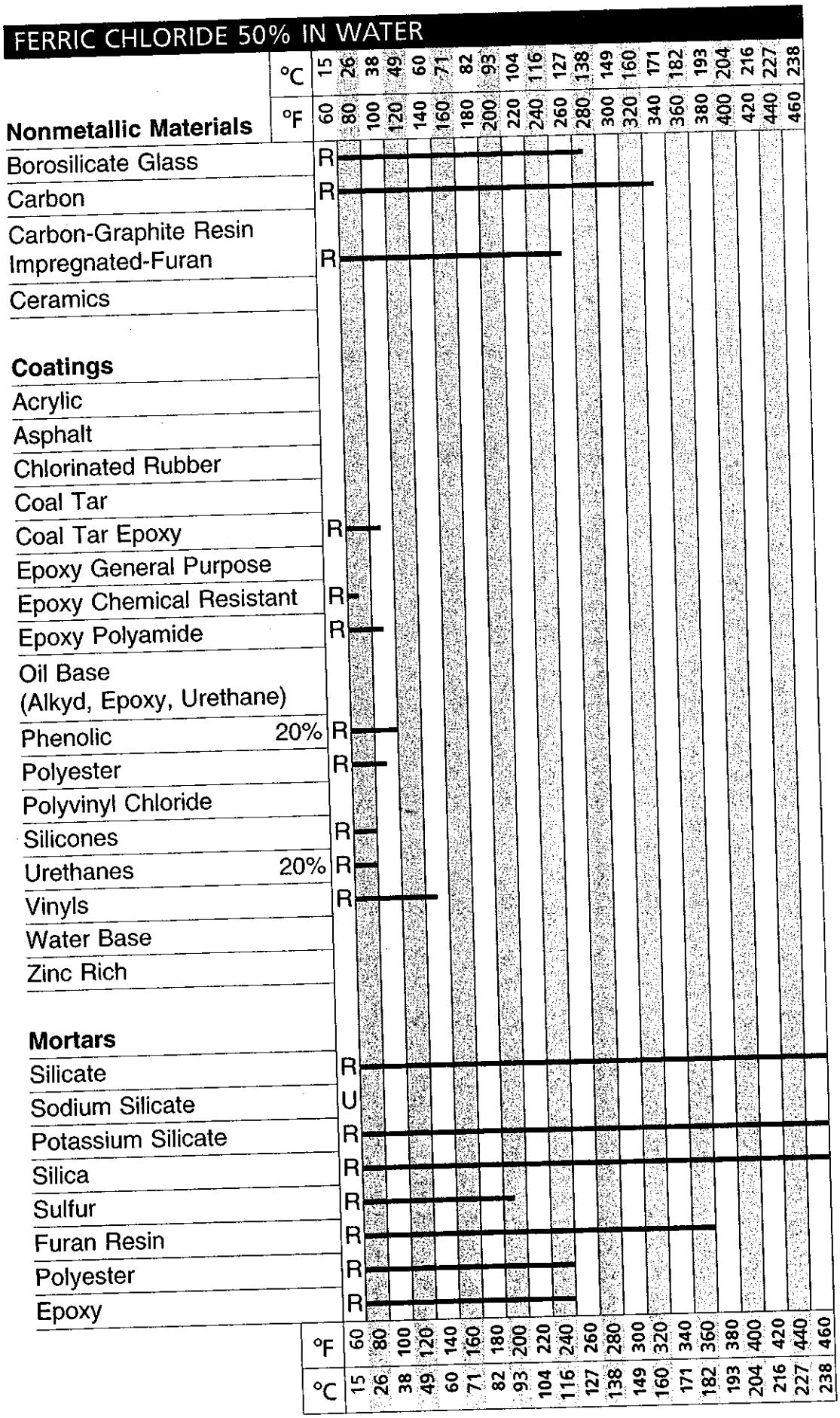
R = Resistant

U = Unsatisfactory

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FERRIC CHLORIDE 50% IN WATER



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FERRIC CHLORIDE 50% IN WATER

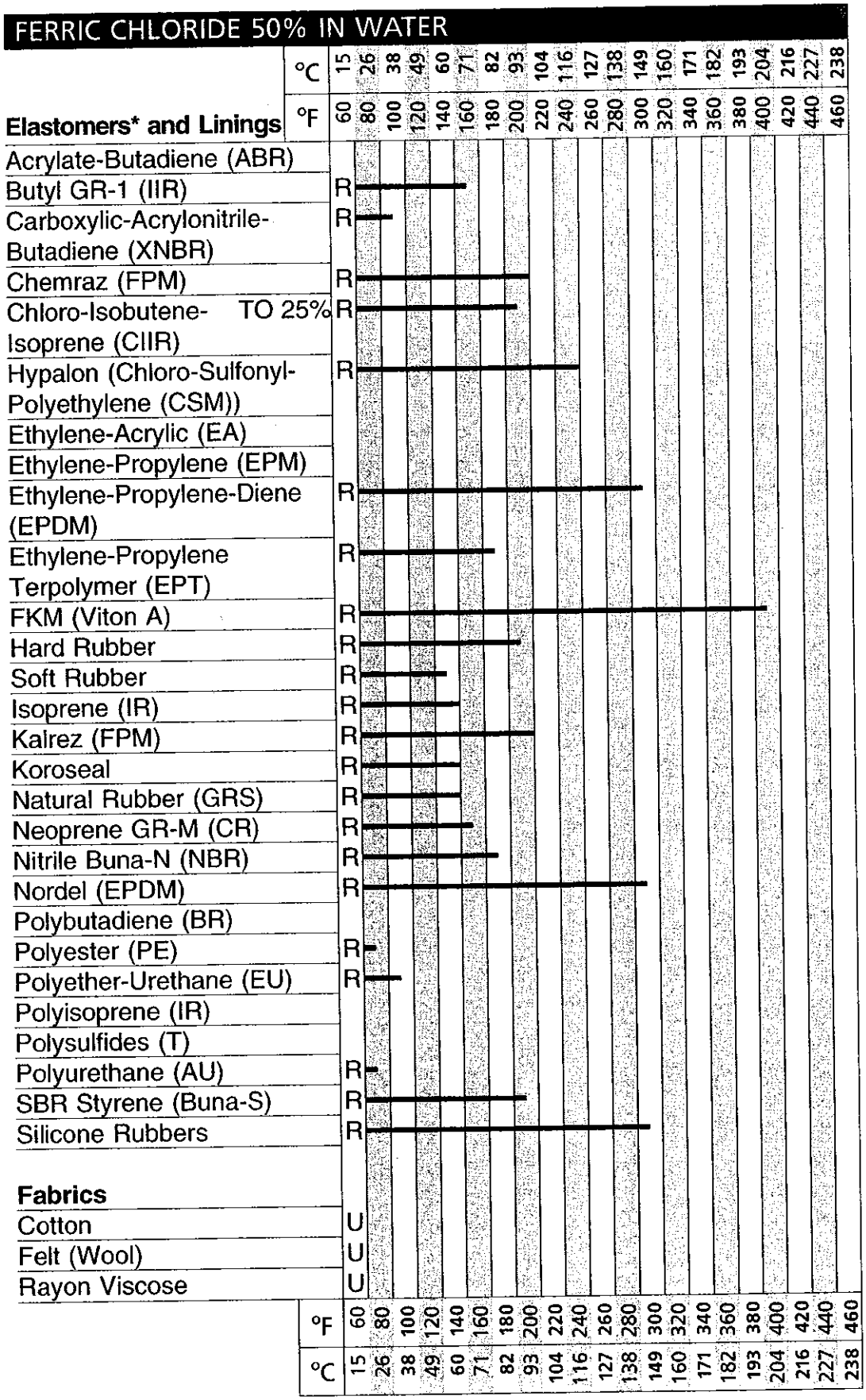
Plastics	°C	°F
ABS		
Acetal	U	
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)	R	
CPVC	R	
E-CTFE (Halar)	R	
Epoxy	R	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)	R	
Noryl		
Nylon 6	U	
Nylon 11	U	
Nylon 66	U	
Phenolic	R	
PFA (Teflon)	R	
Polyamide-Imide <1%	R	
Polyesters		
Bisphenol A–fumarate	R	
Halogenated SAT	R	
Hydrogenated Bisphenol A –Bisphenol A SAT	R	
Isophthalic	R	
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW	R	
Polyethylene UHMW	R	
Polymethylpentene		
Polypropylene (PP)	R	U
Polystyrene	R	
Polysulfone	R	
Polyvinylidene Chloride	R	
PVC Type 1	R	
PVC Type 2		
PVDF (Kynar)	R	
Ryton	R	
TFE (Teflon)	R	
Vinyl Ester	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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FERRIC CHLORIDE 50% IN WATER



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FERRIC HYDROXIDE

Metals	°F	°C
Admiralty Brass		
Aluminum	U	
Aluminum Bronze		
Brass		
Bronze	U	
Carbon Steel		
Columbium (Niobium)		
Copper	G	
Hastelloy B/B-2	U	
Hastelloy C/C-276	E	
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625	G	
Incolloy 800/825	E	
Lead		
Monel 400	G	
Naval Bronze		
Nickel 200/201	G	
Ni-Resist		
Stainless Steels		
Type 304/347	E	
Type 316/316 L	E	
Type 400 series		
Type 317/317 L	E	
17-4 PH		
20 Cb 3	E	
E-Bright 26-1		
Silicon Bronze	G	
Silicon Copper		
Stellite		
Tantalum	E	
Titanium	G	
Zirconium		

°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

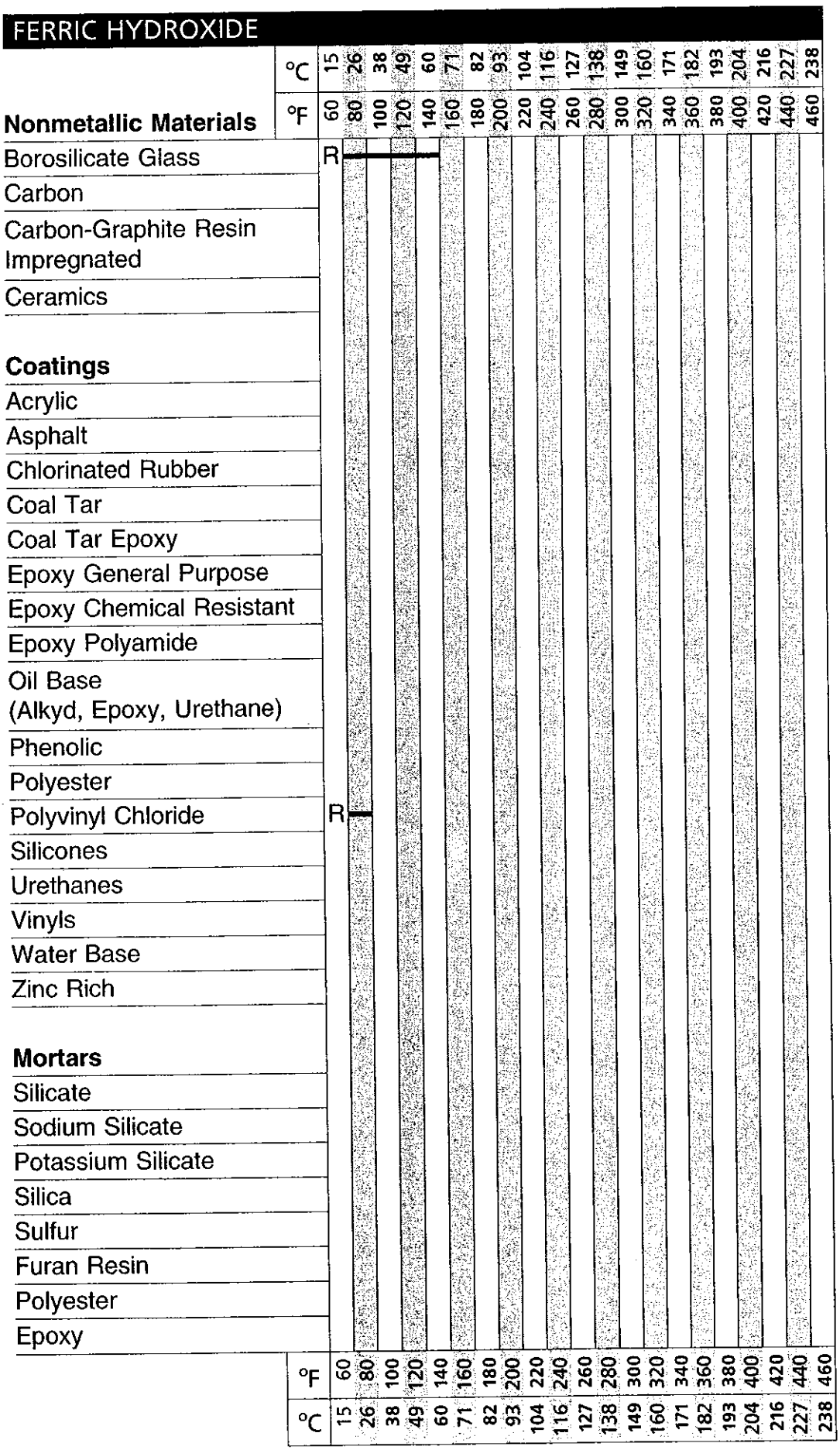
R = Resistant

U = Unsatisfactory

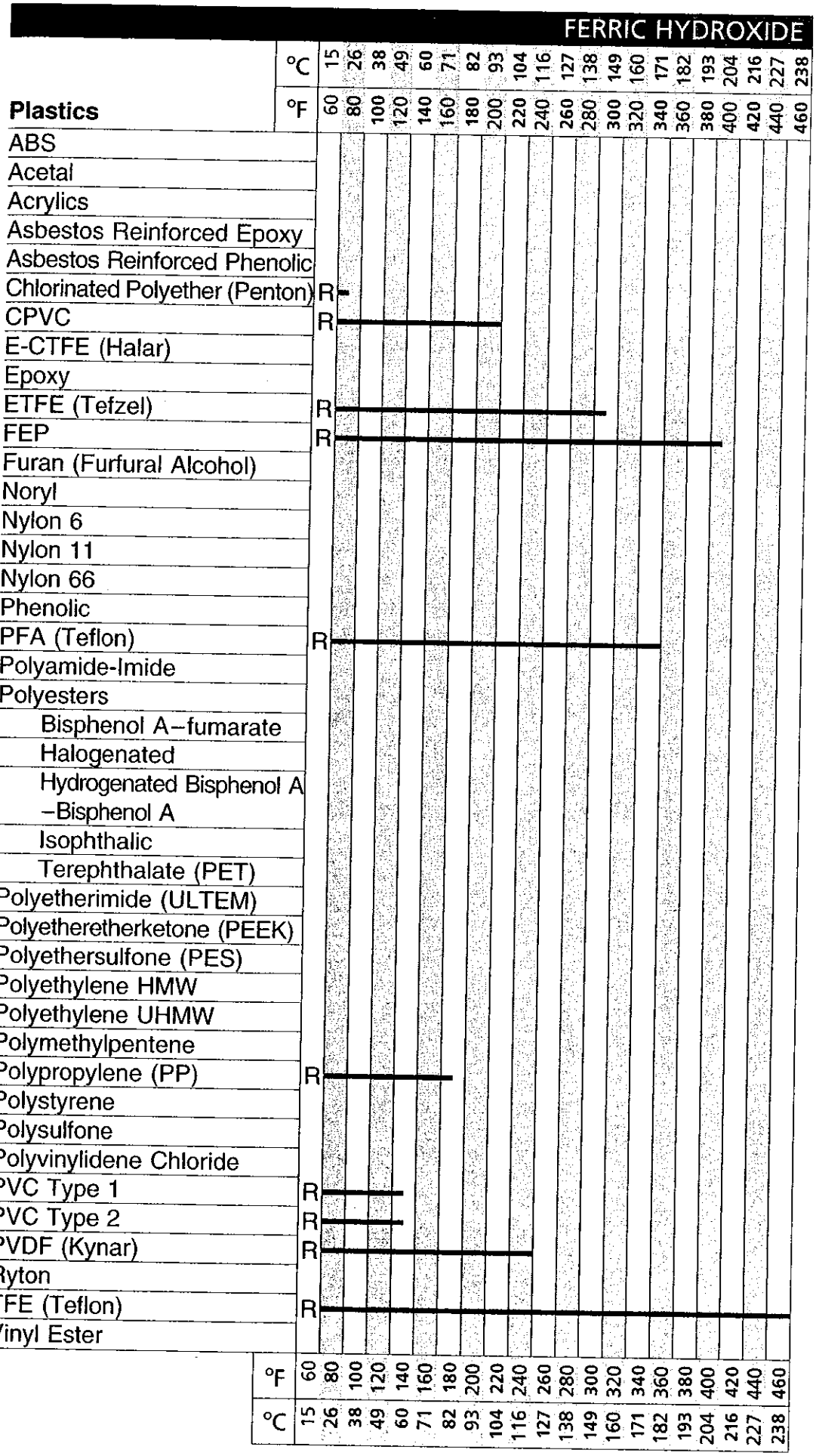
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FERRIC HYDROXIDE

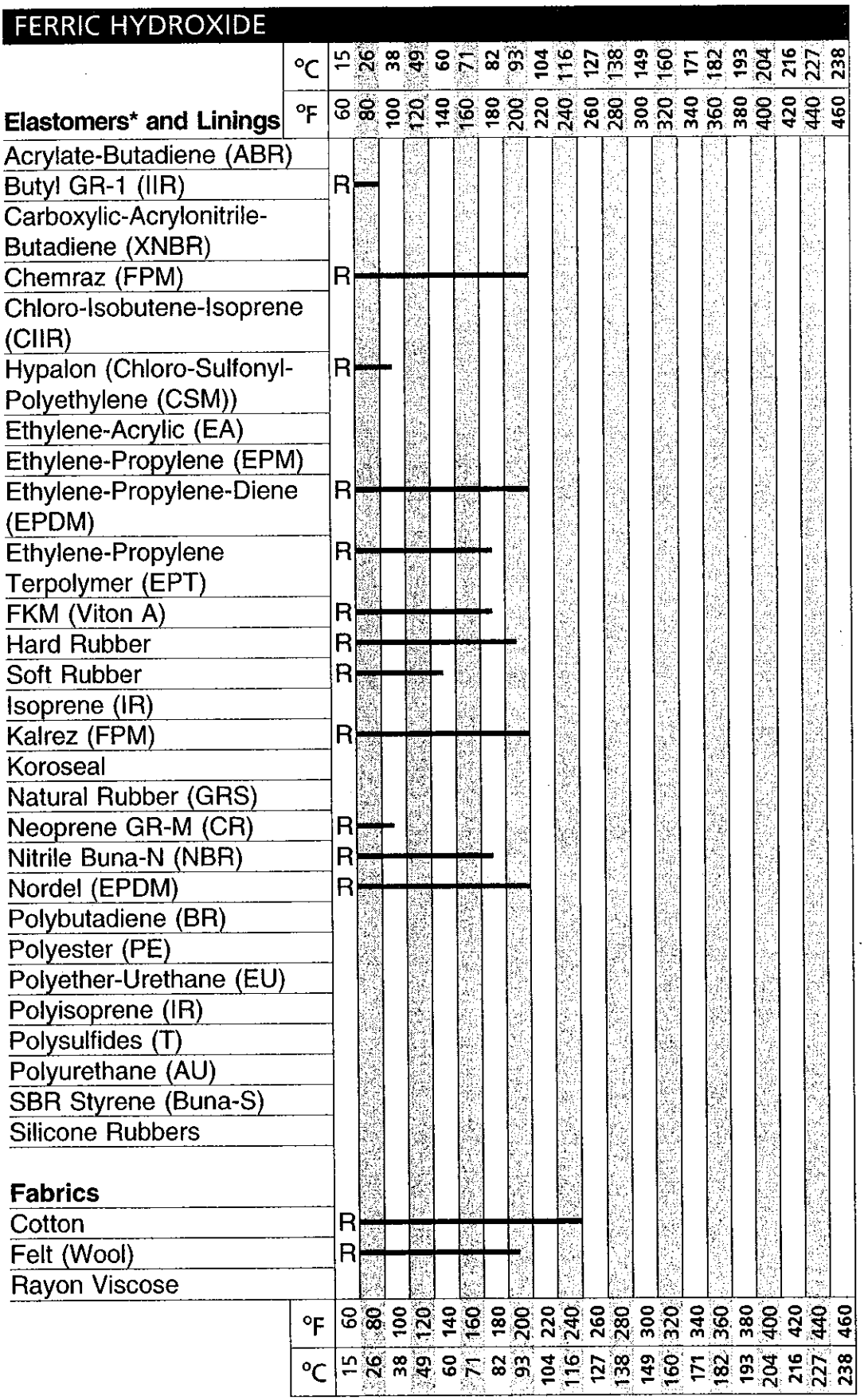


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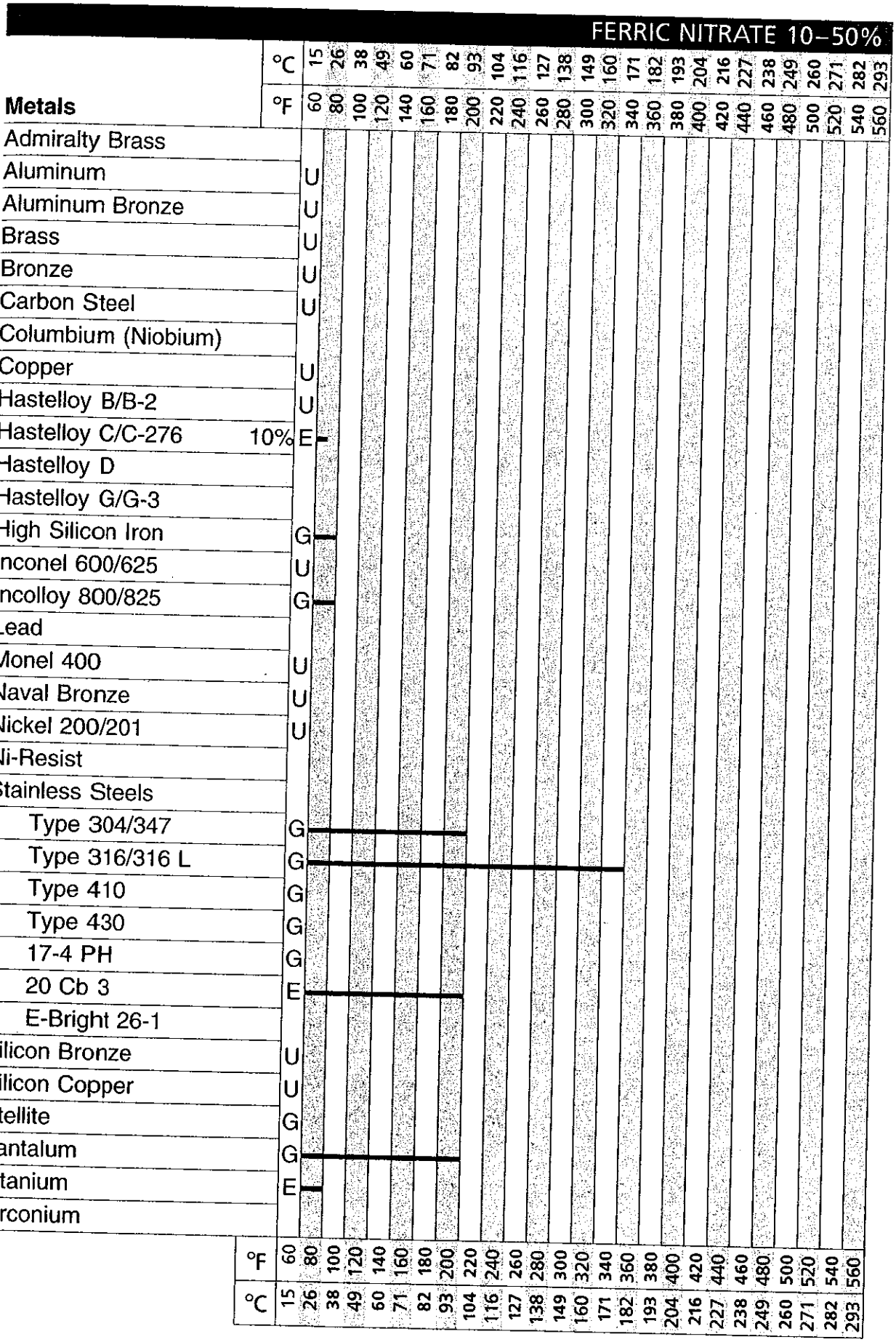
FERRIC HYDROXIDE



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

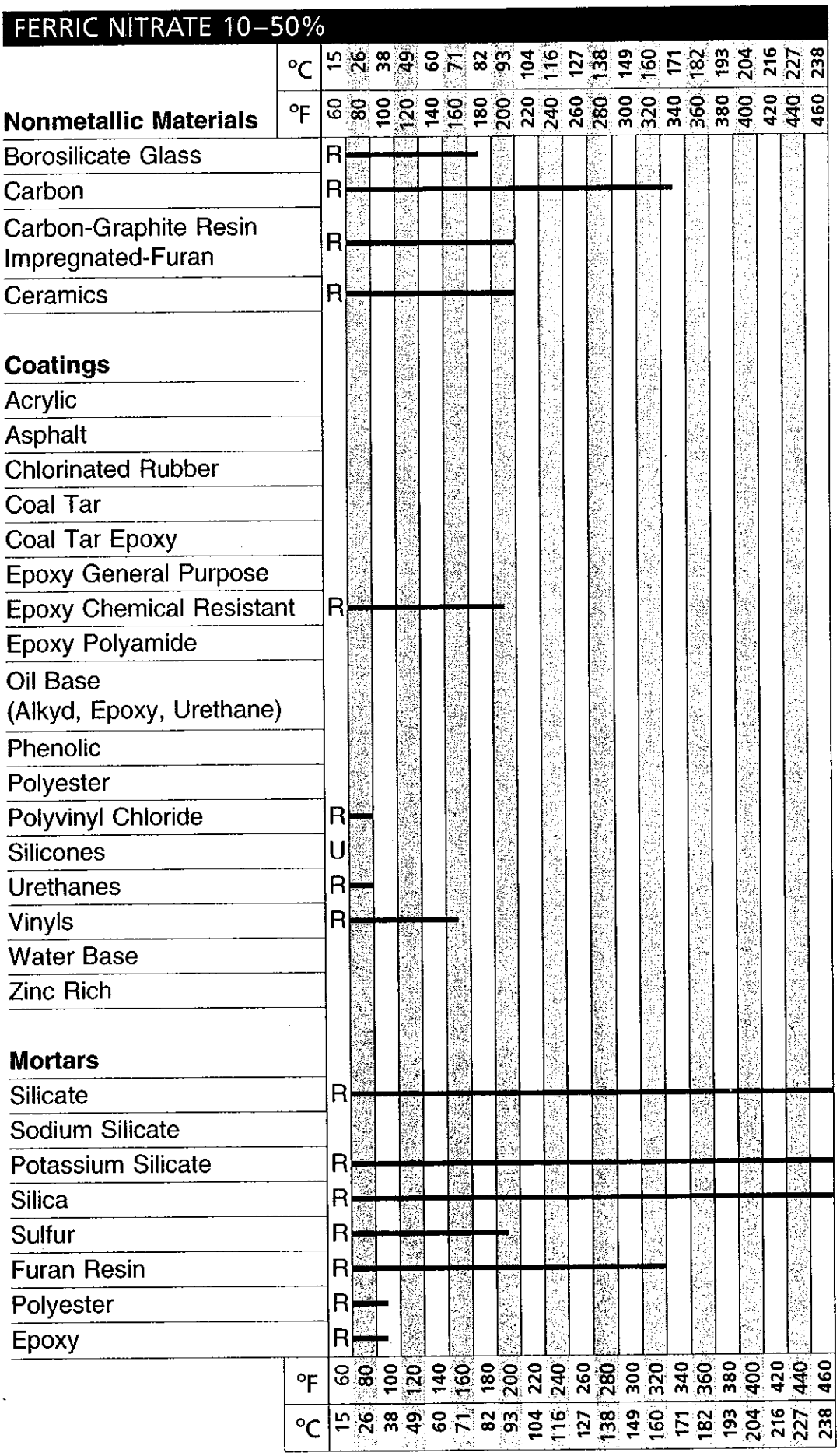
R = Resistant

U = Unsatisfactory

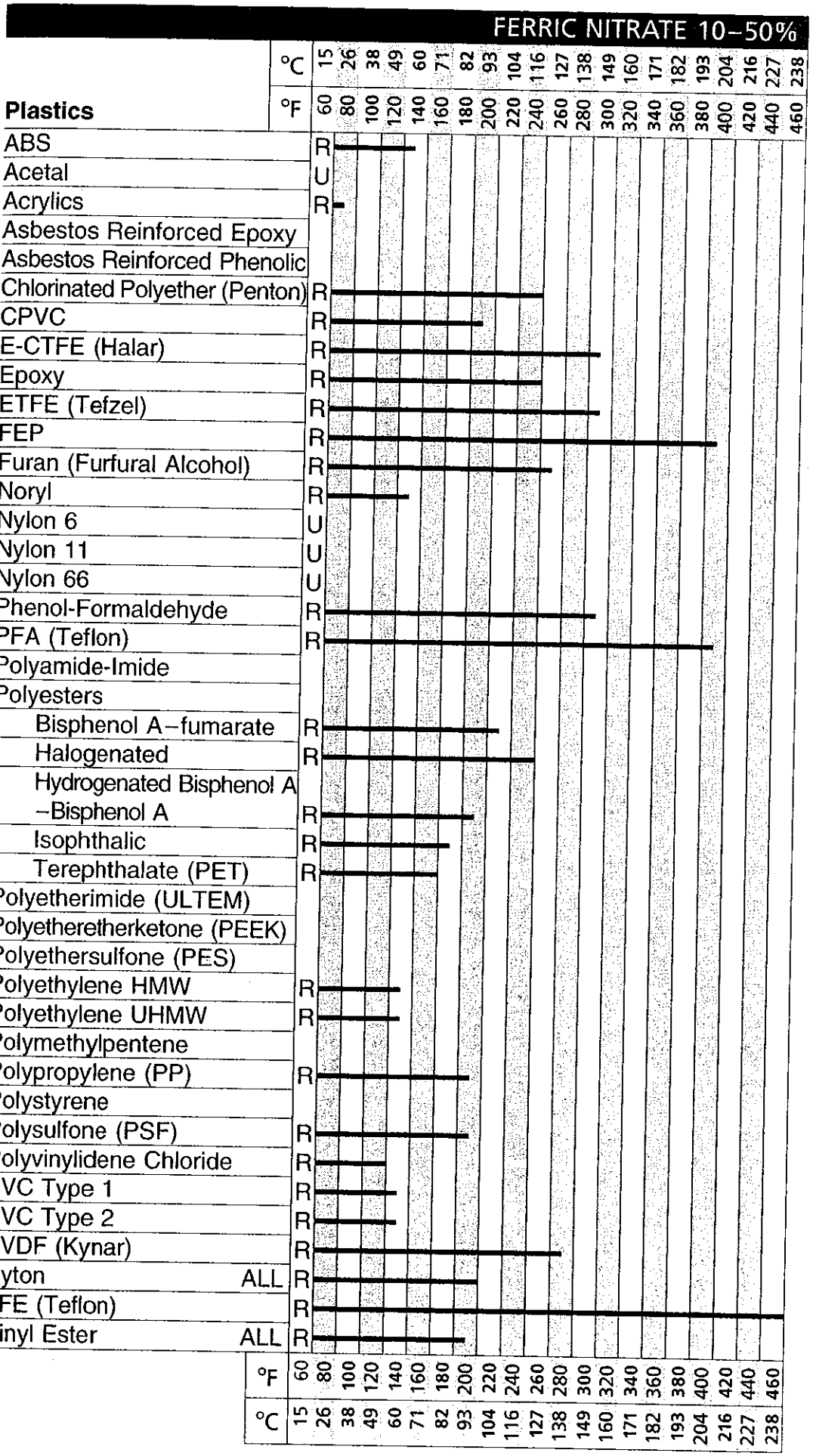
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FERRIC NITRATE 10–50%

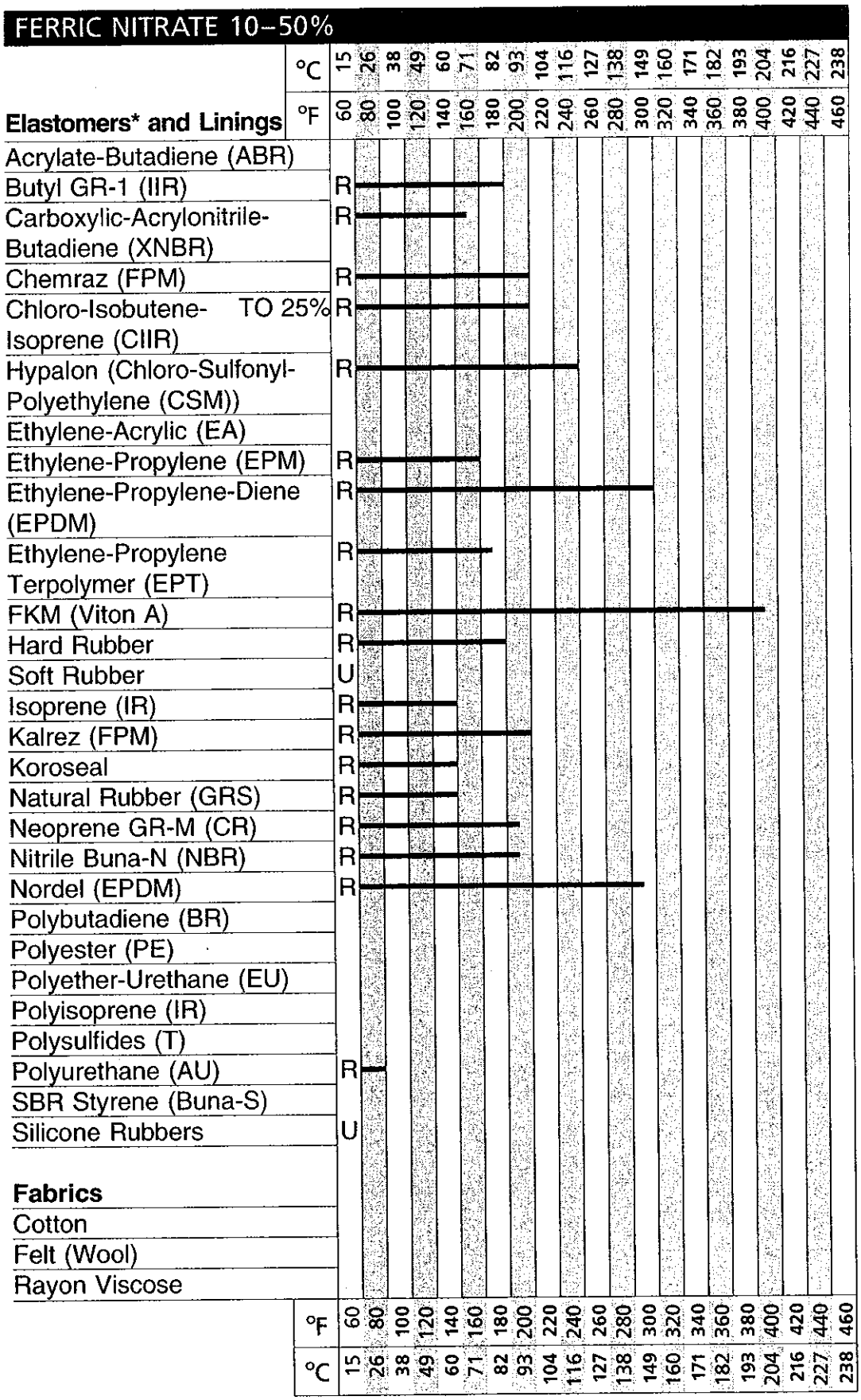


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FERRIC NITRATE 10–50%



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FERRIC NITRATE (SAT.)

Metals	°F	°C
Admiralty Brass		
Aluminum		
Aluminum Bronze	U	
Brass	U	
Bronze	U	
Carbon Steel	U	
Columbium (Niobium)		
Copper	U	
Hastelloy B/B-2	U	
Hastelloy C/C-276	G	
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625	U	
Incolloy 800/825		
Lead		
Monel 400	U	
Naval Bronze	U	
Nickel 200/201	U	
Ni-Resist		
Stainless Steels		
Type 304/347		
Type 316/316 L	G	
Type 400 series		
Type 904-L		
17-4 PH	G	
20 Cb 3	G	
E-Bright 26-1		
Silicon Bronze	U	
Silicon Copper	U	
Stellite		
Tantalum		
Titanium		
Zirconium		

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

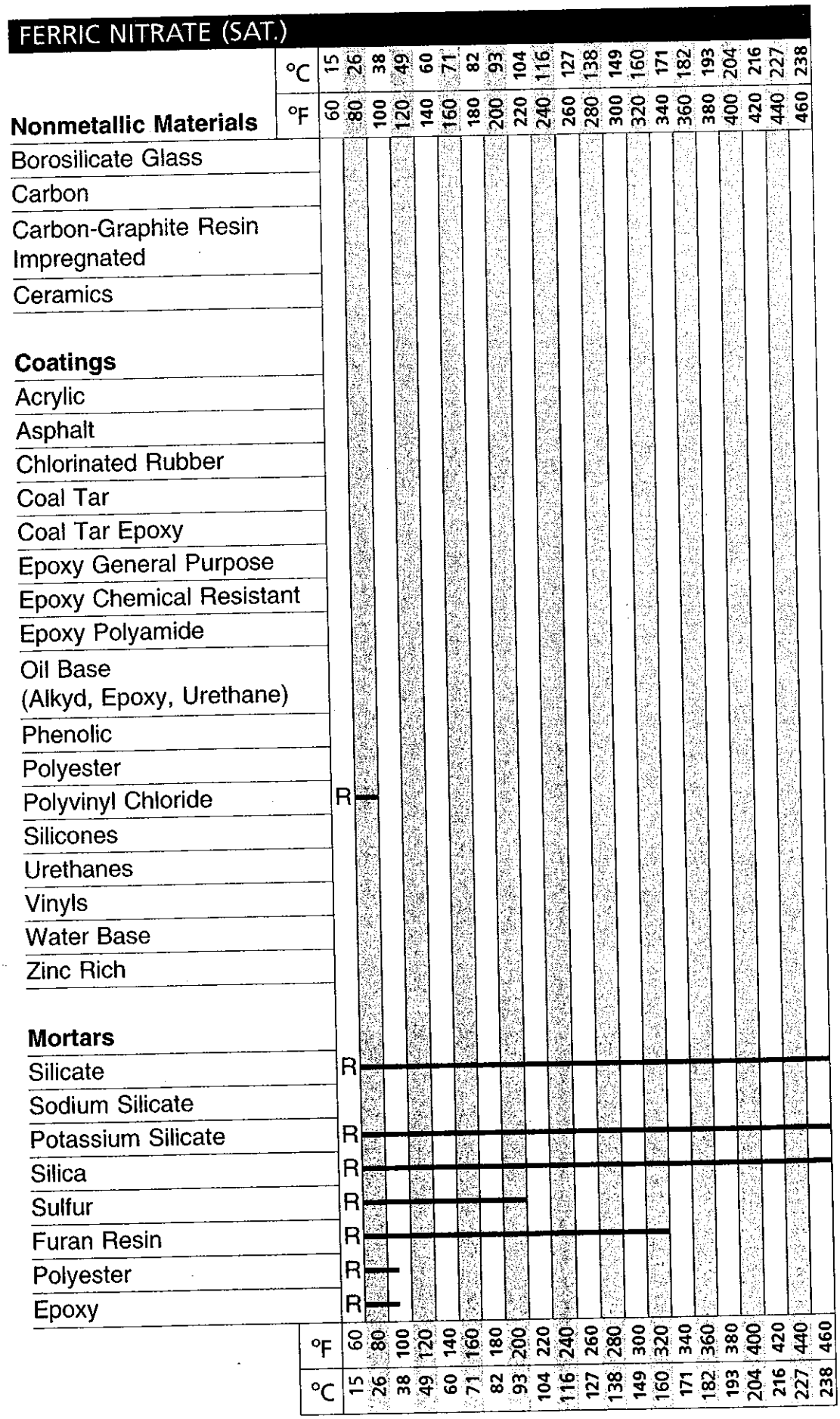
R = Resistant

U = Unsatisfactory

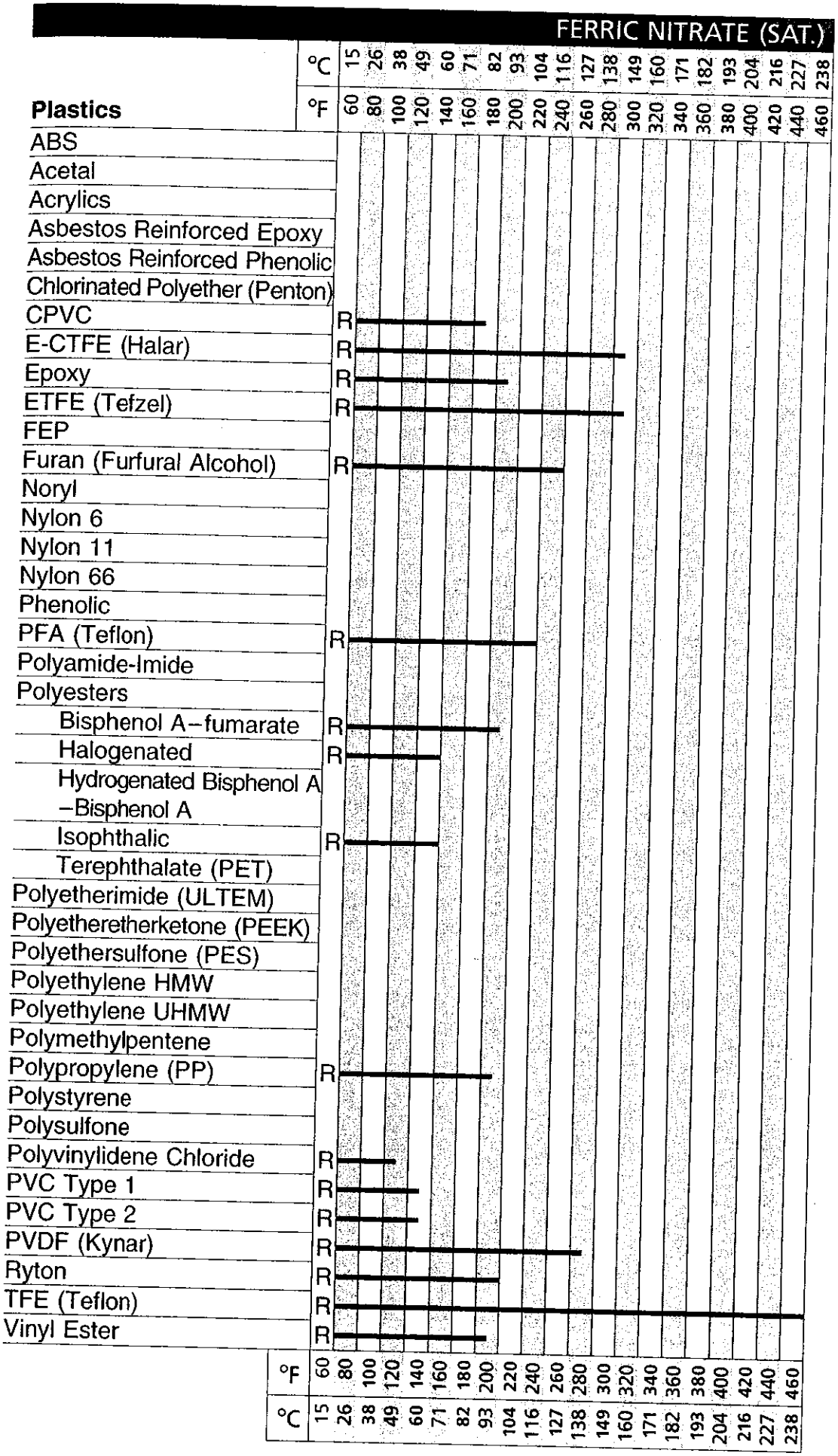
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FERRIC NITRATE (SAT.)

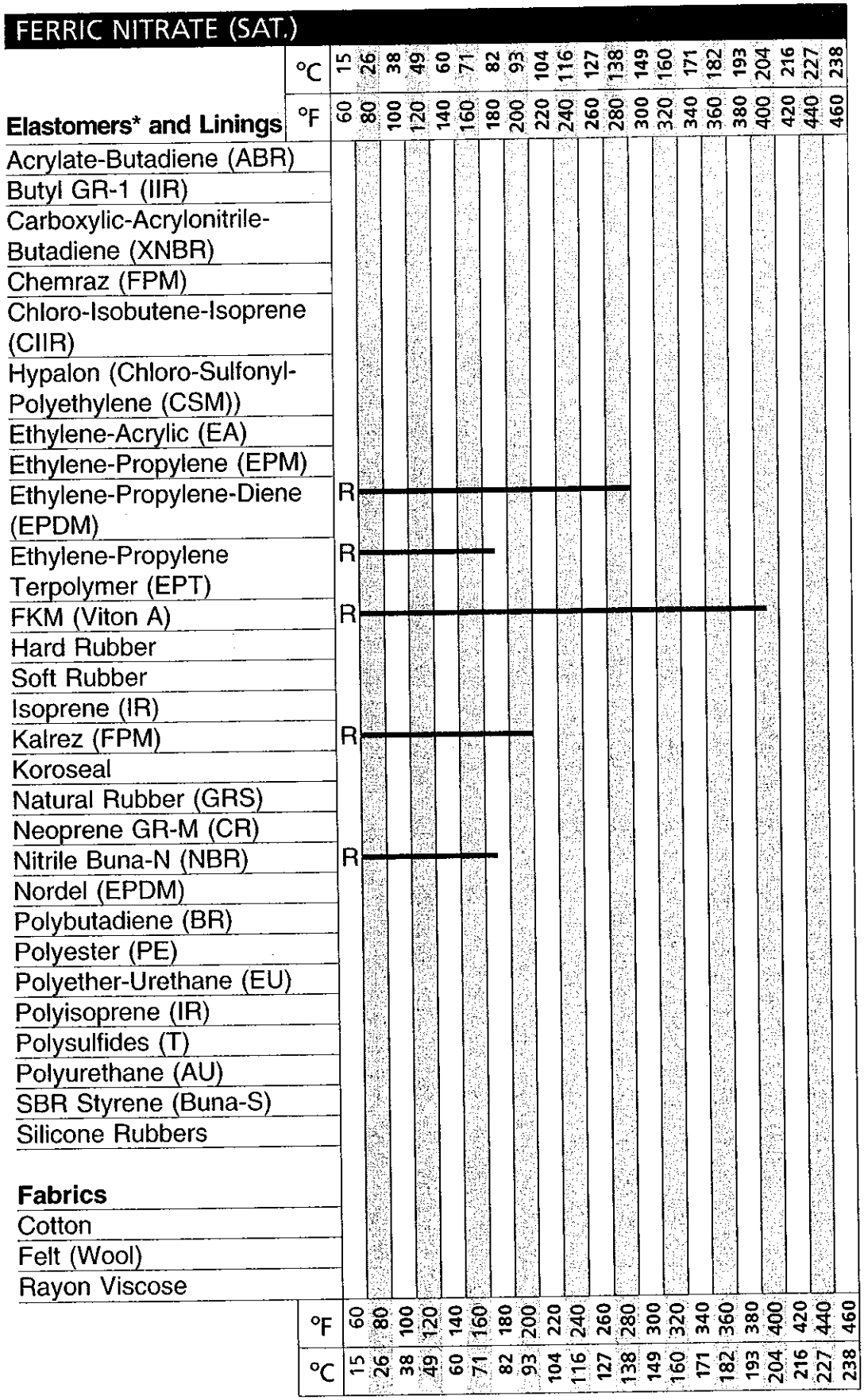


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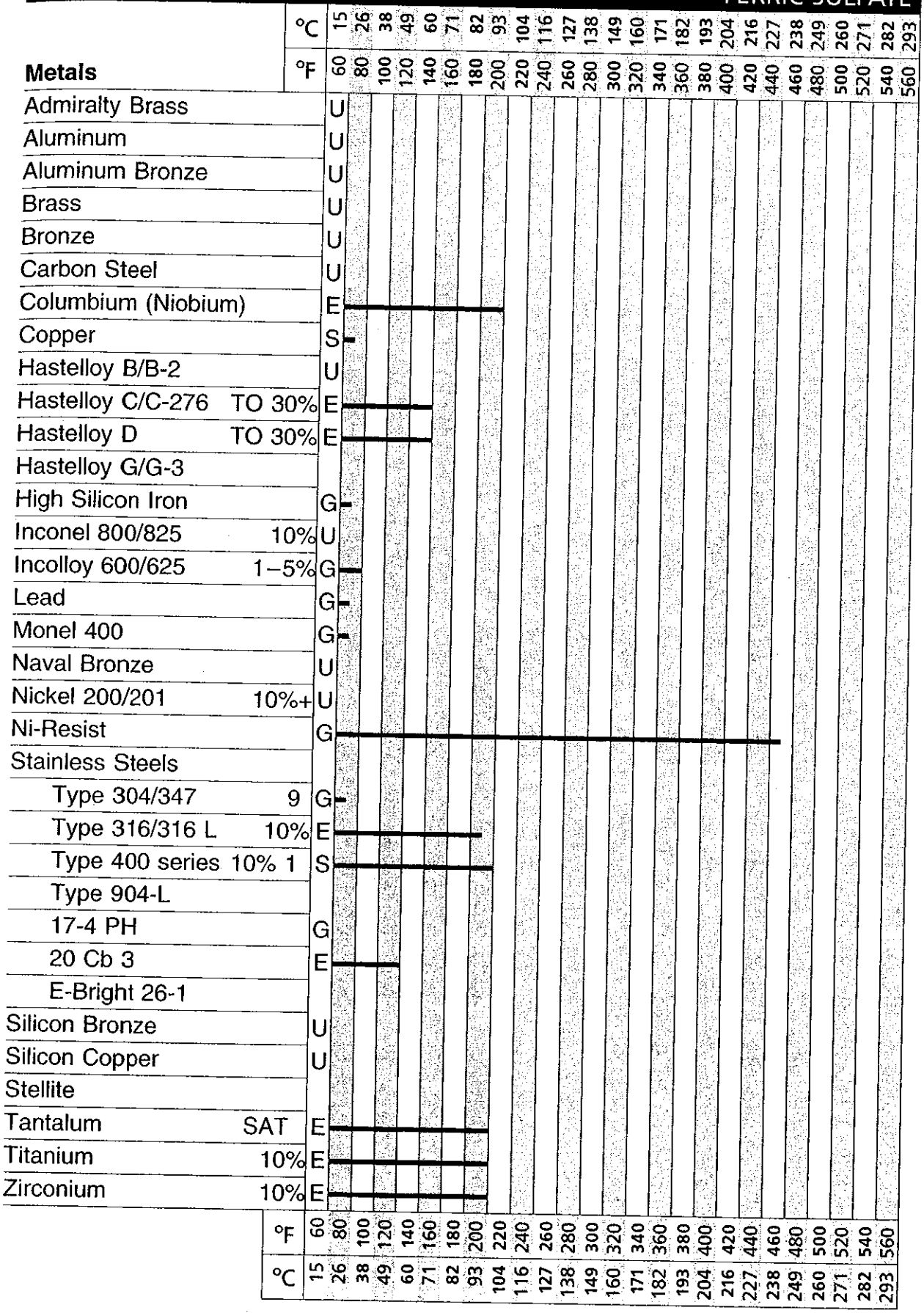
FERRIC NITRATE (SAT.)



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FERRIC SULFATE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

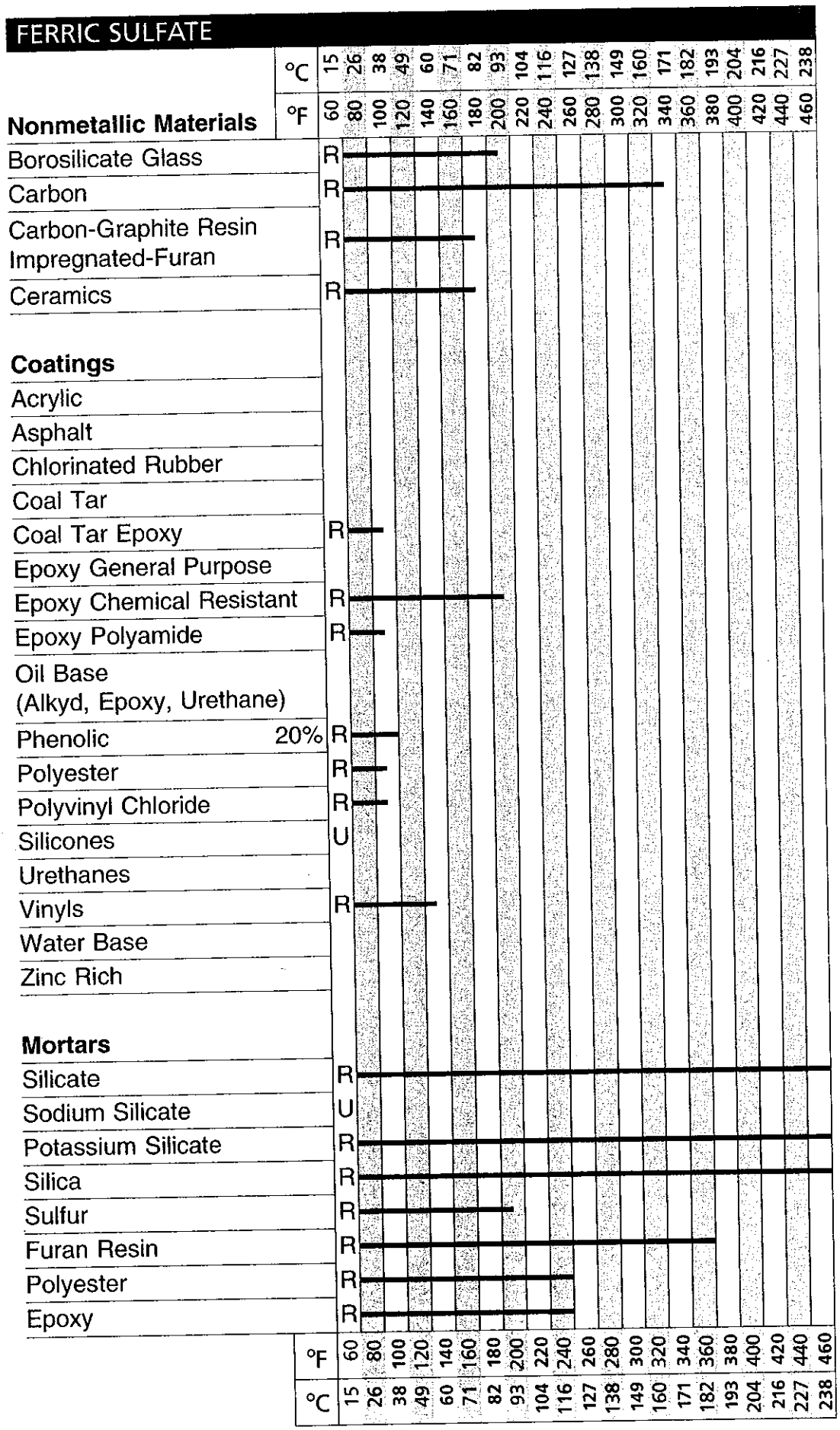
R = Resistant

U = Unsatisfactory

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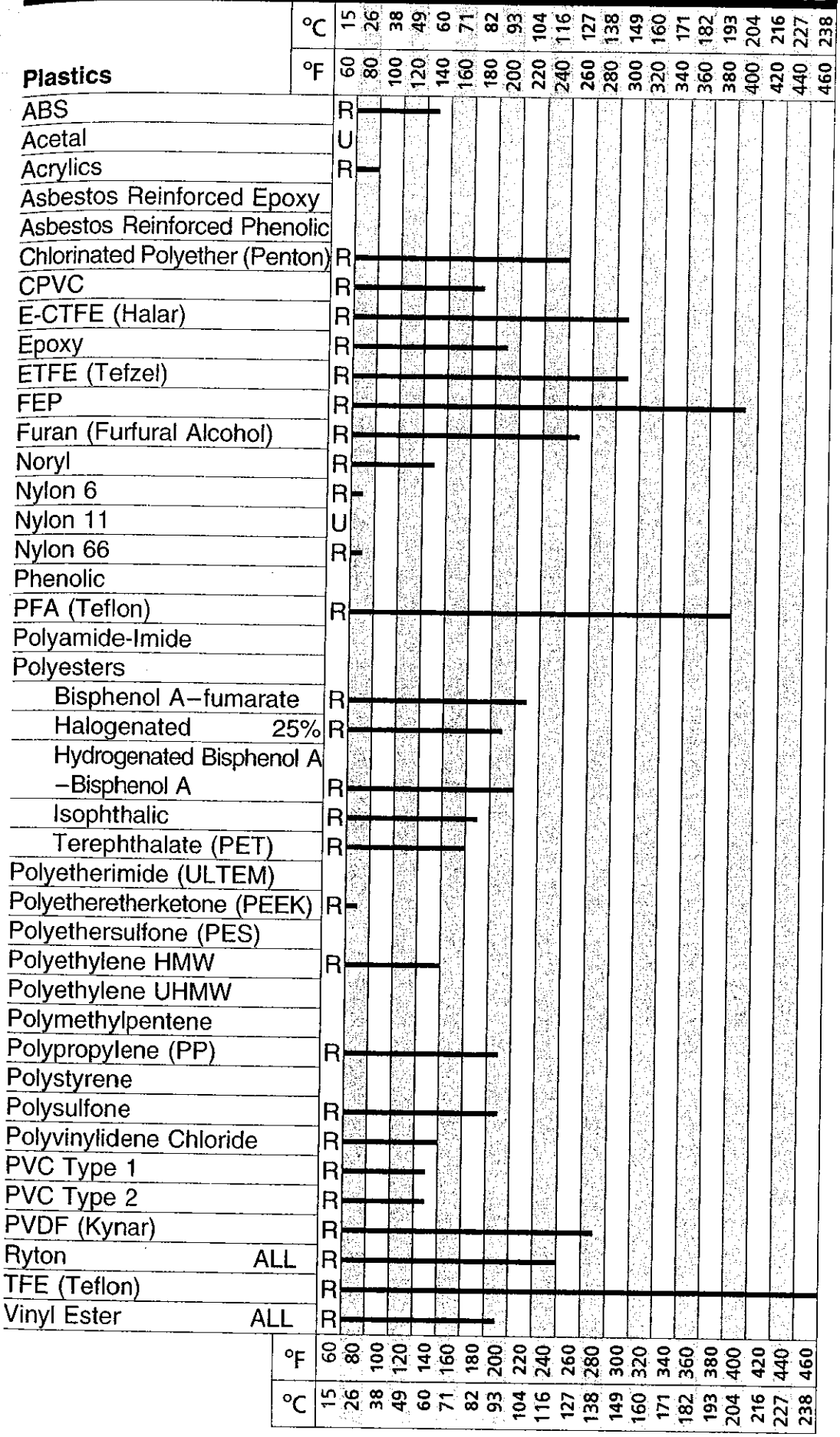
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FERRIC SULFATE



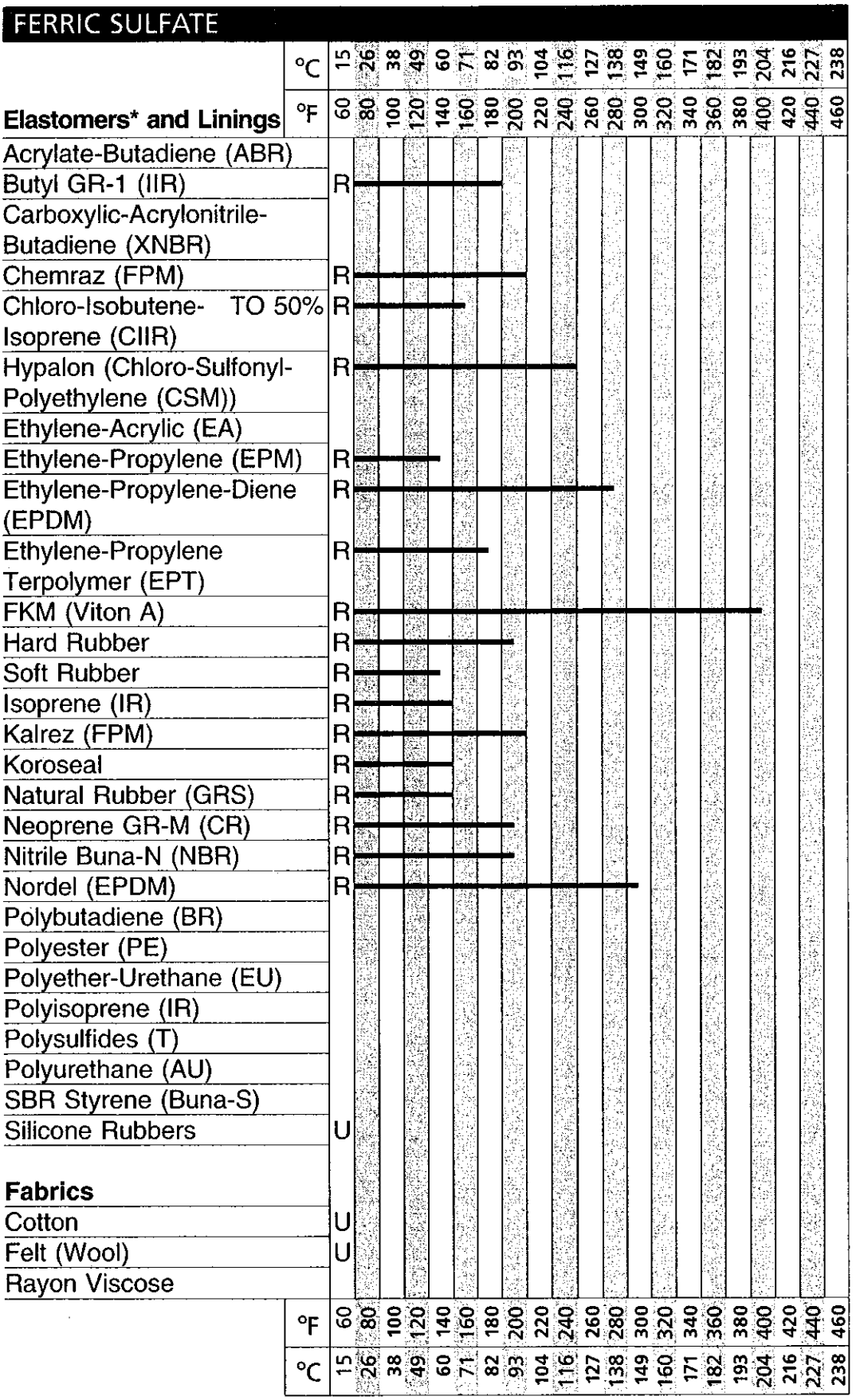
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FERRIC SULFATE



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FERRIC SULFATE



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FERROUS AMMONIUM CITRATE

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum		G																									
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper		G																									
Hastelloy B/B-2		E																									
Hastelloy C/C-276		E																									
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625		E	G																								
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L																											
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze		G																									
Silicon Copper																											
Stellite																											
Tantalum		E																									
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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FERROUS AMMONIUM CITRATE

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

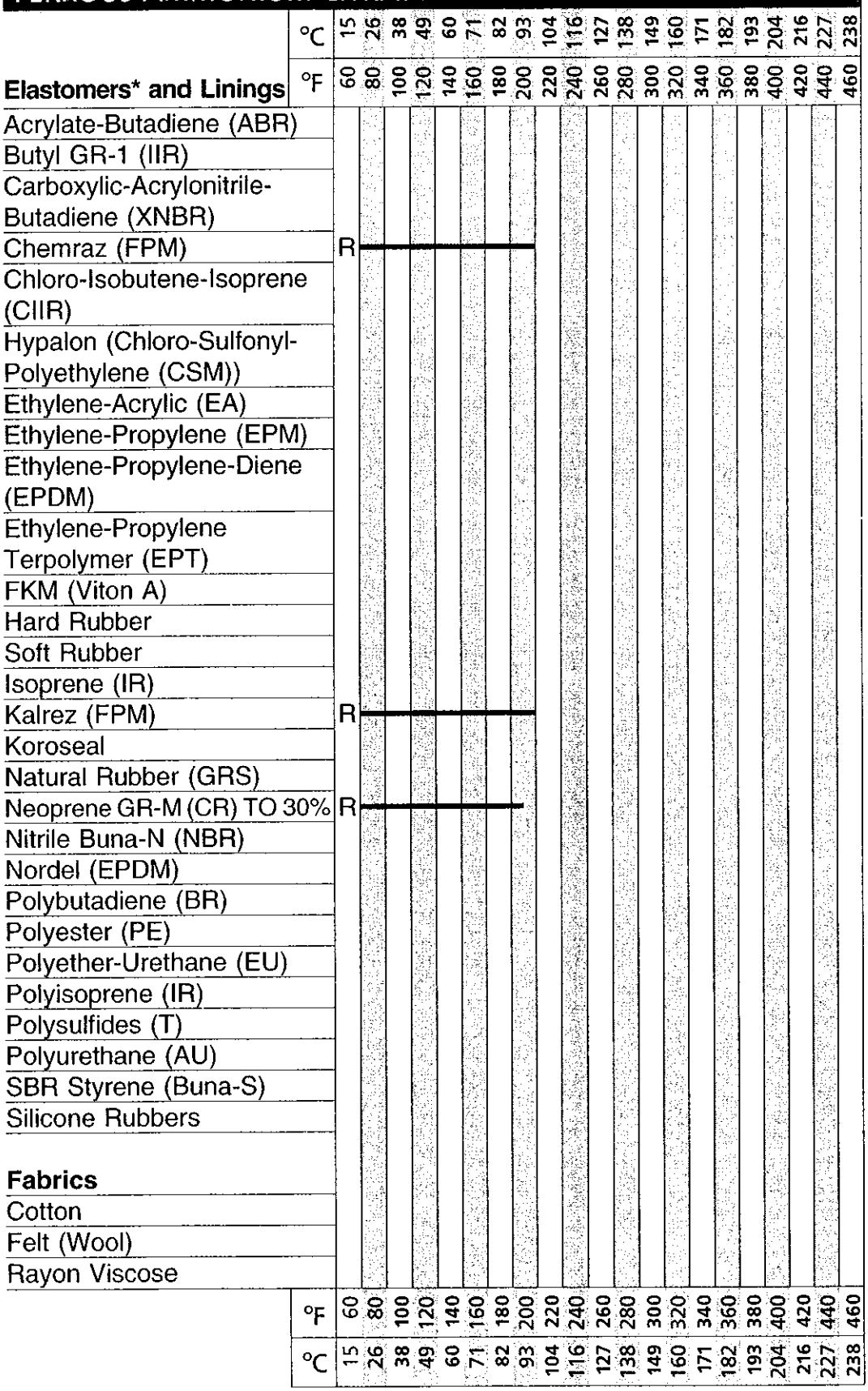
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FERROUS AMMONIUM CITRATE

Plastics	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																					
Acetal																					
Acrylics																					
Asbestos Reinforced Epoxy																					
Asbestos Reinforced Phenolic																					
Chlorinated Polyether (Penton)																					
CPVC																					
E-CTFE (Halar)																					
Epoxy																					
ETFE (Tefzel)	R																				
FEP																					
Furan (Furfural Alcohol)																					
Noryl																					
Nylon 6																					
Nylon 11																					
Nylon 66																					
Phenolic																					
PFA (Teflon)	R																				
Polyamide-Imide																					
Polyesters																					
Bisphenol A–fumarate																					
Halogenated																					
Hydrogenated Bisphenol A –Bisphenol A																					
Isophthalic																					
Terephthalate (PET)																					
Polyetherimide (ULTEM)																					
Polyetheretherketone (PEEK)																					
Polyethersulfone (PES)																					
Polyethylene HMW																					
Polyethylene UHMW																					
Polymethylpentene																					
Polypropylene (PP)																					
Polystyrene																					
Polysulfone																					
Polyvinylidene Chloride																					
PVC Type 1																					
PVC Type 2																					
PVDF (Kynar)																					
Ryton																					
TFE (Teflon)	R																				
Vinyl Ester																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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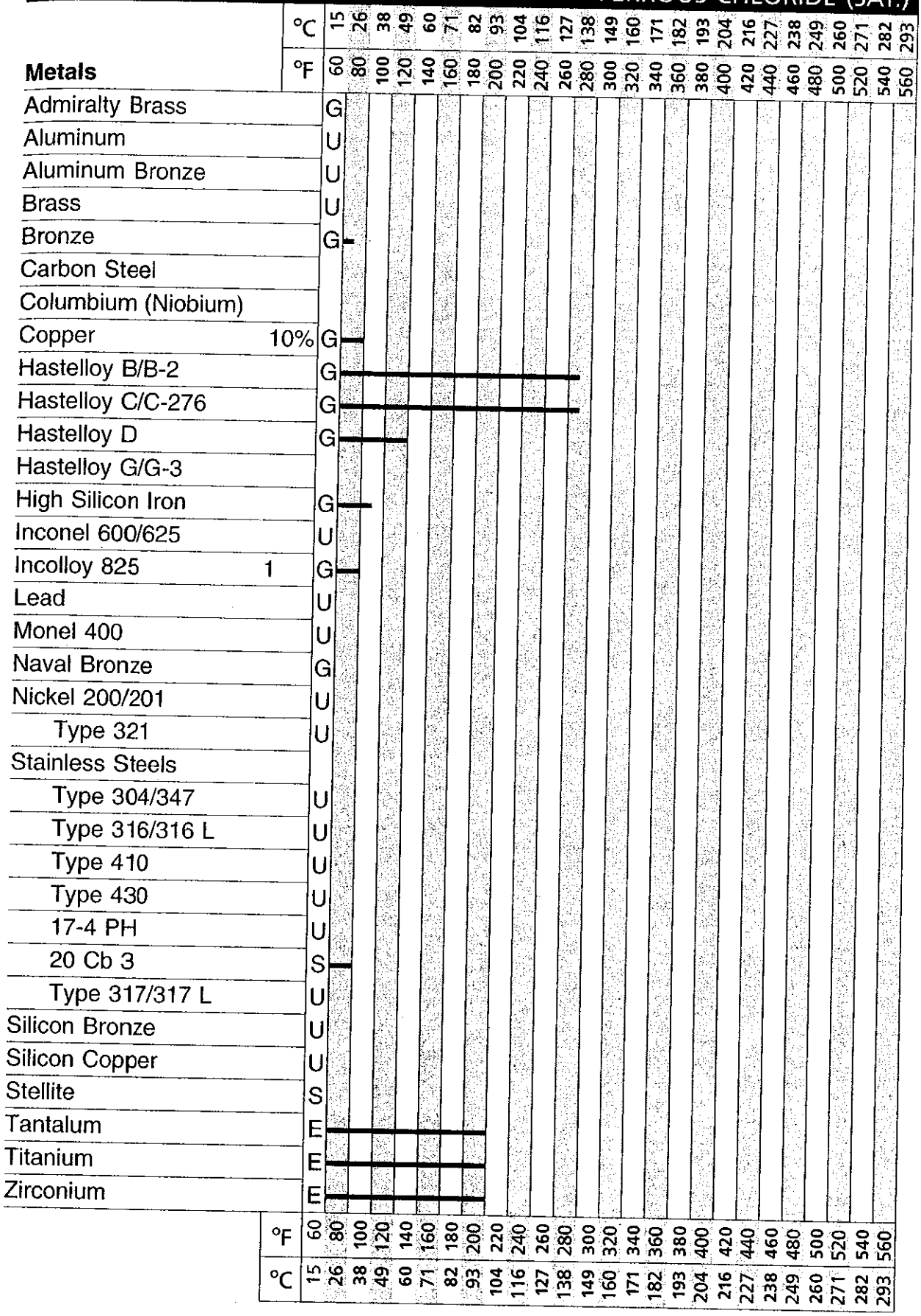
FERROUS AMMONIUM CITRATE



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FERROUS CHLORIDE (SAT.)



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

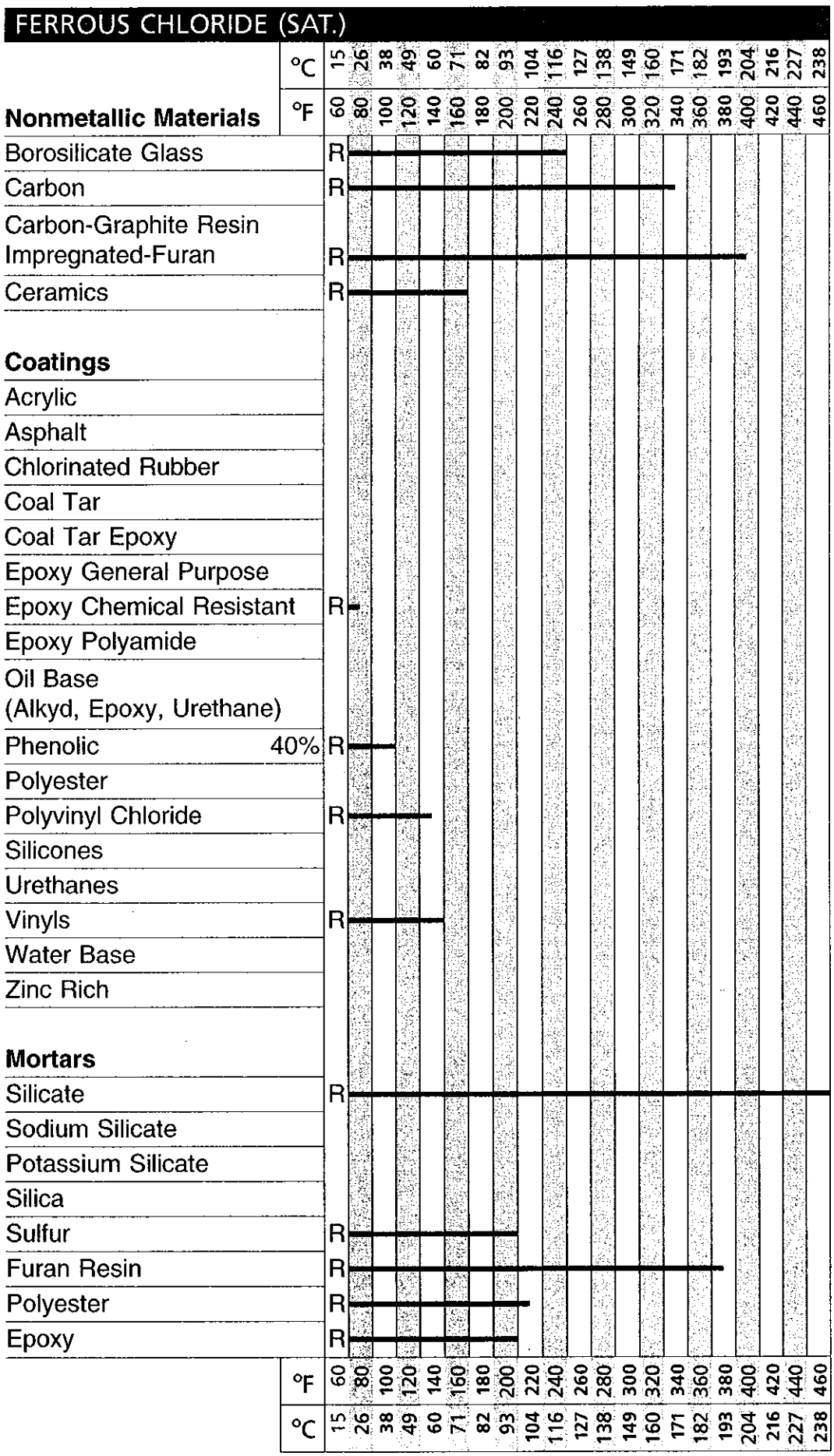
R = Resistant

U = Unsatisfactory

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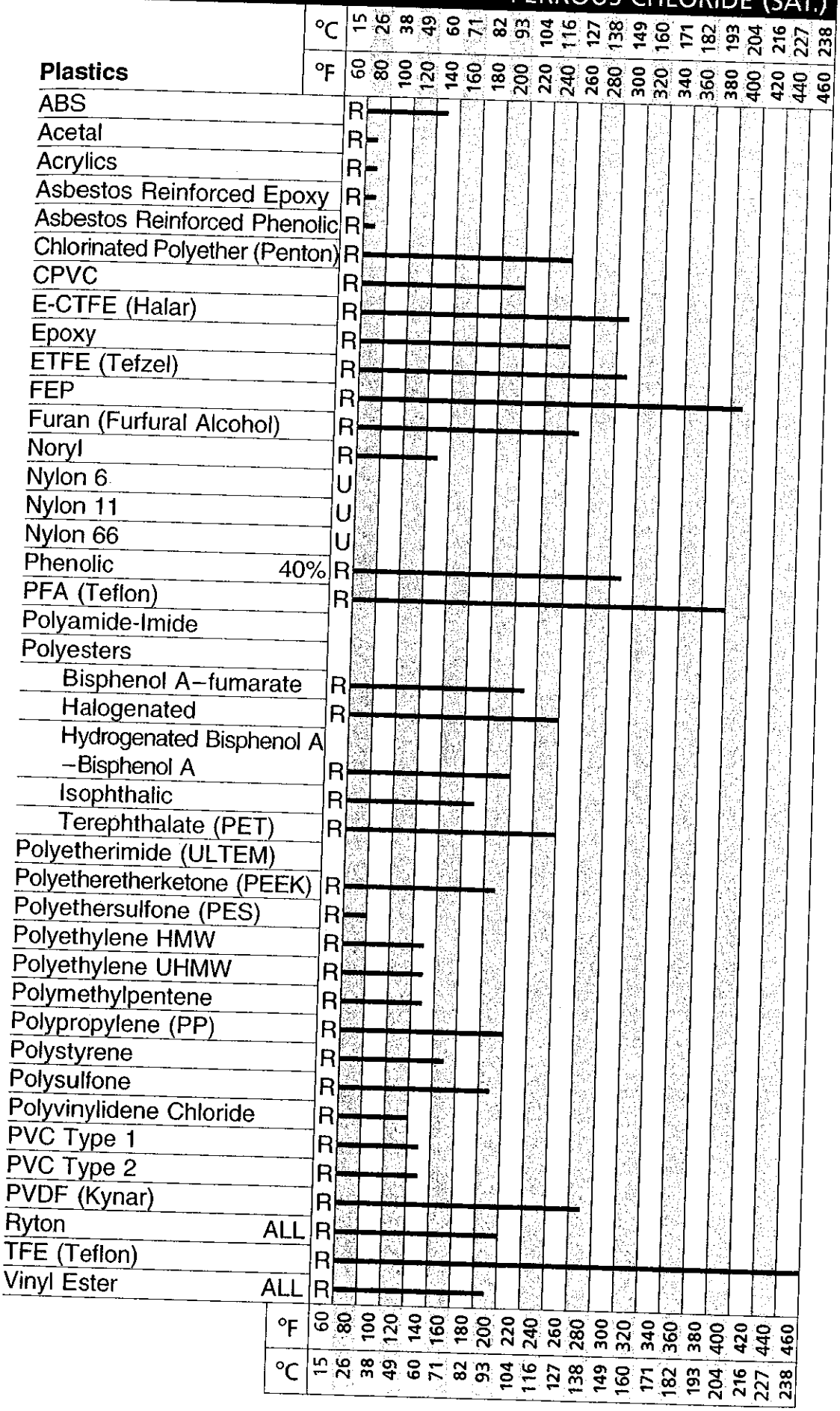
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FERROUS CHLORIDE (SAT.)



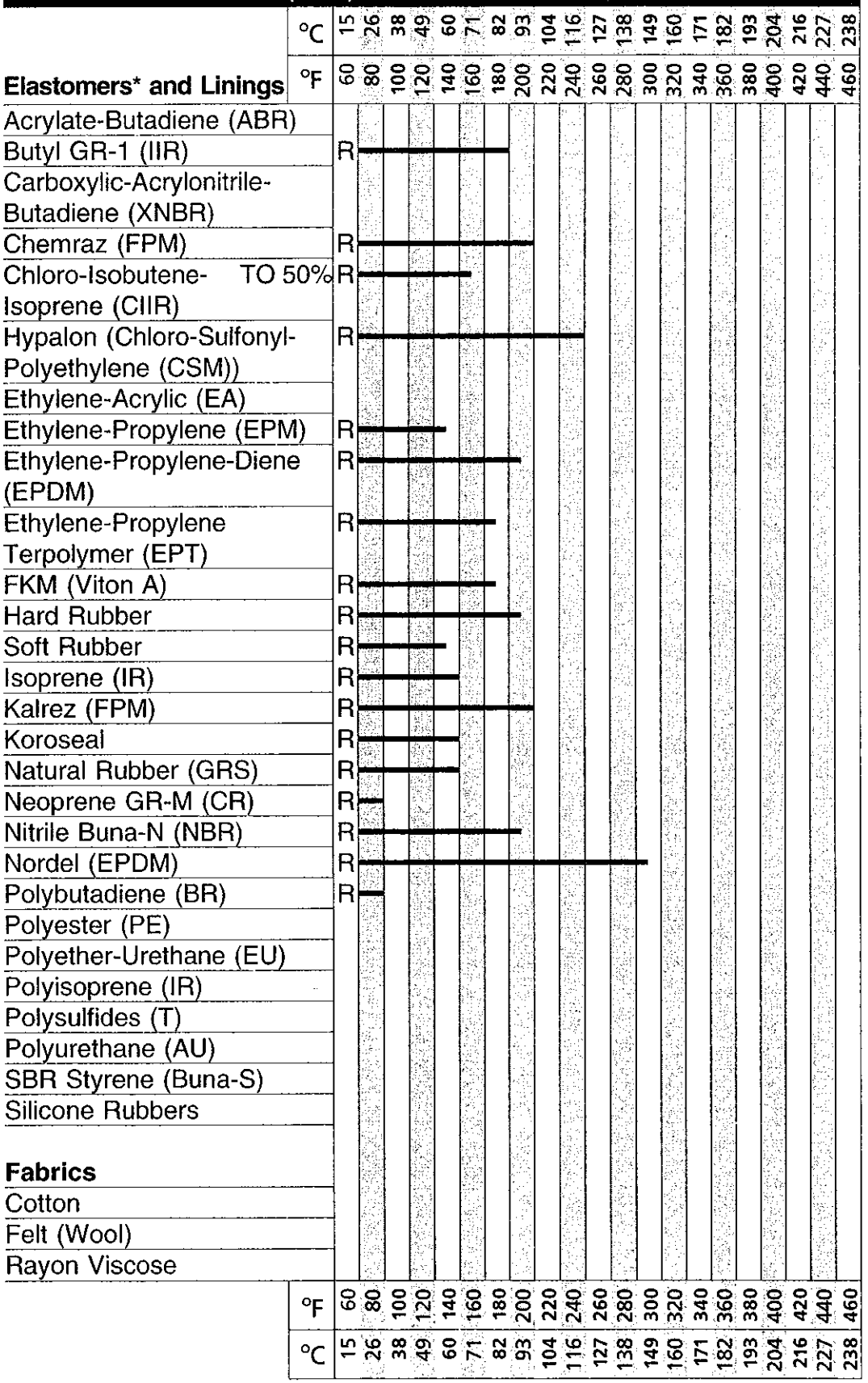
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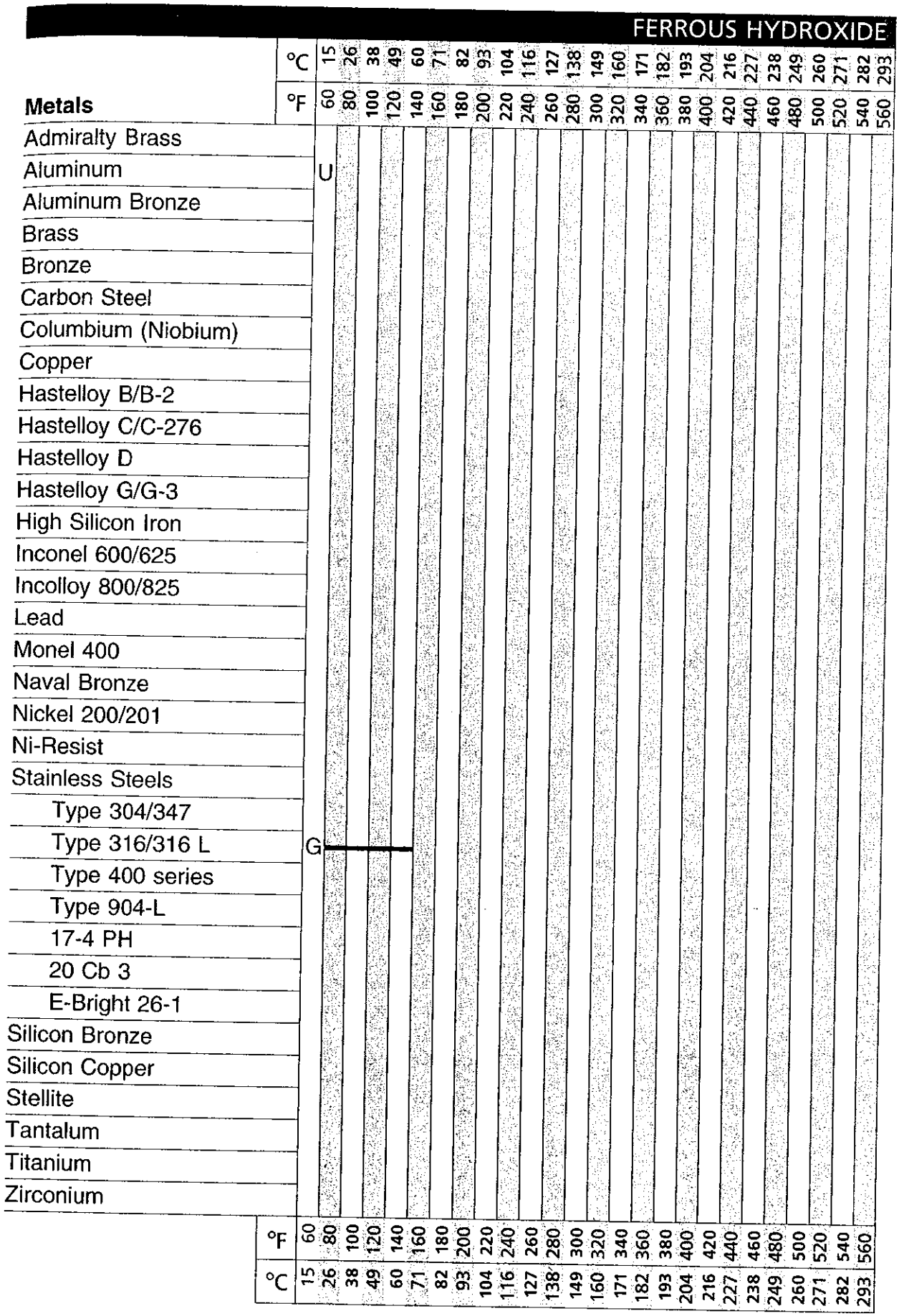
FERROUS CHLORIDE (SAT.)



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FERROUS HYDROXIDE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

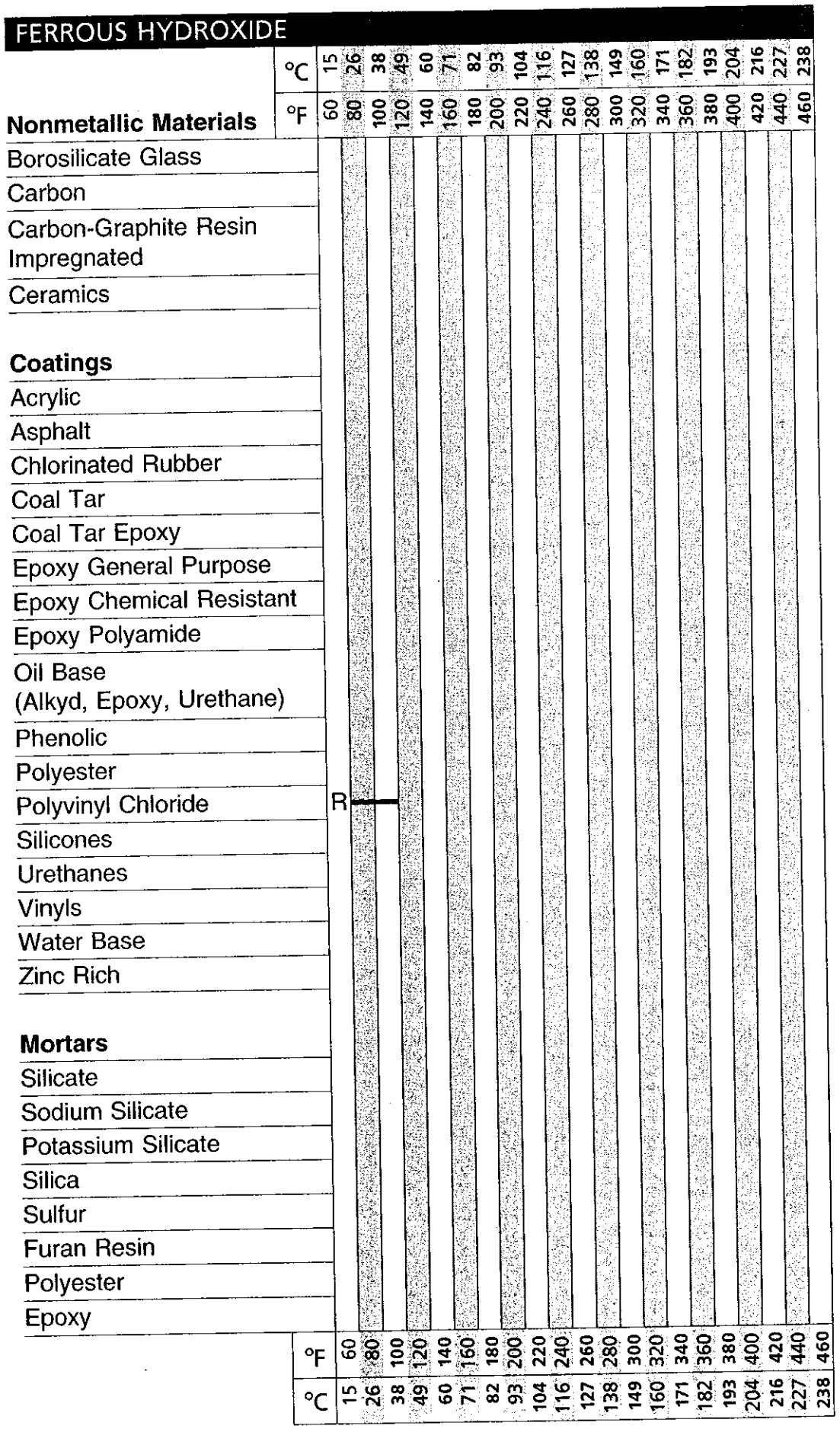
R = Resistant

U = Unsatisfactory

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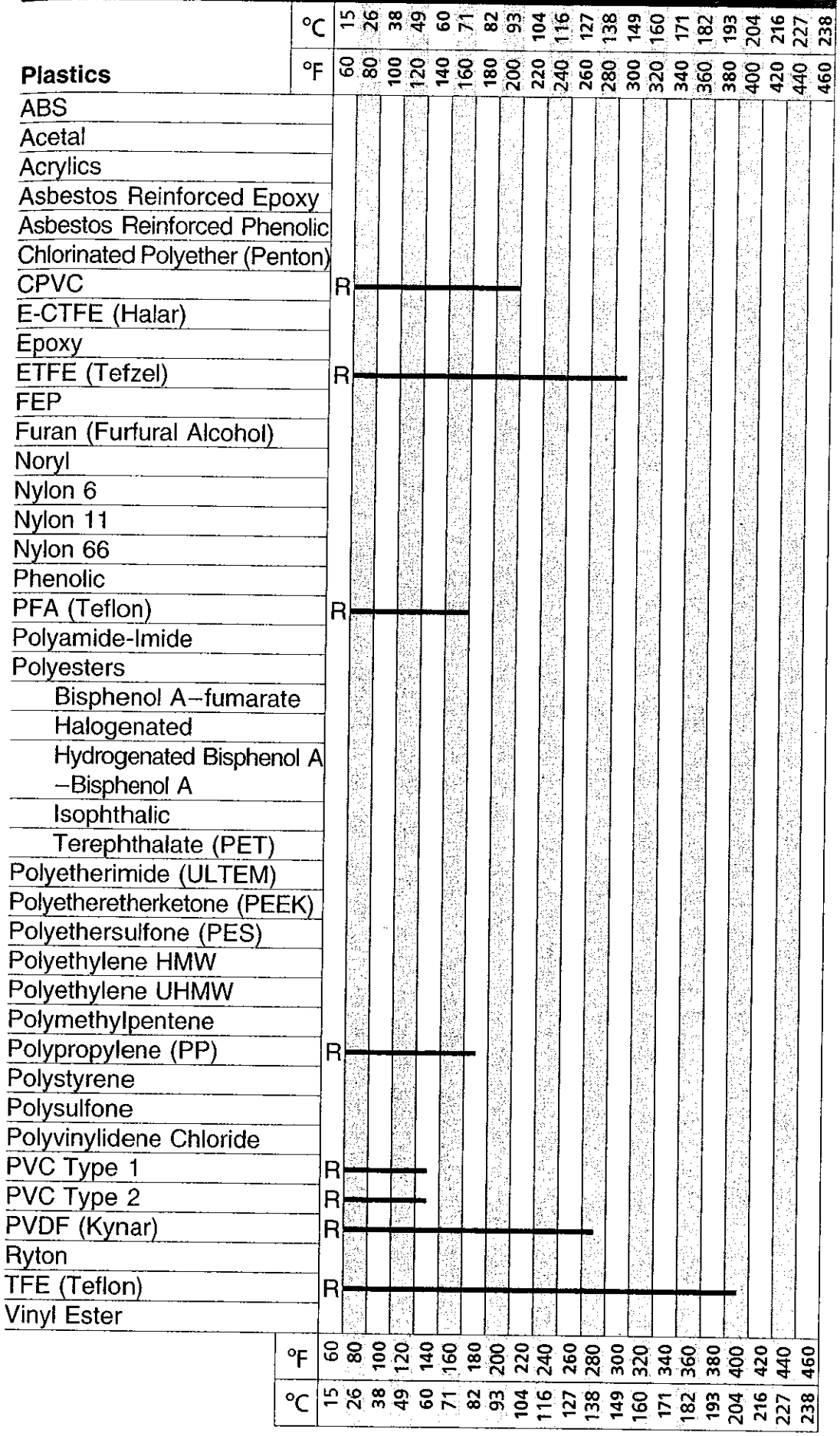
FERROUS HYDROXIDE



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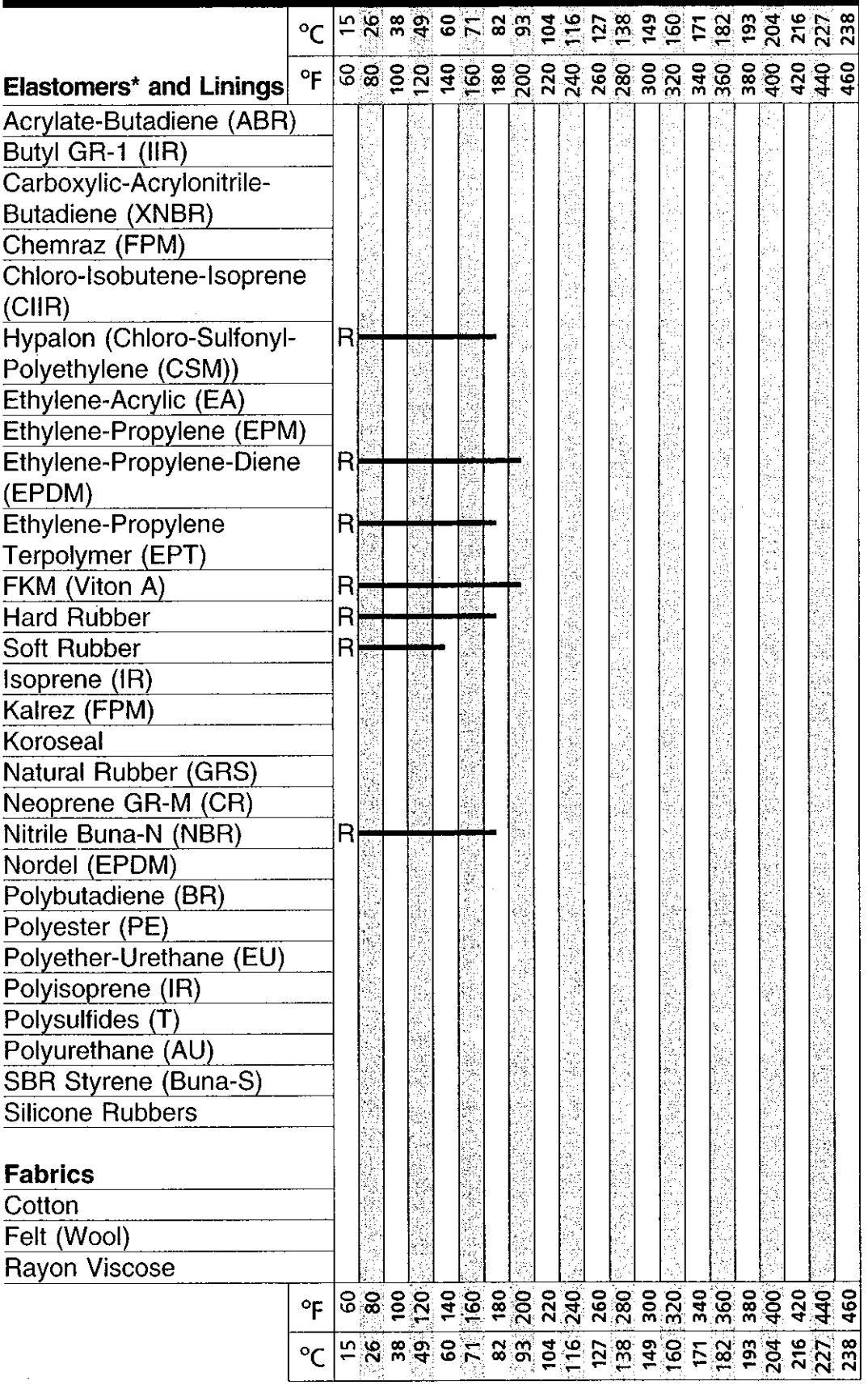
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FERROUS HYDROXIDE



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FERROUS HYDROXIDE



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FERROUS NITRATE

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L	G																										
Type 400 series																											
Type 904-L																											
17-4 PH	G																										
20 Cb 3	G																										
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

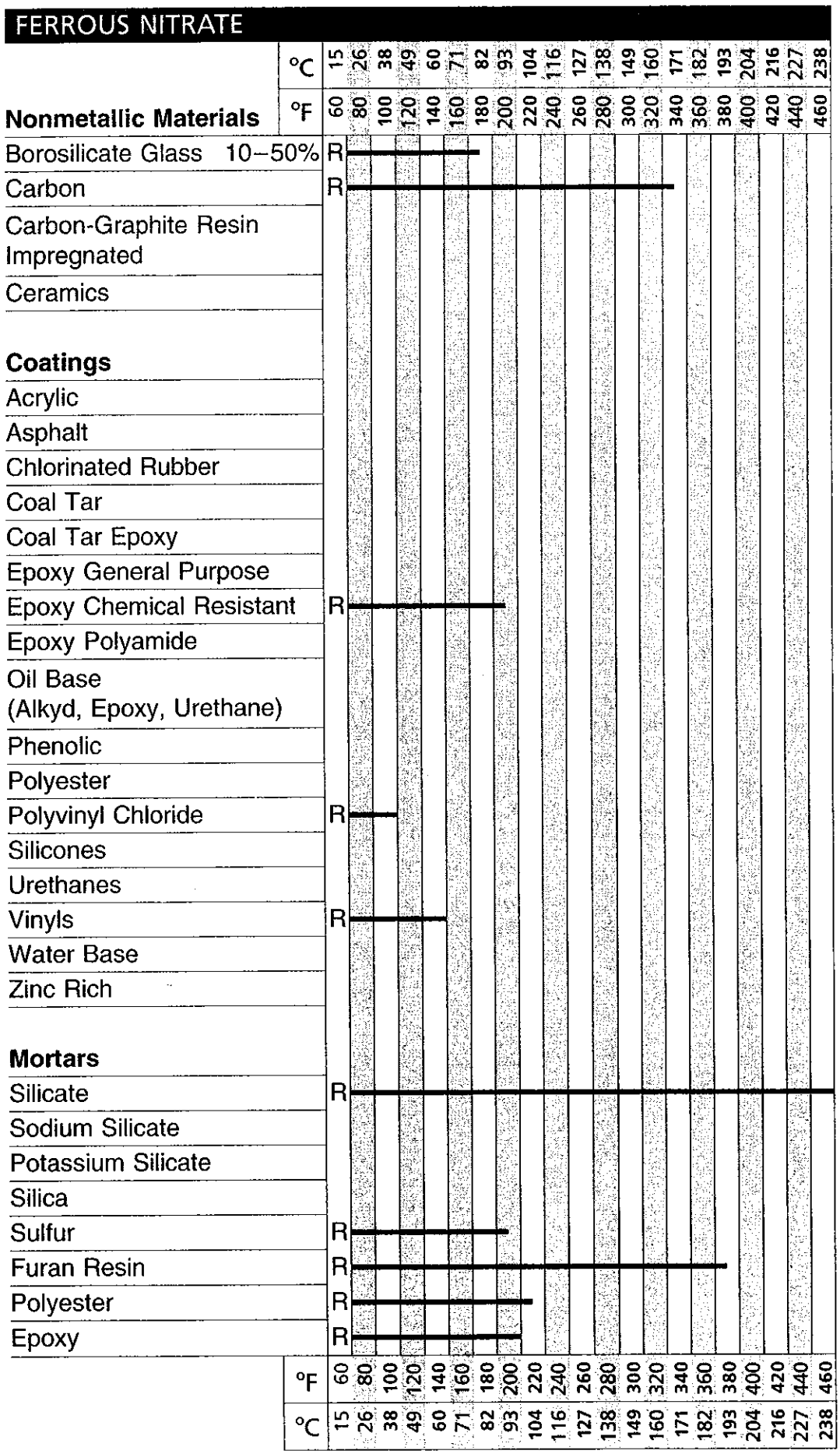
R = Resistant

U = Unsatisfactory

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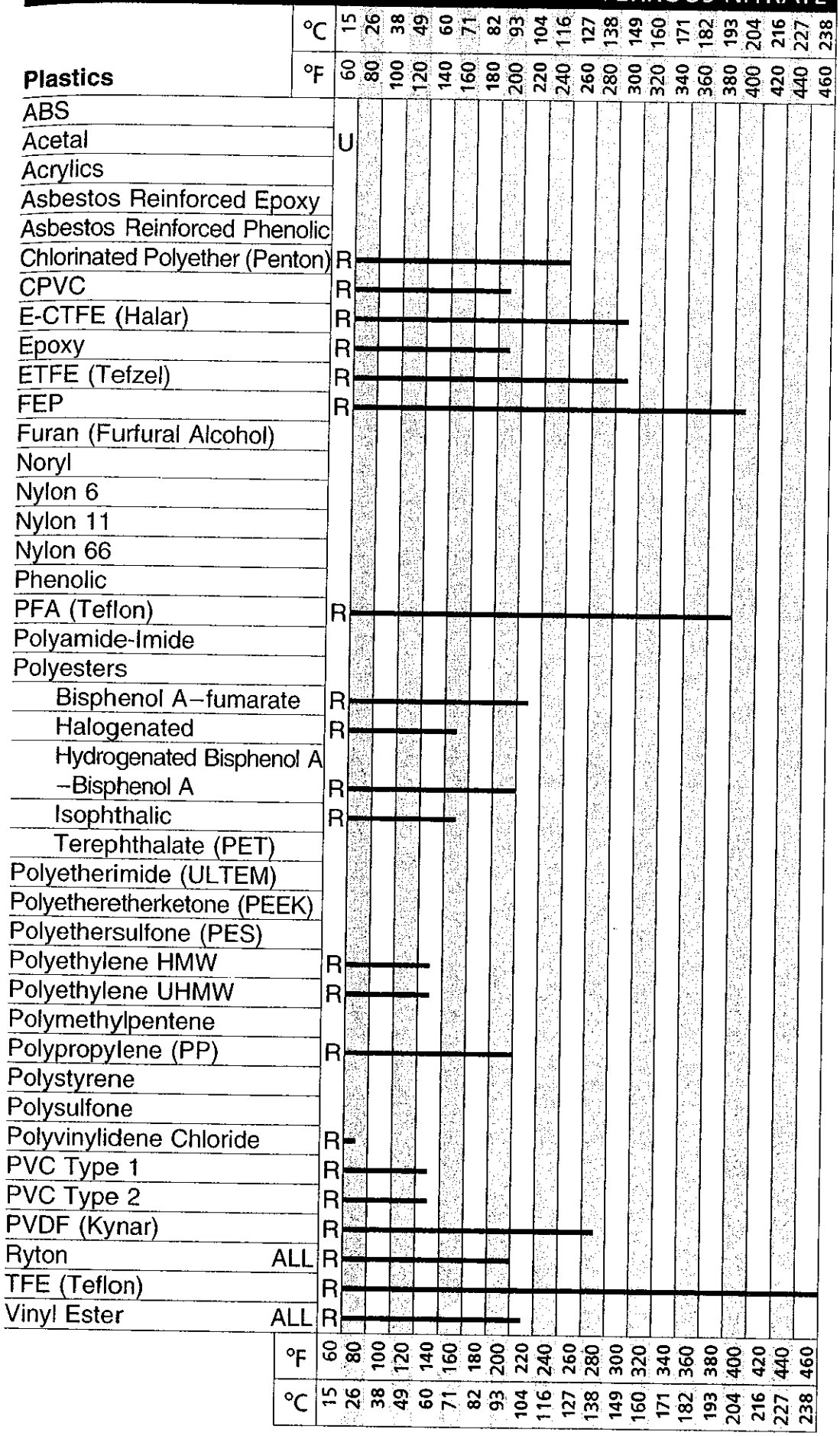
FERROUS NITRATE



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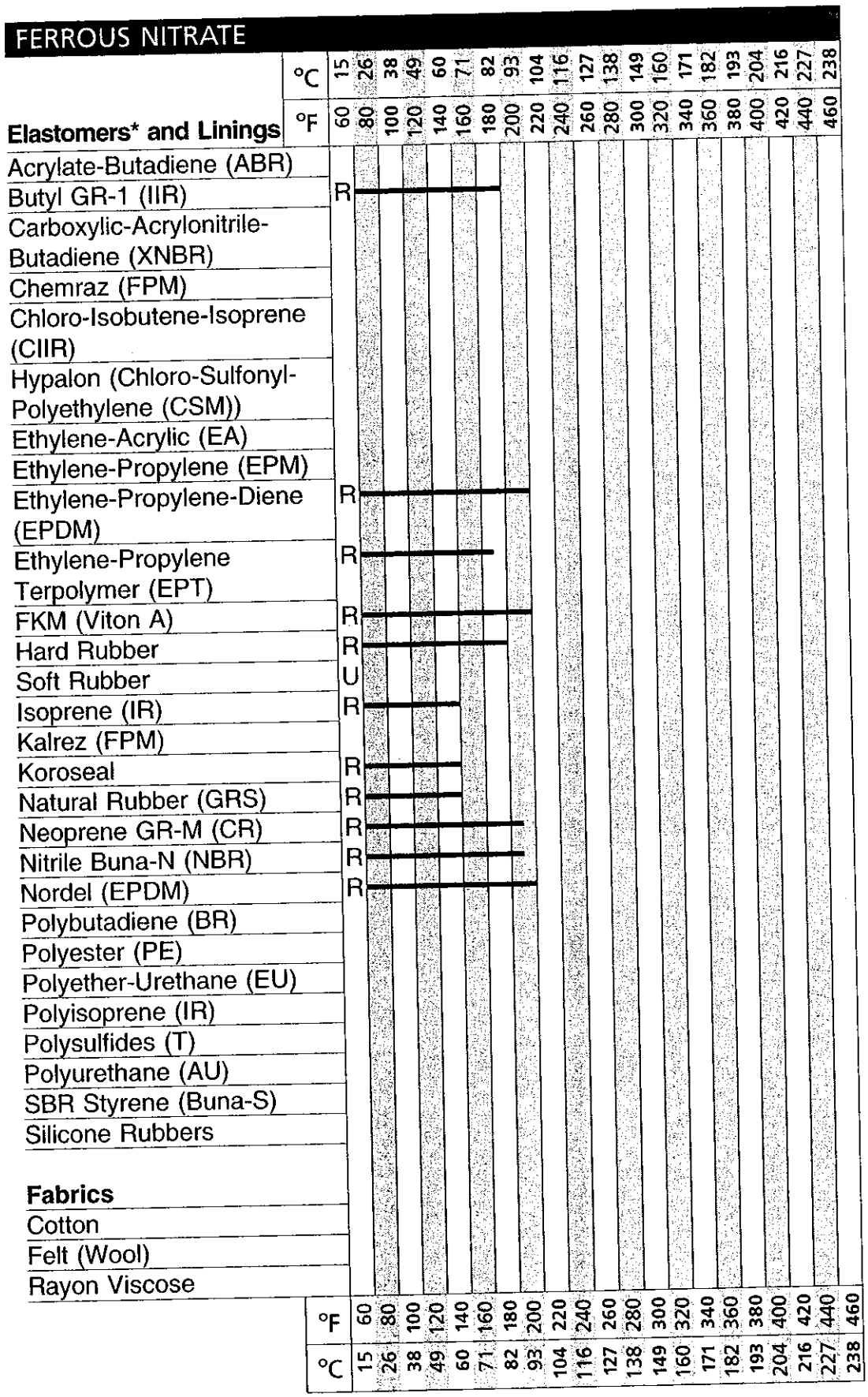
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FERROUS NITRATE



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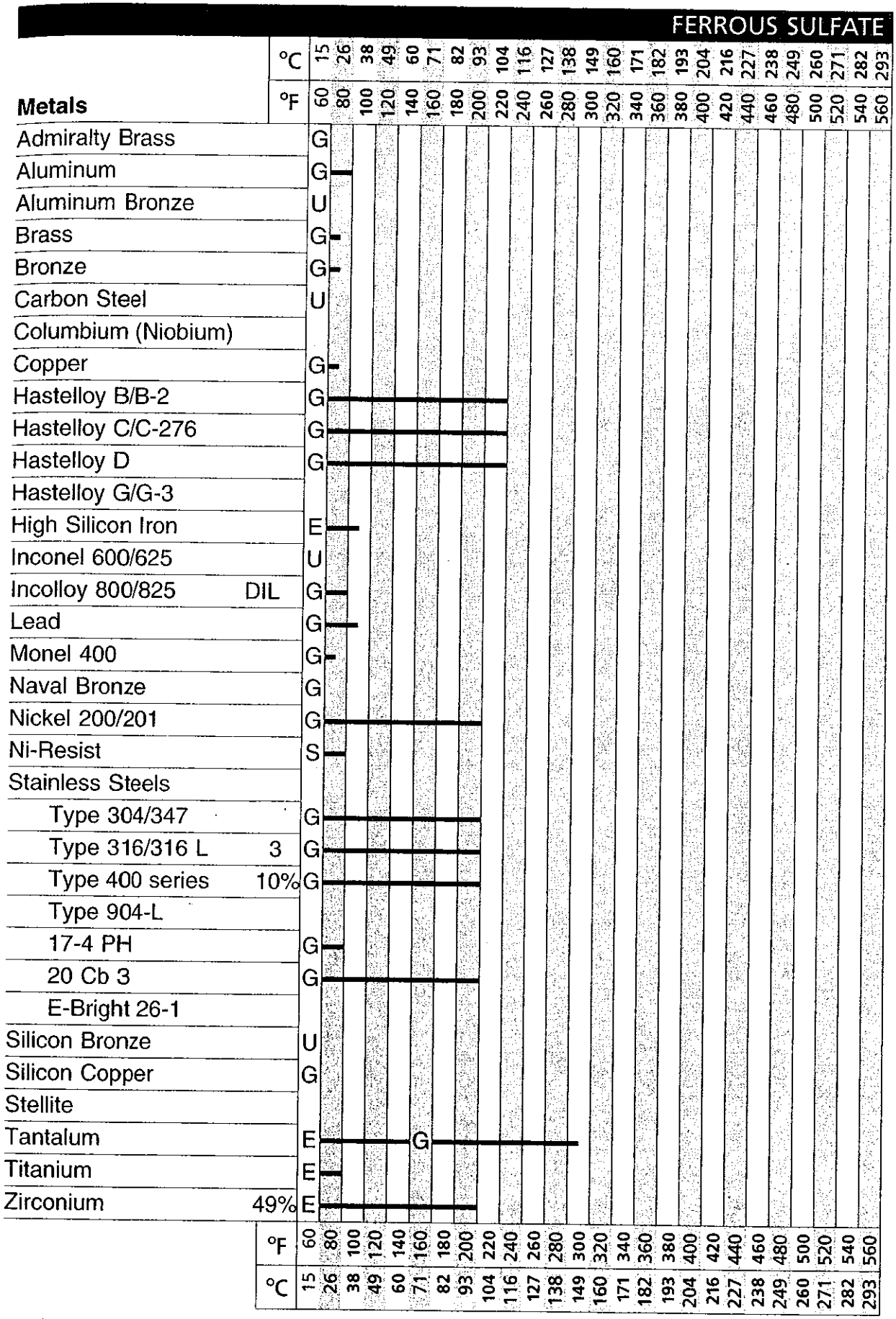
FERROUS NITRATE



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FERROUS SULFATE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

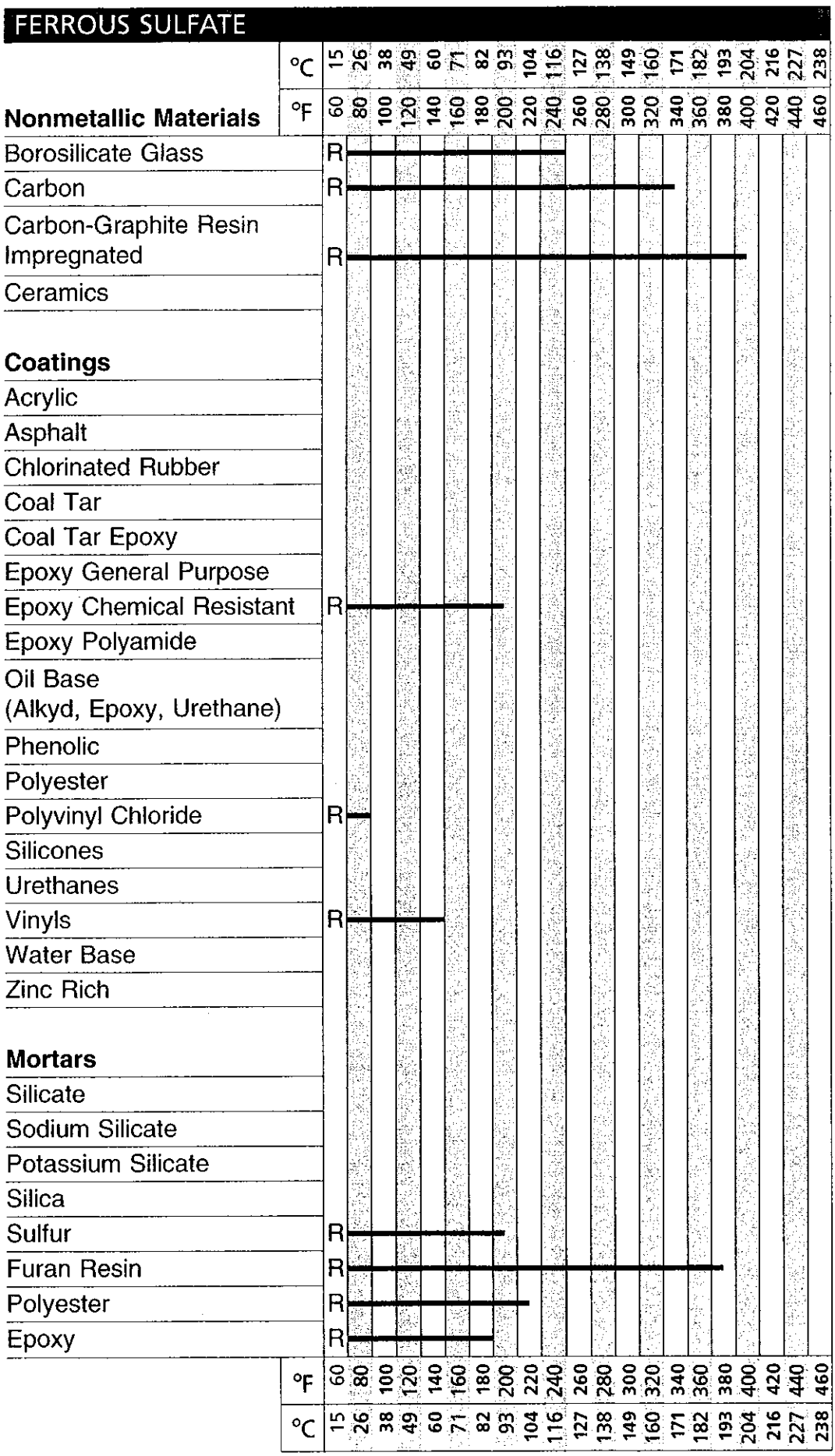
R = Resistant

U = Unsatisfactory

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FERROUS SULFATE



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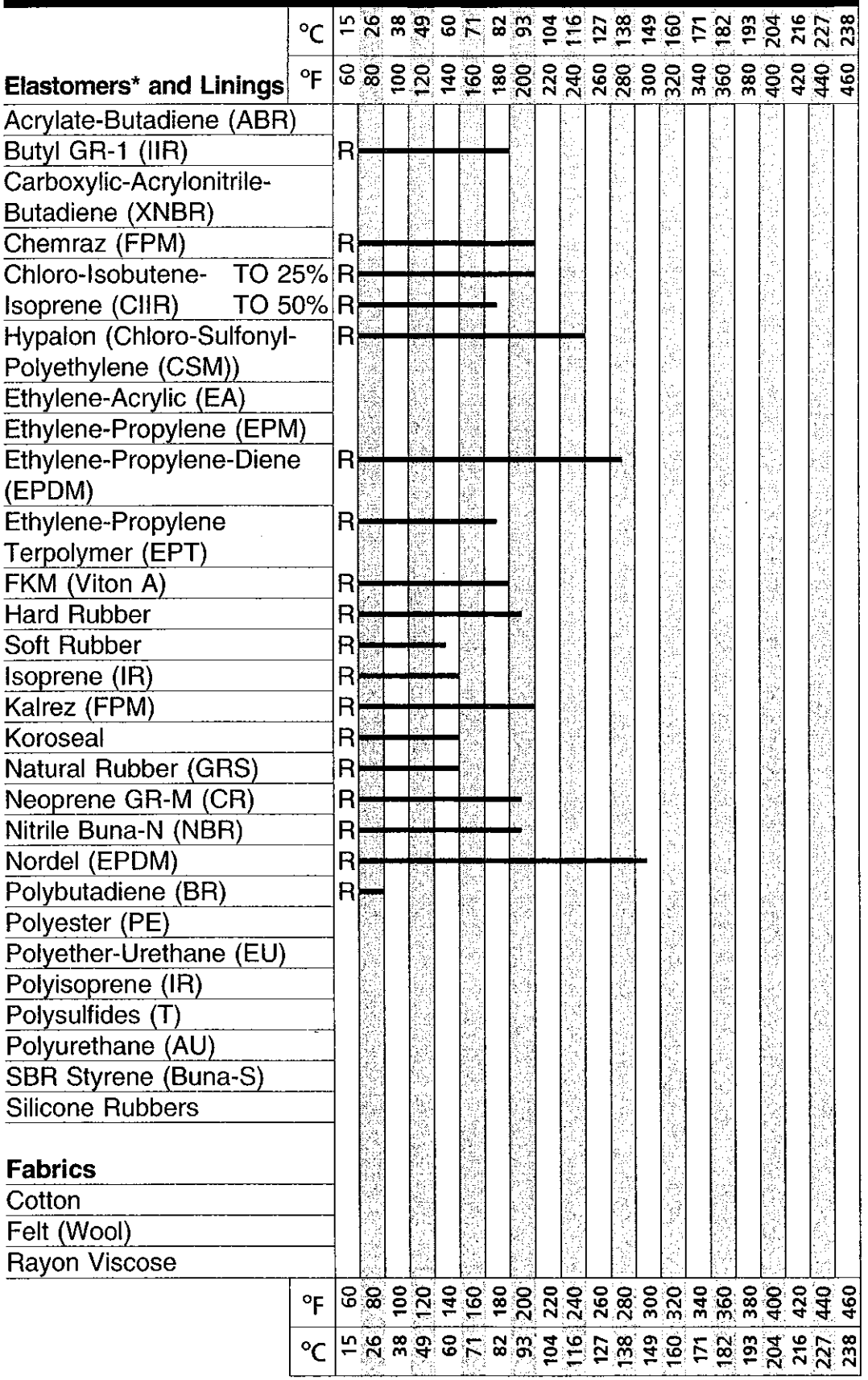
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FERROUS SULFATE

Plastics		°C	°F
ABS	R	15–93	60–200
Acetal	U		
Acrylics	R	15–26	60–80
Asbestos Reinforced Epoxy	R	15–26	60–80
Asbestos Reinforced Phenolic	R	15–26	60–80
Chlorinated Polyether (Penton)	R	15–116	60–240
CPVC	R	15–82	60–180
E-CTFE (Halar)	R	15–138	60–280
Epoxy	R	15–93	60–200
ETFE (Tefzel)	R	15–138	60–280
FEP	R	15–204	60–400
Furan (Furfural Alcohol)	R	15–116	60–240
Noryl	R	15–60	60–140
Nylon 6	U		
Nylon 11	U		
Nylon 66	U		
Phenolic	R	15–26	60–80
PFA (Teflon)	R	15–182	60–360
Polyamide-Imide			
Polyesters			
Bisphenol A–fumarate	R	15–104	60–220
Halogenated	R	15–116	60–240
Hydrogenated Bisphenol A –Bisphenol A	R	15–93	60–200
Isophthalic	R	15–82	60–180
Terephthalate (PET)	R	15–116	60–240
Polyetherimide (ULTEM)			
Polyetheretherketone (PEEK)			
Polyethersulfone (PES)			
Polyethylene HMW	R	15–60	60–140
Polyethylene UHMW	R	15–60	60–140
Polymethylpentene			
Polypropylene (PP)	R	15–93	60–200
Polystyrene	R	15–71	60–160
Polysulfone	R	15–82	60–180
Polyvinylidene Chloride	R	15–60	60–140
PVC Type 1	R	15–60	60–140
PVC Type 2	R	15–60	60–140
PVDF (Kynar)	R	15–127	60–260
Ryton ALL	R	15–93	60–200
TFE (Teflon)	R	15–238	60–460
Vinyl Ester ALL	R	15–93	60–200

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FERROUS SULFATE



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FISH OIL

Metals	°C	°F
Admiralty Brass		
Aluminum		
Aluminum Bronze		
Brass		
Bronze	G	
Carbon Steel	G	
Columbium (Niobium)		
Copper	G	
Hastelloy B/B-2		
Hastelloy C/C-276		
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625		
Incolloy 800/825		
Lead		
Monel 400	G	
Naval Bronze		
Nickel 200/201		
Ni-Resist		
Stainless Steels		
Type 304/347		
Type 316/316 L	G	
Type 400 series	G	
Type 904-L		
17-4 PH	G	
20 Cb 3	G	
E-Bright 26-1		
Silicon Bronze	G	
Silicon Copper		
Stellite	G	
Tantalum		
Titanium		
Zirconium		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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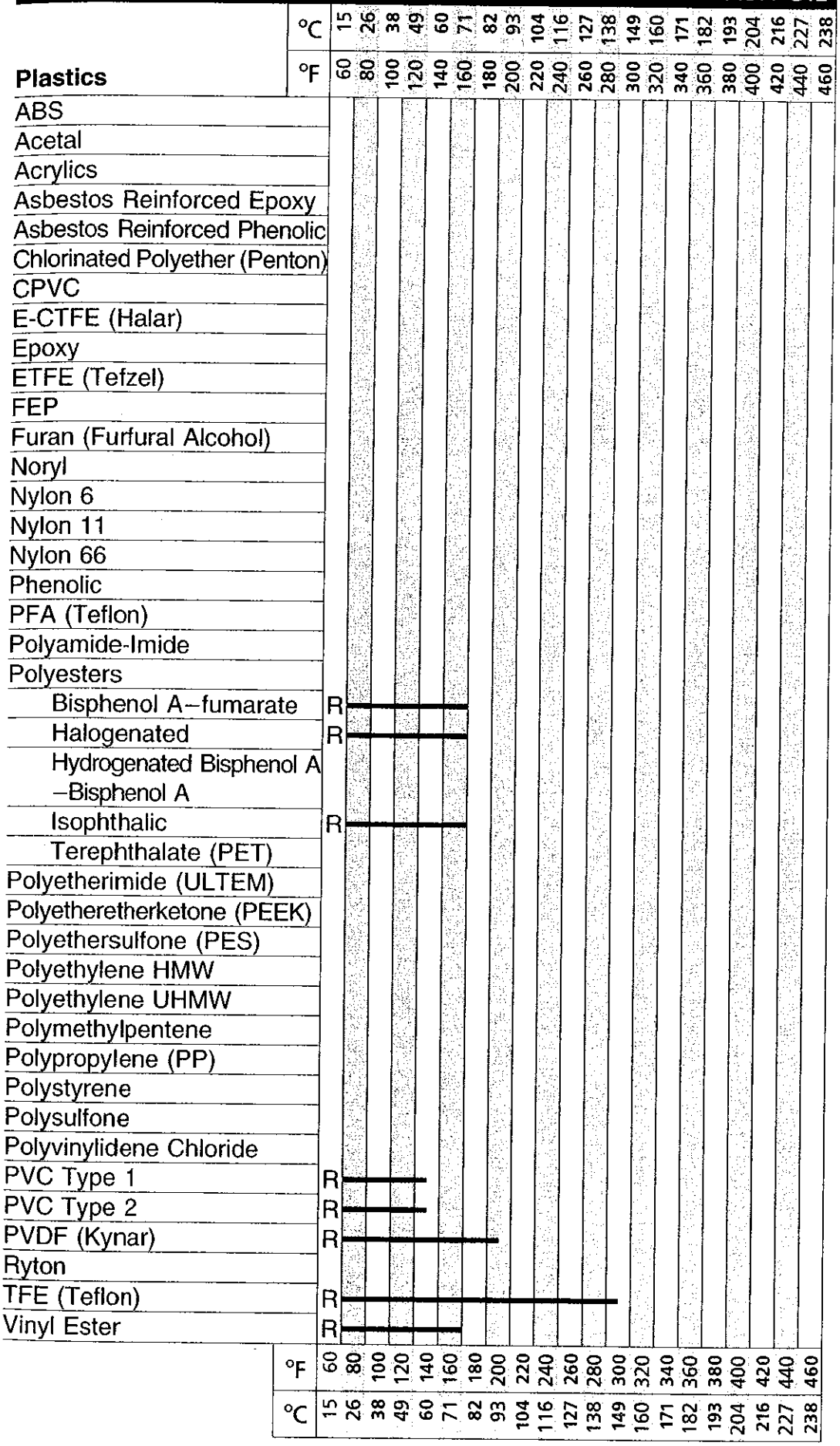
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FISH OIL

Nonmetallic Materials	°C / °F	15 / 60	26 / 80	38 / 100	49 / 120	60 / 140	71 / 160	82 / 180	93 / 200	104 / 220	116 / 240	127 / 260	138 / 280	149 / 300	160 / 320	171 / 340	182 / 360	193 / 380	204 / 400	216 / 420	227 / 440	238 / 460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride		R	R																			
Silicones		R	R																			
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F / °C	60 / 15	80 / 26	100 / 38	120 / 49	140 / 60	160 / 71	180 / 82	200 / 93	220 / 104	240 / 116	260 / 127	280 / 138	300 / 149	320 / 160	340 / 171	360 / 182	380 / 193	400 / 204	420 / 216	440 / 227	460 / 238

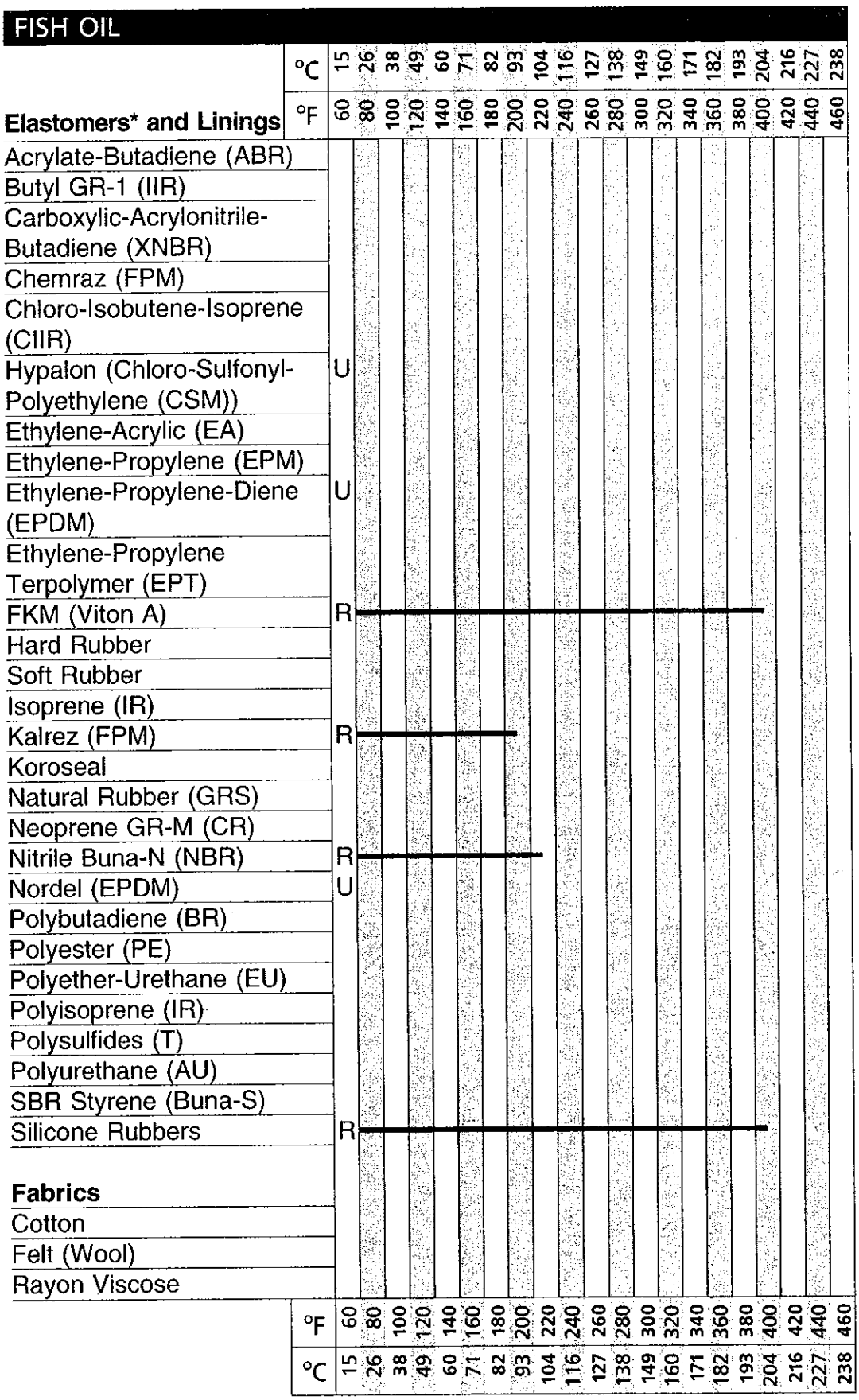
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FISH OIL



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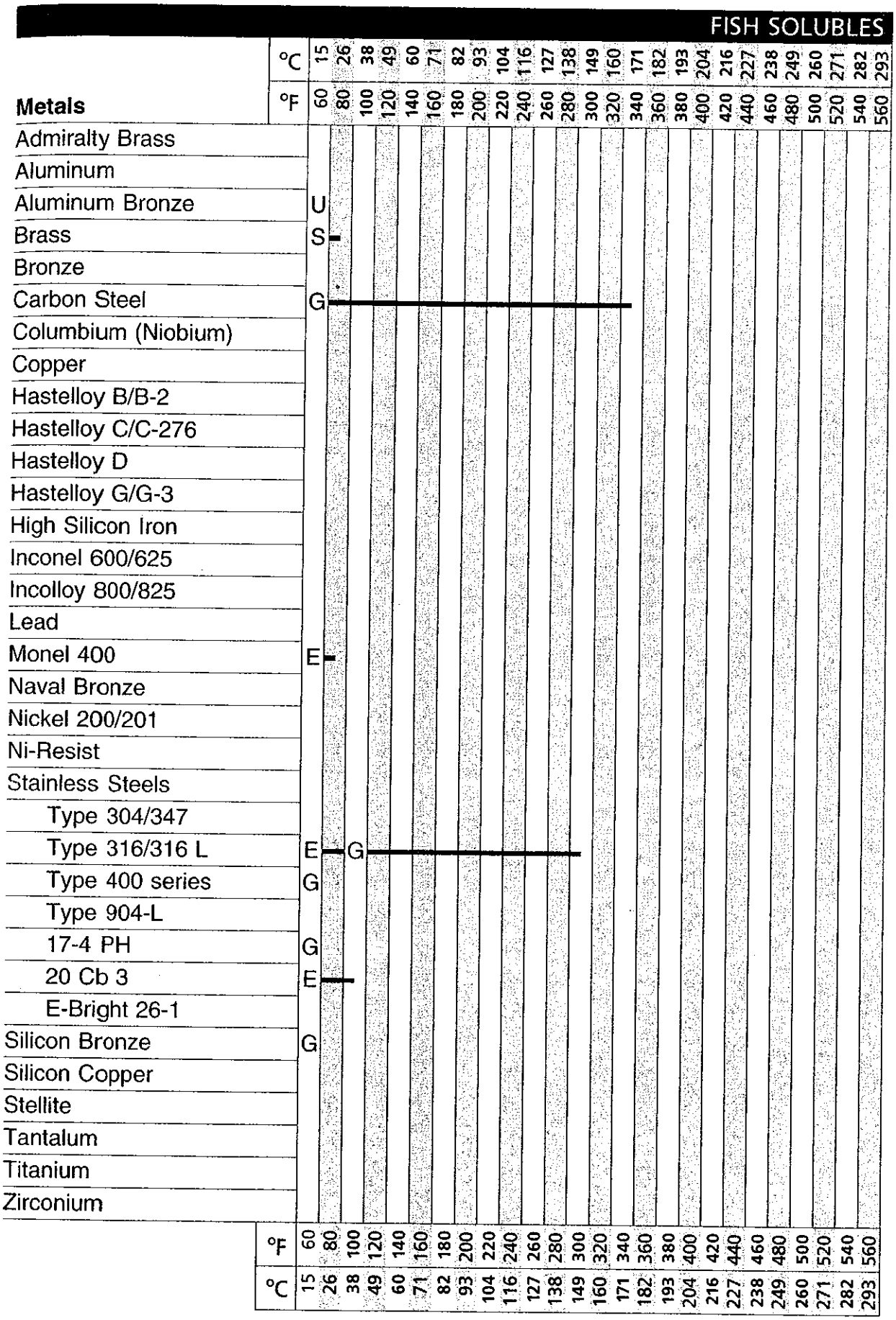
FISH OIL



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FISH SOLUBLES



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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FISH SOLUBLES

Nonmetallic Materials	°F	°C
Borosilicate Glass	R	
Carbon		
Carbon-Graphite Resin Impregnated		
Ceramics		
Coatings		
Acrylic		
Asphalt		
Chlorinated Rubber		
Coal Tar		
Coal Tar Epoxy		
Epoxy General Purpose		
Epoxy Chemical Resistant		
Epoxy Polyamide		
Oil Base (Alkyd, Epoxy, Urethane)		
Phenolic		
Polyester		
Polyvinyl Chloride		
Silicones		
Urethanes		
Vinyls		
Water Base		
Zinc Rich		
Mortars		
Silicate		
Sodium Silicate		
Potassium Silicate		
Silica		
Sulfur		
Furan Resin		
Polyester		
Epoxy		

°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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FISH SOLUBLES

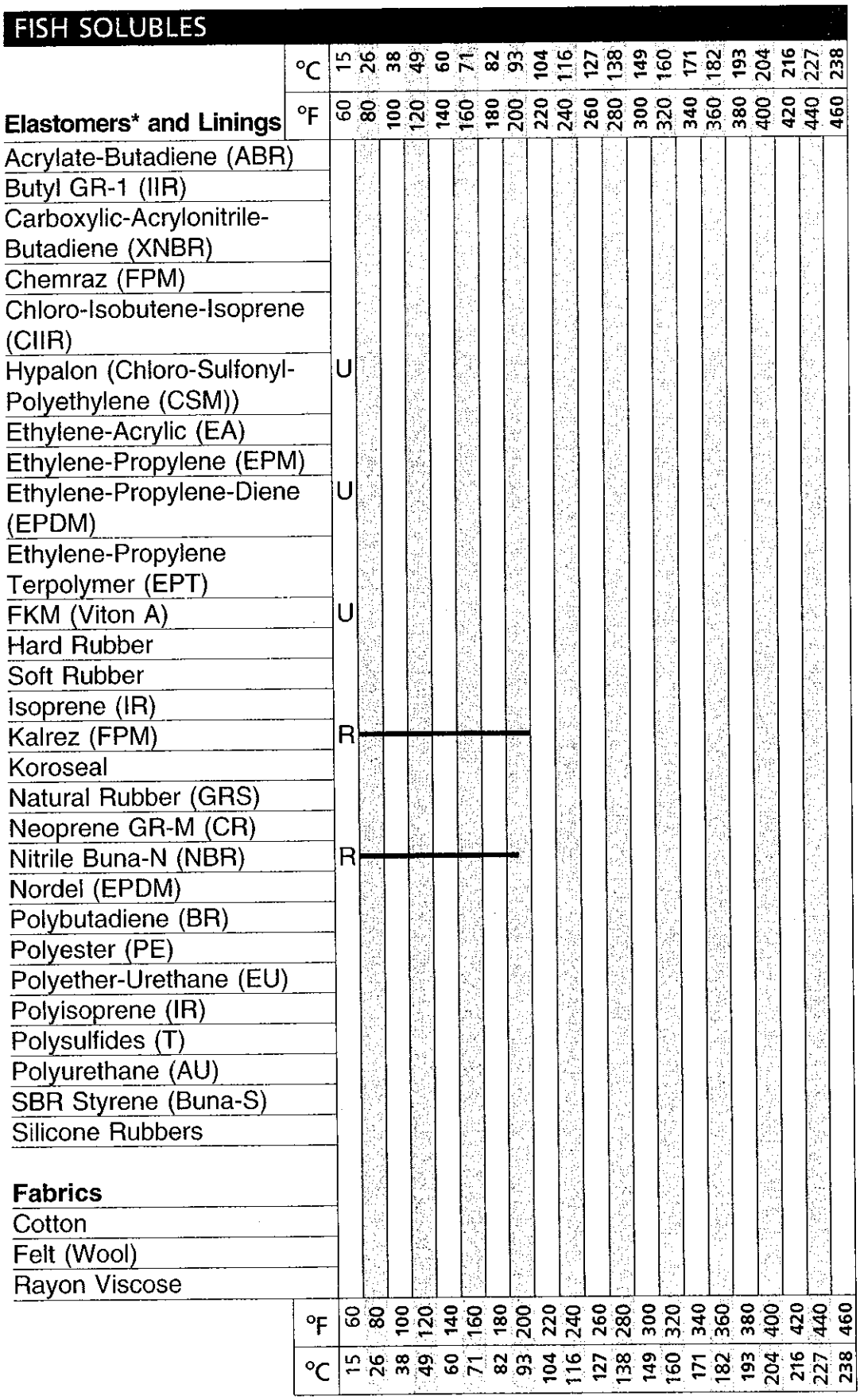
Plastics	°C	°F
ABS	R	
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)	R	
CPVC	R	
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)		
FEP	R	
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated		
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic		
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW	R	
Polyethylene UHMW	R	
Polymethylpentene		
Polypropylene (PP)	R	
Polystyrene		
Polysulfone		
Polyvinylidene Chloride	R	
PVC Type 1	R	
PVC Type 2	R	
PVDF (Kynar)	R	
Ryton		
TFE (Teflon)	R	
Vinyl Ester		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

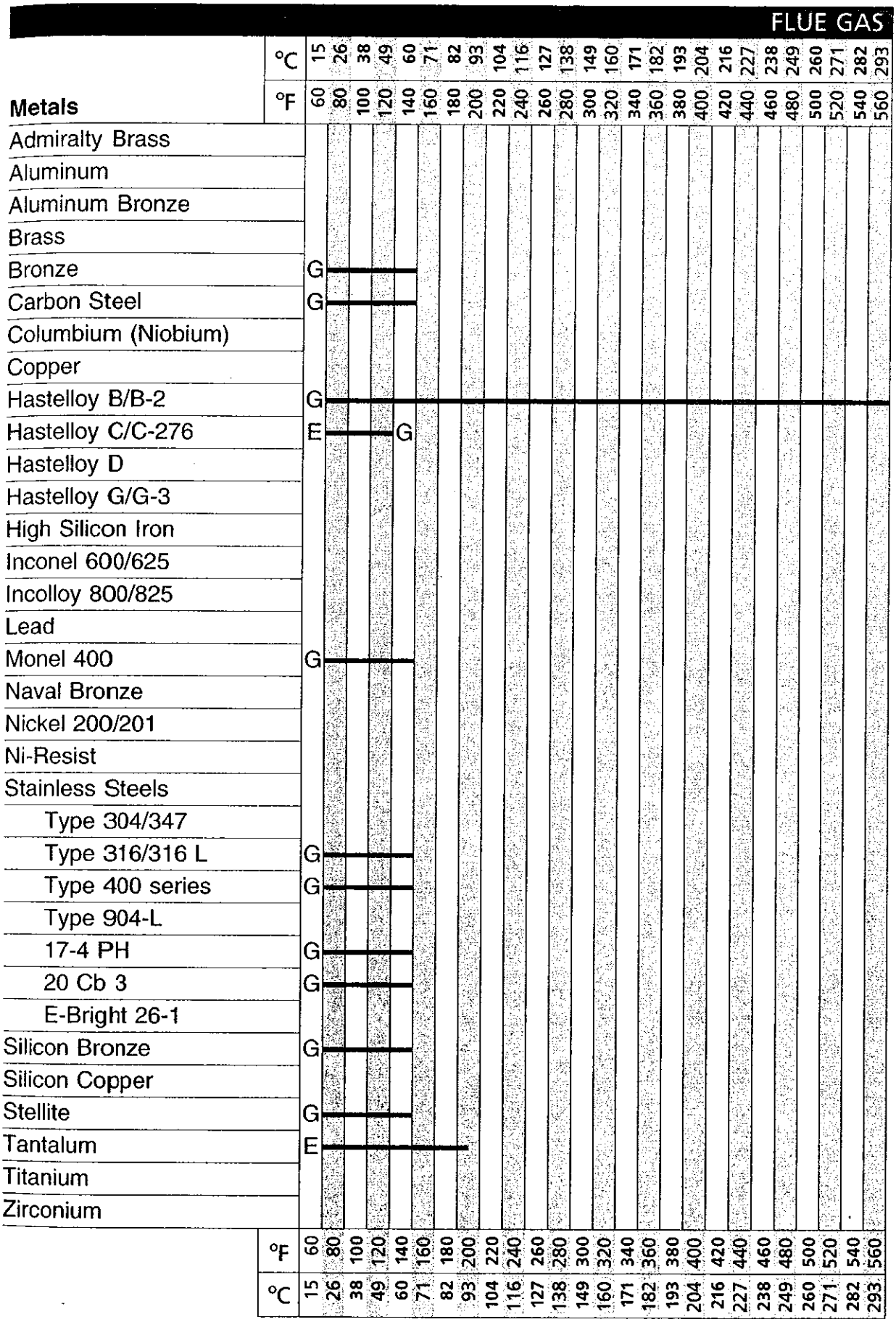
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FISH SOLUBLES



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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FLUE GAS

	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Nonmetallic Materials																						
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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FLUE GAS

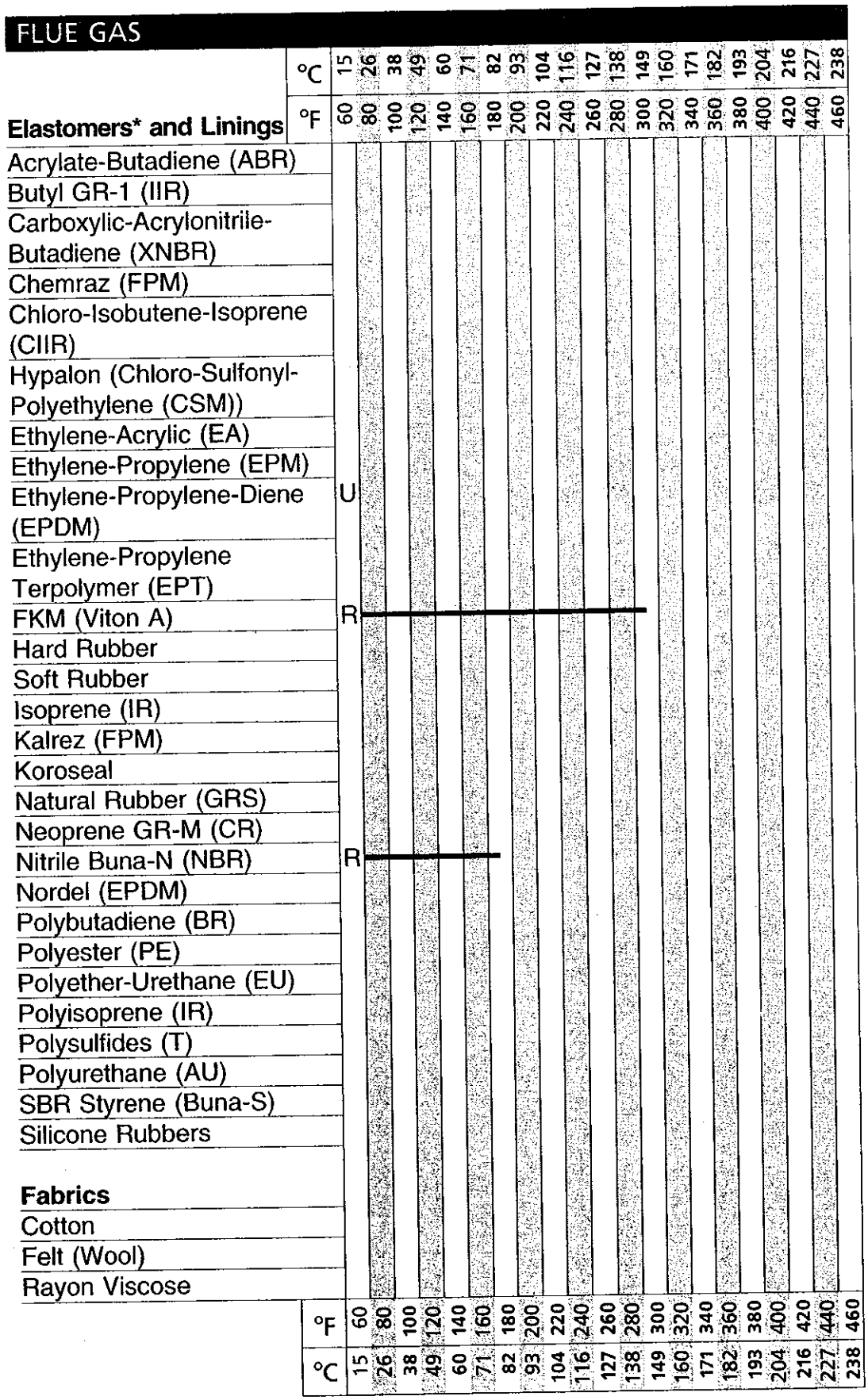
Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC		
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)		
FEP		
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	U	
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)		
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1		
PVC Type 2		
PVDF (Kynar)		
Ryton		
TFE (Teflon)	R	
Vinyl Ester	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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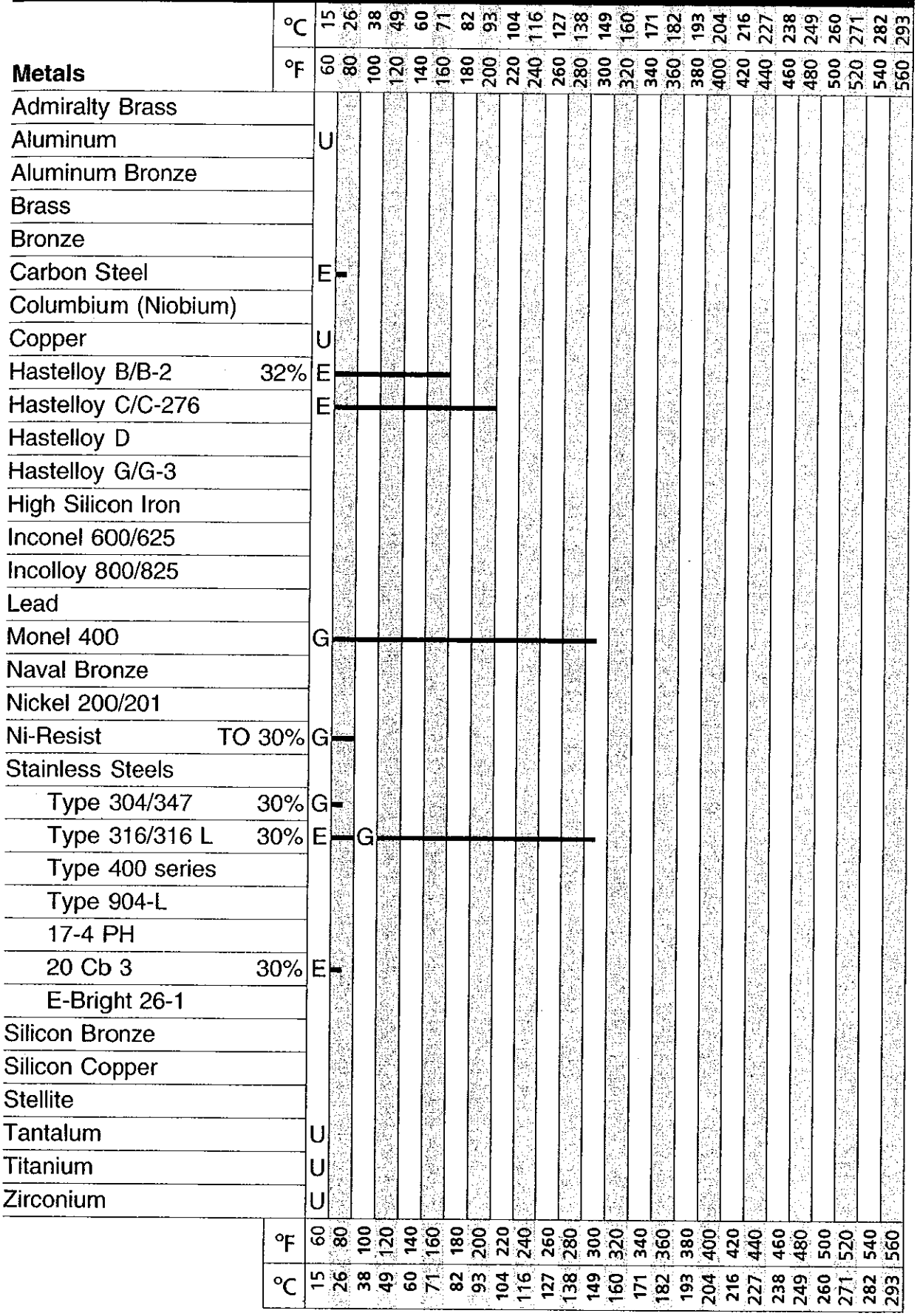
FLUE GAS



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

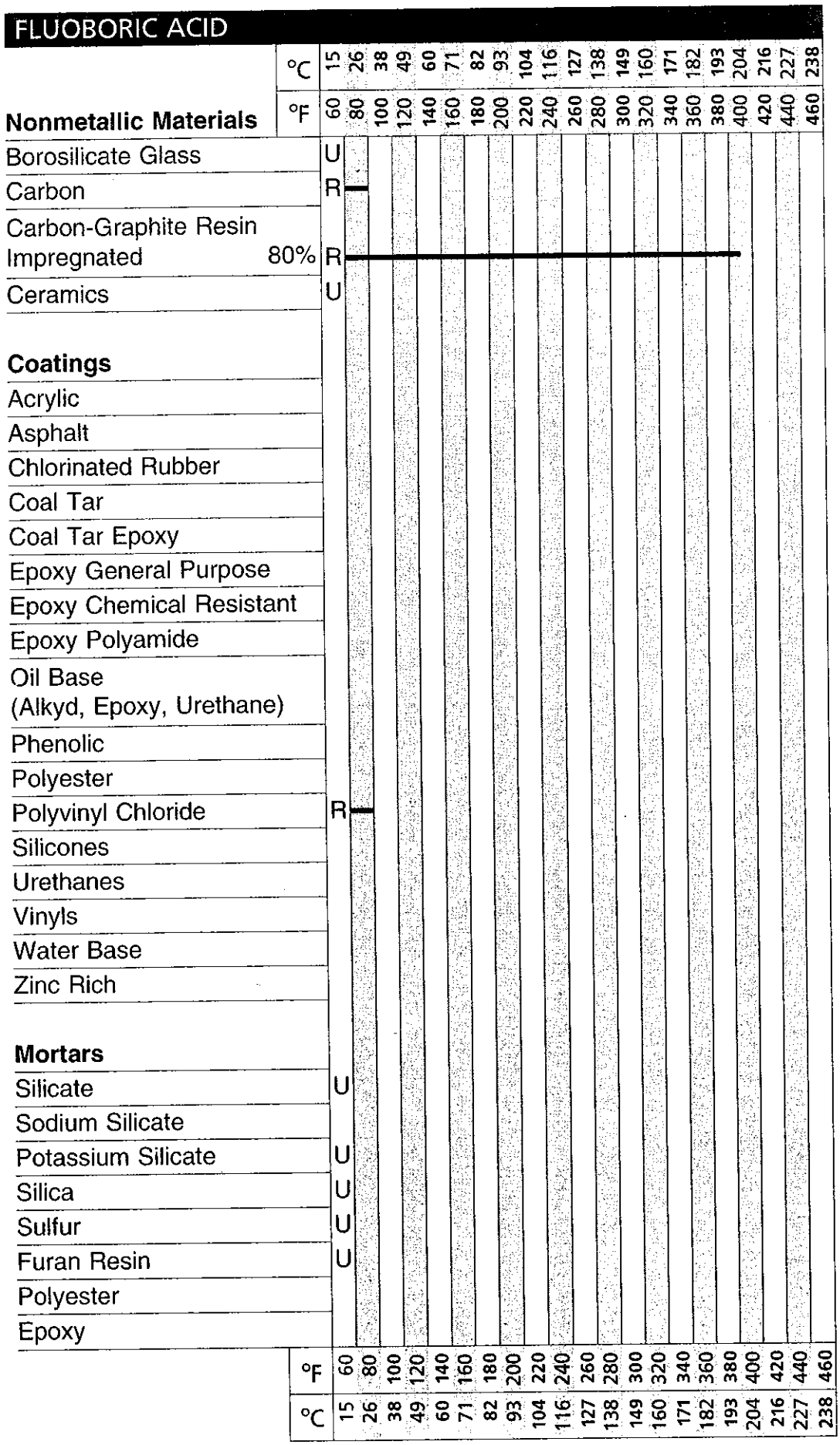
R = Resistant

U = Unsatisfactory

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FLUOBORIC ACID



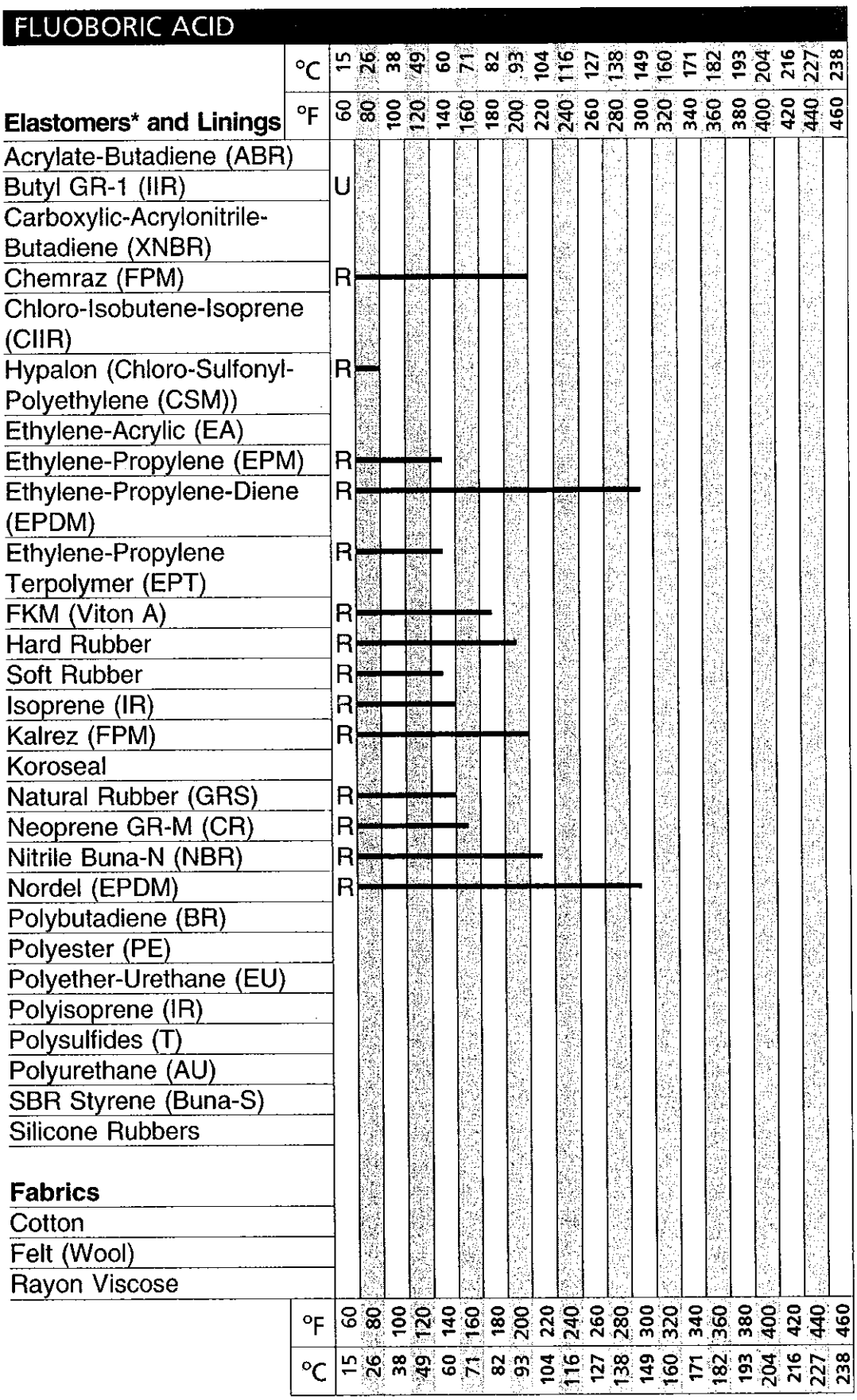
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FLUOBORIC ACID

Plastics		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS			R																				
Acetal																							
Acrylics			R																				
Asbestos Reinforced Epoxy																							
Asbestos Reinforced Phenolic																							
Chlorinated Polyether (Penton)			R																				
CPVC			R																				
E-CTFE (Halar)			R																				
Epoxy			U																				
ETFE (Tefzel)			R																				
FEP			R																				
Furan (Furfural Alcohol)			R																				
Noryl			U																				
Nylon 6			U																				
Nylon 11			U																				
Nylon 66			U																				
Phenolic																							
PFA (Teflon)																							
Polyamide-Imide																							
Polyesters																							
Bisphenol A–fumarate	10		R																				
Halogenated	10		R																				
Hydrogenated Bisphenol A –Bisphenol A	10		R																				
Isophthalic	10		R																				
Terephthalate (PET)			R																				
Polyetherimide (ULTEM)																							
Polyetheretherketone (PEEK)																							
Polyethersulfone (PES)																							
Polyethylene HMW			R																				
Polyethylene UHMW			R																				
Polymethylpentene																							
Polypropylene (PP)			R																				
Polystyrene																							
Polysulfone			R																				
Polyvinylidene Chloride			R																				
PVC Type 1			R																				
PVC Type 2			R																				
PVDF (Kynar)			R																				
Ryton (PPS)																							
TFE (Teflon)			R																				
Vinyl Ester	ALL		R																				
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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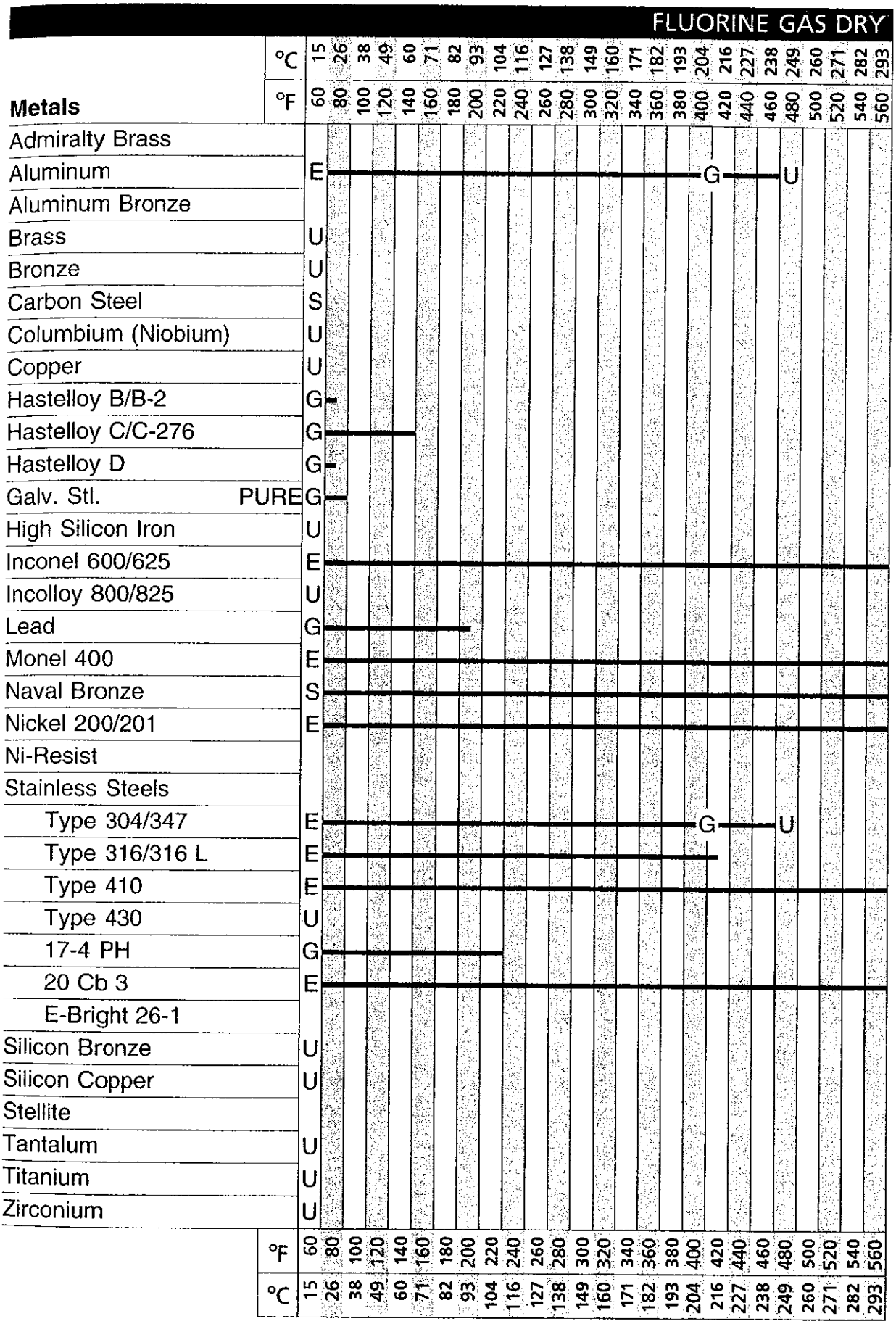
FLUOBORIC ACID



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

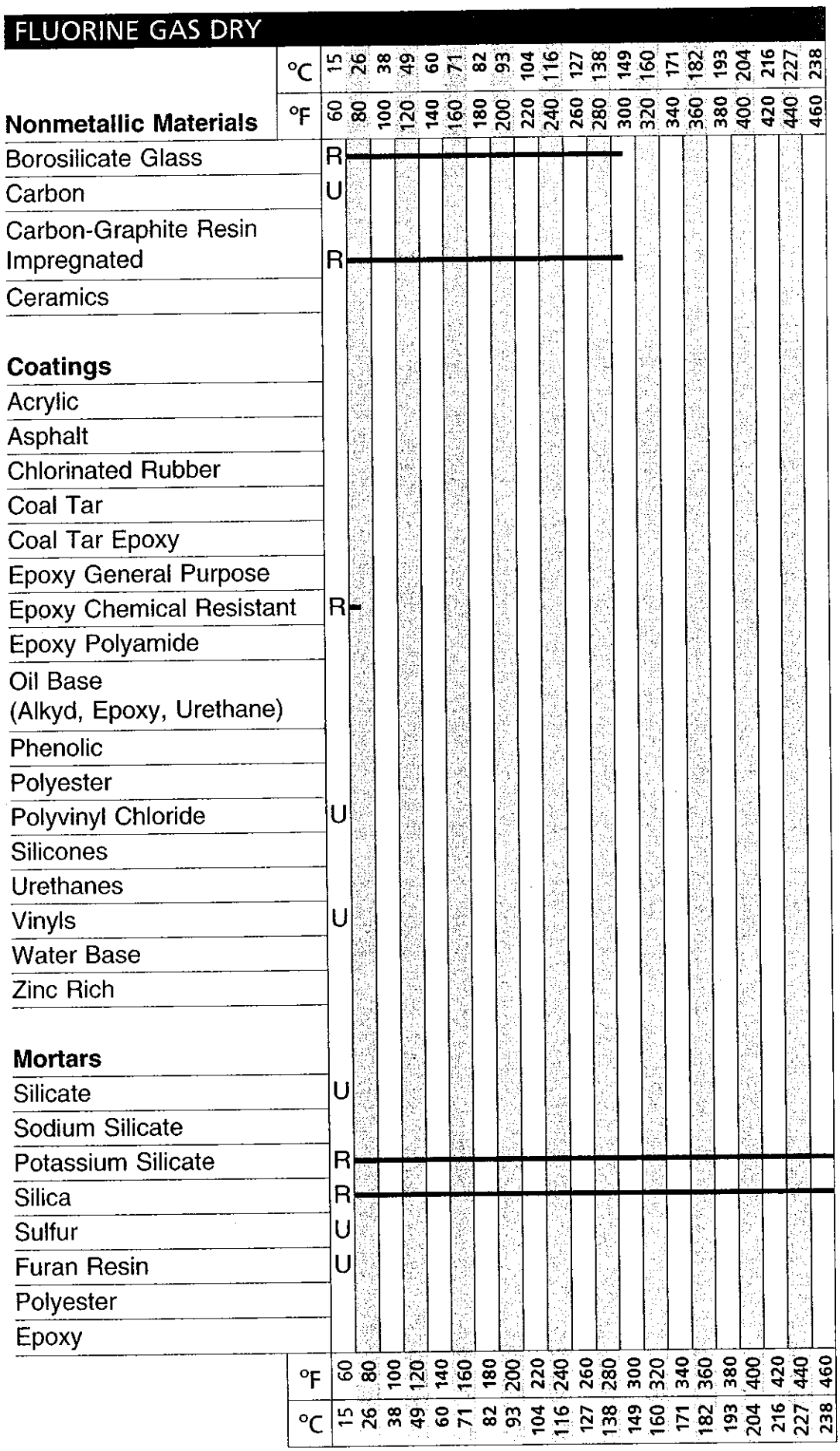
R = Resistant

U = Unsatisfactory

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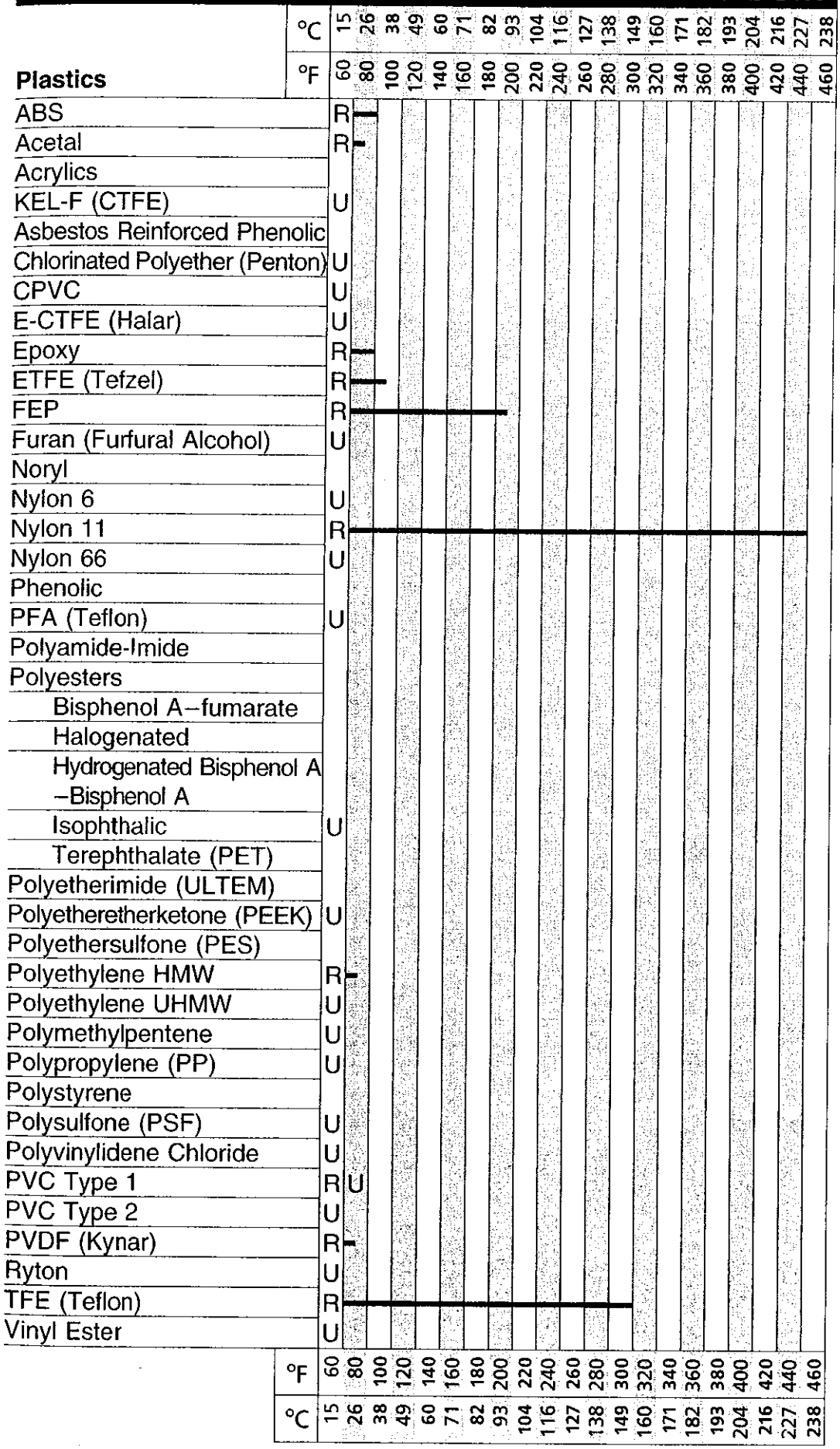
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FLUORINE GAS DRY



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FLUORINE GAS DRY



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FLUORINE GAS DRY

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)	U																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)	U																					
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	R																					
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)																						
Ethylene-Propylene Terpolymer (EPT)	U																					
FKM (Viton A)	U																					
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)	U																					
Kalrez (FPM)	U																					
Koroseal																						
Natural Rubber (GRS)	U																					
Neoprene GR-M (CR)	U																					
Nitrile Buna-N (NBR)	U																					
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)	U																					
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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Metals	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
Admiralty Brass																											
Aluminum		U																									
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel		U																									
Columbium (Niobium)		U																									
Copper		U																									
Hastelloy B/B-2																											
Hastelloy C/C-276		E																									
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron		U																									
Inconel 600/625		G																									
Incolloy 800/825		U																									
Lead																											
Monel 400		U																									
Naval Bronze		U																									
Nickel 200/201		G																									
Type 317/317 L		U																									
Stainless Steels																											
Type 304/347		U																									
Type 316/316 L		U																									
Type 410		U																									
Type 430		U																									
17-4 PH																											
20 Cb 3		U																									
E-Bright 26-1																											
Silicon Bronze		U																									
Silicon Copper		U																									
Stellite																											
Tantalum		U																									
Titanium		U																									
Zirconium		U																									
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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FLUORINE GAS MOIST

Nonmetallic Materials	°C 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238
	°F 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460
Borosilicate Glass	U
Carbon	
Carbon-Graphite Resin Impregnated	U
Ceramics	
Coatings	
Acrylic	
Asphalt	
Chlorinated Rubber	
Coal Tar	
Coal Tar Epoxy	
Epoxy General Purpose	
Epoxy Chemical Resistant	
Epoxy Polyamide	
Oil Base (Alkyd, Epoxy, Urethane)	
Phenolic	
Polyester	
Polyvinyl Chloride	U
Silicones	
Urethanes	
Vinyls	U
Water Base	
Zinc Rich	
Mortars	
Silicate	U
Sodium Silicate	
Potassium Silicate	
Silica	U
Sulfur	U
Furan Resin	U
Polyester	
Epoxy	
	°F 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460
	°C 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

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FLUORINE GAS MOIST

Plastics	°C	°F
ABS		
Acetal		
Acrylics		
KEL-F (CTFE)	R	
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)	U	
CPVC	U	
E-CTFE (Halar)	R	
Epoxy		
ETFE (Tefzel)	R	
FEP	U	
Furan (Furfural Alcohol)	U	
Noryl		
Nylon 6	U	
Nylon 11	U	
Nylon 66	U	
Phenolic		
PFA (Teflon)	U	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated		
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	U	
Terephthalate (PET)	R	
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)	U	
Polyethersulfone (PES)		
Polyethylene HMW	R	
Polyethylene UHMW	U	
Polymethylpentene	U	
Polypropylene (PP)	U	
Polystyrene		
Polysulfone (PSF)	U	
Polyvinylidene Chloride	U	
PVC Type 1	U	
PVC Type 2	U	
PVDF (Kynar)	R	
Ryton		
TFE (Teflon)	R	
Vinyl Ester	U	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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FLUORINE GAS MOIST

Elastomers* and Linings	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)	U																				
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																					
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)	R																				
Ethylene-Propylene Terpolymer (EPT)	R																				
FKM (Viton A)	U																				
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)																					
Kalrez (FPM)	U																				
Koroseal																					
Natural Rubber (GRS)																					
Neoprene GR-M (CR)	U																				
Nitrile Buna-N (NBR)	U																				
Nordel (EPDM)																					
Polybutadiene (BR)																					
Polyester (PE)																					
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)	U																				
Silicone Rubbers																					
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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FLUOSILICIC ACID 50%

Metals	
Admiralty Brass	
Aluminum	U
Aluminum Bronze	
Brass	
Bronze	
Carbon Steel	U
Columbium (Niobium)	
Copper	U
Hastelloy B/B-2	G
Hastelloy C/C-276	G
Hastelloy D	
Hastelloy G/G-3 12%	E
High Silicon Iron	
Inconel 600/625	
Incolloy 800/825	
Lead	
Monel 400	G
Naval Bronze	
Nickel 200/201	
Ni-Resist	
Stainless Steels	
Type 304/347	
Type 316/316 L	G
Type 400 series	
Type 904-L	
17-4 PH	
20 Cb 3	G
E-Bright 26-1	
Silicon Bronze	
Silicon Copper	
Stellite	
Tantalum	
Titanium	U
Zirconium	U

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

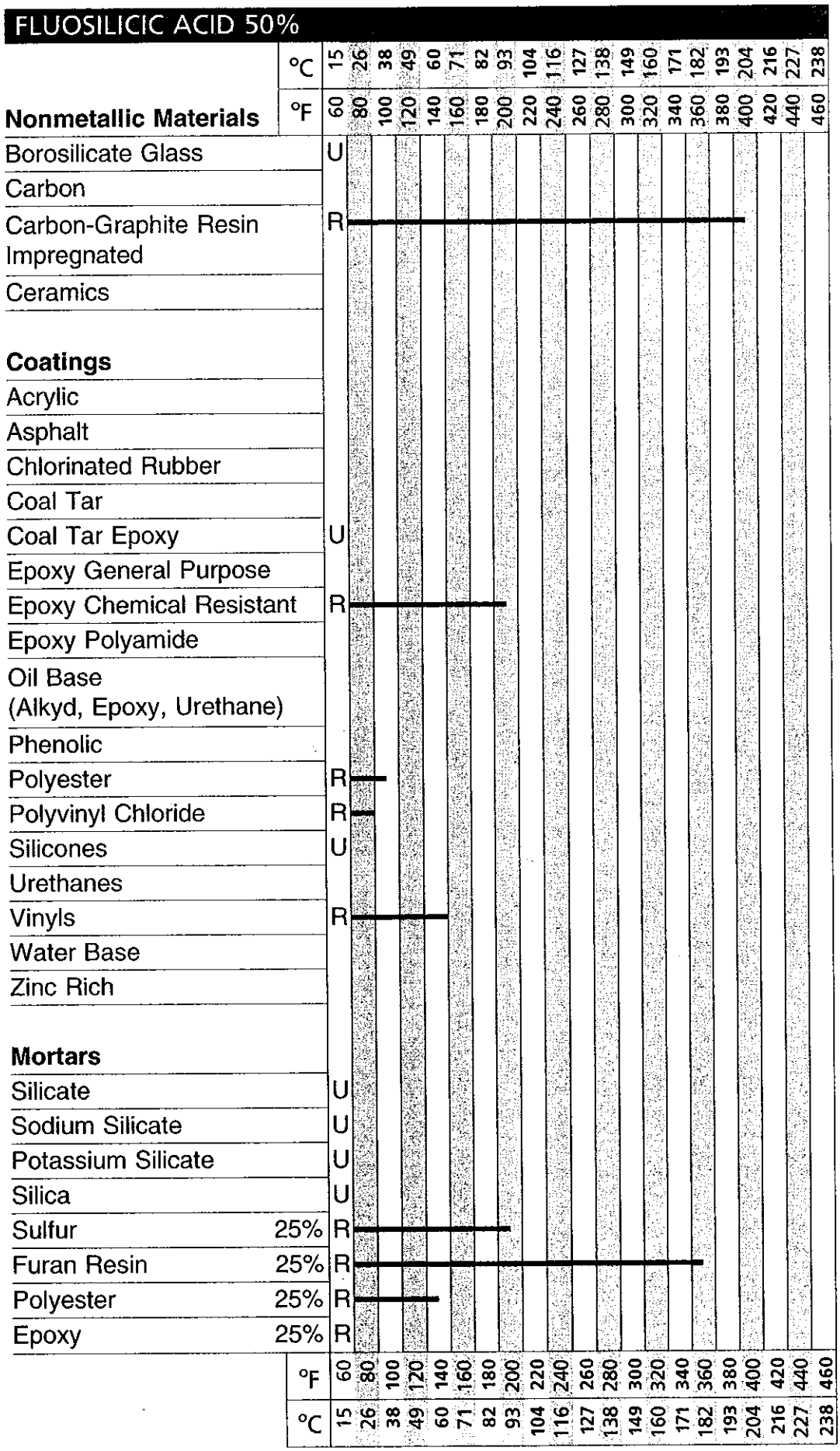
R = Resistant

U = Unsatisfactory

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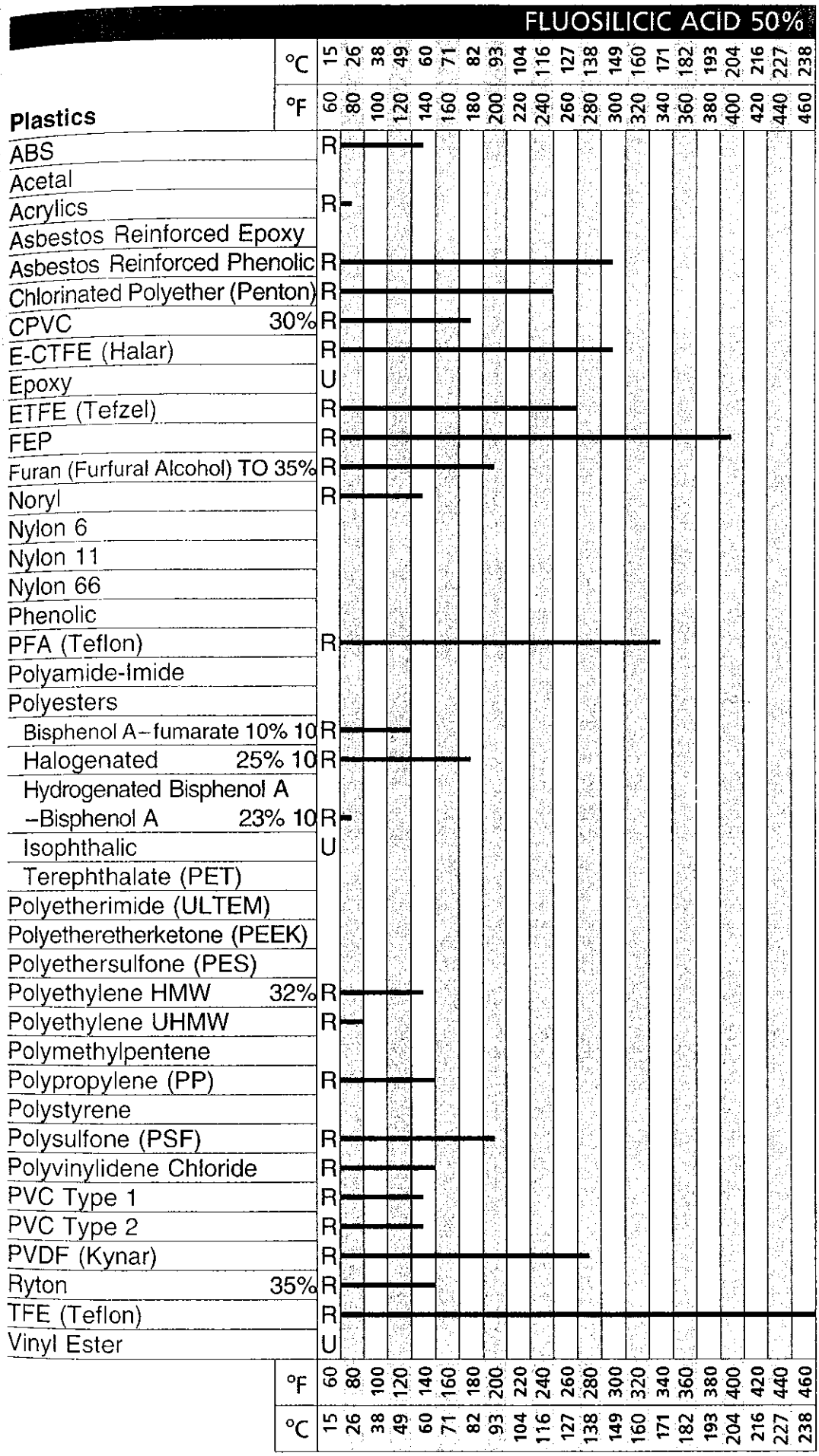
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FLUOSILICIC ACID 50%



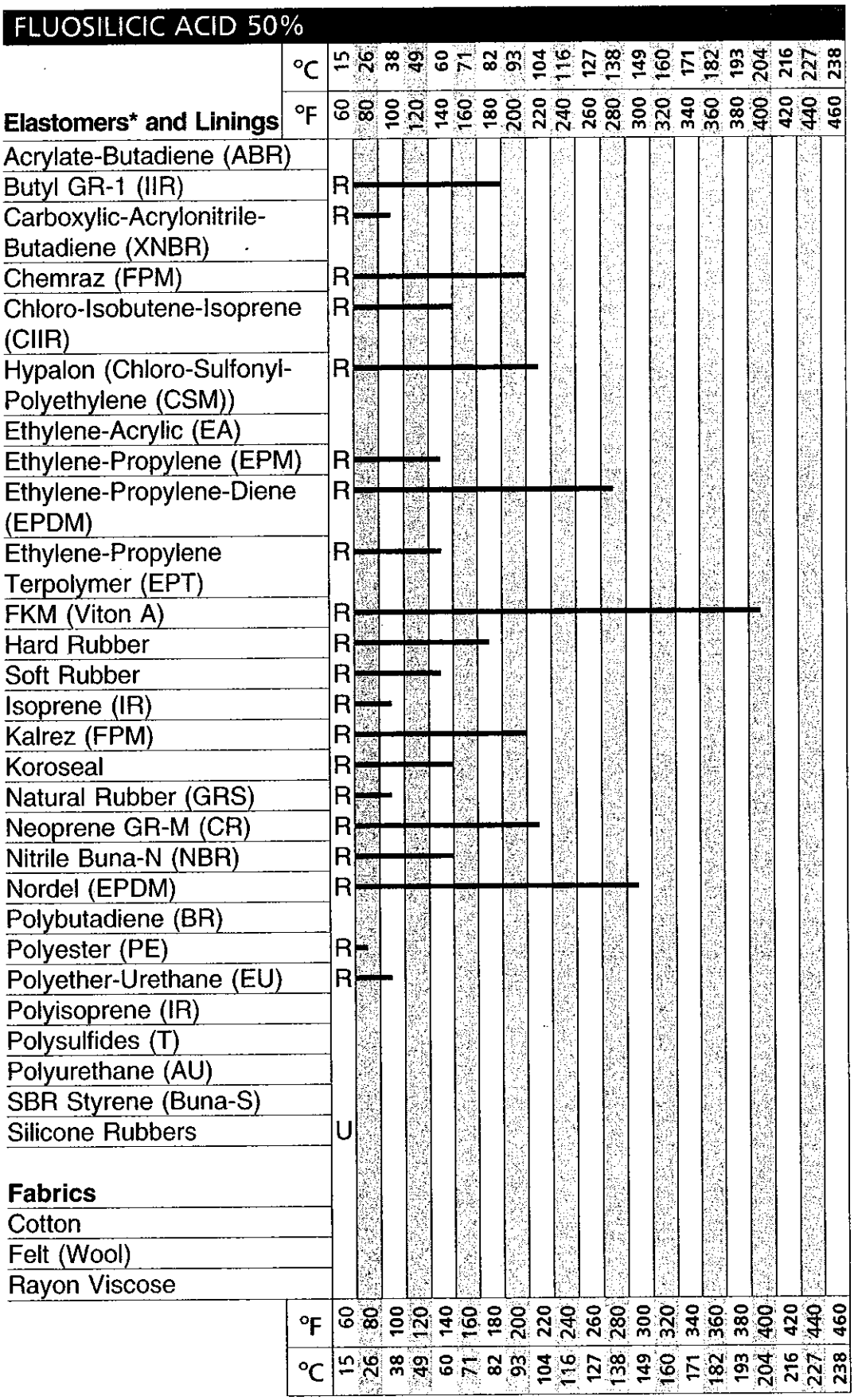
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FLUOSILICIC ACID 50%



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FLUOSILICIC ACID 50%



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FLUOSILICIC ACID

Metals			°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
			°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																													
Aluminum				U																									
Aluminum Bronze																													
Brass	Air Free			G																									
Bronze				G																									
Carbon Steel				U																									
Columbium (Niobium)																													
Copper				G																									
Hastelloy B/B-2		2		G																									
Hastelloy C/C-276		2		G																									
Hastelloy D				G																									
Hastelloy G/G-3	12%			E																									
High Silicon Iron				U																									
Inconel 600/625				E																									
Incolloy 800/825																													
Lead				G																									
Monel 400		2		E																									
Naval Bronze	<10%			G																									
Nickel 200/201				E																									
Ni-Resist																													
Stainless Steels																													
Type 304/347				U																									
Type 316/316 L		1, 3		G																									
Type 400 series																													
Type 904-L																													
17-4 PH																													
20 Cb 3		2		G																									
E-Bright 26-1				U																									
Silicon Bronze																													
Silicon Copper																													
Stellite																													
Tantalum				U																									
Titanium				U																									
Zirconium				U																									
			°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
			°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

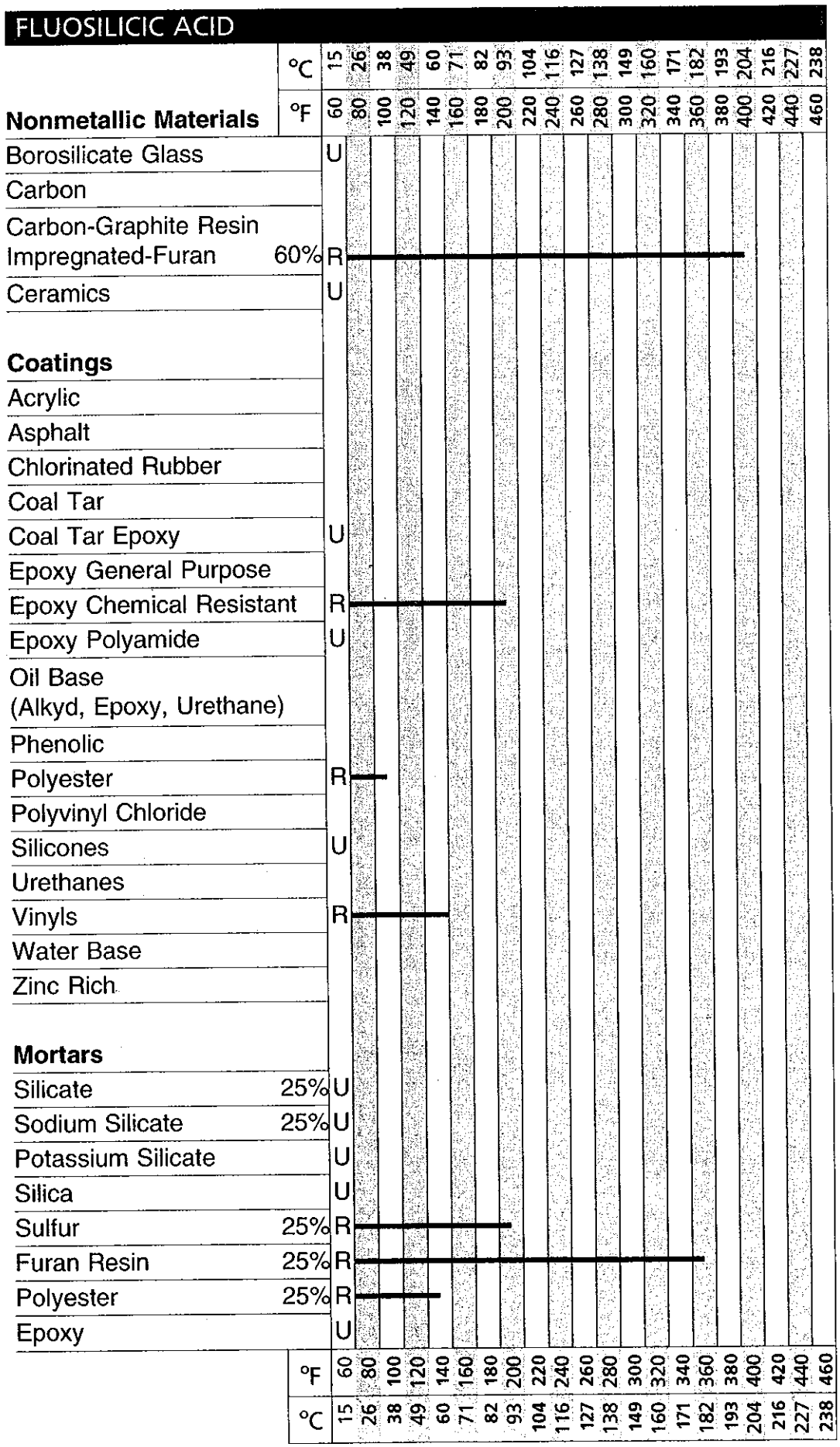
R = Resistant

U = Unsatisfactory

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FLUOSILICIC ACID



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FLUOSILICIC ACID

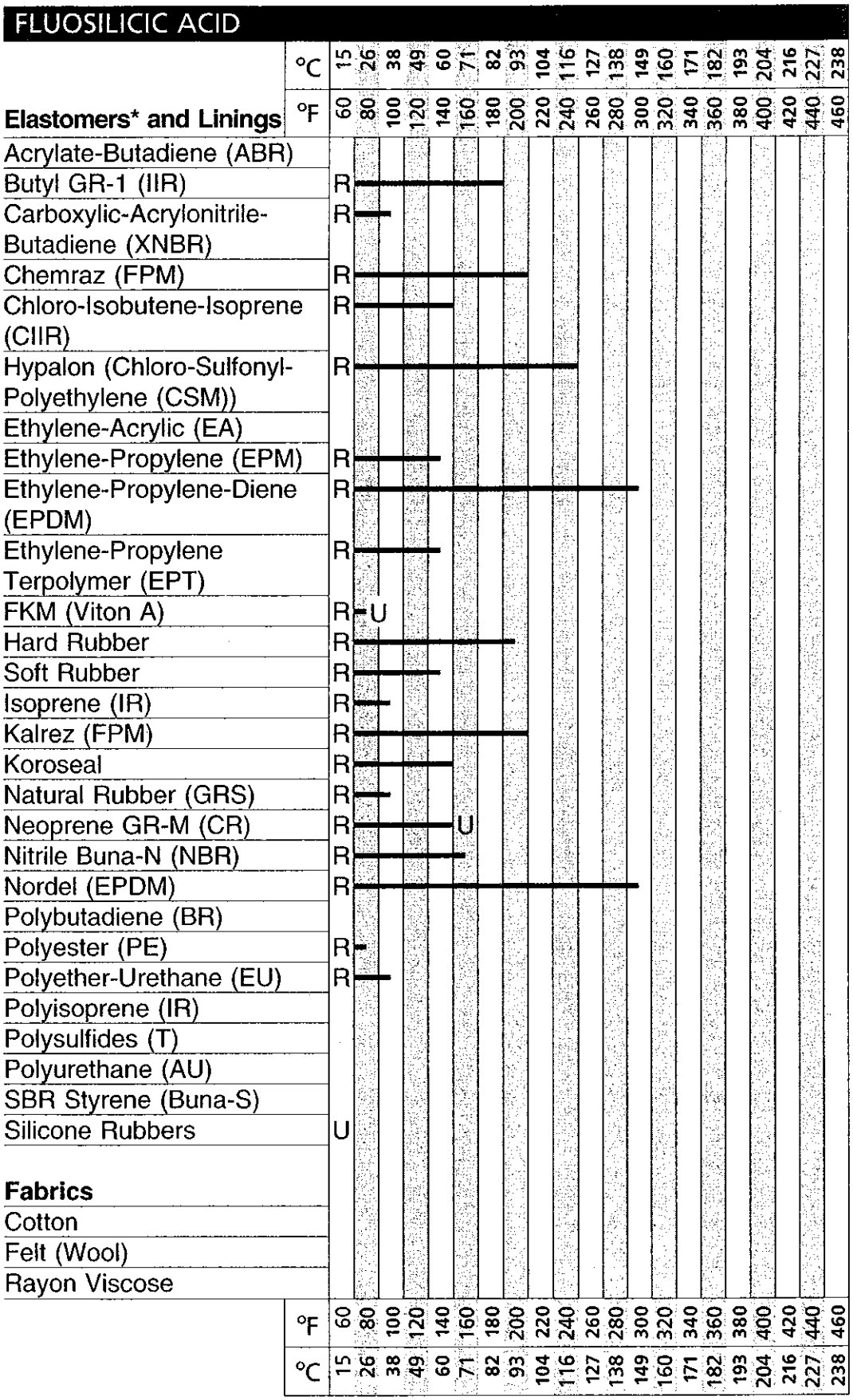
Plastics		
ABS		R
Acetal		
Acrylics		R
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		R
Chlorinated Polyether (Penton)		R
CPVC	25%	R
E-CTFE (Halar)		R
Epoxy	10%	R
ETFE (Tefzel)		R
FEP		R
Furan (Furfural Alcohol)		R
Noryl		R
Nylon 6		U
Nylon 11		U
Nylon 66		U
Phenolic		
PFA (Teflon)		R
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	10% 10	R
Halogenated	25% 10	R
Hydrogenated Bisphenol A –Bisphenol A	23% 10	R
Isophthalic	10	R
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW	32%	R
Polyethylene UHMW		R
Polymethylpentene		
Polypropylene (PP)		R
Polystyrene		
Polysulfone (PSF)		R
Polyvinylidene Chloride		R
PVC Type 1		R
PVC Type 2		R
PVDF (Kynar)		R
Ryton	35%	R
TFE (Teflon)		R
Vinyl Ester	30% 10	R

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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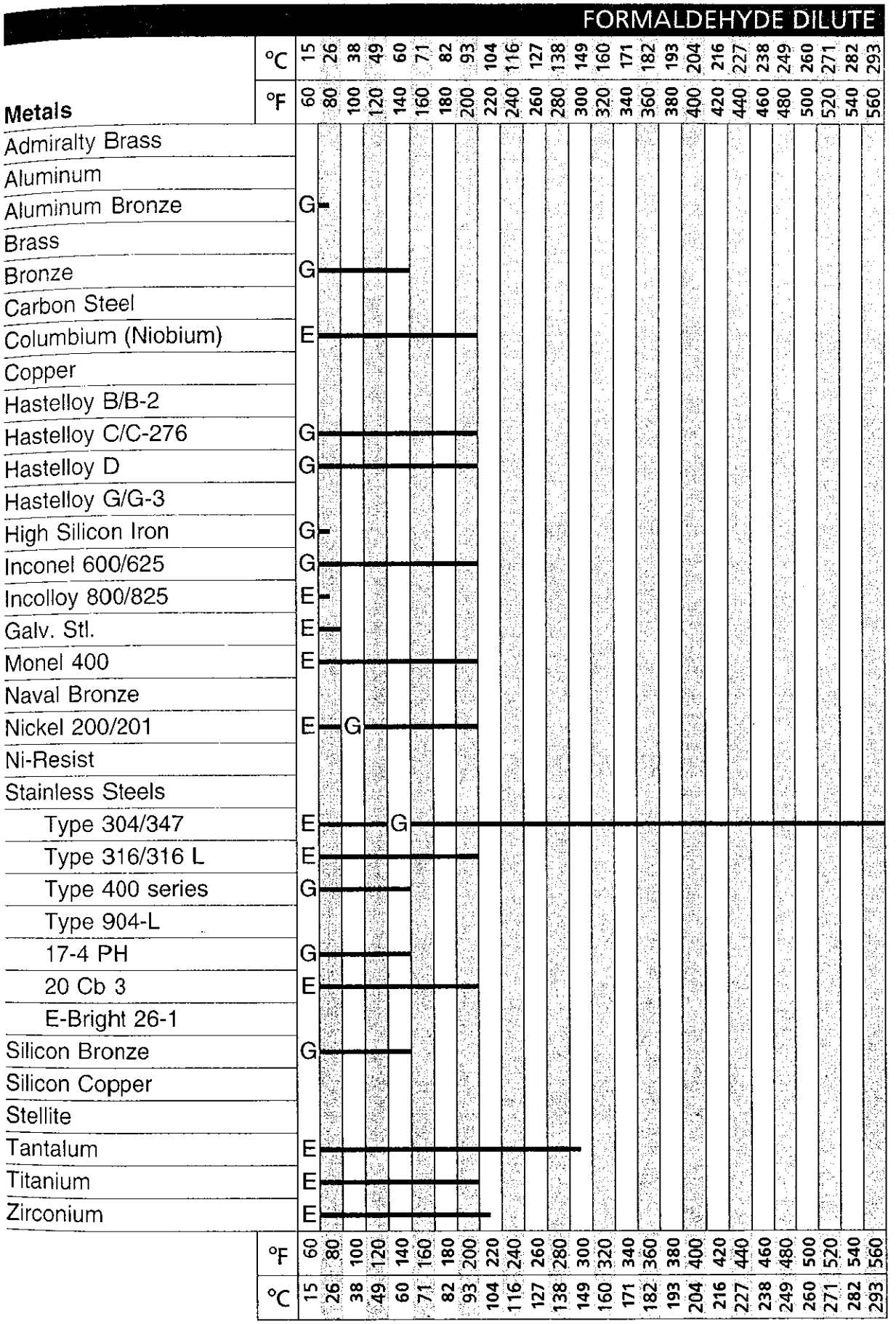
FLUOSILICIC ACID



*See also Nylon 11 under PLASTICS

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FORMALDEHYDE DILUTE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

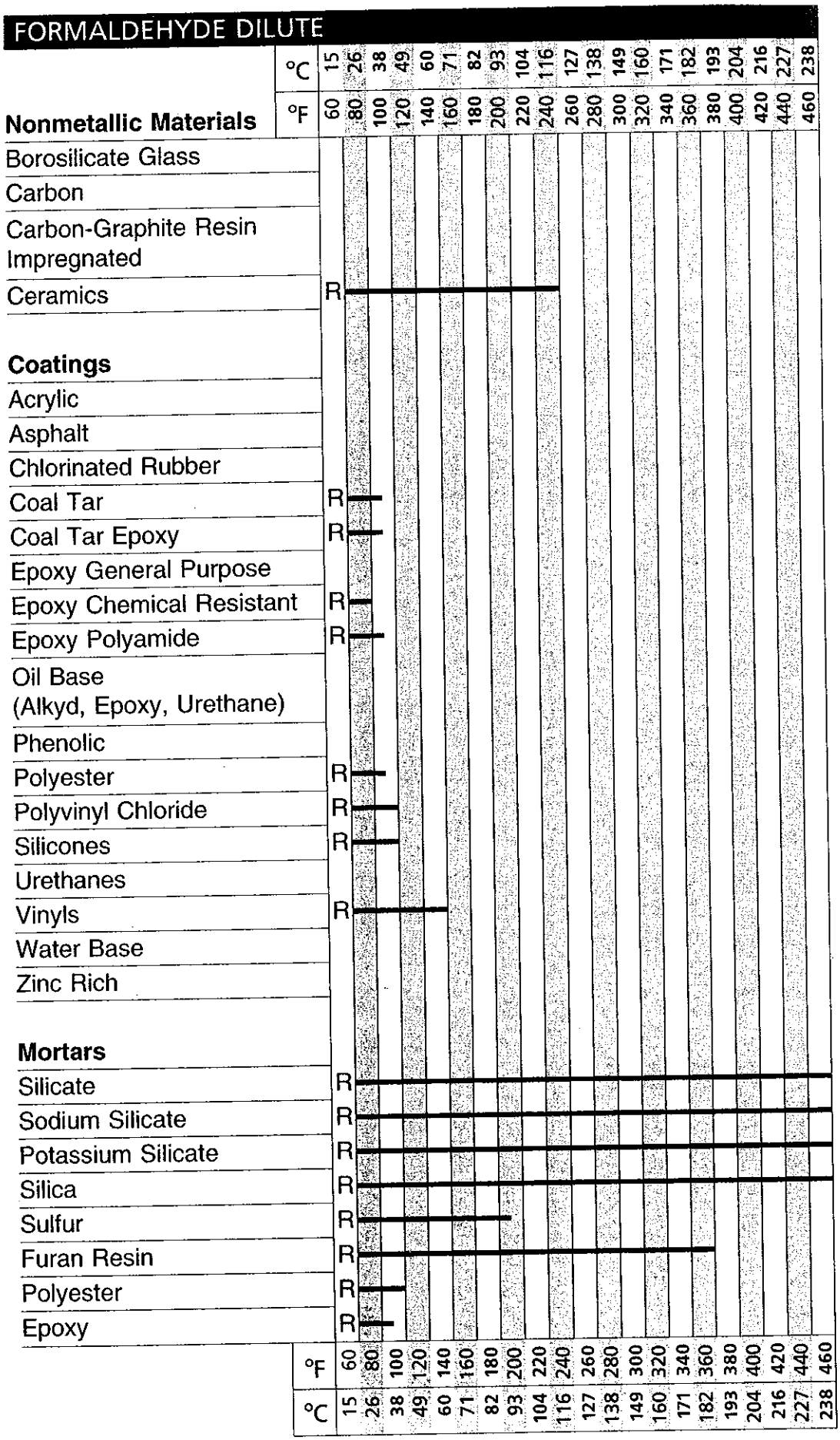
R = Resistant

U = Unsatisfactory

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FORMALDEHYDE DILUTE



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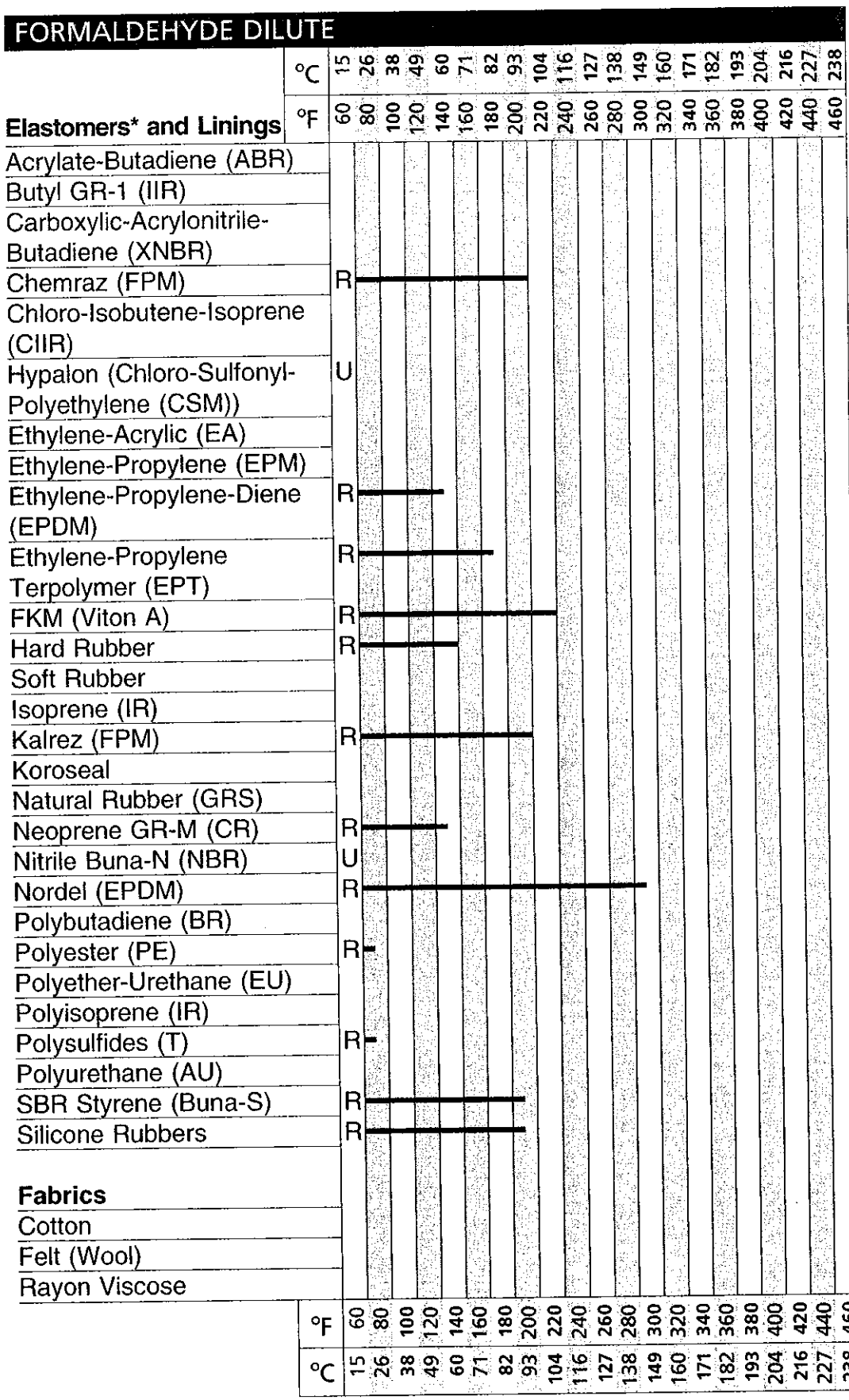
Plastics	°C	°F
ABS	R	
Acetal	R	
Acrylics	R	
Asbestos Reinforced Epoxy	R	
Asbestos Reinforced Phenolic	R	
Chlorinated Polyether (Penton)	R	
CPVC	R	
E-CTFE (Halar)	R	
Epoxy	R	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)	R	
Noryl		
Nylon 6	R	
Nylon 11		
Nylon 66	R	
Phenolic	R	
PFA (Teflon)	R	
Polyamide-Imide	R	
Polyesters		
Bisphenol A–fumarate	R	
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A	R	
Isophthalic	R	
Terephthalate (PET)	R	
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW	R	
Polyethylene UHMW	R	
Polymethylpentene	R	
Polypropylene (PP)	R	
Polystyrene		
Polysulfone (PSF)	R	
Polyvinylidene Chloride	R	
PVC Type 1	R	
PVC Type 2	R	
PVDF (Kynar)	R	
Ryton	R	
TFE (Teflon)	R	
Vinyl Ester	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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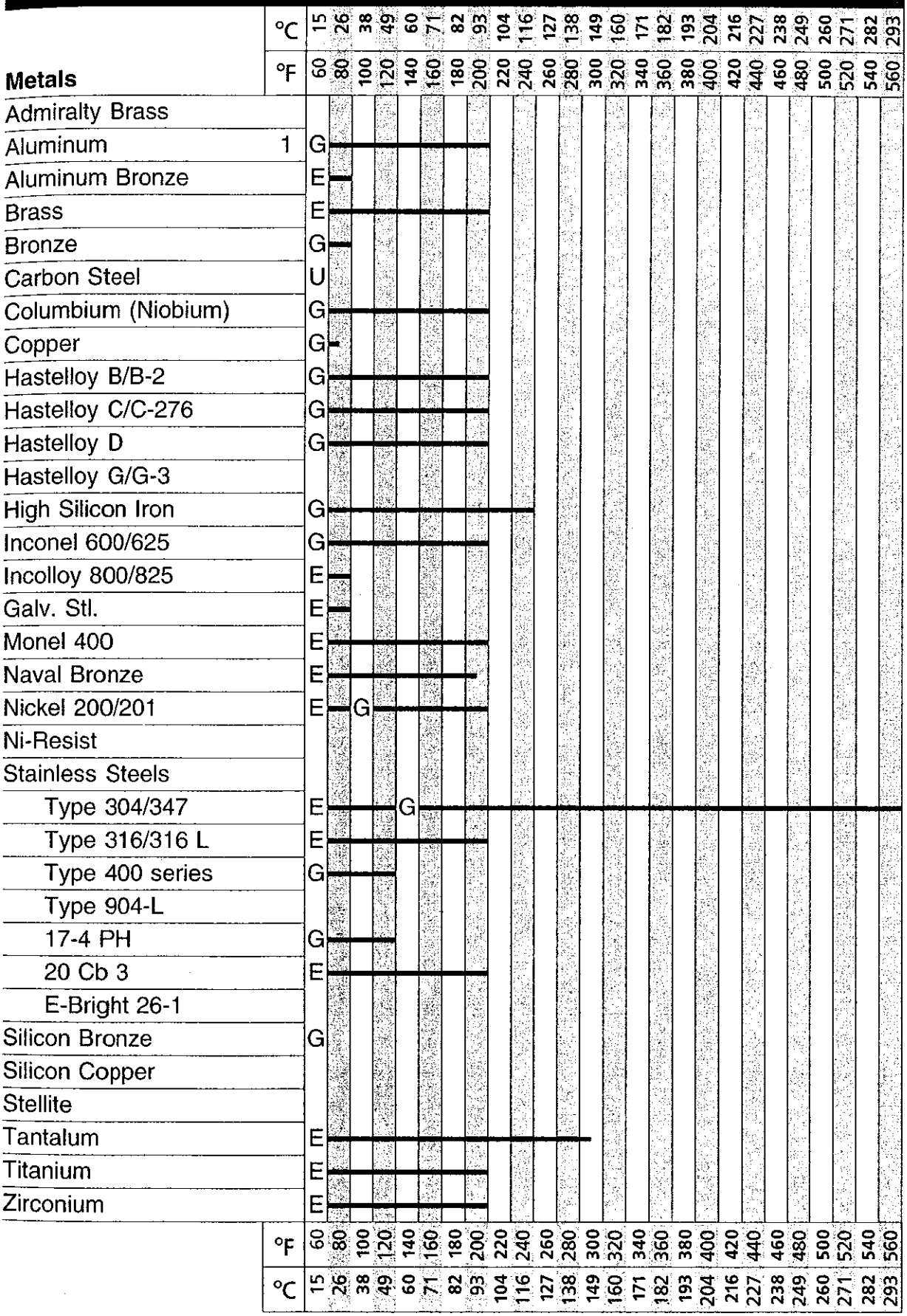
FORMALDEHYDE DILUTE



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FORMALDEHYDE 35% SOLUTION



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

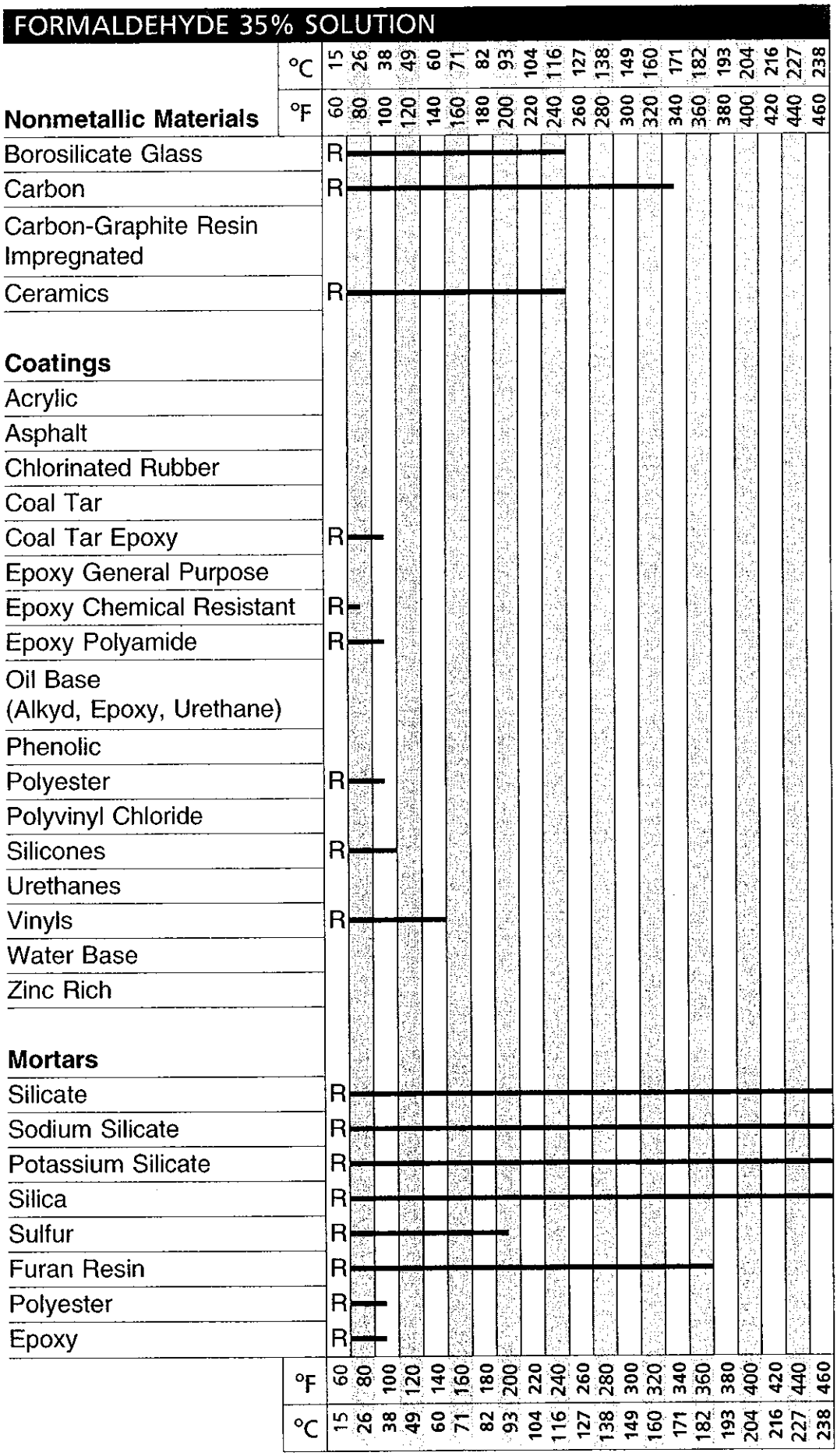
R = Resistant

U = Unsatisfactory

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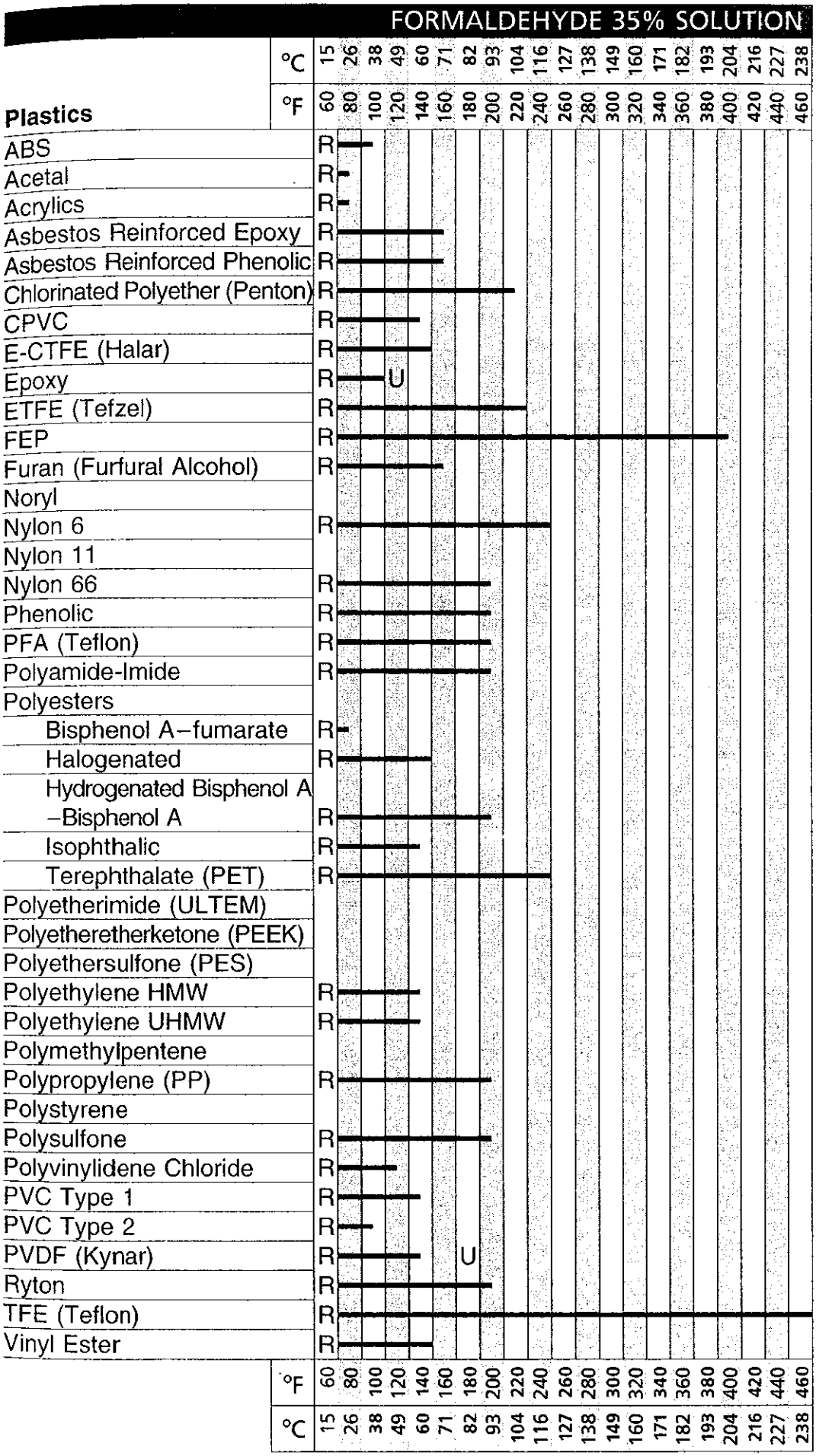
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FORMALDEHYDE 35% SOLUTION



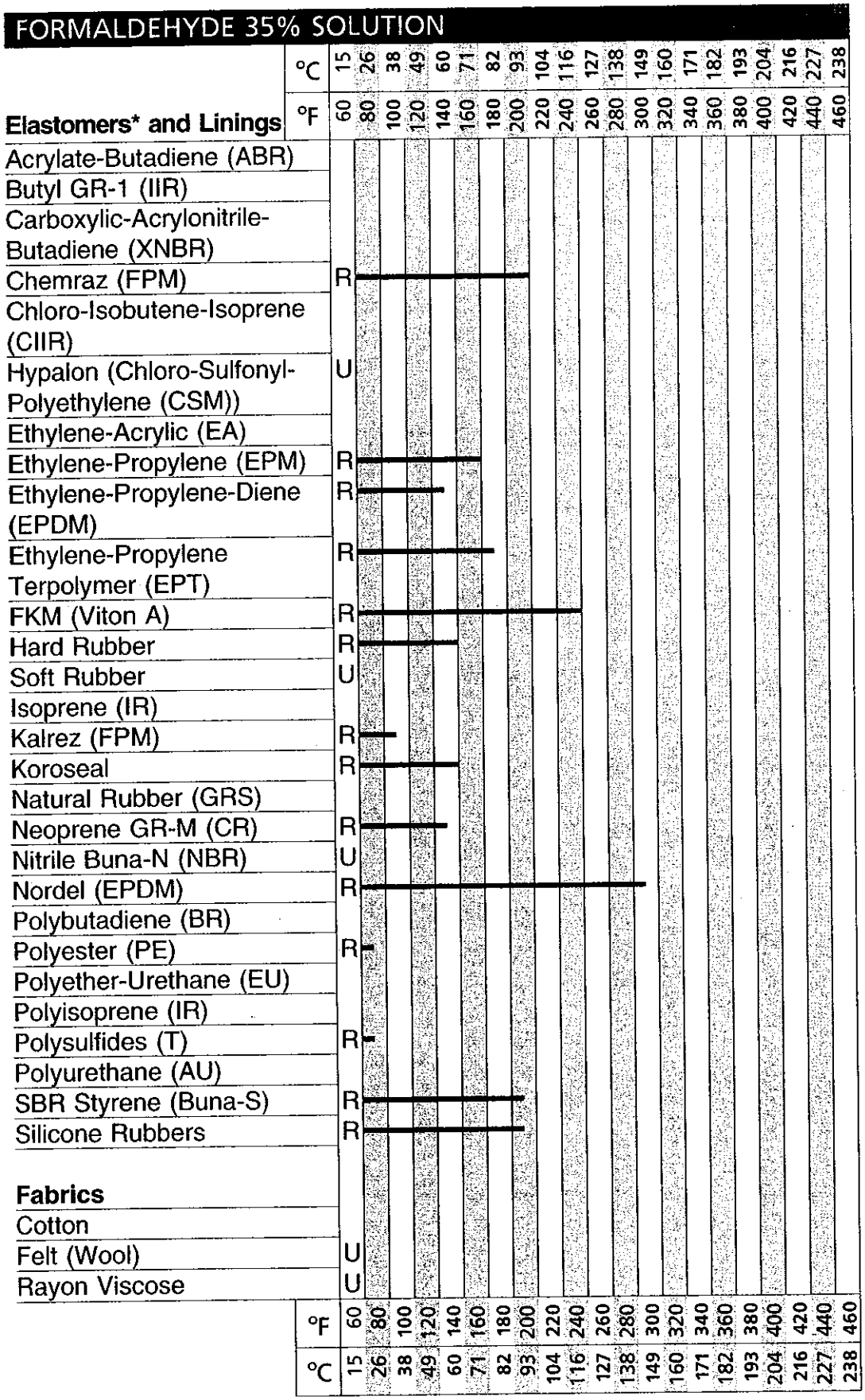
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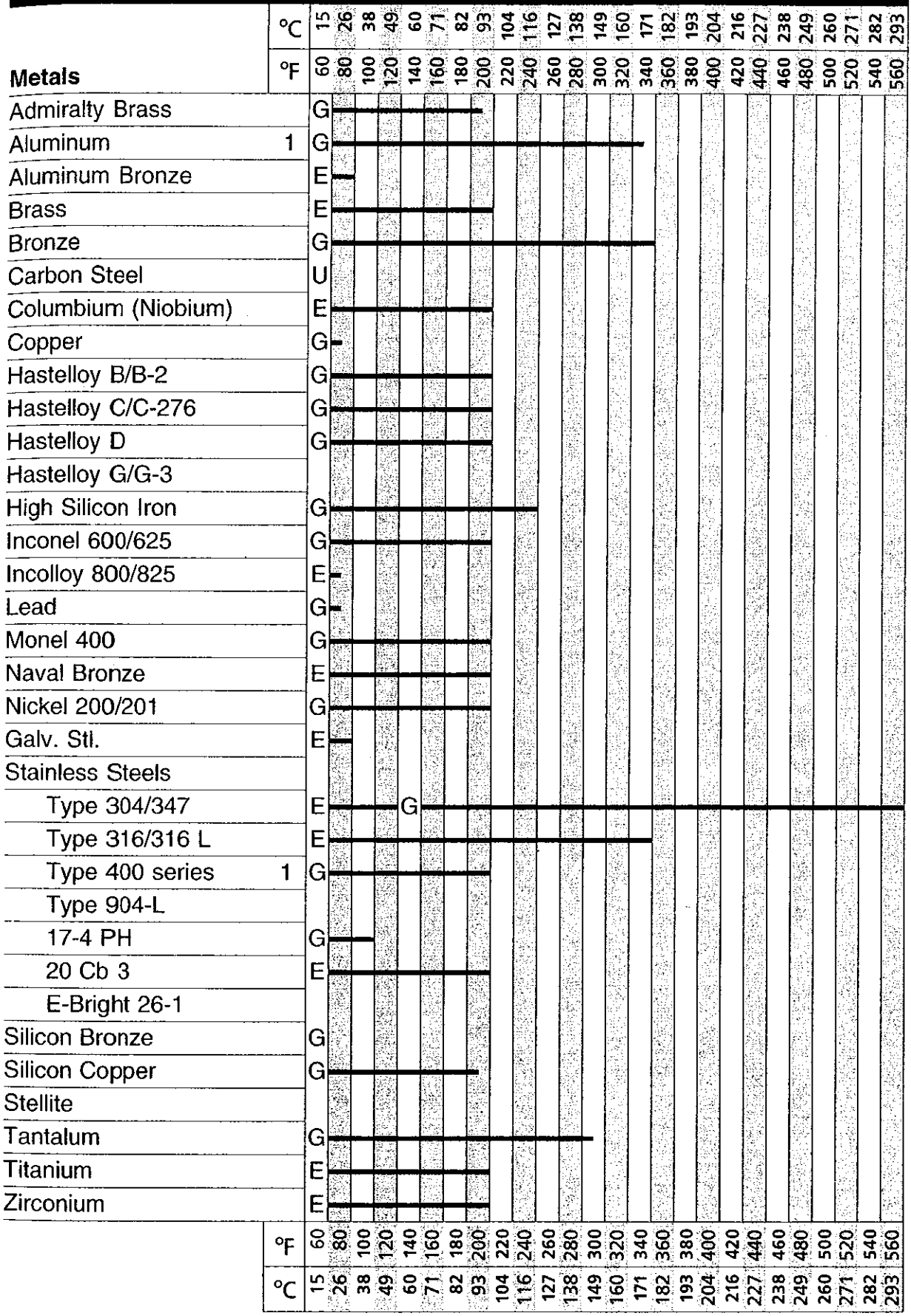
FORMALDEHYDE 35% SOLUTION



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FORMALDEHYDE 37% SOLUTION



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

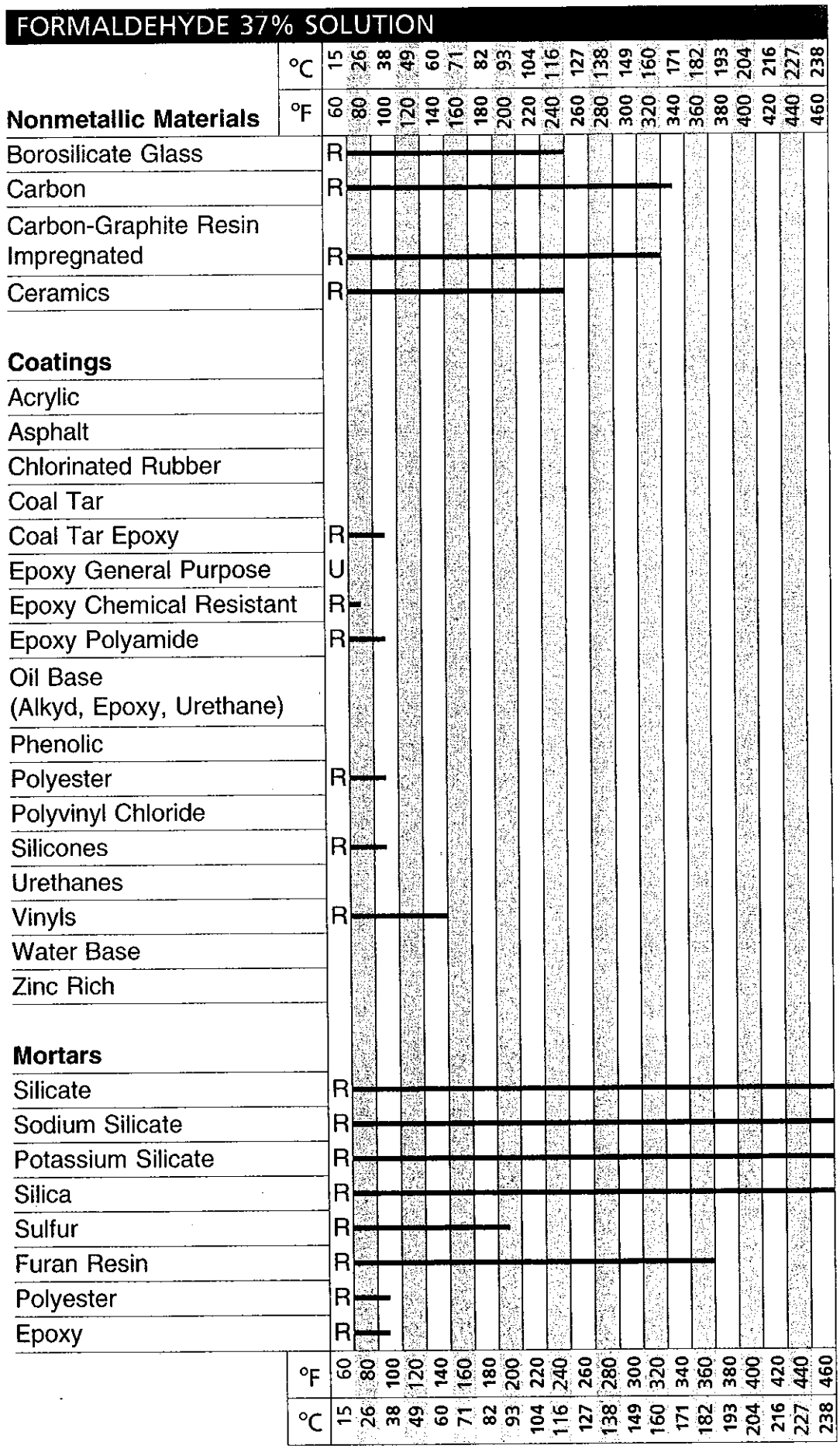
R = Resistant

U = Unsatisfactory

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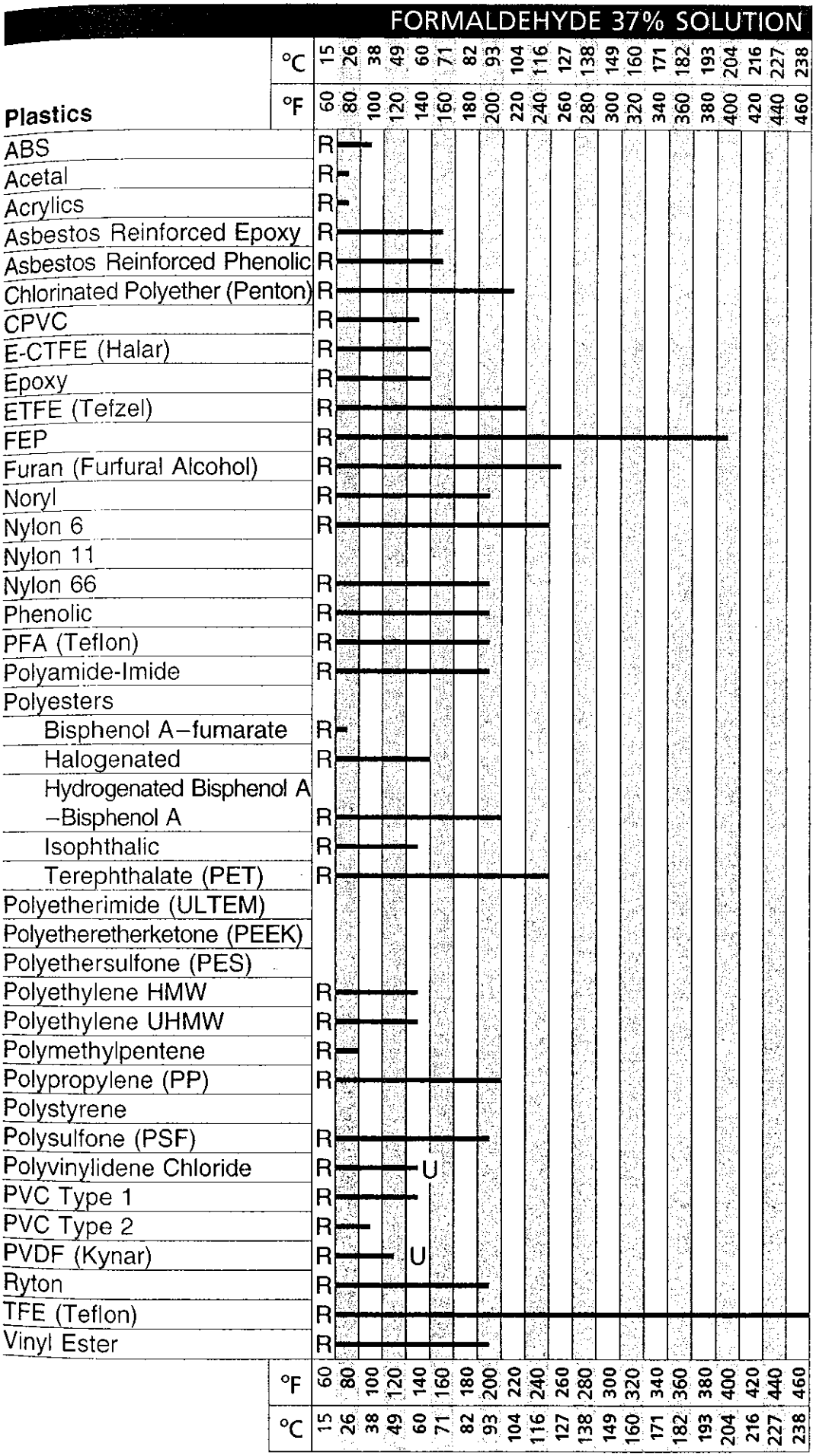
FORMALDEHYDE 37% SOLUTION



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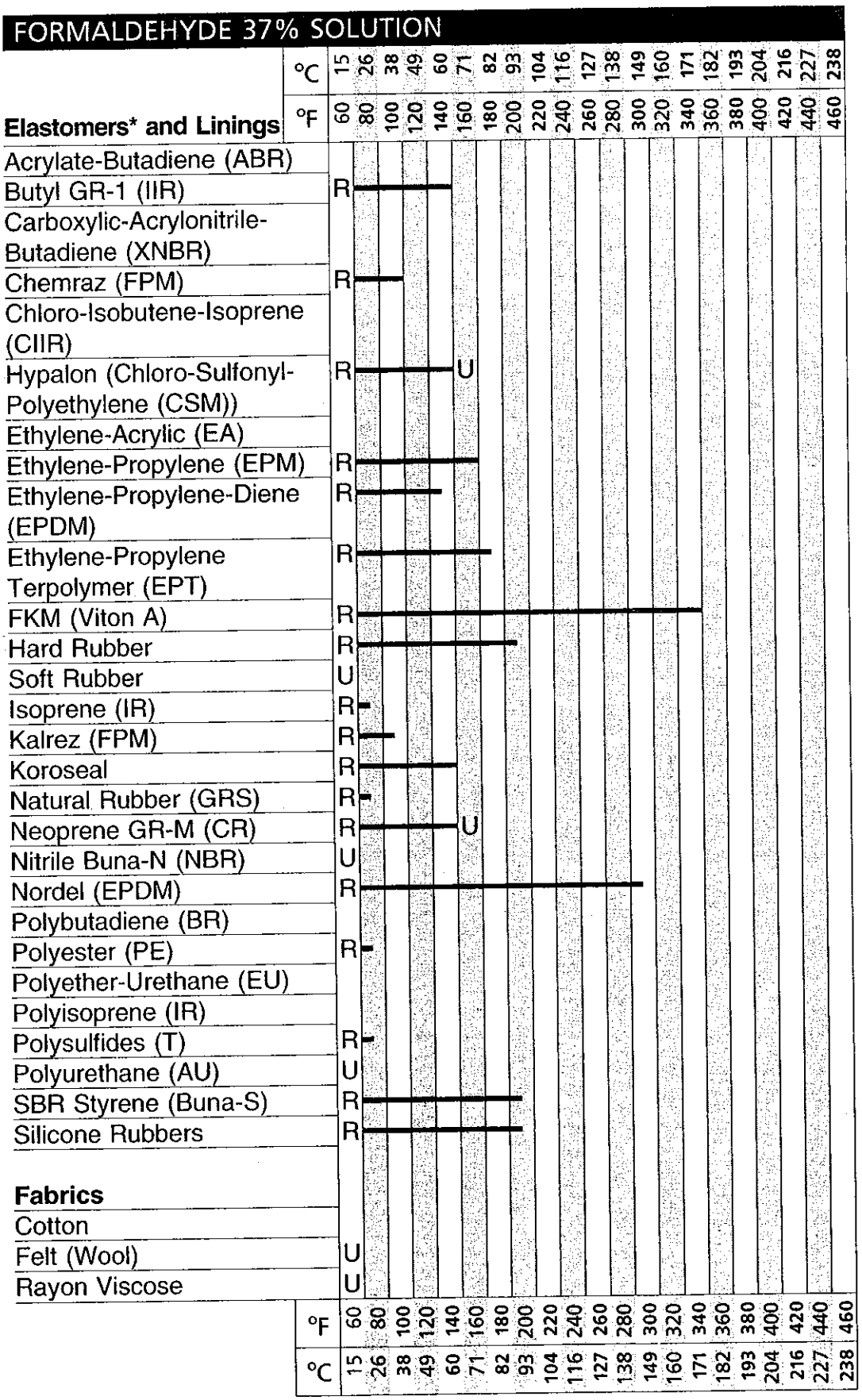
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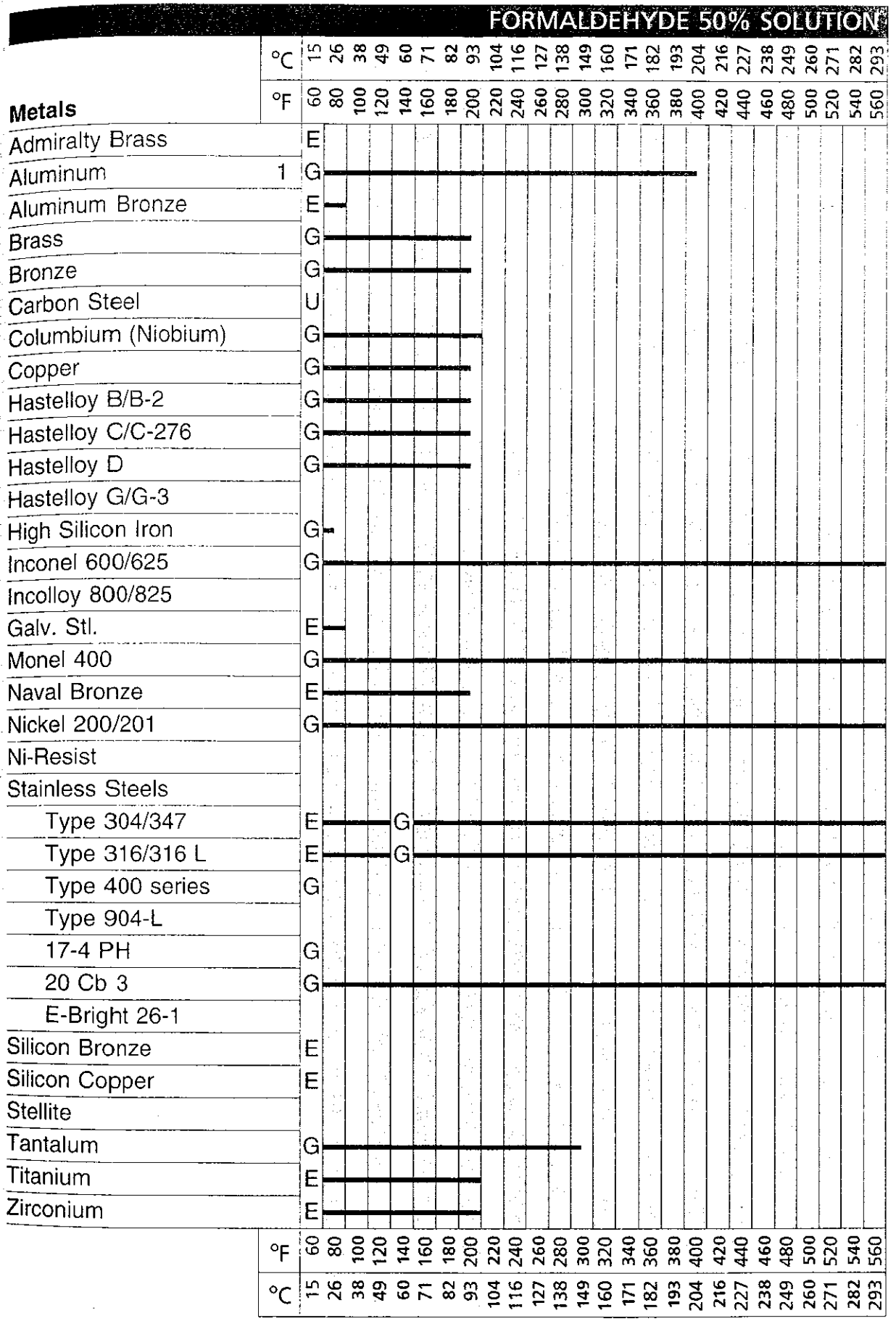


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FORMALDEHYDE 50% SOLUTION



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

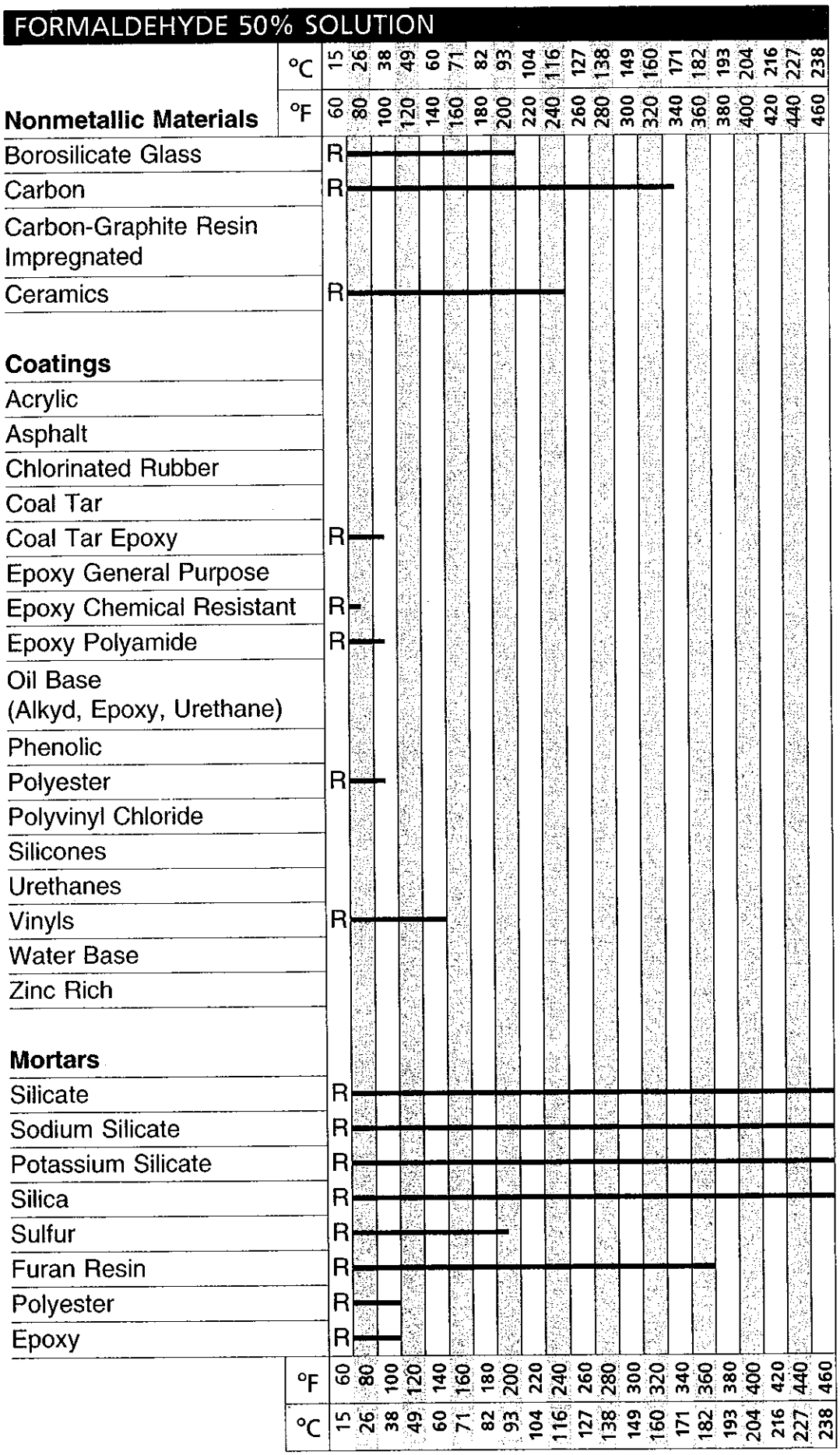
R = Resistant

U = Unsatisfactory

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FORMALDEHYDE 50% SOLUTION



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FORMALDEHYDE 50% SOLUTION

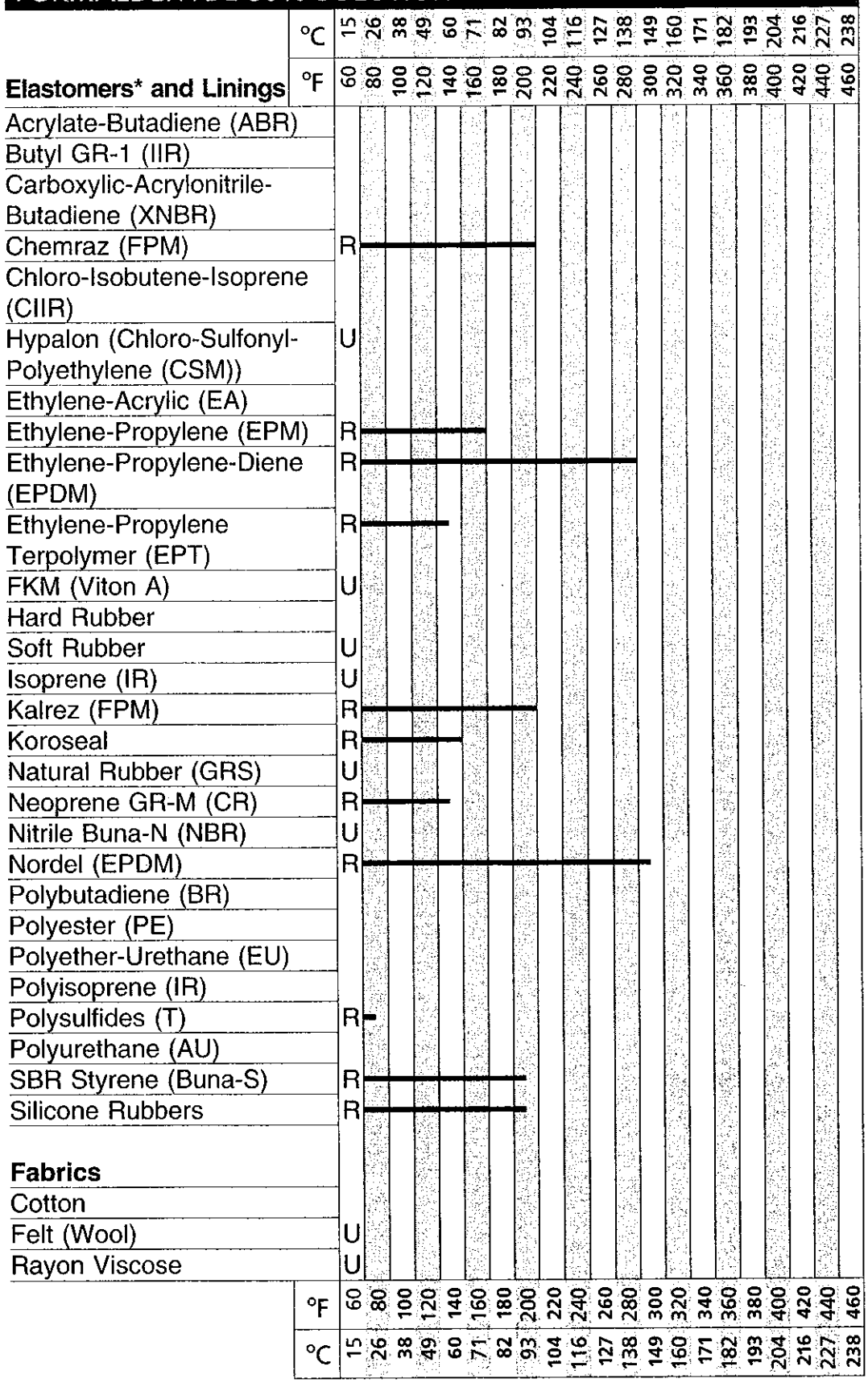
Plastics	°C	°F
ABS	R	R
Acetal		
Acrylics	R	R
Asbestos Reinforced Epoxy	R	R
Asbestos Reinforced Phenolic	R	R
Chlorinated Polyether (Penton)	R	R
CPVC	R	R
E-CTFE (Halar)	R	R
Epoxy	R	R U
ETFE (Tefzel)		
FEP	R	R
Furan (Furfural Alcohol)	R	R
Noryl		
Nylon 6	R	R
Nylon 11		
Nylon 66	R	R
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	R	R
Halogenated	R	R
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	R	R U
Terephthalate (PET)	R	R
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)	R	R
Polystyrene	R	R U
Polysulfone		
Polyvinylidene Chloride	R	R U
PVC Type 1	R	R
PVC Type 2	R	R U
PVDF (Kynar)	R	R
Ryton	R	R
TFE (Teflon)	R	R
Vinyl Ester	R	R

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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FORMALDEHYDE 50% SOLUTION

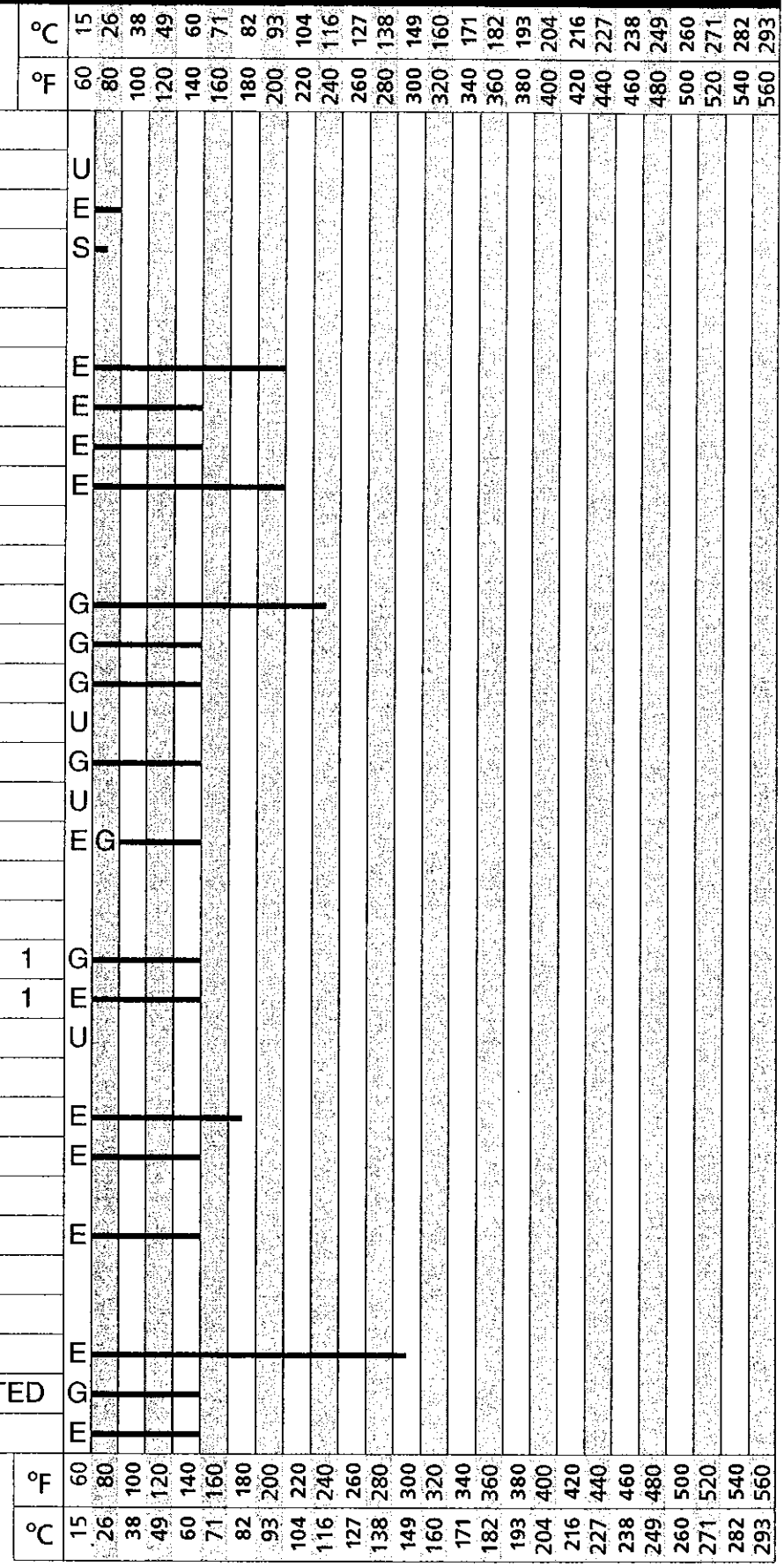


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FORMIC ACID 5%

Metals		°C	°F
Admiralty Brass			
Aluminum		U	
Aluminum Bronze		E	
Brass		S	
Bronze			
Carbon Steel			
Columbium (Niobium)		E	
Copper		E	
Hastelloy B/B-2		E	
Hastelloy C/C-276		E	
Hastelloy D			
Hastelloy G/G-3			
High Silicon Iron		G	
Inconel 600/625		G	
Incolloy 800/825		G	
Galv. Stl.		U	
Monel 400		G	
Naval Bronze		U	
Nickel 200/201		E	G
Ni-Resist			
Stainless Steels			
Type 304/347	1	G	
Type 316/316 L	1	E	
Type 400 series		U	
Type 904-L			
17-4 PH		E	
20 Cb 3		E	
E-Bright 26-1			
Silicon Bronze		E	
Silicon Copper			
Stellite			
Tantalum		E	
Titanium	AERATED	G	
Zirconium		E	



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

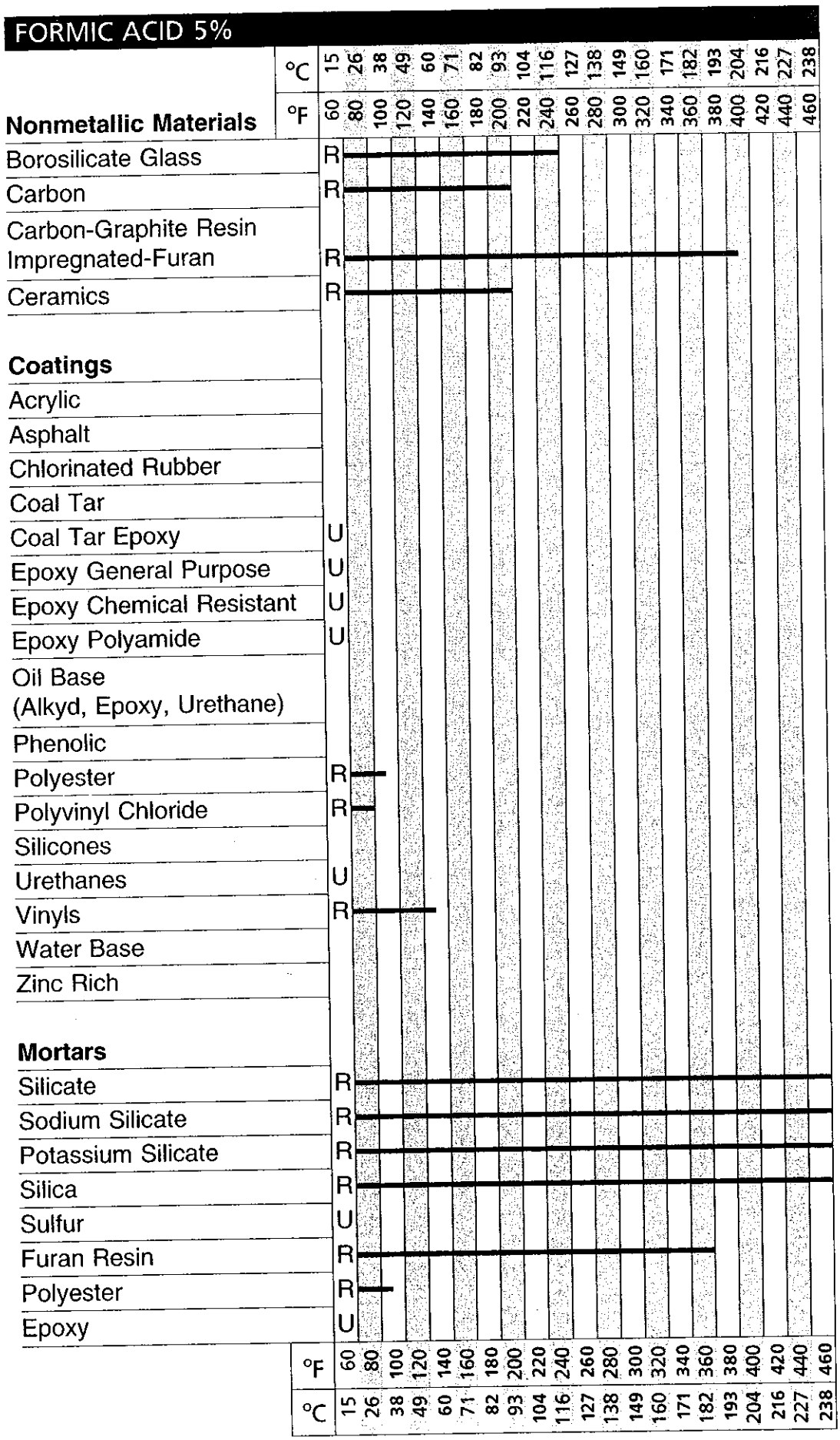
R = Resistant

U = Unsatisfactory

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FORMIC ACID 5%



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FORMIC ACID 5%

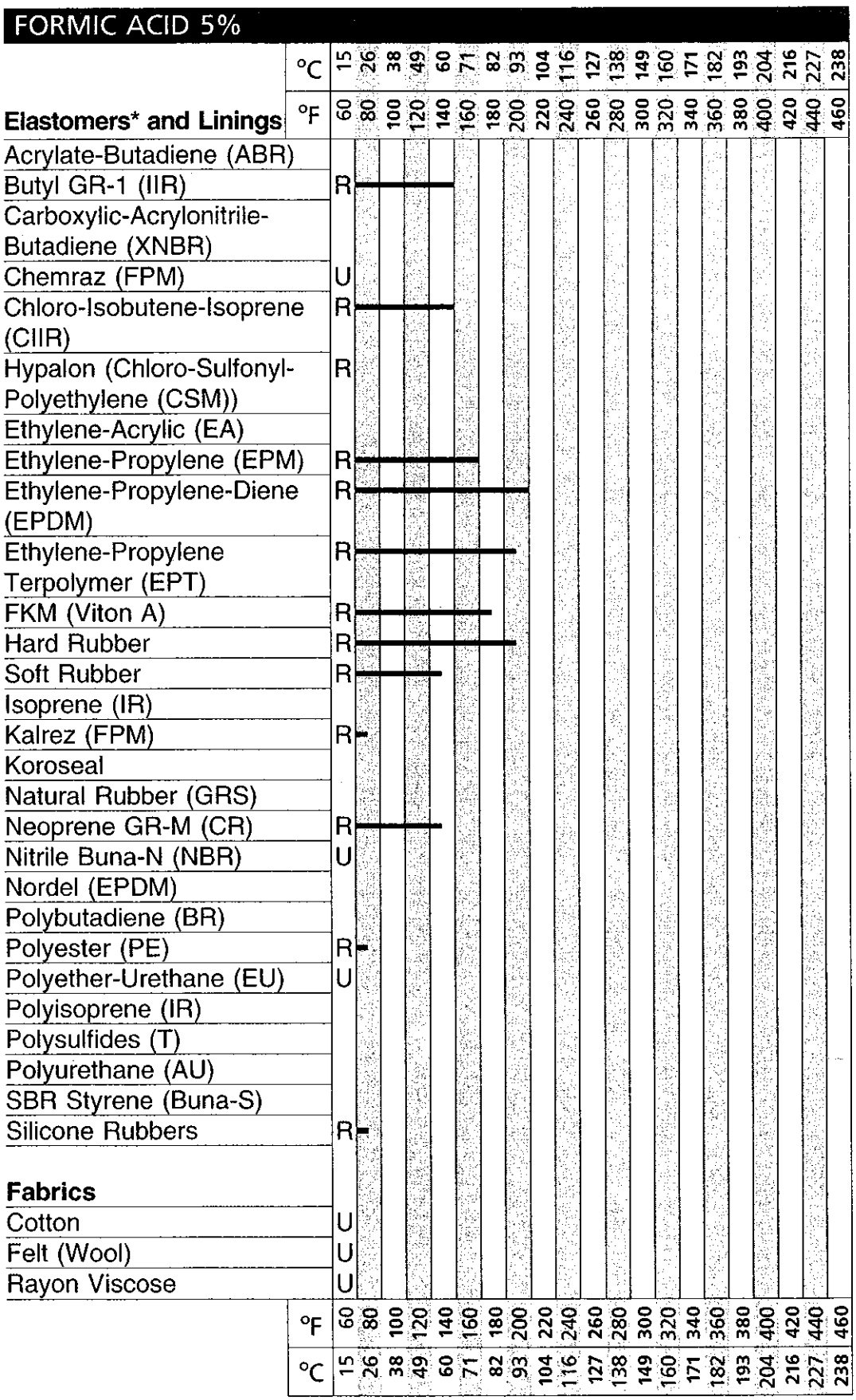
Plastics	°C	°F
ABS		
Acetal	U	
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC	R	
E-CTFE (Halar)	R	
Epoxy	R	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)	R	
Noryl		
Nylon 6	U	
Nylon 11	U	
Nylon 66	U	
Phenolic	R	
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	R	
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	R	
Terephthalate (PET)	R	
Polyetherimide (ULTEM)	R	
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW	R	
Polyethylene UHMW	R	
Polymethylpentene	R	
Polypropylene (PP)	R	
Polystyrene		
Polysulfone (PSF)	R	
Polyvinylidene Chloride	R	
PVC Type 1	R	
PVC Type 2		
PVDF (Kynar)	R	
Polyphenylene Oxide PPO	R	
TFE (Teflon)	R	
Vinyl Ester	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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FORMIC ACID 5%

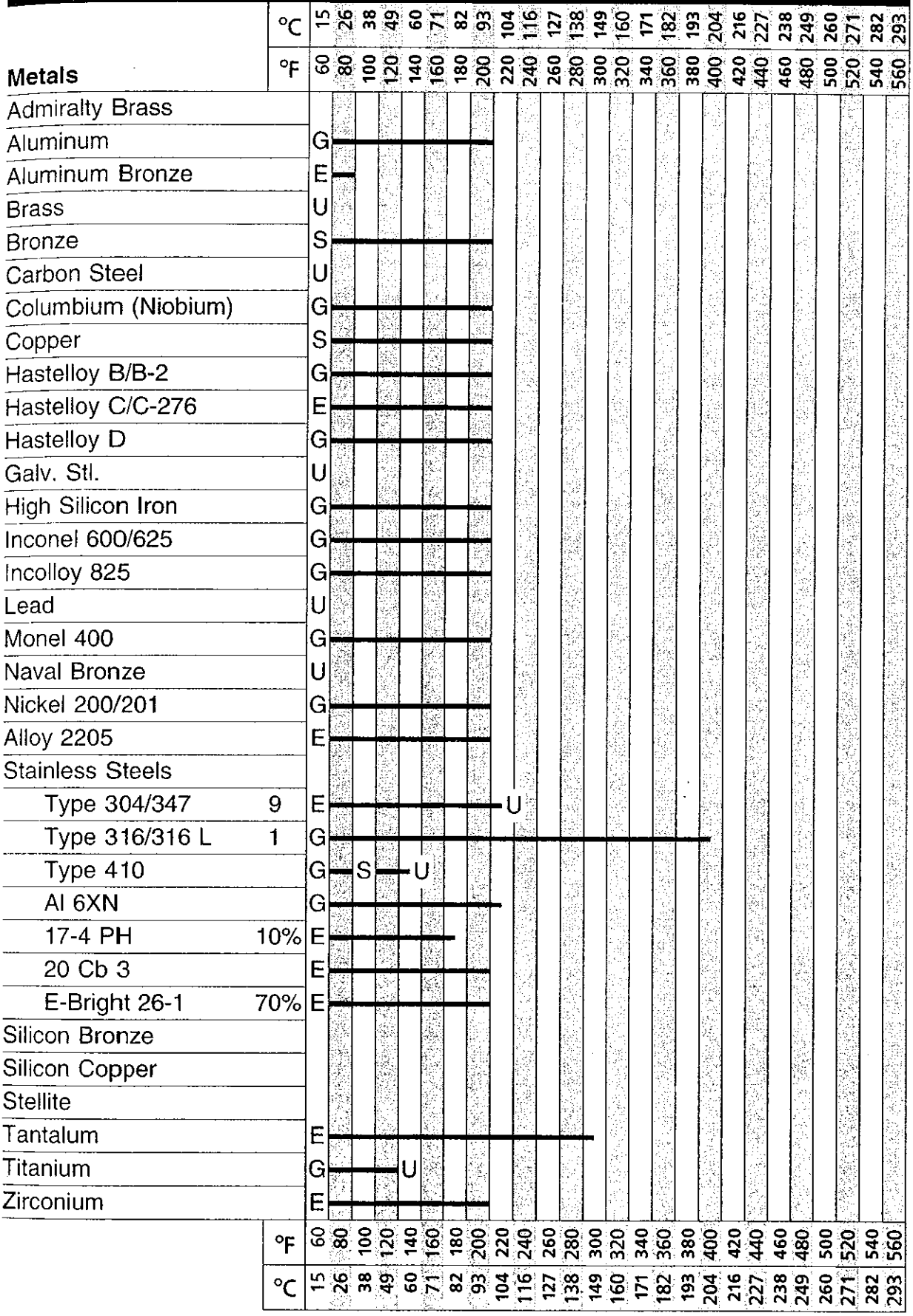


*See also Nylon 11 under PLASTICS

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FORMIC ACID 10–85%



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

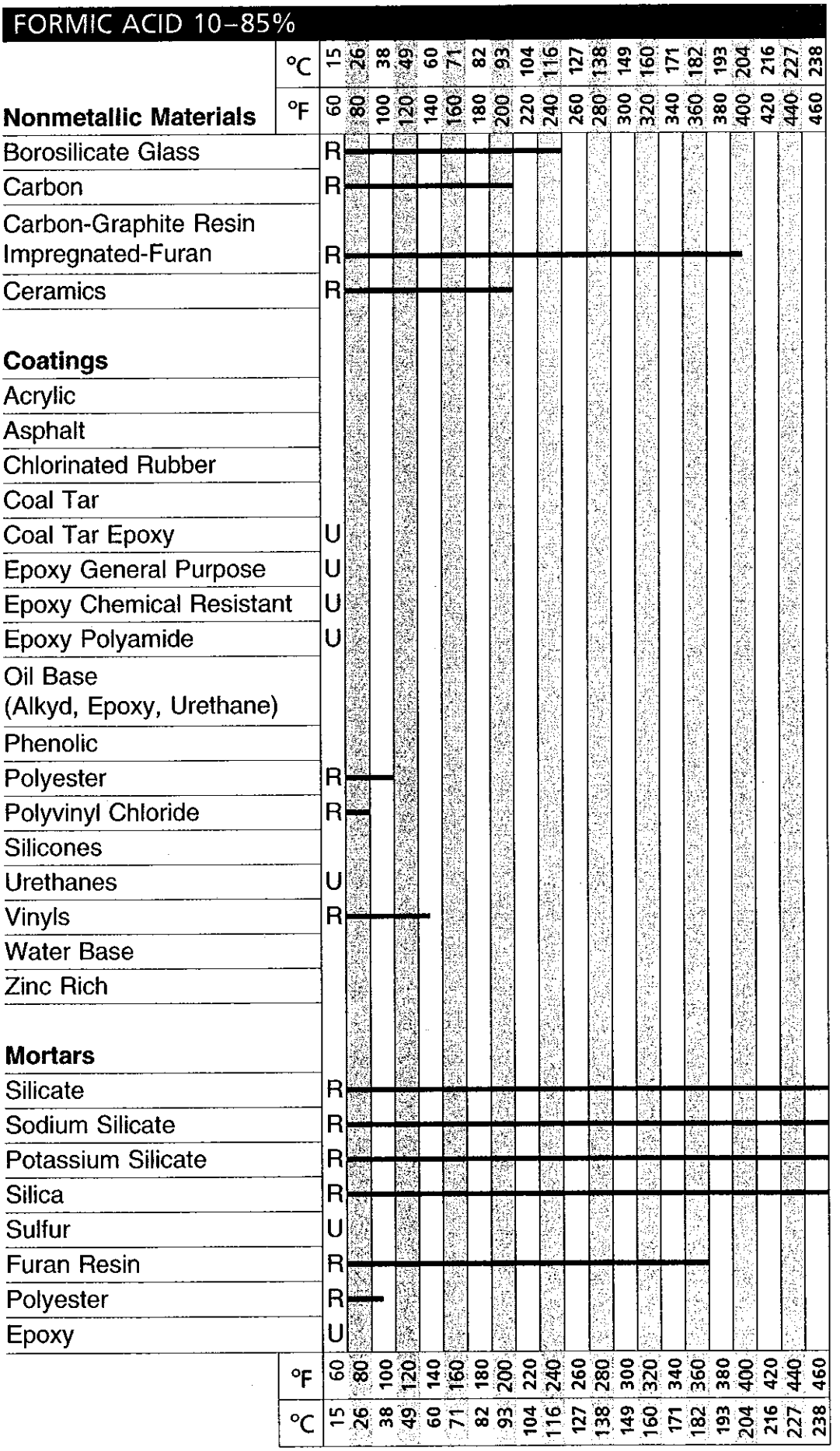
R = Resistant

U = Unsatisfactory

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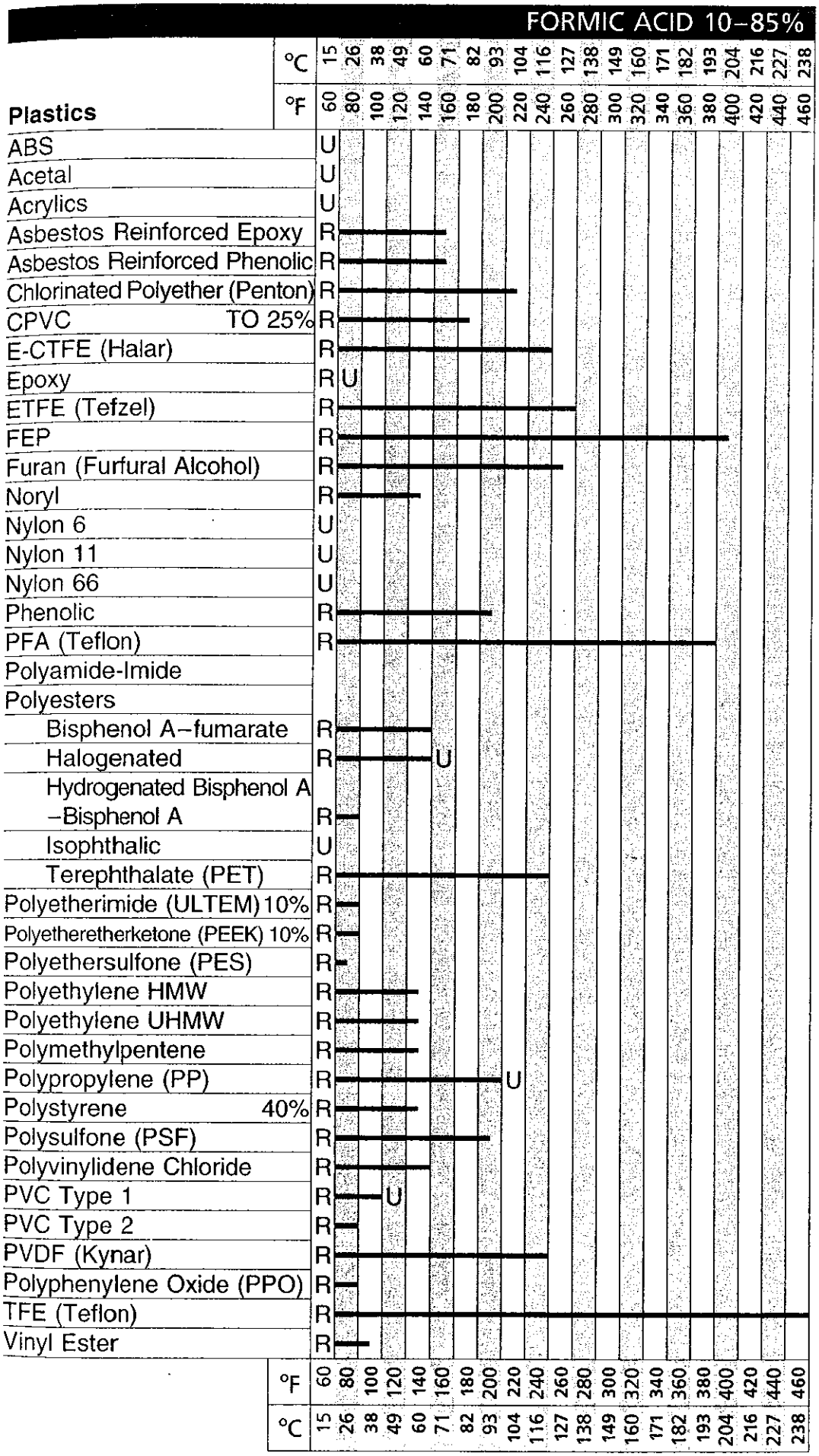
FORMIC ACID 10–85%



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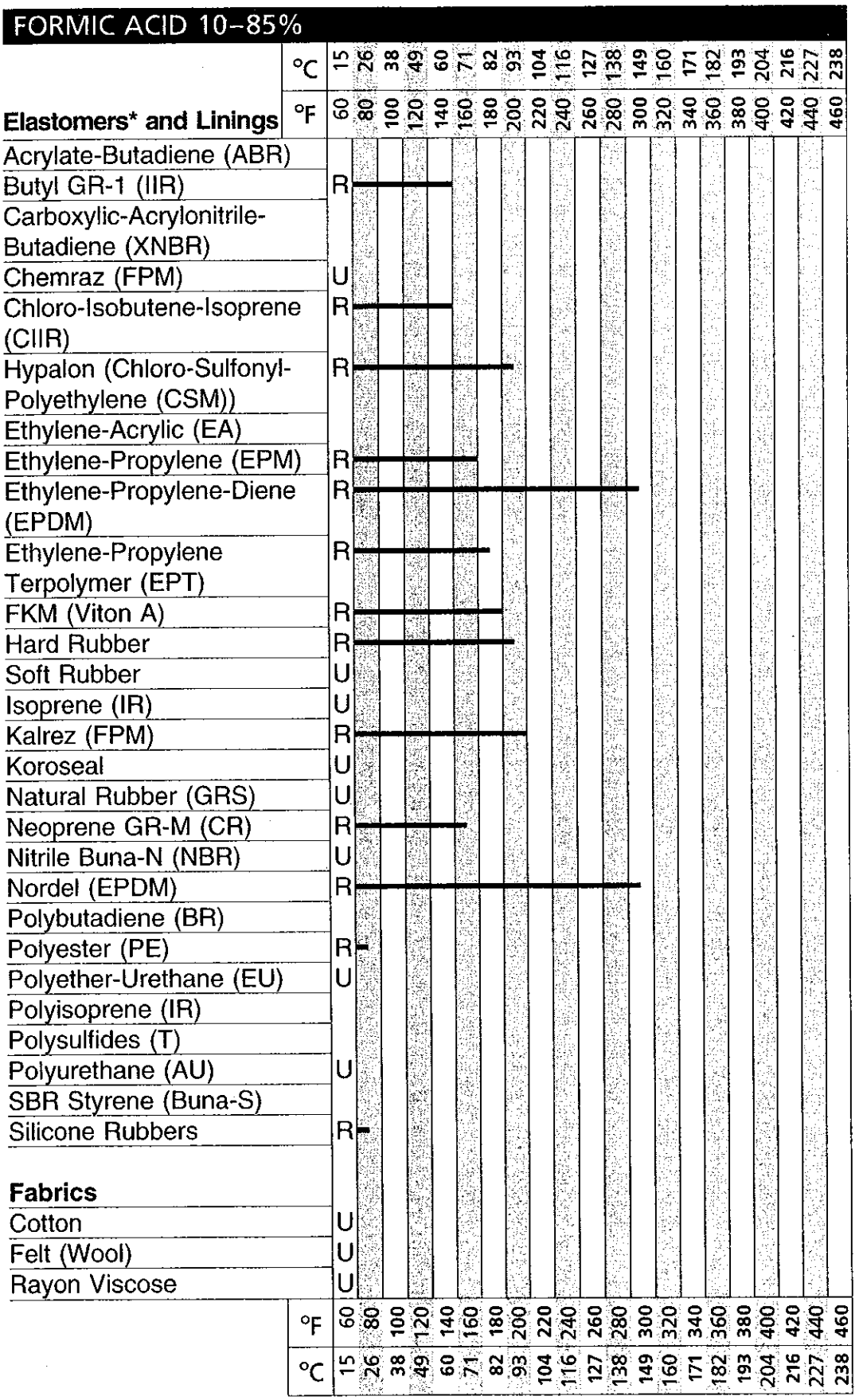
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FORMIC ACID ANHYDROUS

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass			E																									
Aluminum			E																									
Aluminum Bronze			E																									
Brass			U																									
Bronze			G																									
Carbon Steel			U																									
Columbium (Niobium)			E																									
Copper			G																									
Hastelloy B/B-2			E																									
Hastelloy C/C-276			E																									
Galv. Stl.			U																									
Hastelloy G/G-3																												
High Silicon Iron			E			G																						
Inconel 600/625			G																									
Incolloy 800/825																												
Lead			U																									
Monel 400			G																									
Naval Bronze			S																									
Nickel 200/201			G																									
Ni-Resist																												
Stainless Steels																												
Type 304/347	9		G	S																								
Type 316/316 L	1		E	G																								
Type 400 series			G																									
Type 904-L																												
17-4 PH			G																									
20 Cb 3			E																									
E-Bright 26-1																												
Silicon Bronze			U																									
Silicon Copper			E																									
Stellite																												
Tantalum			E																									
Titanium			G				U																					
Zirconium			E																									
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

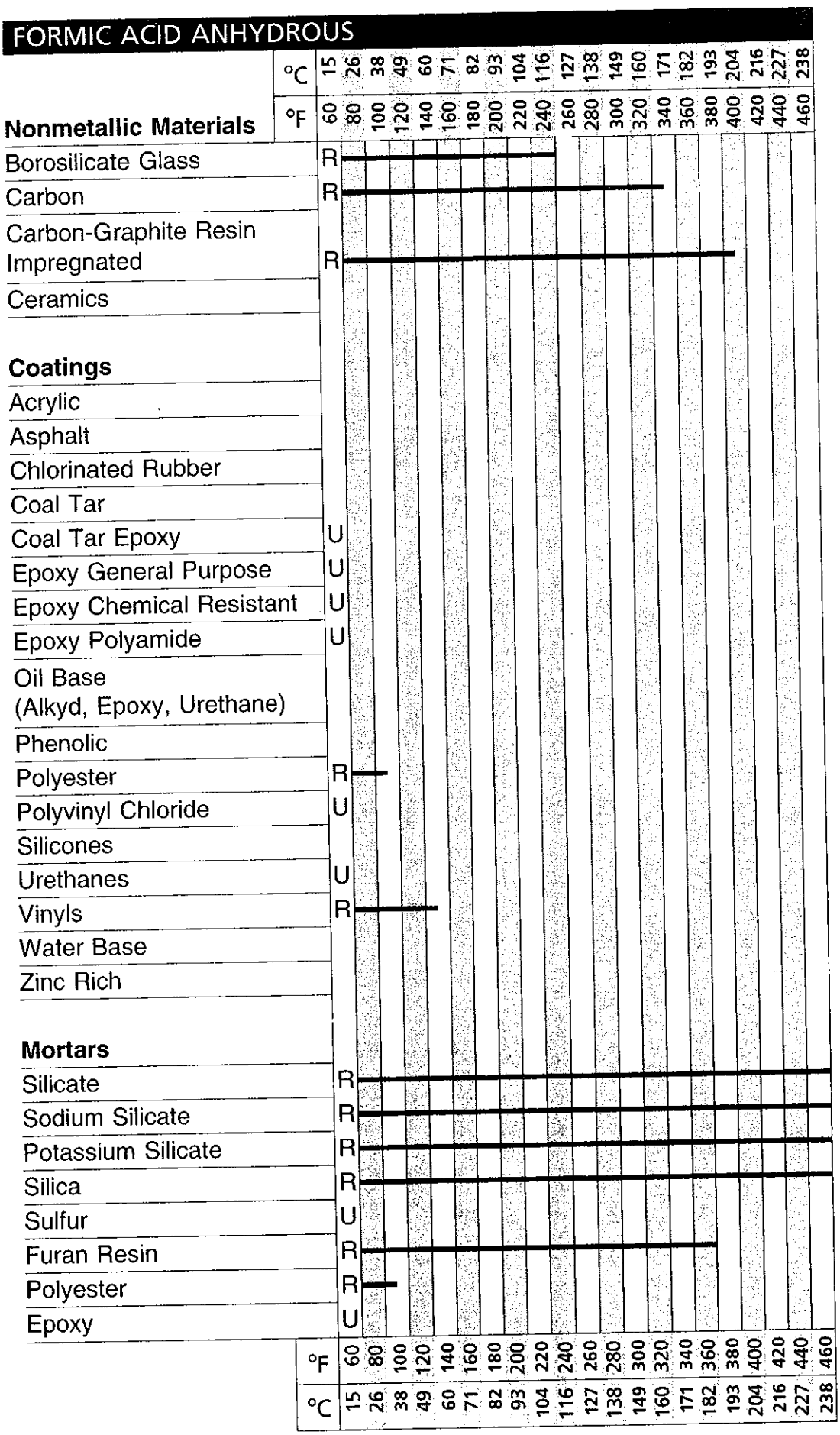
R = Resistant

U = Unsatisfactory

Schweitzer/*Corrosion Resistance Tables: Fifth Edition, Revised and Expanded* DOI: 10.1081/5672-X-120029442

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FORMIC ACID ANHYDROUS

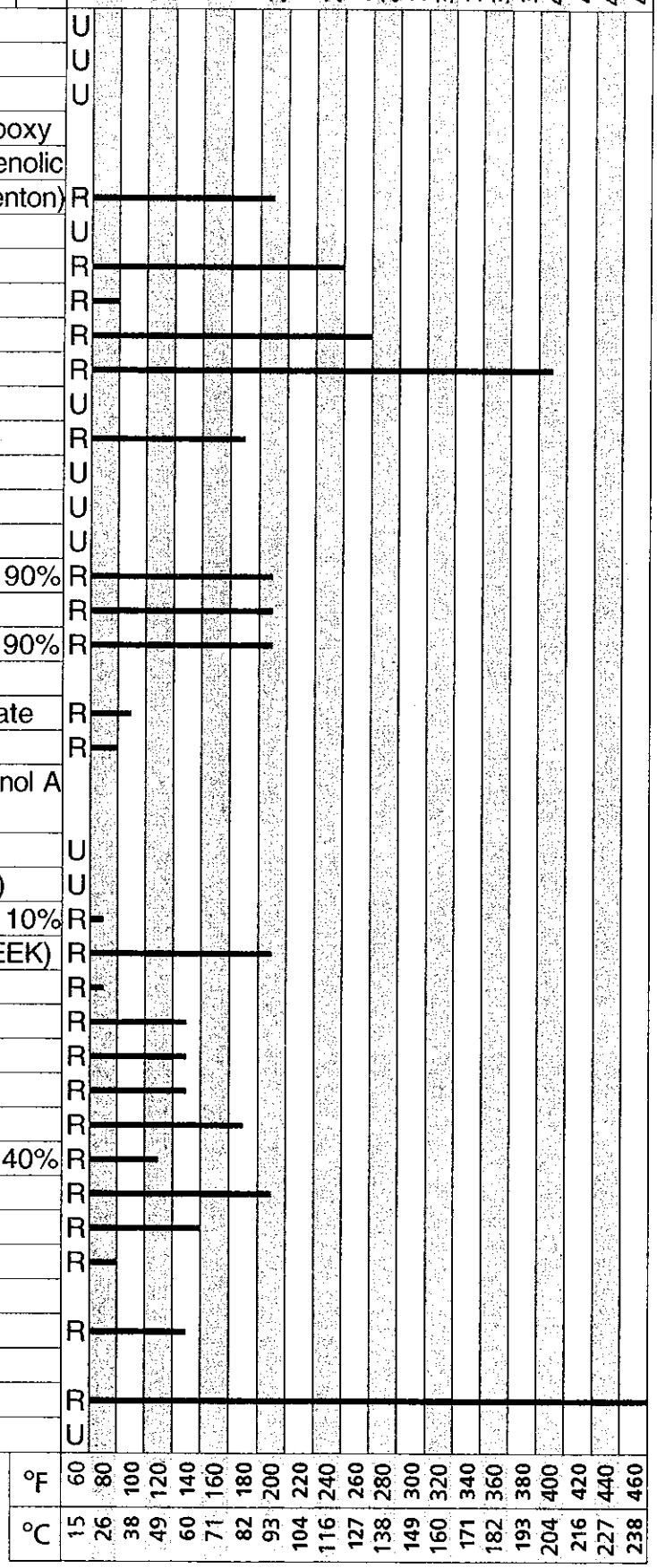


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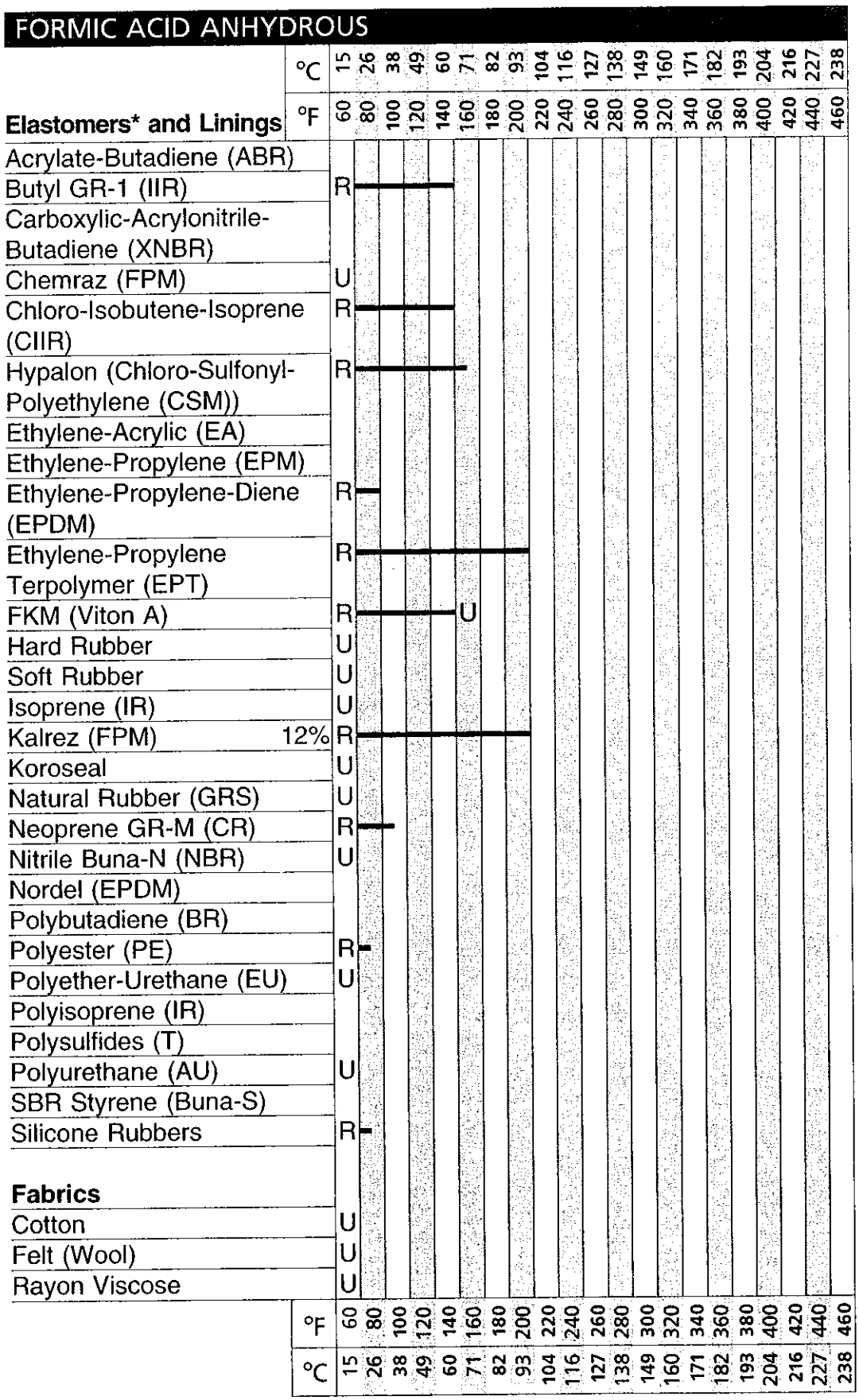
FORMIC ACID ANHYDROUS

Plastics	
ABS	U
Acetal	U
Acrylics	U
Asbestos Reinforced Epoxy	
Asbestos Reinforced Phenolic	
Chlorinated Polyether (Penton)	R
CPVC	U
E-CTFE (Halar)	R
Epoxy	R
ETFE (Tefzel)	R
FEP	R
Furan (Furfural Alcohol)	U
Noryl	R
Nylon 6	U
Nylon 11	U
Nylon 66	U
Phenolic 90%	R
PFA (Teflon)	R
Polyamide-Imide 90%	R
Polyesters	
Bisphenol A–fumarate	R
Halogenated	R
Hydrogenated Bisphenol A –Bisphenol A	
Isophthalic	U
Terephthalate (PET)	U
Polyetherimide (ULTEM) 10%	R
Polyetheretherketone (PEEK)	R
Polyethersulfone (PES)	R
Polyethylene HMW	R
Polyethylene UHMW	R
Polymethylpentene	R
Polypropylene (PP)	R
Polystyrene 40%	R
Polysulfone	R
Polyvinylidene Chloride	R
PVC Type 1	R
PVC Type 2	
PVDF (Kynar)	R
Ryton	
TFE (Teflon)	R
Vinyl Ester	U



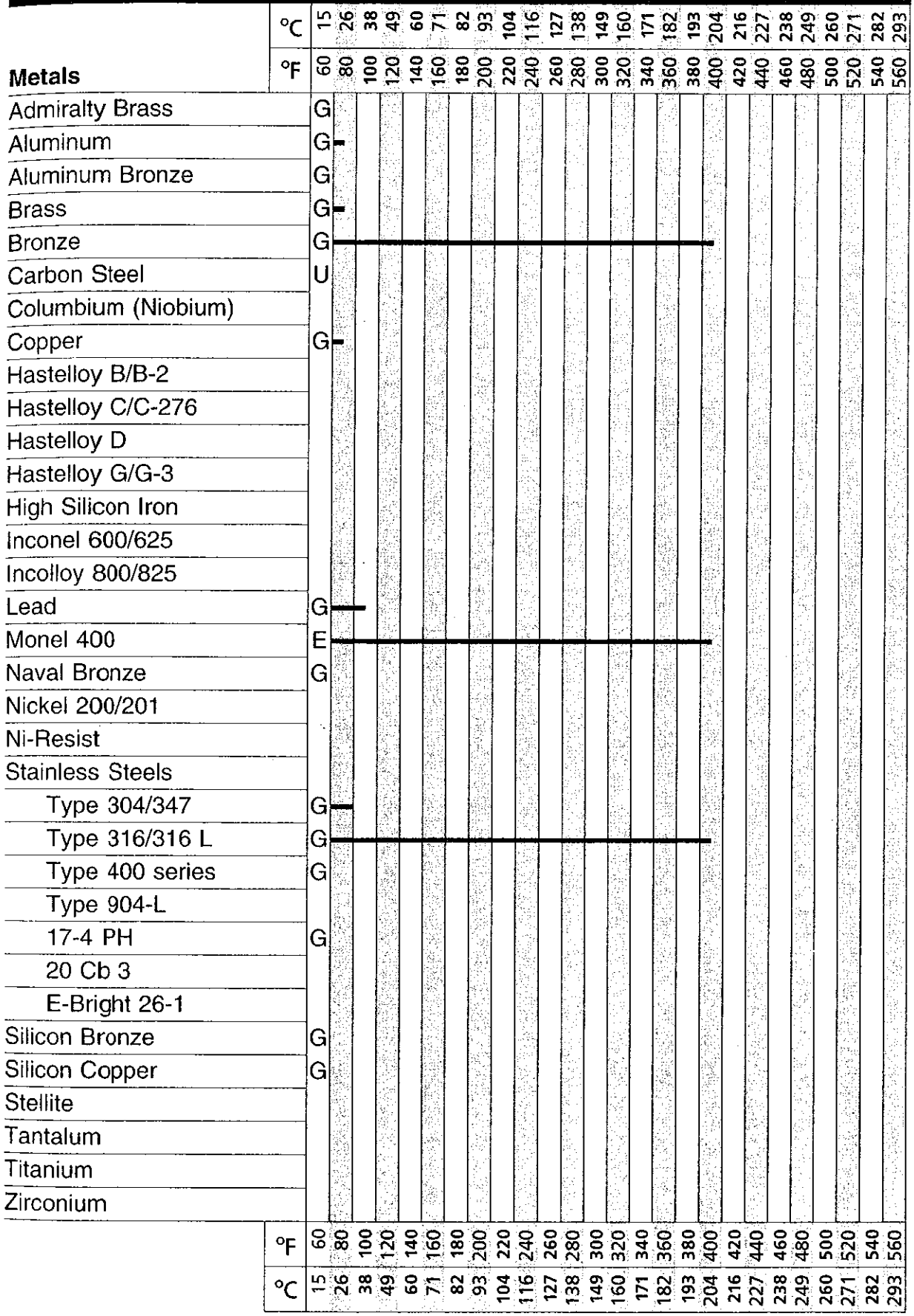
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FORMIC ACID ANHYDROUS



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

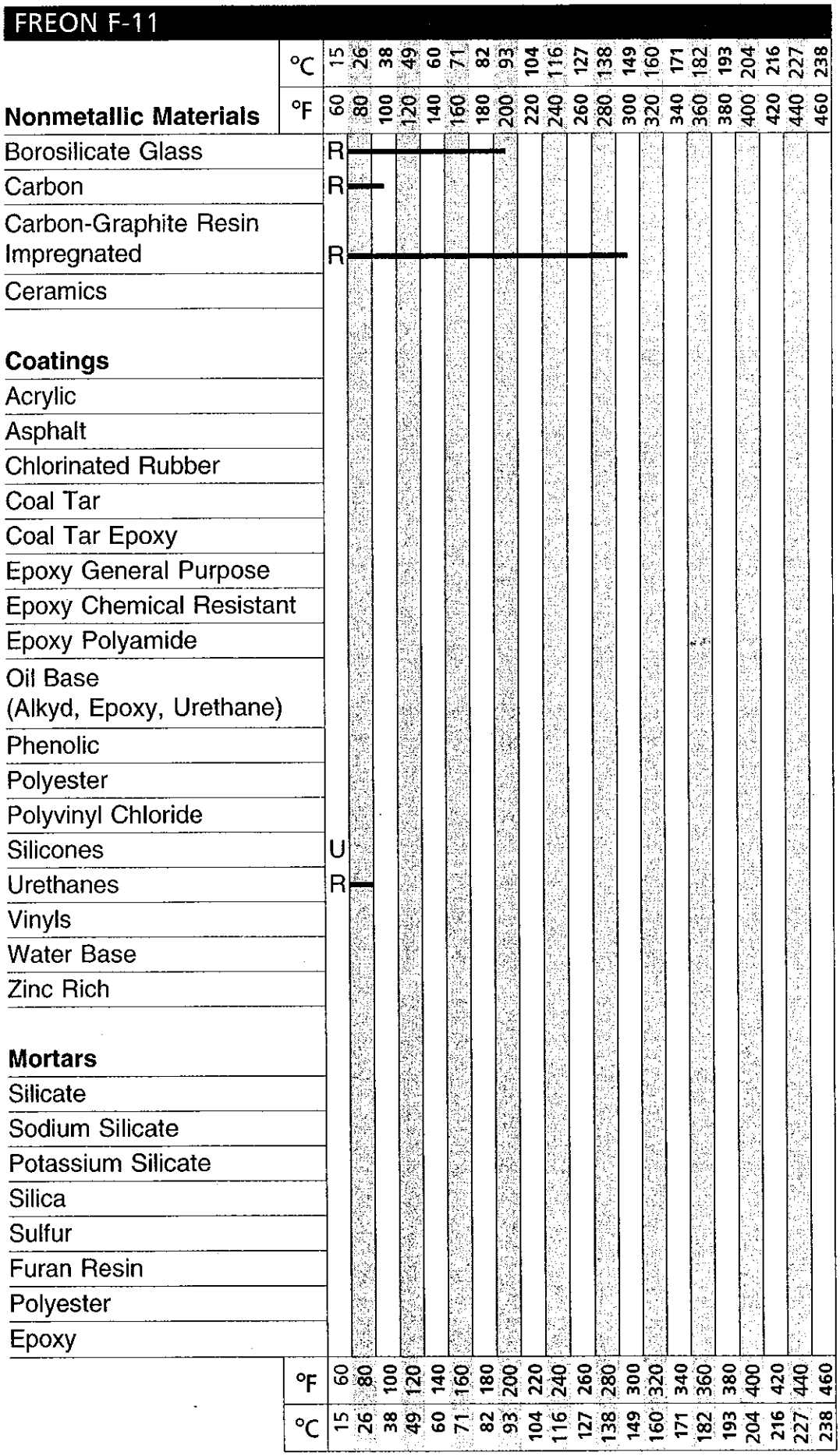
R = Resistant

U = Unsatisfactory

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FREON F-11



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FREON F-11

Plastics	°C	°F
ABS	U	
Acetal	R	
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)	R	
CPVC	R	
E-CTFE (Halar)	R	
Epoxy	R	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)		
Noryl	R	
Nylon 6	U	
Nylon 11	U	
Nylon 66	U	
Phenolic		
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	R	
Halogenated		
Hydrogenated Bisphenol A–Bisphenol A		
Isophthalic		
Terephthalate (PET)		
Polyetherimide (ULTEM)	R	
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW	R	
Polyethylene UHMW	R	
Polymethylpentene		
Polypropylene (PP)	U	
Polystyrene		
Polysulfone	U	
Polyvinylidene Chloride	R	
PVC Type 1	R	
PVC Type 2	U	
PVDF (Kynar)	R	
Ryton	R	
TFE (Teflon)	R	
Vinyl Ester	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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FREON F-11

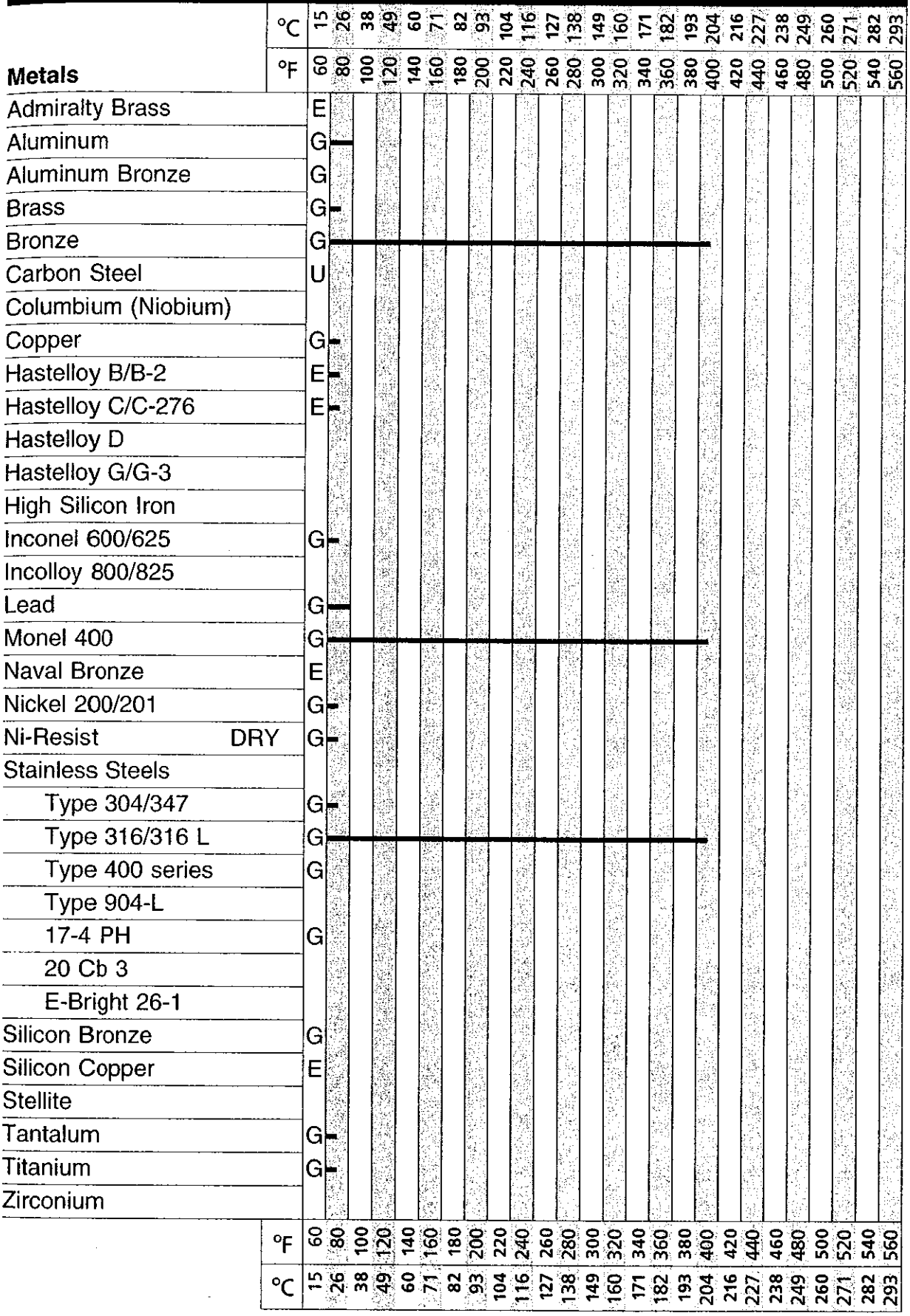
Elastomers* and Linings	°C	°F
Acrylate-Butadiene (ABR)		
Butyl GR-1 (IIR)	U	
Carboxylic-Acrylonitrile-Butadiene (XNBR)	R	
Chemraz (FPM)	U	
Chloro-Isobutene-Isoprene (CIIR)		
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	R	
Ethylene-Acrylic (EA)		
Ethylene-Propylene (EPM)		
Ethylene-Propylene-Diene (EPDM)	U	
Ethylene-Propylene Terpolymer (EPT)	U	
FKM (Viton A)	R	
Hard Rubber		
Soft Rubber		
Isoprene (IR)	U	
Kalrez (FPM)	U	
Koroseal		
Natural Rubber (GRS)	U	
Neoprene GR-M (CR)	R	
Nitrile Buna-N (NBR)	R	
Nordel (EPDM)	U	
Polybutadiene (BR)		
Polyester (PE)	R	
Polyether-Urethane (EU)	U	
Polyisoprene (IR)		
Polysulfides (T)	R	
Polyurethane (AU)	R	
SBR Styrene (Buna-S)	U	
Silicone Rubbers	U	
Fabrics		
Cotton		
Felt (Wool)	R	
Rayon Viscose	R	

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460

*See also Nylon 11 under PLASTICS

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FREON F-12



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

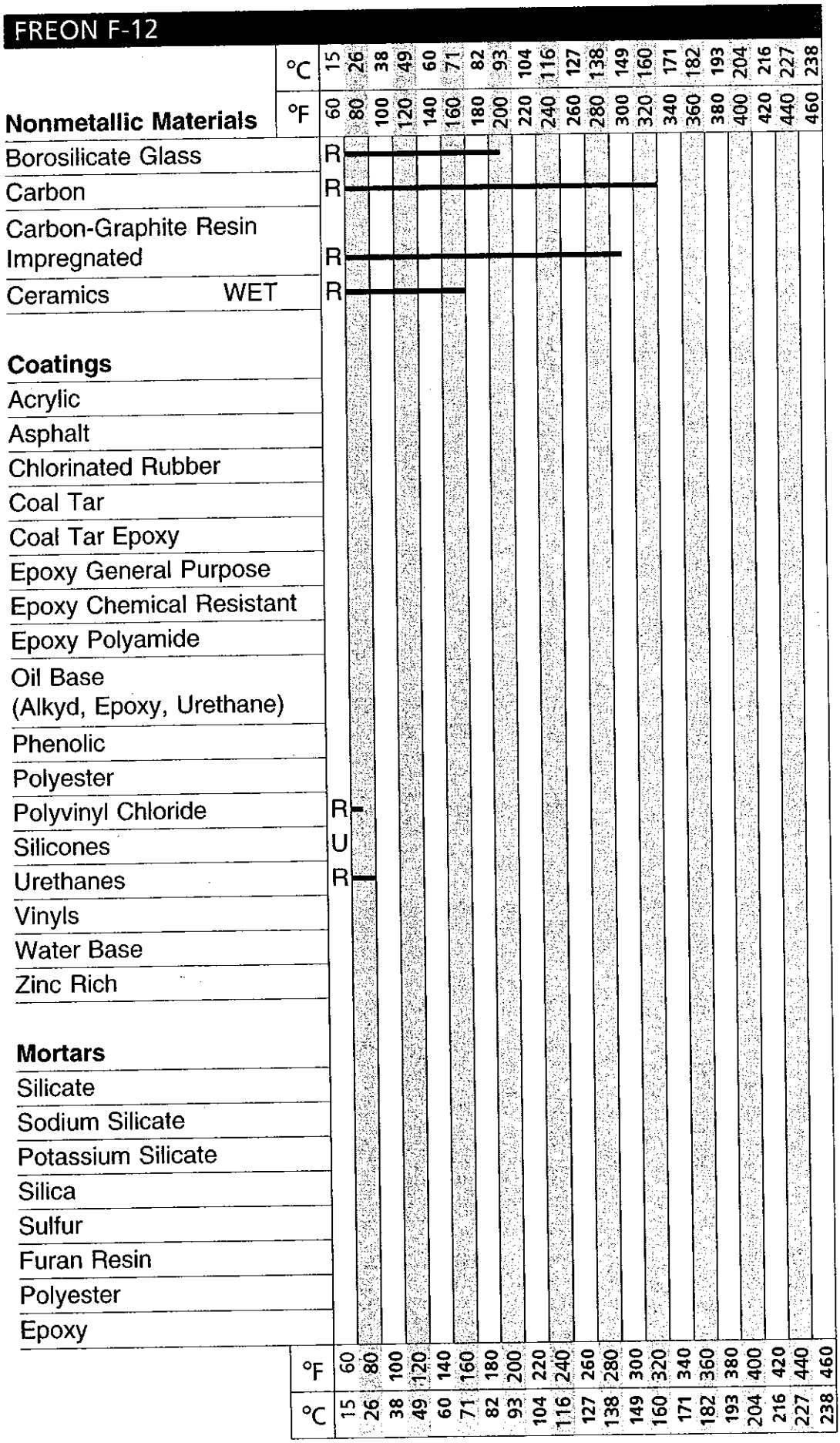
R = Resistant

U = Unsatisfactory

Schweitzer/*Corrosion Resistance Tables: Fifth Edition, Revised and Expanded* DOI: 10.1081/5672-X-120029444

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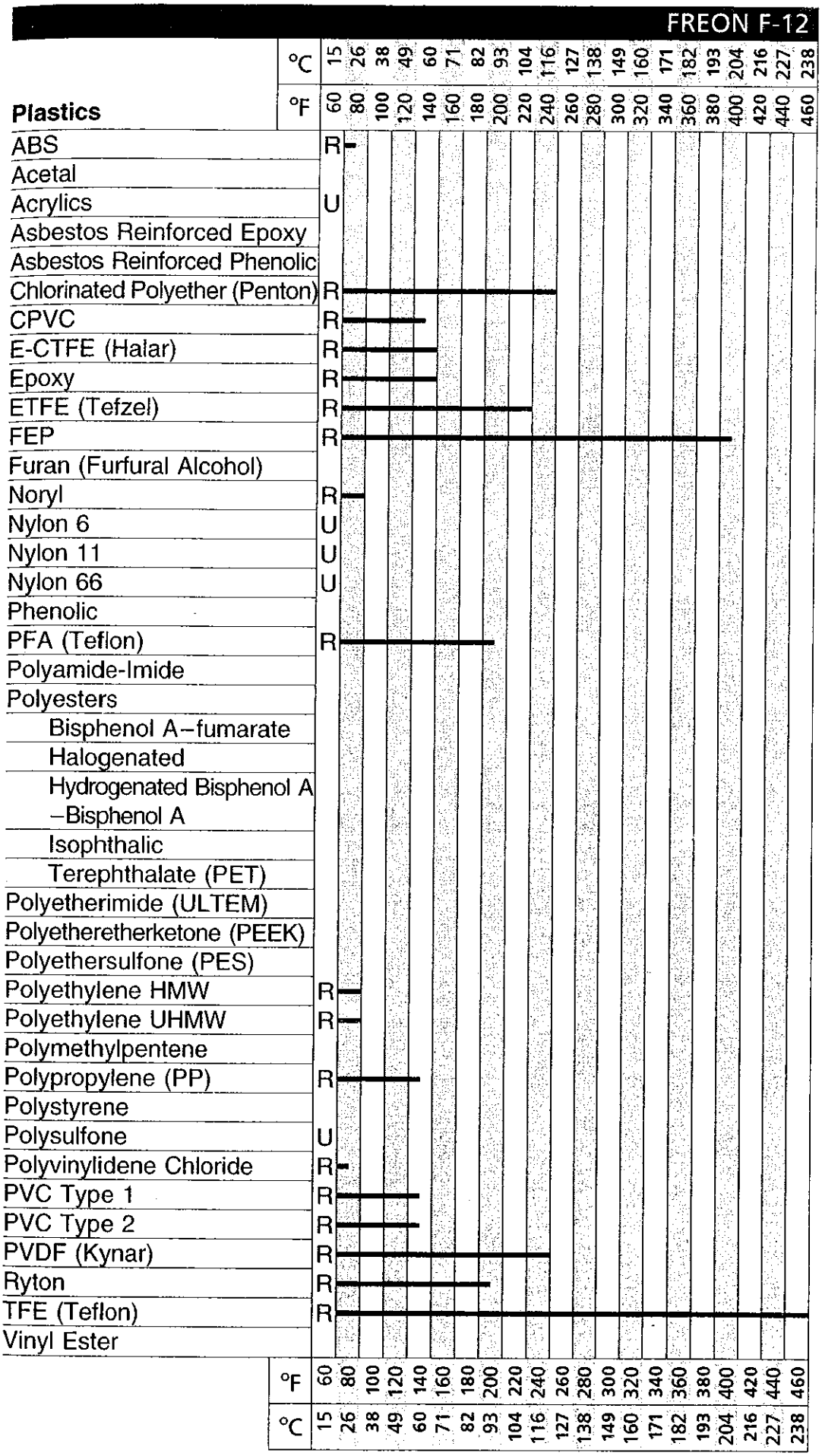
FREON F-12



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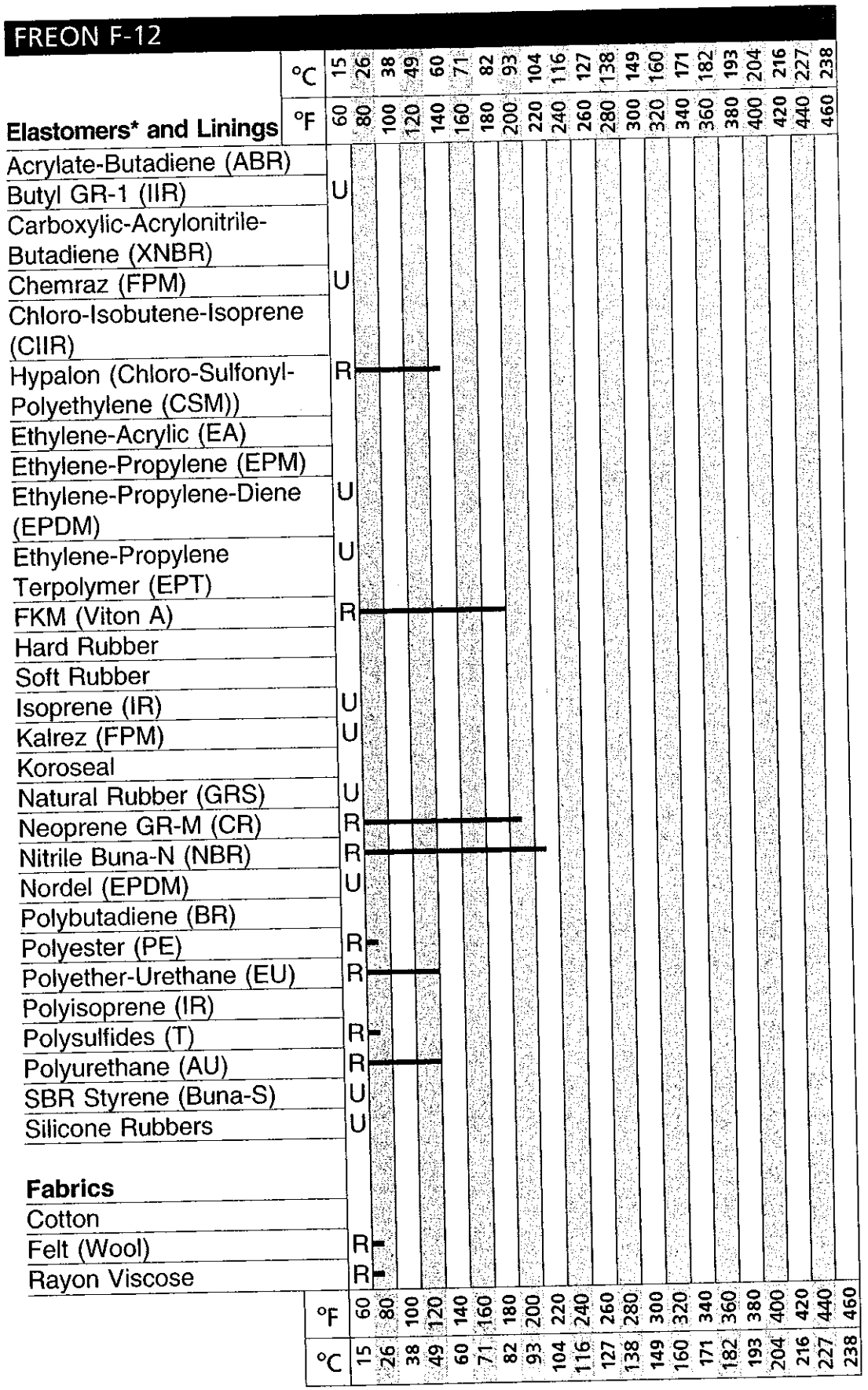
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FREON F-12



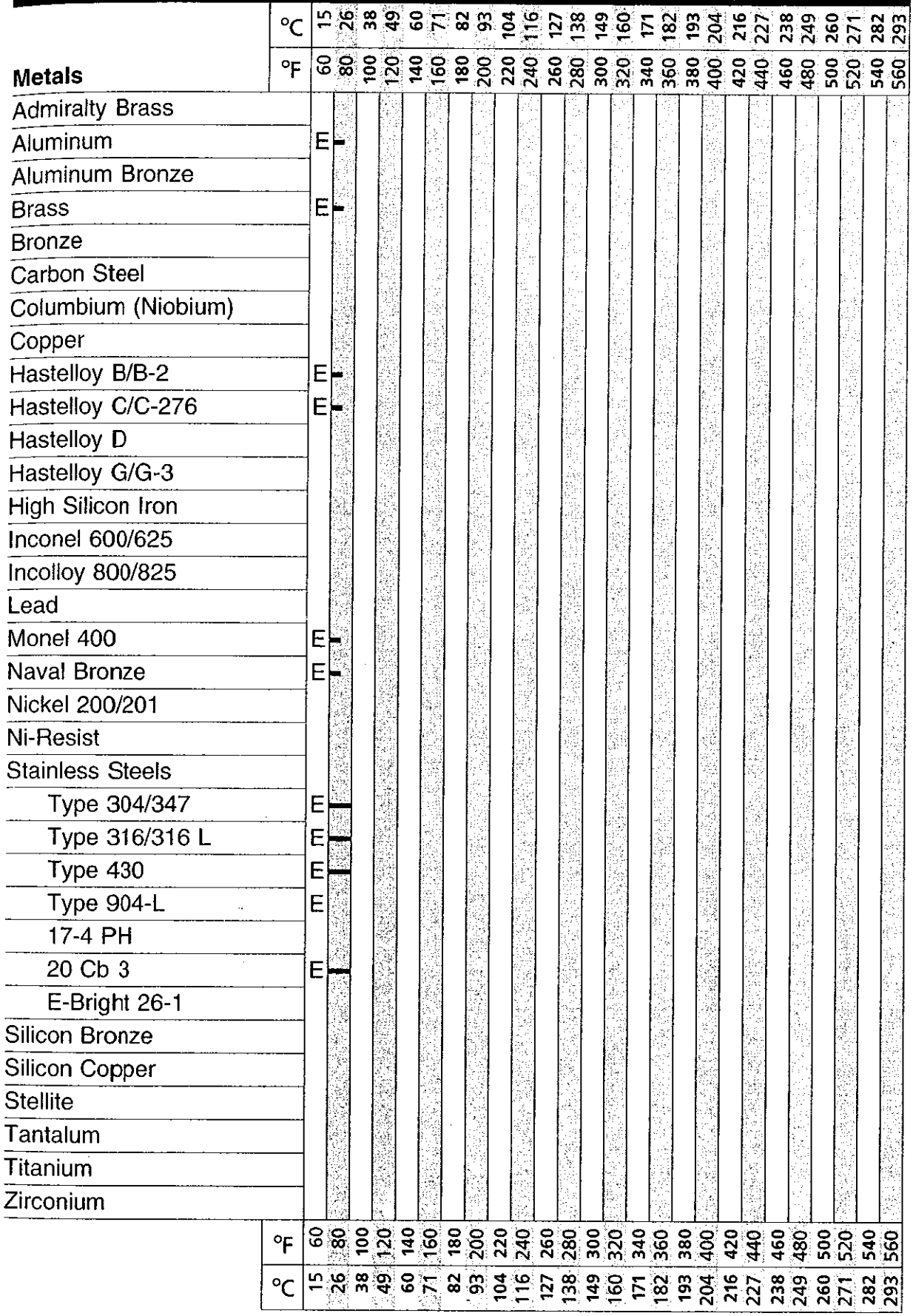
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FREON F-12



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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FREON 17

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Nonmetallic Materials																					
Borosilicate Glass	R																				
Carbon																					
Carbon-Graphite Resin Impregnated																					
Ceramics																					
Coatings																					
Acrylic																					
Asphalt																					
Chlorinated Rubber																					
Coal Tar																					
Coal Tar Epoxy																					
Epoxy General Purpose																					
Epoxy Chemical Resistant																					
Epoxy Polyamide																					
Oil Base (Alkyd, Epoxy, Urethane)																					
Phenolic																					
Polyester																					
Polyvinyl Chloride																					
Silicones																					
Urethanes																					
Vinyls																					
Water Base																					
Zinc Rich																					
Mortars																					
Silicate																					
Sodium Silicate																					
Potassium Silicate																					
Silica																					
Sulfur																					
Furan Resin																					
Polyester																					
Epoxy																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC	U																					
E-CTFE (Halar)	R																					
Epoxy																						
ETFE (Tefzel)																						
FEP	R																					
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)	R																					
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)																						
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)																						
Ryton																						
TFE (Teflon)	R																					
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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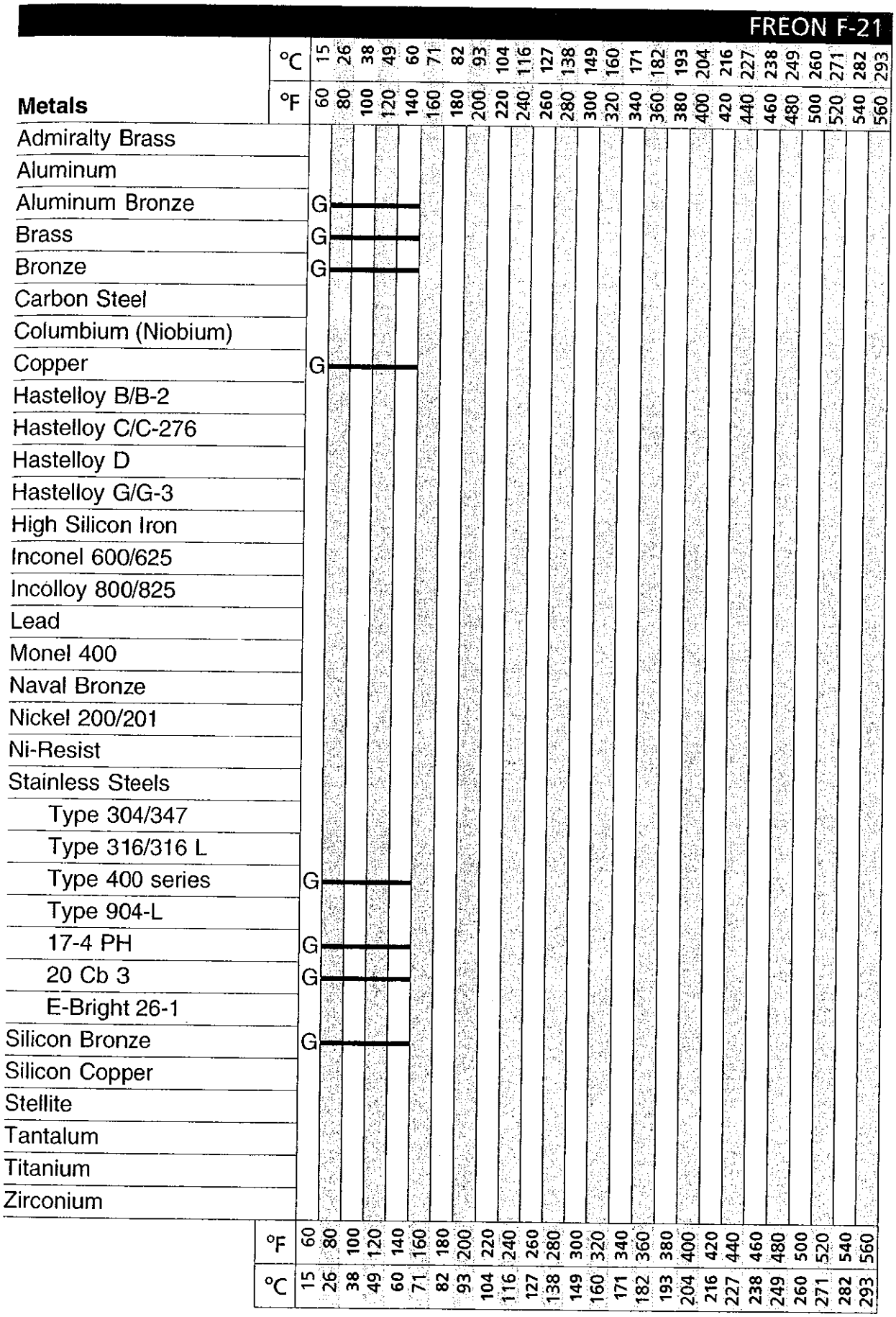
FREON 17

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)																						
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)																						
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)																						
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)																						
Nitrile Buna-N (NBR)																						
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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FREON F-21



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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FREON F-21

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride		U																				
Silicones		U																				
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC		
E-CTFE (Halar)	R	
Epoxy		
ETFE (Tefzel)		
FEP		
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated		
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic		
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)		
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1	U	
PVC Type 2	U	
PVDF (Kynar)	R	
Ryton		
TFE (Teflon)	R	
Vinyl Ester		

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460

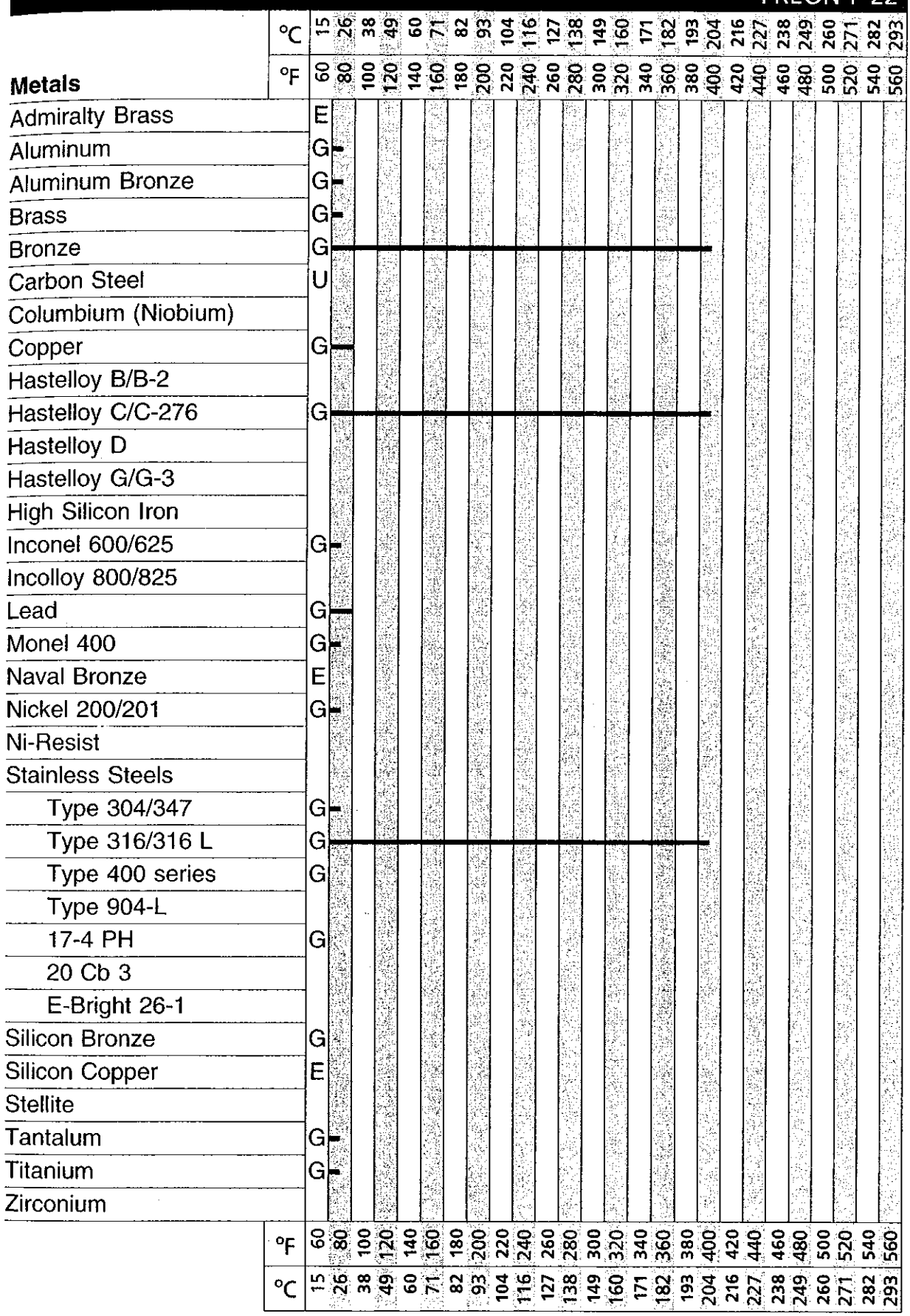
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FREON F-21

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)	U																					
Ethylene-Propylene Terpolymer (EPT)	U																					
FKM (Viton A)	U																					
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)	R																					
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)	U																					
Nitrile Buna-N (NBR)	U																					
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers	U																					
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

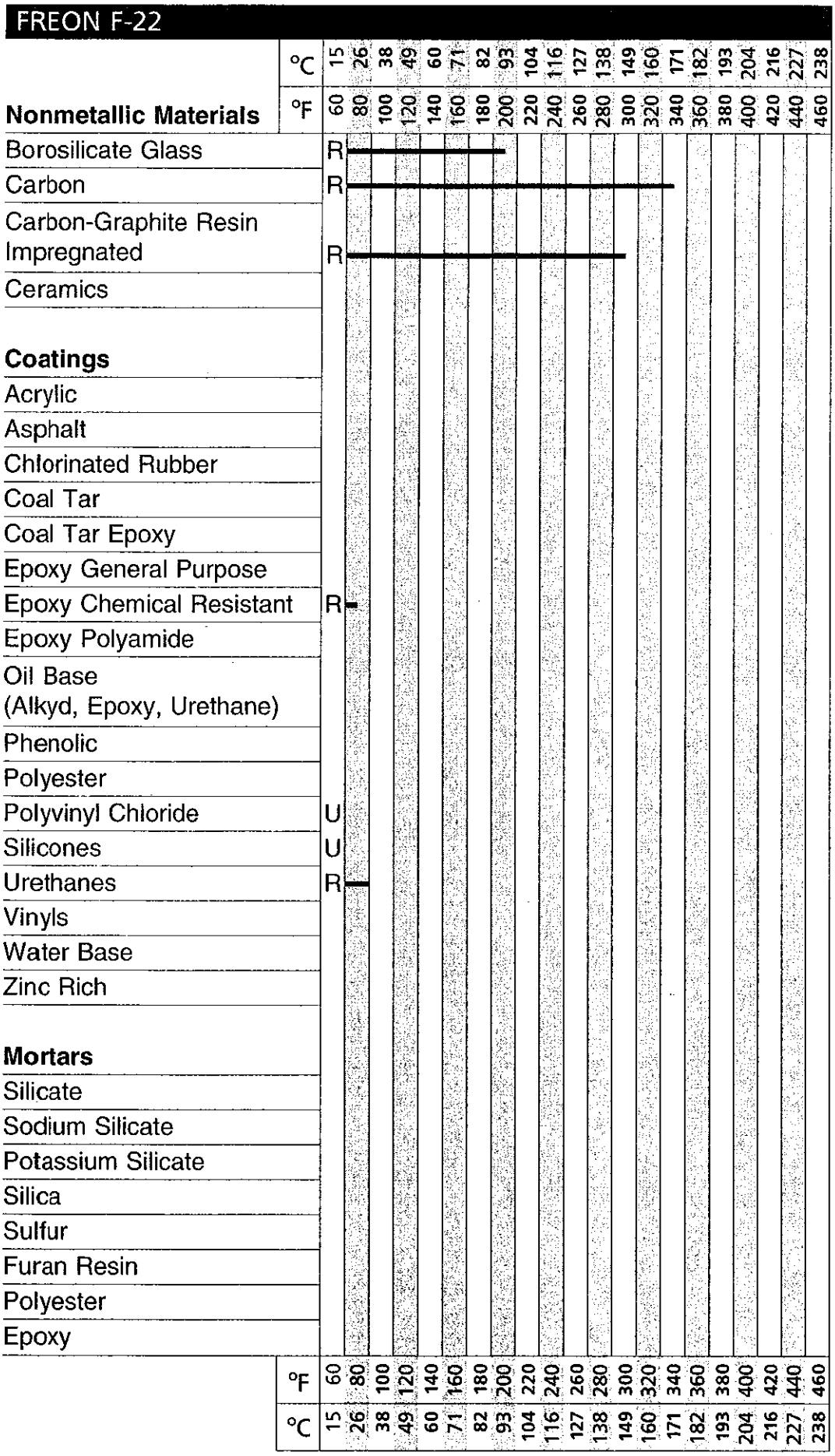
R = Resistant

U = Unsatisfactory

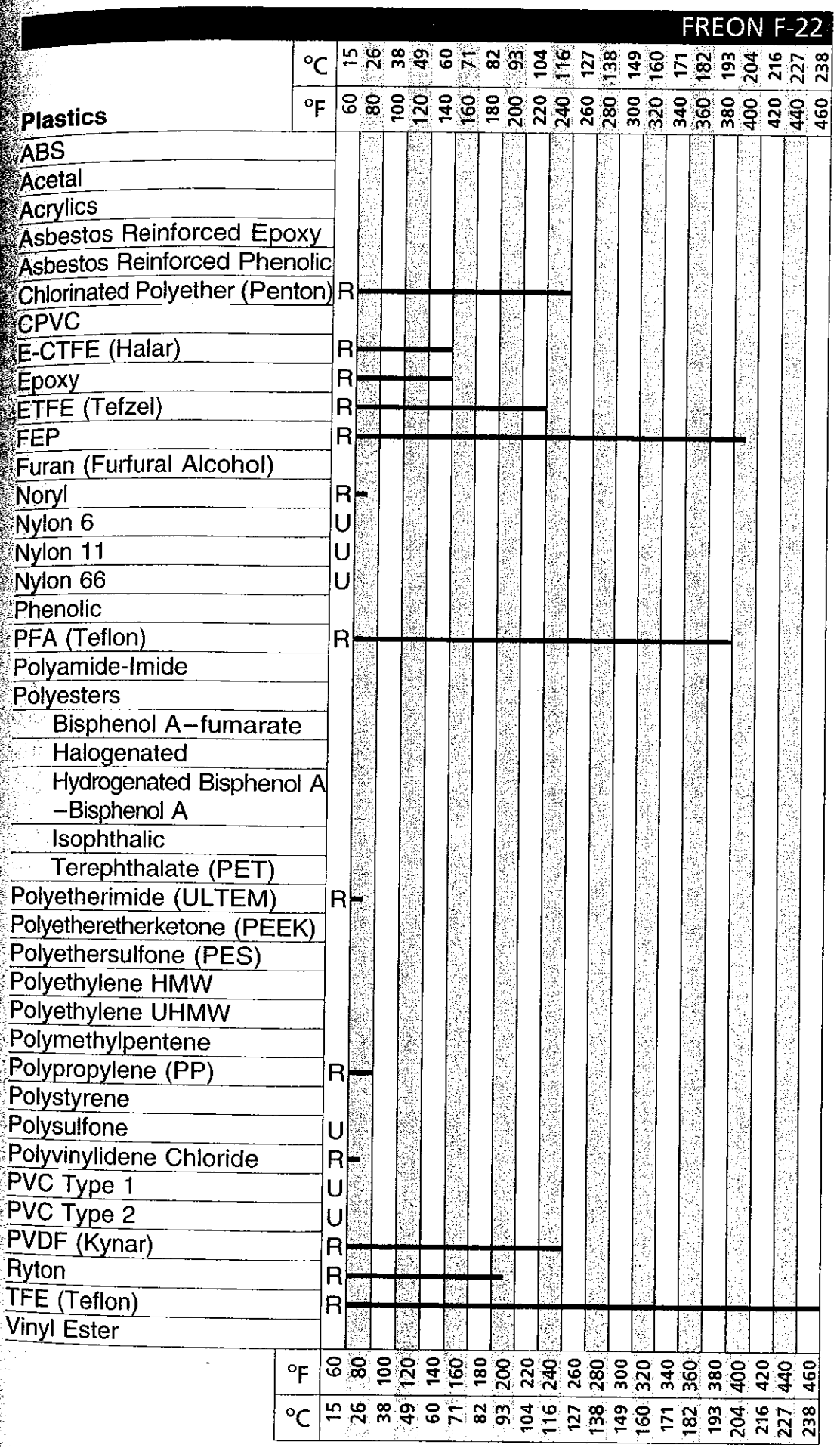
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FREON F-22

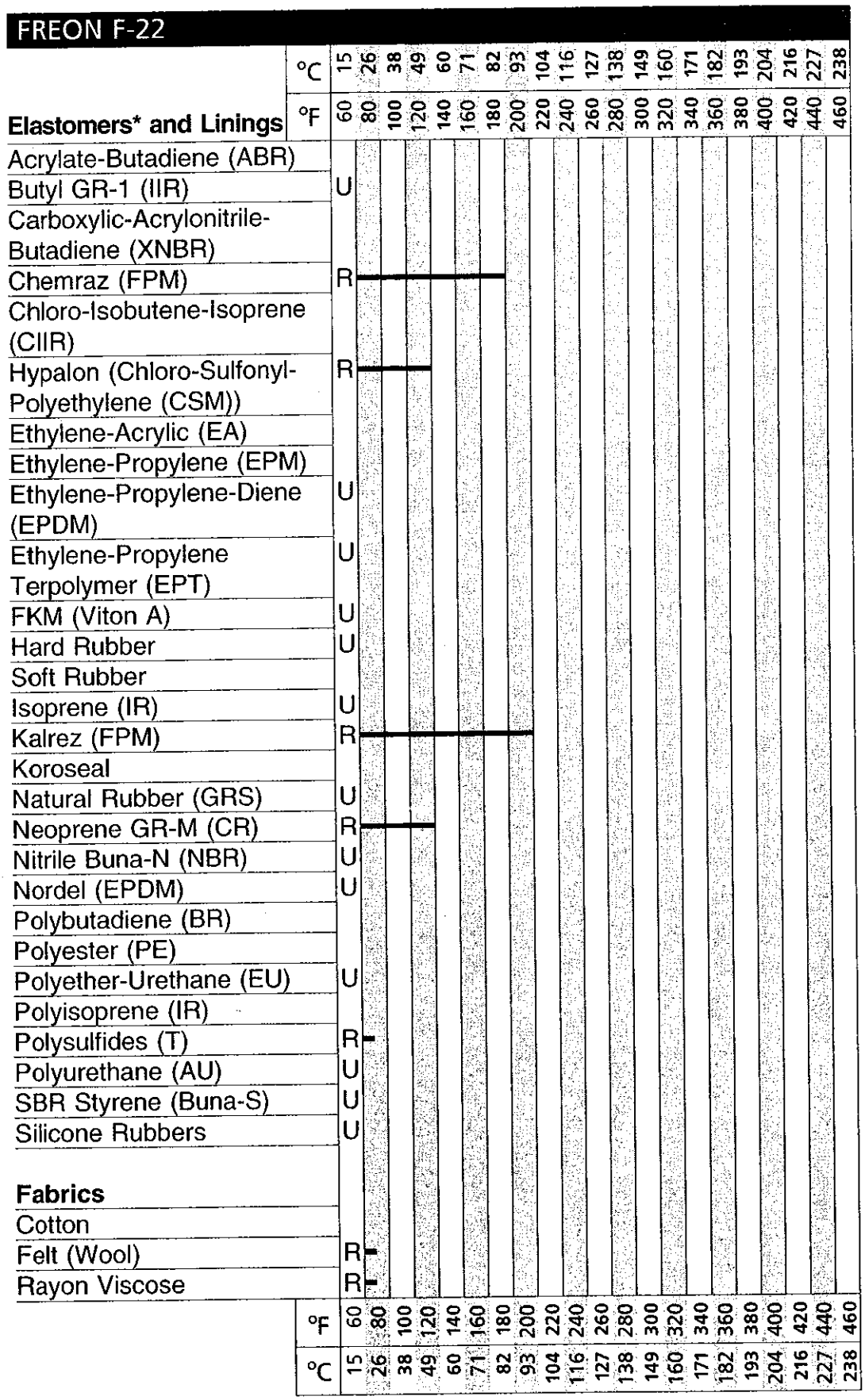


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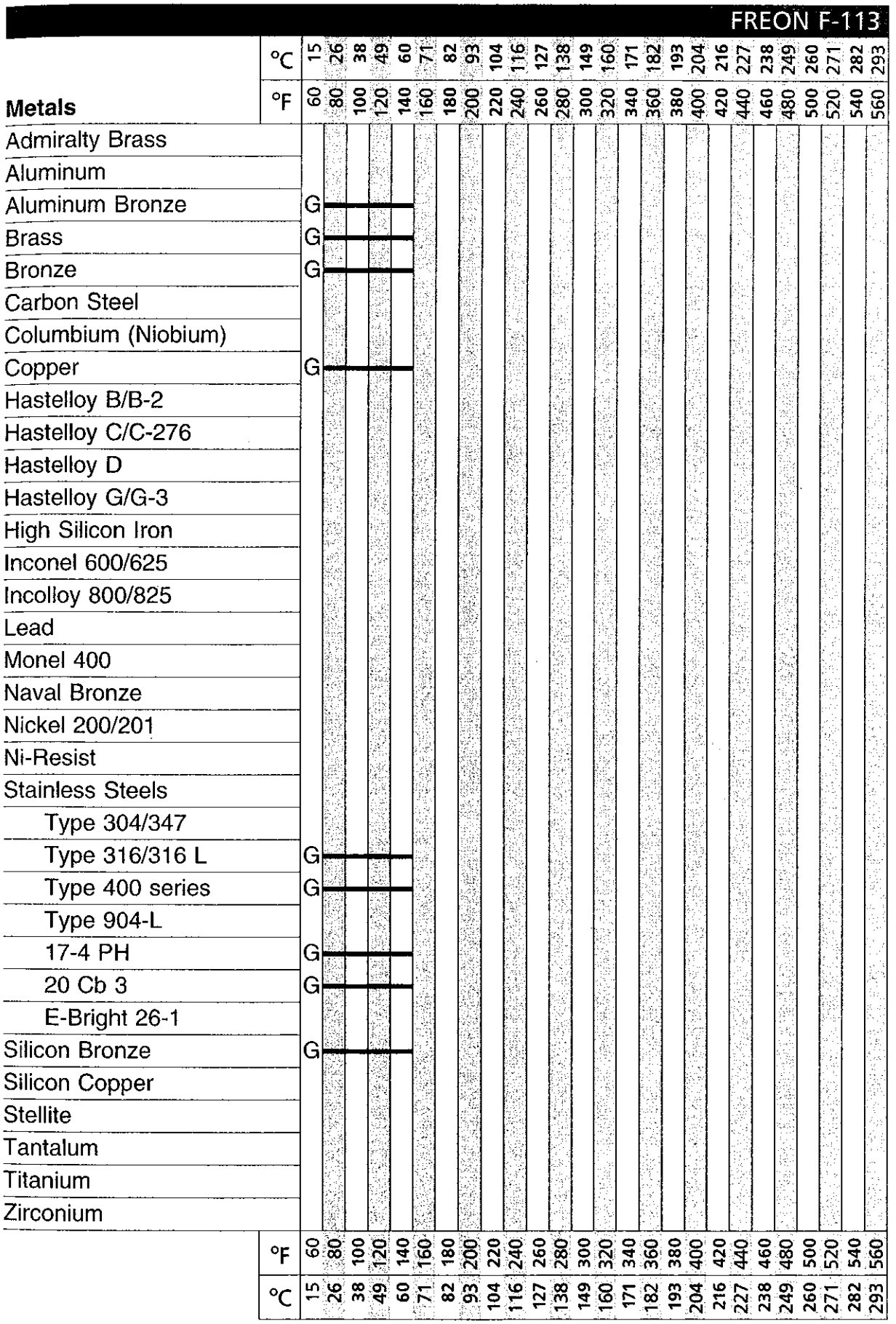
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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

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U = Unsatisfactory

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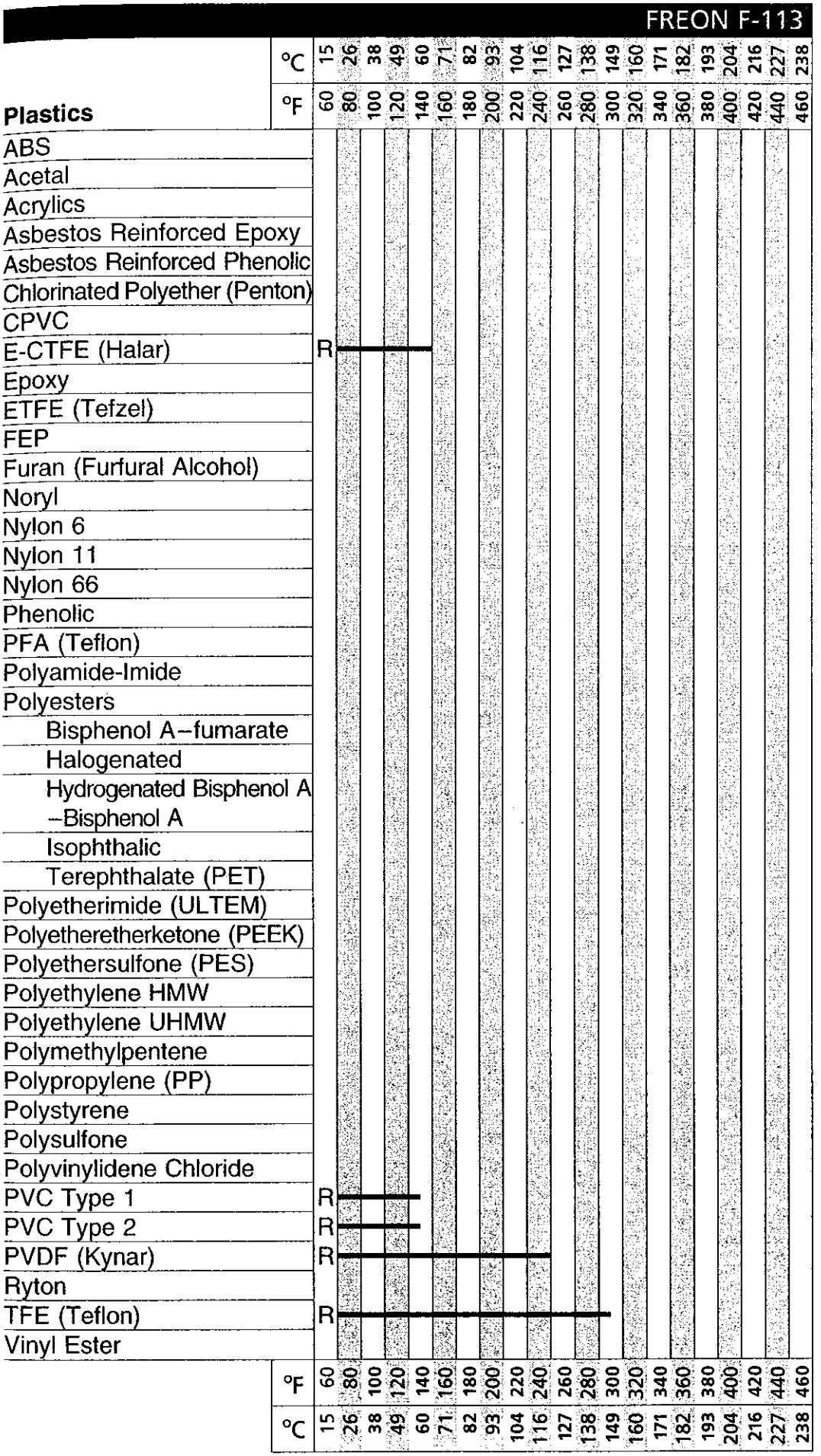
FREON F-113

Nonmetallic Materials	°F	°C
Borosilicate Glass	R	
Carbon	U	
Carbon-Graphite Resin Impregnated		
Ceramics		
Coatings		
Acrylic		
Asphalt		
Chlorinated Rubber		
Coal Tar		
Coal Tar Epoxy		
Epoxy General Purpose		
Epoxy Chemical Resistant		
Epoxy Polyamide		
Oil Base (Alkyd, Epoxy, Urethane)		
Phenolic		
Polyester		
Polyvinyl Chloride		
Silicones		
Urethanes		
Vinyls		
Water Base		
Zinc Rich		
Mortars		
Silicate		
Sodium Silicate		
Potassium Silicate		
Silica		
Sulfur		
Furan Resin		
Polyester		
Epoxy		

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

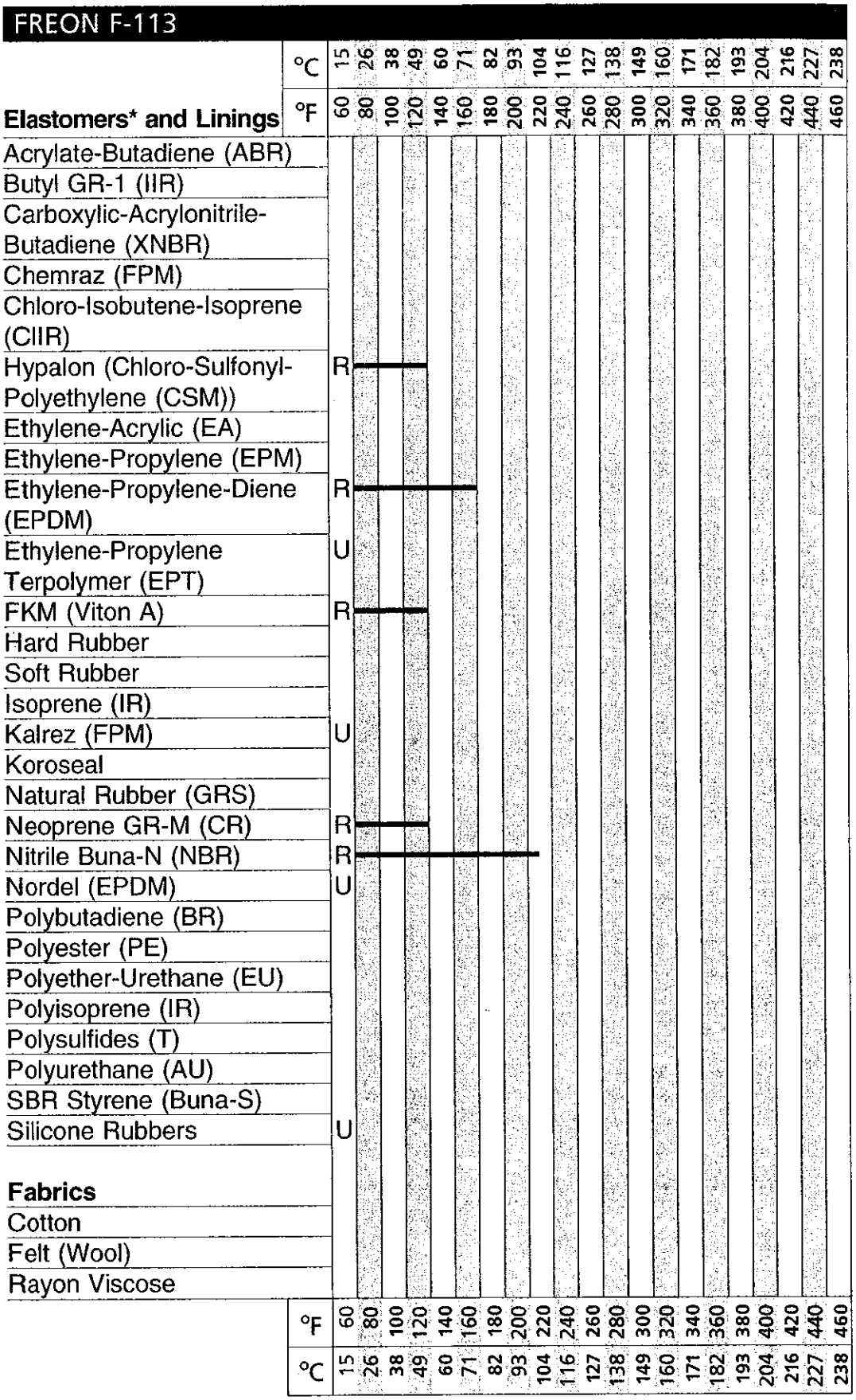
°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

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FREON F-113



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FISH SOLUBLES

Metals	°C	°F
Admiralty Brass		
Aluminum		
Aluminum Bronze	U	
Brass	S	
Bronze		
Carbon Steel	G	
Columbium (Niobium)		
Copper		
Hastelloy B/B-2		
Hastelloy C/C-276		
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625		
Incolloy 800/825		
Lead		
Monel 400	E	
Naval Bronze		
Nickel 200/201		
Ni-Resist		
Stainless Steels		
Type 304/347		
Type 316/316 L	E	G
Type 400 series	G	
Type 904-L		
17-4 PH	G	
20 Cb 3	E	
E-Bright 26-1		
Silicon Bronze	G	
Silicon Copper		
Stellite		
Tantalum		
Titanium		
Zirconium		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400		E																									
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L		G																									
Type 400 series		G																									
Type 904-L																											
17-4 PH		G																									
20 Cb 3		E																									
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite		E																									
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

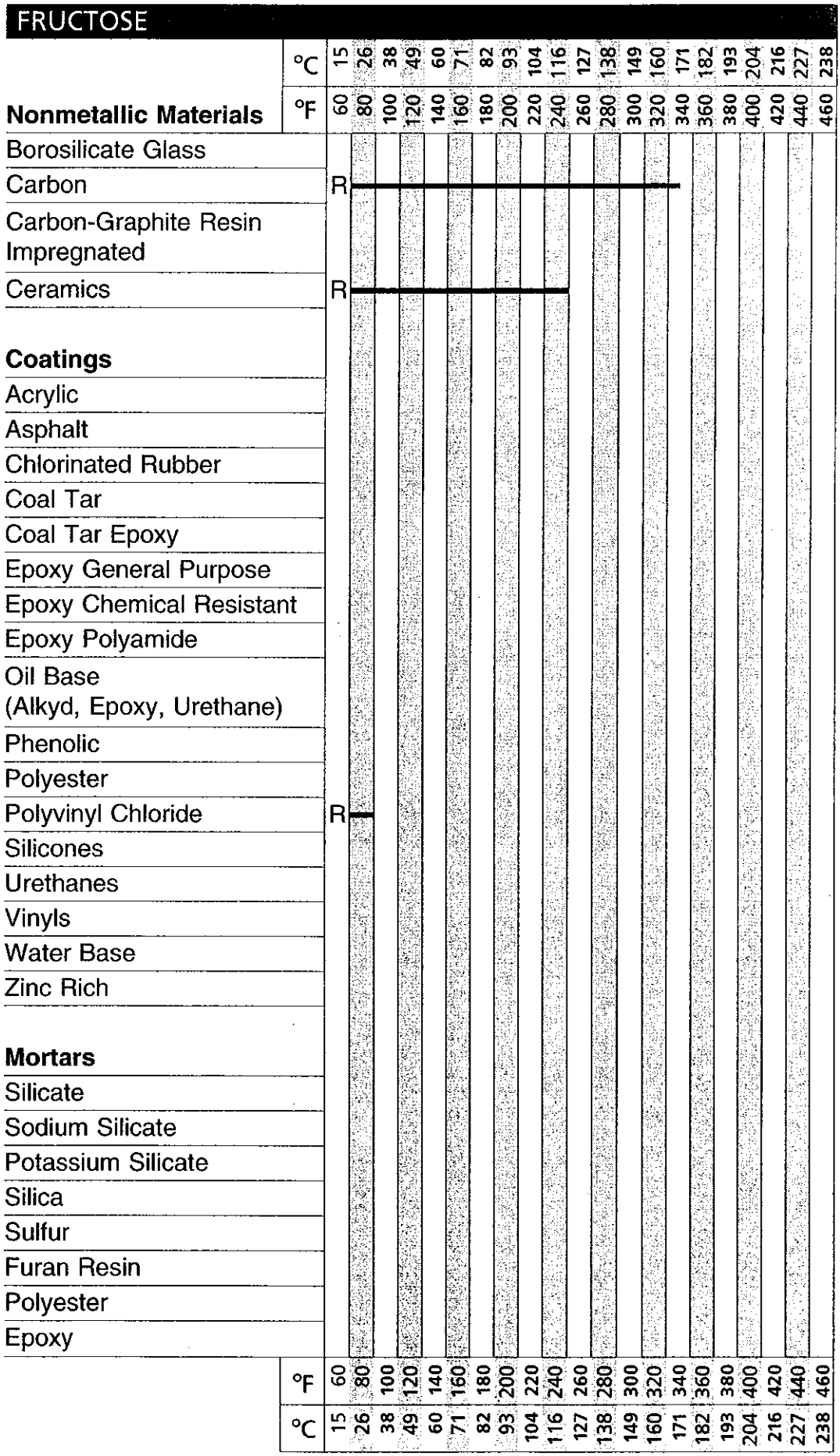
R = Resistant

U = Unsatisfactory

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FRUCTOSE



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Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS		R																				
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)		R																				
CPVC		R																				
E-CTFE (Halar)		R																				
Epoxy																						
ETFE (Tefzel)																						
FEP		R																				
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)		R																				
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A–Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW		R																				
Polyethylene UHMW		R																				
Polymethylpentene																						
Polypropylene (PP)		R																				
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride		R																				
PVC Type 1		R																				
PVC Type 2		R																				
PVDF (Kynar)		R																				
Ryton																						
TFE (Teflon)		R																				
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

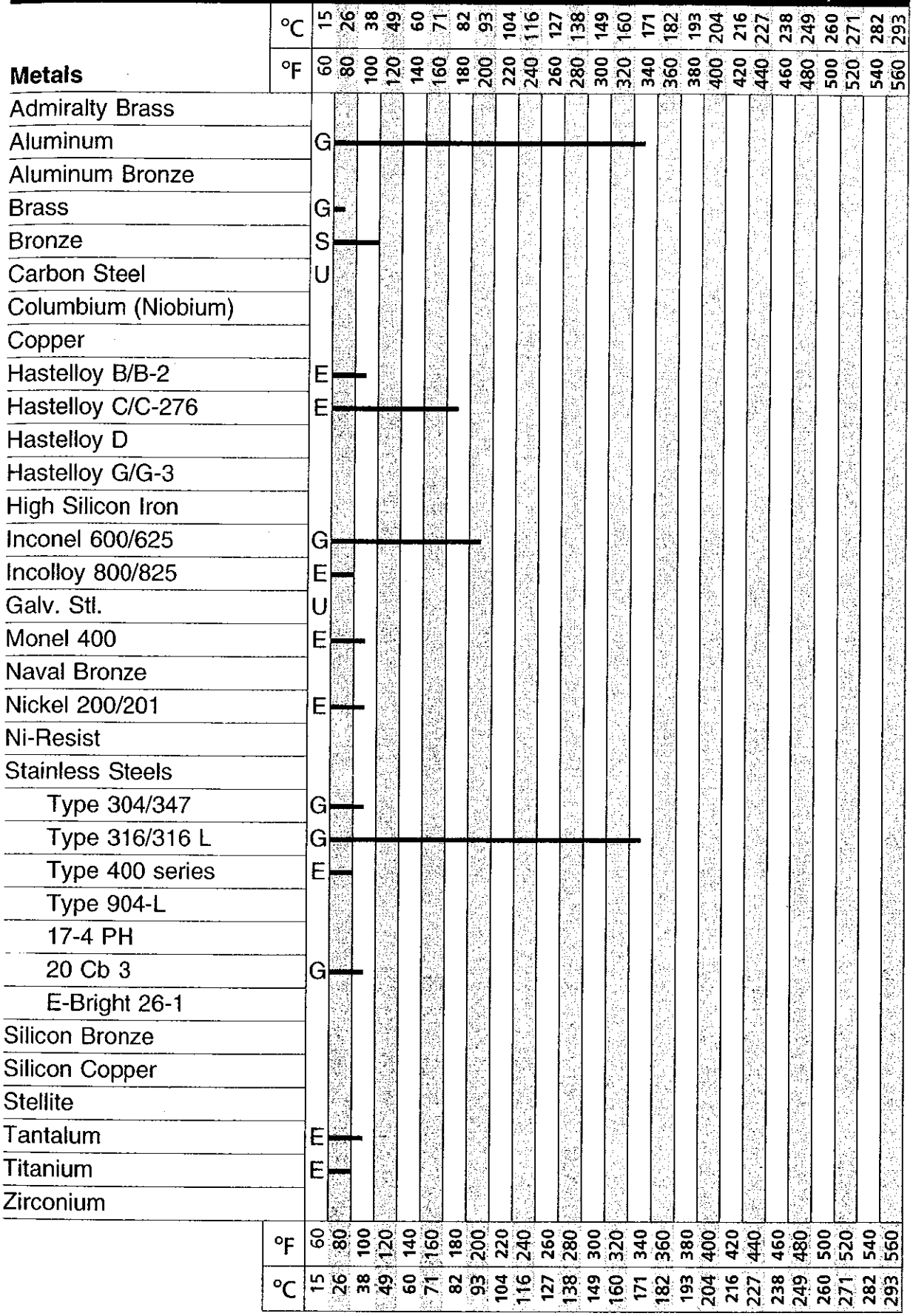
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Elastomers* and Linings	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)	R																					
Ethylene-Propylene Terpolymer (EPT)	R																					
FKM (Viton A)	R																					
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)																						
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)	R																					
Nitrile Buna-N (NBR)	R																					
Nordel (EPDM)	R																					
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

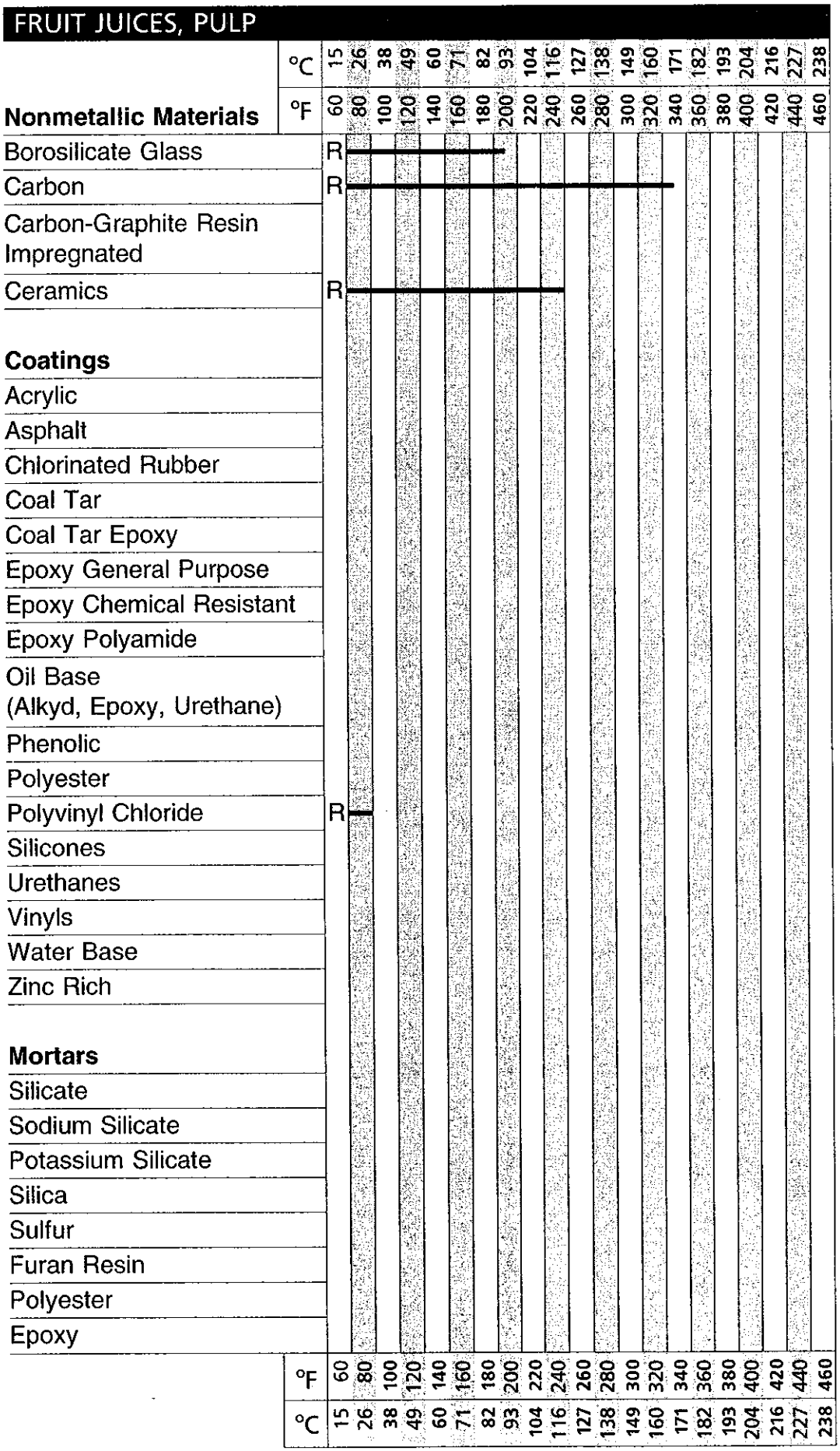
R = Resistant

U = Unsatisfactory

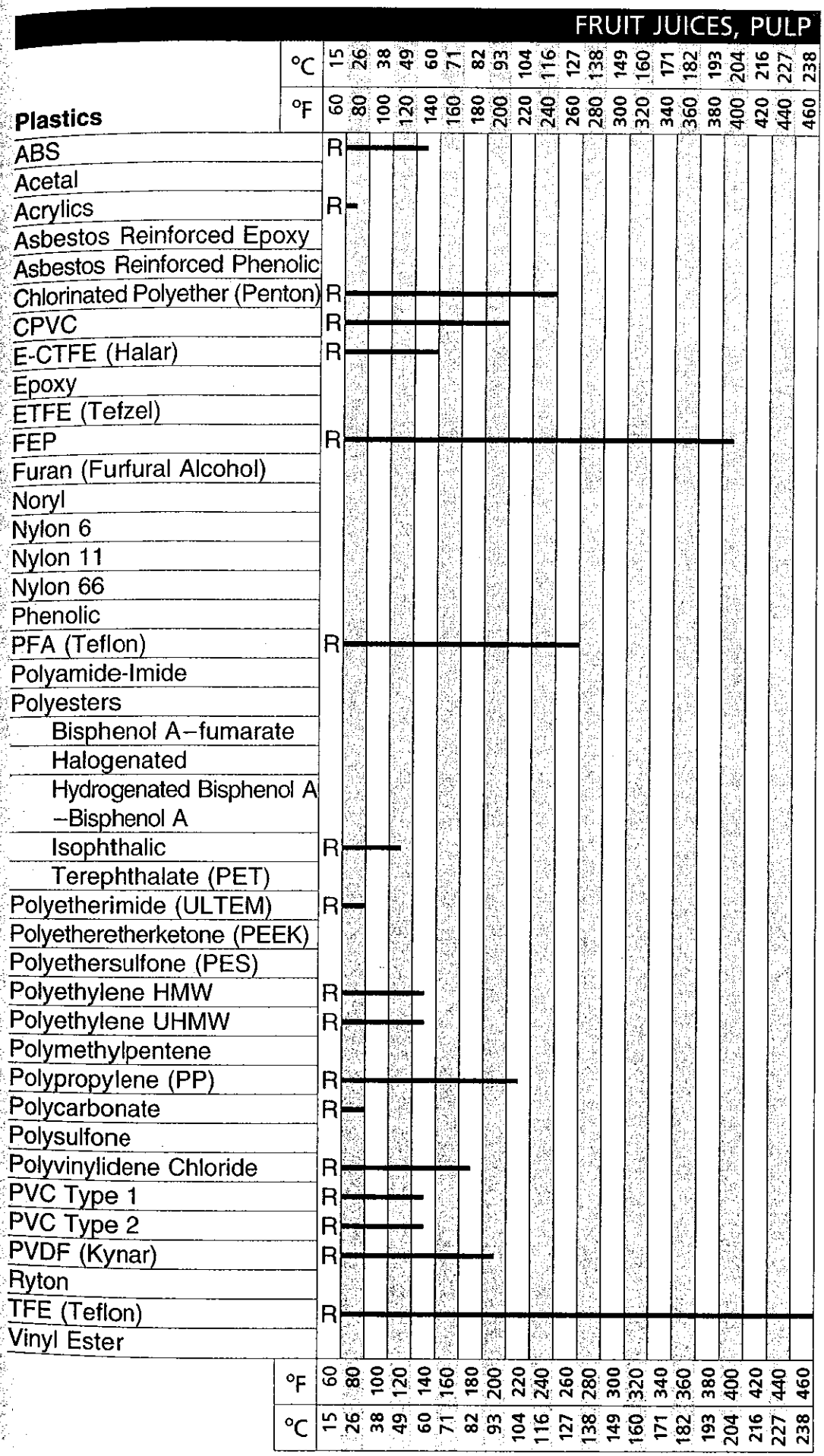
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FRUIT JUICES, PULP

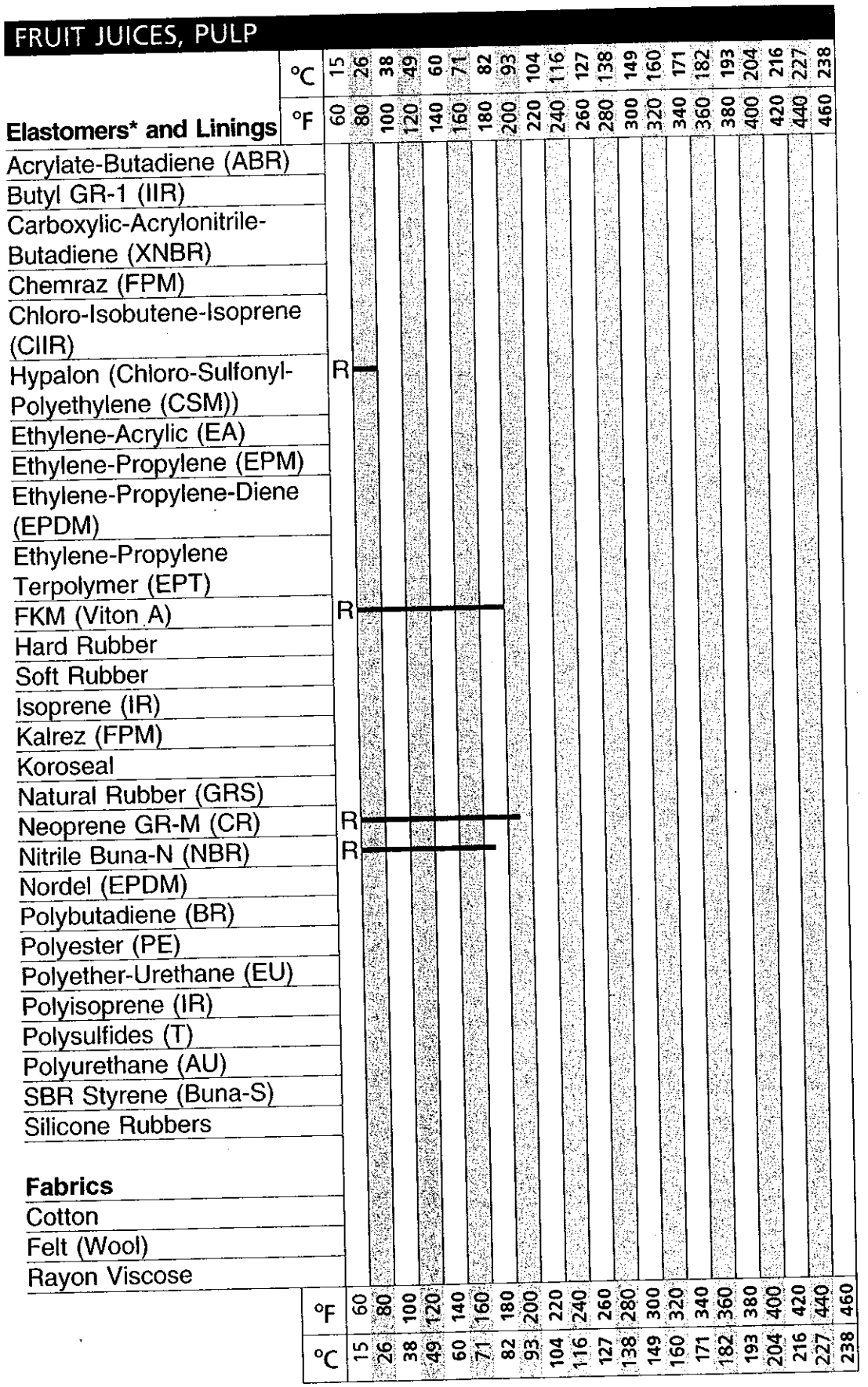


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FRUIT JUICES, PULP

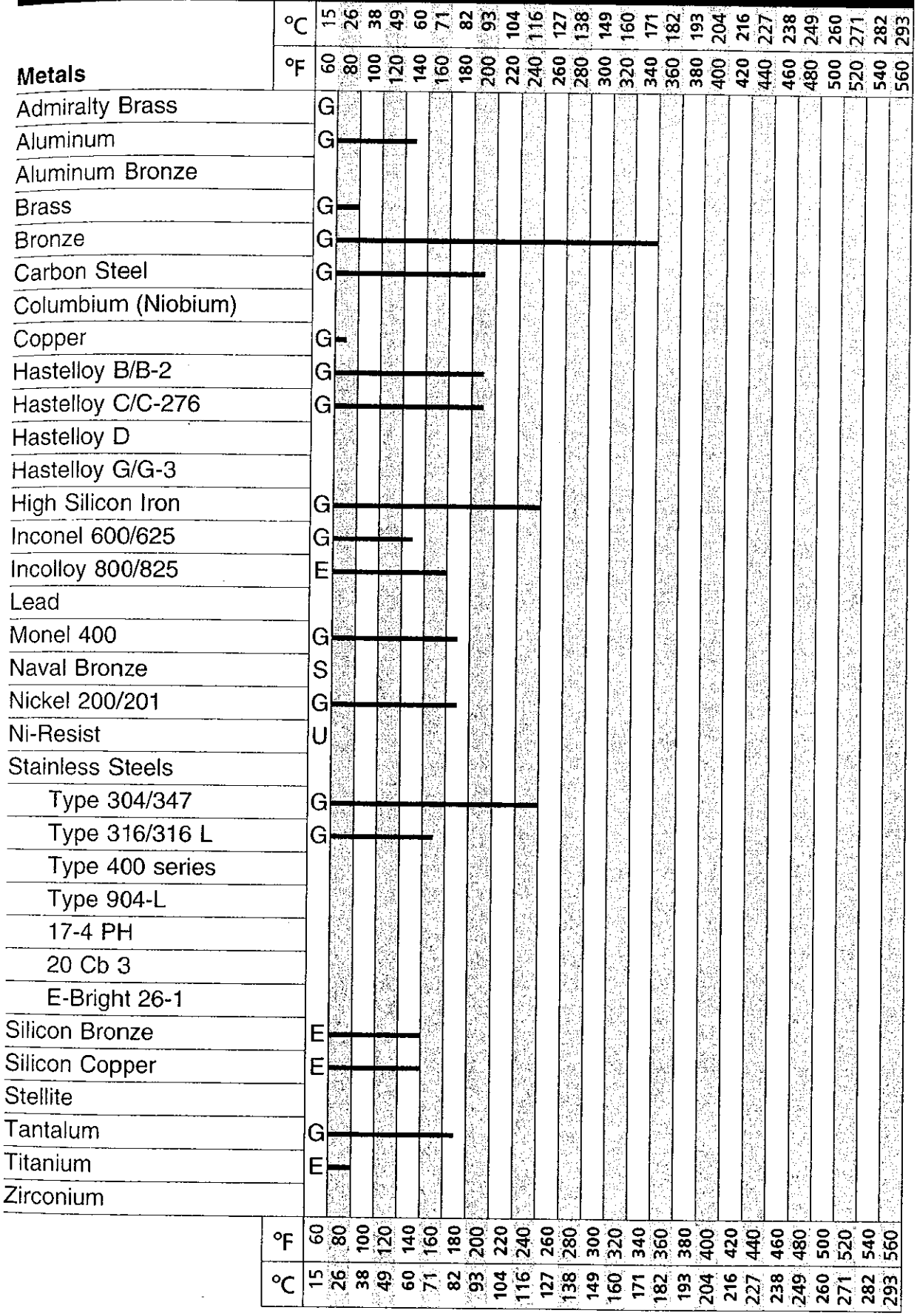


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FUEL OIL



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

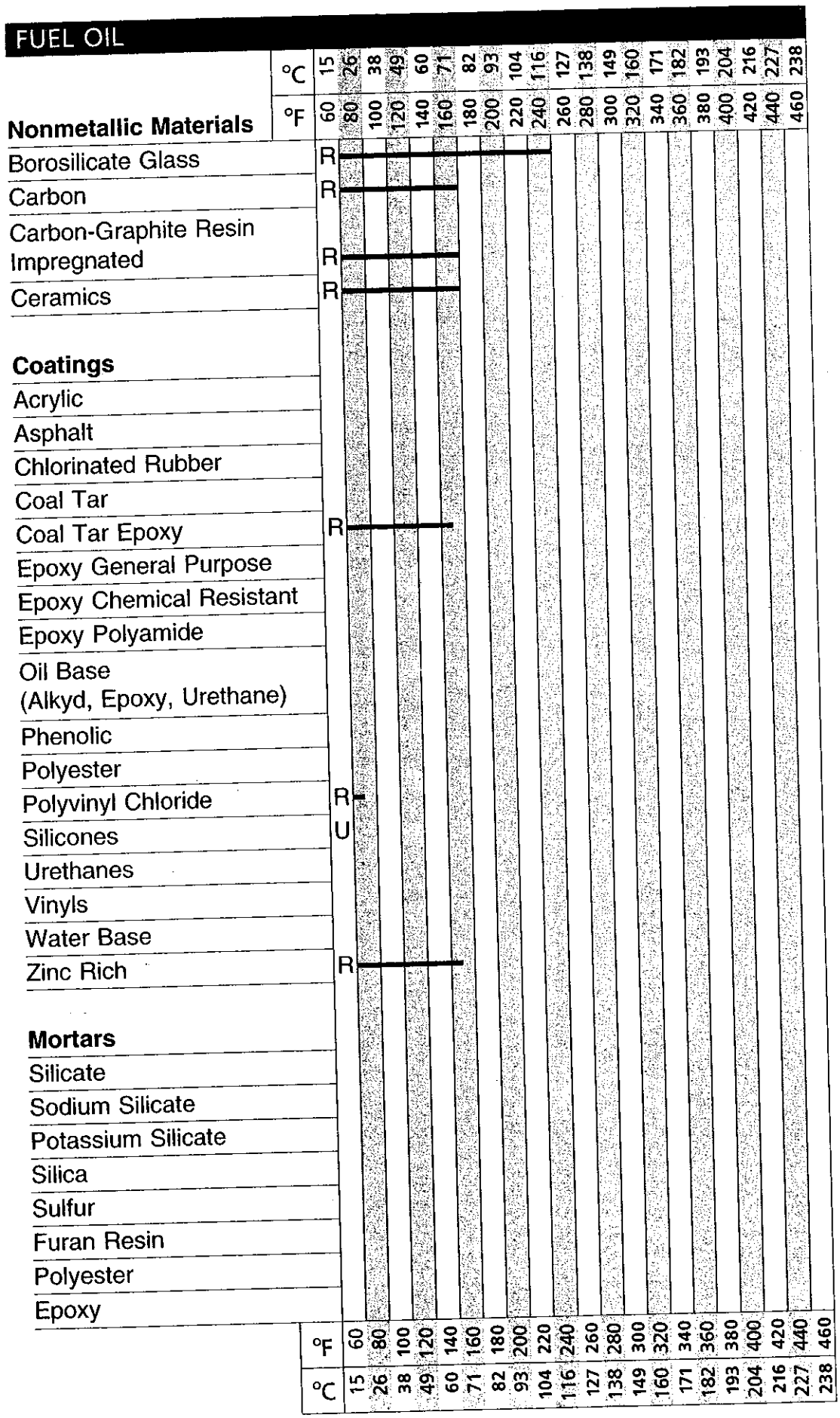
R = Resistant

U = Unsatisfactory

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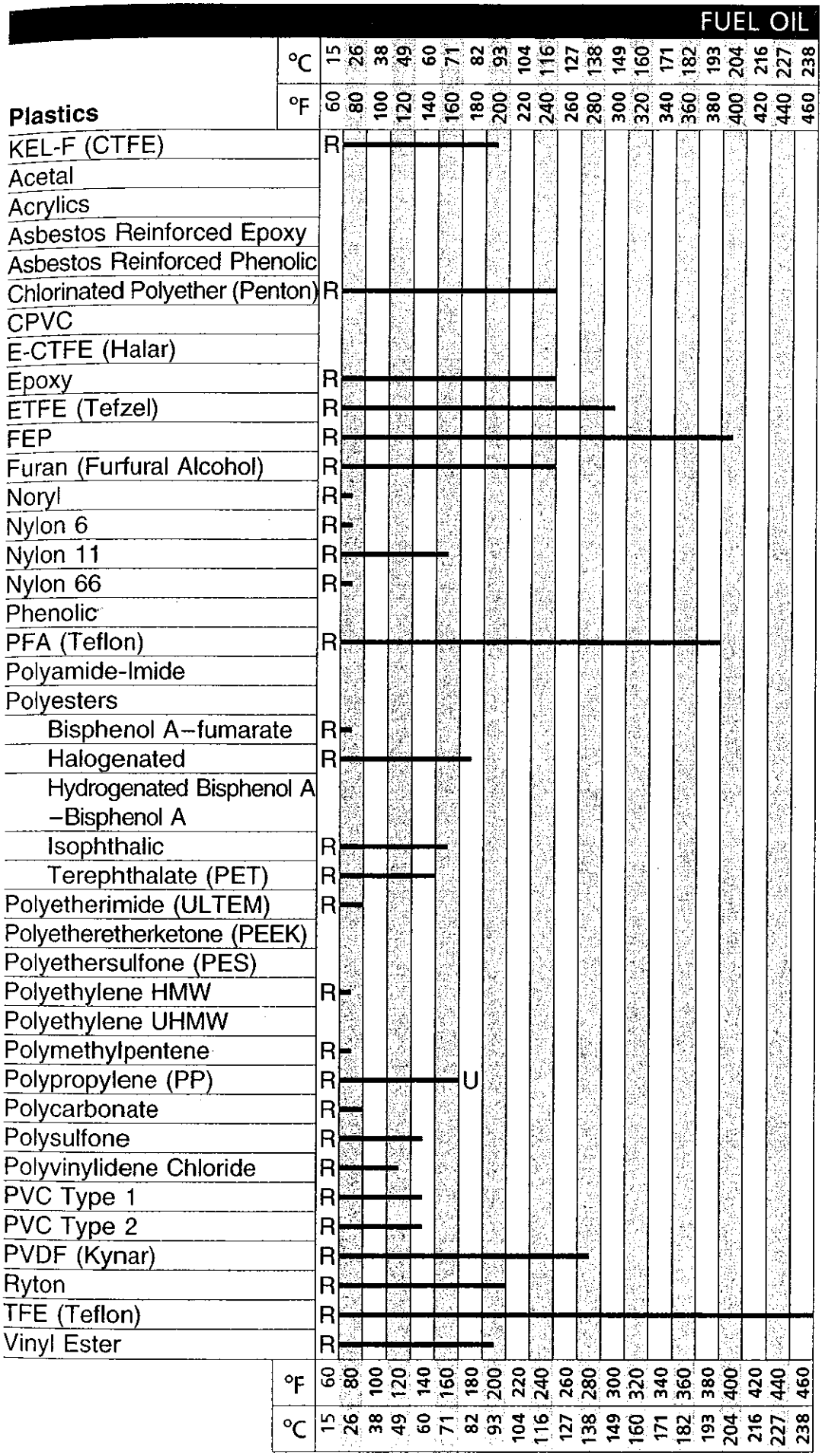
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FUEL OIL



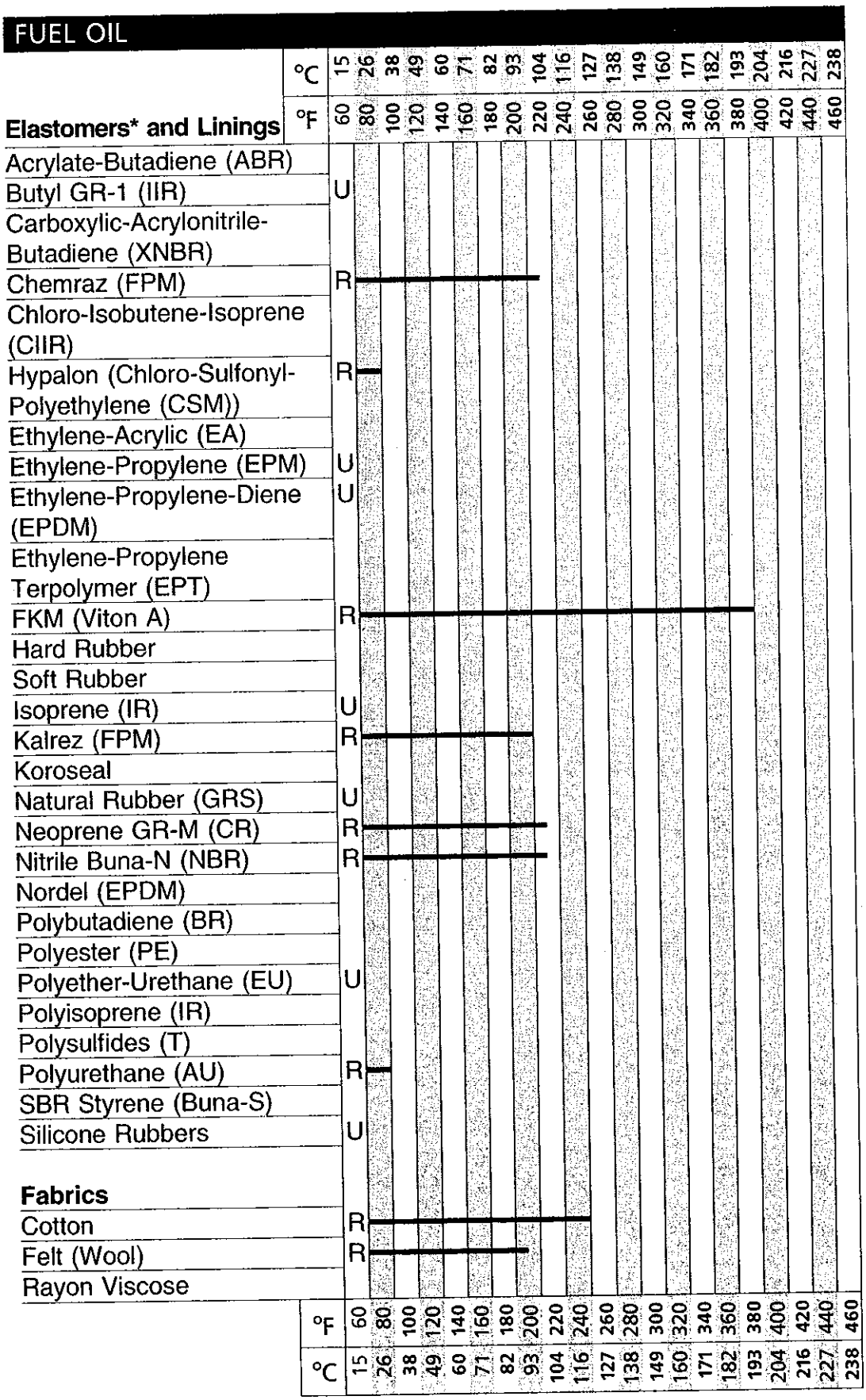
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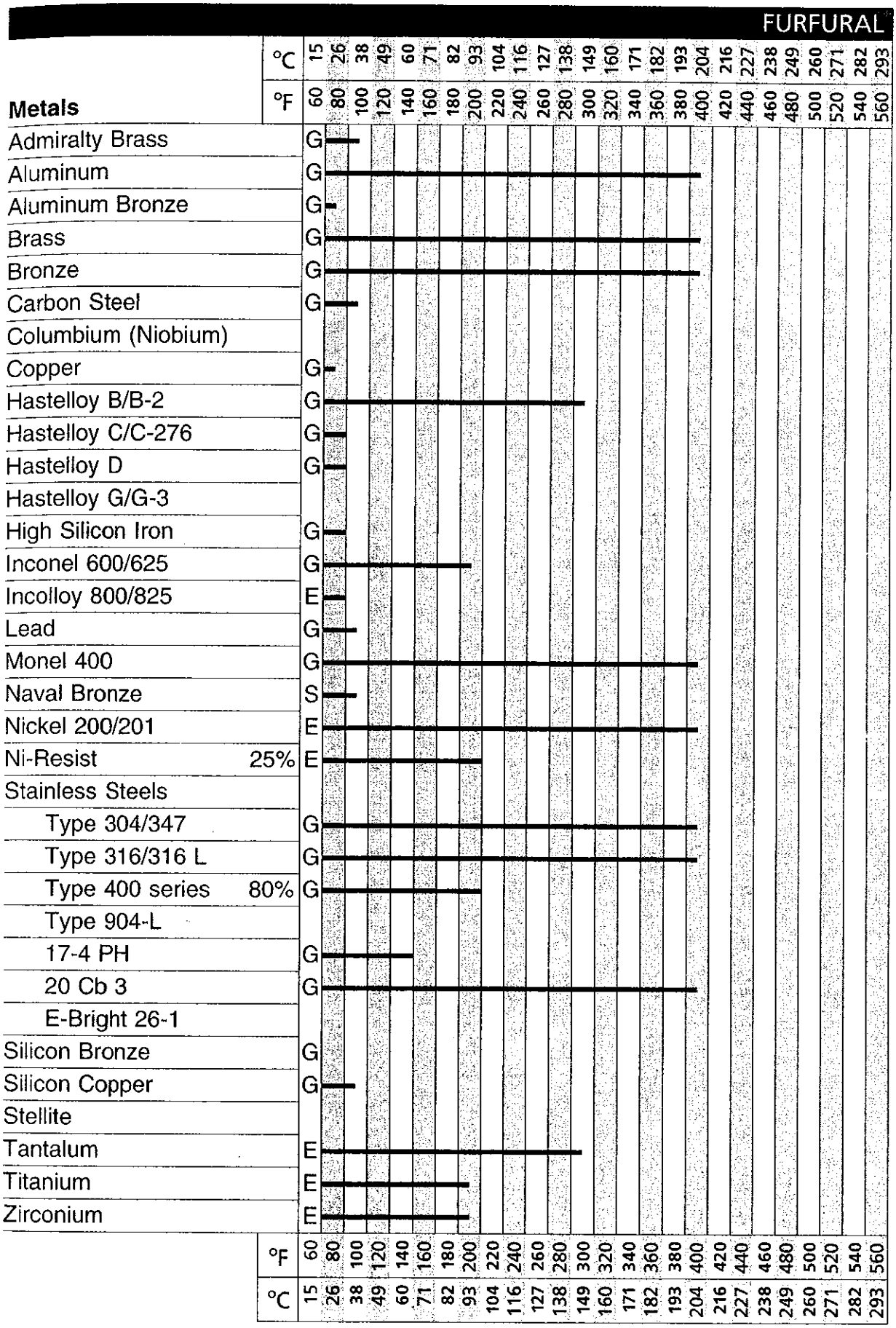
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FOR NONMETALLICS

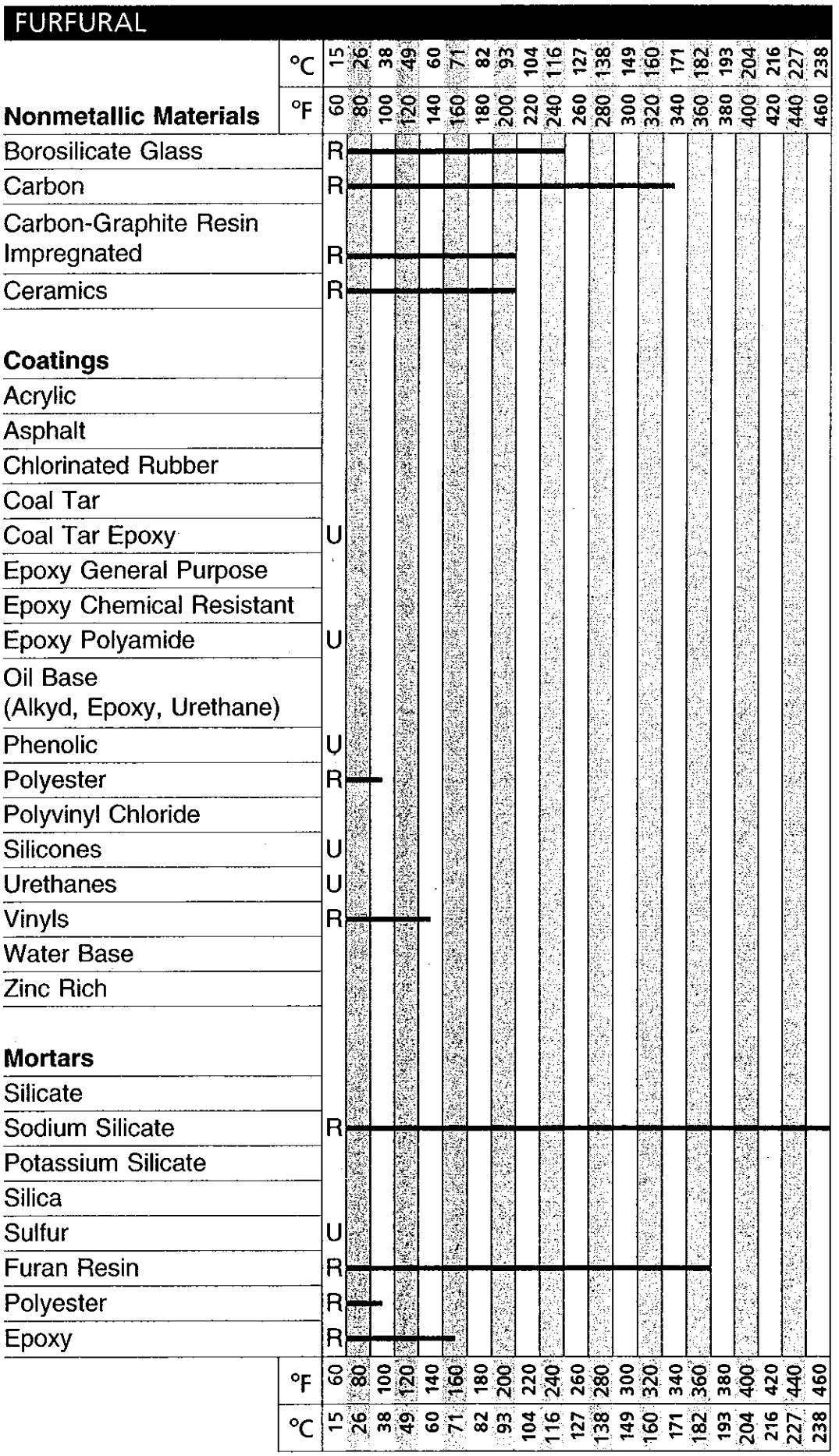
R = Resistant

U = Unsatisfactory

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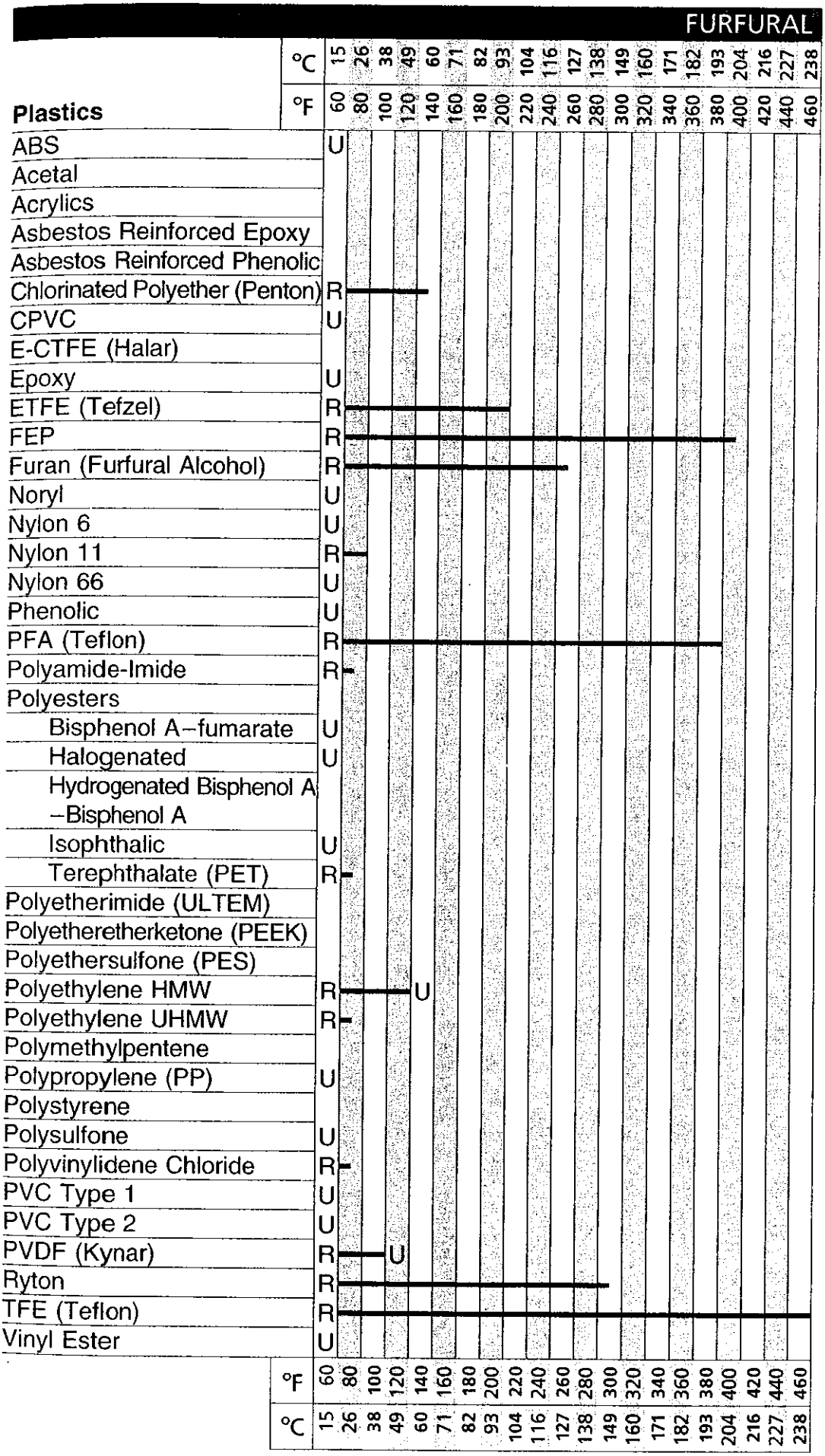
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FURFURAL



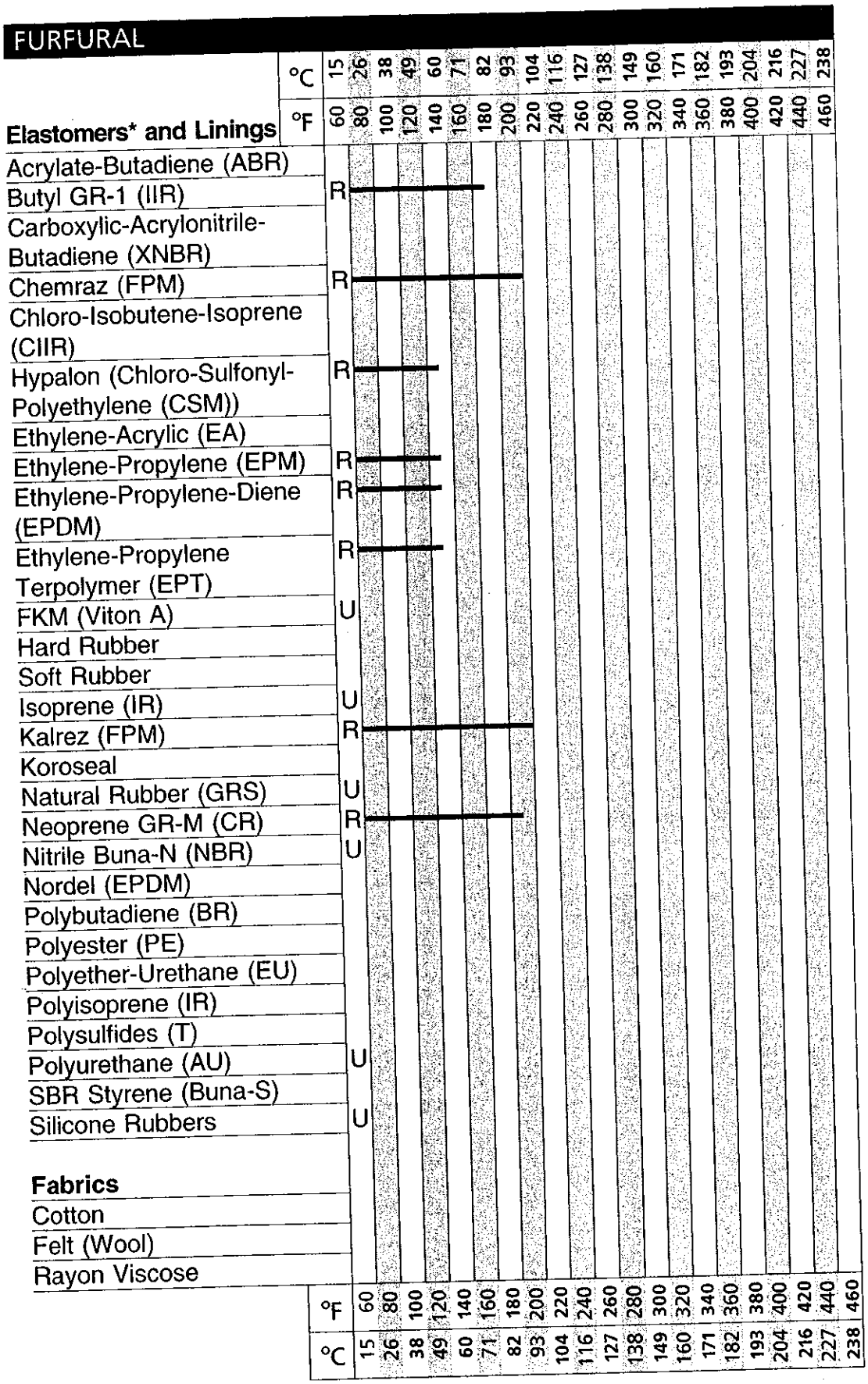
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FURFURAL



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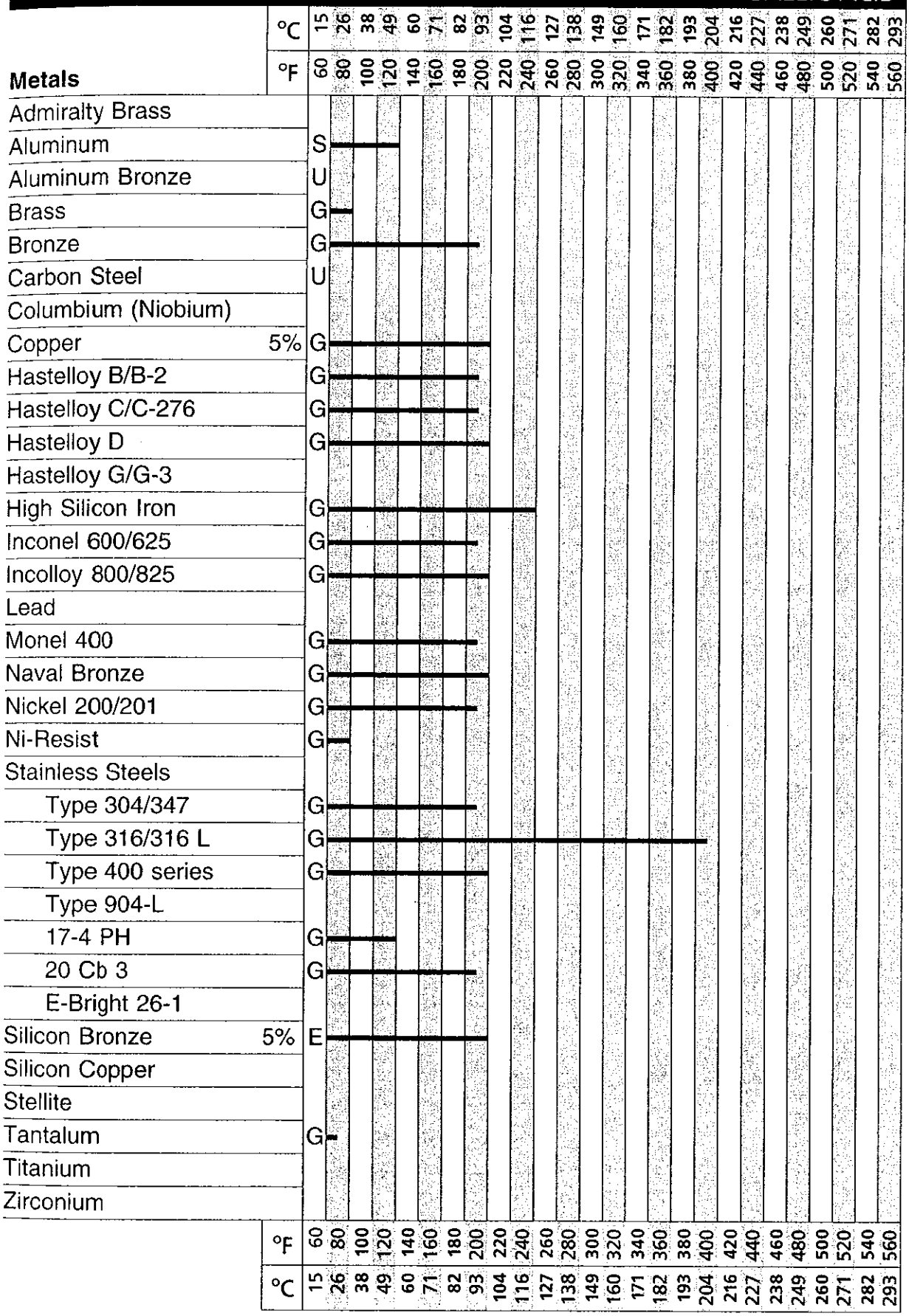
FURFURAL



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S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

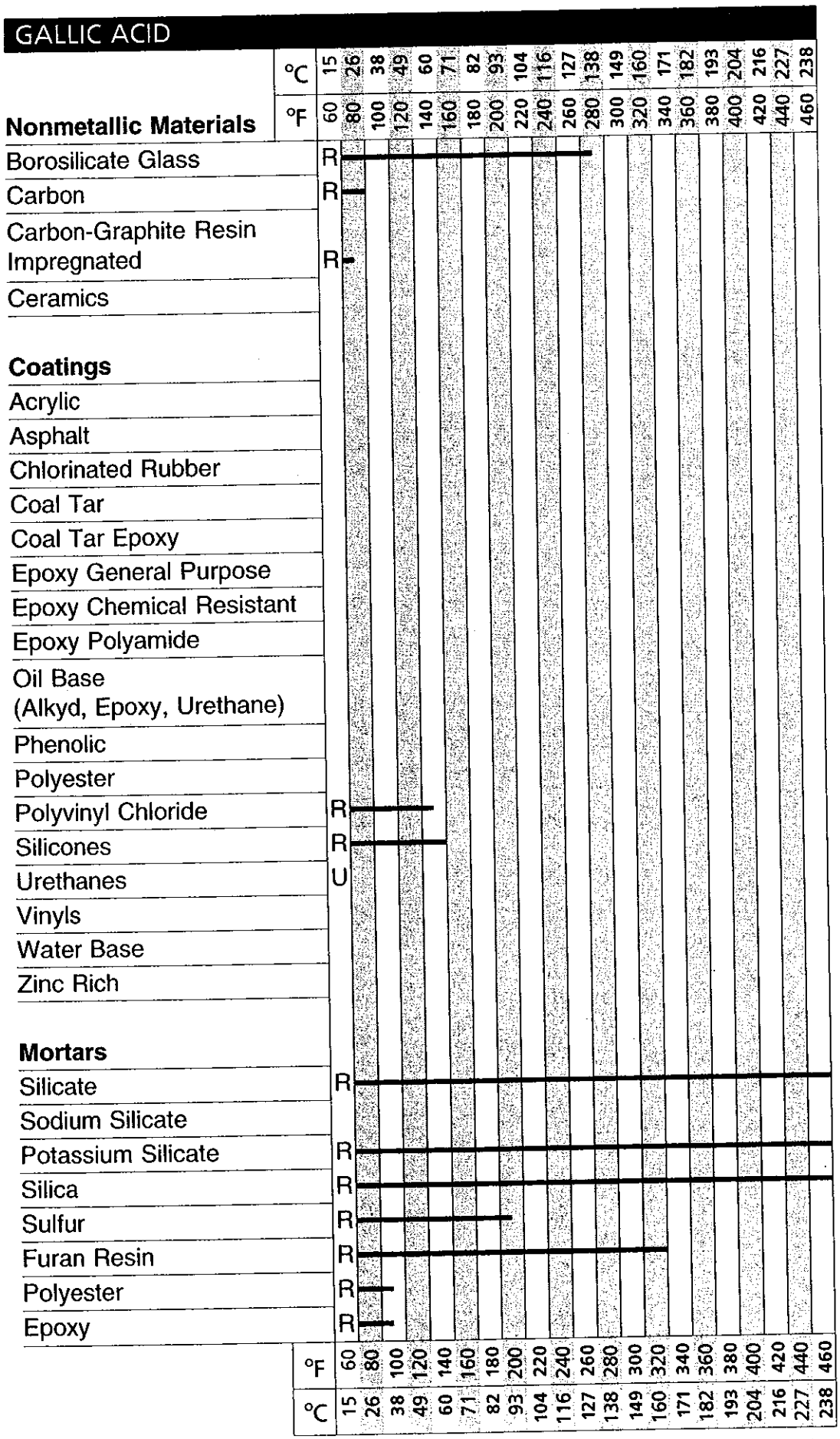
R = Resistant

U = Unsatisfactory

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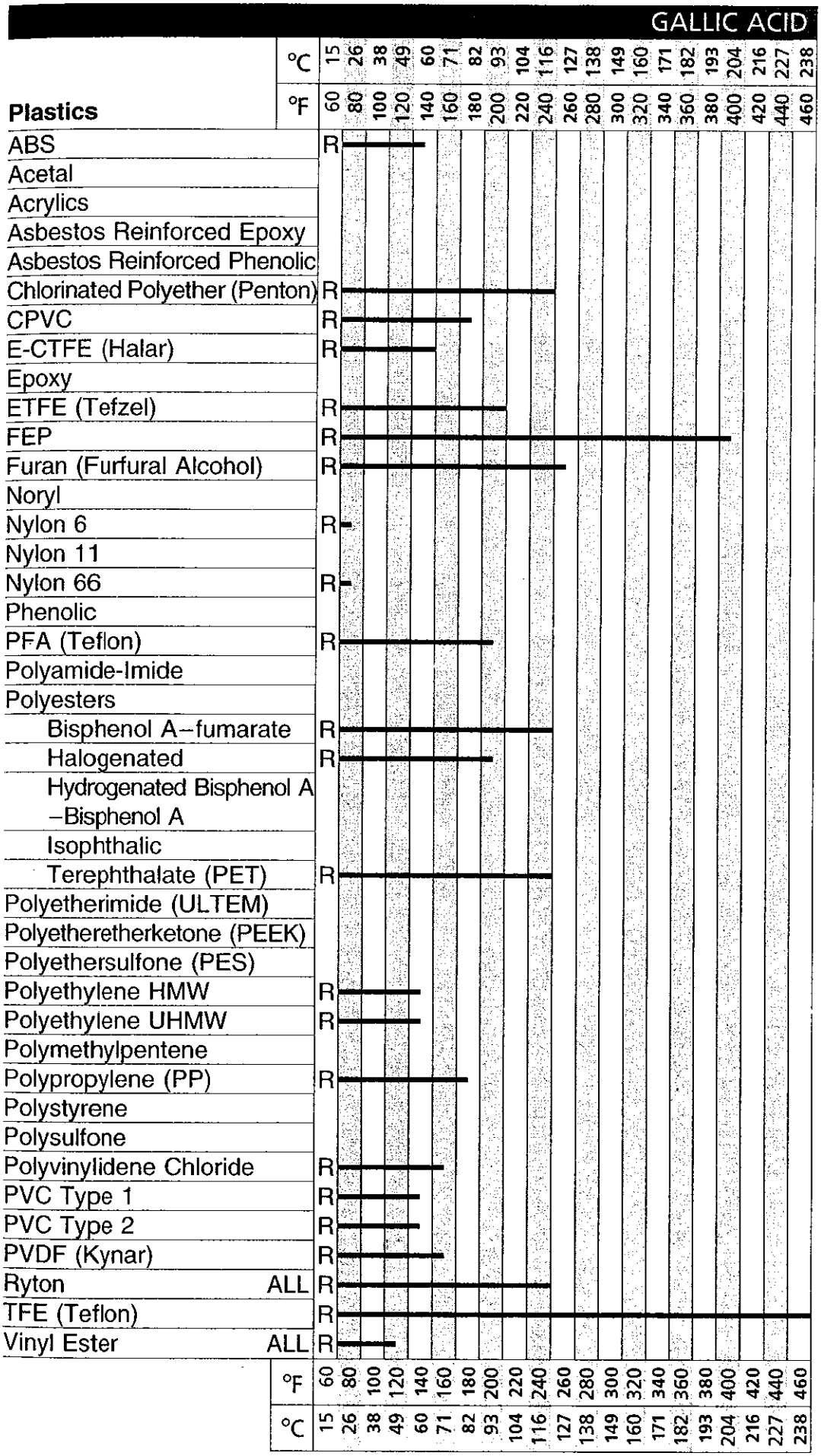
GALLIC ACID



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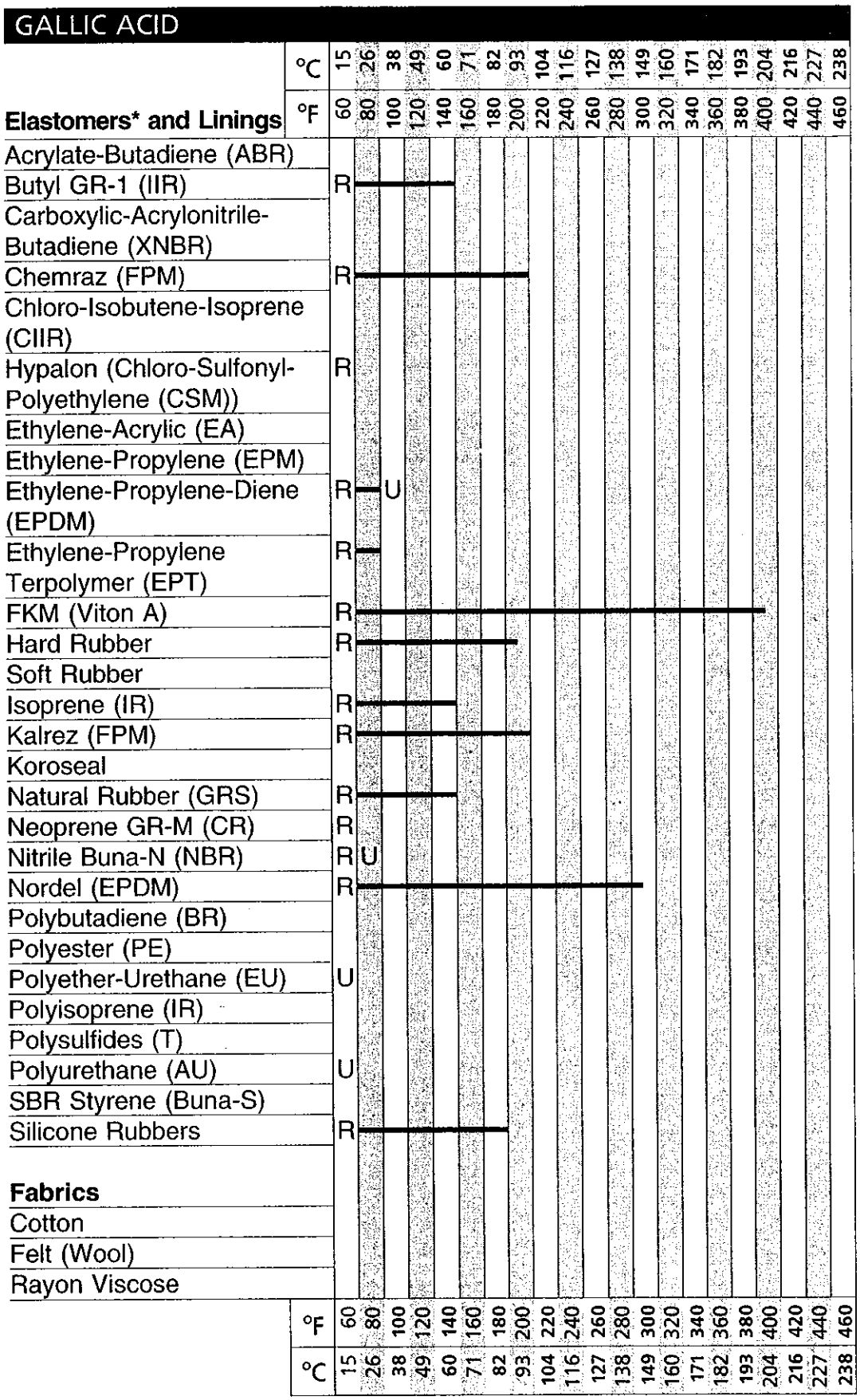
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GALLIC ACID

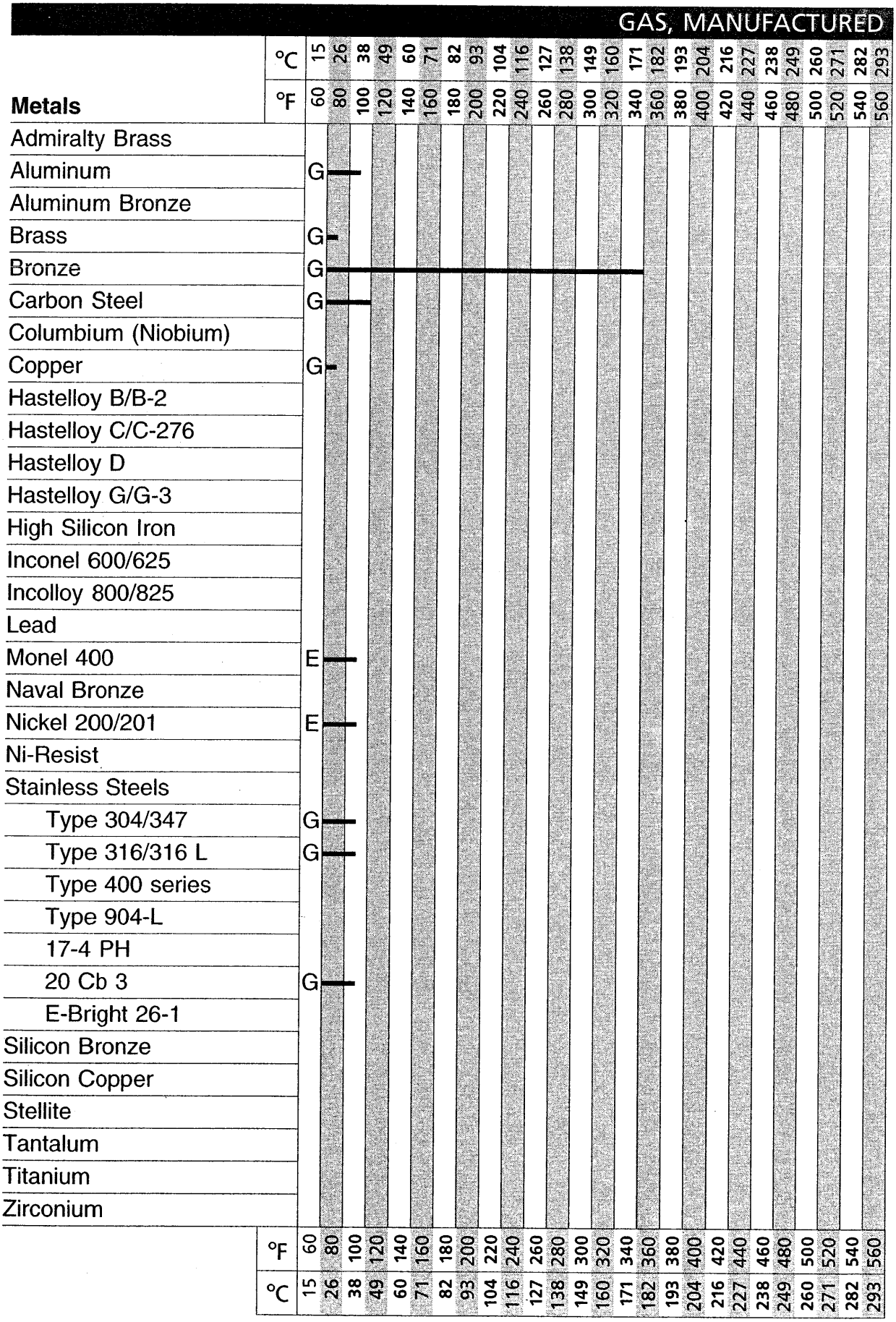


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GAS, MANUFACTURED



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

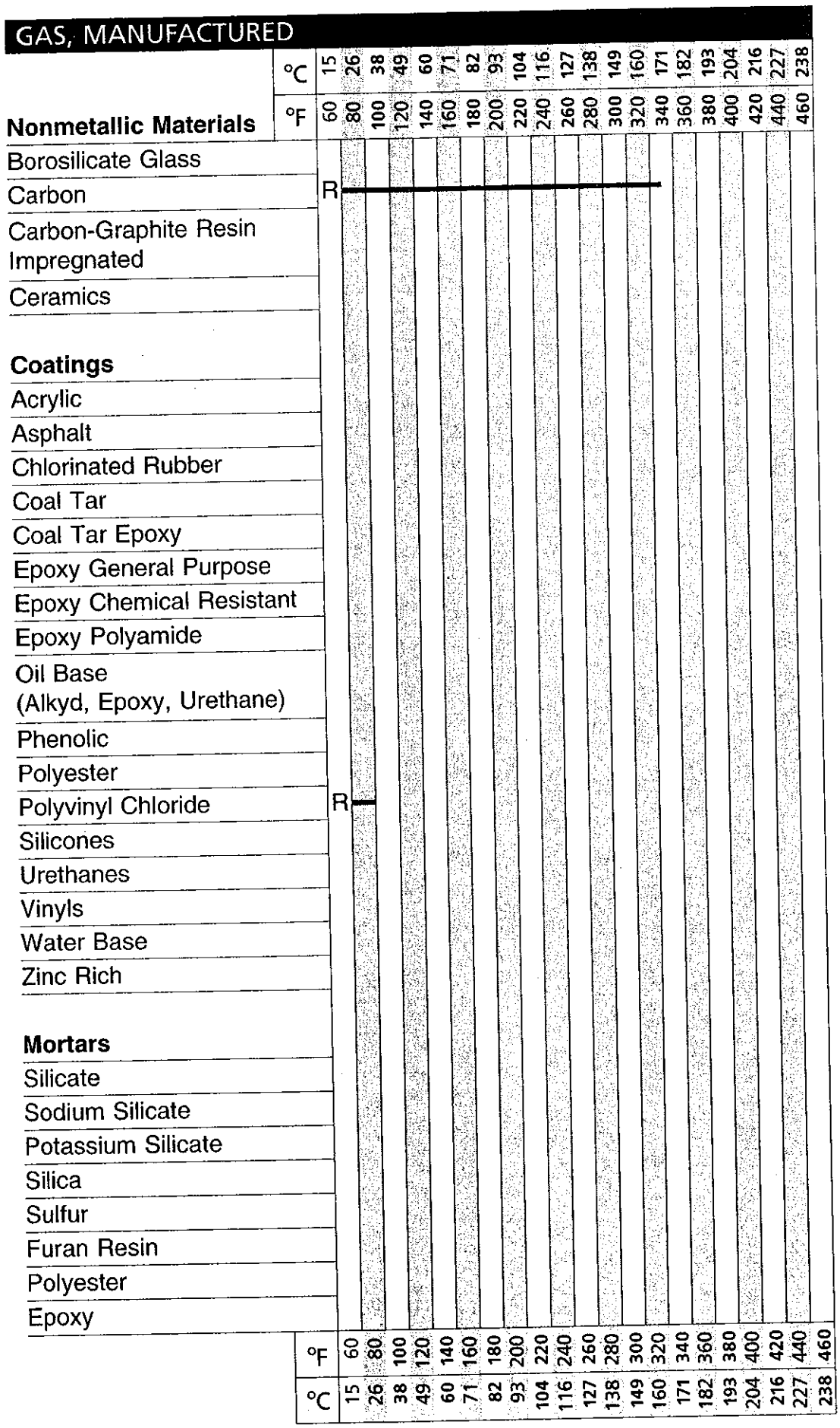
R = Resistant

U = Unsatisfactory

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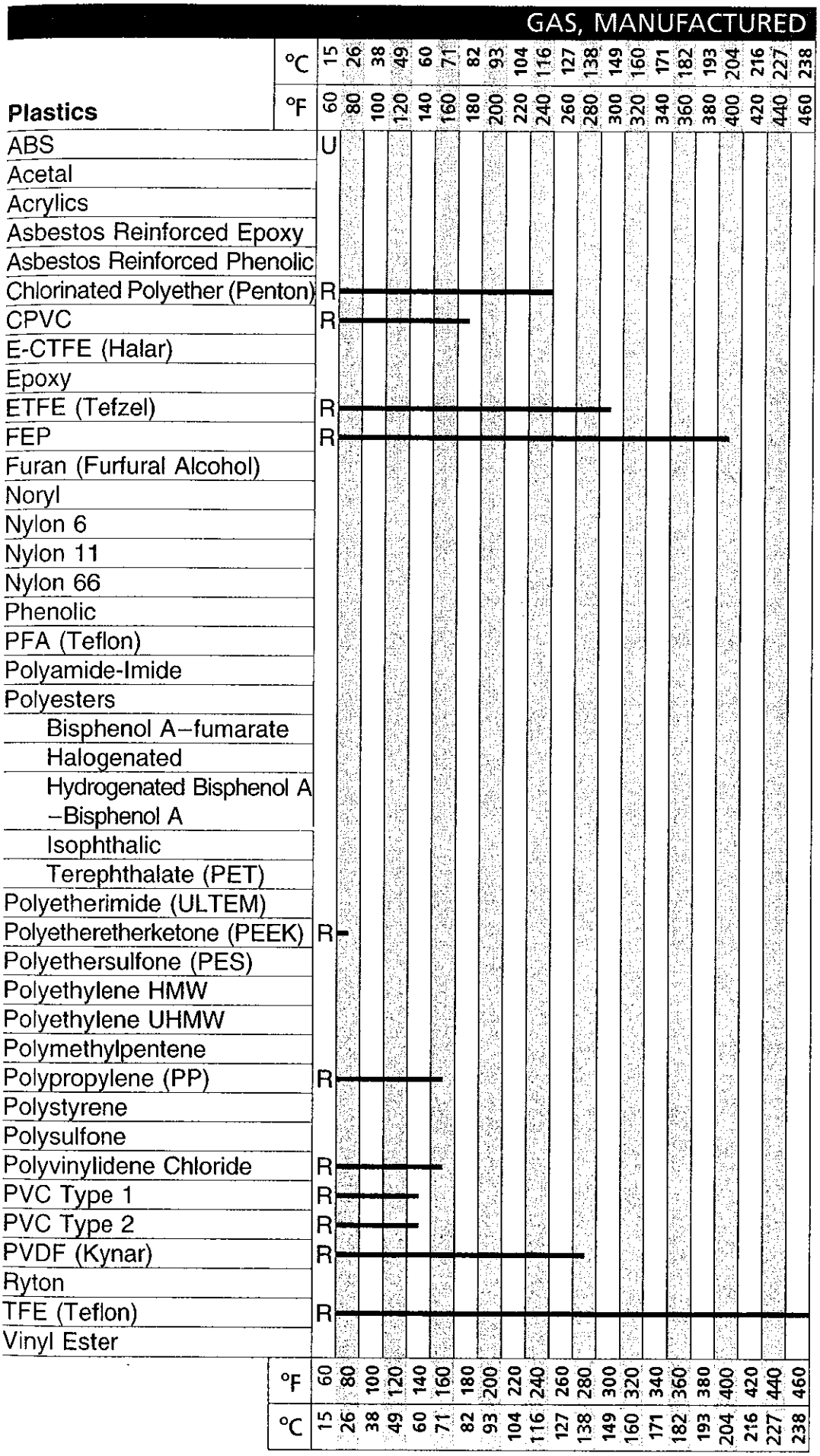
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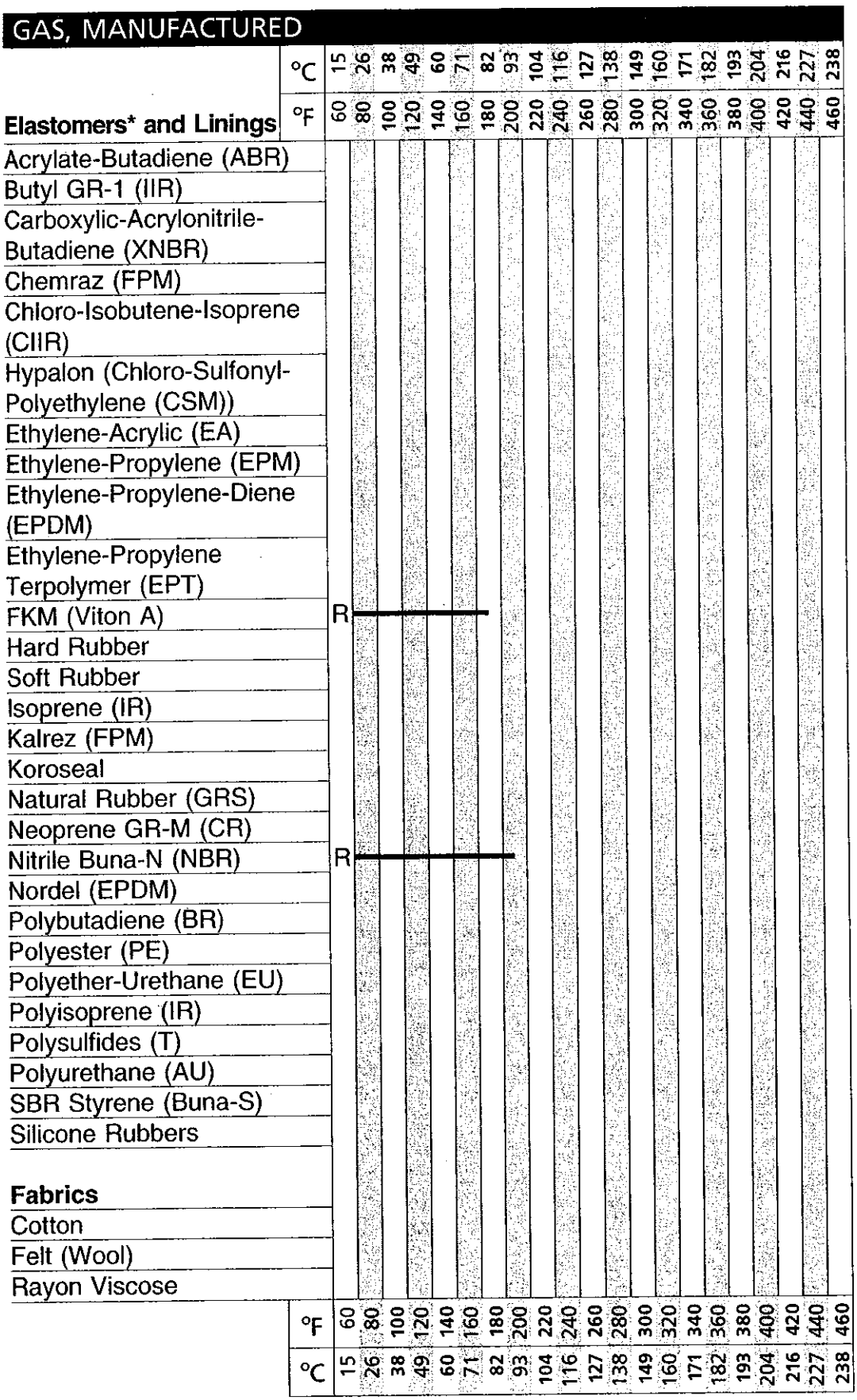
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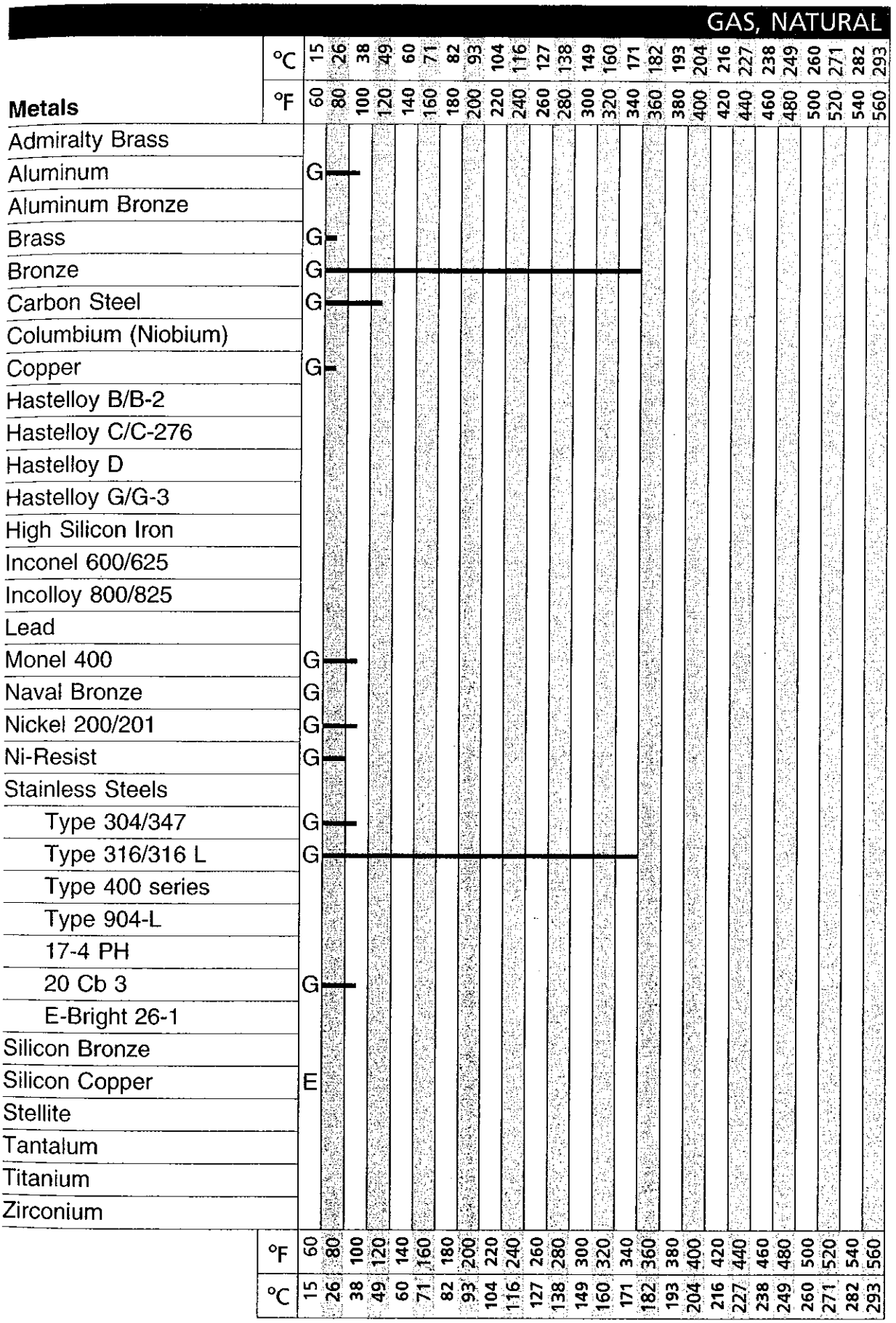
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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

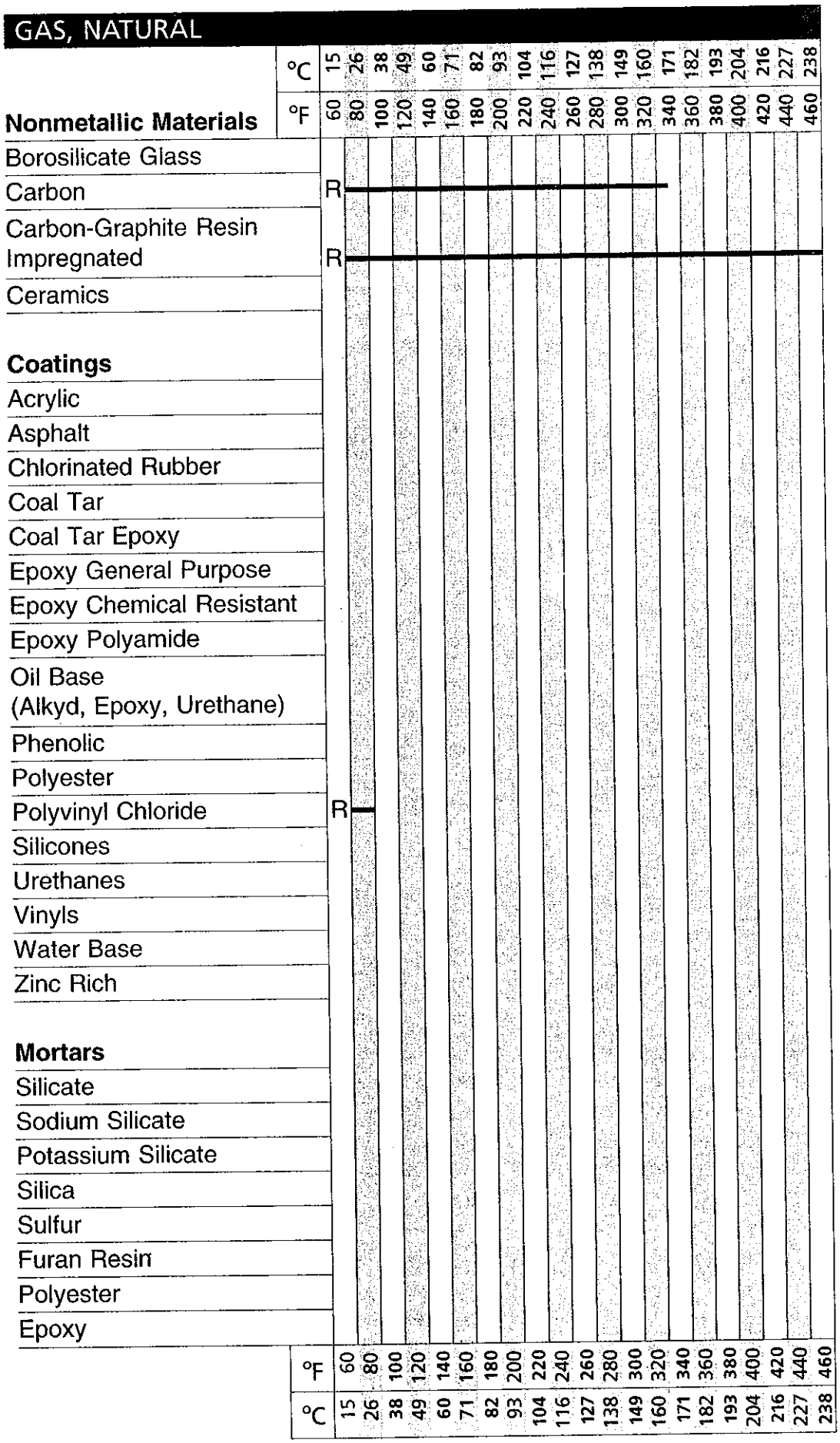
R = Resistant

U = Unsatisfactory

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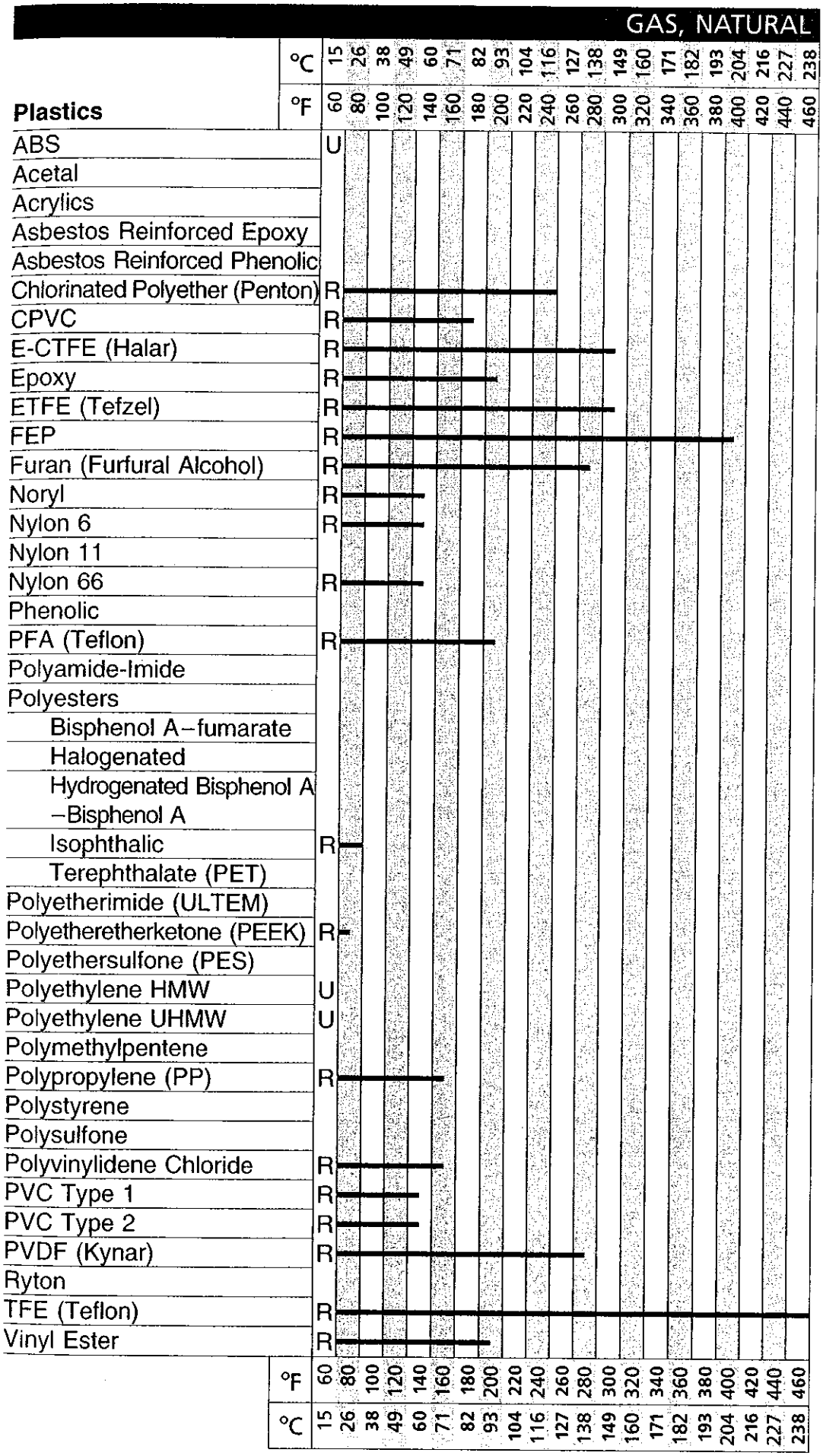
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GAS, NATURAL



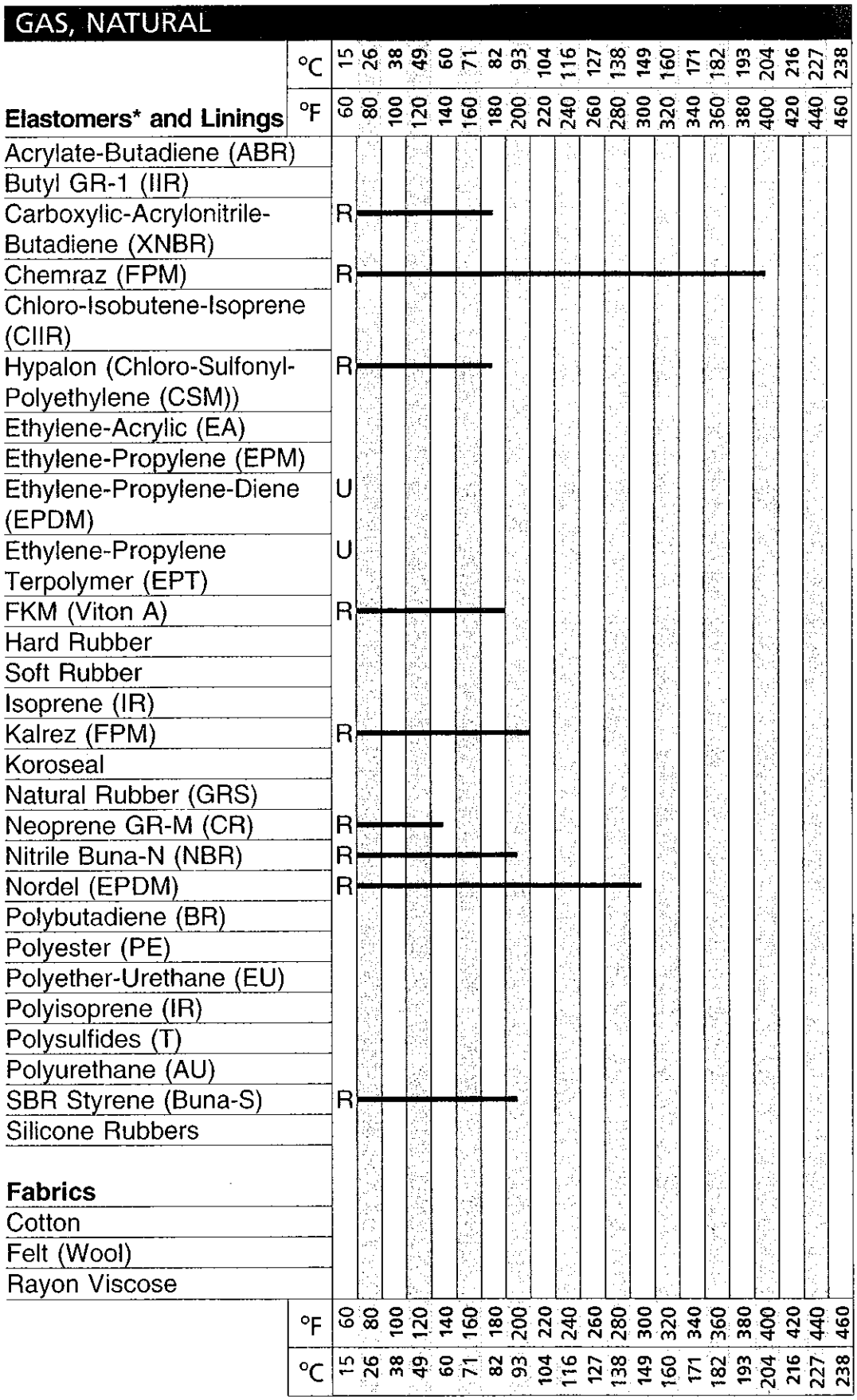
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GAS, NATURAL



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GAS, NATURAL



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GASOHOL

Metals	°F	°C
Admiralty Brass		
Aluminum	G	
Aluminum Bronze	G	
Brass	G	
Bronze	G	
Carbon Steel	G	
Columbium (Niobium)		
Copper	G	
Hastelloy B/B-2		
Hastelloy C/C-276	G	
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625		
Incolloy 800/825		
Lead		
Monel 400	G	
Naval Bronze		
Nickel 200/201		
Ni-Resist		
Stainless Steels		
Type 304/347		
Type 316/316 L	G	
Type 400 series	G	
Type 904-L		
17-4 PH	G	
20 Cb 3	G	
E-Bright 26-1		
Silicon Bronze	G	
Silicon Copper		
Stellite	G	
Tantalum		
Titanium		
Zirconium		

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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GASOHOL

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride		R	—																			
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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GASOHOL

Plastics	°C	°F
ABS	U	
Acetal		
Acrylics		
Siloxirane	R	
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC		
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)		
FEP		
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated		
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic		
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)	U	
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1	R	
PVC Type 2	R	
PVDF (Kynar)	R	
Ryton		
TFE (Teflon)	R	
Vinyl Ester		

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460

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GASOHOL

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)	U																					
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)	R		—																			
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)																						
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)																						
Nitrile Buna-N (NBR)	R	—																				
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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GASOLINE, LEADED

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass		G																									
Aluminum		G																									
Aluminum Bronze		G																									
Brass		G																									
Bronze		G																									
Carbon Steel		G																									
Columbium (Niobium)																											
Copper		G																									
Hastelloy B/B-2		E																									
Hastelloy C/C-276		E																									
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625		E																									
Incolloy 800/825																											
Galv. Stl.		G																									
Monel 400		G																									
Naval Bronze		E																									
Nickel 200/201		G																									
Ni-Resist		E																									
Stainless Steels																											
Type 304/347		G																									
Type 316/316 L		G																									
Type 400 series		E																									
Type 904-L																											
17-4 PH		G																									
20 Cb 3		G																									
E-Bright 26-1																											
Silicon Bronze		G																									
Silicon Copper		E																									
Stellite		G																									
Tantalum		E																									
Titanium		E																									
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

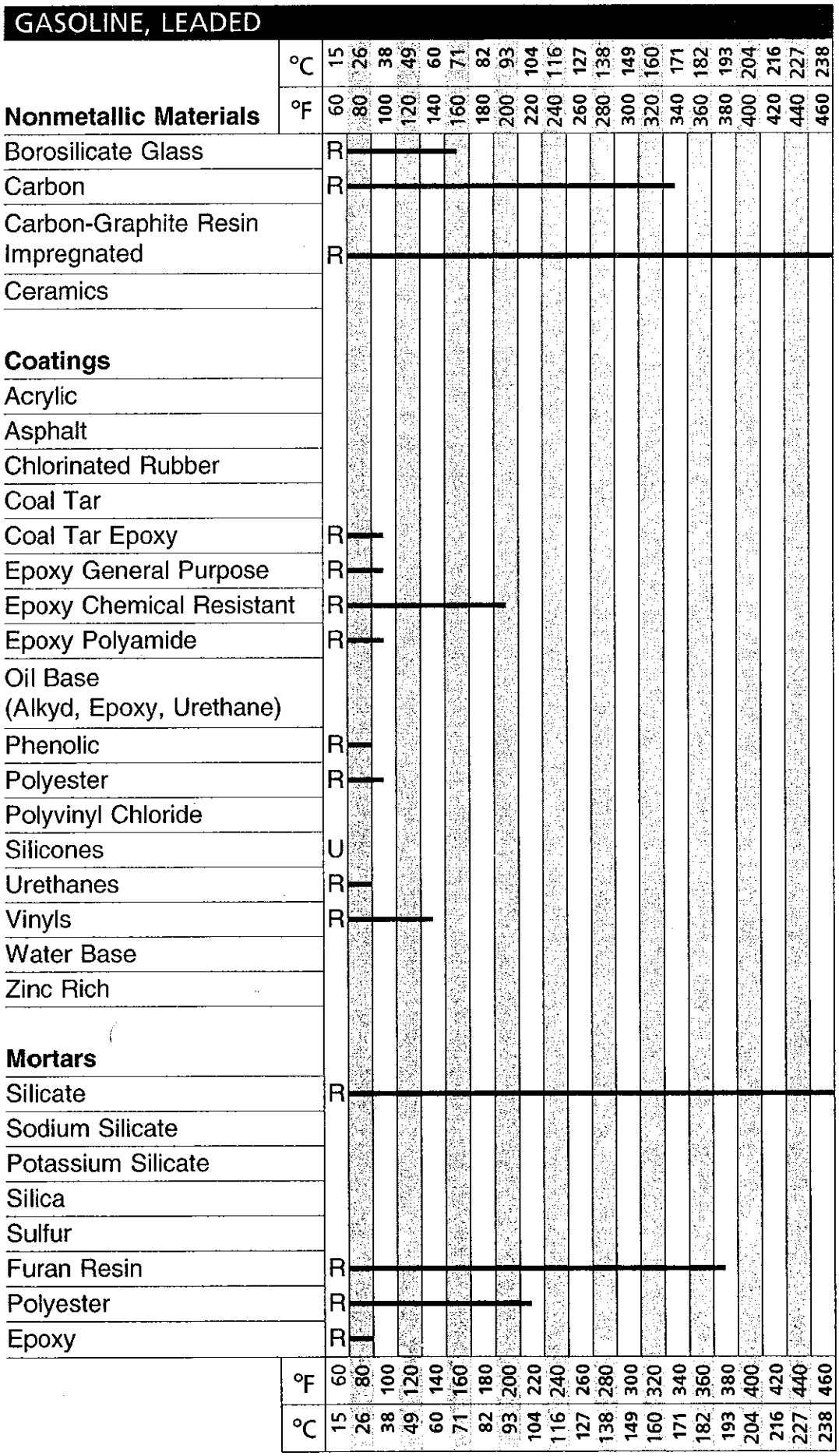
R = Resistant

U = Unsatisfactory

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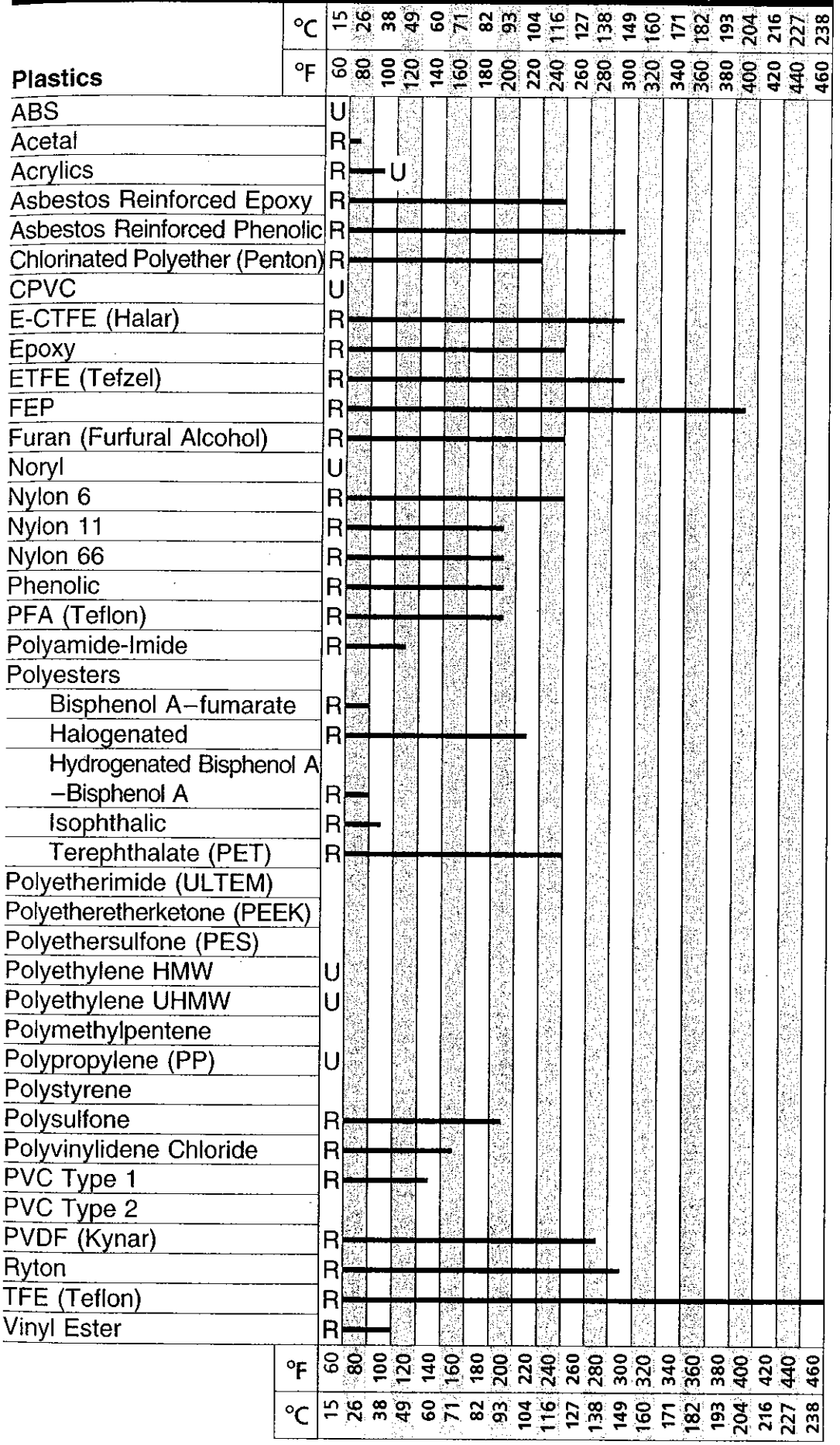
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GASOLINE, LEADED



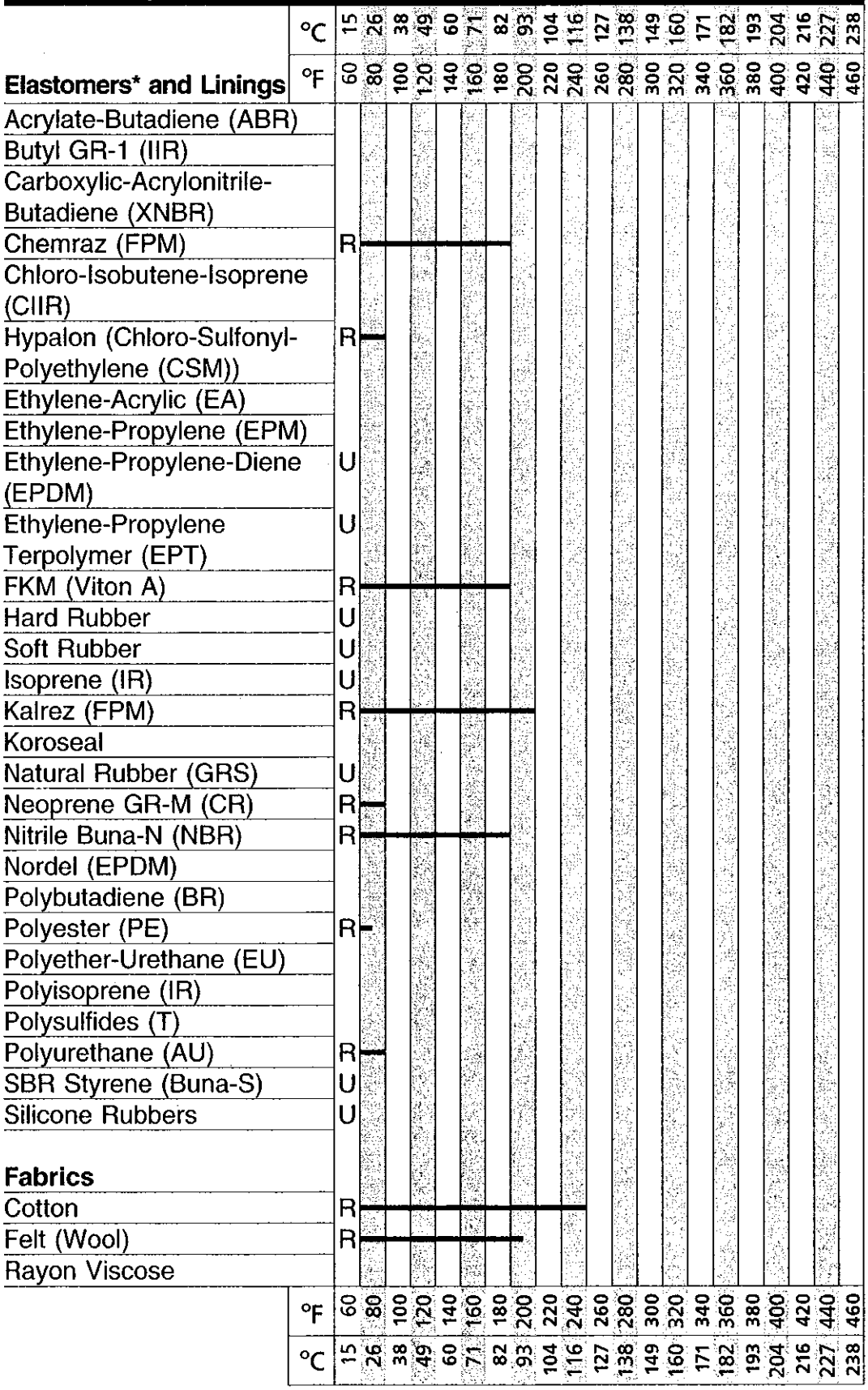
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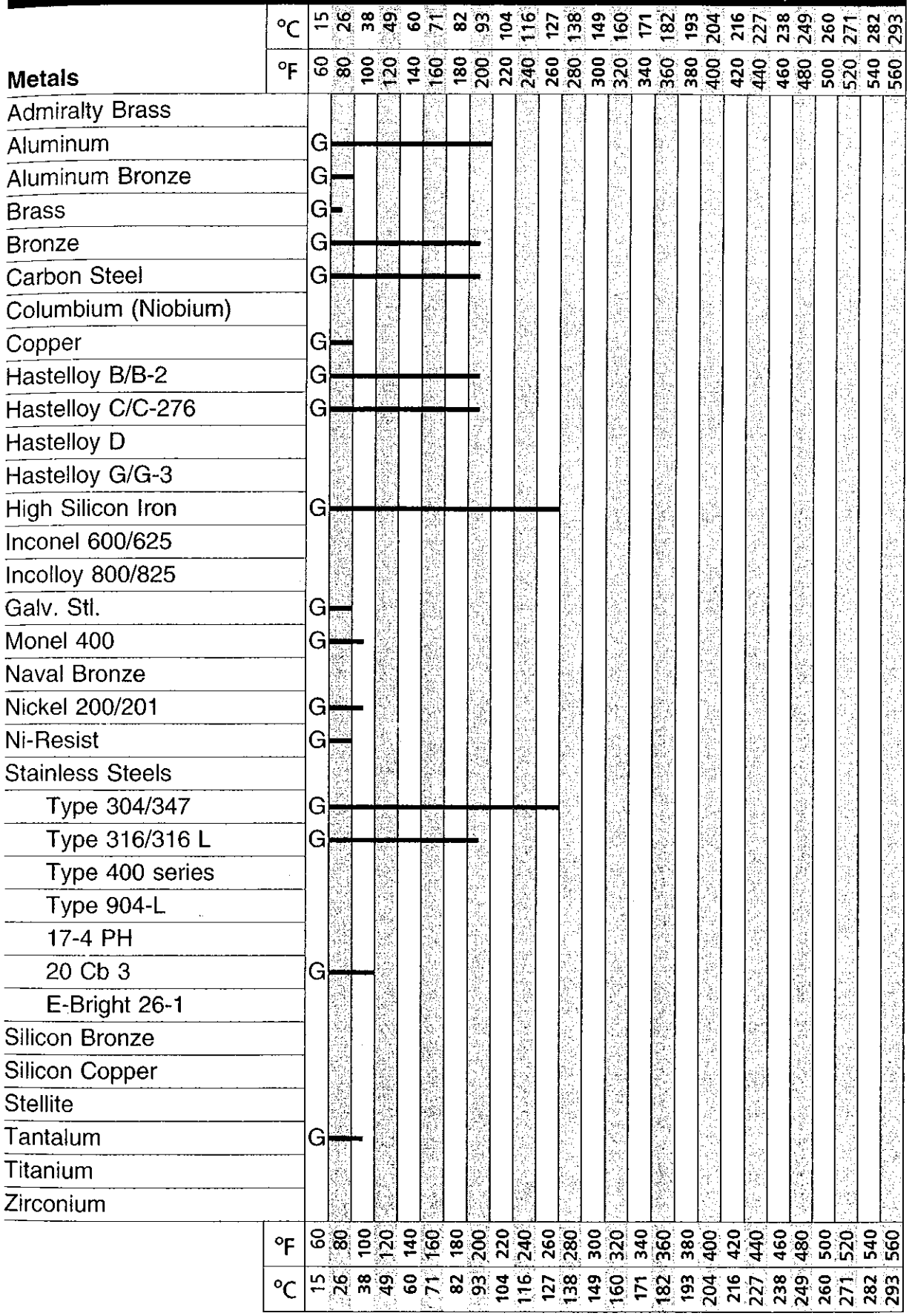
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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

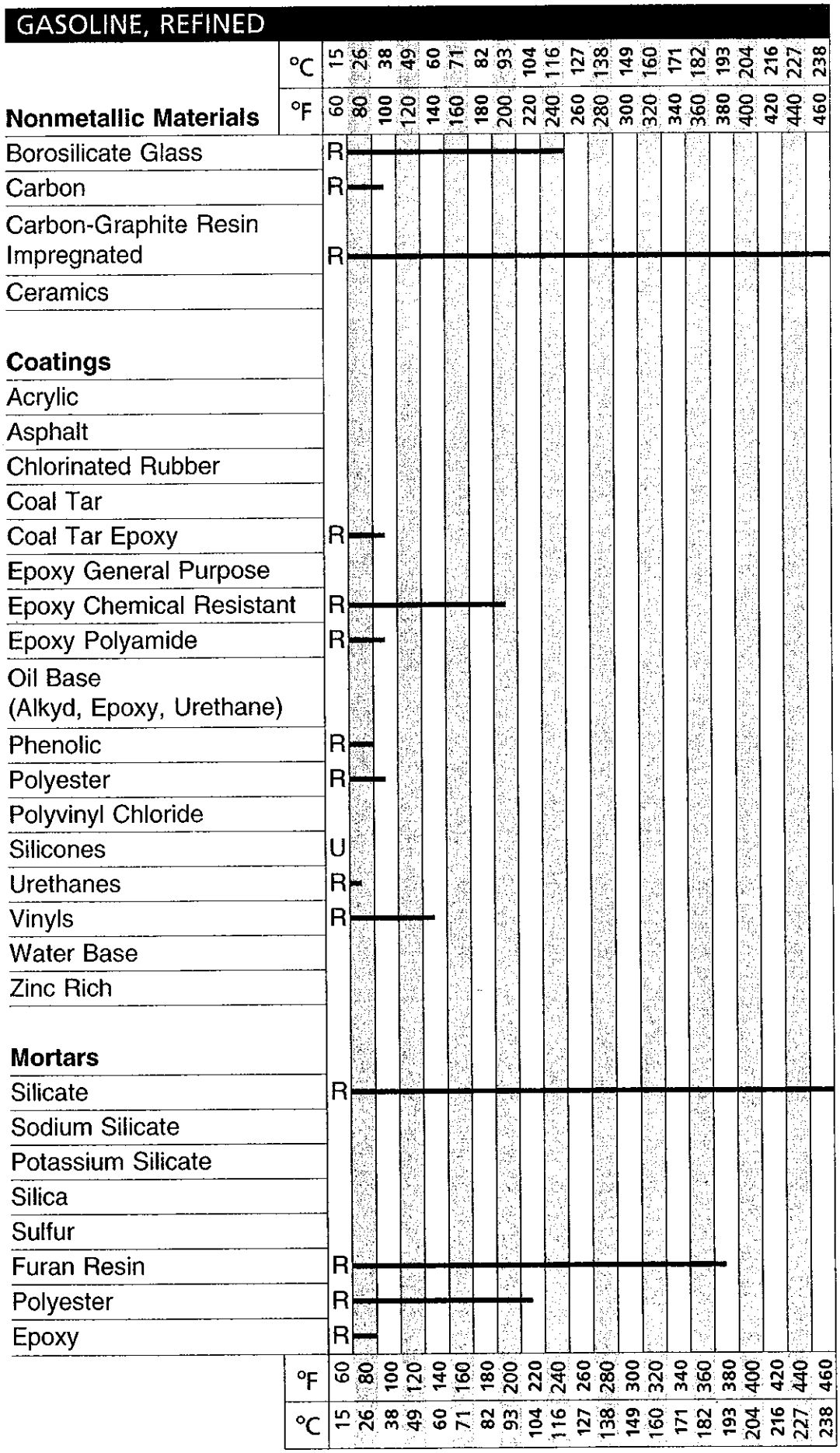
R = Resistant

U = Unsatisfactory

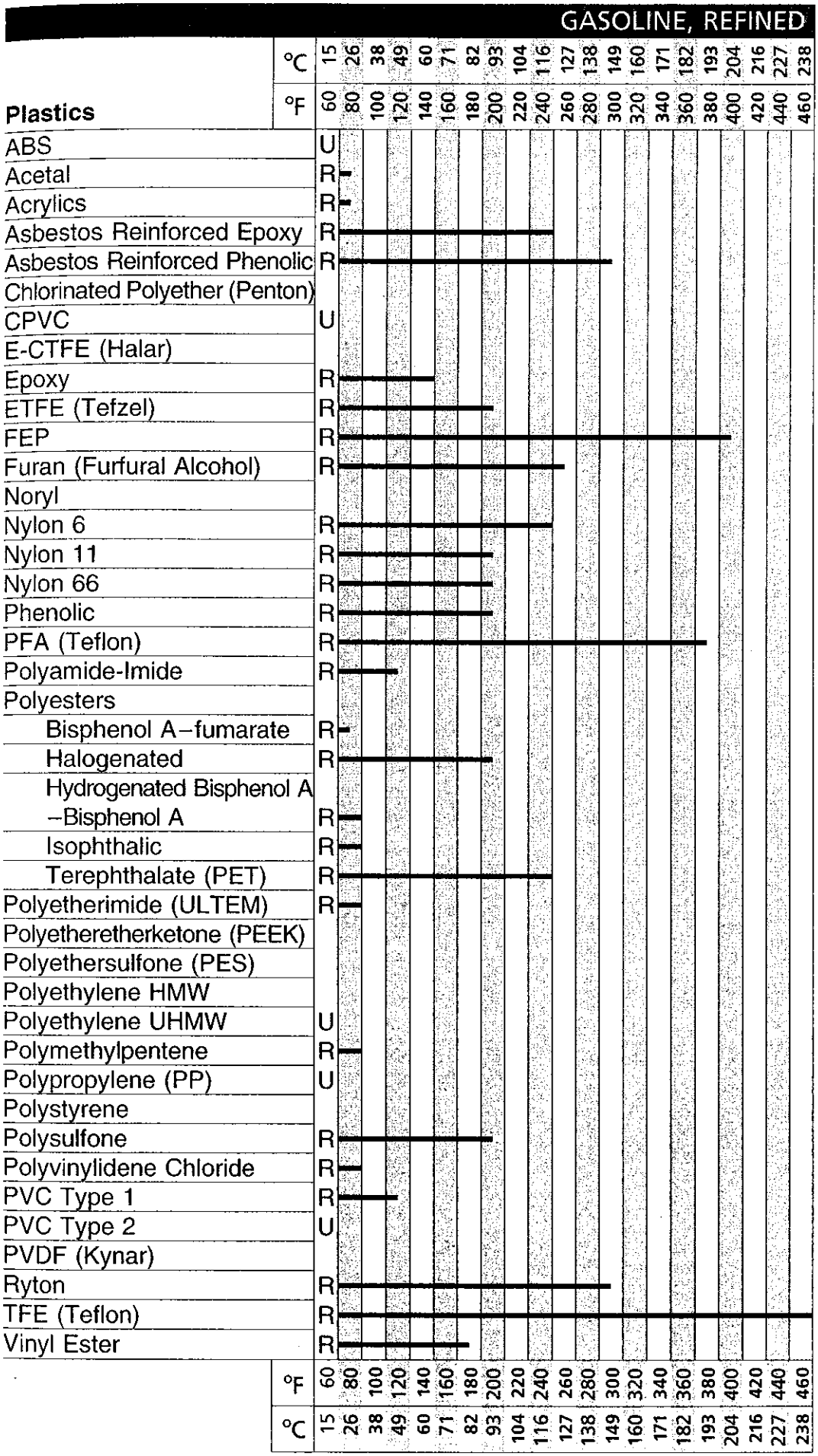
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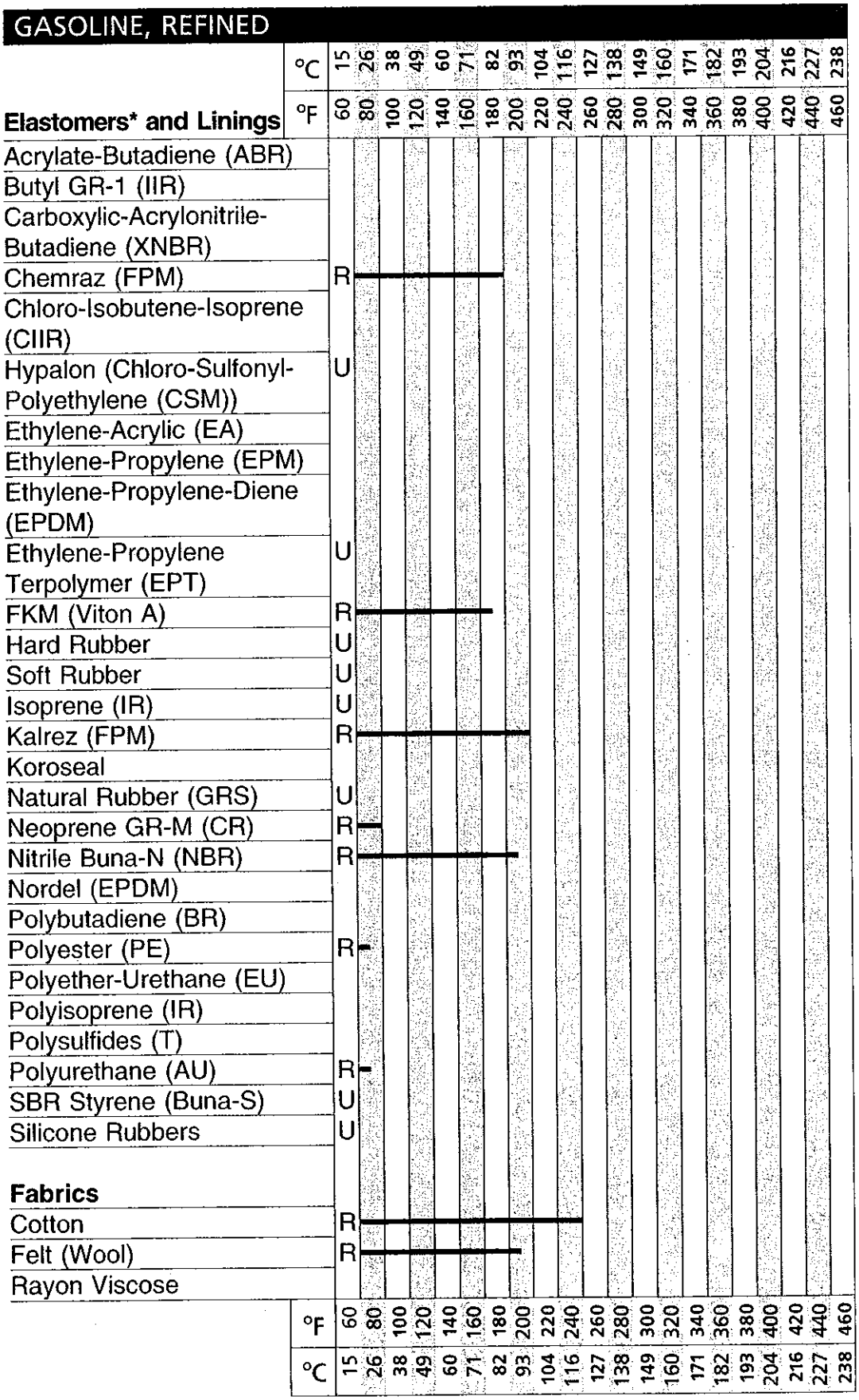


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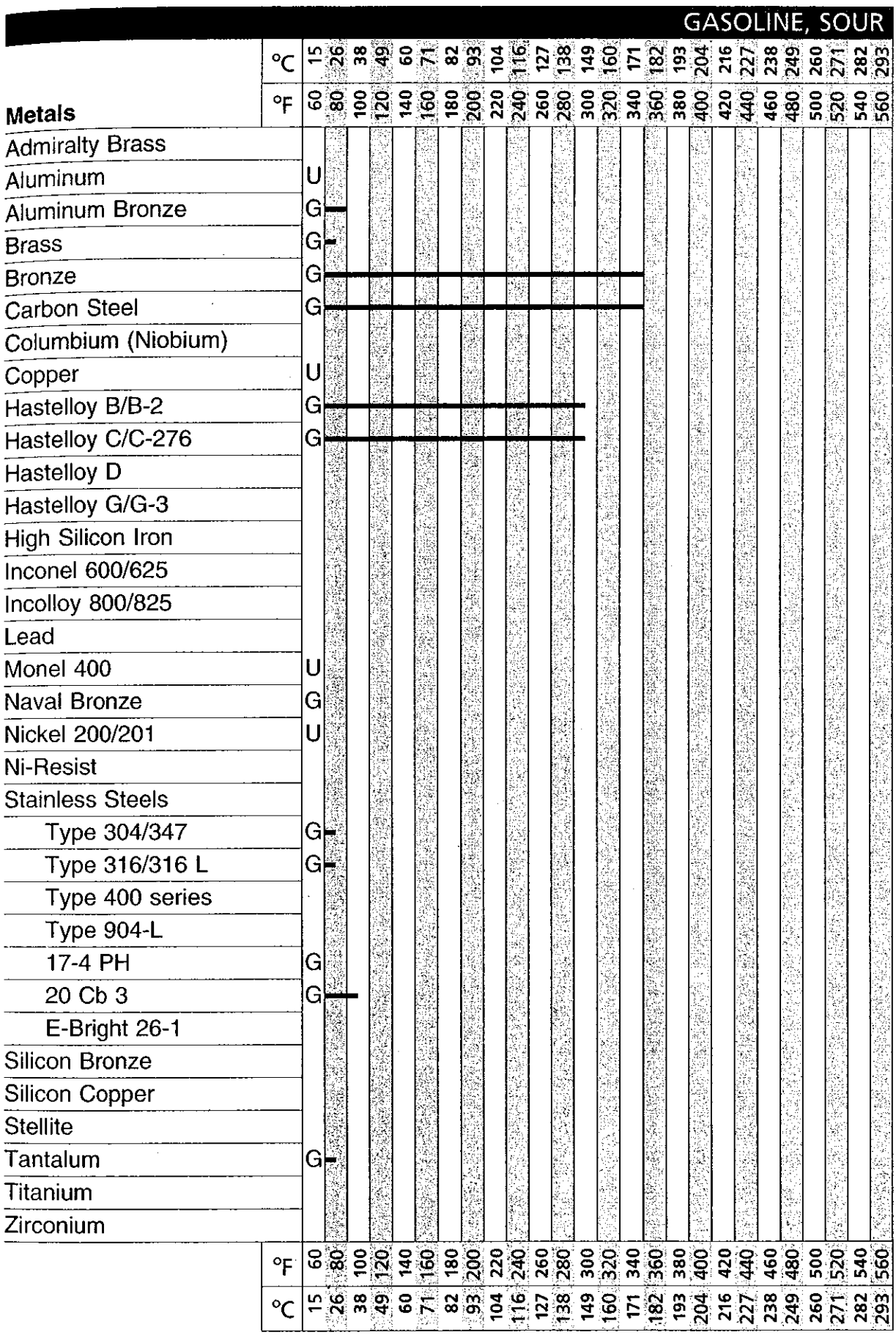
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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

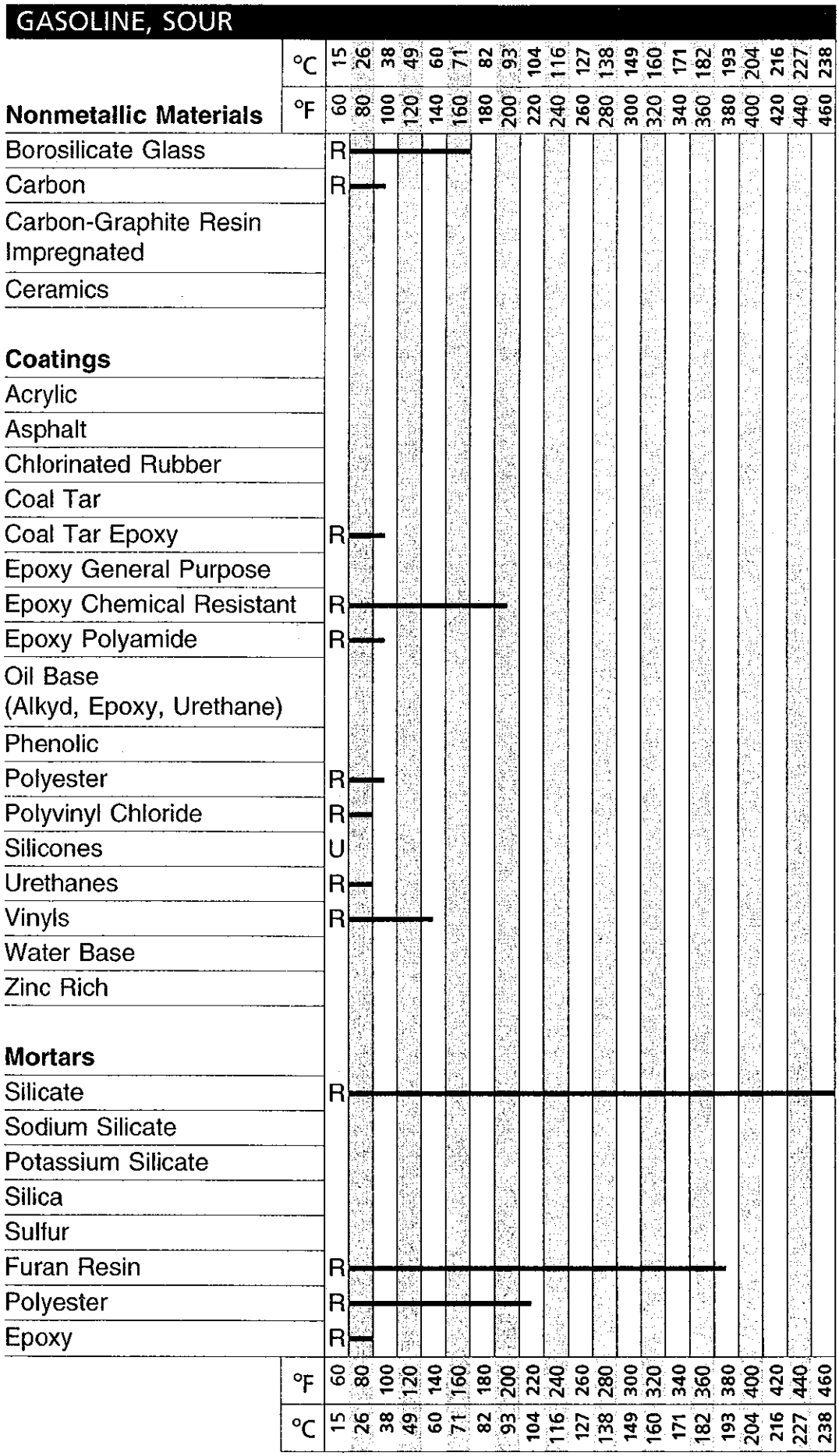
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GASOLINE, SOUR



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GASOLINE, SOUR

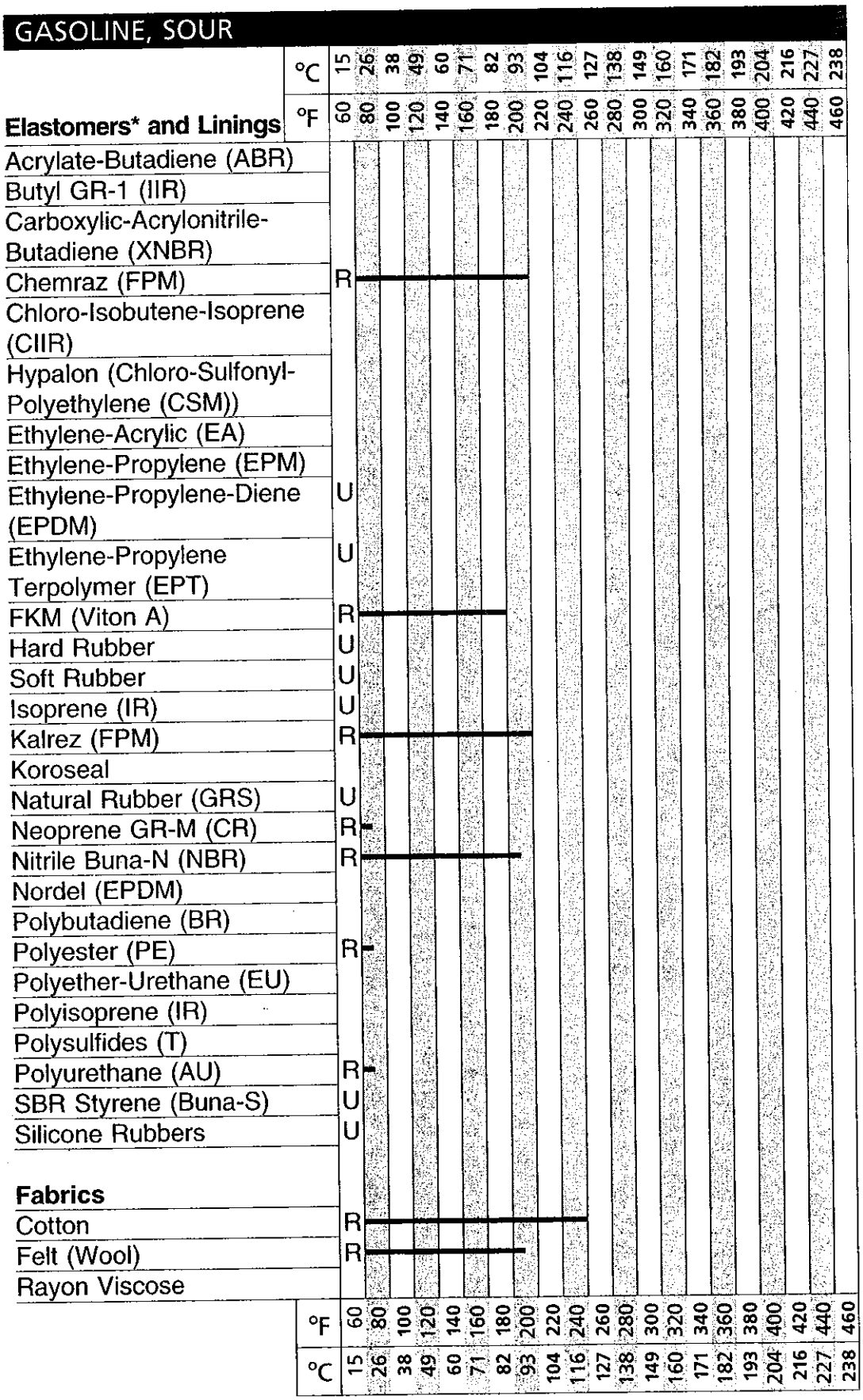
Plastics	°C	°F
ABS	U	
Acetal	R	
Acrylics		
Asbestos Reinforced Epoxy	R	
Asbestos Reinforced Phenolic	R	
Chlorinated Polyether (Penton)	R	
CPVC	U	
E-CTFE (Halar)	R	
Epoxy	R	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)	R	
Noryl		
Nylon 6	R	
Nylon 11	R	
Nylon 66	R	
Phenolic	R	
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	R	
Halogenated		
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	R	
Terephthalate (PET)	R	
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)	R	
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)	U	
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1	R	
PVC Type 2	R	
PVDF (Kynar)	R	
Ryton	R	
TFE (Teflon)	R	
Vinyl Ester	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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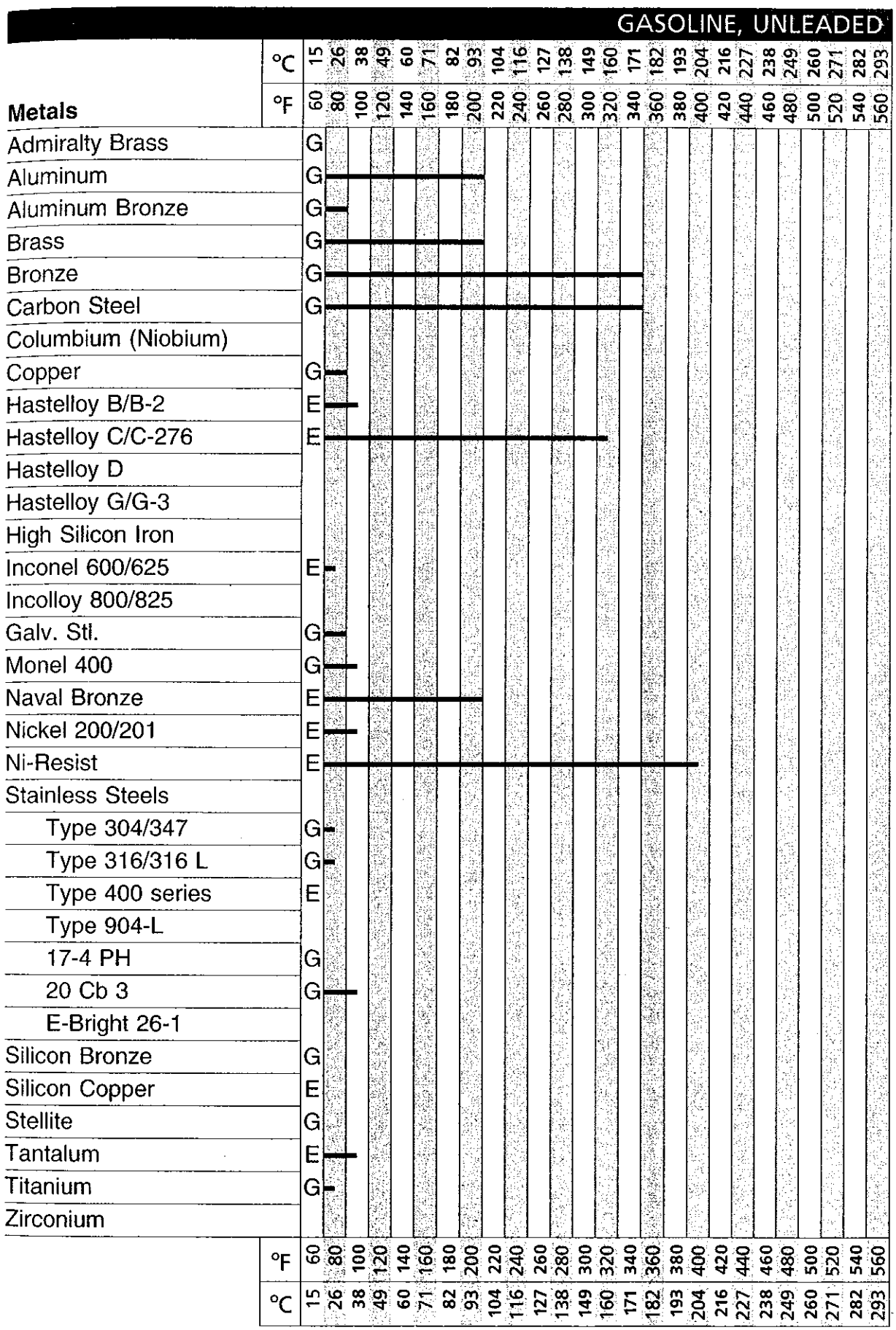
GASOLINE, SOUR



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GASOLINE, UNLEADED



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

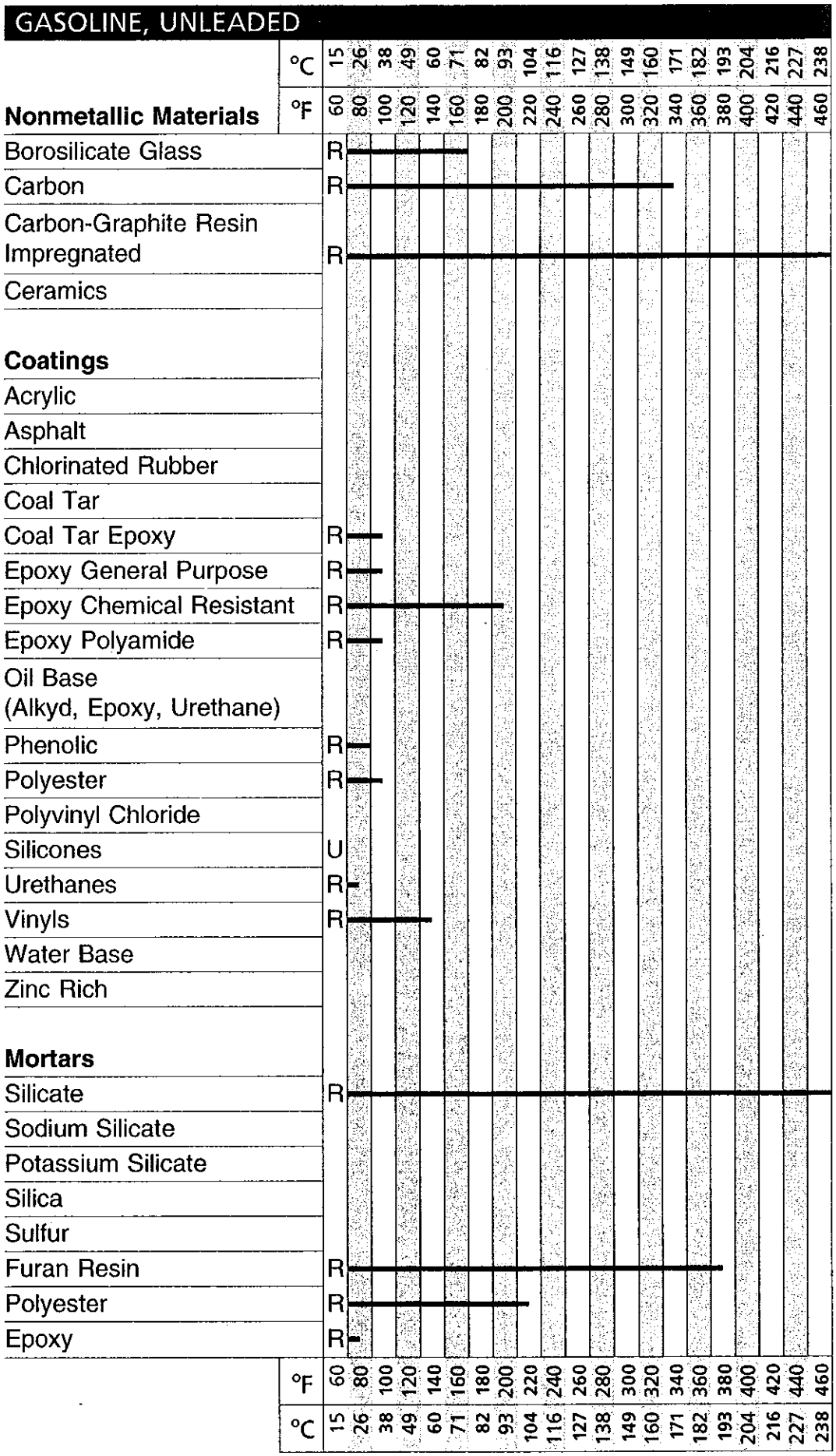
R = Resistant

U = Unsatisfactory

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GASOLINE, UNLEADED

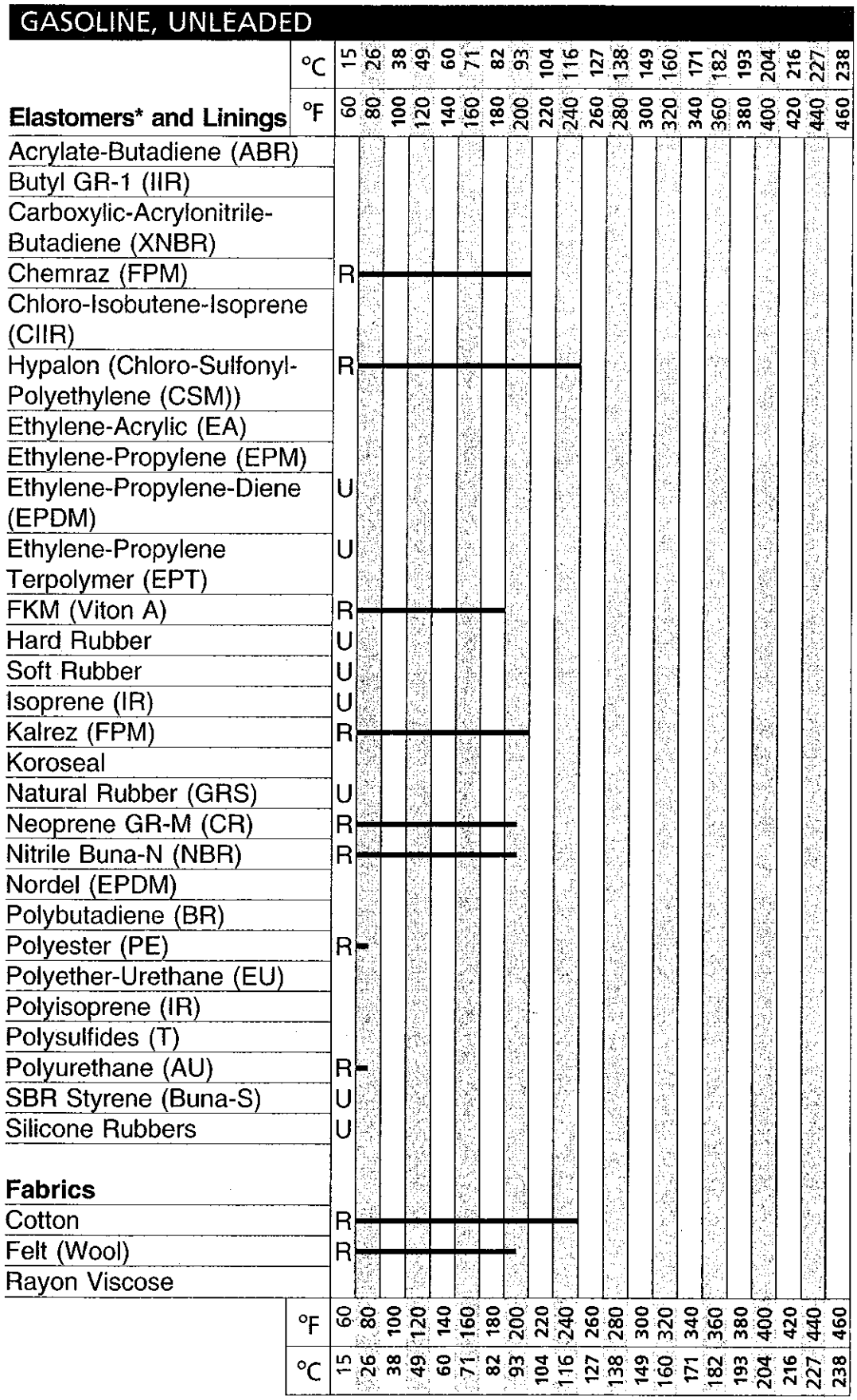
Plastics	°C	°F
ABS	U	
Acetal	R	
Acrylics	R	U
Asbestos Reinforced Epoxy	R	
Asbestos Reinforced Phenolic	R	
Chlorinated Polyether (Penton)	R	
CPVC	U	
E-CTFE (Halar)	R	
Epoxy	R	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)	R	
Noryl	U	
Nylon 6	R	
Nylon 11	R	
Nylon 66	R	
Phenolic	R	
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	R	
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A	R	
Isophthalic	R	
Terephthalate (PET)	R	
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW	U	
Polyethylene UHMW	R	
Polymethylpentene		
Polypropylene (PP)	U	
Polystyrene		
Polysulfone	R	
Polyvinylidene Chloride	R	
PVC Type 1	R	
PVC Type 2		
PVDF (Kynar)	R	
Ryton	R	
TFE (Teflon)	R	
Vinyl Ester	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

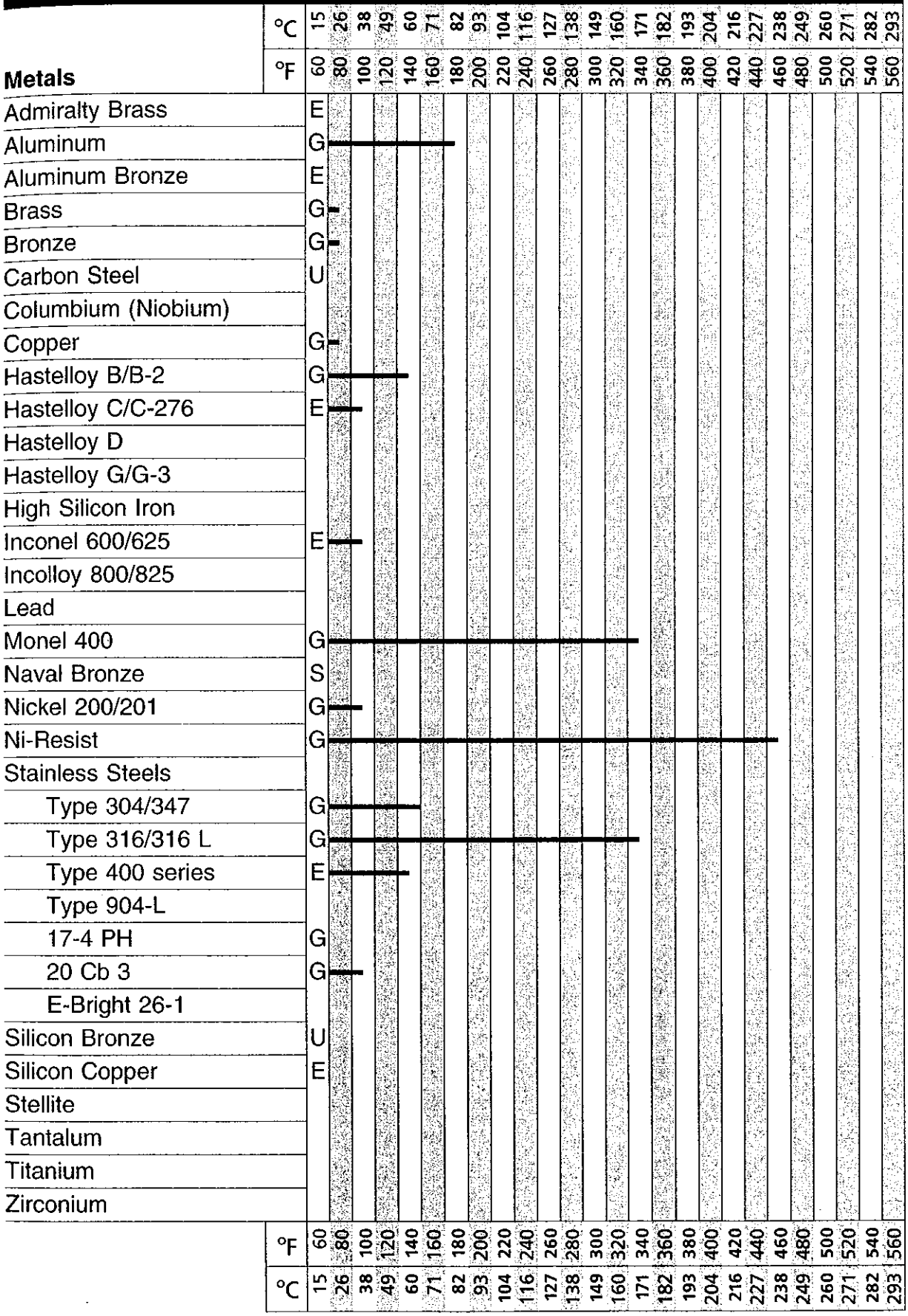
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GASOLINE, UNLEADED



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

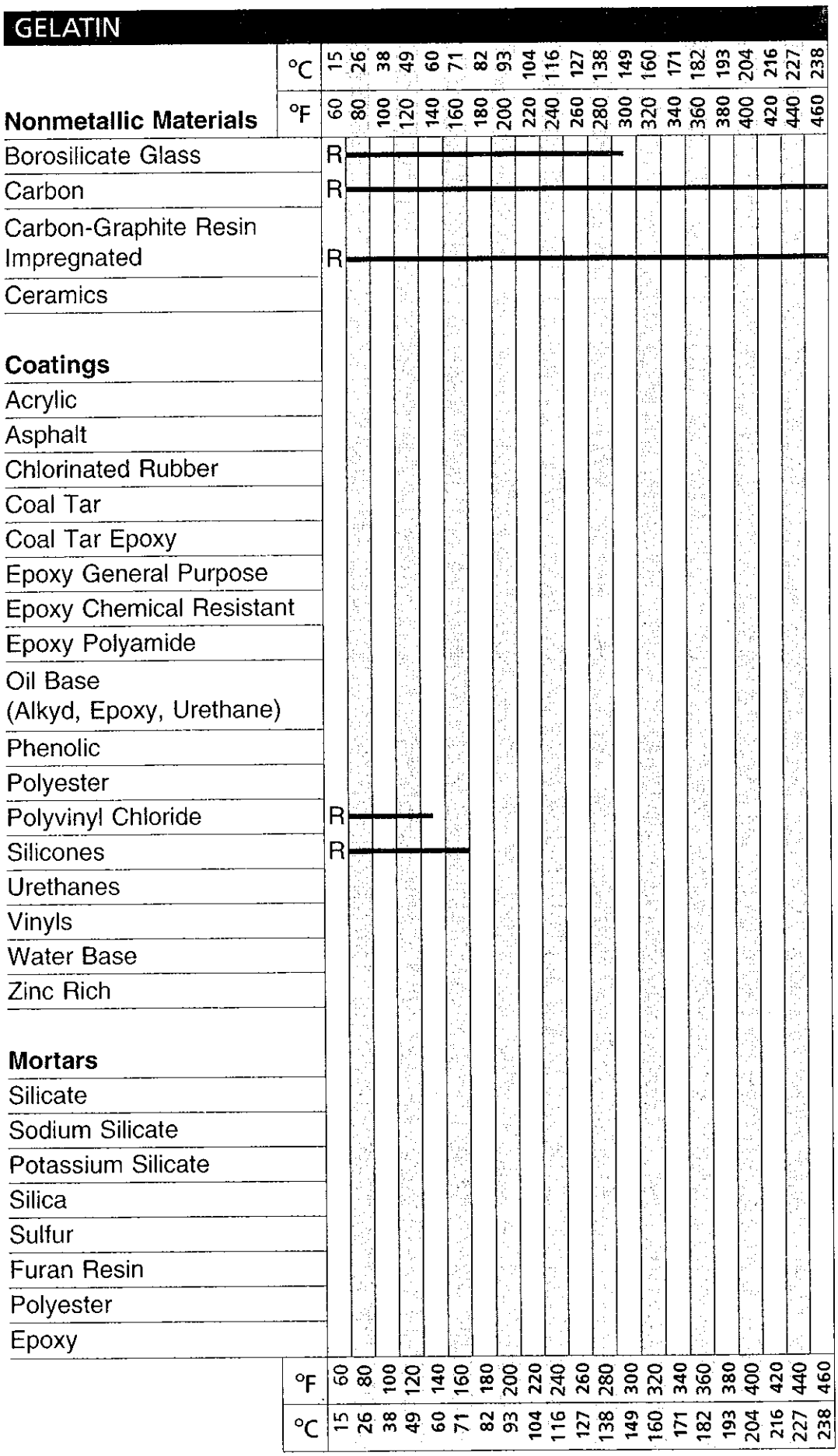
R = Resistant

U = Unsatisfactory

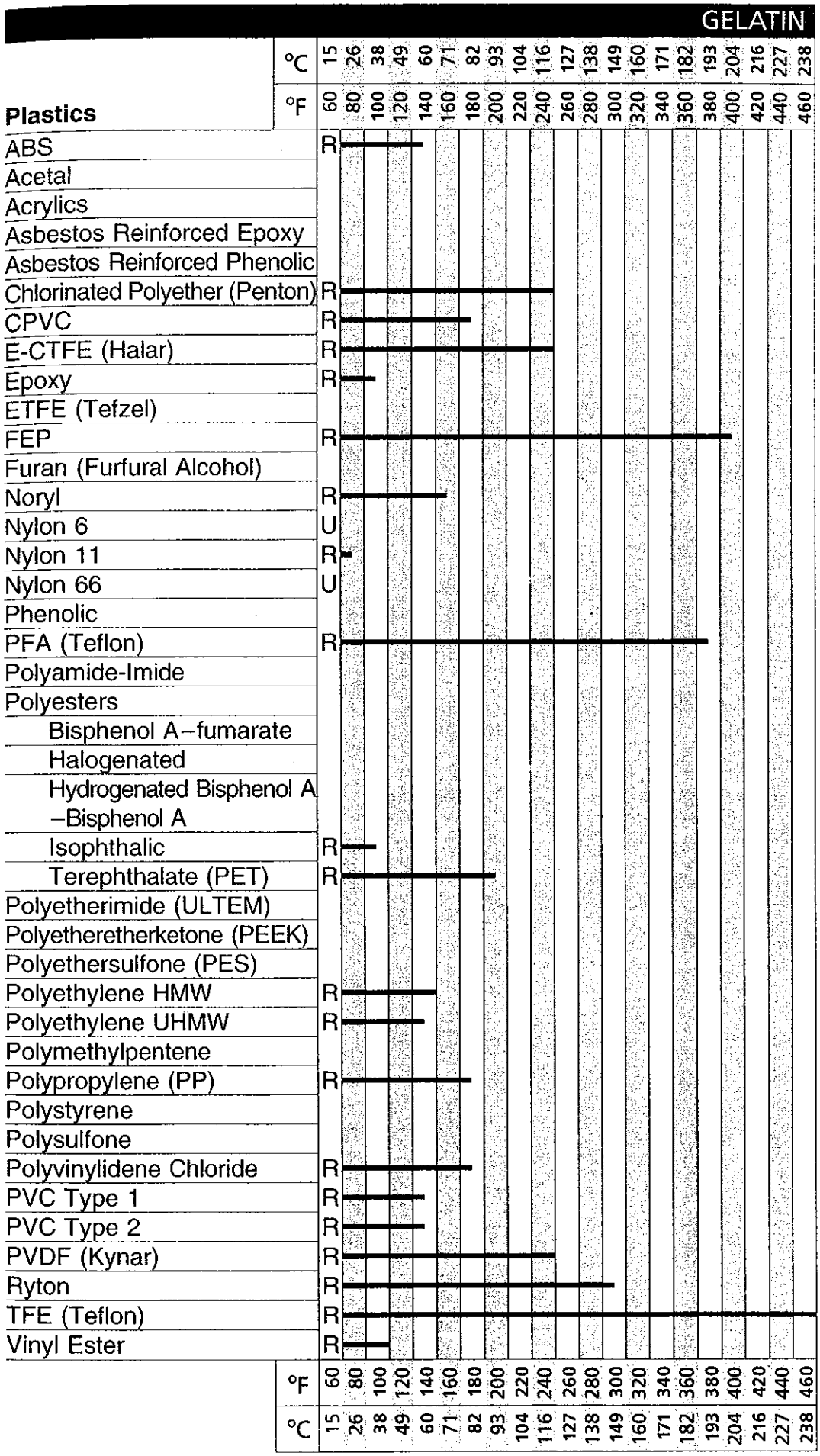
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GELATIN

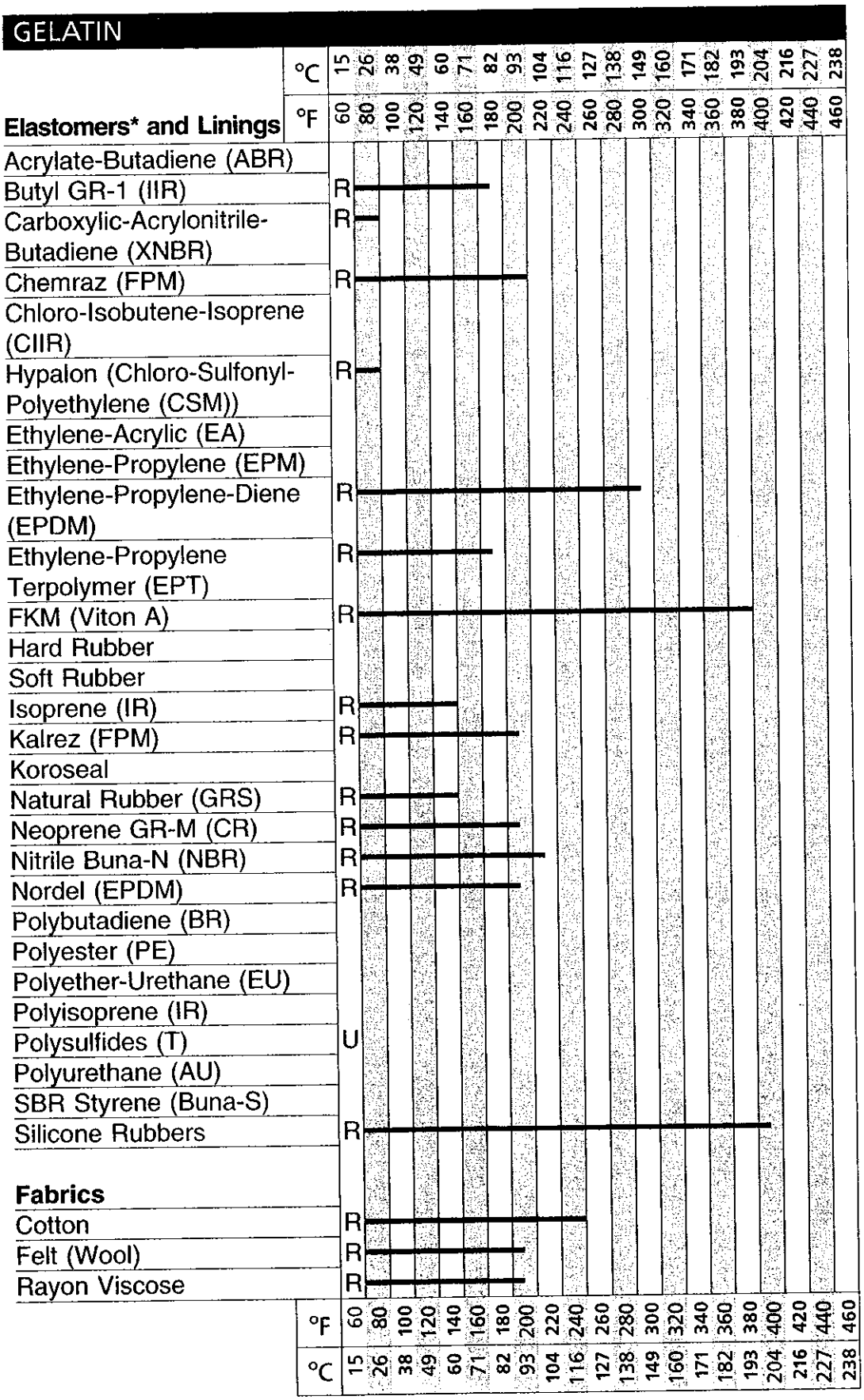


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GELATIN



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Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron	G																										
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347	G																										
Type 316/316 L	G																										
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

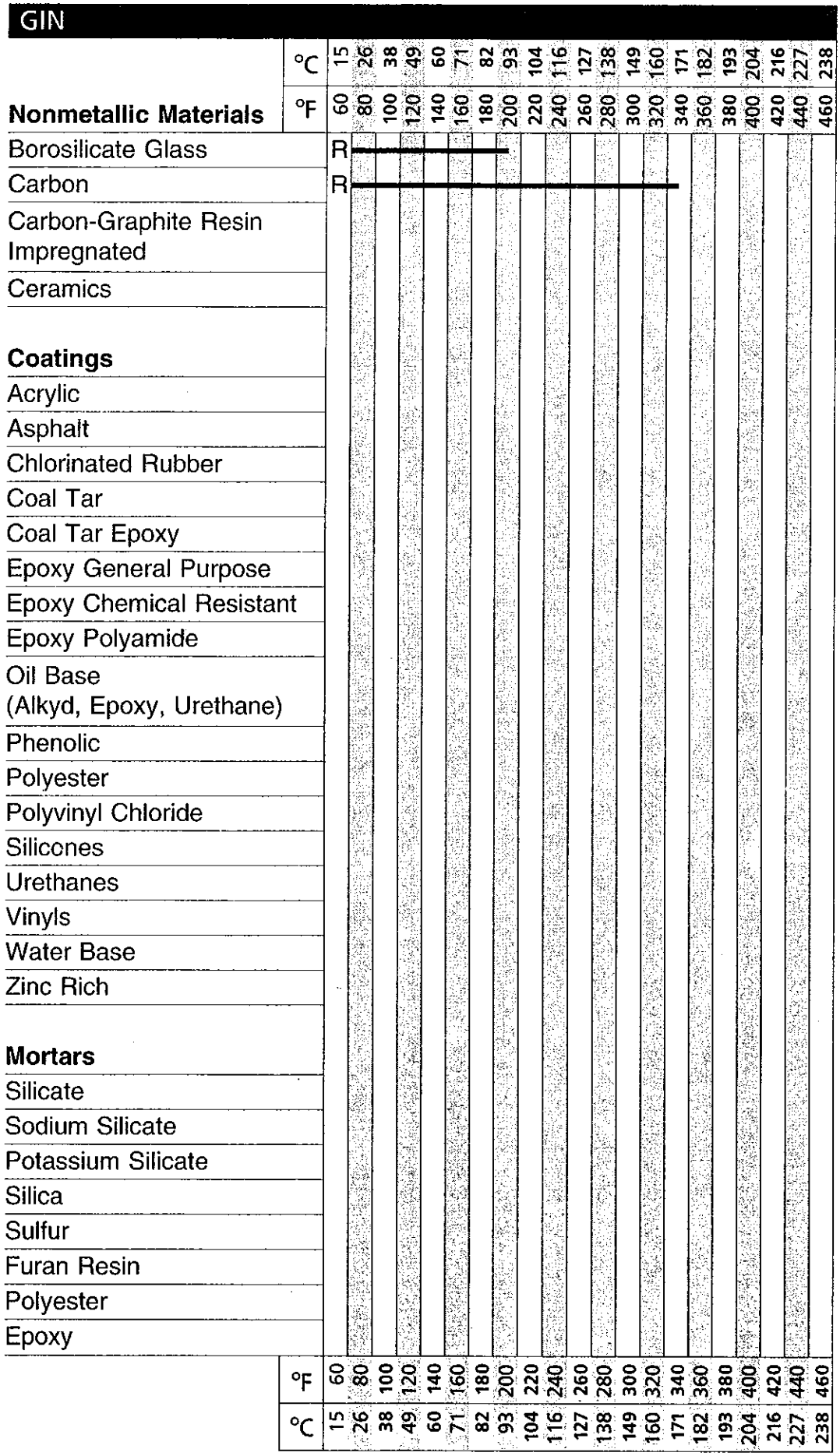
FOR NONMETALLICS

R = Resistant

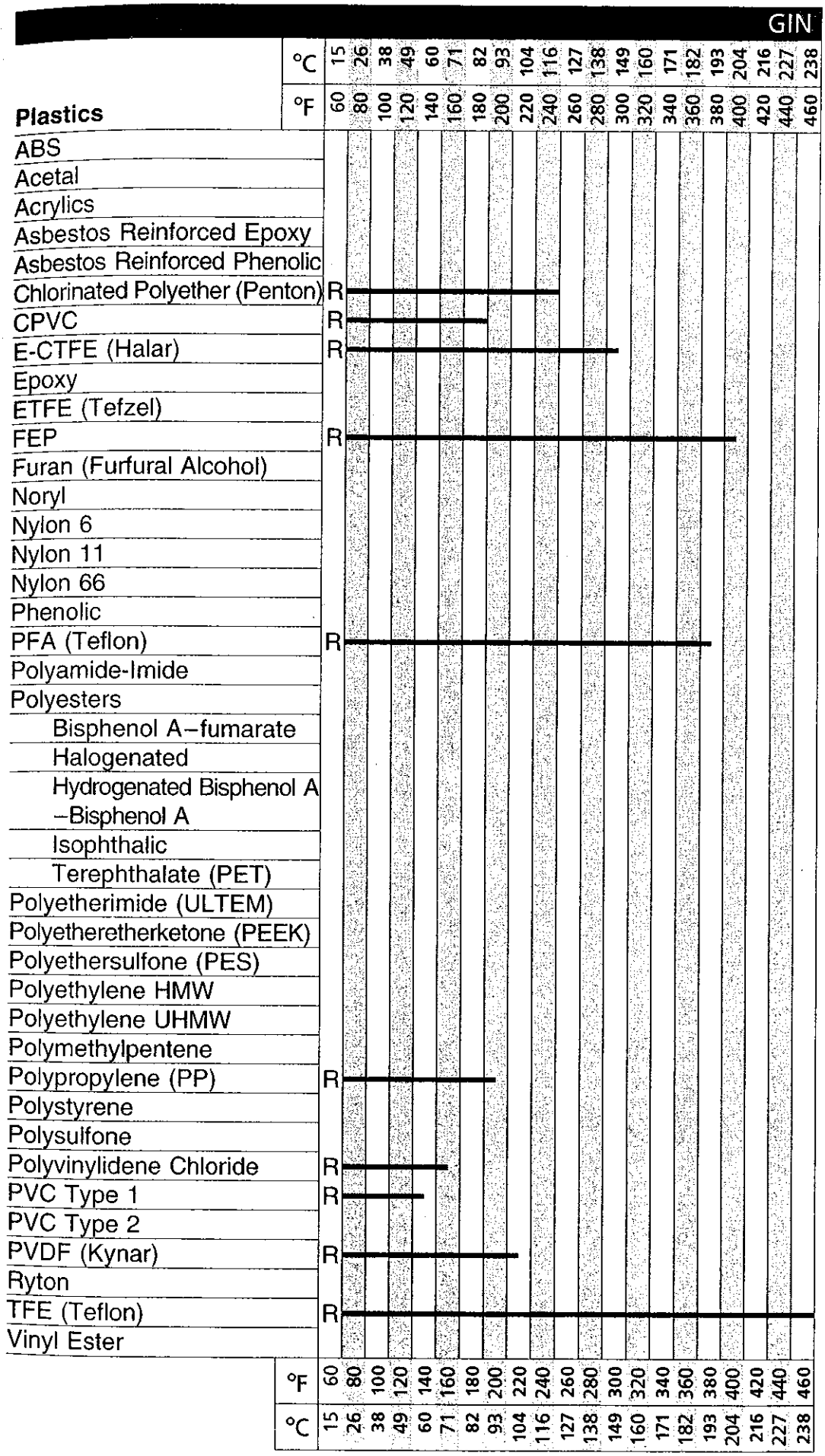
U = Unsatisfactory

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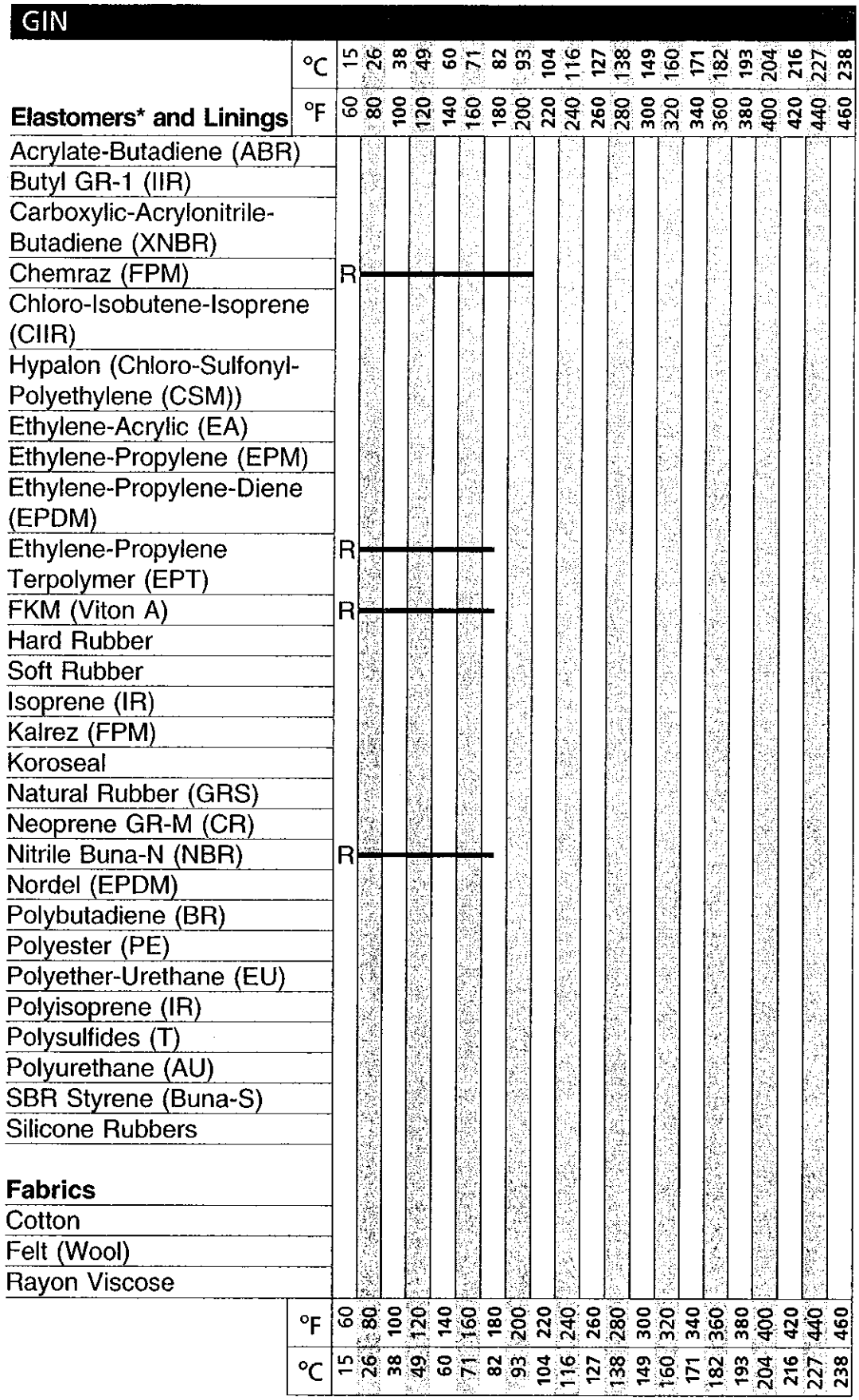
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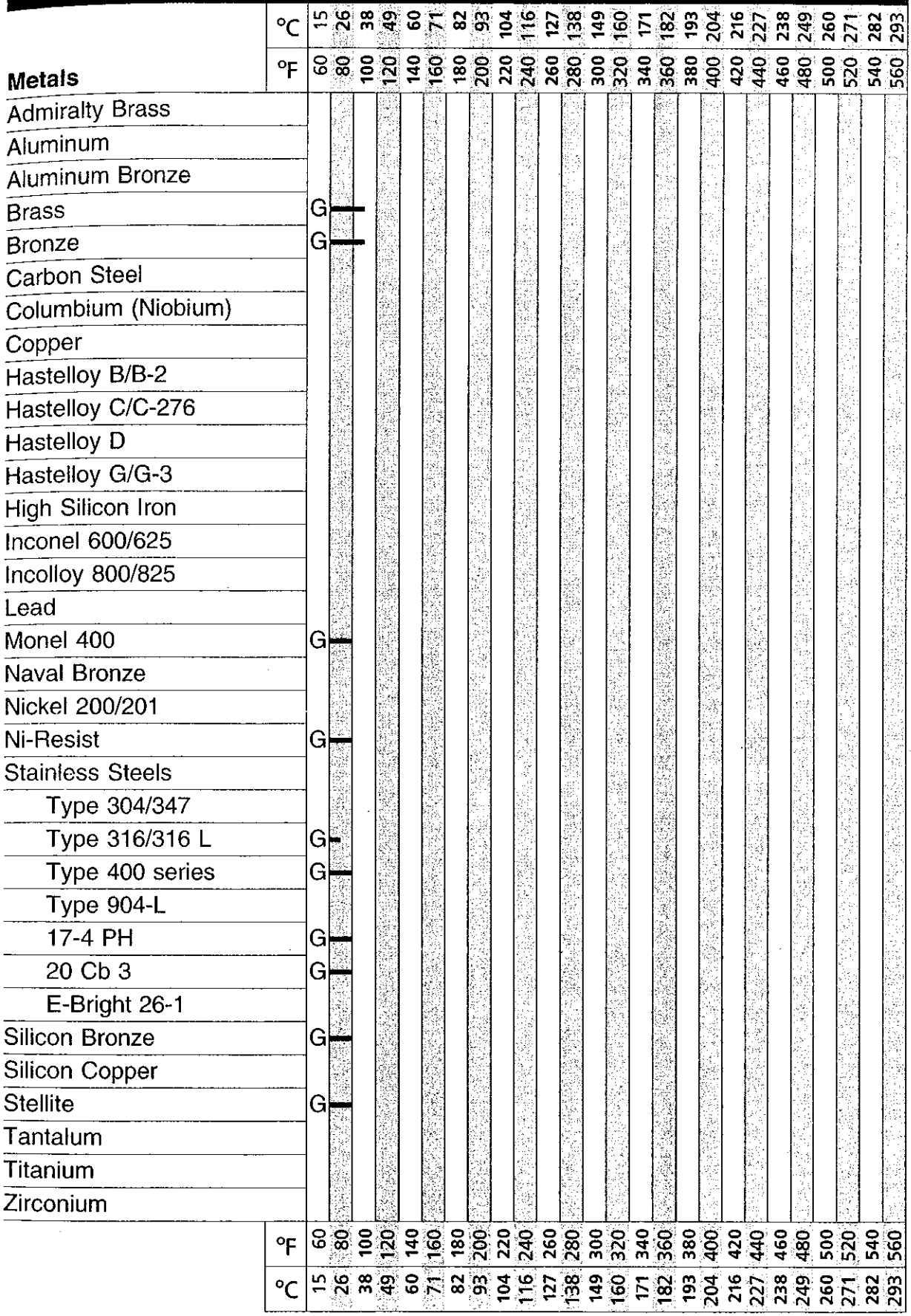


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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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GLAUBER'S SALT

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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GLAUBER'S SALT

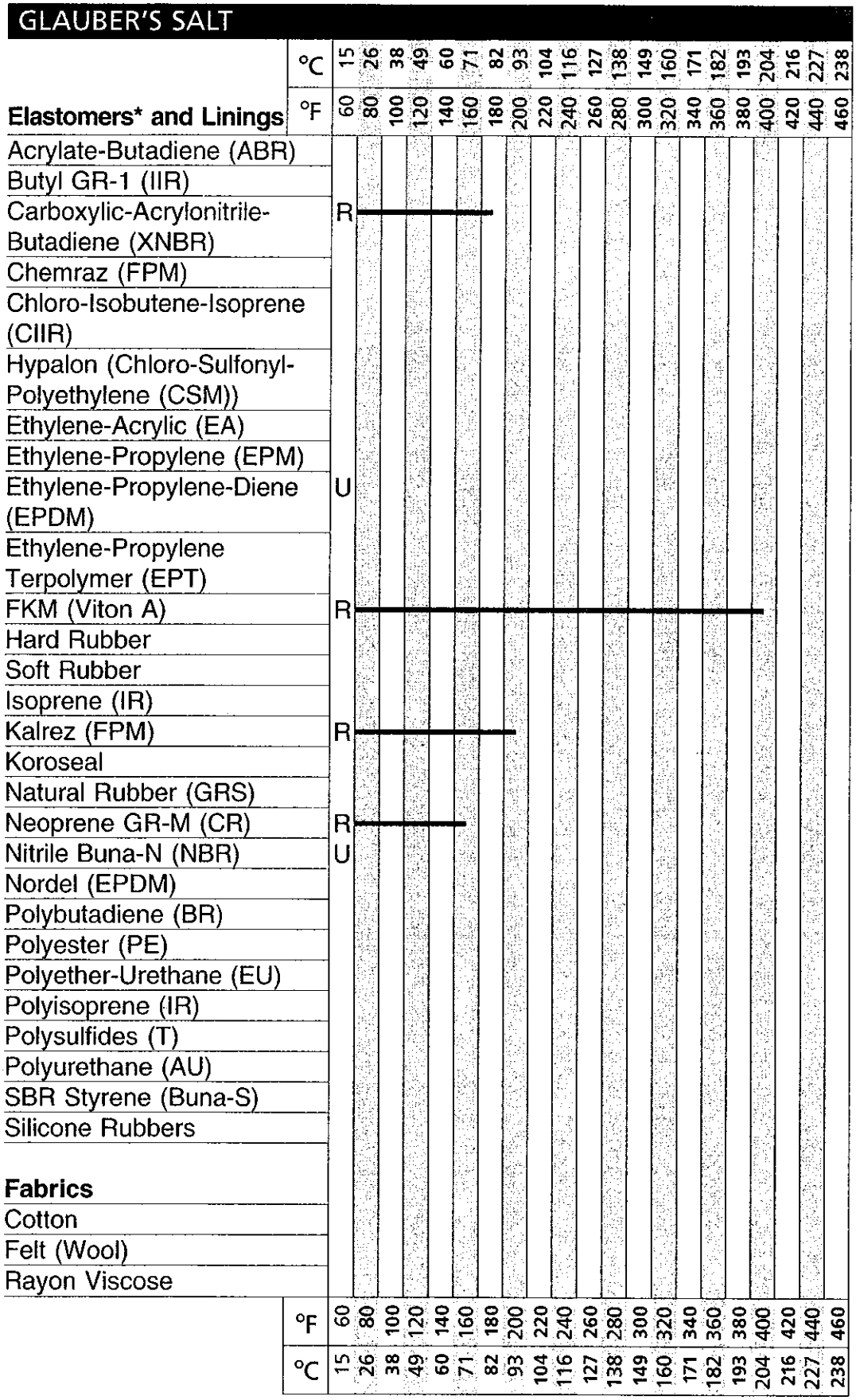
Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC		
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)		
FEP		
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated		
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic		
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)		
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1		
PVC Type 2		
PVDF (Kynar)		
Ryton		
TFE (Teflon)	R	
Vinyl Ester		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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GLAUBER'S SALT



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GLUCOSE (CORN SYRUP)

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass		E																									
Aluminum		G																									
Aluminum Bronze		G																									
Brass		G																									
Bronze		G																									
Carbon Steel		G																									
Columbium (Niobium)																											
Copper		G																									
Hastelloy B/B-2																											
Hastelloy C/C-276		G																									
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead		G																									
Monel 400		G																									
Naval Bronze		E																									
Nickel 200/201		E																									
Ni-Resist		E																									
Stainless Steels																											
Type 304/347		G																									
Type 316/316 L		G																									
Type 400 series		E																									
Type 904-L																											
17-4 PH		G																									
20 Cb 3		G																									
E-Bright 26-1																											
Silicon Bronze		G																									
Silicon Copper		E																									
Stellite		G																									
Tantalum		G																									
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

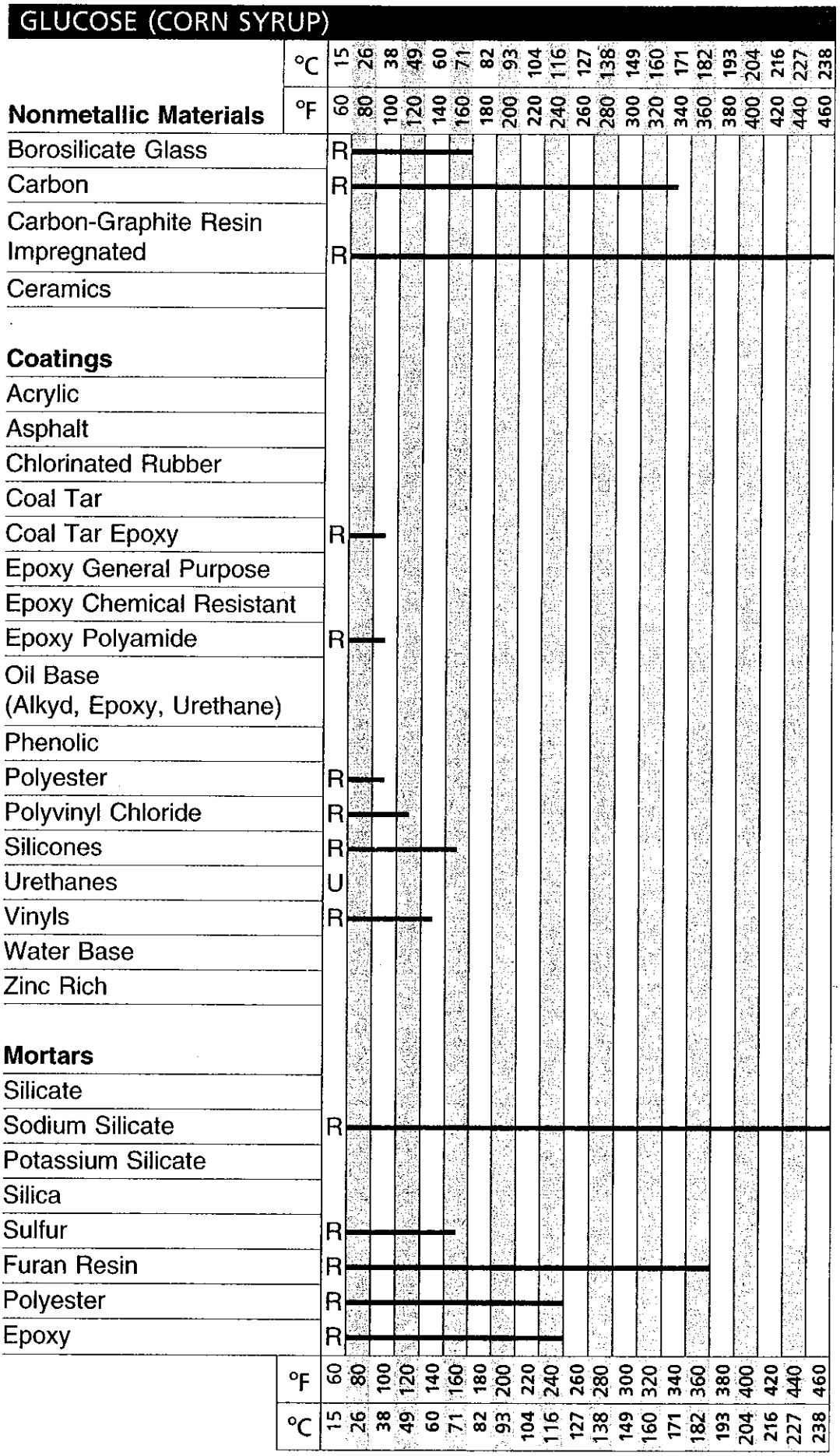
R = Resistant

U = Unsatisfactory

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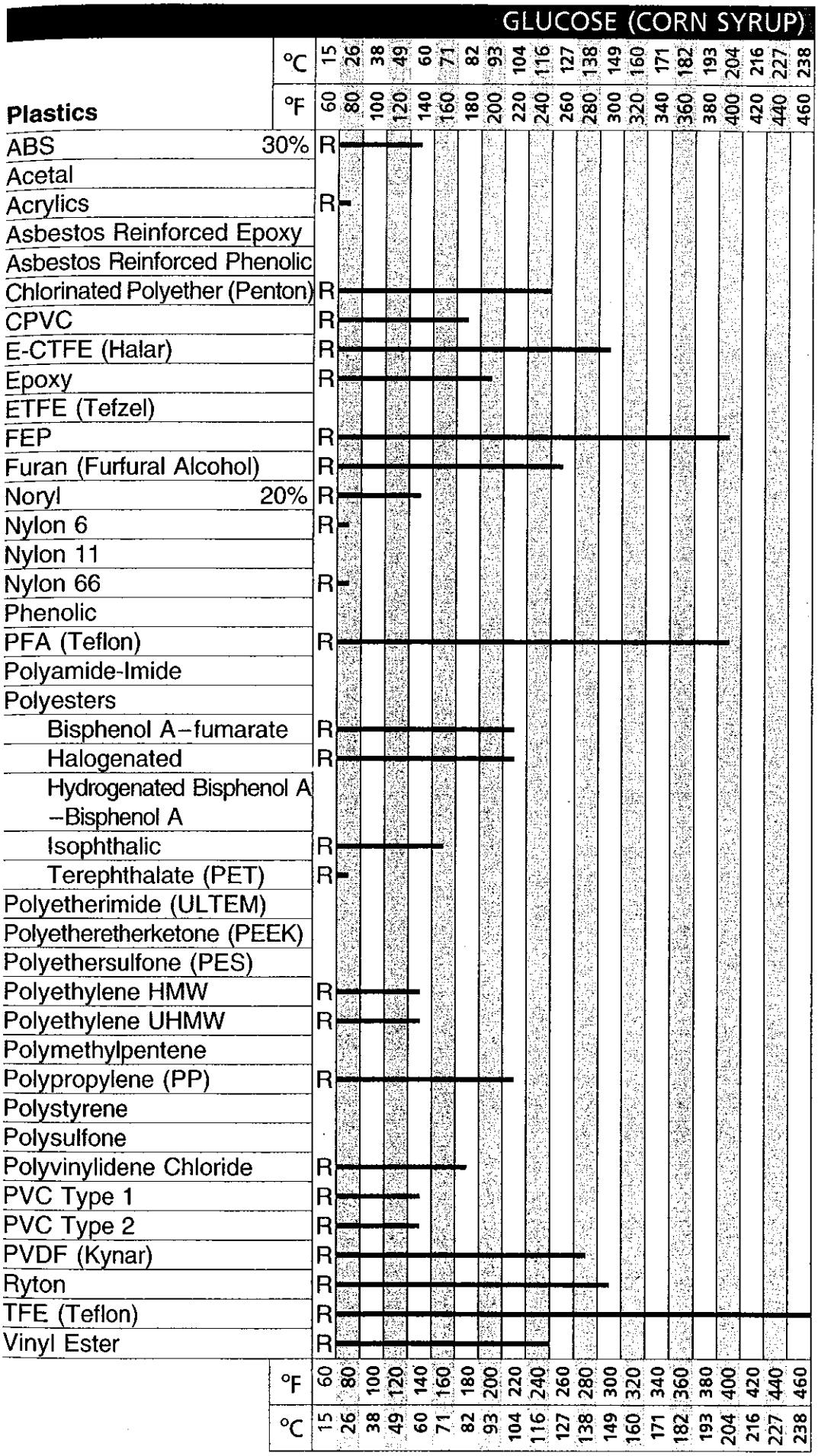
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GLUCOSE (CORN SYRUP)



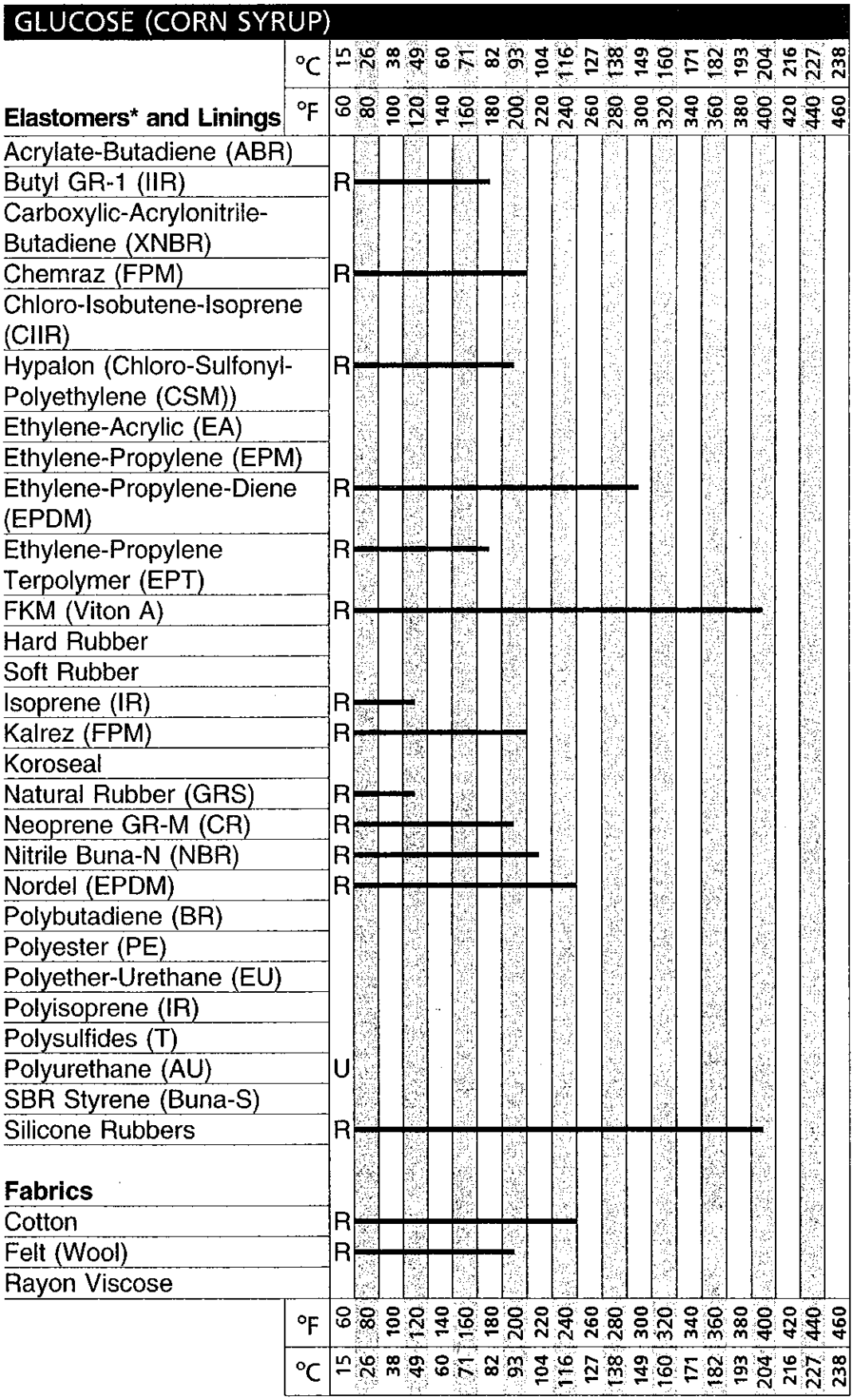
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GLUCOSE (CORN SYRUP)



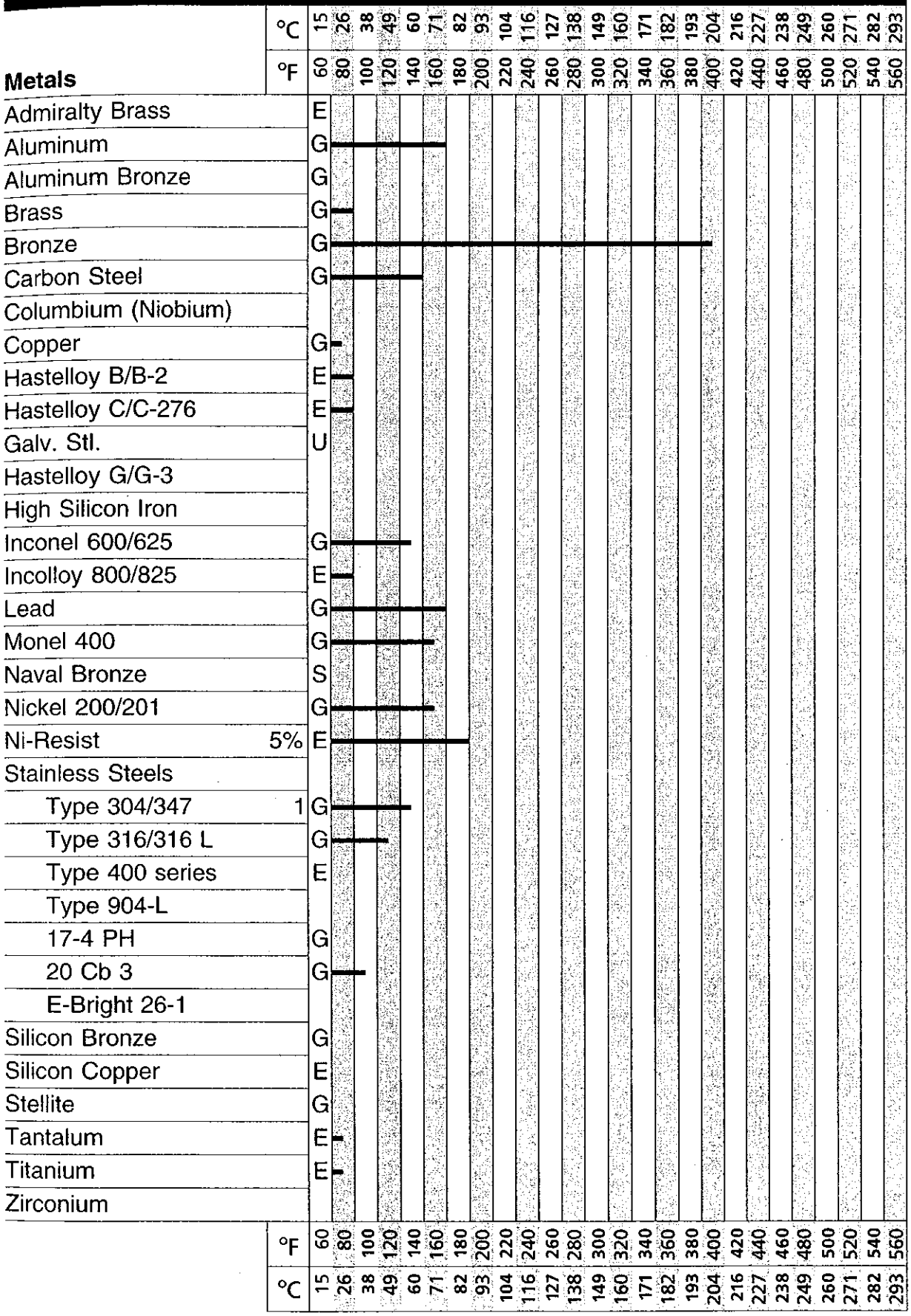
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GLUCOSE (CORN SYRUP)



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

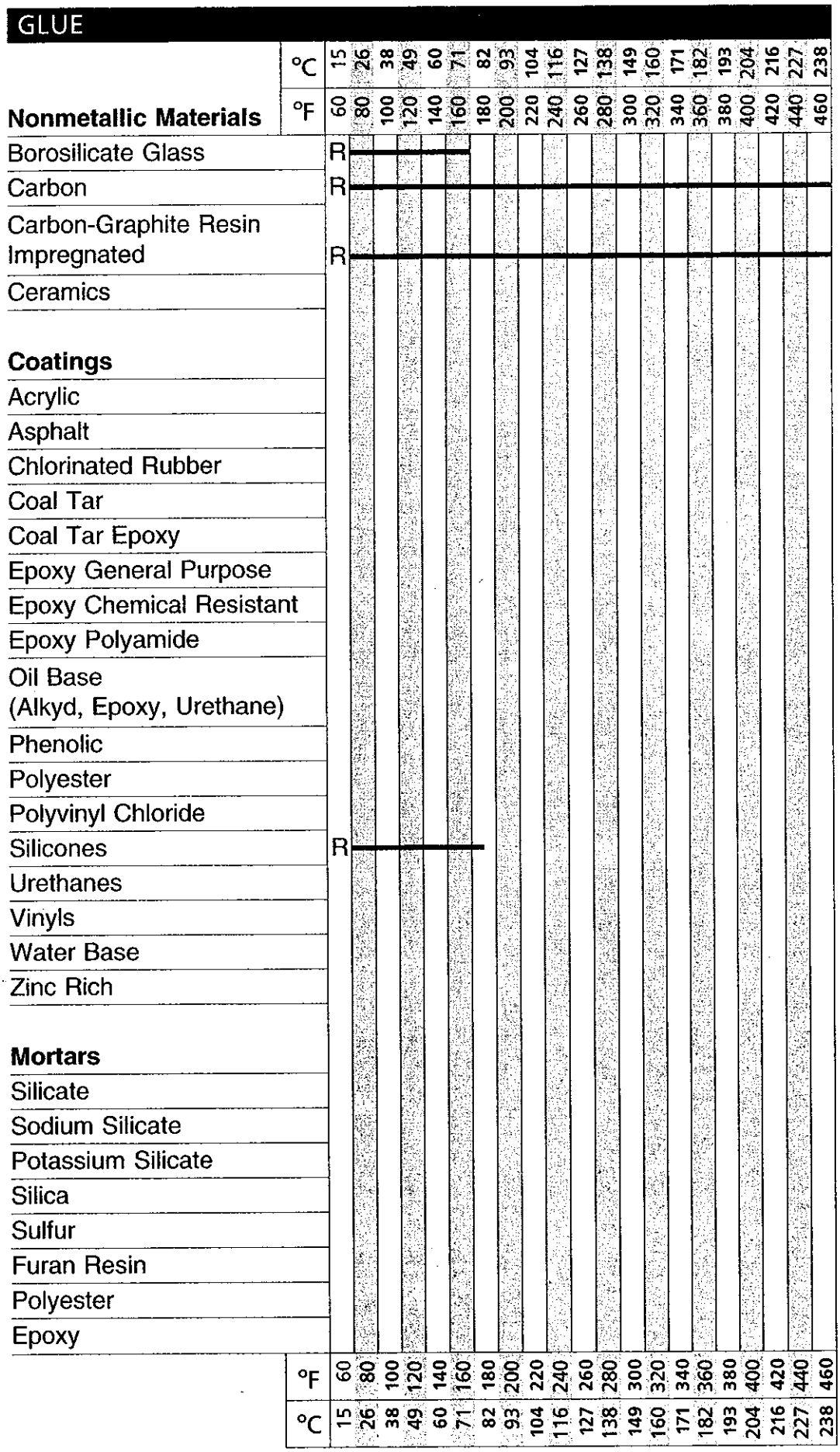
R = Resistant

U = Unsatisfactory

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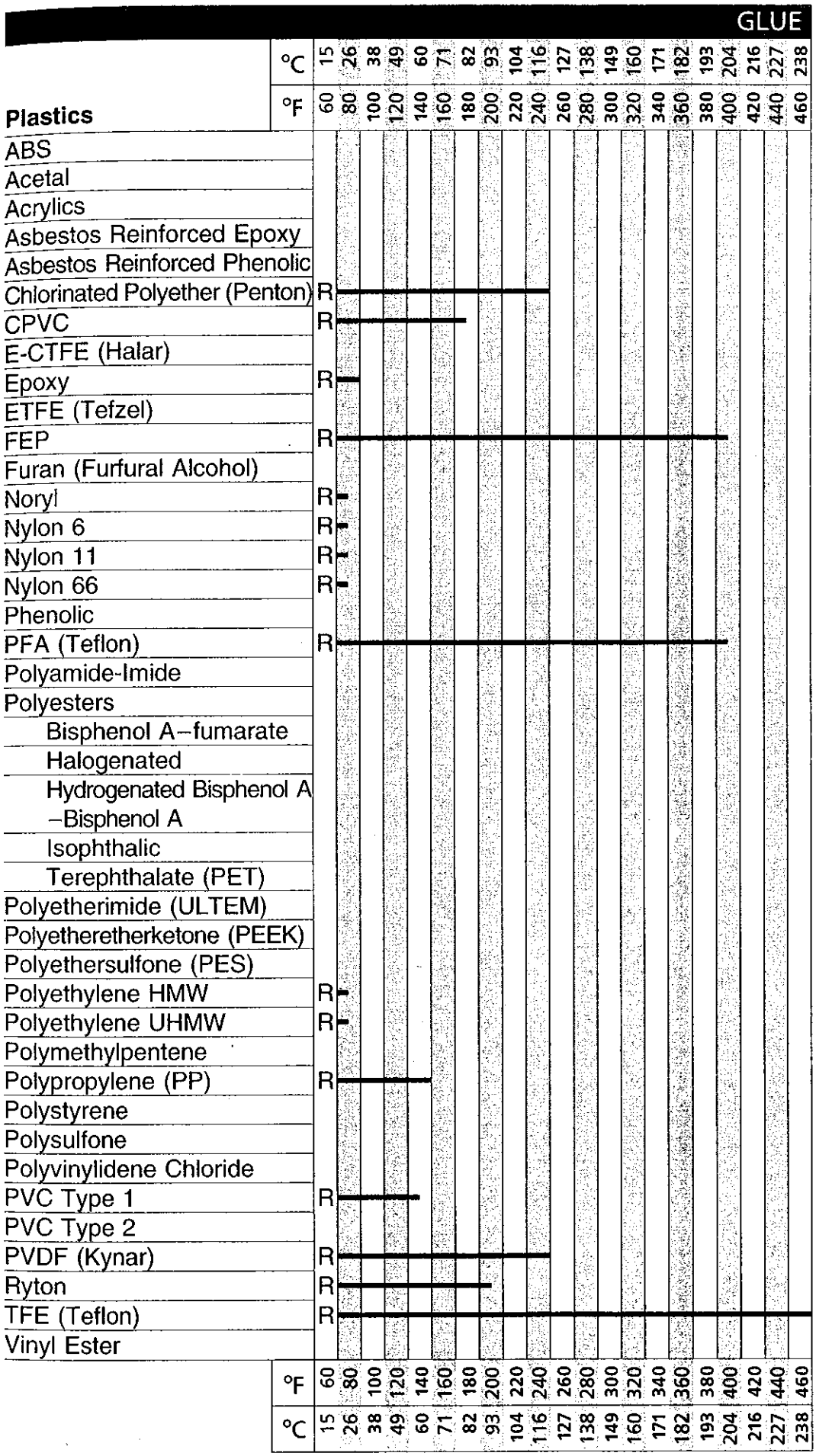
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GLUE

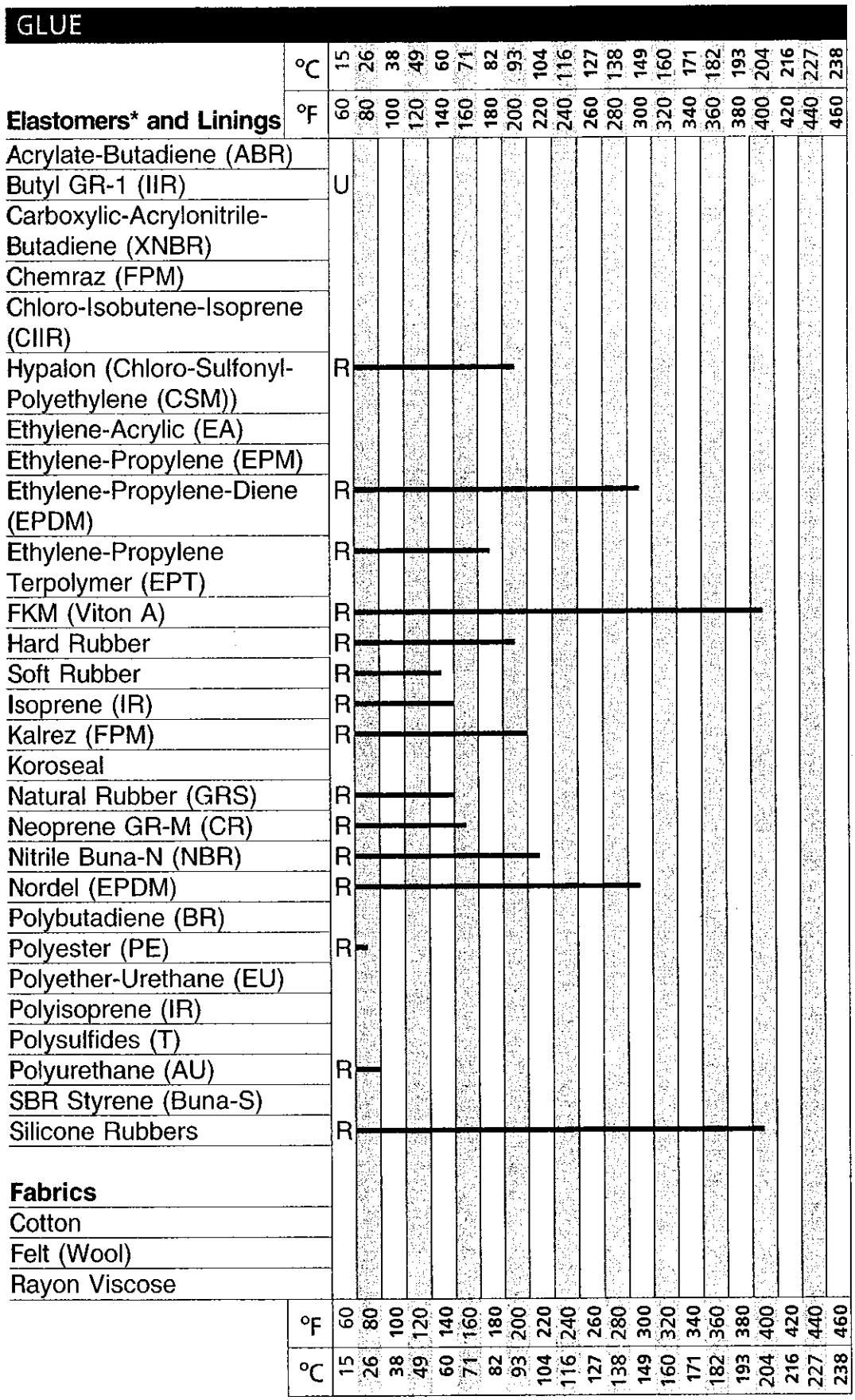


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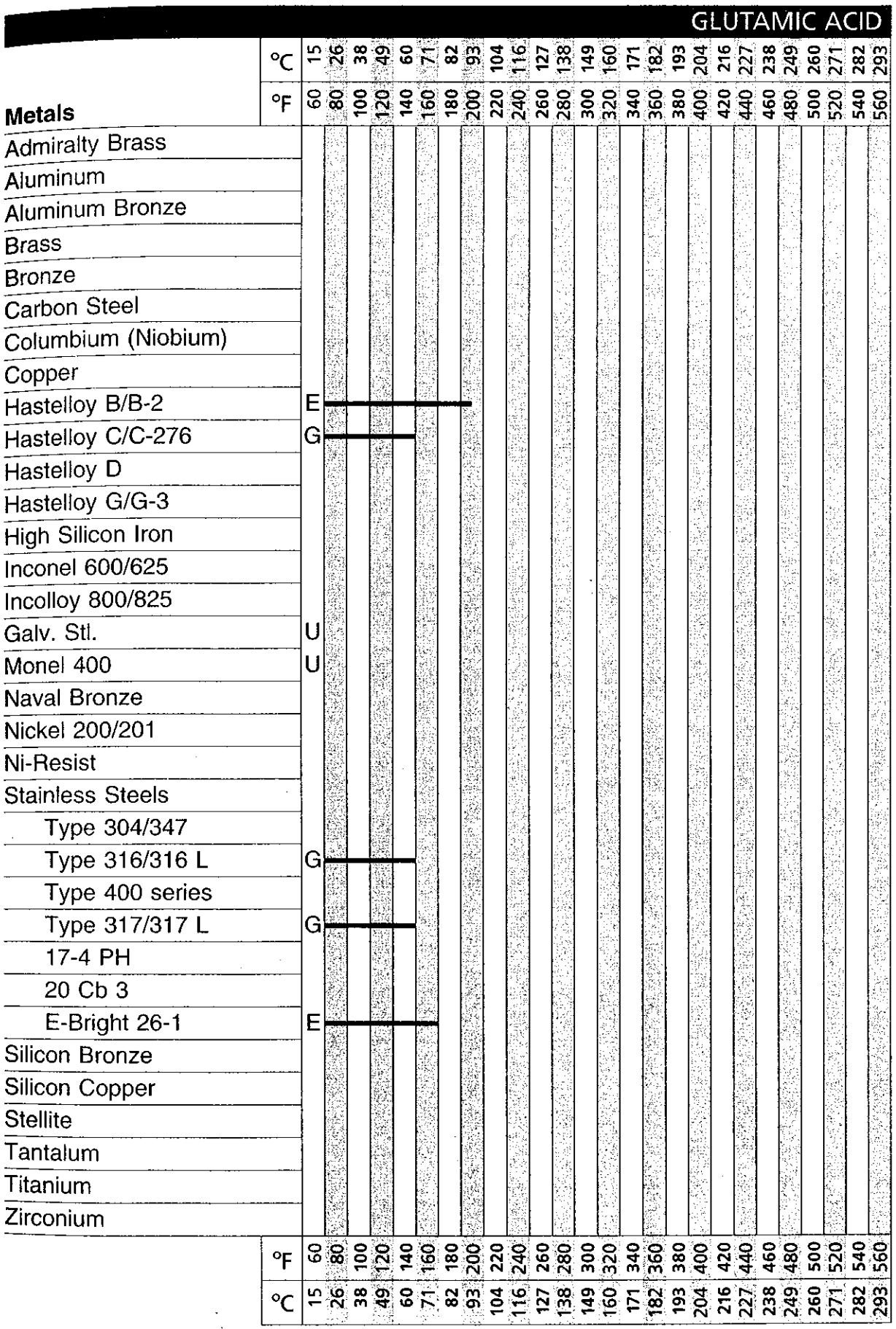


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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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GLUTAMIC ACID

Nonmetallic Materials	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																					
Carbon																					
Carbon-Graphite Resin Impregnated																					
Ceramics																					
Coatings																					
Acrylic																					
Asphalt																					
Chlorinated Rubber																					
Coal Tar																					
Coal Tar Epoxy																					
Epoxy General Purpose																					
Epoxy Chemical Resistant																					
Epoxy Polyamide																					
Oil Base (Alkyd, Epoxy, Urethane)																					
Phenolic																					
Polyester																					
Polyvinyl Chloride																					
Silicones																					
Urethanes																					
Vinyls																					
Water Base																					
Zinc Rich																					
Mortars																					
Silicate																					
Sodium Silicate																					
Potassium Silicate																					
Silica																					
Sulfur																					
Furan Resin																					
Polyester																					
Epoxy																					
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

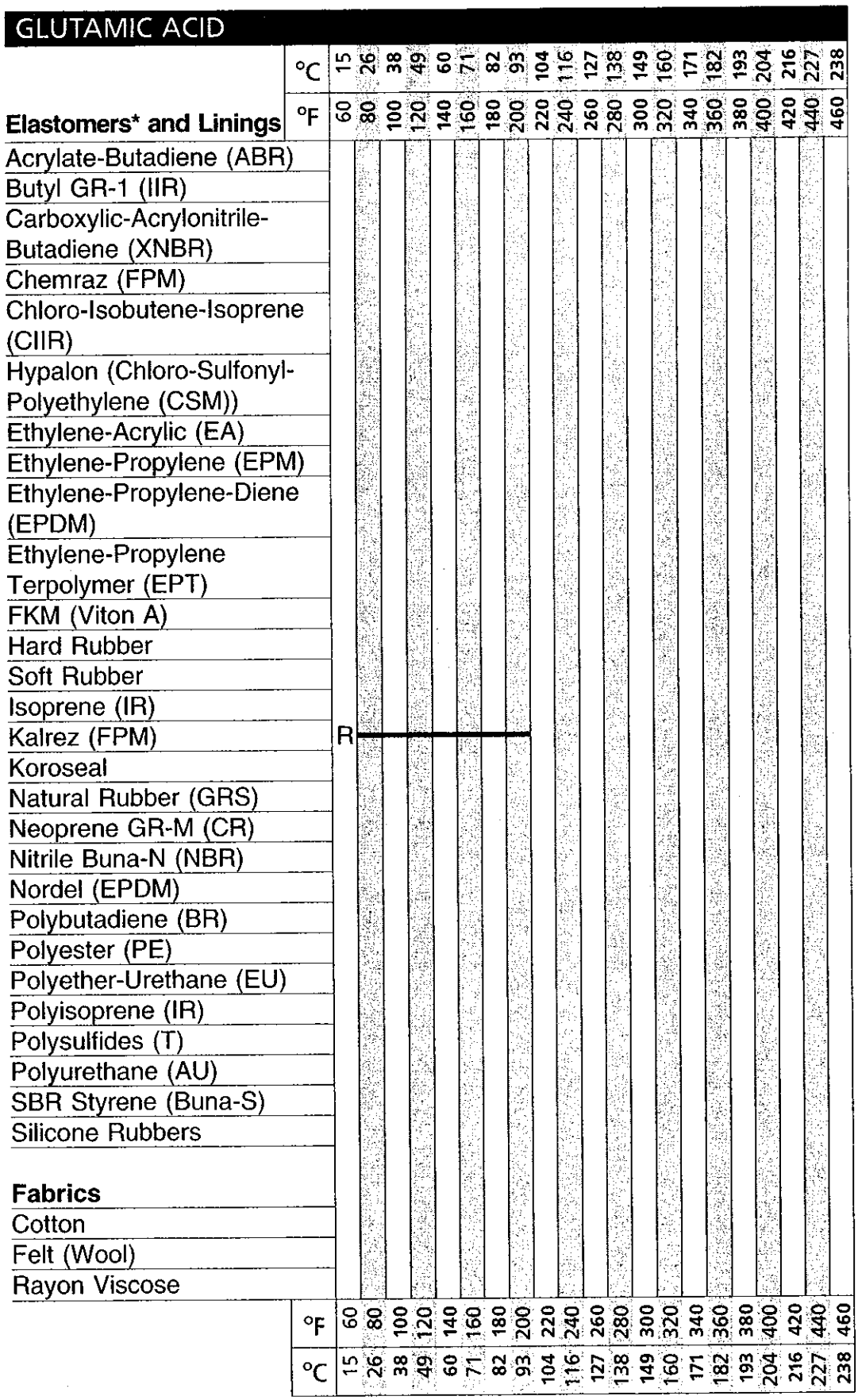
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GLUTAMIC ACID

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)																						
Epoxy																						
ETFE (Tefzel)																						
FEP																						
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)																						
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)																						
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)																						
Ryton																						
TFE (Teflon)																						
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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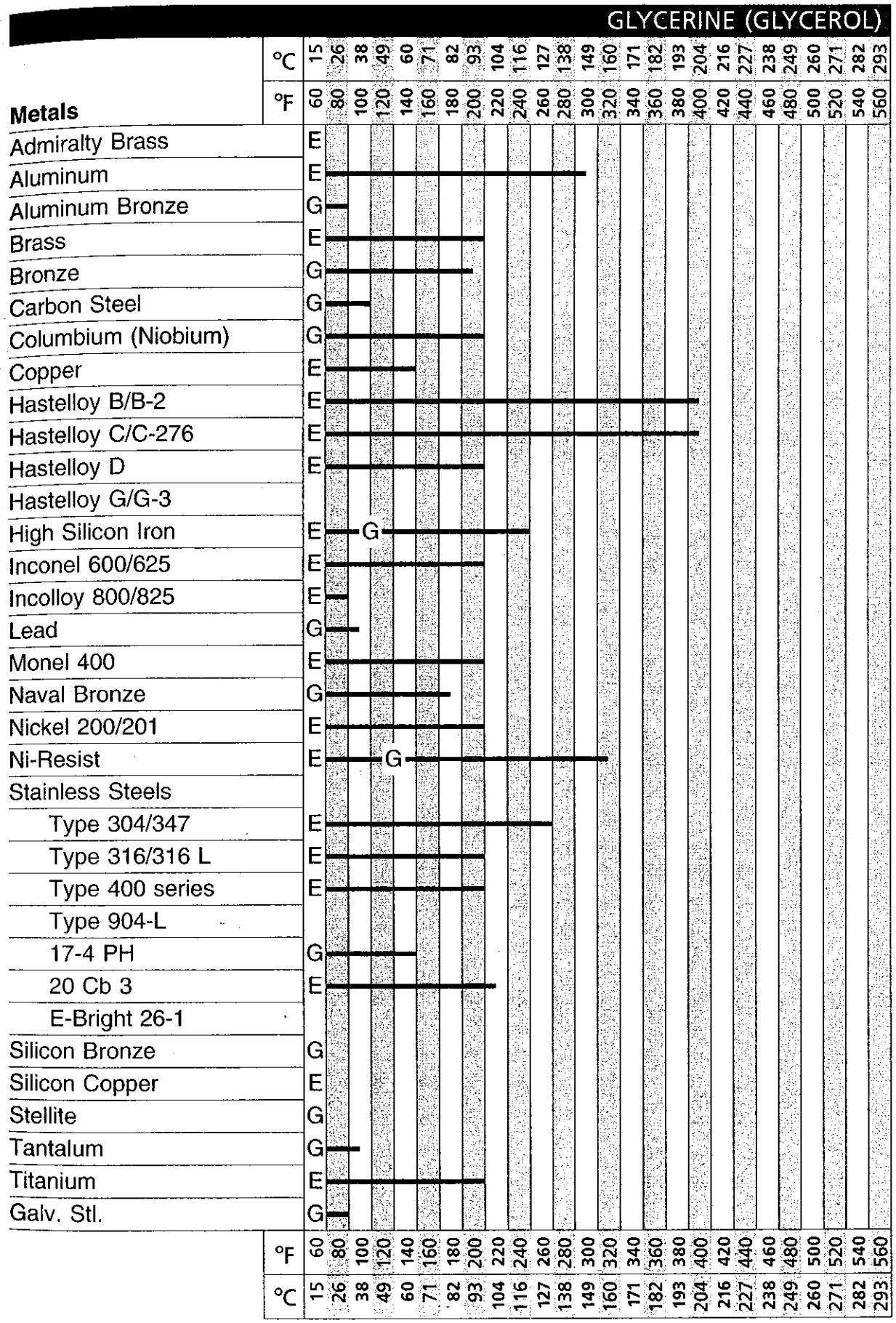
GLUTAMIC ACID



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GLYCERINE (GLYCEROL)



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

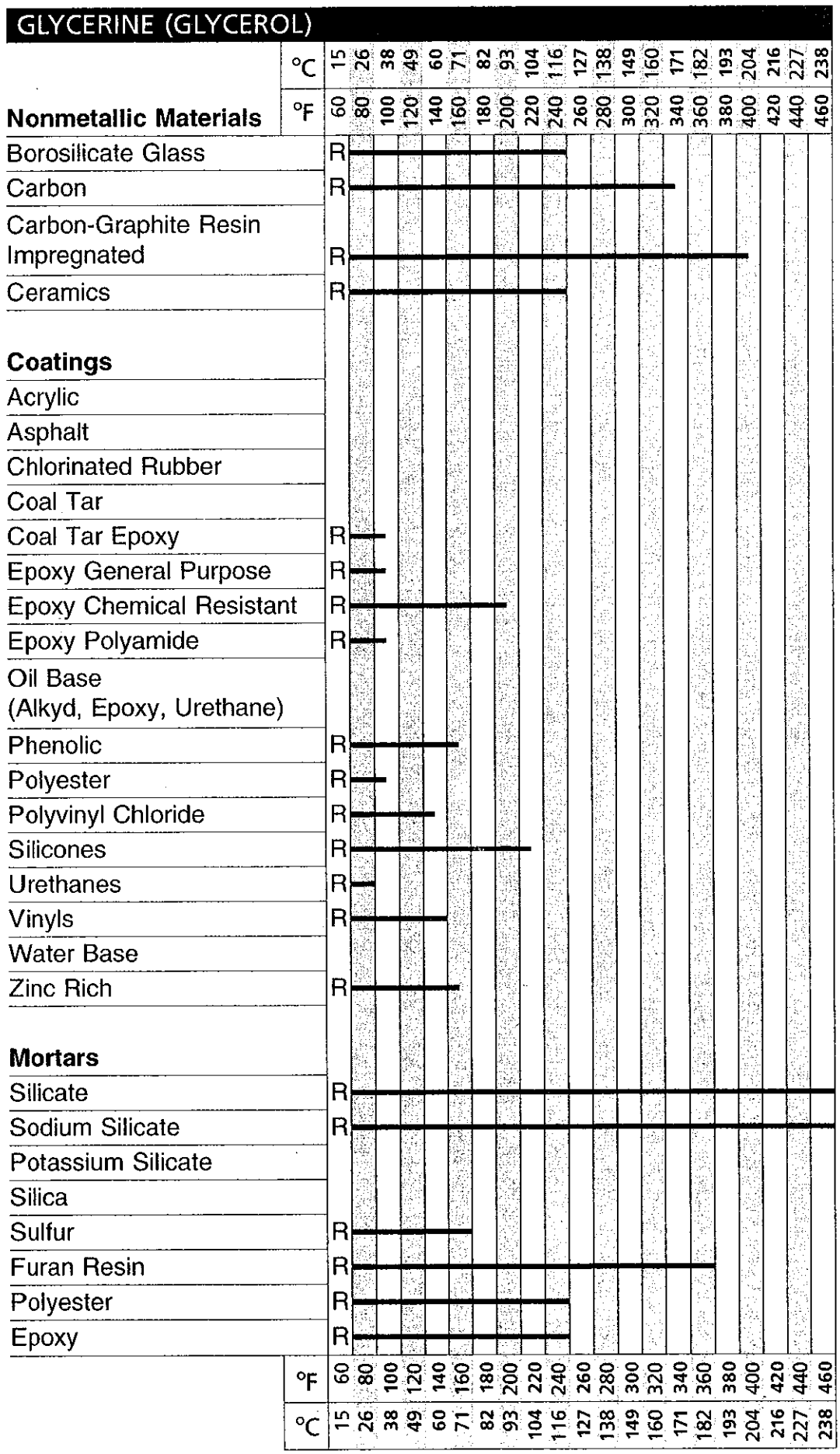
R = Resistant

U = Unsatisfactory

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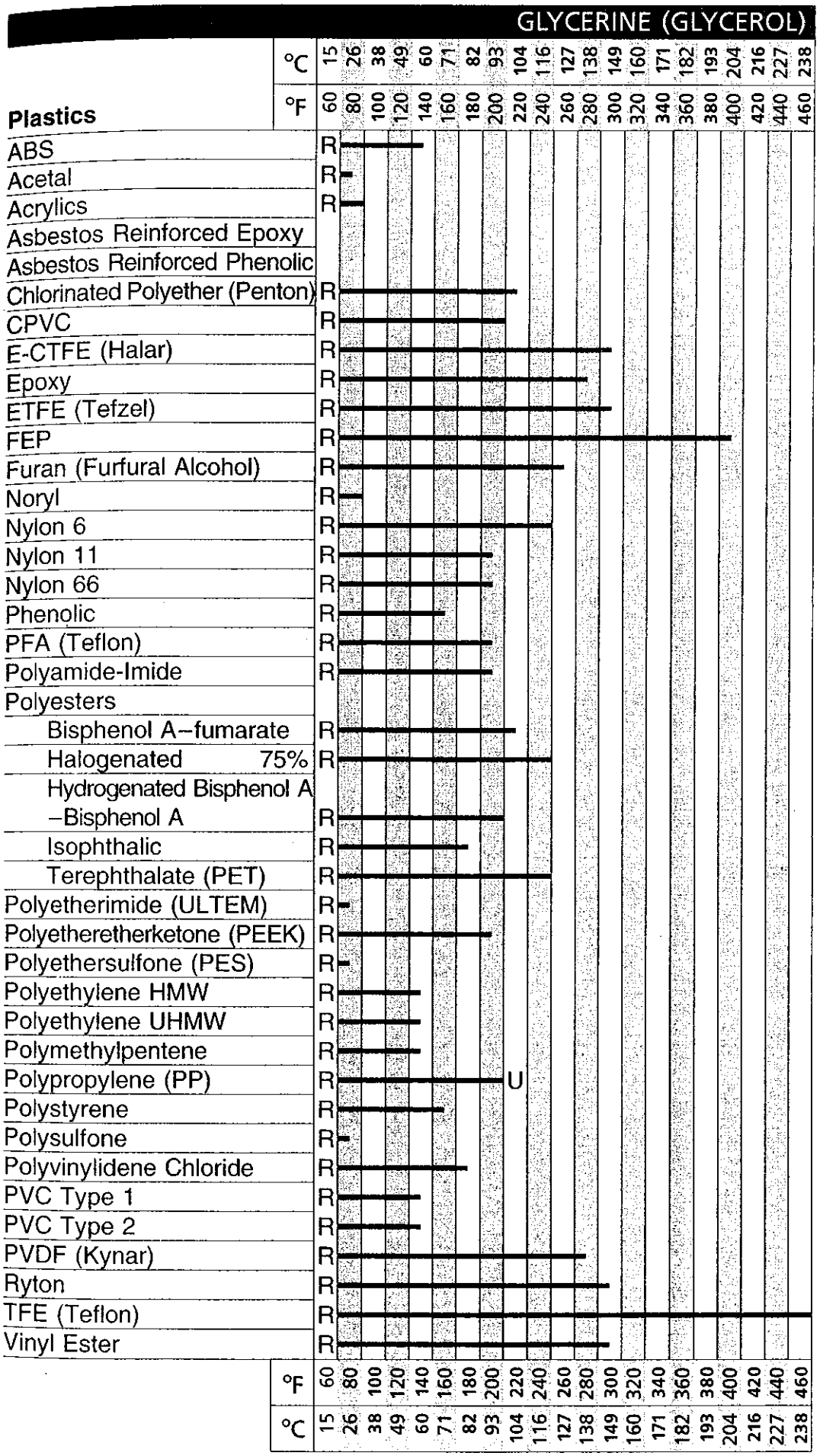
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GLYCERINE (GLYCEROL)



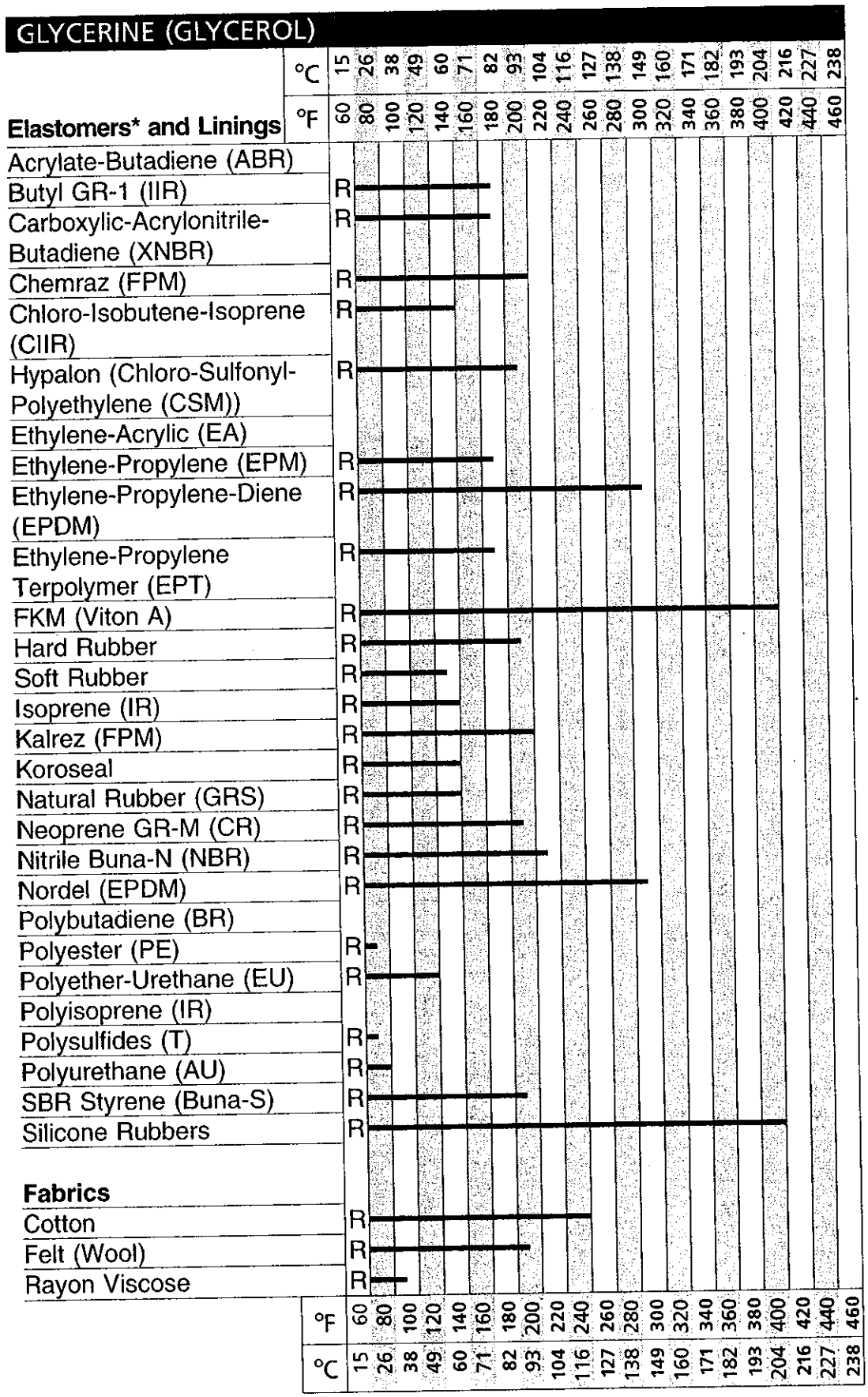
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GLYCERINE (GLYCEROL)



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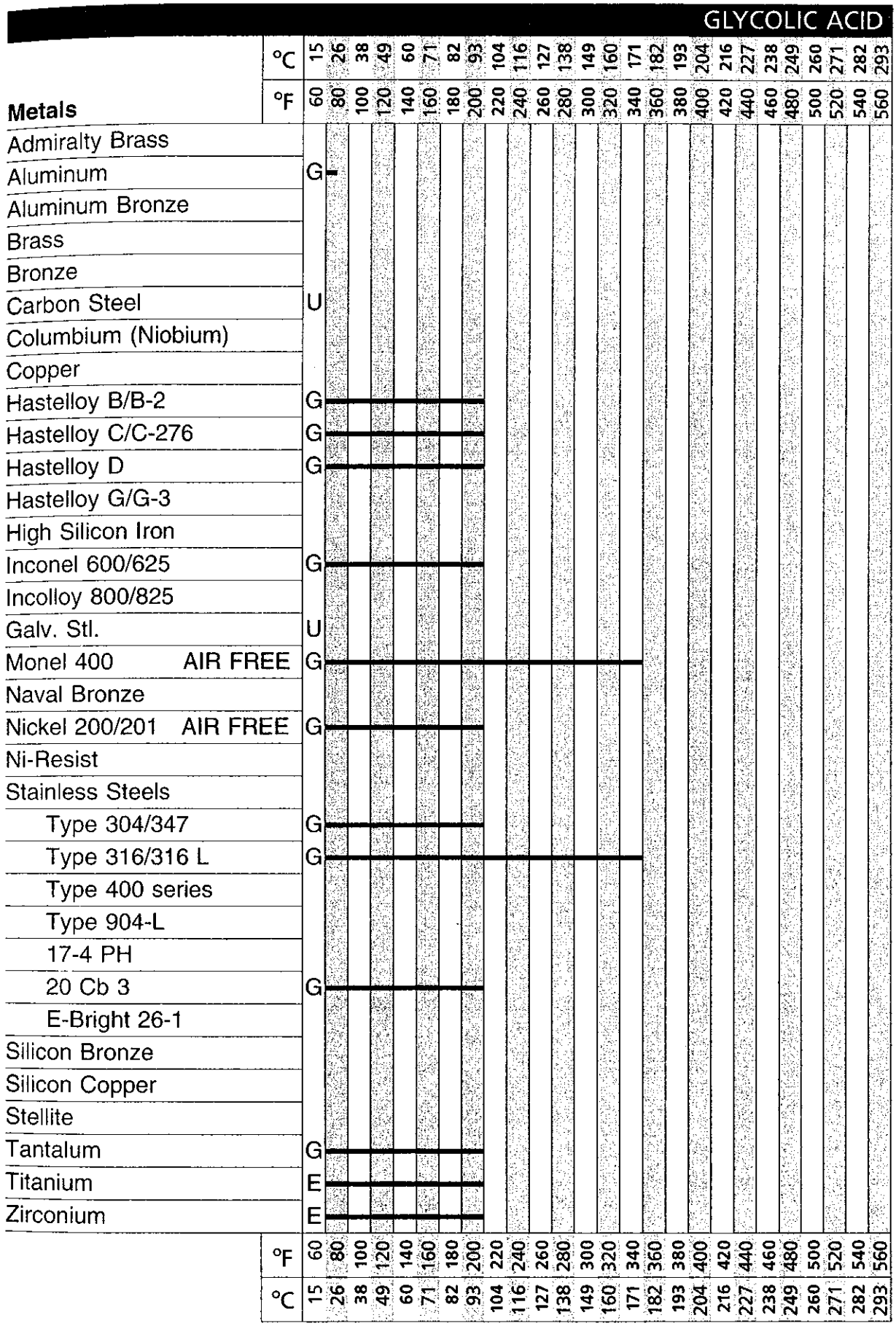
GLYCERINE (GLYCEROL)



*See also Nylon 11 under PLASTICS

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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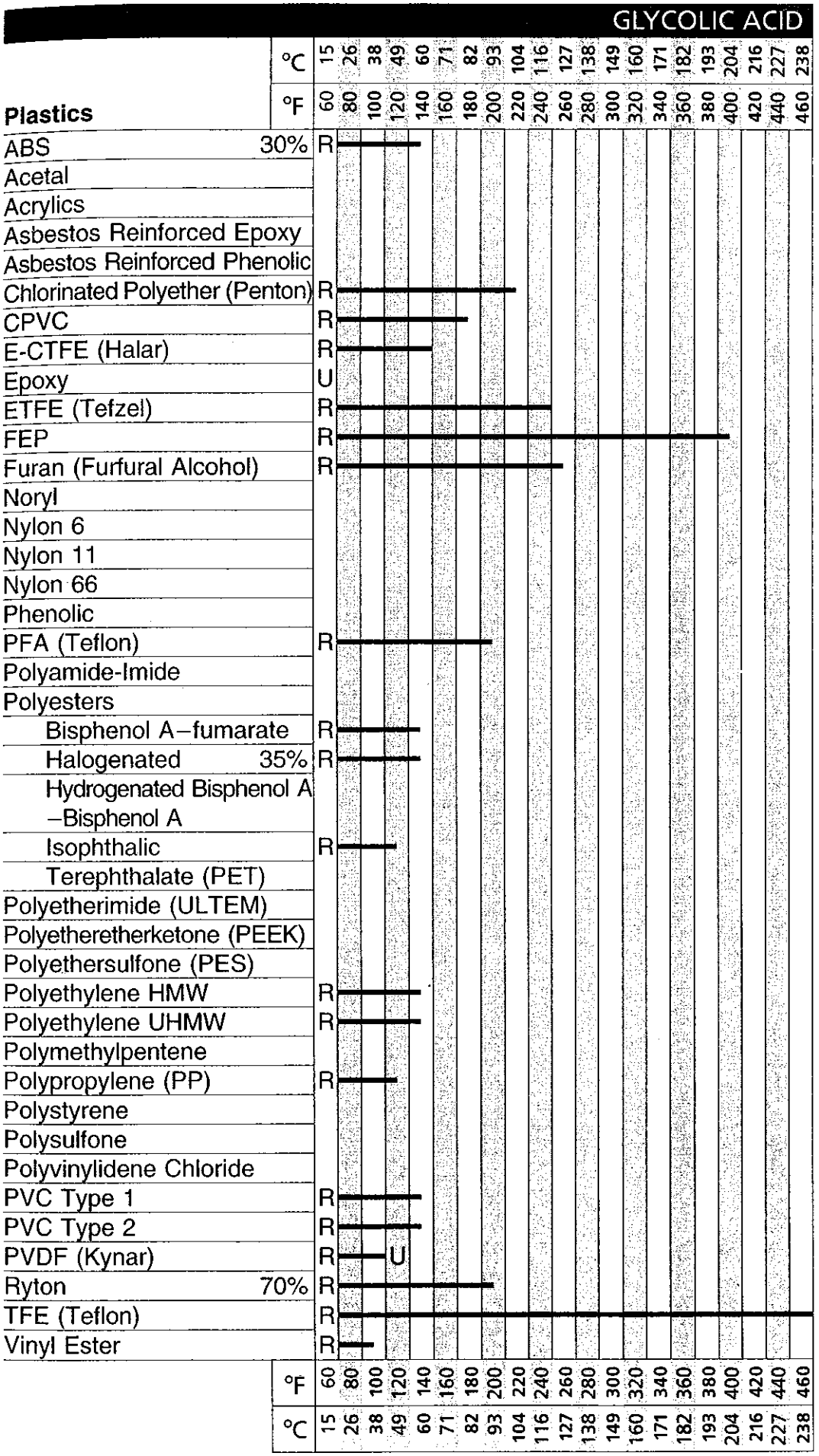
GLYCOLIC ACID

Nonmetallic Materials	°F	°C
Borosilicate Glass		
Carbon	R	
Carbon-Graphite Resin Impregnated	R	
Ceramics		
Coatings		
Acrylic		
Asphalt		
Chlorinated Rubber		
Coal Tar		
Coal Tar Epoxy	U	
Epoxy General Purpose		
Epoxy Chemical Resistant		
Epoxy Polyamide	U	
Oil Base (Alkyd, Epoxy, Urethane)		
Phenolic		
Polyester	R	
Polyvinyl Chloride	R	
Silicones		
Urethanes		
Vinyls	R	
Water Base		
Zinc Rich		
Mortars		
Silicate		
Sodium Silicate	R	
Potassium Silicate		
Silica		
Sulfur	U	
Furan Resin	R	
Polyester	R	
Epoxy	U	

°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

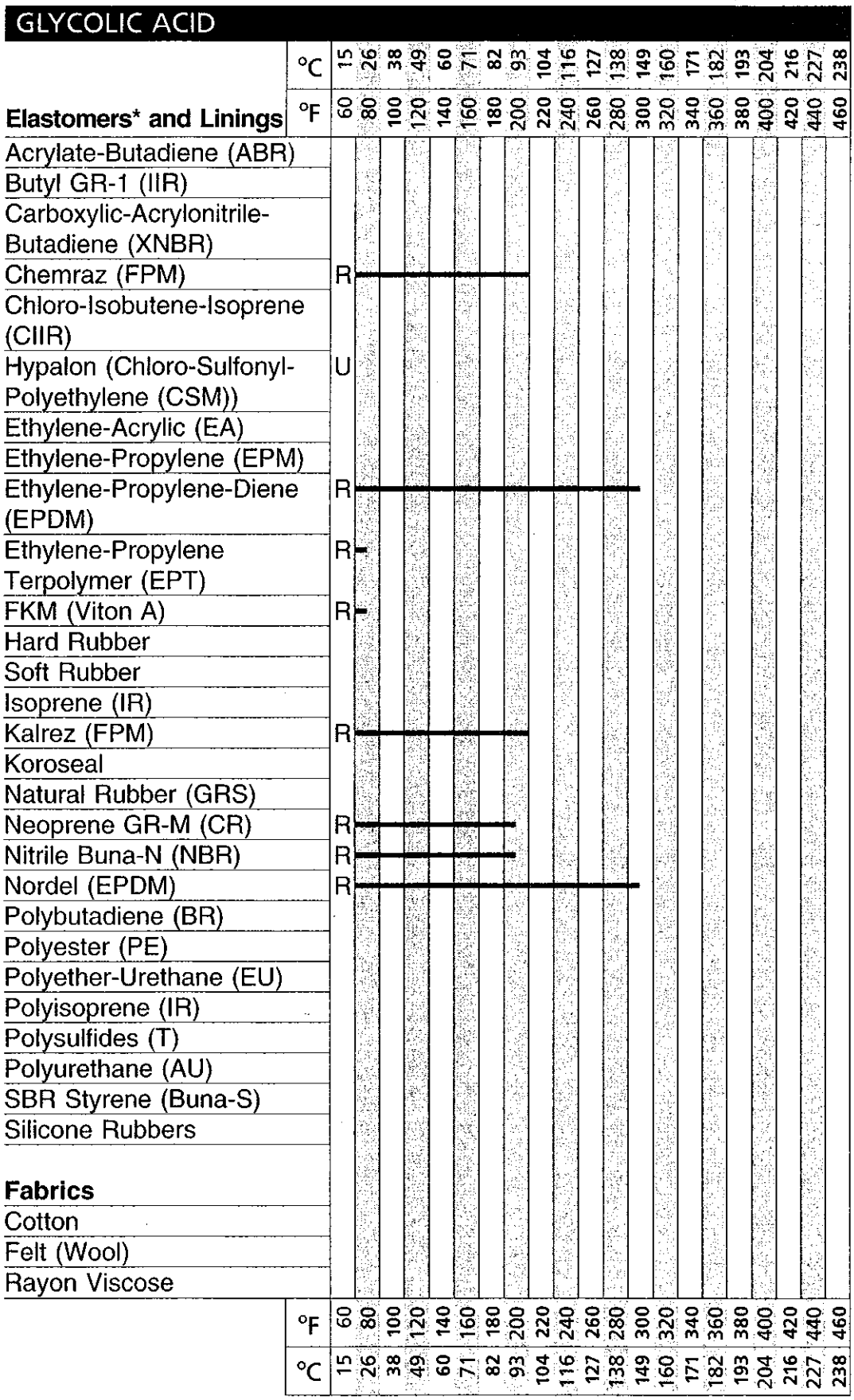
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GLYCOLIC ACID



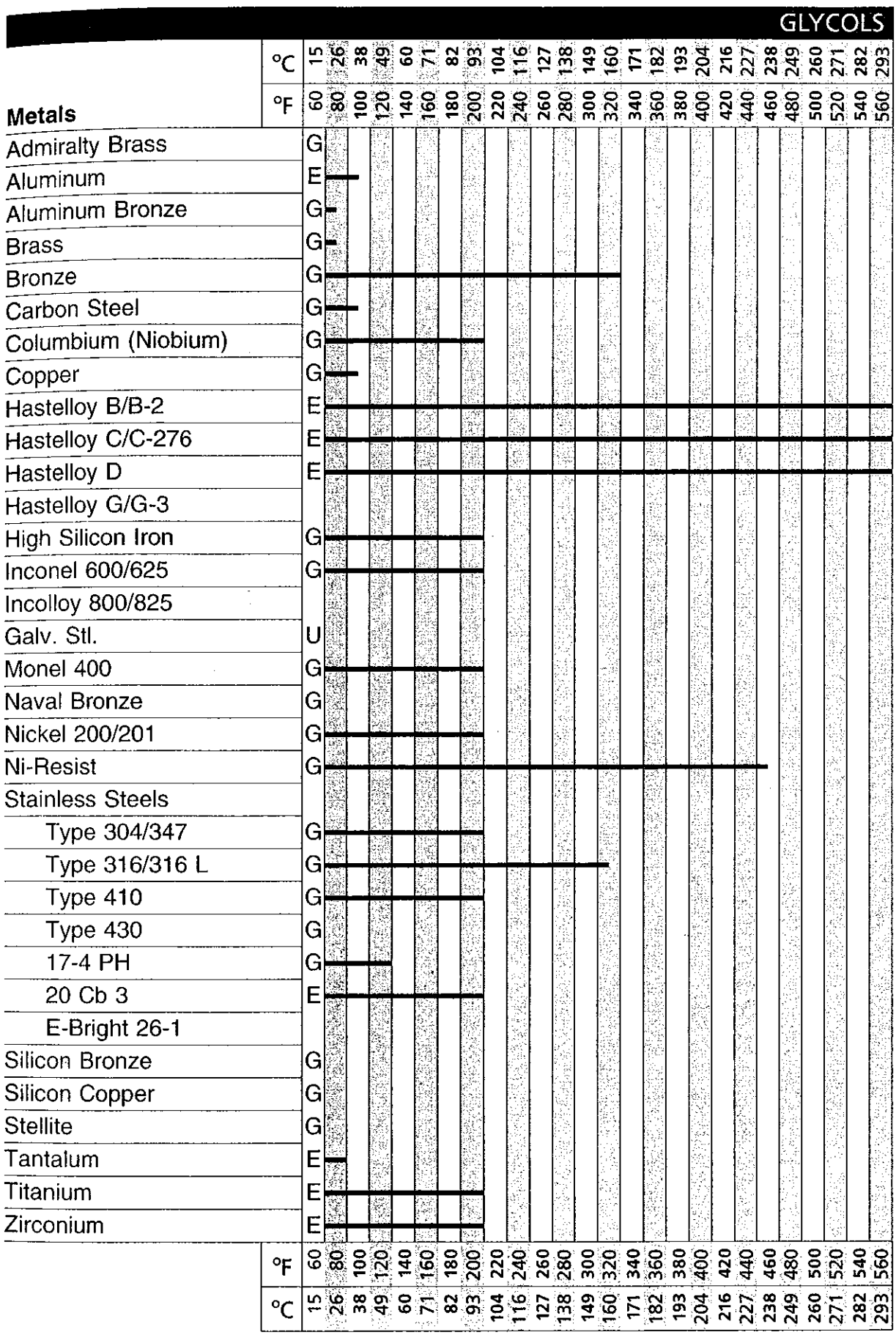
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GLYCOLIC ACID



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

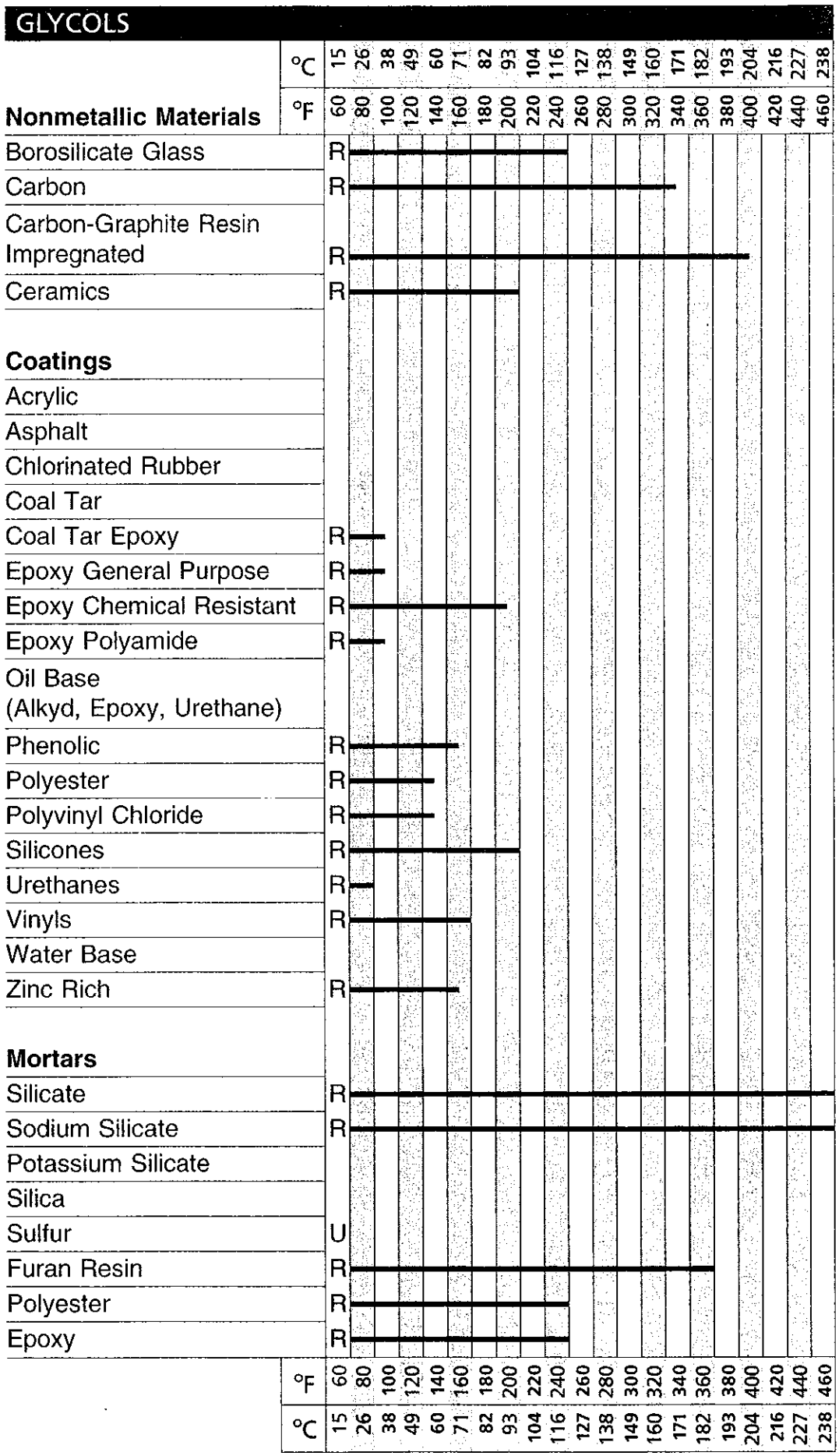
R = Resistant

U = Unsatisfactory

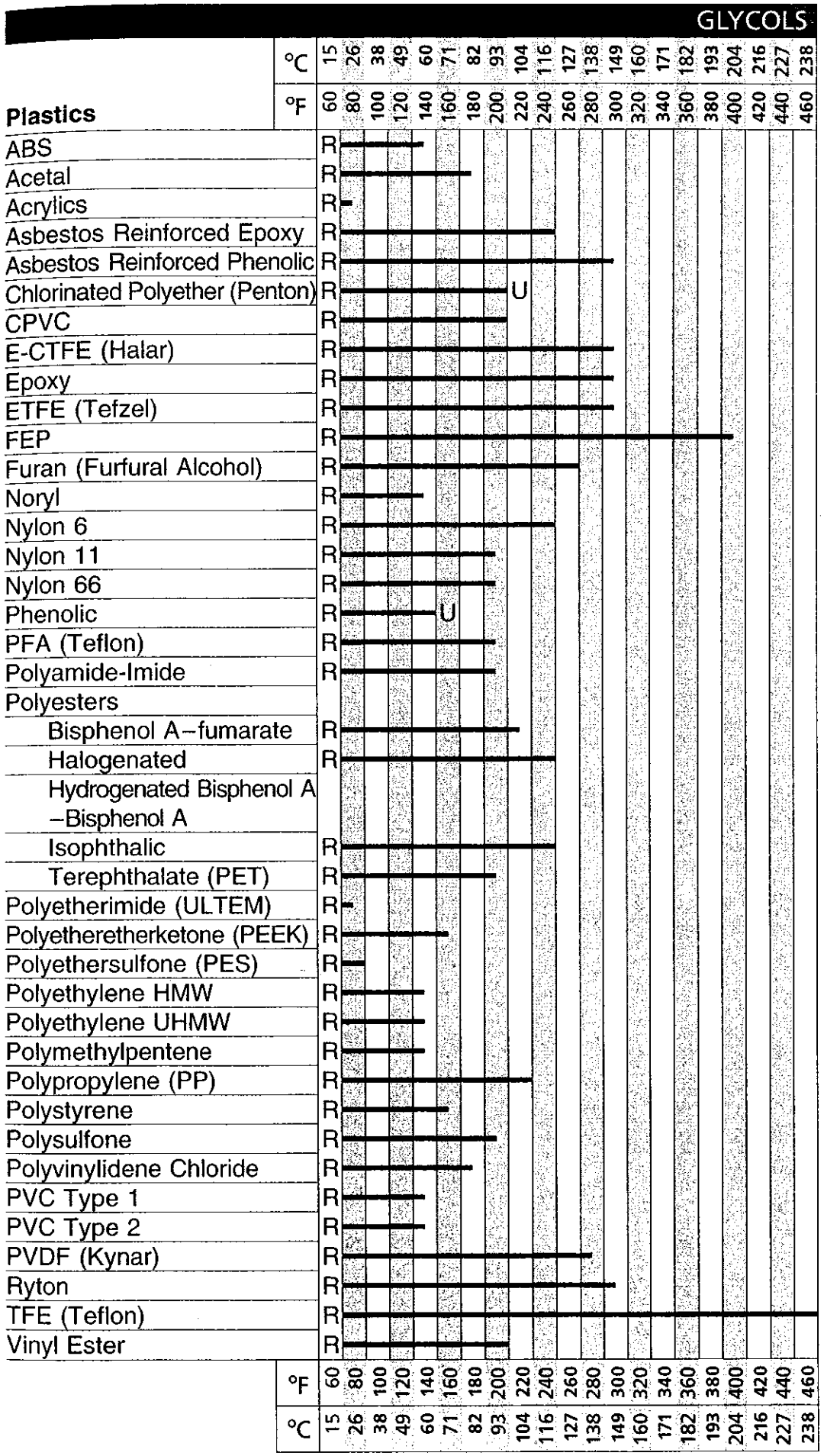
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GLYCOLS

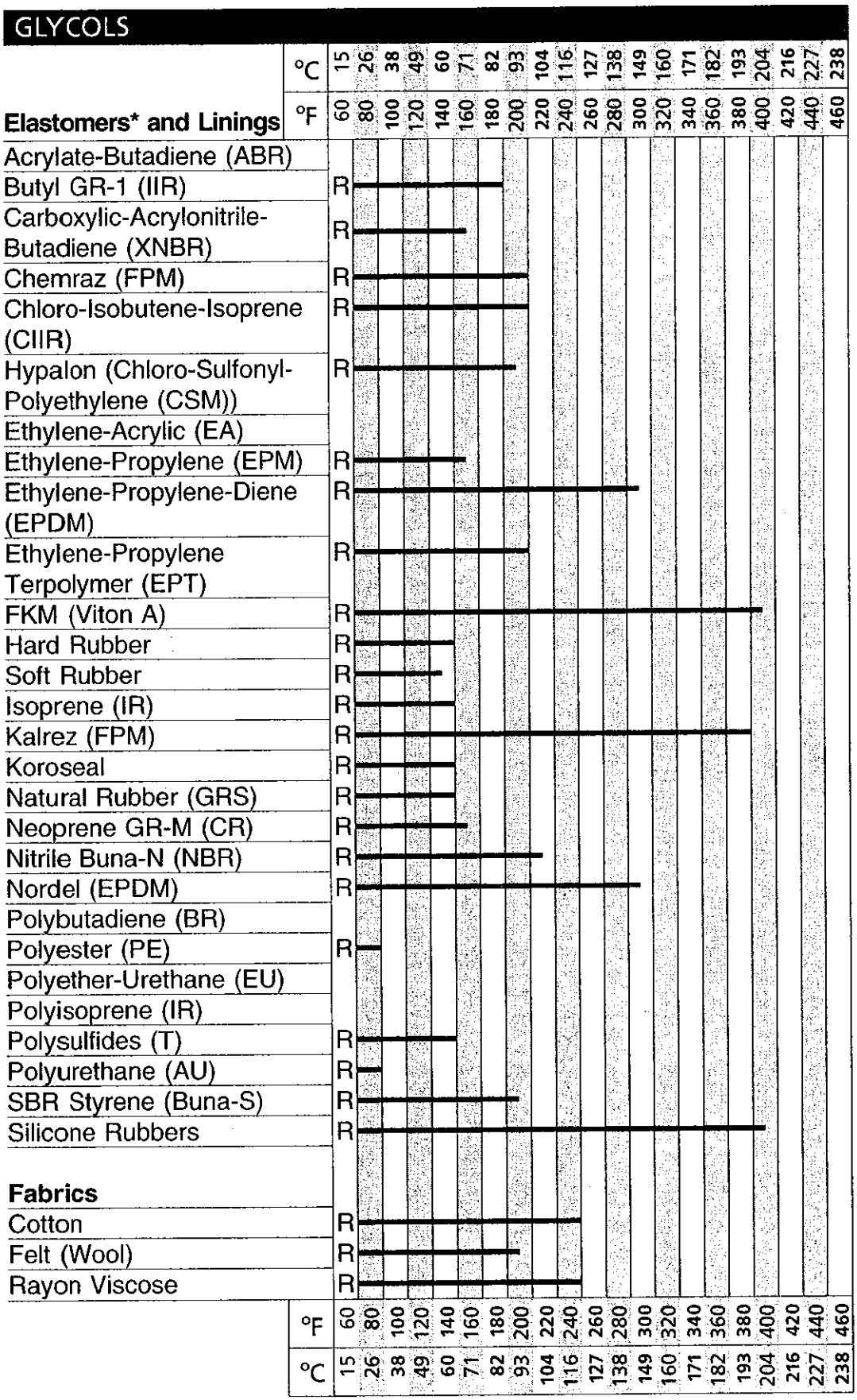


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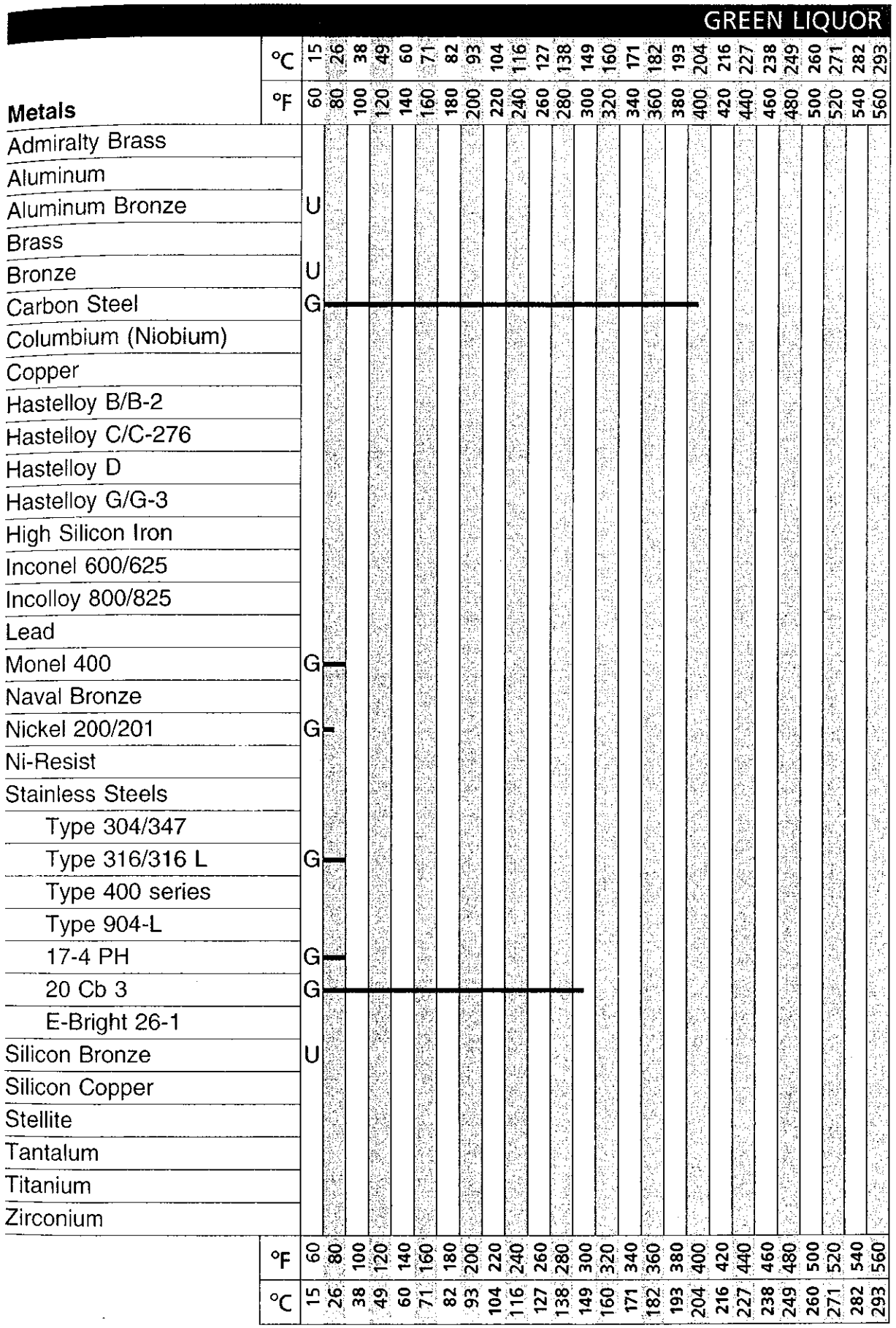
GLYCOLS



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GREEN LIQUOR



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

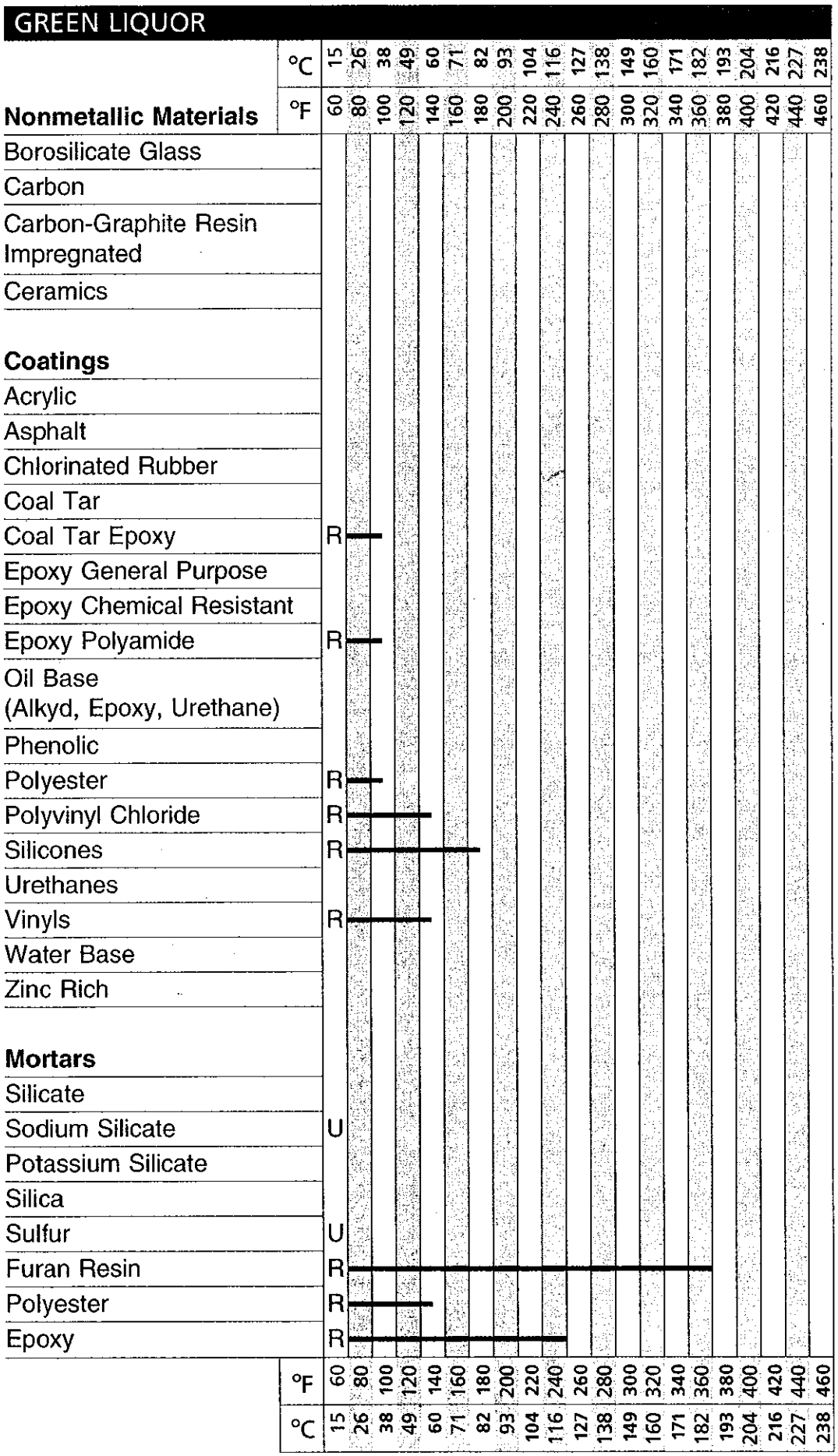
R = Resistant

U = Unsatisfactory

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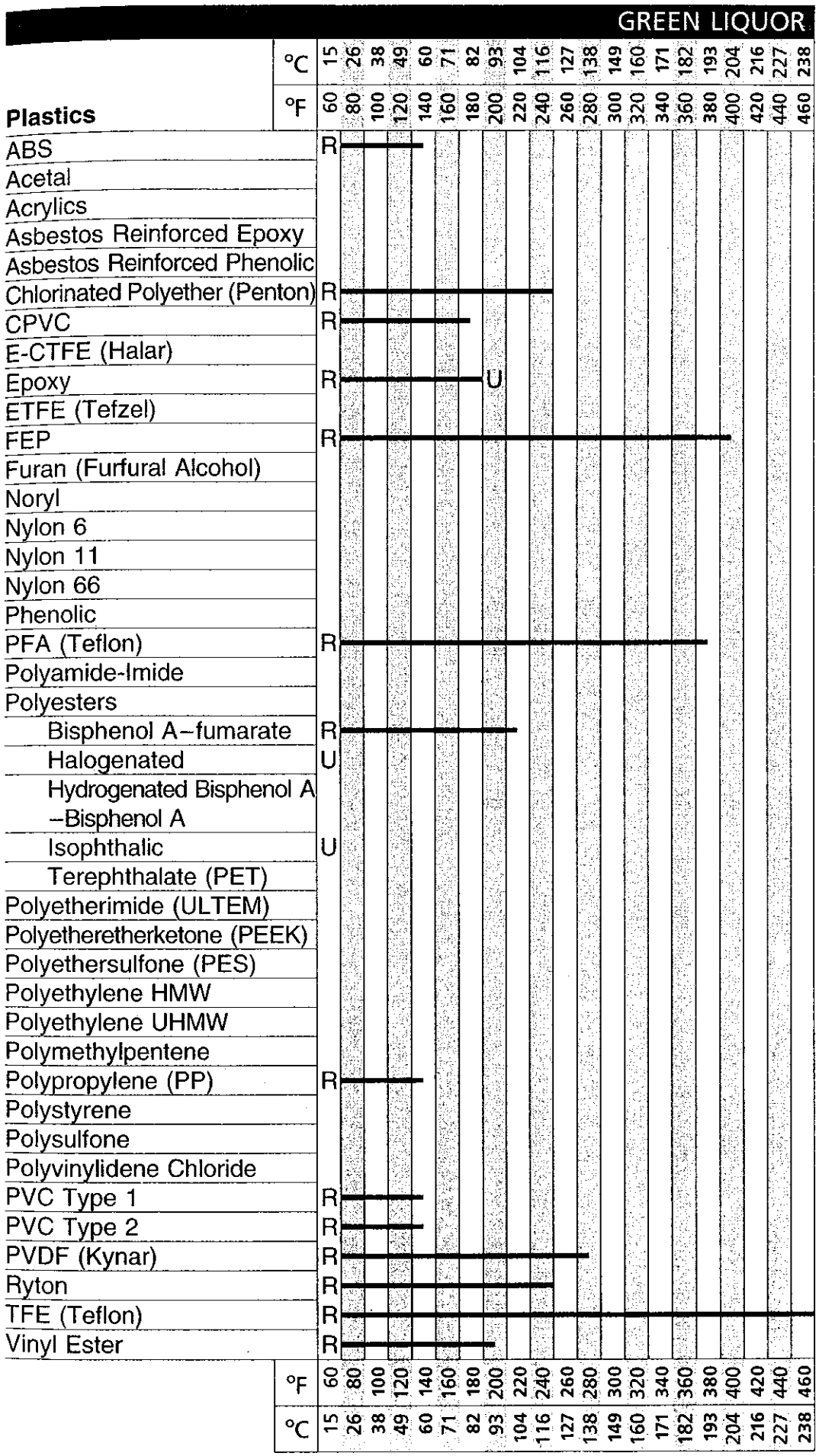
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GREEN LIQUOR



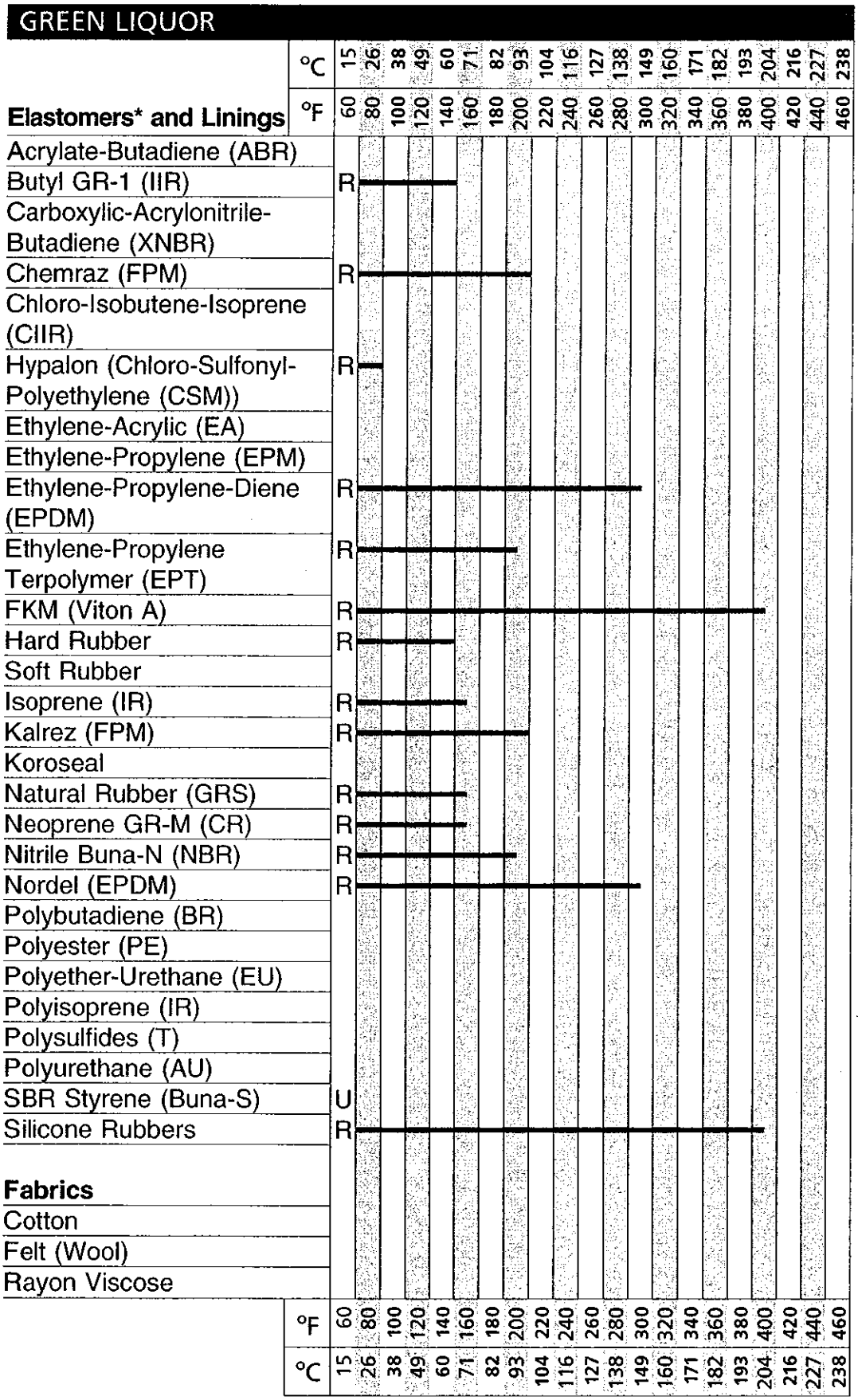
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GREEN LIQUOR



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GREEN LIQUOR



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Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum		E																									
Aluminum Bronze																											
Brass		E																									
Bronze																											
Carbon Steel		E																									
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel																											
Incolloy																											
Lead																											
Monel																											
Naval Bronze																											
Nickel																											
Ni-Resist																											
Stainless Steels																											
Type 304/347		E																									
Type 316		E																									
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum		E																									
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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HELIUM

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HELIUM

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Polycarbonate	R																					
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)	R																					
Epoxy																						
ETFE (Tefzel)																						
FEP	R																					
Furan (Furfural Alcohol)																						
Noryl	R																					
Nylon 6	R																					
Nylon 11	R																					
Nylon 66	R																					
Phenolic																						
PFA (Teflon)	R																					
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)																						
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)																						
Ryton																						
TFE (Teflon)	R																					
Vinyl Ester	R																					
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HELIUM

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)																					
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																					
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)																					
Ethylene-Propylene Terpolymer (EPT)																					
FKM (Viton A)																					
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)																					
Kalrez (FPM)	R	R	R	R	R	R	R	R													
Koroseal																					
Natural Rubber (GRS)																					
Neoprene GR-M (CR)																					
Nitrile Buna-N (NBR)																					
Nordel (EPDM)																					
Polybutadiene (BR)																					
Polyester (PE)																					
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers																					
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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HEPTANE

Metals	°C	°F
Admiralty Brass		
Aluminum	G	
Aluminum Bronze	G	
Brass	G	
Bronze	G	
Carbon Steel	G	
Columbium (Niobium)		
Copper	G	
Hastelloy B/B-2	E	
Hastelloy C/C-276	E	
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron	G	
Inconel 600/625	G	
Incolloy 800/825		
Lead		
Monel 400	G	
Naval Bronze	E	
Nickel 200/201	G	
Ni-Resist	G	
Stainless Steels		
Type 304/347	G	
Type 316/316 L	G	
Type 410	G	
Type 904-L	G	
17-4 PH	G	
20 Cb 3	G	
E-Bright 26-1		
Silicon Bronze	G	
Silicon Copper		
Stellite	G	
Tantalum	G	
Titanium	G	
Zirconium	G	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

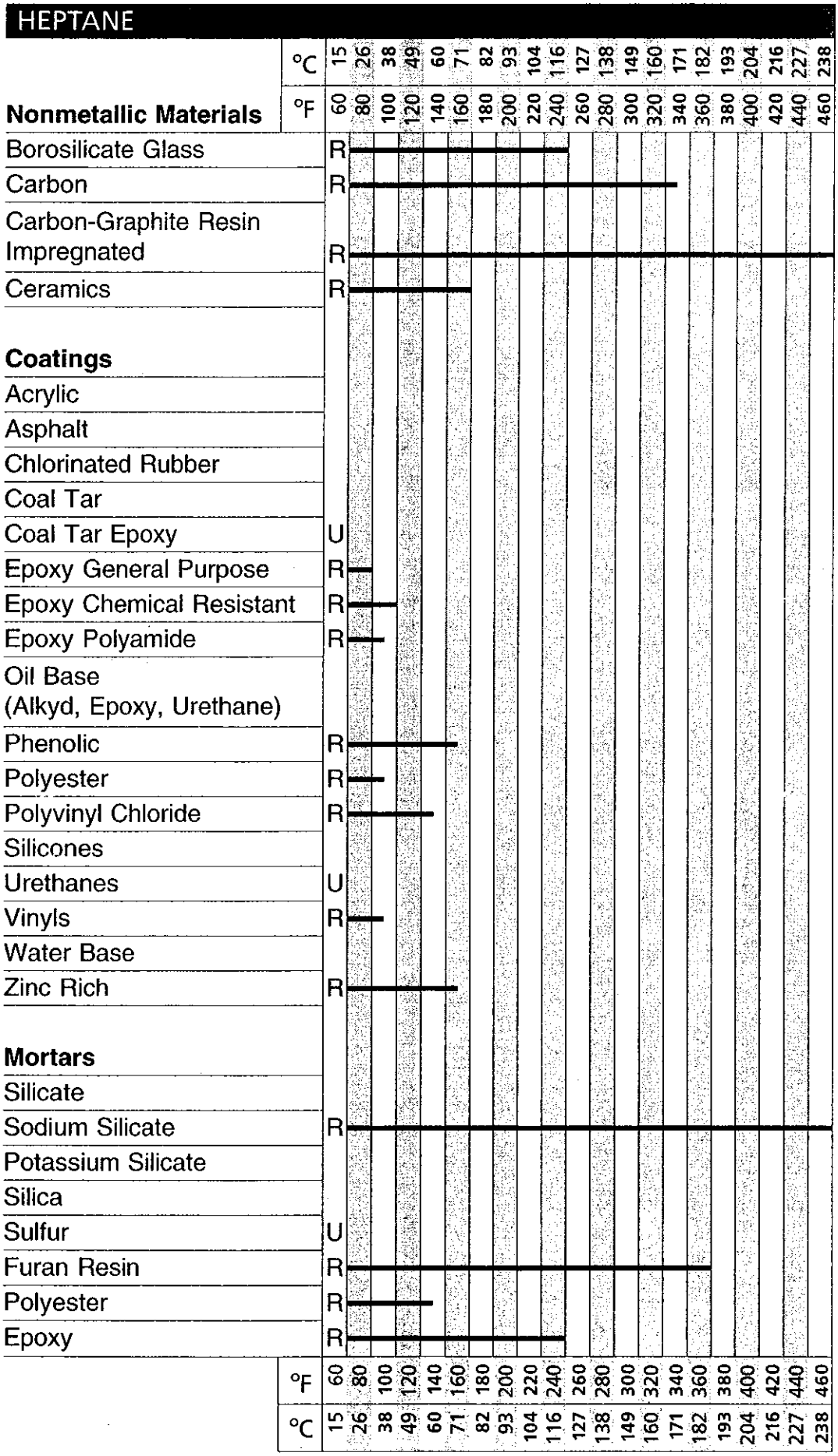
R = Resistant

U = Unsatisfactory

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HEPTANE



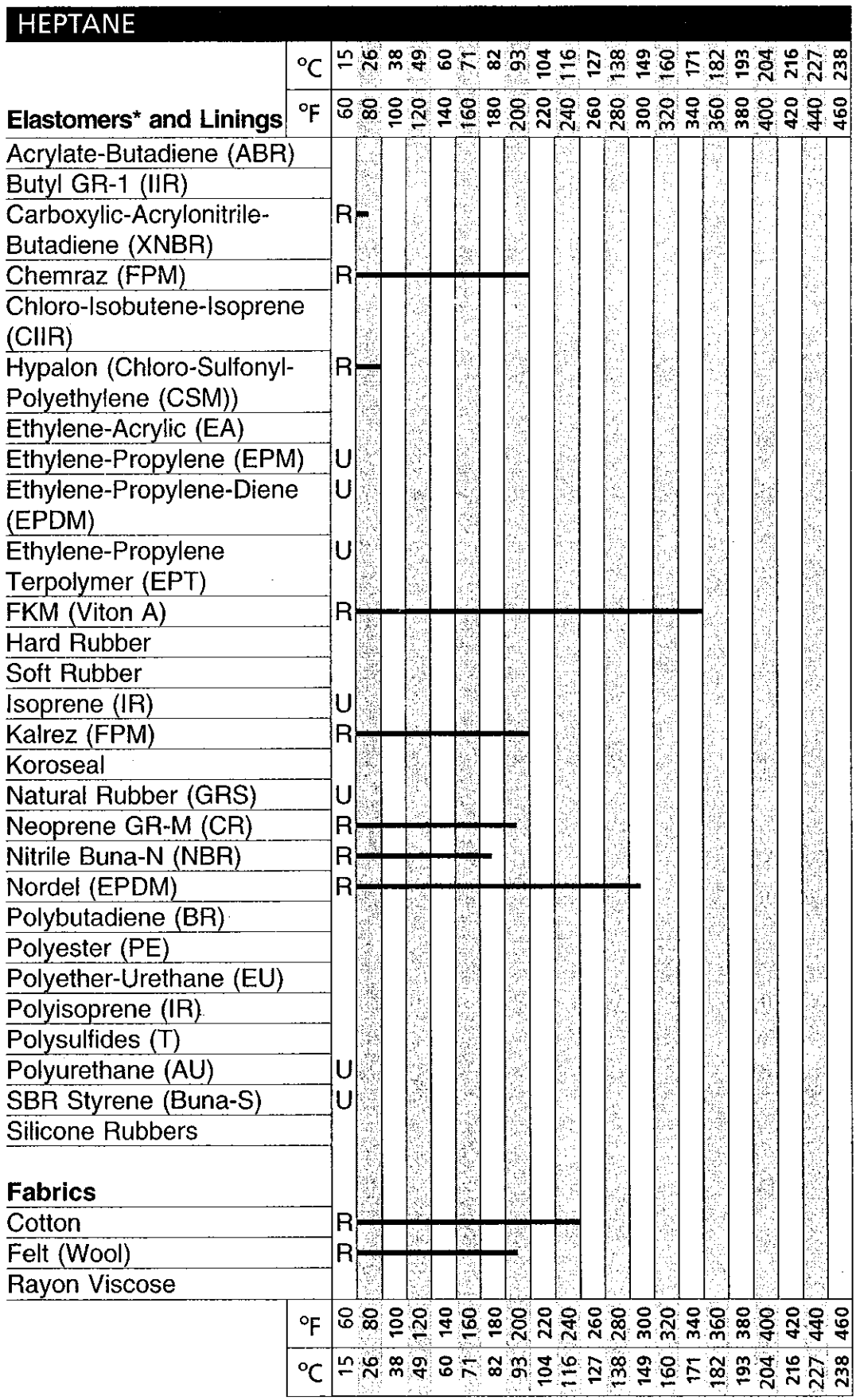
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HEPTANE

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS		R				U																
Acetal		R																				
Acrylics																						
Asbestos Reinforced Epoxy		R																				
Asbestos Reinforced Phenolic		R																				
Chlorinated Polyether (Penton)		R																				
CPVC		U																				
E-CTFE (Halar)		R																				
Epoxy		R																				
ETFE (Tefzel)		R																				
FEP		R																				
Furan (Furfural Alcohol)		R																				
Noryl																						
Nylon 6		R																				
Nylon 11		R																				
Nylon 66		R																				
Phenolic		R																				
PFA (Teflon)		R																				
Polyamide-Imide		R																				
Polyesters																						
Bisphenol A–fumarate		R																				
Halogenated		R																				
Hydrogenated Bisphenol A –Bisphenol A		R																				
Isophthalic		R																				
Terephthalate (PET)		R																				
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)		R																				
Polyethersulfone (PES)																						
Polyethylene HMW		R	U																			
Polyethylene UHMW		R																				
Polymethylpentene		U																				
Polypropylene (PP)		R	U																			
Polystyrene																						
Polysulfone		R																				
Polyvinylidene Chloride		R																				
PVC Type 1		R																				
PVC Type 2		R																				
PVDF (Kynar)		R																				
Ryton		R																				
TFE (Teflon)		R																				
Vinyl Ester		R																				
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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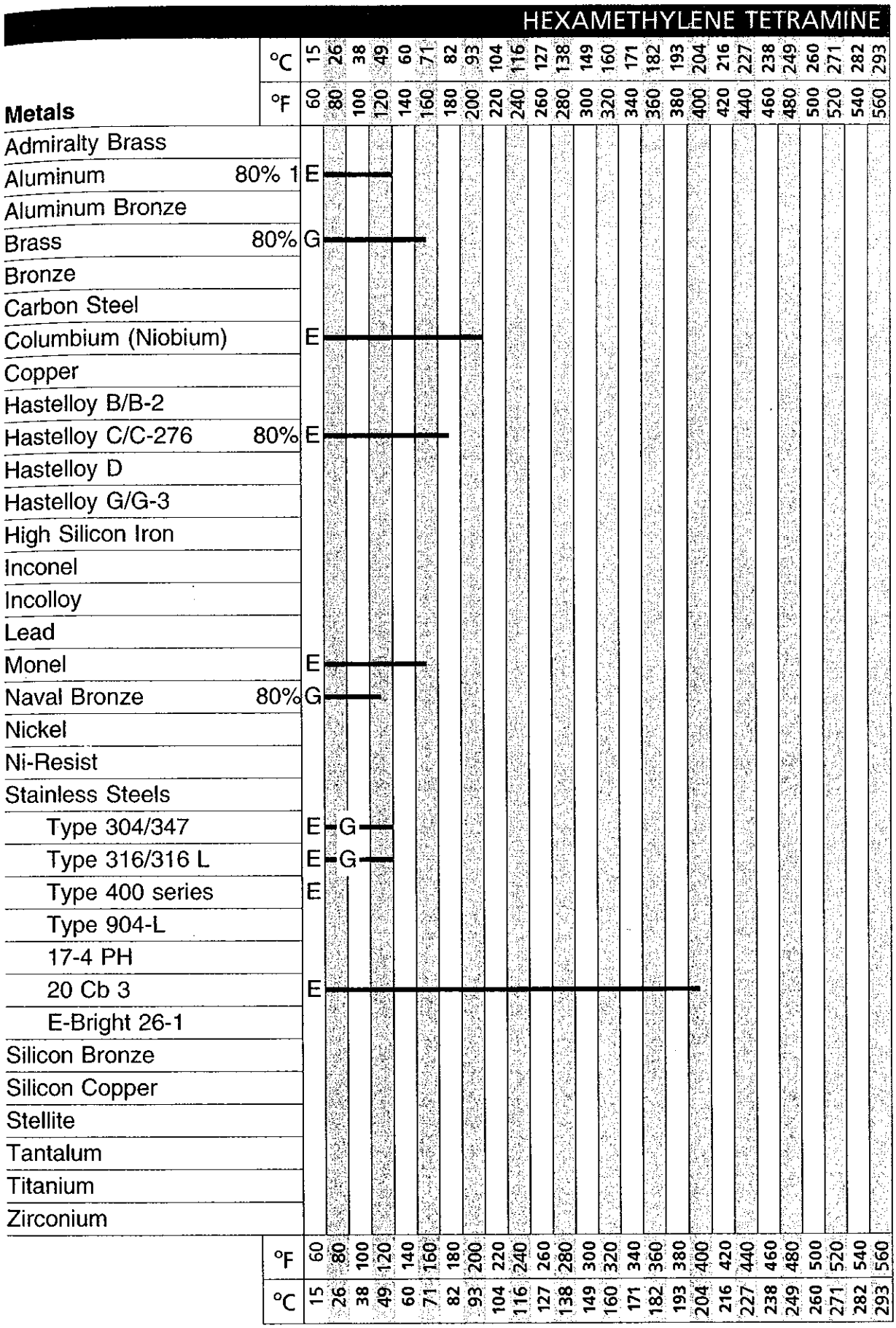
HEPTANE



*See also Nylon 11 under PLASTICS

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HEXAMETHYLENE TETRAMINE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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HEXAMETHYLENE TETRAMINE

	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Nonmetallic Materials																						
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated		R																				
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HEXAMETHYLENE TETRAMINE

Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC		
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)		
FEP	R	
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate 65%	R	
Halogenated 28%	R	
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic 28%	R	
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)		
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1		
PVC Type 2		
PVDF (Kynar)		
Ryton		
TFE (Teflon)	R	
Vinyl Ester 40%	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

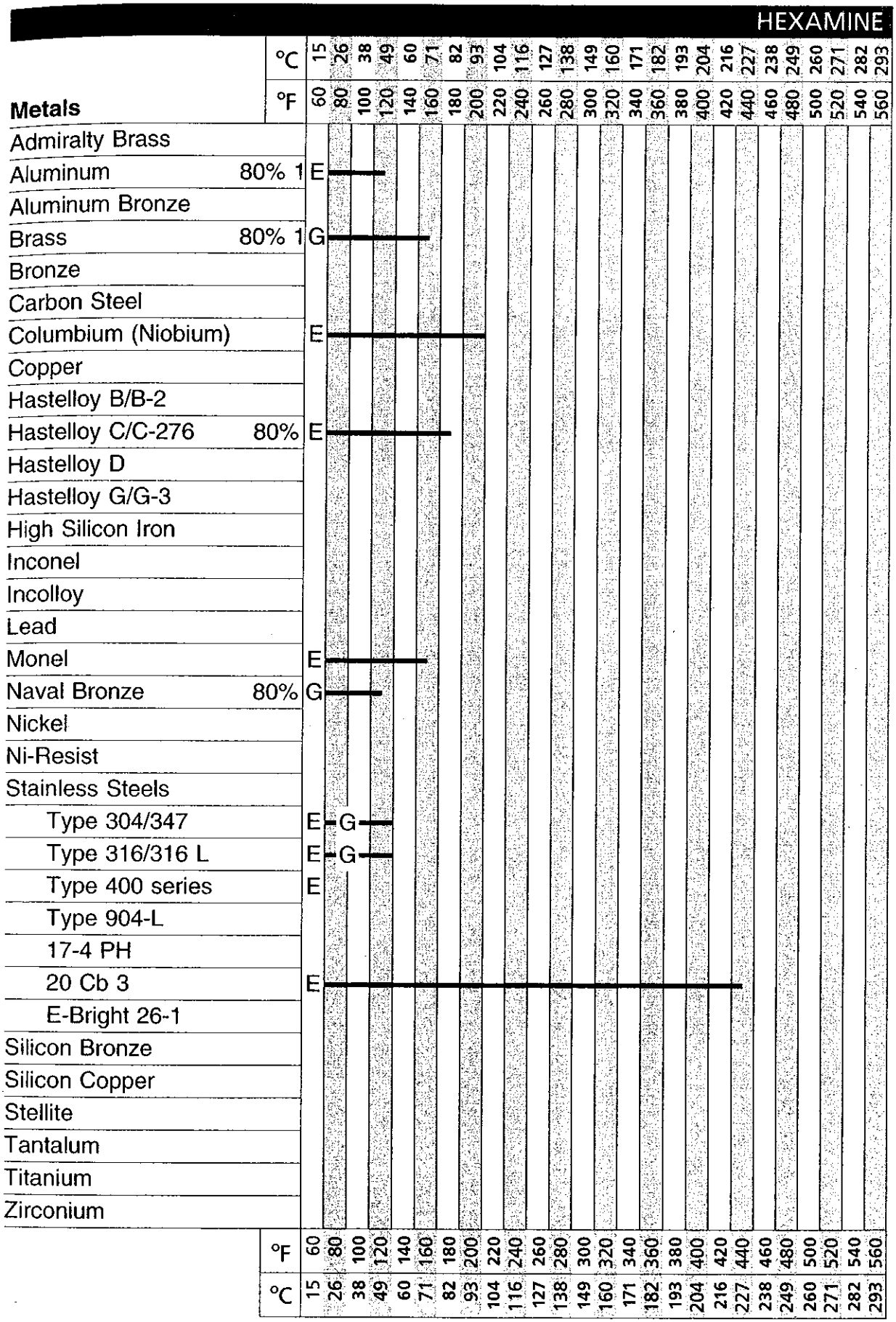
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HEXAMETHYLENE TETRAMINE

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)	R																				
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																					
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)																					
Ethylene-Propylene Terpolymer (EPT)																					
FKM (Viton A)																					
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)																					
Kalrez (FPM)	R																				
Koroseal																					
Natural Rubber (GRS)																					
Neoprene GR-M (CR)																					
Nitrile Buna-N (NBR)																					
Nordel (EPDM)																					
Polybutadiene (BR)																					
Polyester (PE)																					
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers																					
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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HEXAMINE

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated		R																				
Ceramics																						
Coatings																						
Acrylic																						
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Sulfur																						
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Polyester																						
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	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
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Acrylics																						
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Phenolic																						
PFA (Teflon)	R																					
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Bisphenol A–fumarate 65%	R																					
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Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)																						
Ryton																						
TFE (Teflon)	R																					
Vinyl Ester 40%	R																					
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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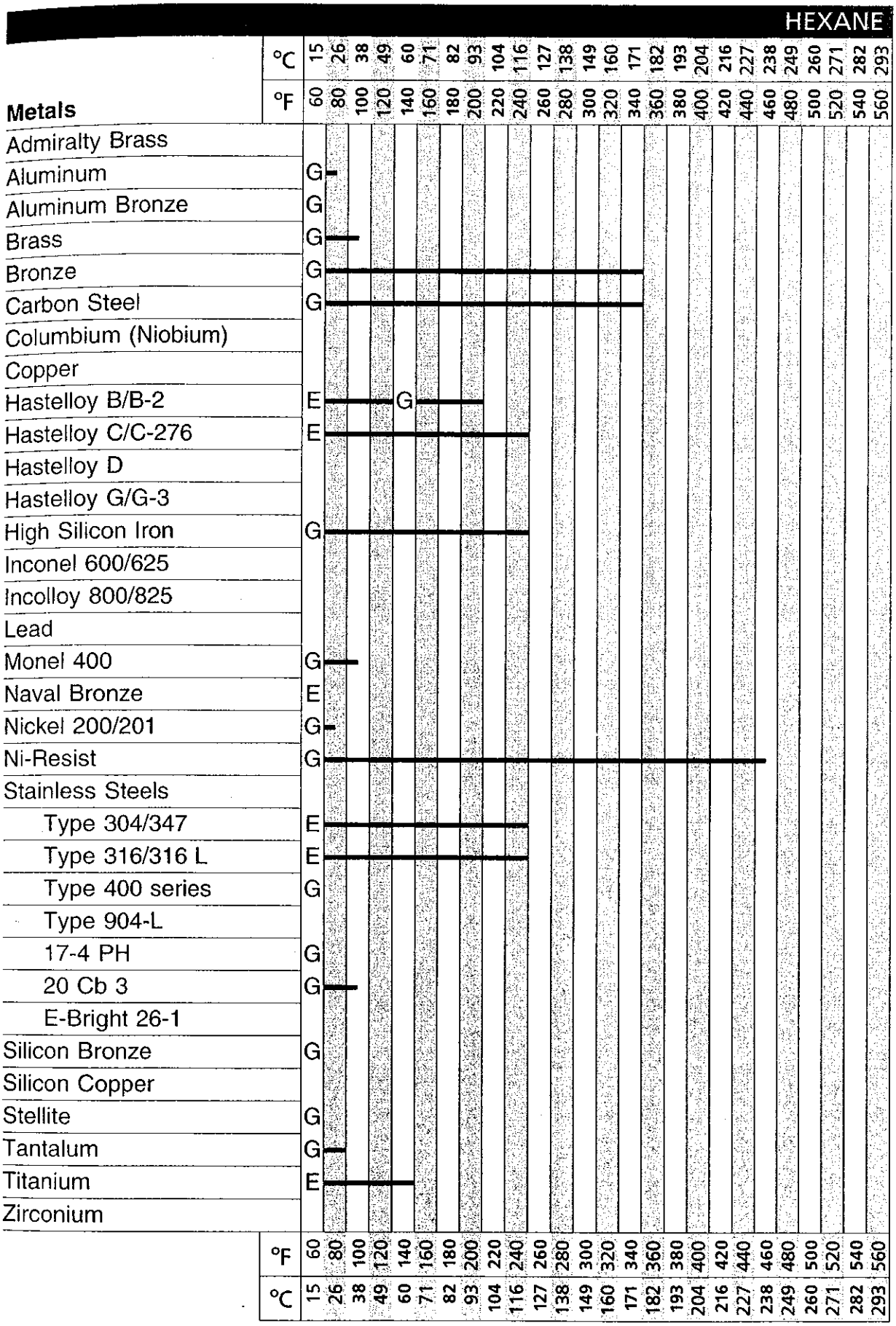
HEXAMINE

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)	R	R	R	R	R	R	R	R													
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																					
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)																					
Ethylene-Propylene Terpolymer (EPT)																					
FKM (Viton A)																					
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)																					
Kalrez (FPM)	R	R	R	R	R	R	R	R													
Koroseal																					
Natural Rubber (GRS)																					
Neoprene GR-M (CR)																					
Nitrile Buna-N (NBR)																					
Nordel (EPDM)																					
Polybutadiene (BR)																					
Polyester (PE)																					
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers																					
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HEXANE



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

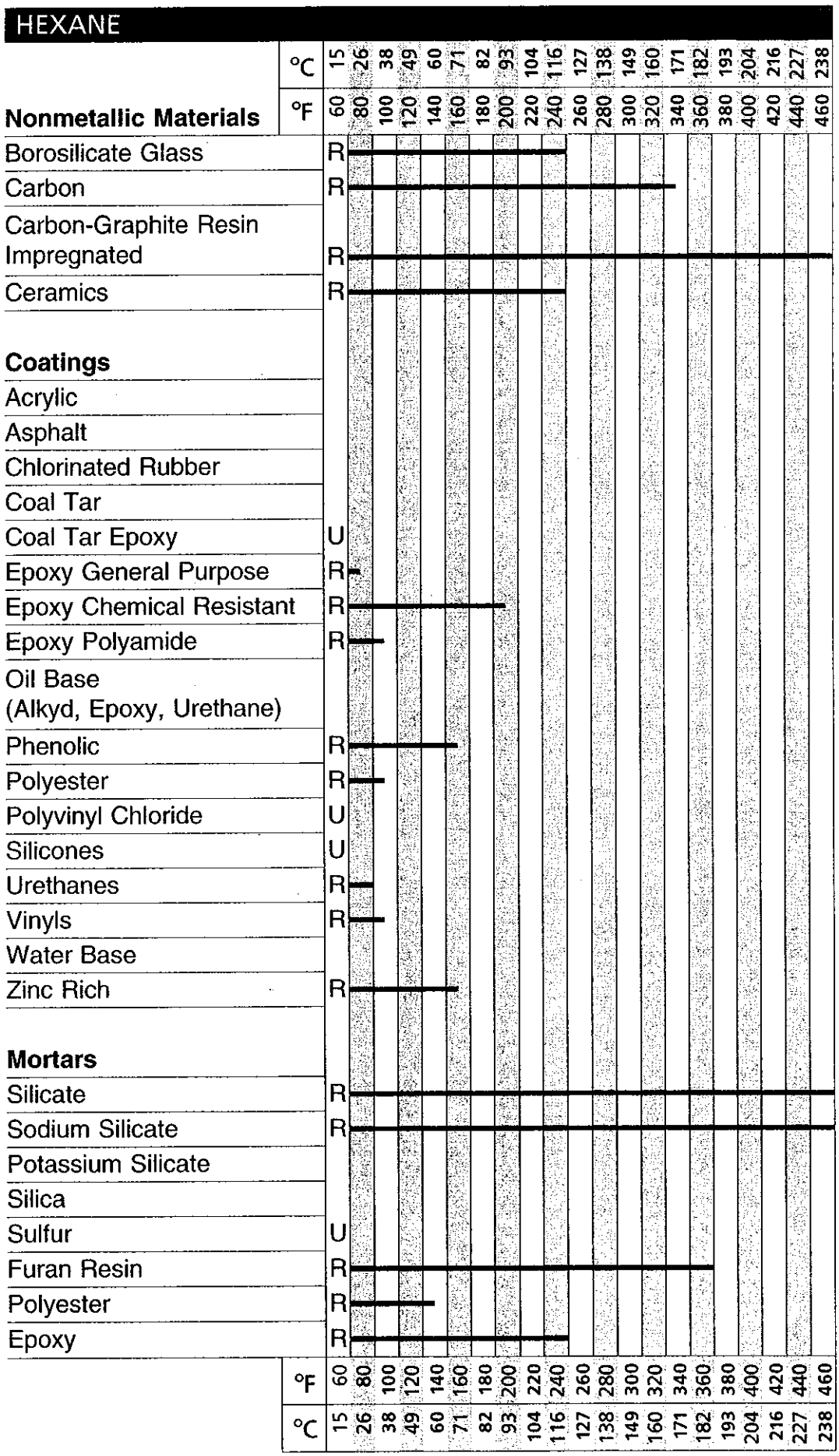
R = Resistant

U = Unsatisfactory

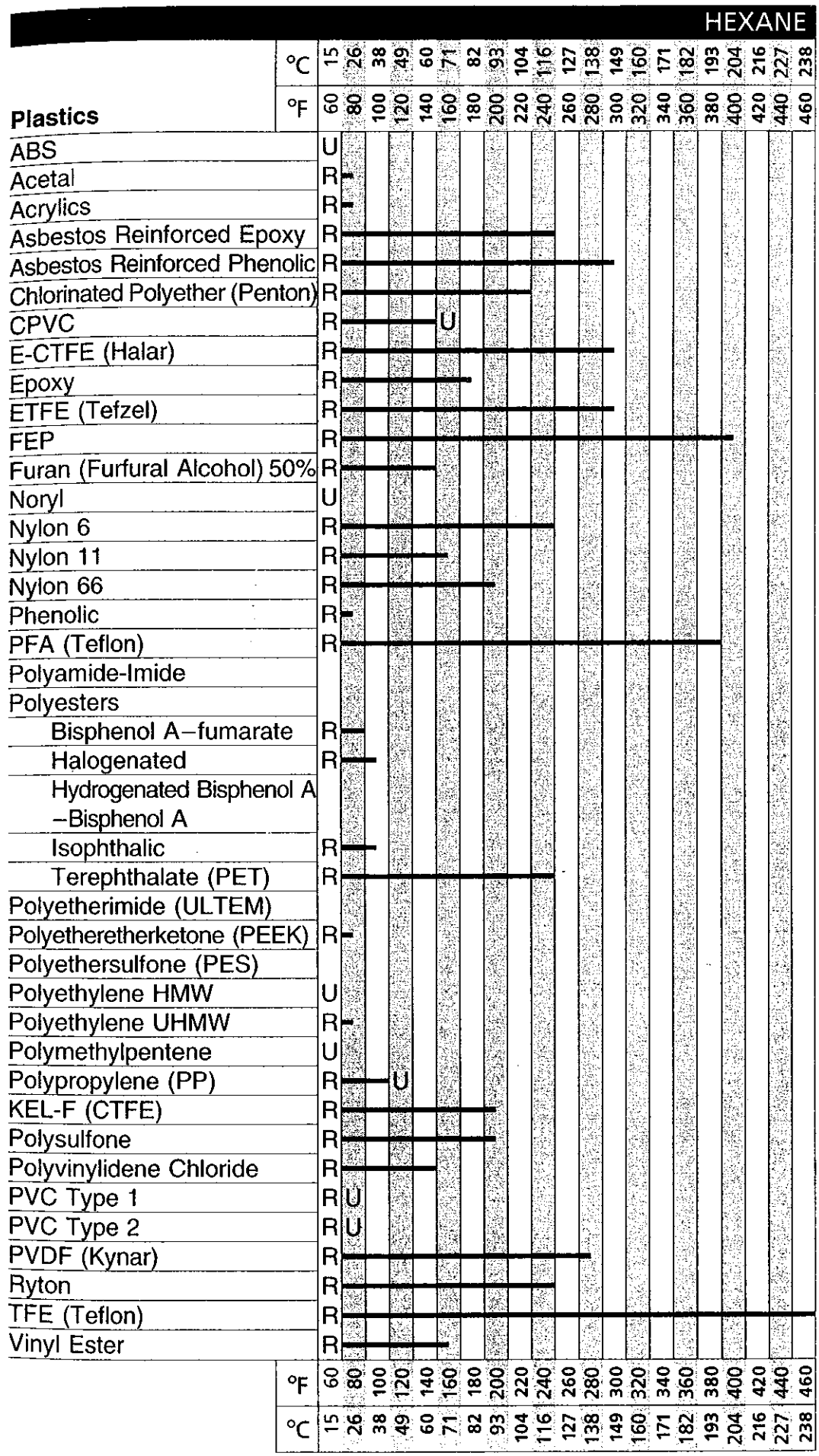
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HEXANE



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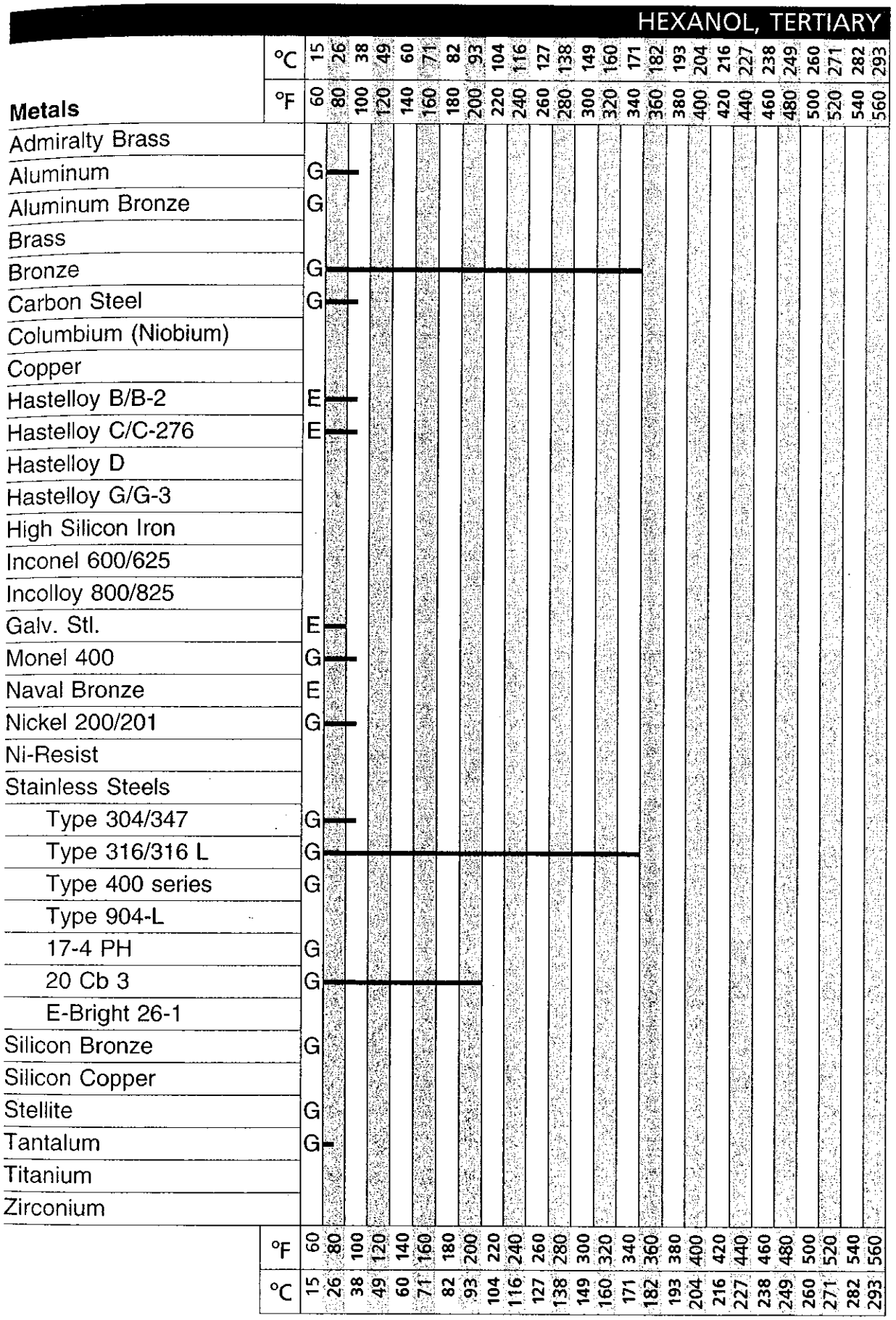
HEXANE

Elastomers* and Linings	°F	°C
Acrylate-Butadiene (ABR)		
Butyl GR-1 (IIR)	U	
Carboxylic-Acrylonitrile-Butadiene (XNBR)	R	
Chemraz (FPM)	R	
Chloro-Isobutene-Isoprene (CIIR)		
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	R	
Ethylene-Acrylic (EA)		
Ethylene-Propylene (EPM)	U	
Ethylene-Propylene-Diene (EPDM)	U	
Ethylene-Propylene Terpolymer (EPT)	U	
FKM (Viton A)	R	
Hard Rubber		
Soft Rubber		
Isoprene (IR)	U	
Kalrez (FPM)	R	
Koroseal		
Natural Rubber (GRS)	U	
Neoprene GR-M (CR)	R	
Nitrile Buna-N (NBR)	R	
Nordel (EPDM)	U	
Polybutadiene (BR)		
Polyester (PE)	R	
Polyether-Urethane (EU)		
Polyisoprene (IR)		
Polysulfides (T)		
Polyurethane (AU)	R	
SBR Styrene (Buna-S)	U	
Silicone Rubbers	U	
Fabrics		
Cotton	R	
Felt (Wool)	R	
Rayon Viscose		

°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

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FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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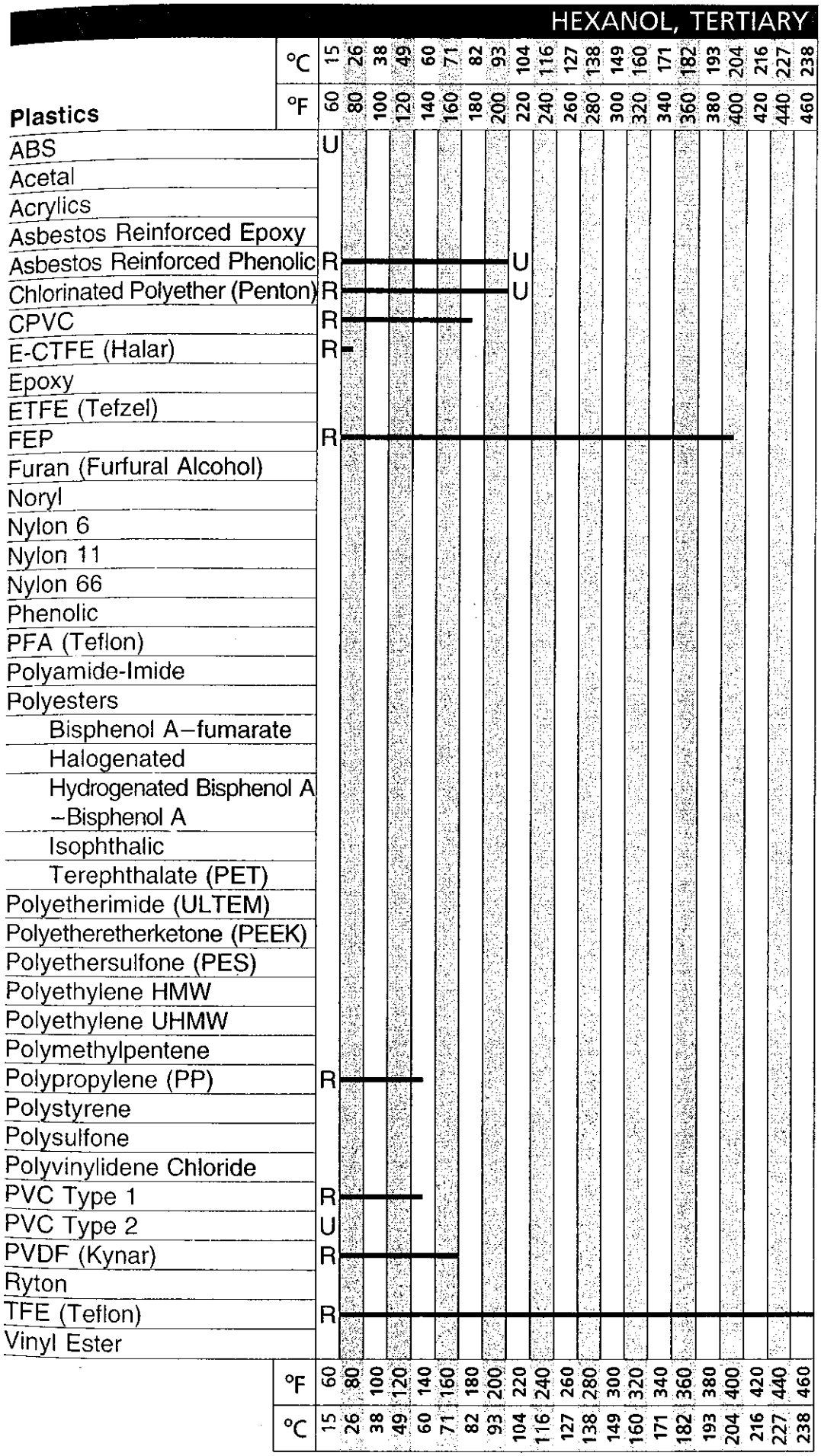
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HEXANOL, TERTIARY

Nonmetallic Materials	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
Borosilicate Glass	R																				
Carbon	R																				
Carbon-Graphite Resin Impregnated	R																				
Ceramics																					
Coatings																					
Acrylic																					
Asphalt																					
Chlorinated Rubber																					
Coal Tar																					
Coal Tar Epoxy																					
Epoxy General Purpose																					
Epoxy Chemical Resistant																					
Epoxy Polyamide																					
Oil Base (Alkyd, Epoxy, Urethane)																					
Phenolic																					
Polyester																					
Polyvinyl Chloride	U																				
Silicones	U																				
Urethanes																					
Vinyls																					
Water Base																					
Zinc Rich																					
Mortars																					
Silicate																					
Sodium Silicate																					
Potassium Silicate																					
Silica																					
Sulfur																					
Furan Resin																					
Polyester																					
Epoxy																					
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HEXANOL, TERTIARY



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HEXANOL, TERTIARY

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
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Ethylene-Propylene-Diene (EPDM)	R																				
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FKM (Viton A)	R																				
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)	U																				
Kalrez (FPM)	R																				
Koroseal																					
Natural Rubber (GRS)	U																				
Neoprene GR-M (CR)	U																				
Nitrile Buna-N (NBR)	R																				
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Polysulfides (T)																					
Polyurethane (AU)	U																				
SBR Styrene (Buna-S)																					
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	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDRAULIC FLUID (PETROLEUM)

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																												
Aluminum			E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Aluminum Bronze																												
Brass			E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Bronze			E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Carbon Steel			E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Columbium (Niobium)																												
Copper																												
Hastelloy B/B-2																												
Hastelloy C/C-276	50%																											
Hastelloy D																												
Hastelloy G/G-3																												
High Silicon Iron																												
Inconel 600/625																												
Incolloy 800/825																												
Lead																												
Monel 400																												
Naval Bronze																												
Nickel 200/201																												
Ni-Resist																												
Stainless Steels																												
Type 304/347			E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Type 316/316 L			E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Type																												
Type 904-L																												
17-4 PH																												
20 Cb 3																												
E-Bright 26-1																												
Silicon Bronze																												
Silicon Copper																												
Stellite																												
Tantalum																												
Titanium																												
Zirconium																												
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

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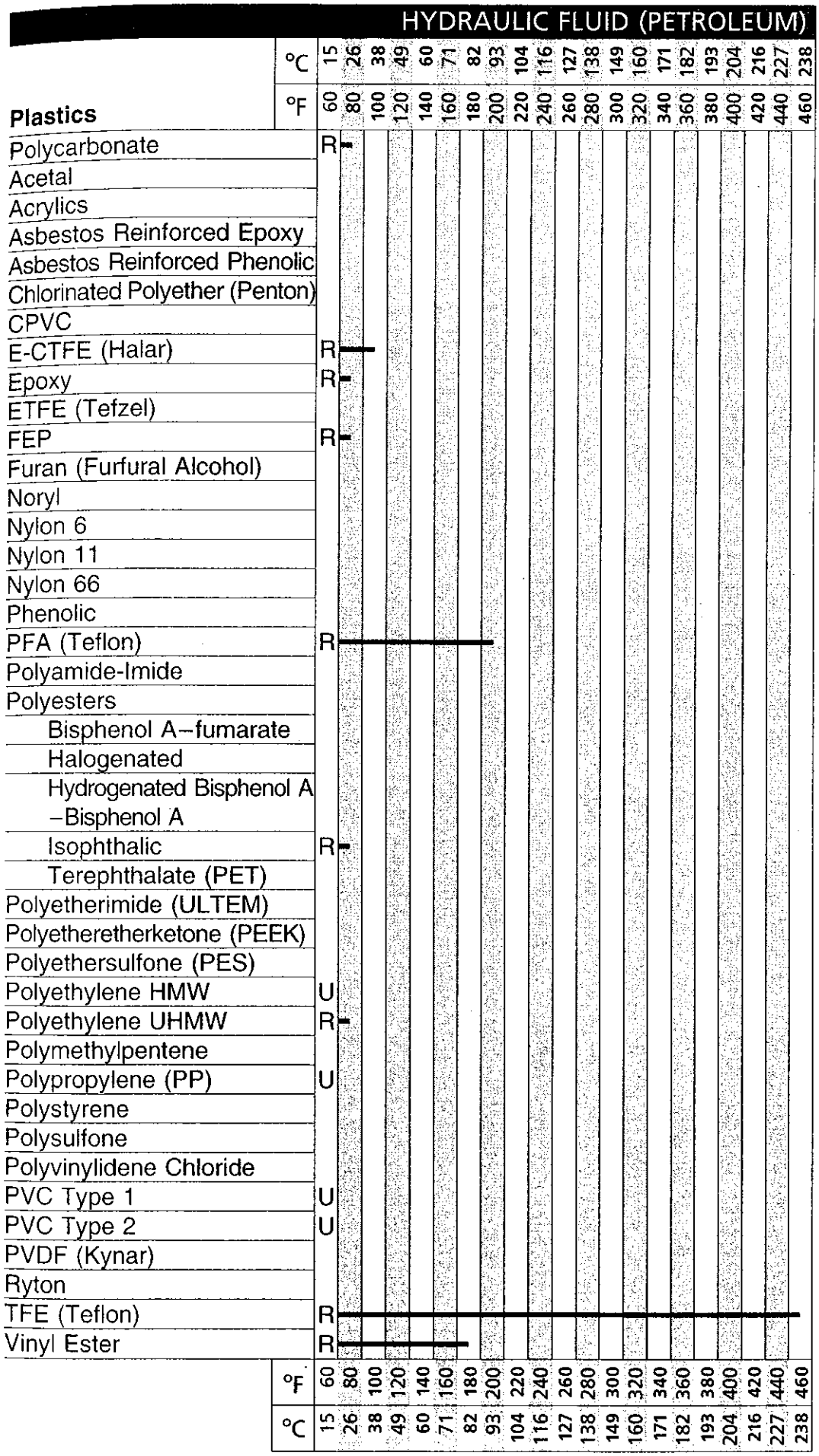
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HYDRAULIC FLUID (PETROLEUM)

Nonmetallic Materials	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																					
Carbon	R																				
Carbon-Graphite Resin Impregnated																					
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Mortars																					
Silicate																					
Sodium Silicate																					
Potassium Silicate																					
Silica																					
Sulfur																					
Furan Resin																					
Polyester																					
Epoxy																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDRAULIC FLUID (PETROLEUM)

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)																					
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)																					
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																					
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)	U																				
Ethylene-Propylene Terpolymer (EPT)																					
FKM (Viton A)	R																				
Hard Rubber																					
Soft Rubber																					
Isoprene (IR)																					
Kalrez (FPM)	R																				
Koroseal																					
Natural Rubber (GRS)																					
Neoprene GR-M (CR)																					
Nitrile Buna-N (NBR)	R																				
Nordel (EPDM)	U																				
Polybutadiene (BR)																					
Polyester (PE)																					
Polyether-Urethane (EU)																					
Polyisoprene (IR)																					
Polysulfides (T)																					
Polyurethane (AU)																					
SBR Styrene (Buna-S)																					
Silicone Rubbers	U																				
Fabrics																					
Cotton																					
Felt (Wool)																					
Rayon Viscose																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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HYDRAULIC FLUID (SYNTHETIC)

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum		E																									
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel		E																									
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347		E																									
Type 316/316 L		E																									
Type																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

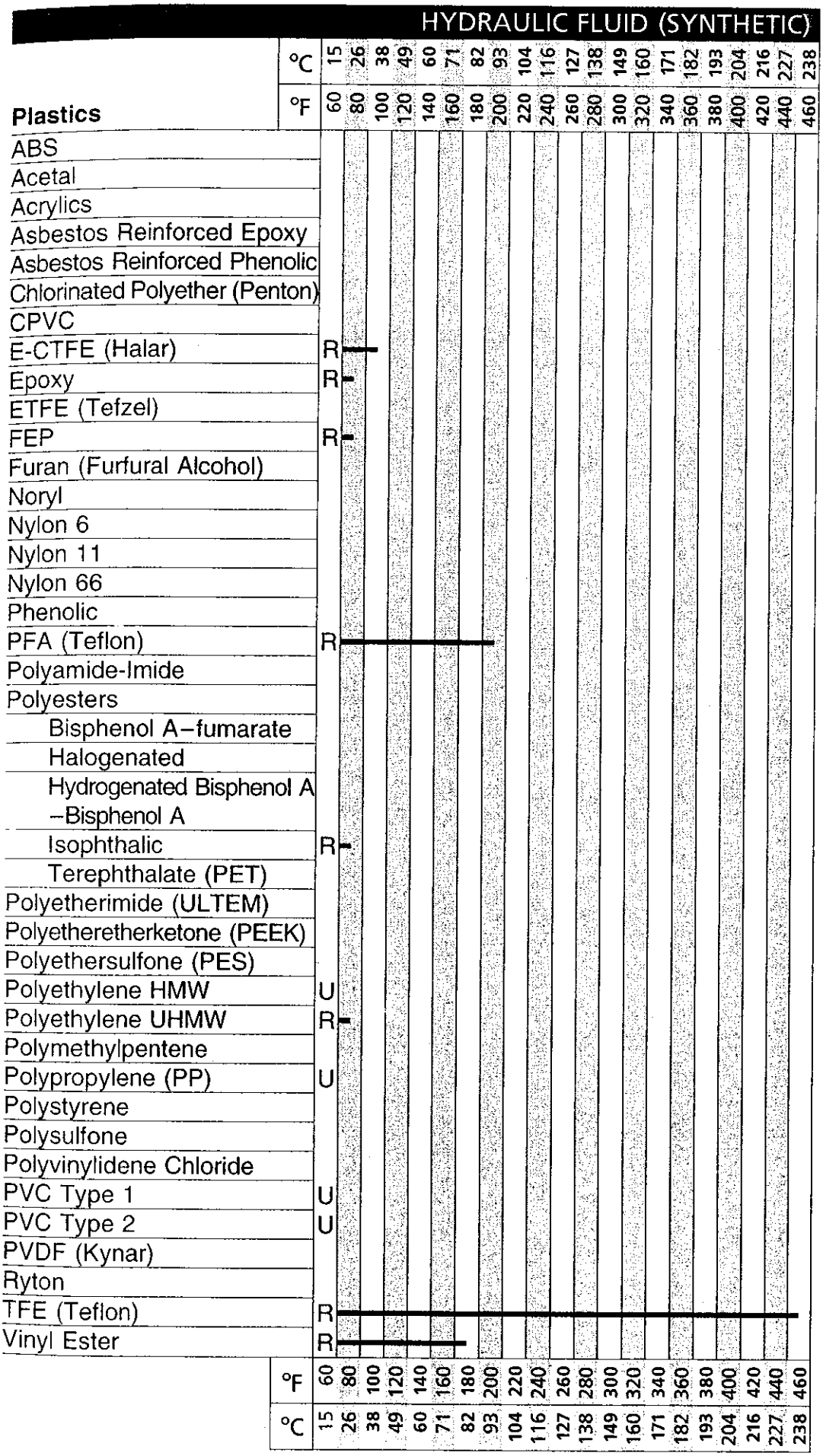
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HYDRAULIC FLUID (SYNTHETIC)

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon		R																				
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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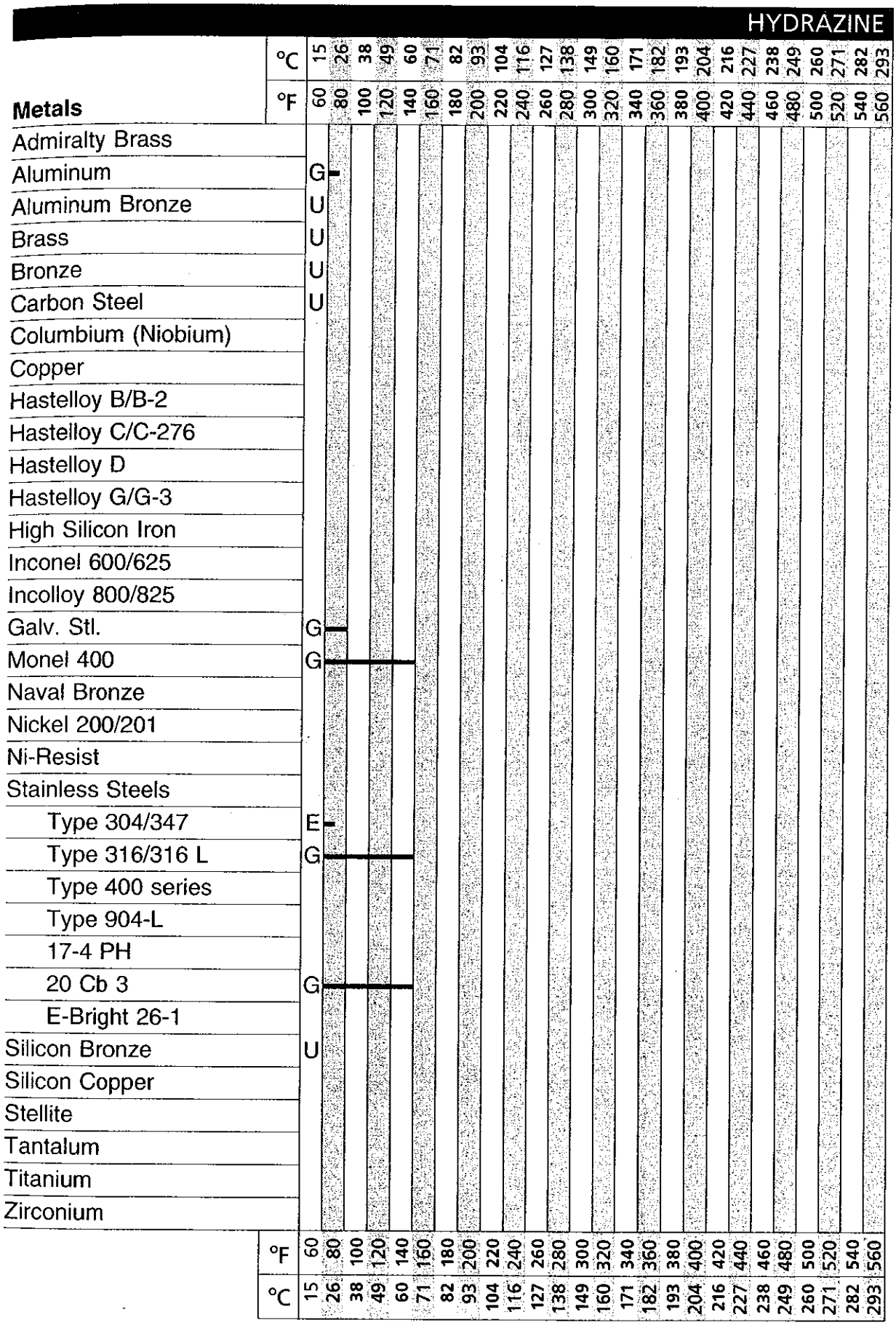
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HYDRAULIC FLUID (SYNTHETIC)

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)																						
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)																						
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)	R																					
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)																						
Nitrile Buna-N (NBR)																						
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

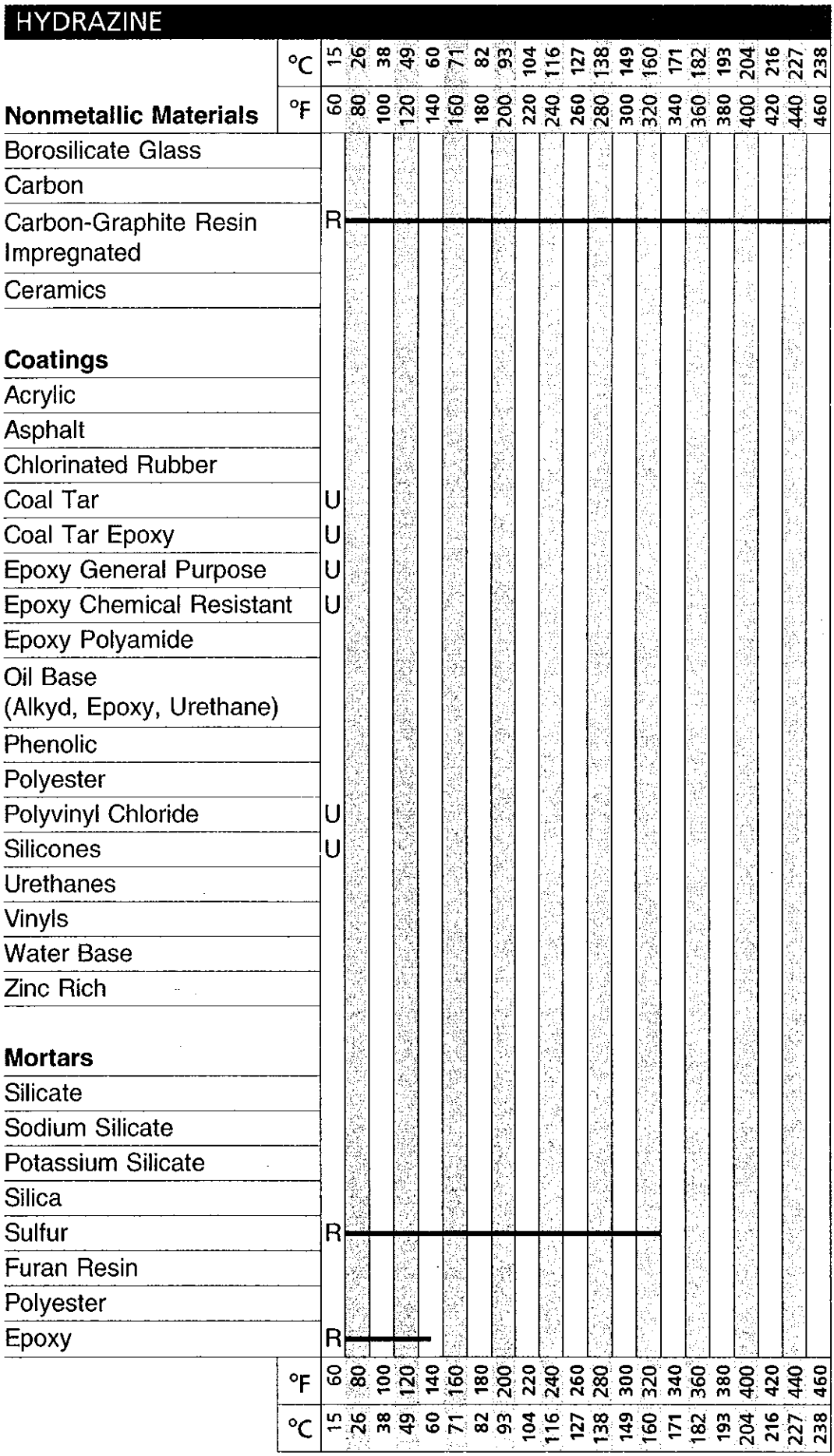
R = Resistant

U = Unsatisfactory

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HYDRAZINE



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HYDRAZINE

Plastics	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																					
Acetal																					
Acrylics																					
Asbestos Reinforced Epoxy																					
Asbestos Reinforced Phenolic																					
Chlorinated Polyether (Penton)																					
CPVC	U																				
E-CTFE (Halar)																					
Epoxy	U																				
ETFE (Tefzel)	R	—																			
FEP																					
Furan (Furfural Alcohol)	U																				
Noryl																					
Nylon 6																					
Nylon 11																					
Nylon 66																					
Phenolic																					
PFA (Teflon)																					
Polyamide-Imide																					
Polyesters																					
Bisphenol A–fumarate	U																				
Halogenated 10%	R	—																			
Hydrogenated Bisphenol A –Bisphenol A																					
Isophthalic	U																				
Terephthalate (PET)																					
Polyetherimide (ULTEM)																					
Polyetheretherketone (PEEK)																					
Polyethersulfone (PES)																					
Polyethylene HMW																					
Polyethylene UHMW																					
Polymethylpentene																					
Polypropylene (PP)	R	—																			
Polystyrene																					
Polysulfone																					
Polyvinylidene Chloride																					
PVC Type 1	U																				
PVC Type 2	U																				
PVDF (Kynar)	R	—																			
Ryton	R	—																			
TFE (Teflon)	R	—																			
Vinyl Ester	U																				
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDRAZINE

Elastomers* and Linings	°C	°F
Acrylate-Butadiene (ABR)		
Butyl GR-1 (IIR)		
Carboxylic-Acrylonitrile-Butadiene (XNBR)		
Chemraz (FPM)		
Chloro-Isobutene-Isoprene (CIIR)		
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	R	
Ethylene-Acrylic (EA)		
Ethylene-Propylene (EPM)		
Ethylene-Propylene-Diene (EPDM)	R	
Ethylene-Propylene Terpolymer (EPT)	R	
FKM (Viton A)	U	
Hard Rubber		
Soft Rubber		
Isoprene (IR)		
Kalrez (FPM)	R	
Koroseal		
Natural Rubber (GRS)		
Neoprene GR-M (CR)		
Nitrile Buna-N (NBR)	R	
Nordel (EPDM)	R	
Polybutadiene (BR)		
Polyester (PE)		
Polyether-Urethane (EU)	U	
Polyisoprene (IR)		
Polysulfides (T)		
Polyurethane (AU)		
SBR Styrene (Buna-S)		
Silicone Rubbers	U	
Fabrics		
Cotton		
Felt (Wool)		
Rayon Viscose		

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460

*See also Nylon 11 under PLASTICS

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HYDROBROMIC ACID DILUTE

Metals	°C	°F
Admiralty Brass	U	
Aluminum	U	
Aluminum Bronze	U	
Brass	U	
Bronze	U	
Carbon Steel	U	
Columbium (Niobium)		
Copper	U	
Hastelloy B/B-2	G	
Hastelloy C/C-276	E	
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron	U	
Inconel 600/625	G	U
Incolloy 800/825	U	
Lead	U	
Monel 400	U	
Naval Bronze	U	
Nickel 200/201	U	
Ni-Resist		
Stainless Steels		
Type 304/347	U	
Type 316/316 L	U	
Type 400 series	U	
Type 904-L		
17-4 PH	U	
20 Cb 3	U	
E-Bright 26-1		
Silicon Bronze	U	
Silicon Copper	U	
Stellite	U	
Tantalum	E	
Titanium	E	
Zirconium	G	

°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

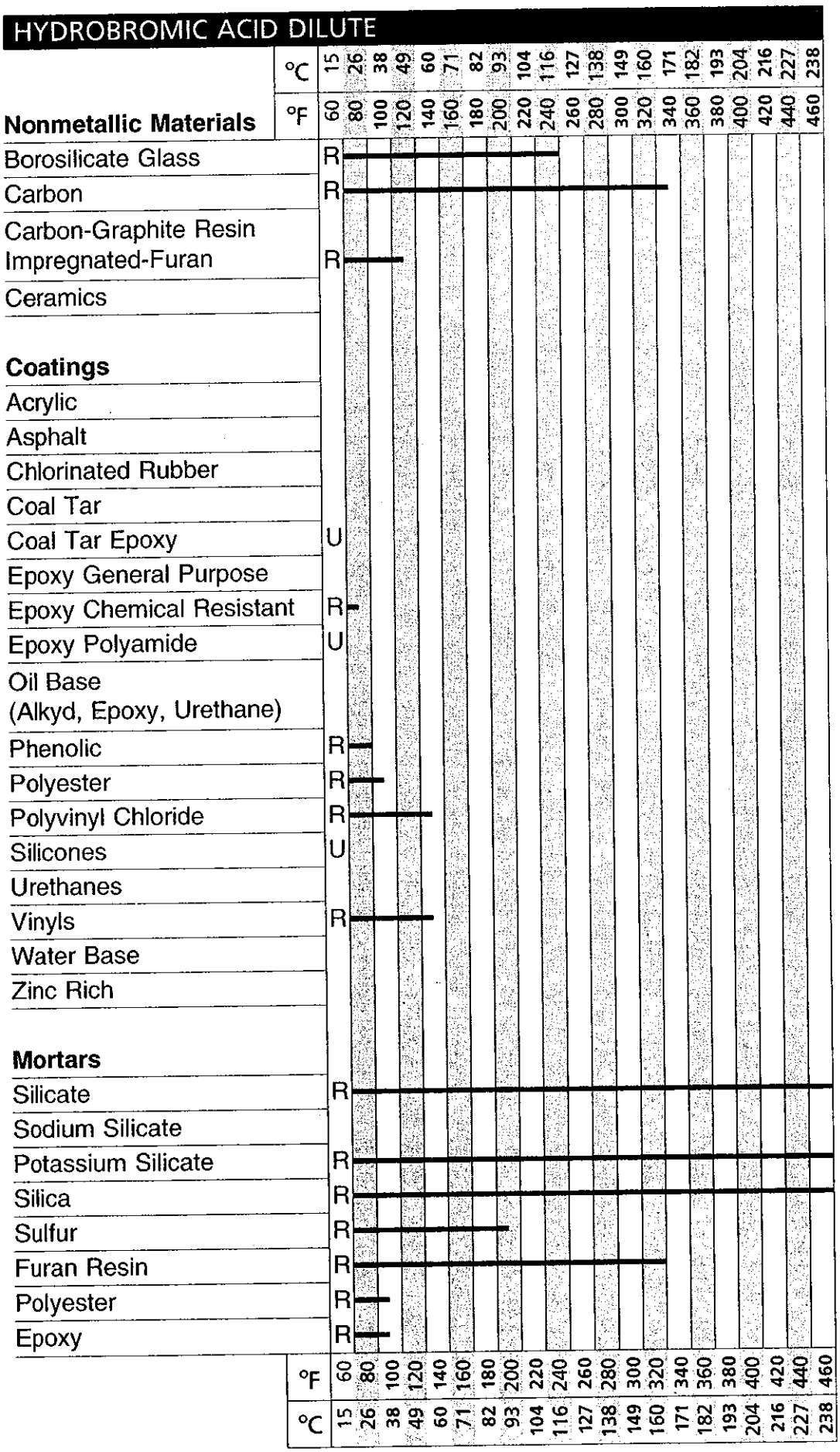
R = Resistant

U = Unsatisfactory

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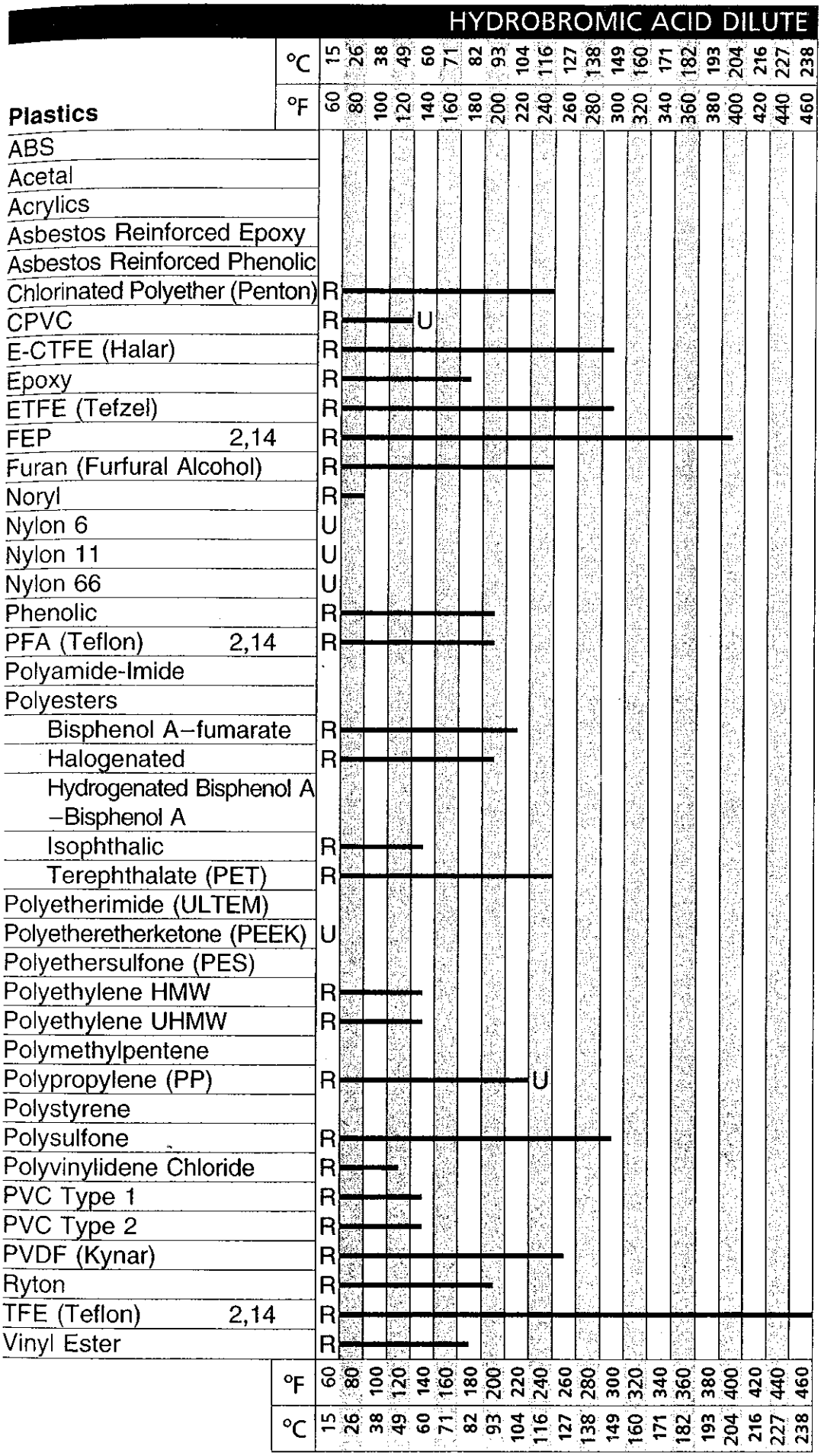
HYDROBROMIC ACID DILUTE



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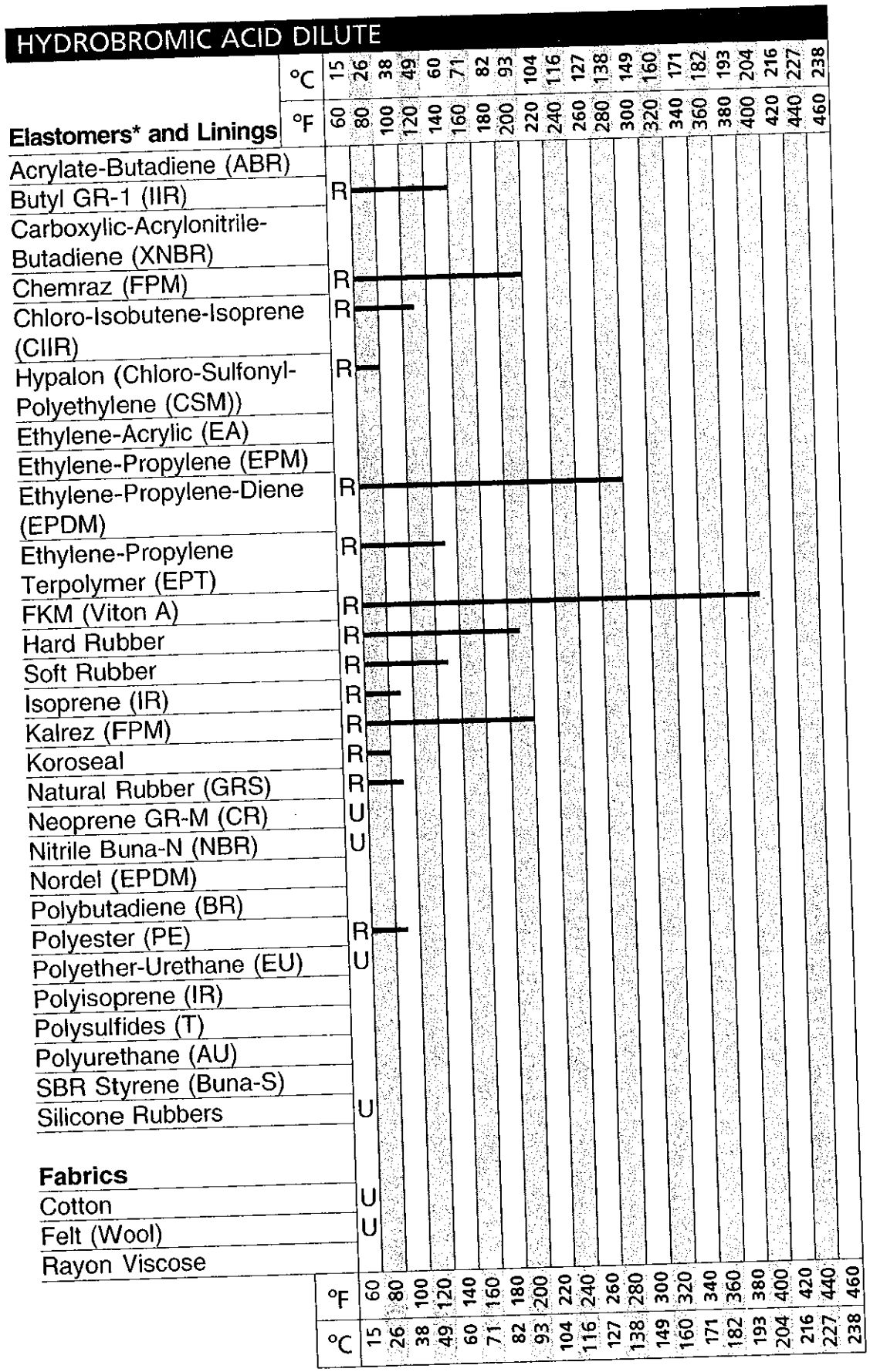
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HYDROBROMIC ACID DILUTE



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HYDROBROMIC ACID DILUTE



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HYDROBROMIC ACID 20%

Metals	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
Admiralty Brass	U																									
Aluminum	U																									
Aluminum Bronze	U																									
Brass	U																									
Bronze	U																									
Carbon Steel	U																									
Columbium (Niobium)																										
Copper	U																									
Hastelloy B/B-2	G																									
Hastelloy C/C-276	E																									
Hastelloy D																										
Hastelloy G/G-3																										
High Silicon Iron	U																									
Inconel 600/625	G	U																								
Incolloy 800/825	U																									
Lead	U																									
Monel 400	U																									
Naval Bronze	U																									
Nickel 200/201	U																									
Ni-Resist																										
Stainless Steels																										
Type 304/347	U																									
Type 316/316 L	U																									
Type 400 series	U																									
Type 904-L																										
17-4 PH	U																									
20 Cb 3	U																									
E-Bright 26-1																										
Silicon Bronze	U																									
Silicon Copper	U																									
Stellite	U																									
Tantalum	E																									
Titanium	E																									
Zirconium	U																									
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

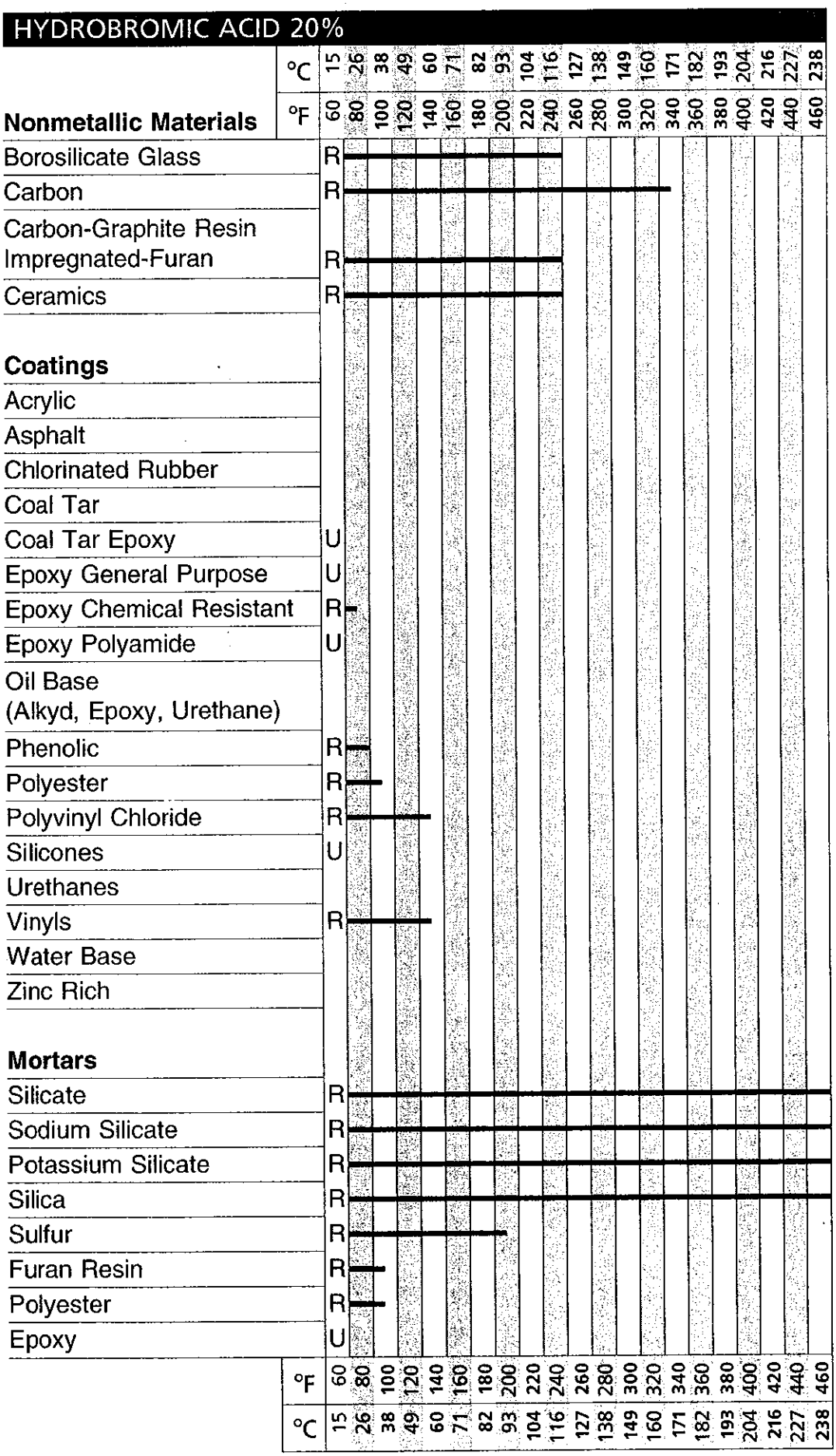
R = Resistant

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HYDROBROMIC ACID 20%



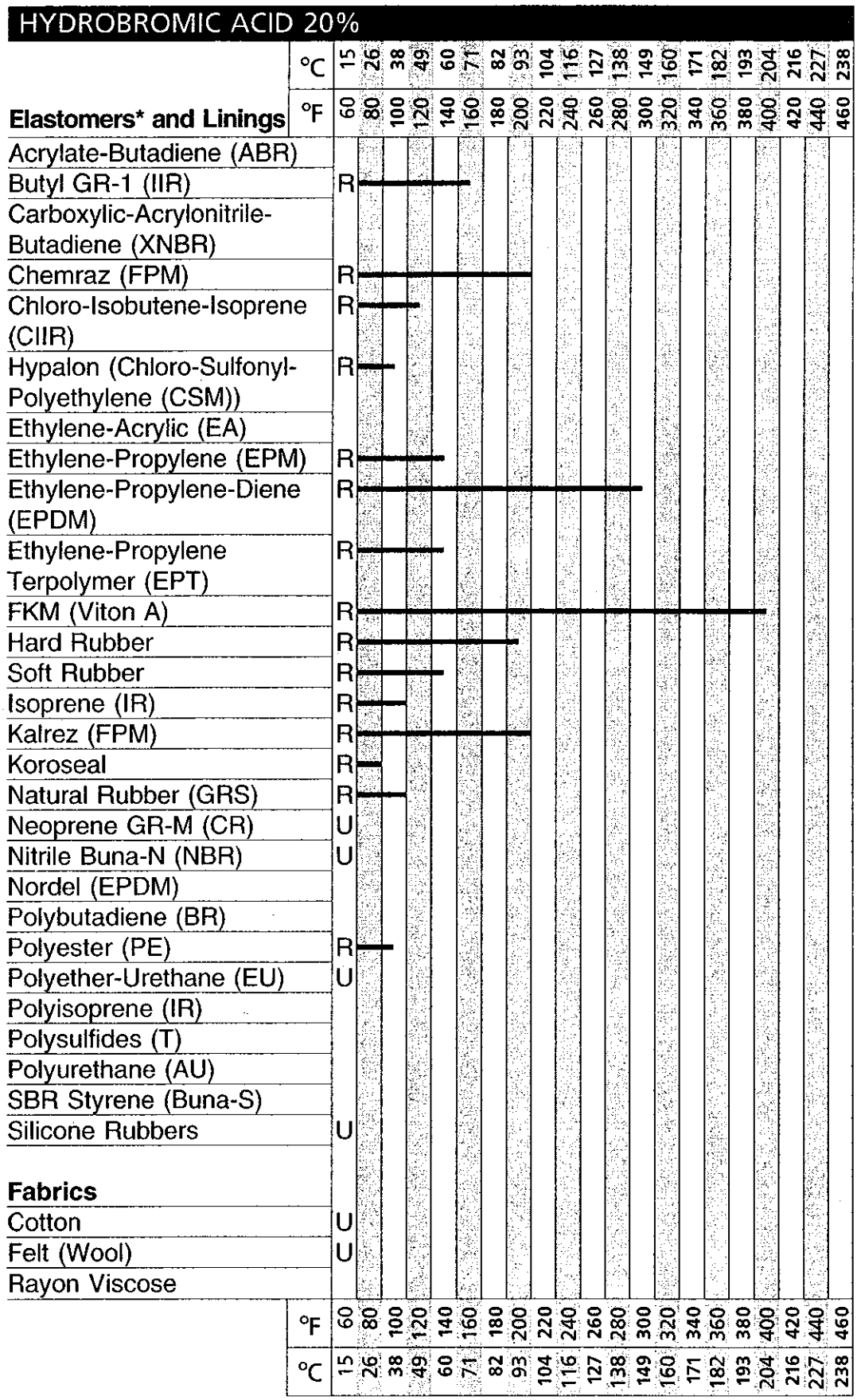
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HYDROBROMIC ACID 20%

Plastics		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS			R																				
Acetal																							
Acrylics																							
Asbestos Reinforced Epoxy																							
Asbestos Reinforced Phenolic																							
Chlorinated Polyether (Penton)			R																				
CPVC			R																				
E-CTFE (Halar)			R																				
Epoxy			R																				
ETFE (Tefzel)			R																				
FEP	2,14		R																				
Furan (Furfural Alcohol)			R																				
Noryl			R																				
Nylon 6			U																				
Nylon 11			U																				
Nylon 66			U																				
Phenolic			R																				
PFA (Teflon)	2,14		R																				
Polyamide-Imide																							
Polyesters																							
Bisphenol A–fumarate			R																				
Halogenated			R																				
Hydrogenated Bisphenol A –Bisphenol A			R																				
Isophthalic			R																				
Terephthalate (PET)			R																				
Polyetherimide (ULTEM)																							
Polyetheretherketone (PEEK)			U																				
Polyethersulfone (PES)																							
Polyethylene HMW			R																				
Polyethylene UHMW			R																				
Polymethylpentene																							
Polypropylene (PP)			R																				
Polystyrene																							
Polysulfone			R																				
Polyvinylidene Chloride			R																				
PVC Type 1			R																				
PVC Type 2			R																				
PVDF (Kynar)			R																				
Ryton			R																				
TFE (Teflon)	2,14		R																				
Vinyl Ester			R																				
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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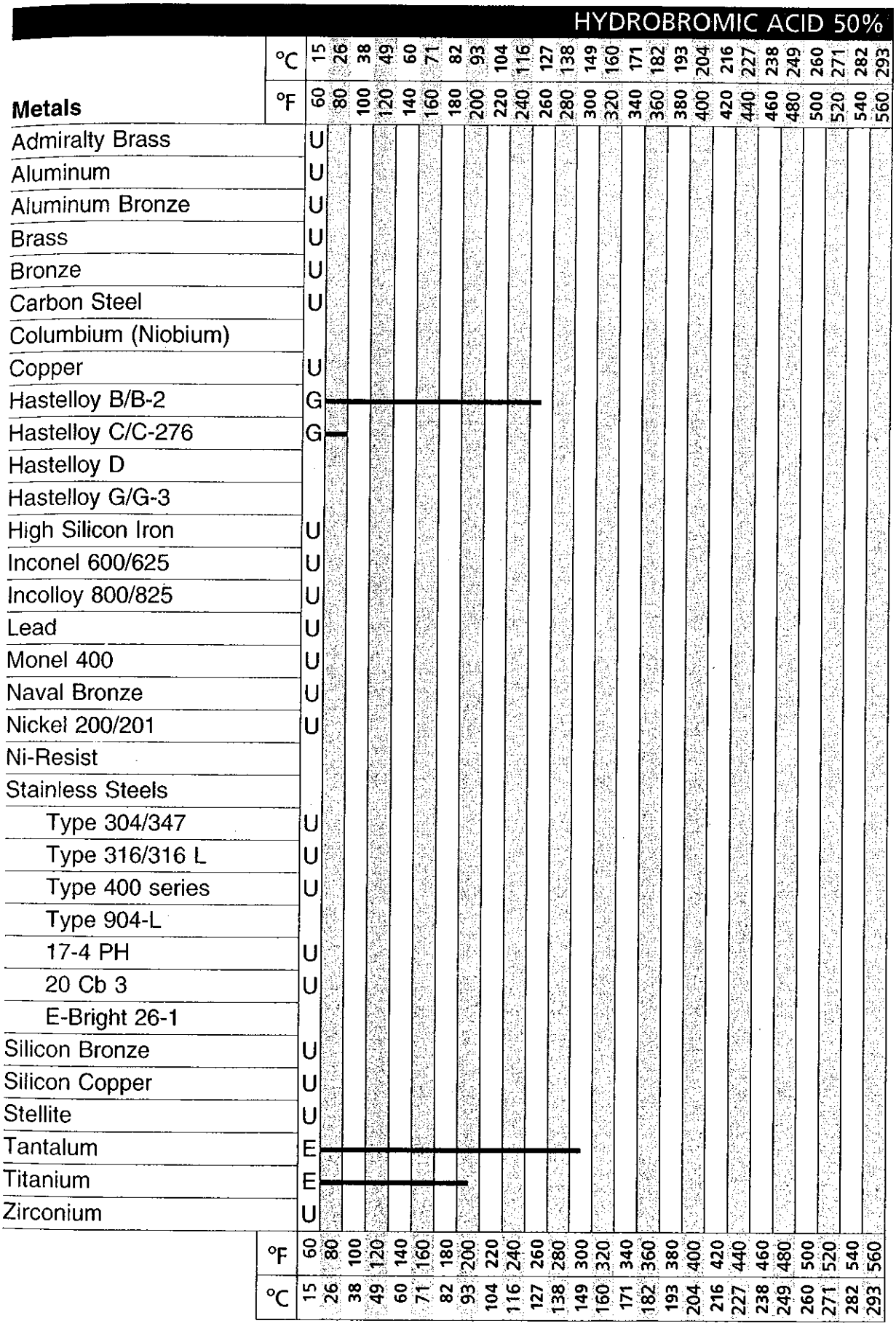
HYDROBROMIC ACID 20%



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HYDROBROMIC ACID 50%



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

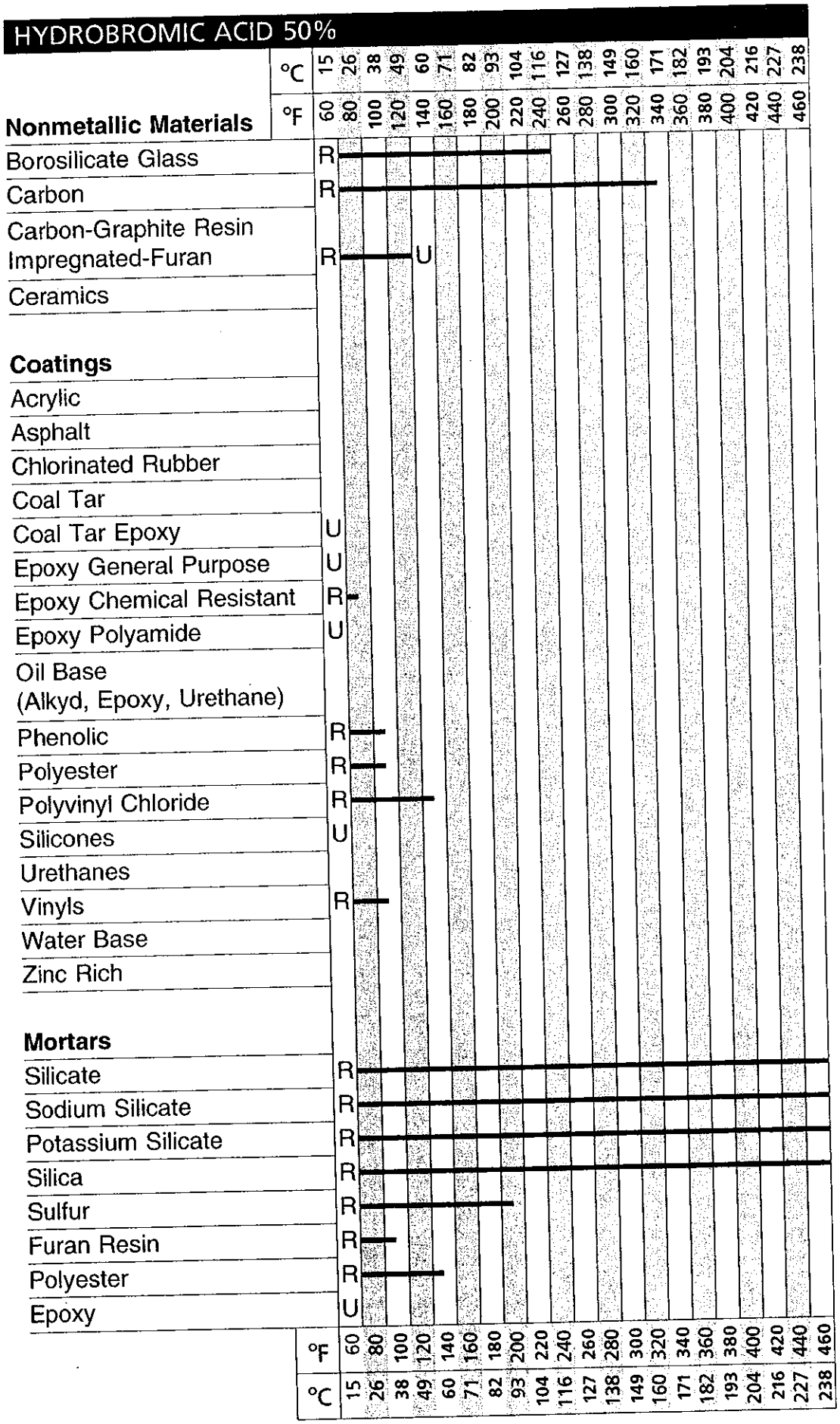
R = Resistant

U = Unsatisfactory

Schweitzer/*Corrosion Resistance Tables: Fifth Edition, Revised and Expanded* DOI: 10.1081/5672-X-120029482

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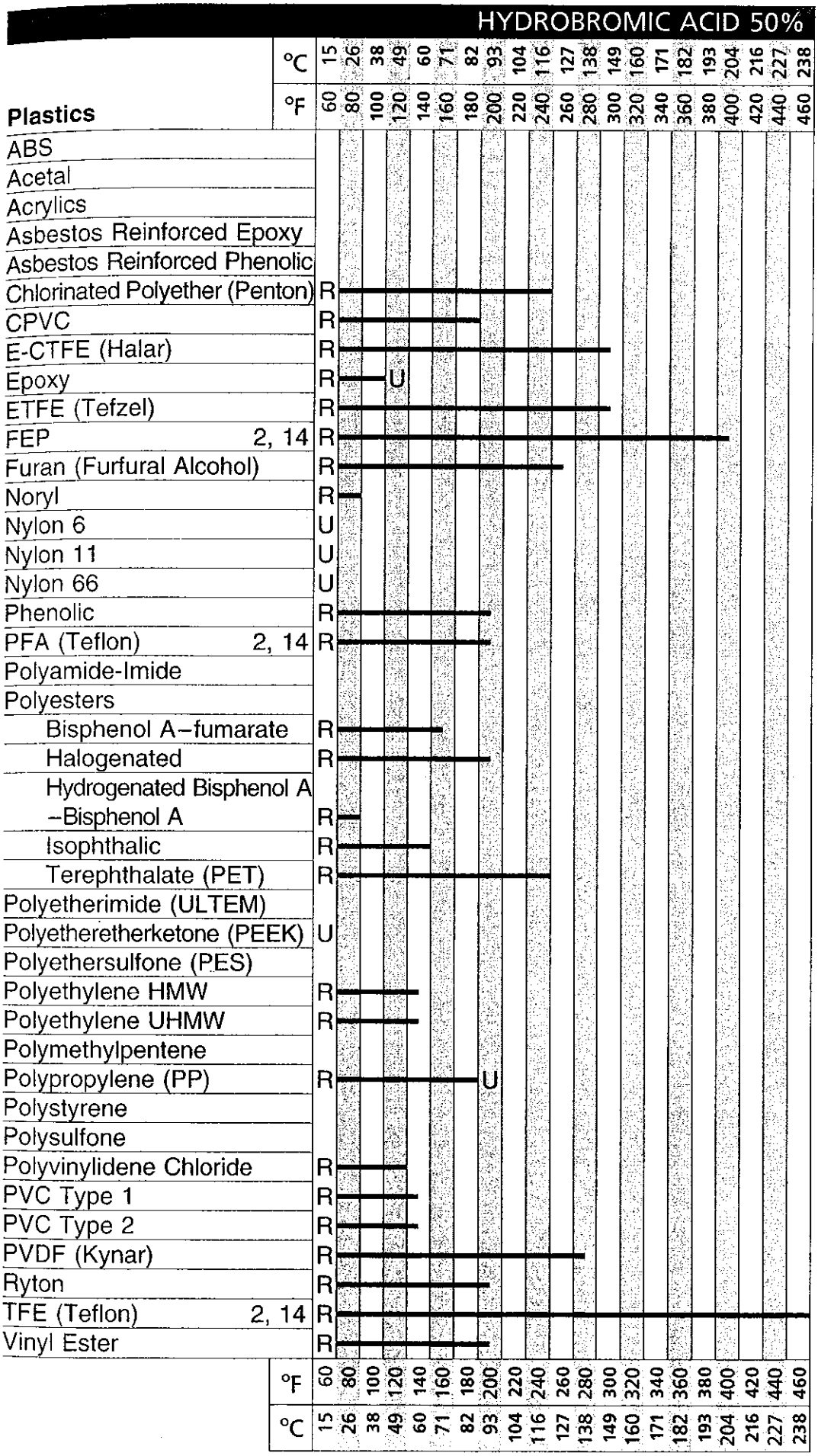
HYDROBROMIC ACID 50%



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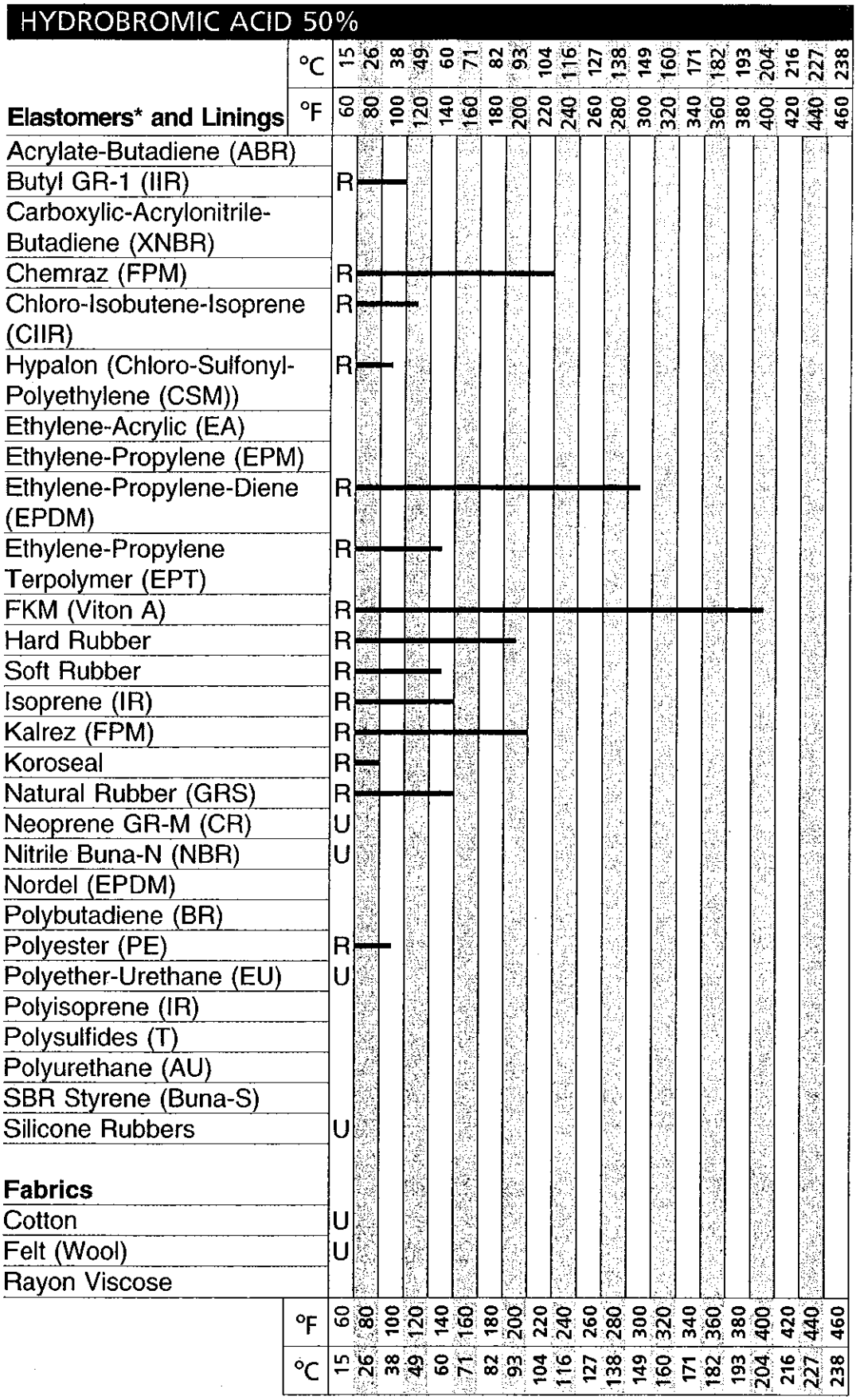
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HYDROBROMIC ACID 50%



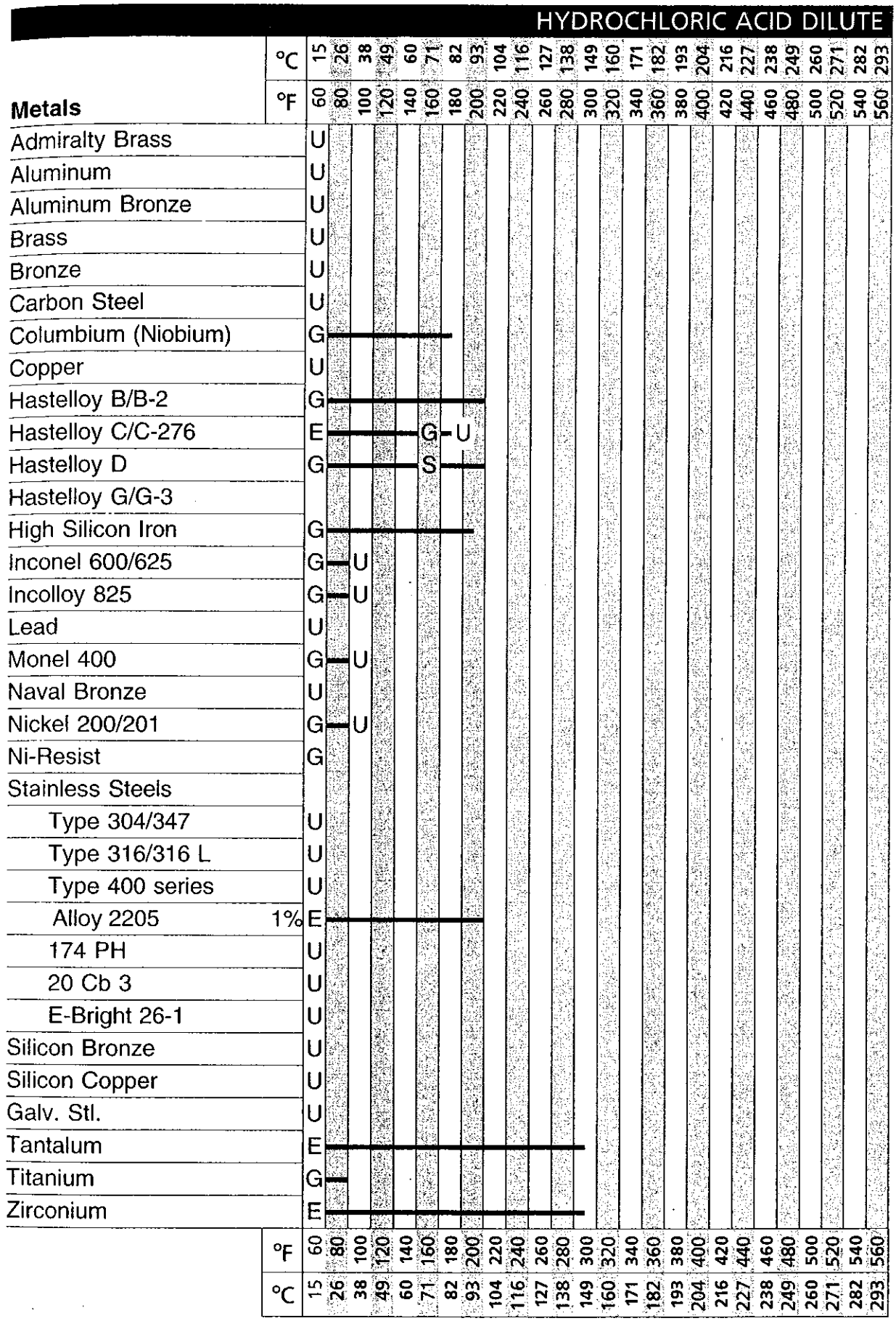
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HYDROBROMIC ACID 50%



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

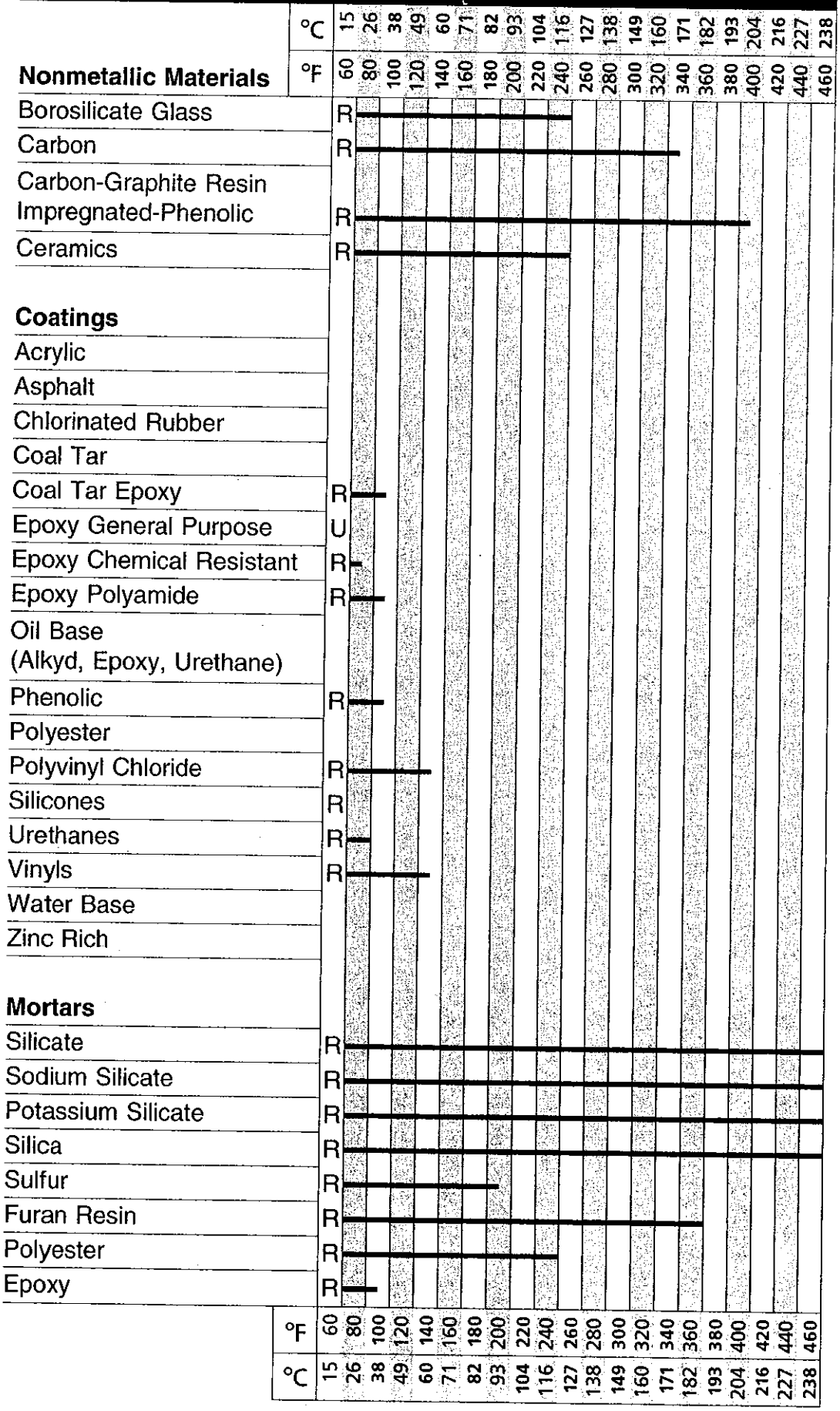
R = Resistant

U = Unsatisfactory

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HYDROCHLORIC ACID DILUTE



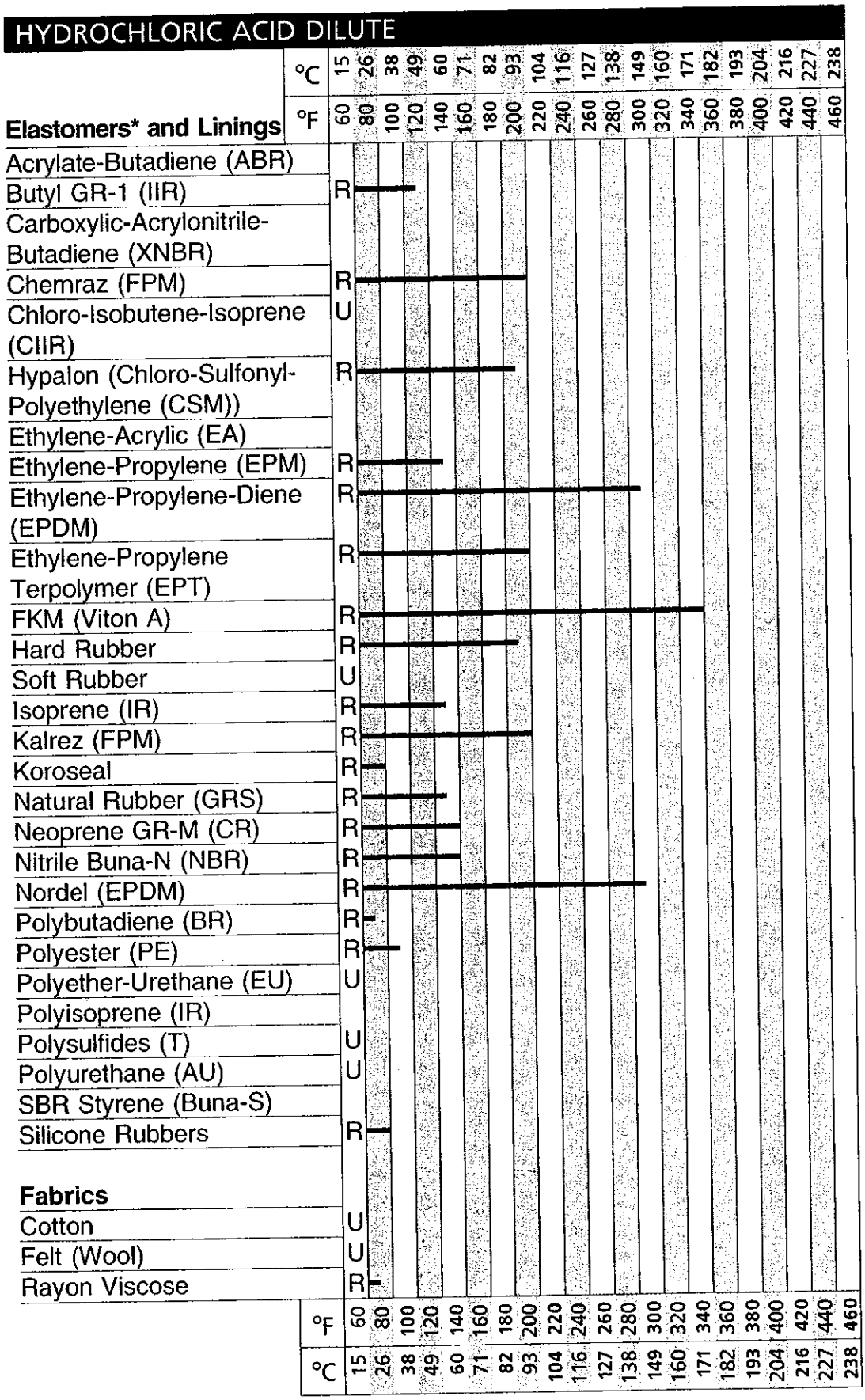
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HYDROCHLORIC ACID DILUTE

Plastics		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS			R																				
Acetal			U																				
Acrylics			R																				
Asbestos Reinforced Epoxy			R																				
Asbestos Reinforced Phenolic			R																				
Chlorinated Polyether (Penton)			R																				
CPVC			R																				
E-CTFE (Halar)			R																				
Epoxy	10%		R							U													
ETFE (Tefzel)			R																				
FEP	2,14		R																				
Furan (Furfural Alcohol)			R																				
Noryl			R																				
Nylon 6			U																				
Nylon 11			R																				
Nylon 66			U																				
Phenolic			R																				
PFA (Teflon)	2,14		R																				
Polyamide-Imide			R																				
Polyesters																							
Bisphenol A–fumarate	10%		R							U													
Halogenated																							
Hydrogenated Bisphenol A –Bisphenol A			R																				
Isophthalic	10%		R																				
Terephthalate (PET)			R																				
Polyetherimide (ULTEM)			R																				
Polyetheretherketone (PEEK)			R																				
Polyethersulfone (PES)			R																				
Polyethylene HMW			R																				
Polyethylene UHMW			R																				
Polymethylpentene			R																				
Polypropylene (PP)			R																				
Polystyrene			R																				
Polysulfone			R																				
Polyvinylidene Chloride			R																				
PVC Type 1			R																				
PVC Type 2			R																				
PVDF (Kynar)			R																				
Ryton			R																				
TFE (Teflon)	2		R																				
Vinyl Ester			R																				
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDROCHLORIC ACID DILUTE



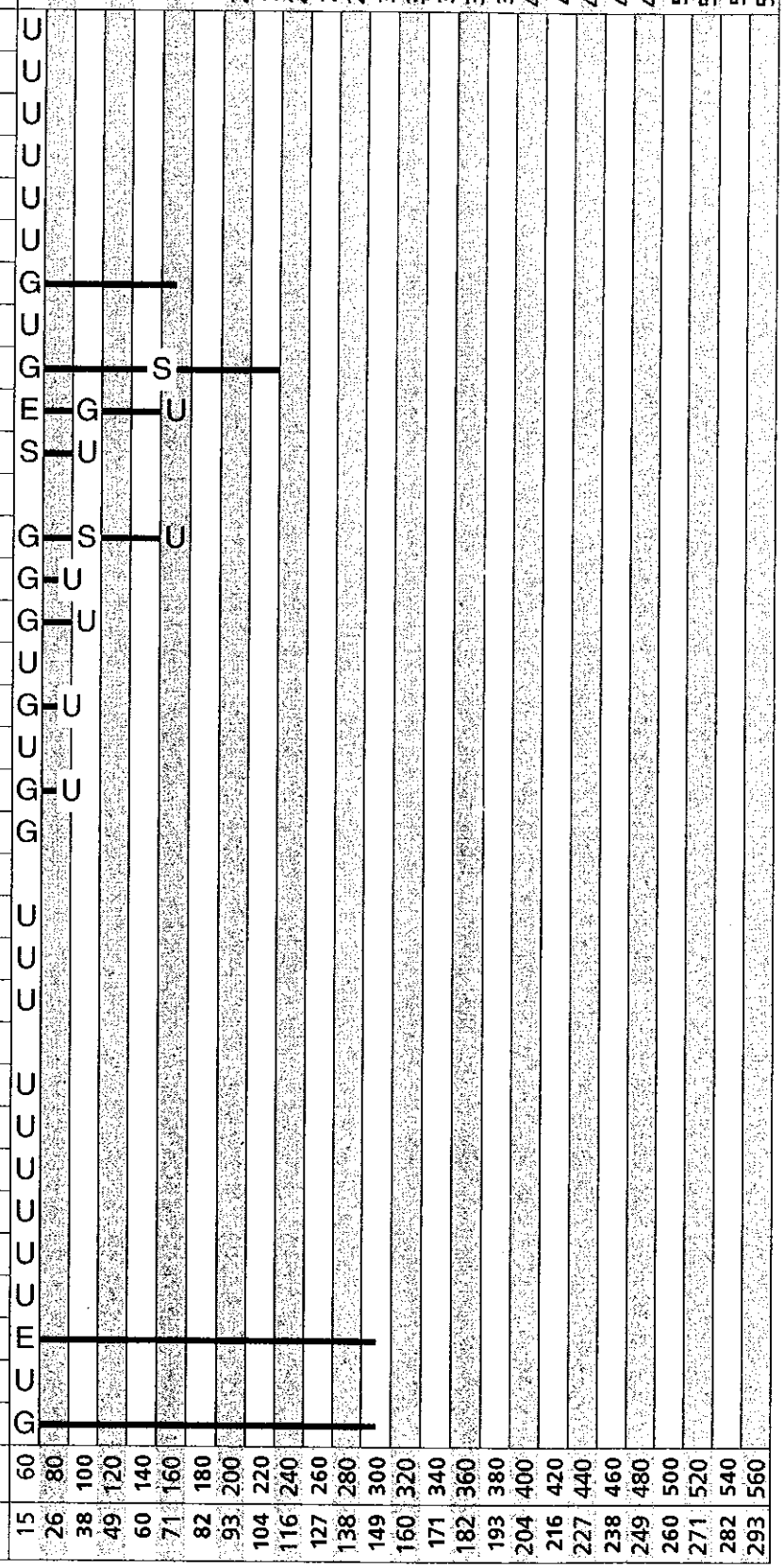
*See also Nylon 11 under PLASTICS

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HYDROCHLORIC ACID 20%

Metals	
Admiralty Brass	U
Aluminum	U
Aluminum Bronze	U
Brass	U
Bronze	U
Carbon Steel	U
Columbium (Niobium)	G
Copper	U
Hastelloy B/B-2	G
Hastelloy C/C-276	E
Hastelloy D	S
Hastelloy G/G-3	
High Silicon Iron	G
Inconel 600/625	G
Incolloy 825	G
Lead	U
Monel 400	G
Naval Bronze	U
Nickel 200/201	G
Ni-Resist	G
Stainless Steels	
Type 304/347	U
Type 316/316 L	U
Type 400 series	U
Type 904-L	
17-4 PH	U
20 Cb 3	U
E-Bright 26-1	U
Silicon Bronze	U
Silicon Copper	U
Galv. Stl.	U
Tantalum	E
Titanium	U
Zirconium	G



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

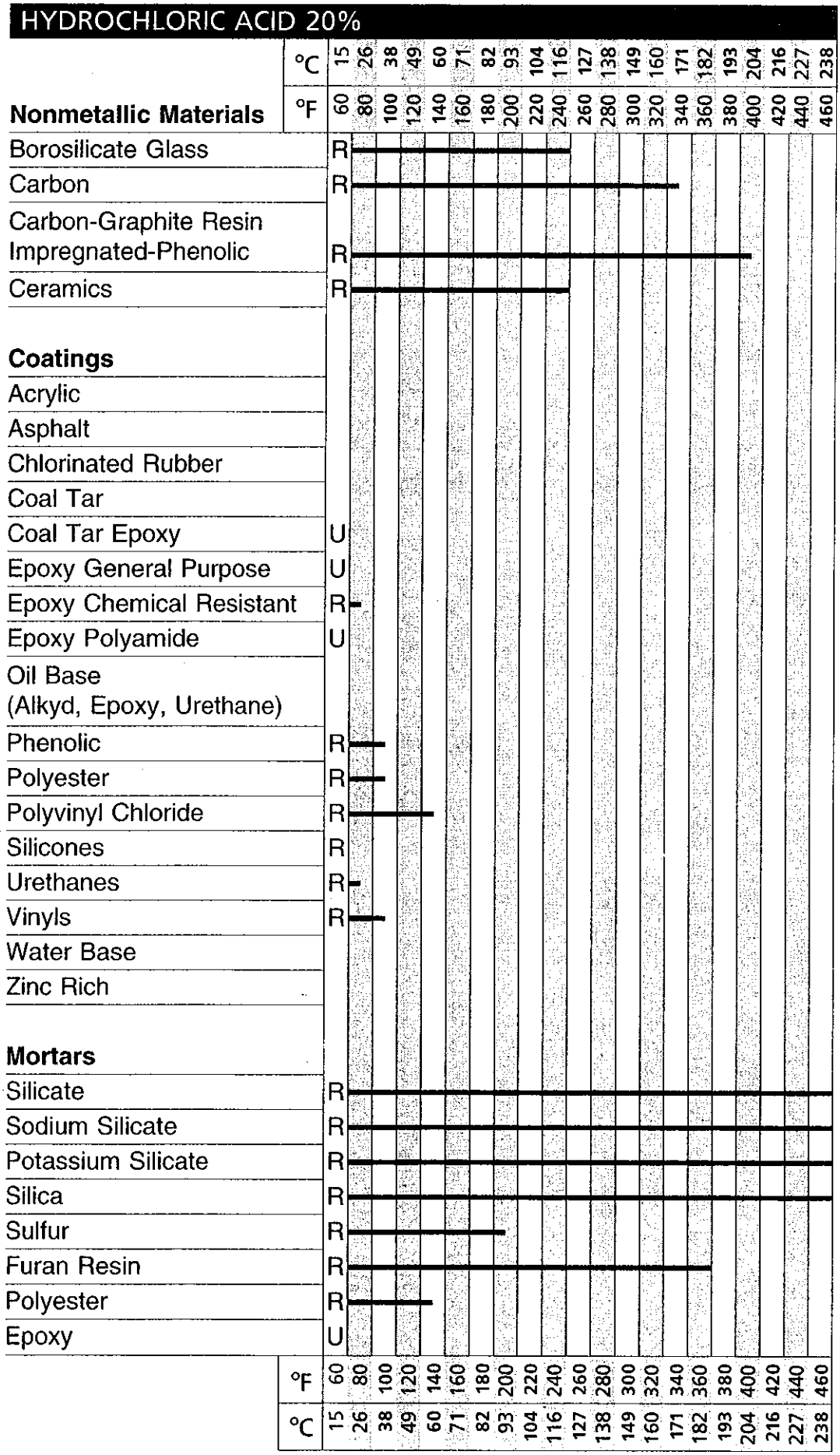
R = Resistant

U = Unsatisfactory

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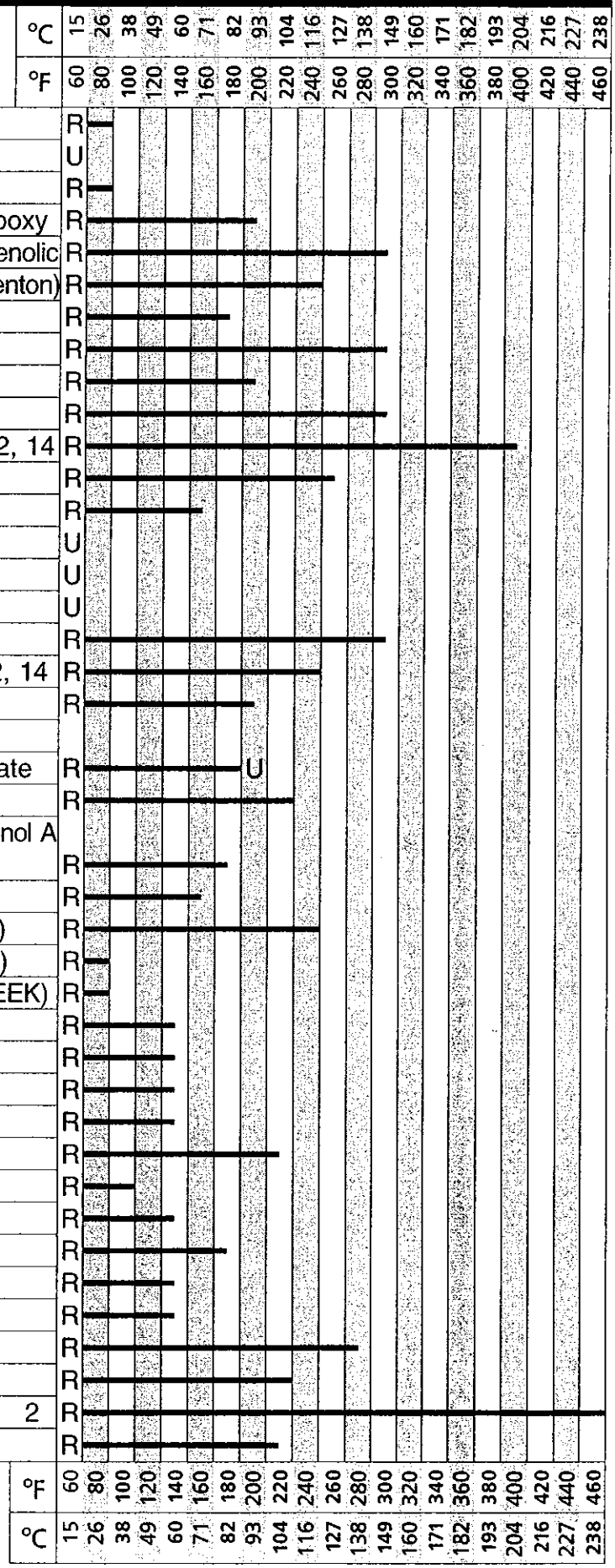
HYDROCHLORIC ACID 20%



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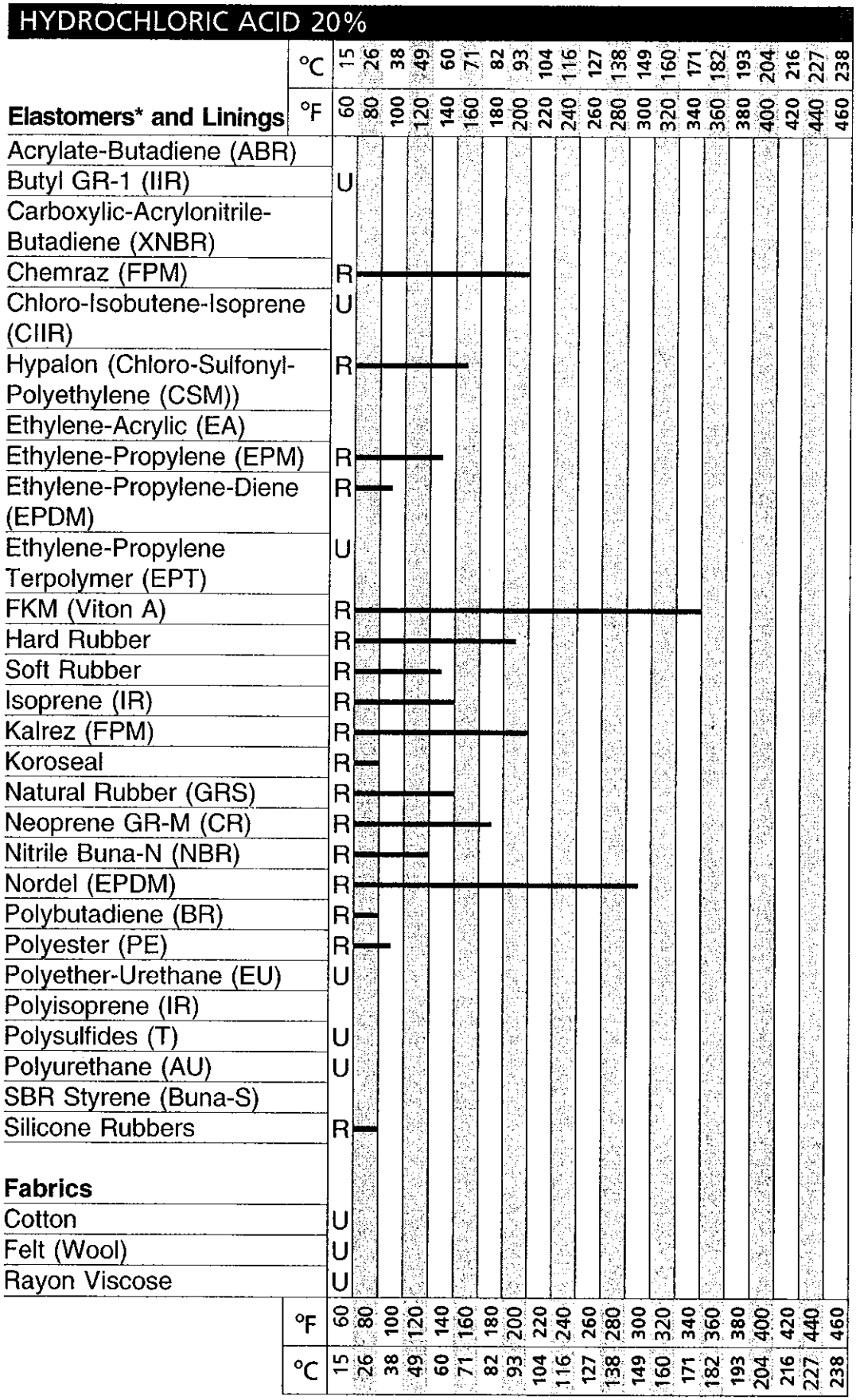
HYDROCHLORIC ACID 20%

Plastics	
ABS	R
Acetal	U
Acrylics	R
Asbestos Reinforced Epoxy	R
Asbestos Reinforced Phenolic	R
Chlorinated Polyether (Penton)	R
CPVC	R
E-CTFE (Halar)	R
Epoxy	R
ETFE (Tefzel)	R
FEP 2, 14	R
Furan (Furfural Alcohol)	R
Noryl	R
Nylon 6	U
Nylon 11	U
Nylon 66	U
Phenolic	R
PFA (Teflon) 2, 14	R
Polyamide-Imide	R
Polyesters	
Bisphenol A–fumarate	R
Halogenated	R
Hydrogenated Bisphenol A –Bisphenol A	R
Isophthalic	R
Terephthalate (PET)	R
Polyetherimide (ULTEM)	R
Polyetheretherketone (PEEK)	R
Polyethersulfone (PES)	R
Polyethylene HMW	R
Polyethylene UHMW	R
Polymethylpentene	R
Polypropylene (PP)	R
Polystyrene	R
Polysulfone	R
Polyvinylidene Chloride	R
PVC Type 1	R
PVC Type 2	R
PVDF (Kynar)	R
Ryton	R
TFE (Teflon) 2	R
Vinyl Ester	R



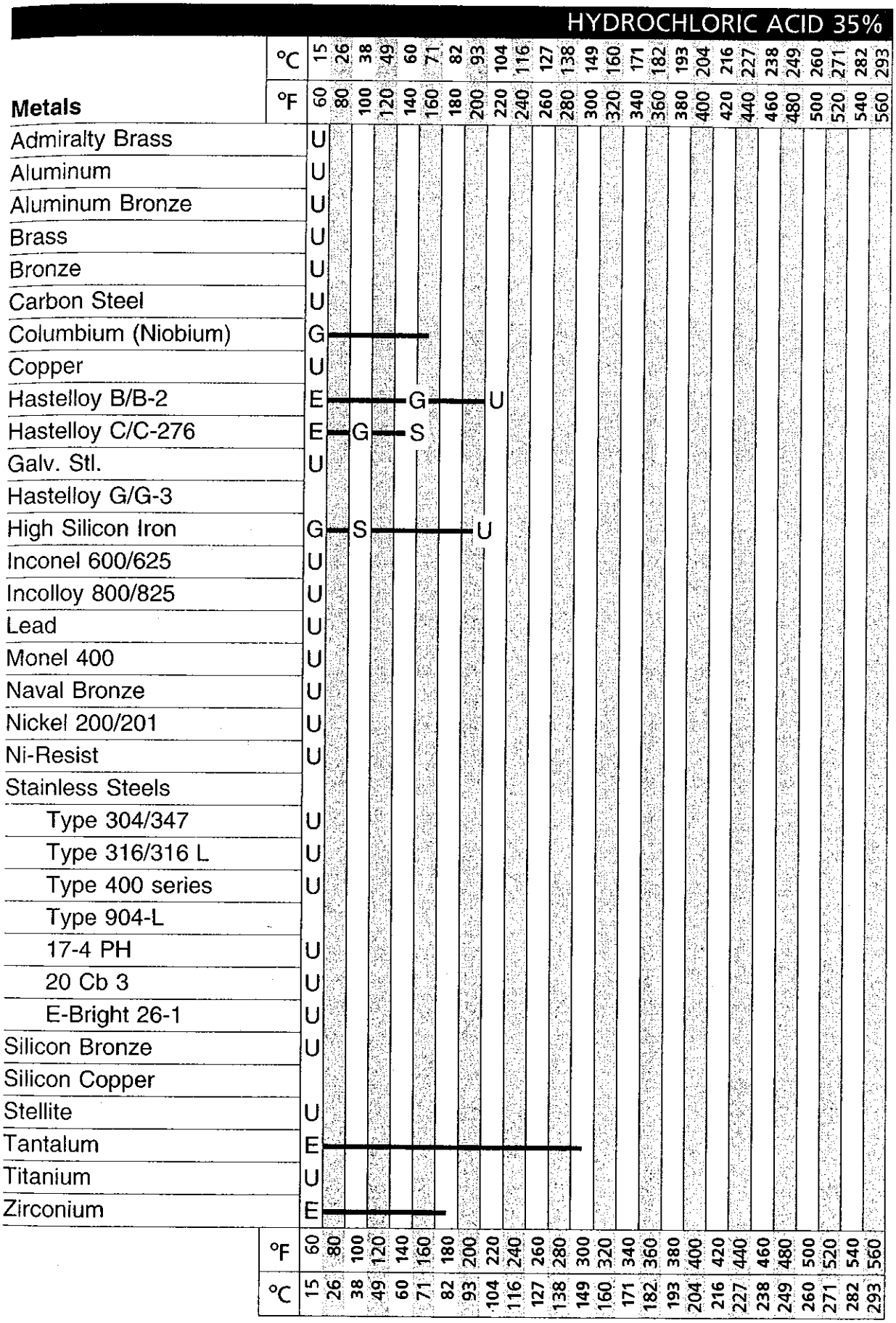
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HYDROCHLORIC ACID 20%



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

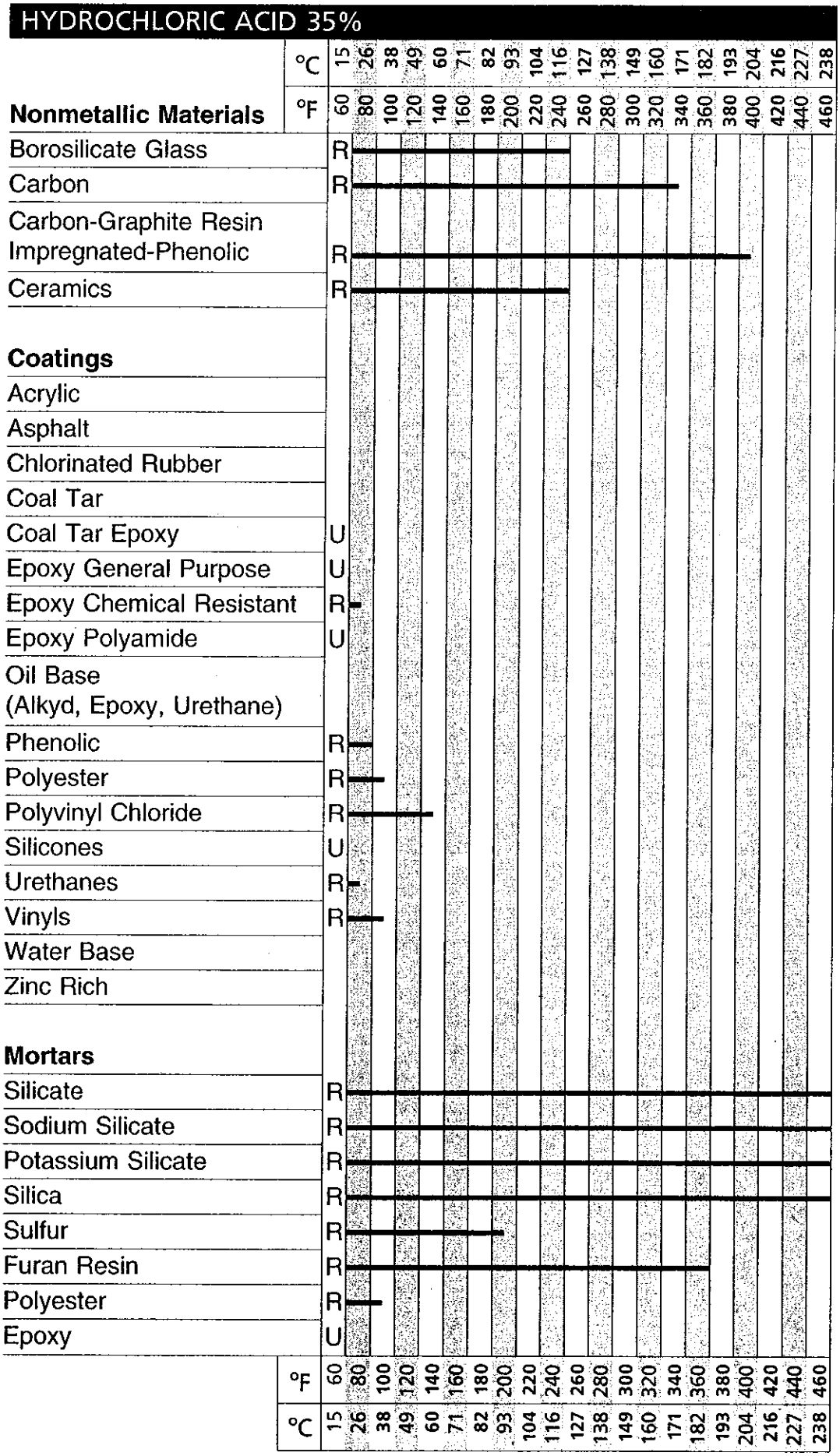
R = Resistant

U = Unsatisfactory

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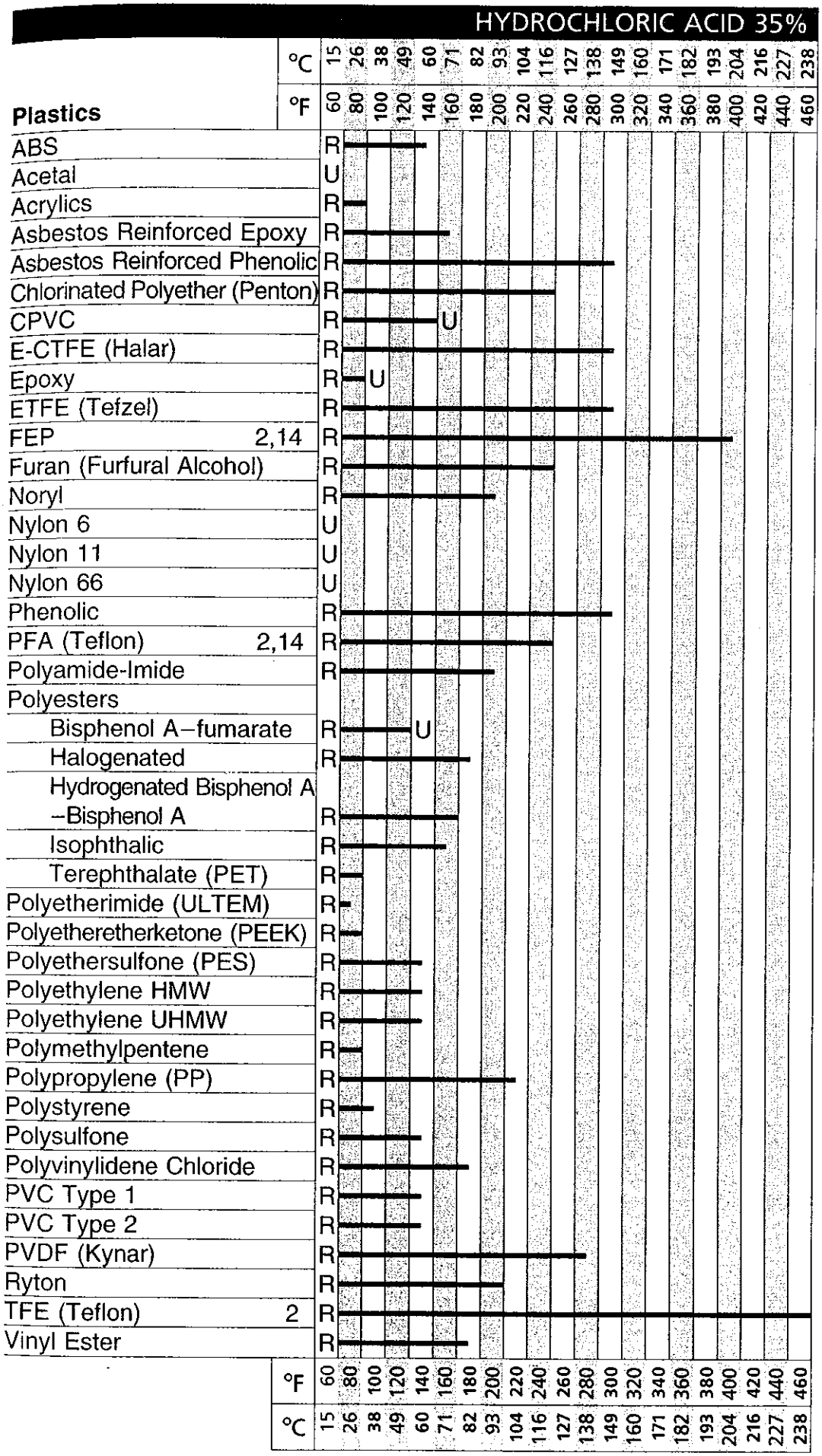
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HYDROCHLORIC ACID 35%



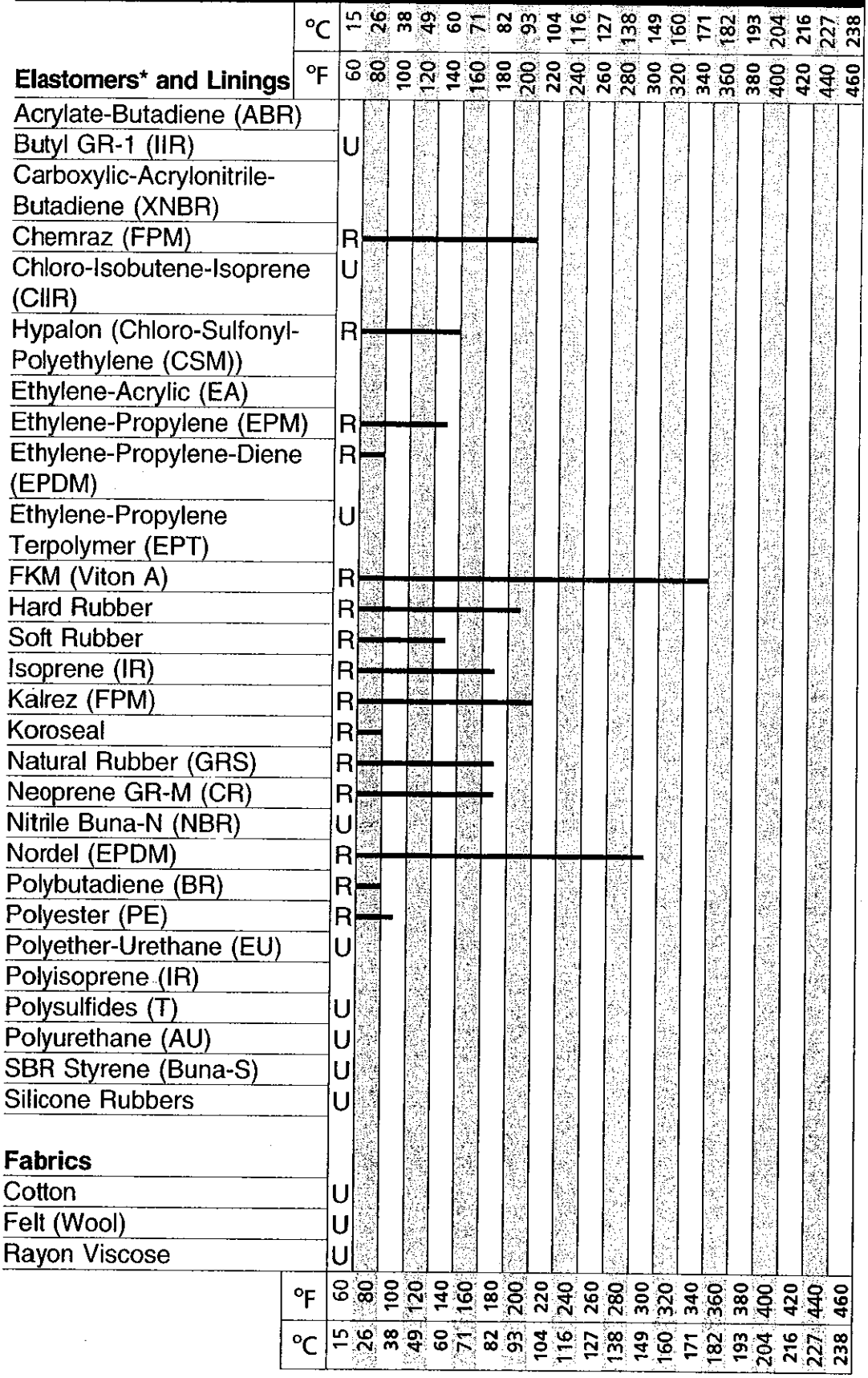
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HYDROCHLORIC ACID 35%



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HYDROCHLORIC ACID 35%



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HYDROCHLORIC ACID 38%

Metals	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass	U																									
Aluminum	U																									
Aluminum Bronze	U																									
Brass	U																									
Bronze	U																									
Carbon Steel	U																									
Columbium (Niobium)	G																									
Copper	U																									
Hastelloy B/B-2	E				U																					
Hastelloy C/C-276	E		S		U																					
Galv. Stl.	U																									
Hastelloy G/G-3																										
High Silicon Iron	U																									
Inconel 600/625	U																									
Incolloy 800/825	U																									
Lead	U																									
Monel 400	U																									
Naval Bronze	U																									
Nickel 200/201	U																									
Ni-Resist	U																									
Stainless Steels																										
Type 304/347	U																									
Type 316/316 L	U																									
Type 400 series	U																									
Type 904-L																										
17-4 PH	U																									
20 Cb 3	U																									
E-Bright 26-1	U																									
Silicon Bronze	U																									
Silicon Copper	U																									
Stellite	U																									
Tantalum	E																									
Titanium	U																									
Zirconium	E				U																					
°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560	
°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293	

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

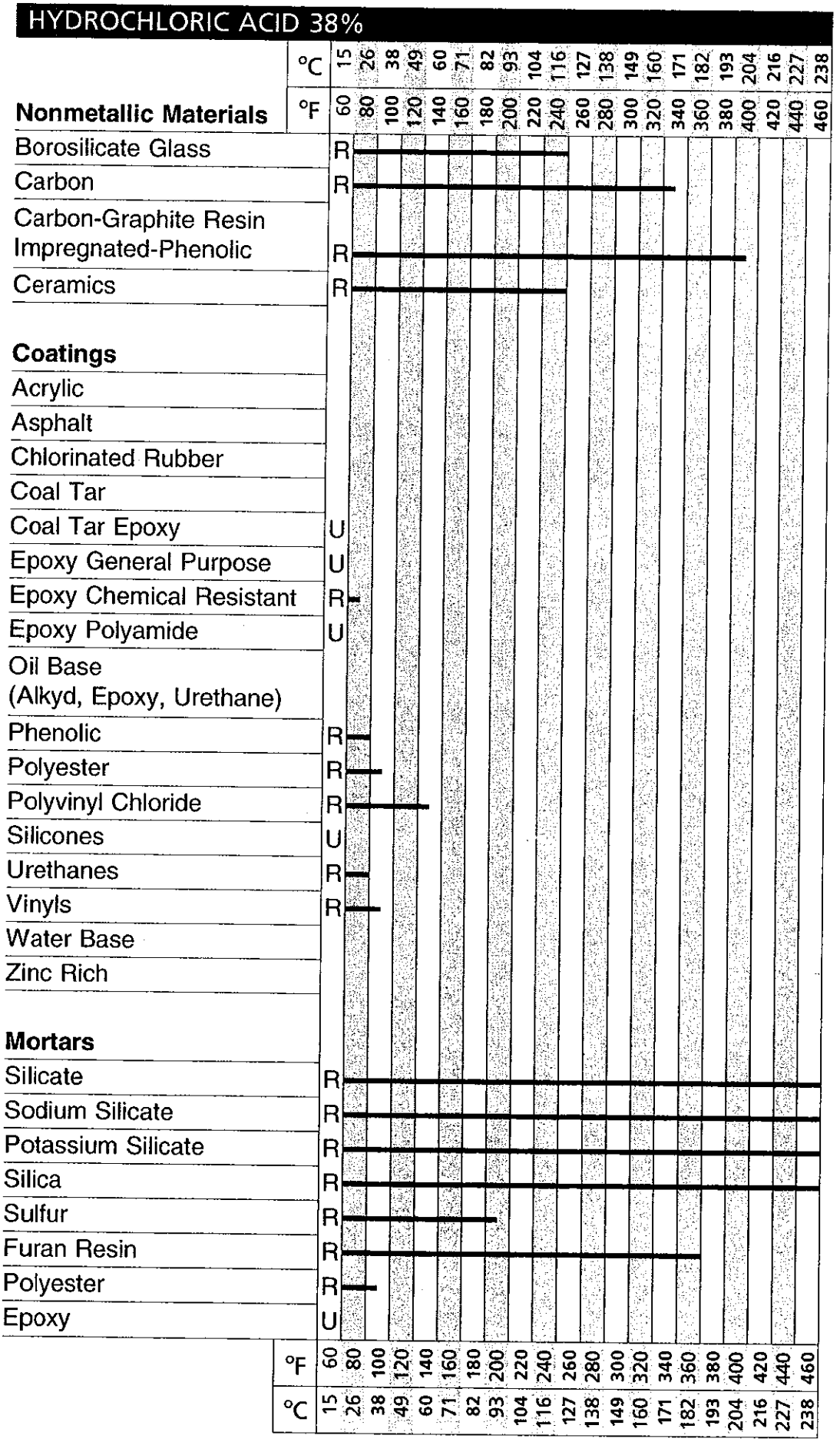
R = Resistant

U = Unsatisfactory

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HYDROCHLORIC ACID 38%



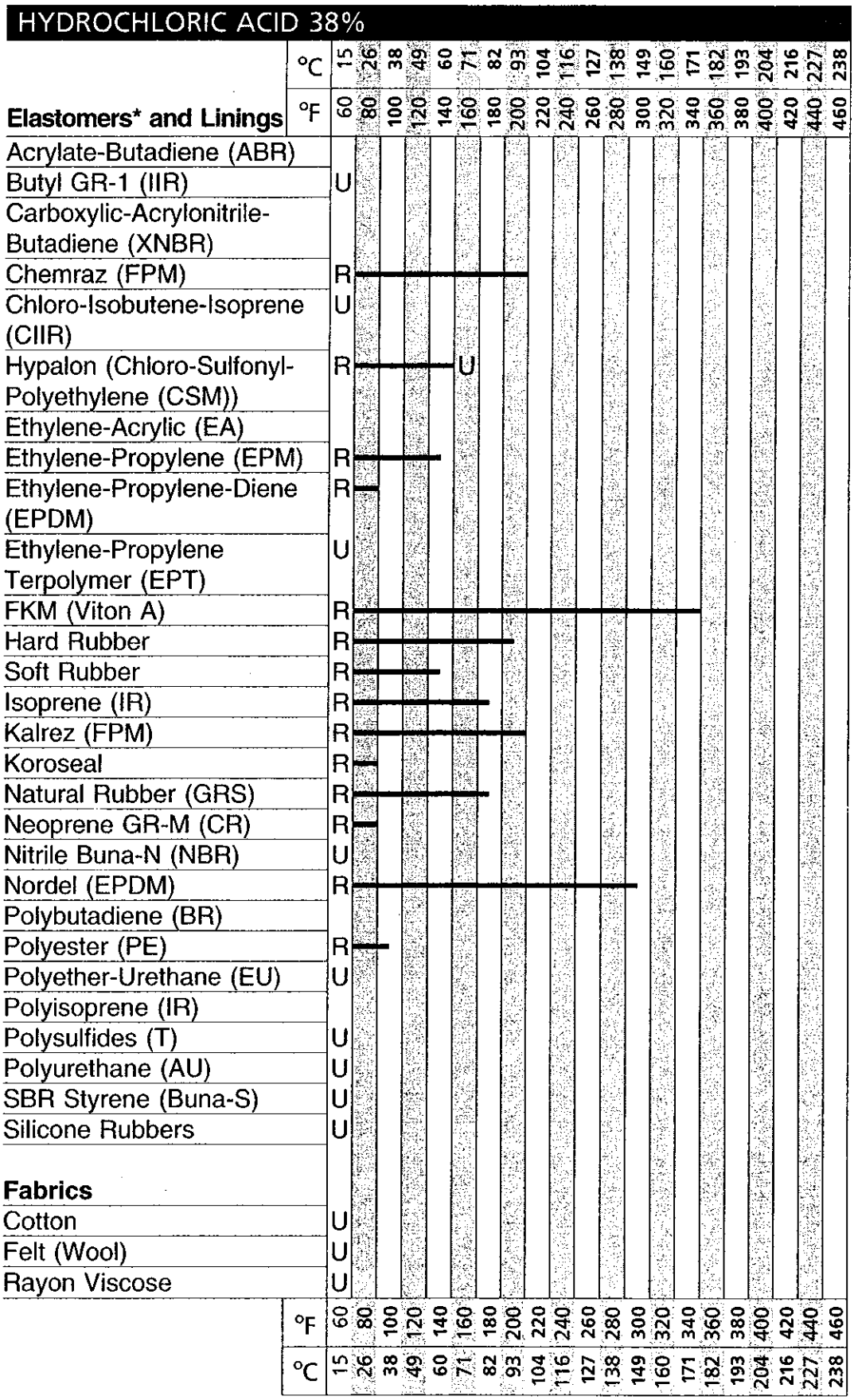
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HYDROCHLORIC ACID 38%

Plastics		°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
		°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS		R																				
Acetal		U																				
Acrylics		R																				
Asbestos Reinforced Epoxy		R																				
Asbestos Reinforced Phenolic		R																				
Chlorinated Polyether (Penton)		R																				
CPVC		R						U														
E-CTFE (Halar)		R																				
Epoxy		R																				
ETFE (Tefzel)		R																				
FEP	2, 14	R																				
Furan (Furfural Alcohol)		R																				
Noryl		R																				
Nylon 6		U																				
Nylon 11		U																				
Nylon 66		U																				
Phenolic		R																				
PFA (Teflon)	2, 14	R																				
Polyamide-Imide		R																				
Polyesters																						
Bisphenol A–fumarate		U																				
Halogenated		R																				
Hydrogenated Bisphenol A –Bisphenol A		R																				
Isophthalic		R																				
Terephthalate (PET)		R																				
Polyetherimide (ULTEM)		R																				
Polyetheretherketone (PEEK)		R																				
Polyethersulfone (PES)		R																				
Polyethylene HMW		R																				
Polyethylene UHMW		R																				
Polymethylpentene		R																				
Polypropylene (PP)		R																				
Polystyrene		R																				
Polysulfone		R																				
Polyvinylidene Chloride		R																				
PVC Type 1		R																				
PVC Type 2		R																				
PVDF (Kynar)		R																				
Ryton		R																				
TFE (Teflon)	2	R																				
Vinyl Ester		R																				
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDROCHLORIC ACID 38%



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HYDROCHLORIC ACID 50%

Metals	°C	°F
Admiralty Brass	U	
Aluminum	U	
Aluminum Bronze	U	
Brass	U	
Bronze	U	
Carbon Steel	U	
Columbium (Niobium)	G	
Copper	U	
Hastelloy B/B-2	G	
Hastelloy C/C-276	G	
Hastelloy D	U	
Galv. Stl.	U	
High Silicon Iron	G	S
Inconel 600/625	U	
Incolloy 800/825	U	
Lead	U	
Monel 400	U	
Naval Bronze	U	
Nickel 200/201	U	
Ni-Resist	U	
Stainless Steels		
Type 304/347	U	
Type 316/316 L	U	
Type 400 series	U	
Type 904-L		
17-4 PH	U	
20 Cb 3	U	
E-Bright 26-1	U	
Silicon Bronze	U	
Silicon Copper		
Stellite	U	
Tantalum	E	
Titanium	U	
Zirconium	E	U

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

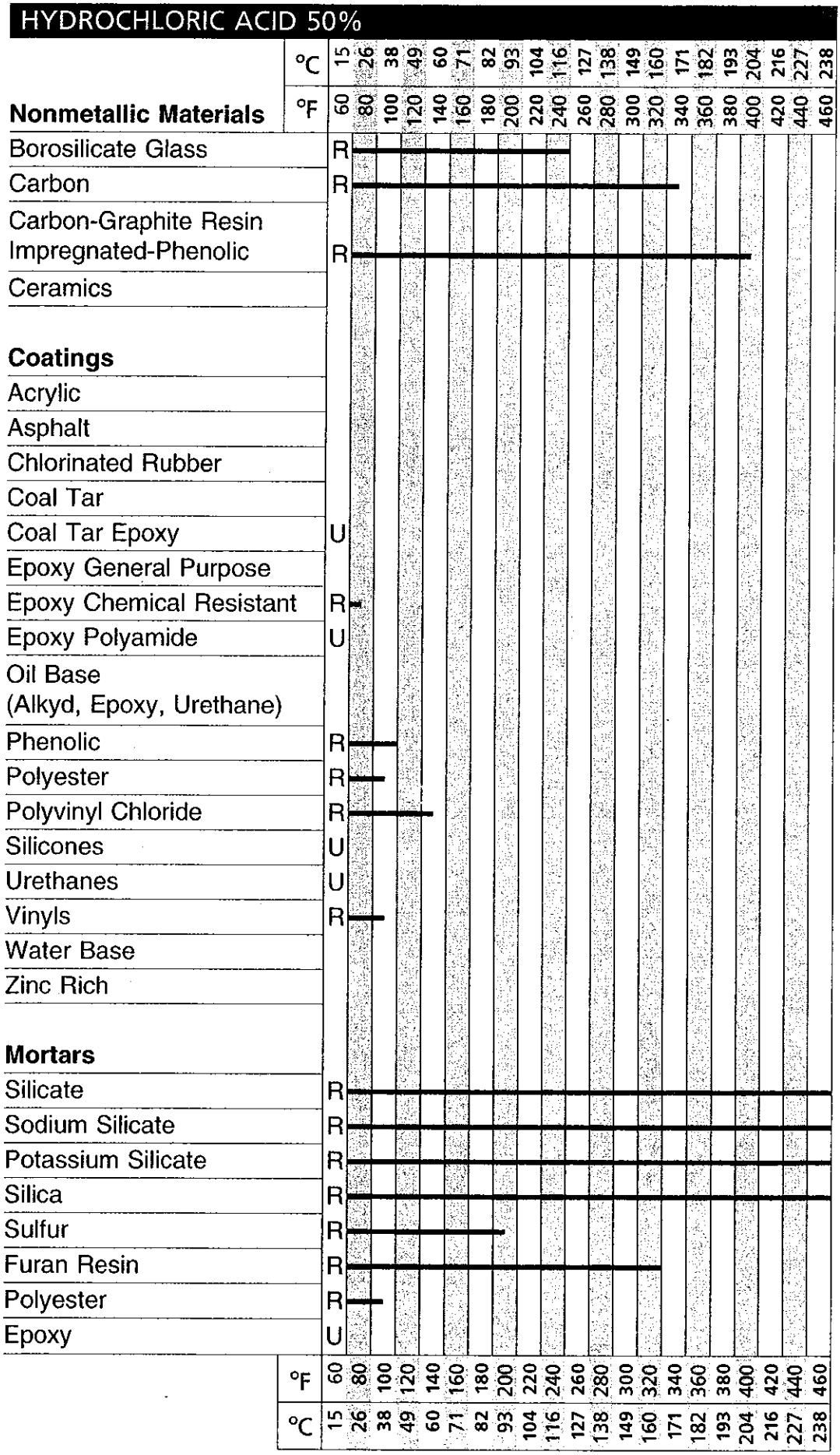
R = Resistant

U = Unsatisfactory

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HYDROCHLORIC ACID 50%



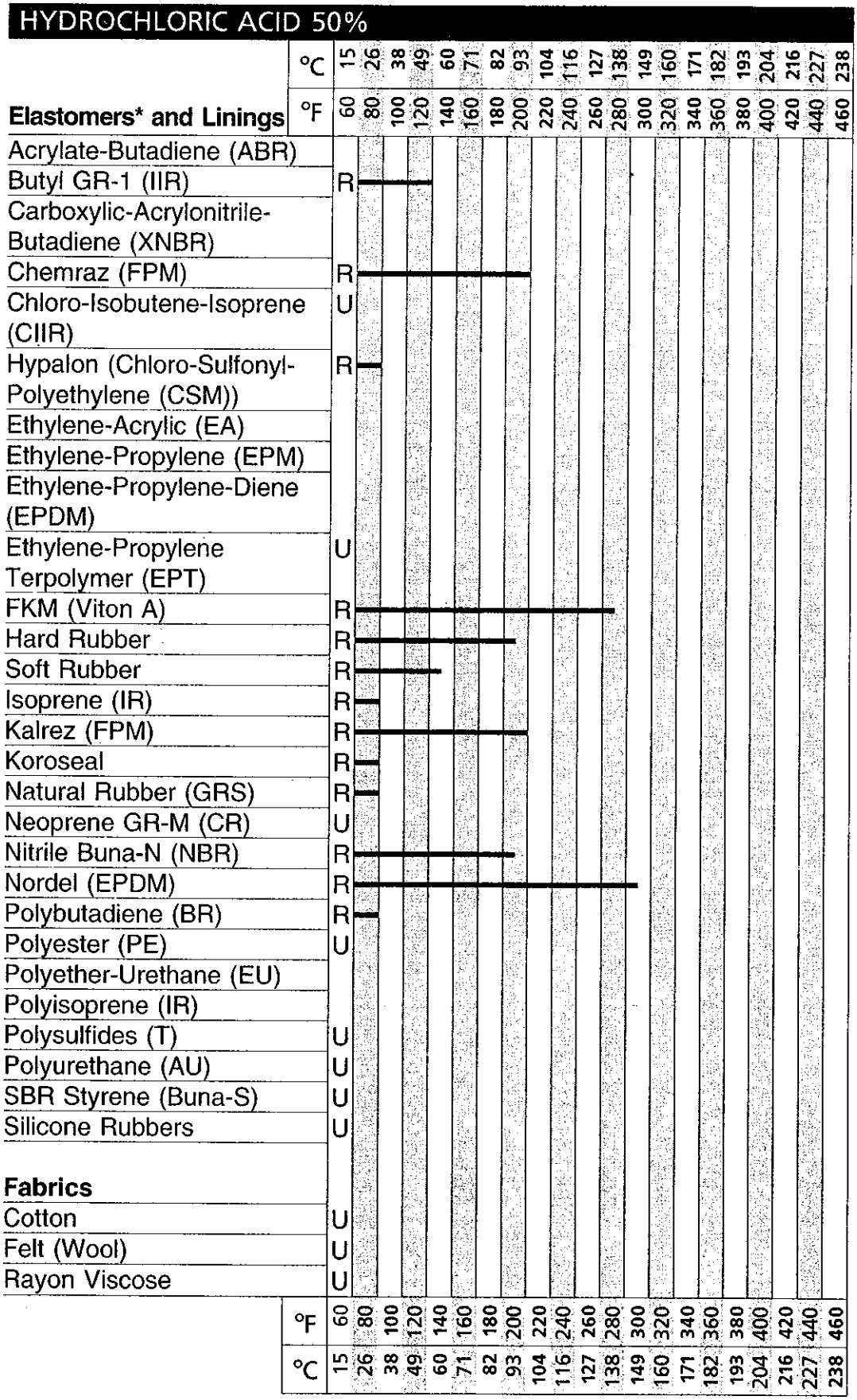
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Plastics		°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
		°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS		R				U																
Acetal		U																				
Acrylics		R																				
Asbestos Reinforced Epoxy		R																				
Asbestos Reinforced Phenolic		R																				
Chlorinated Polyether (Penton)		R																				
CPVC		R																				
E-CTFE (Halar)																						
Epoxy		R																				
ETFE (Tefzel)		R																				
FEP	2,14	R																				
Furan (Furfural Alcohol)		R																				
Noryl		U																				
Nylon 6		U																				
Nylon 11		U																				
Nylon 66		U																				
Phenolic		R																				
PFA (Teflon)	2,14	R																				
KEL-F (CTFE)		R																				
Polyesters																						
Bisphenol A–fumarate		R																				
Halogenated		R																				
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic		U																				
Terephthalate (PET)		R																				
Polyetherimide (ULTEM)		R																				
Polyetheretherketone (PEEK)		R																				
Polyethersulfone (PES)		R																				
Polyethylene HMW		R																				
Polyethylene UHMW		R																				
Polymethylpentene		R																				
Polypropylene (PP)		R			U																	
Polystyrene		U																				
Polysulfone		R																				
Polyvinylidene Chloride		R																				
PVC Type 1		R																				
PVC Type 2		R																				
PVDF (Kynar)		R																				
Ryton																						
TFE (Teflon)	2	R																				
Vinyl Ester		R																				
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDROCHLORIC ACID 50%



*See also Nylon 11 under PLASTICS

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HYDROCHLORIC ACID FUMES

Metals	°C / °F	15 / 60	26 / 80	38 / 100	49 / 120	60 / 140	71 / 160	82 / 180	93 / 200	104 / 220	116 / 240	127 / 260	138 / 280	149 / 300	160 / 320	171 / 340	182 / 360	193 / 380	204 / 400	216 / 420	227 / 440	238 / 460	249 / 480	260 / 500	271 / 520	282 / 540	293 / 560
Admiralty Brass		U																									
Aluminum		U																									
Aluminum Bronze		U																									
Brass		U																									
Bronze		U																									
Carbon Steel		U																									
Columbium (Niobium)																											
Copper		U																									
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625		U																									
Incolloy 800/825		U																									
Lead																											
Monel 400		U																									
Naval Bronze		U																									
Nickel 200/201		U																									
Ni-Resist																											
Stainless Steels																											
Type 304/347		U																									
Type 316/316 L		U																									
Type 400 series		U																									
Type 904-L																											
17-4 PH		U																									
20 Cb 3		U																									
E-Bright 26-1		U																									
Silicon Bronze		U																									
Silicon Copper		U																									
Stellite																											
Tantalum		E																									
Titanium		U																									
Zirconium		U																									
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

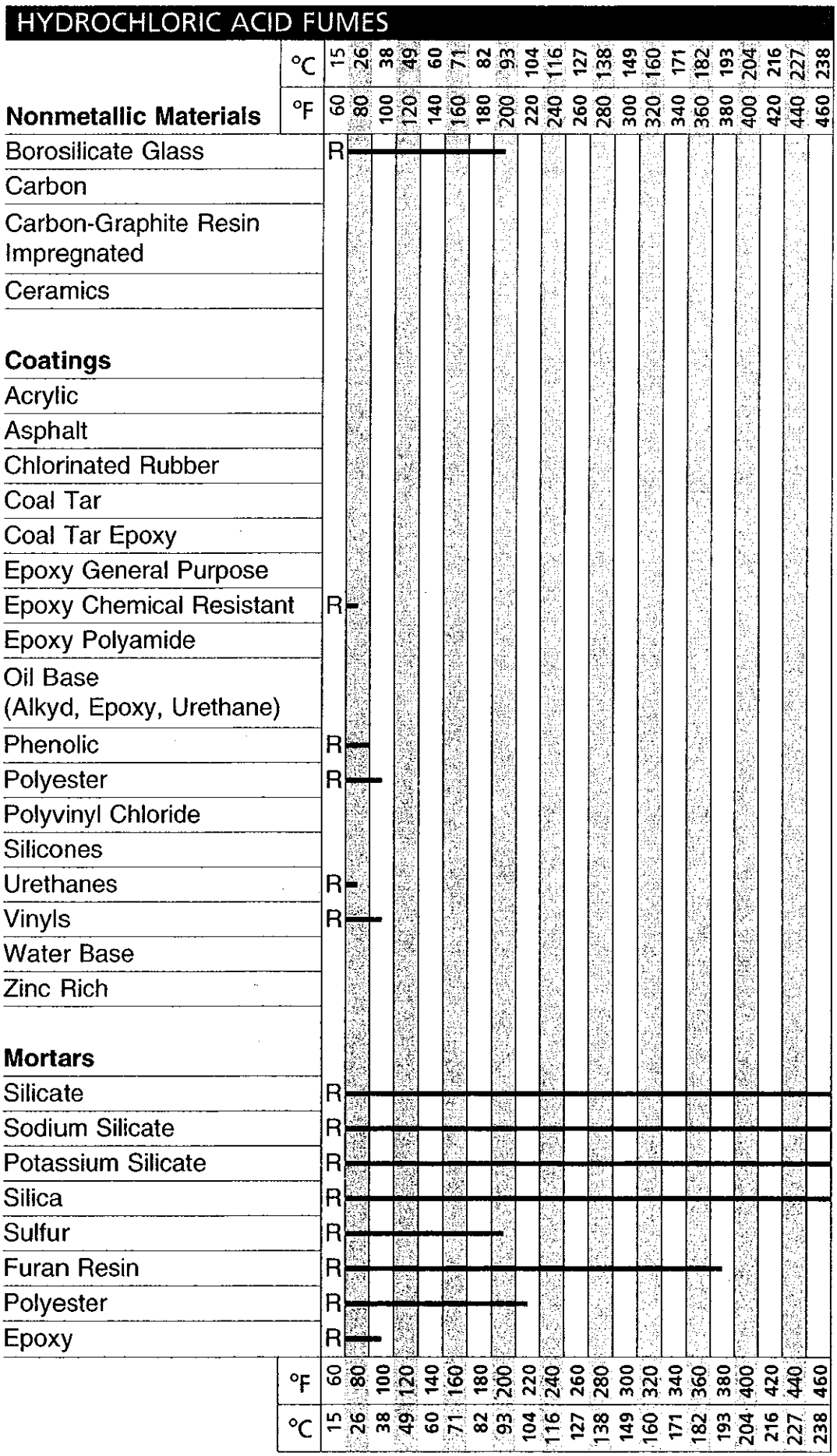
R = Resistant

U = Unsatisfactory

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HYDROCHLORIC ACID FUMES



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HYDROCHLORIC ACID FUMES

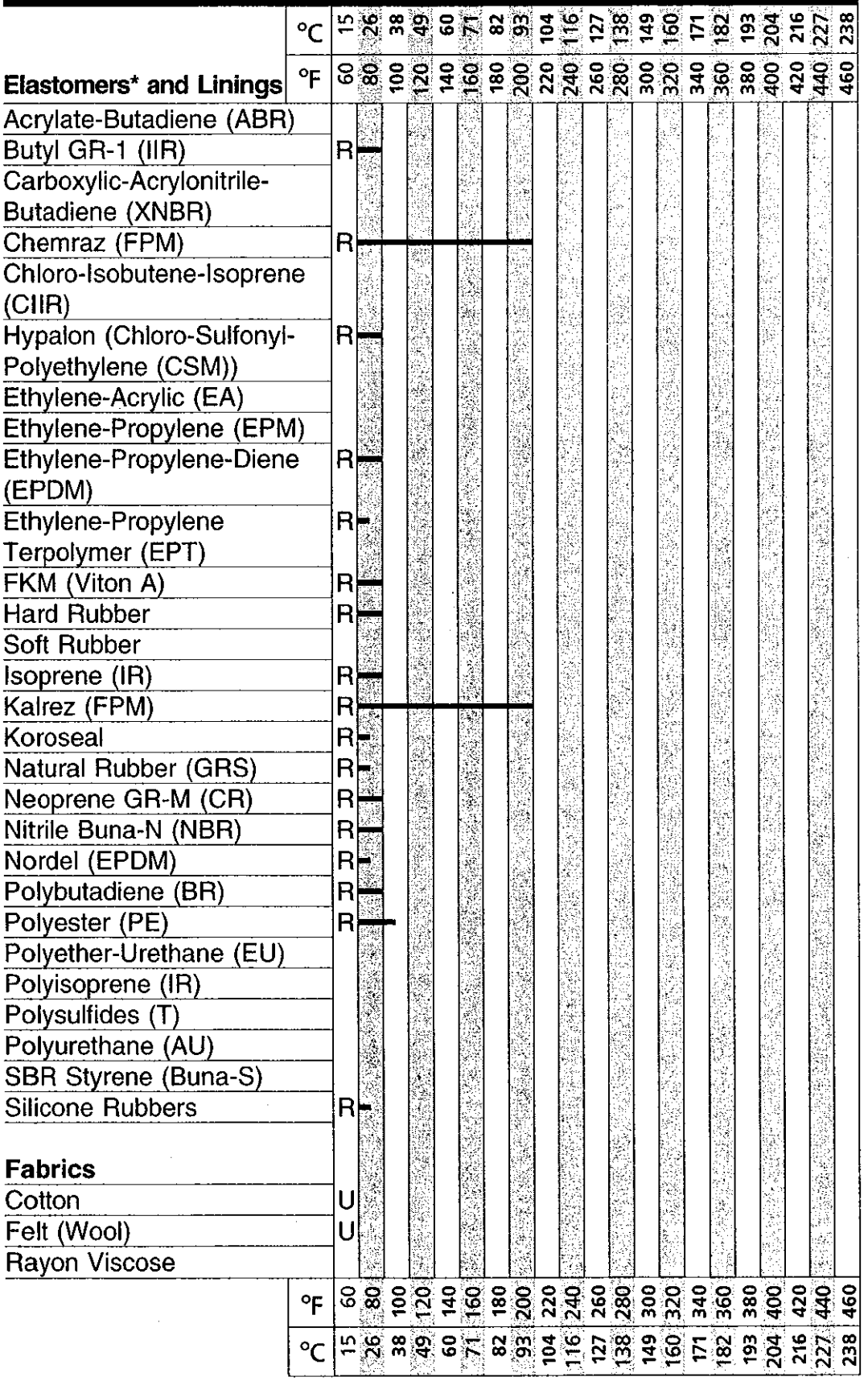
Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC		
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	R	
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	R	
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)		
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1		
PVC Type 2		
PVDF (Kynar)		
Ryton	R	
TFE (Teflon)	R	
Vinyl Ester	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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HYDROCHLORIC ACID FUMES



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HYDROCYANIC ACID 10%

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass		U																									
Aluminum		G																									
Aluminum Bronze		U																									
Brass		U																									
Bronze		U																									
Carbon Steel		G																									
Columbium (Niobium)																											
Copper		U																									
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron		U																									
Inconel 600/625																											
Incolloy 800/825		E																									
Lead		U																									
Monel 400		G																									
Naval Bronze		U																									
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347		G																									
Type 316/316 L		G																									
Type 410		G																									
Type 430		U																									
17-4 PH		S																									
20 Cb 3		G																									
E-Bright 26-1																											
Silicon Bronze		U																									
Silicon Copper		U																									
Stellite		U																									
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

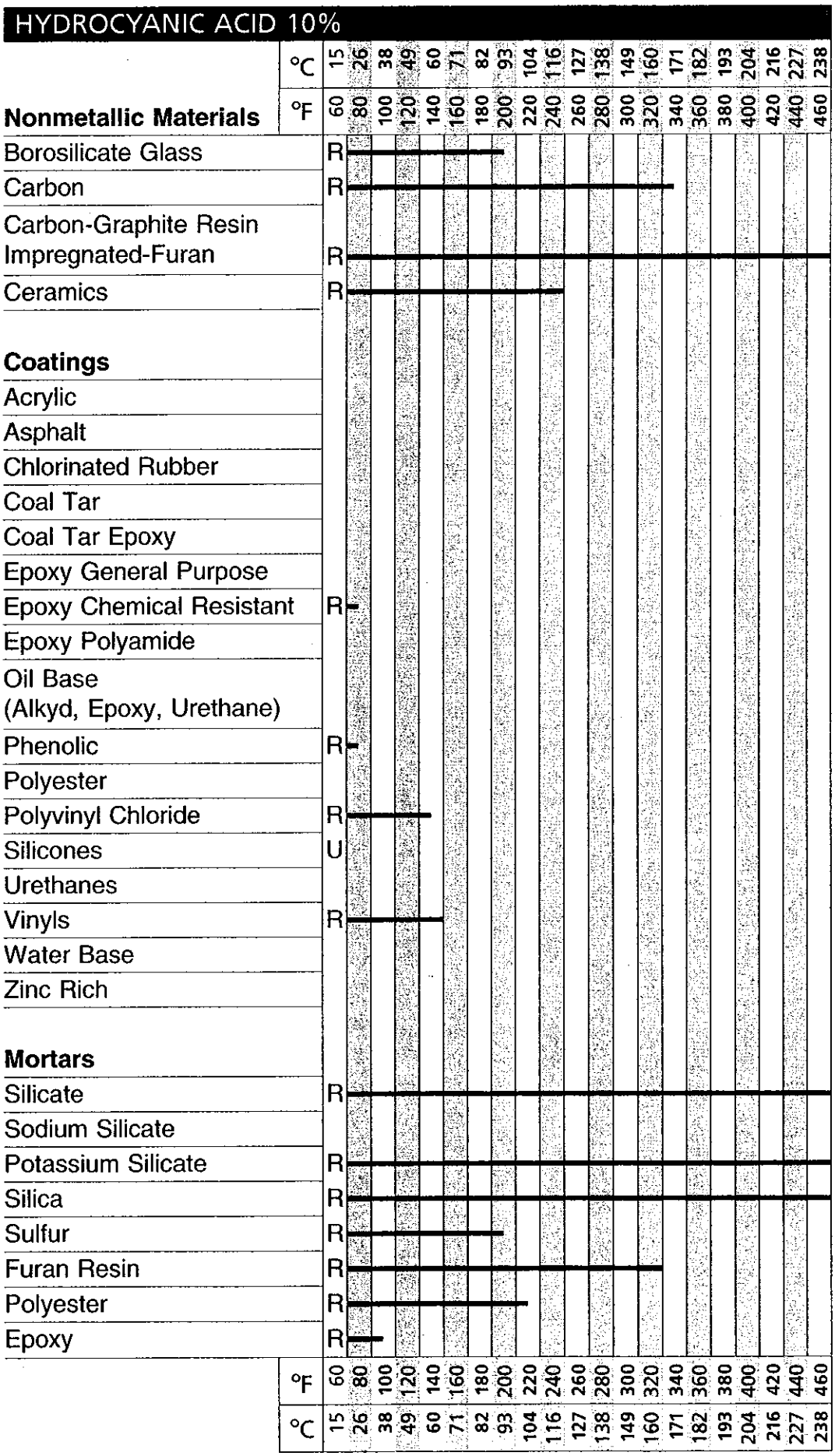
R = Resistant

U = Unsatisfactory

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HYDROCYANIC ACID 10%



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HYDROCYANIC ACID 10%

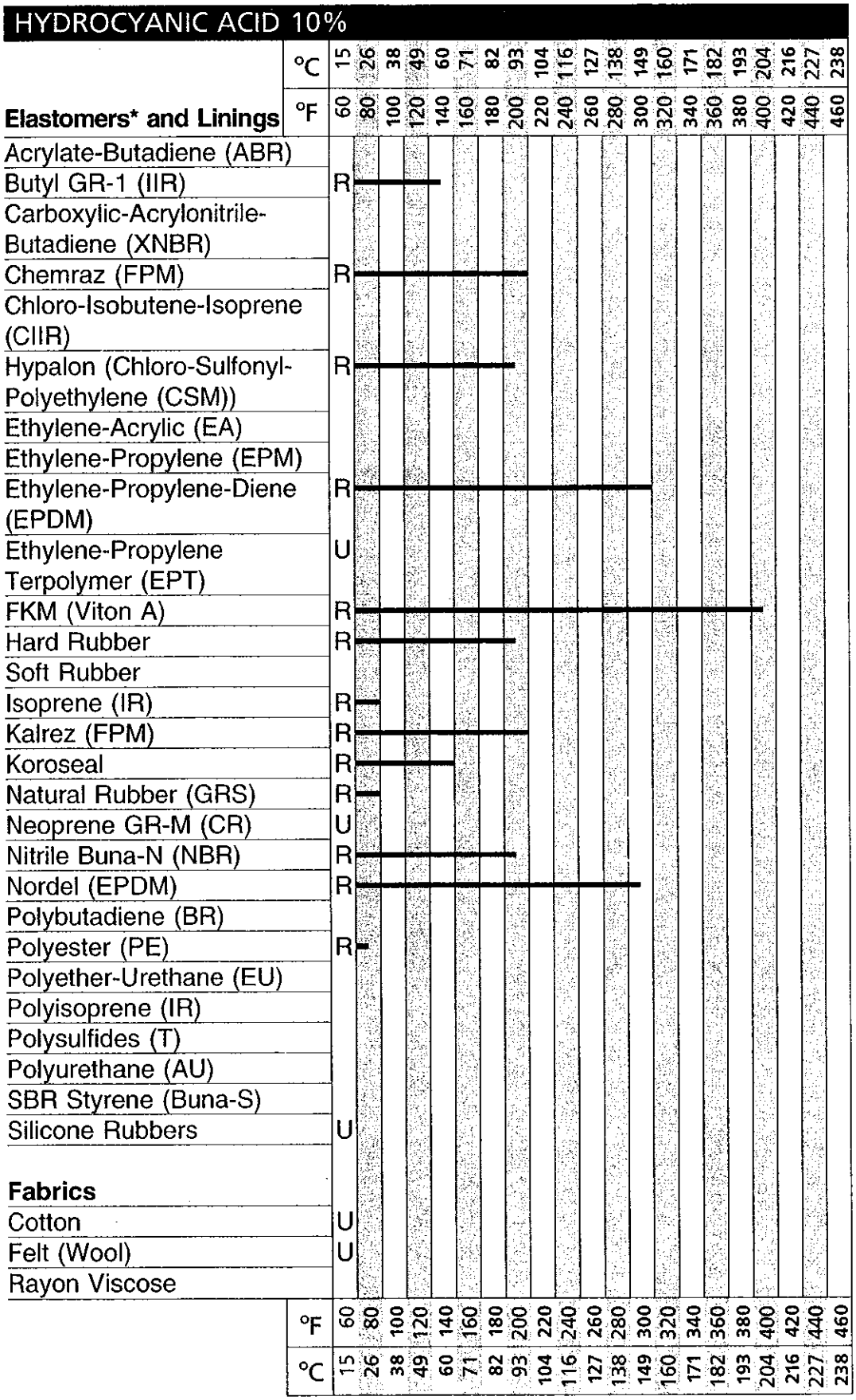
Plastics	°F	°C
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)	R	
CPVC	R	
E-CTFE (Halar)	R	
Epoxy	R	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)	R	
Noryl		
Nylon 6	U	
Nylon 11	U	
Nylon 66	U	
Phenolic	R	
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	R	
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A	U	
Isophthalic	R	
Terephthalate (PET)	R	
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW	R	
Polyethylene UHMW	R	
Polymethylpentene		
Polypropylene (PP)	R	
Polystyrene		
Polysulfone		
Polyvinylidene Chloride	R	
PVC Type 1	R	
PVC Type 2	R	
PVDF (Kynar)	R	
Ryton	R	
TFE (Teflon)	R	
Vinyl Ester	R	

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

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HYDROCYANIC ACID 10%

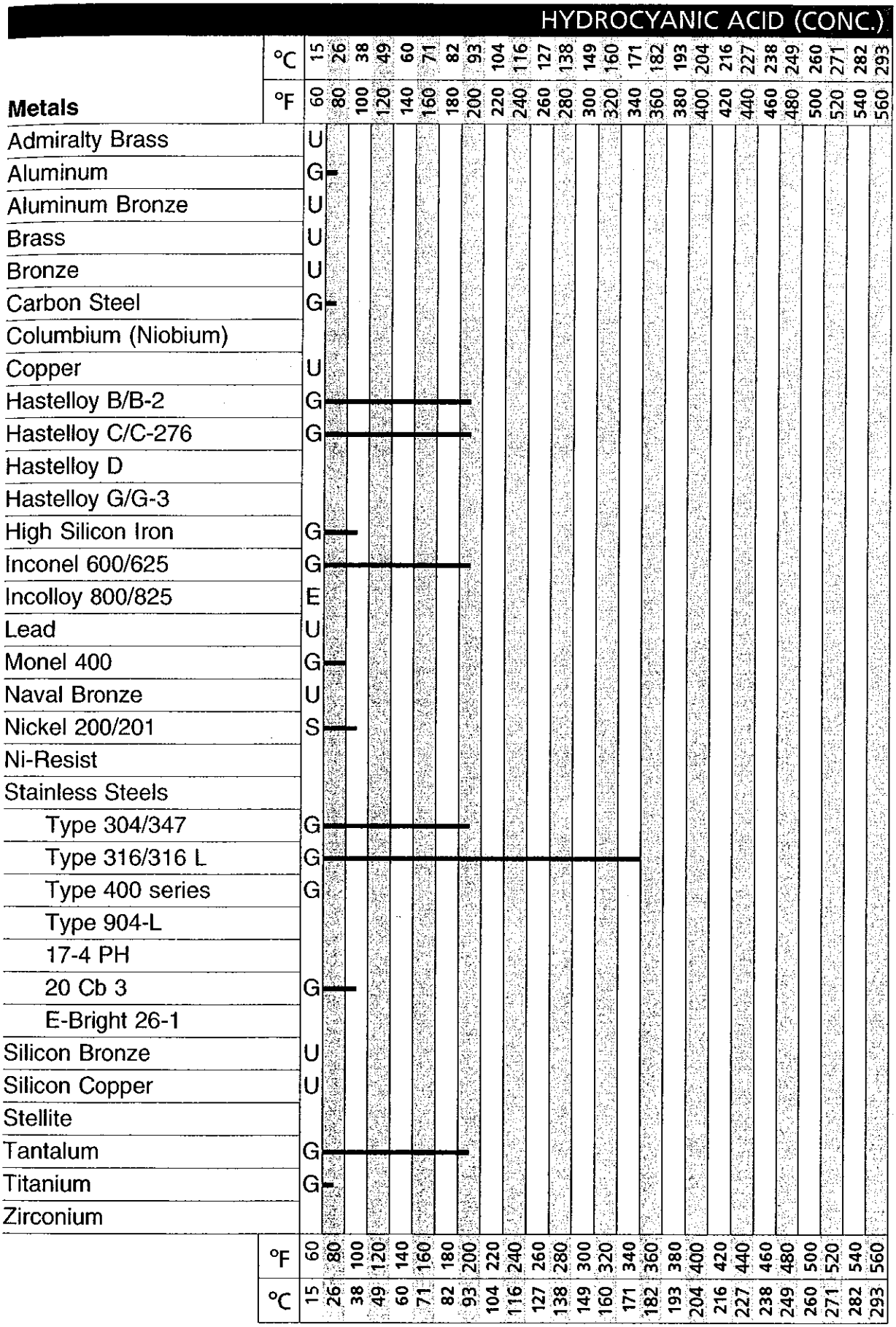


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HYDROCYANIC ACID (CONC.)



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

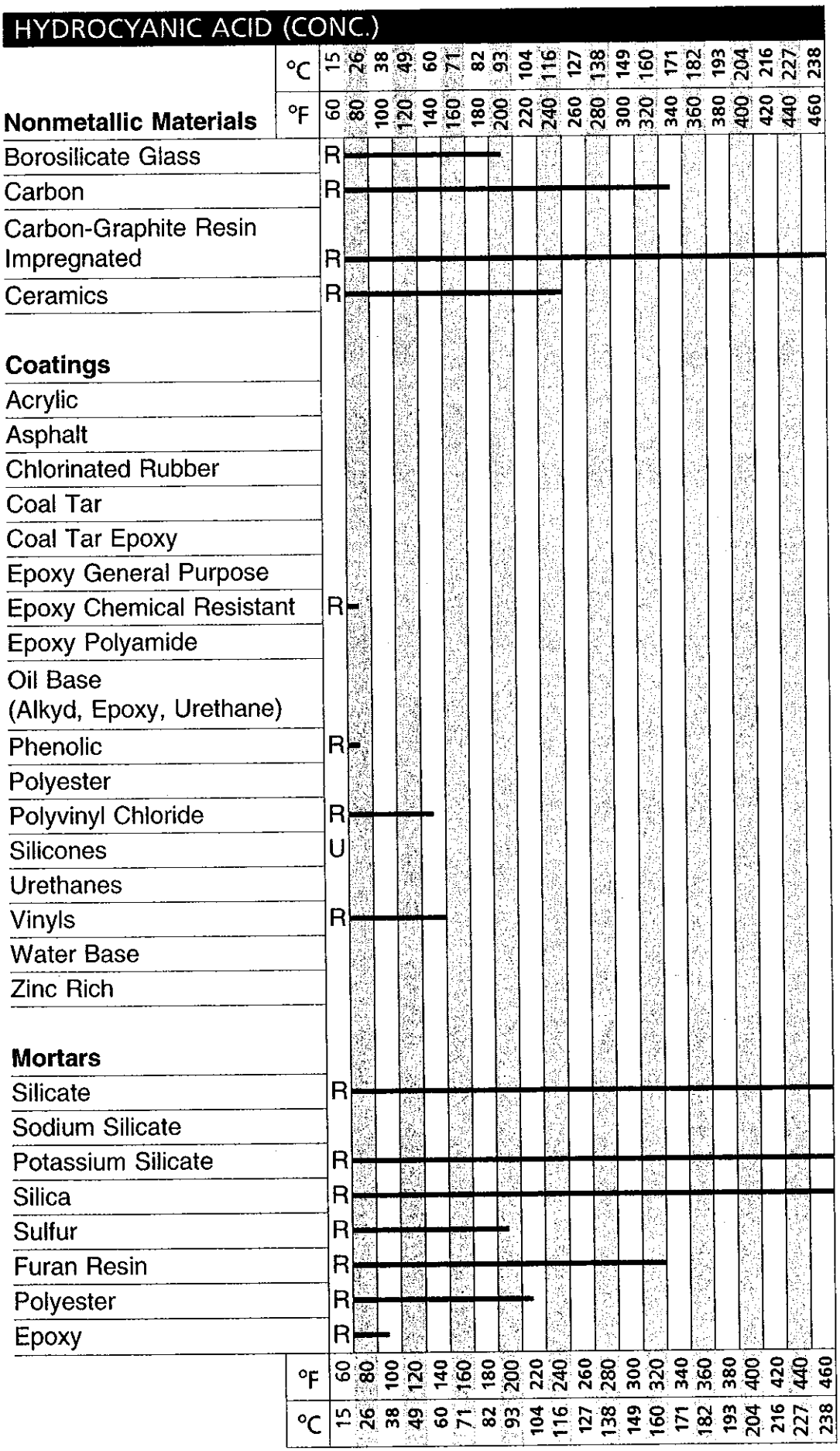
R = Resistant

U = Unsatisfactory

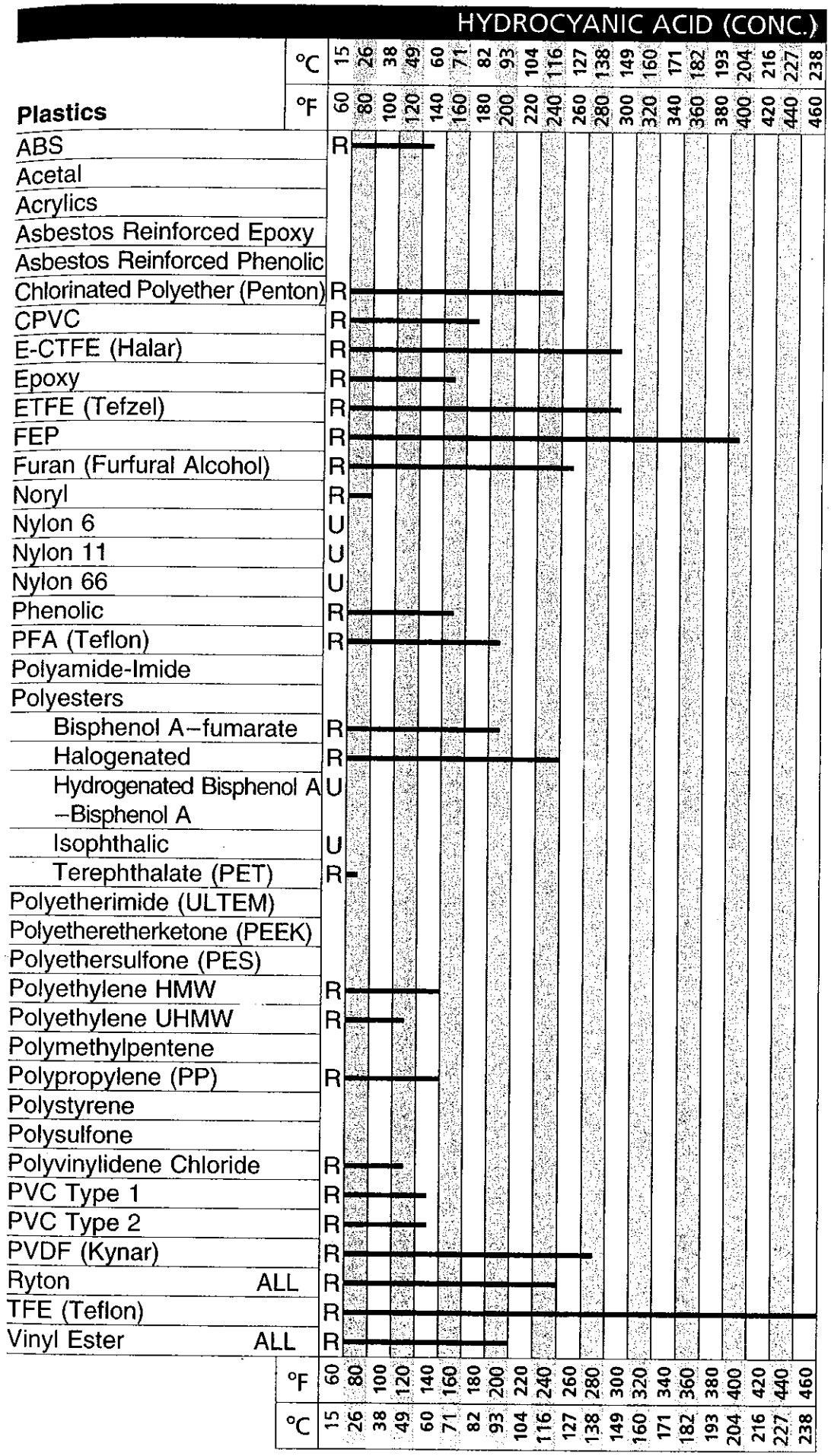
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HYDROCYANIC ACID (CONC.)

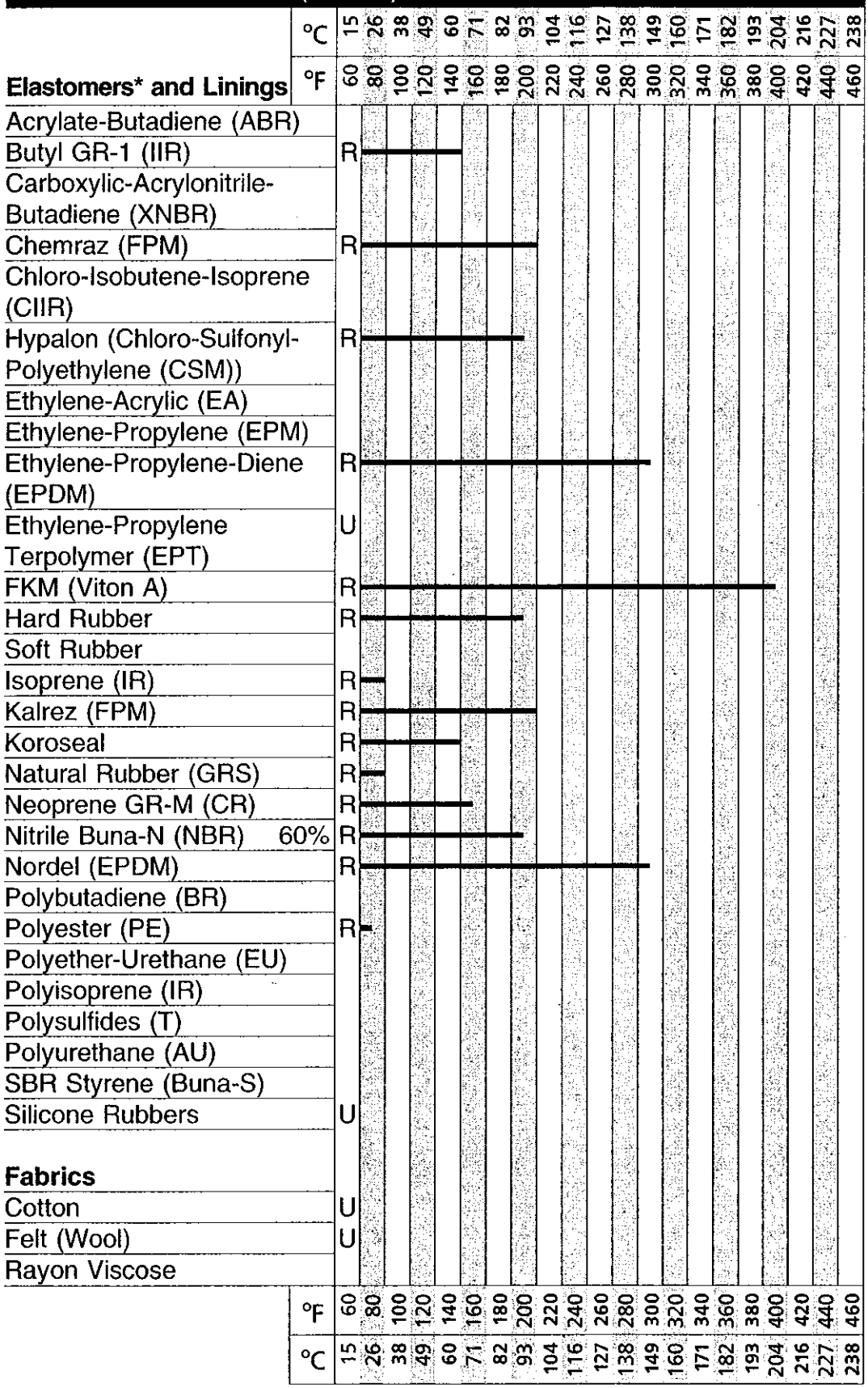


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HYDROCYANIC ACID (CONC.)



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HYDROFLUORIC ACID DILUTE

Metals	
Admiralty Brass	U
Aluminum	U
Aluminum Bronze	U
Brass	U
Bronze	G
Carbon Steel	U
Columbium (Niobium)	U
Copper	G
Hastelloy B/B-2	G
Hastelloy C/C-276	E
Hastelloy D	G
Hastelloy G/G-3	
High Silicon Iron	U
Inconel 600/625	E–U
Incolloy 800/825	U
Lead	G
Monel 400	2 E
Naval Bronze	G
Nickel 200/201	G–S–U
Ni-Resist	E
Stainless Steels	
Type 304/347	U
Type 316/316 L	U
Type 400 series	U
Type 904-L	
17-4 PH	U
20 Cb 3	G
E-Bright 26-1	
Silicon Bronze	U
Silicon Copper	G
Stellite	U
Tantalum	U
Titanium	U
Zirconium	U

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

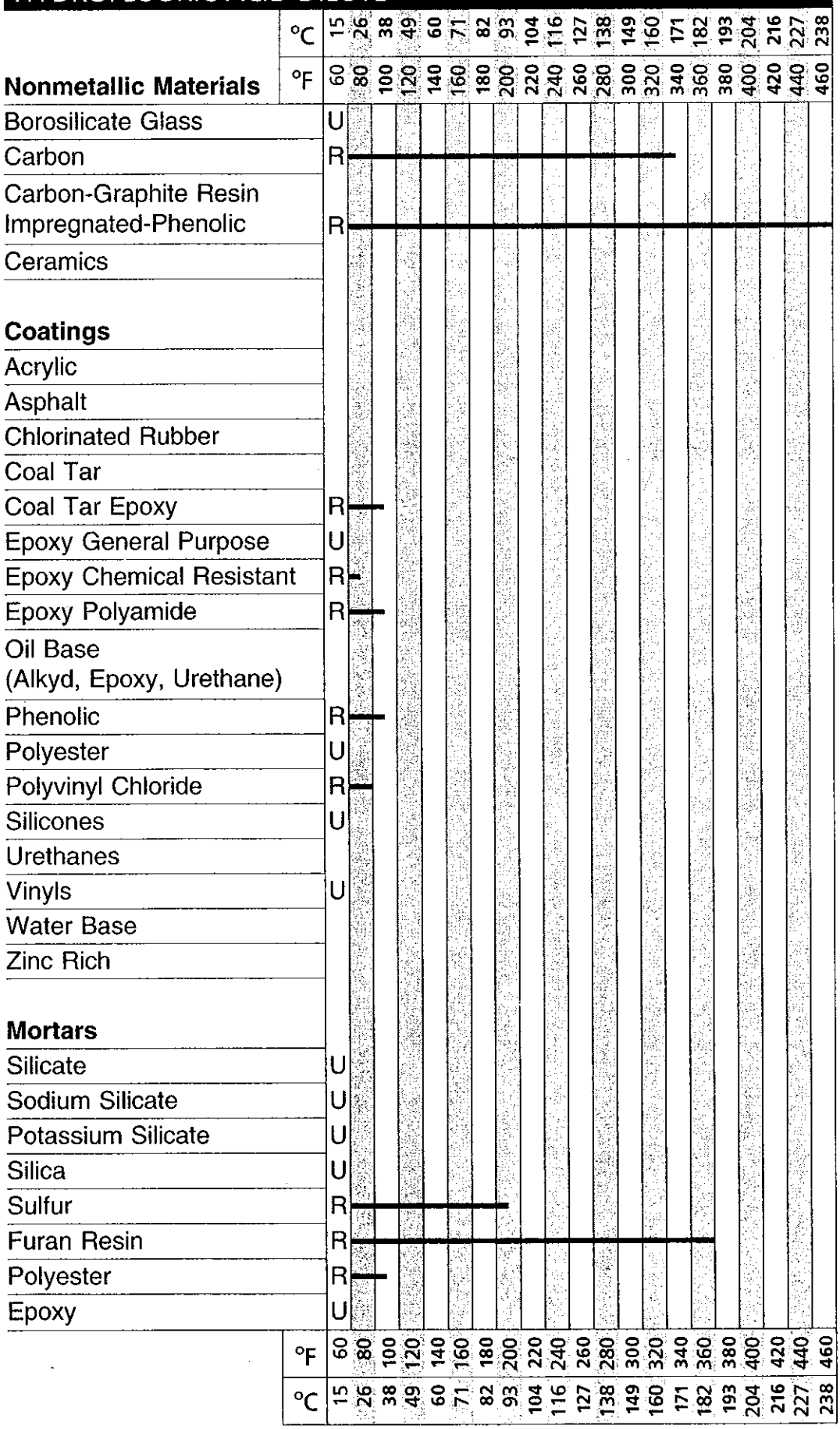
R = Resistant

U = Unsatisfactory

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HYDROFLUORIC ACID DILUTE



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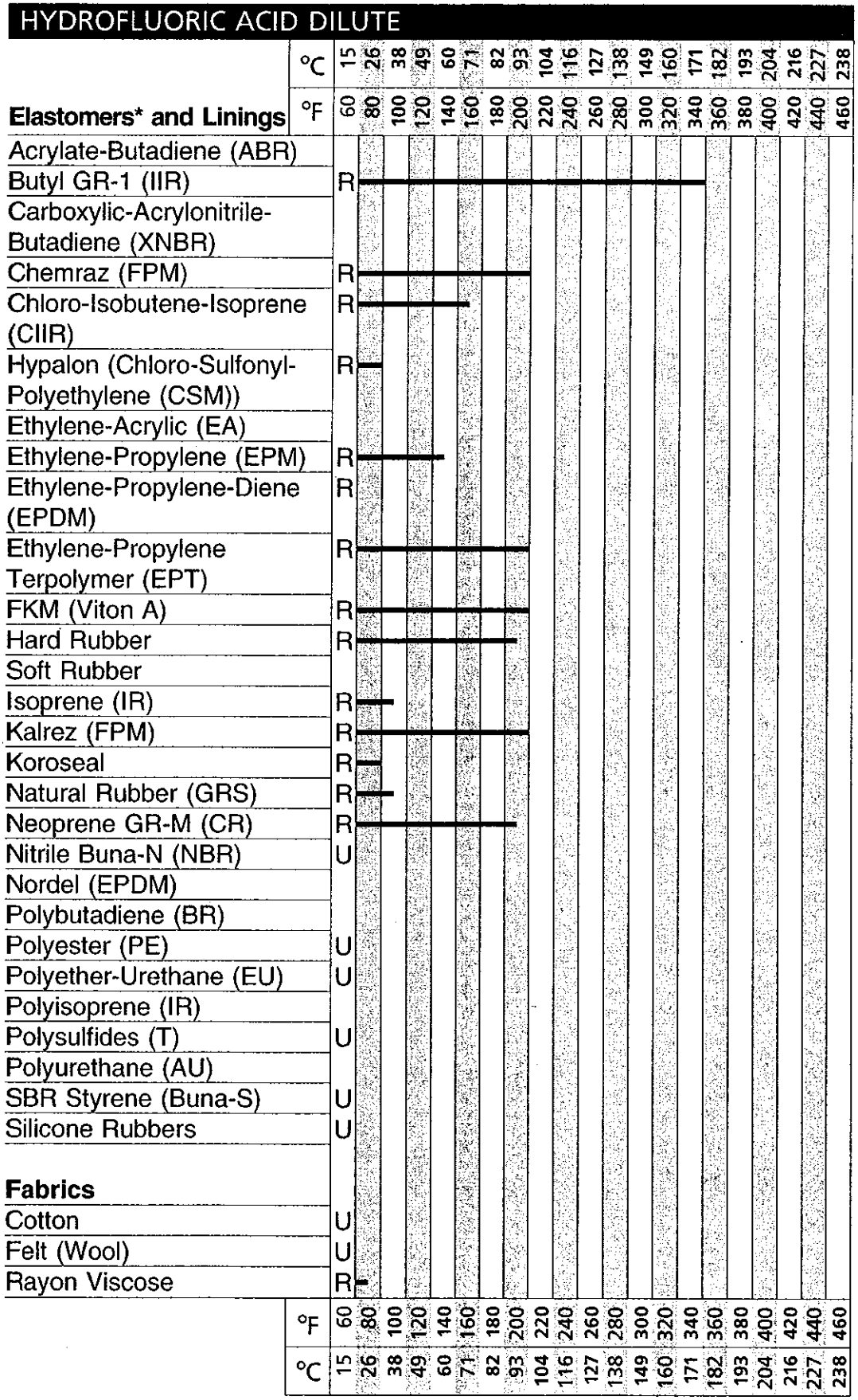
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HYDROFLUORIC ACID DILUTE

Plastics			°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
			°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS				U																				
Acetal				U																				
Acrylics				R																				
Asbestos Reinforced Epoxy				R																				
Asbestos Reinforced Phenolic				R																				
Chlorinated Polyether (Penton)				R																				
CPVC				R	U																			
E-CTFE (Halar)				R																				
Epoxy		10%		U																				
ETFE (Tefzel)				R																				
FEP		14		R																				
Furan (Furfural Alcohol)				R																				
Noryl				R																				
Nylon 6				U																				
Nylon 11				U																				
Nylon 66				U																				
Phenolic				U																				
PFA (Teflon)		14		R																				
KEL-F (CTFE)				R																				
Polyesters																								
Bisphenol A–fumarate	20%	10		R																				
Halogenated	20%	10		R																				
Hydrogenated Bisphenol A –Bisphenol A		10		R																				
Isophthalic	10%	10		R																				
Terephthalate (PET)				U																				
Polyetherimide (ULTEM)				R																				
Polyetheretherketone (PEEK)				U																				
Polyethersulfone (PES)																								
Polyethylene HMW				R																				
Polyethylene UHMW				R																				
Polymethylpentene				R																				
Polypropylene (PP)				R																				
Polystyrene				R																				
Polysulfone				R																				
Polyvinylidene Chloride				R																				
PVC Type 1				R				U																
PVC Type 2				R																				
PVDF (Kynar)				R																				
Ryton				R																				
TFE (Teflon)		14		R																				
Vinyl Ester	20%	10		R																				
			°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
			°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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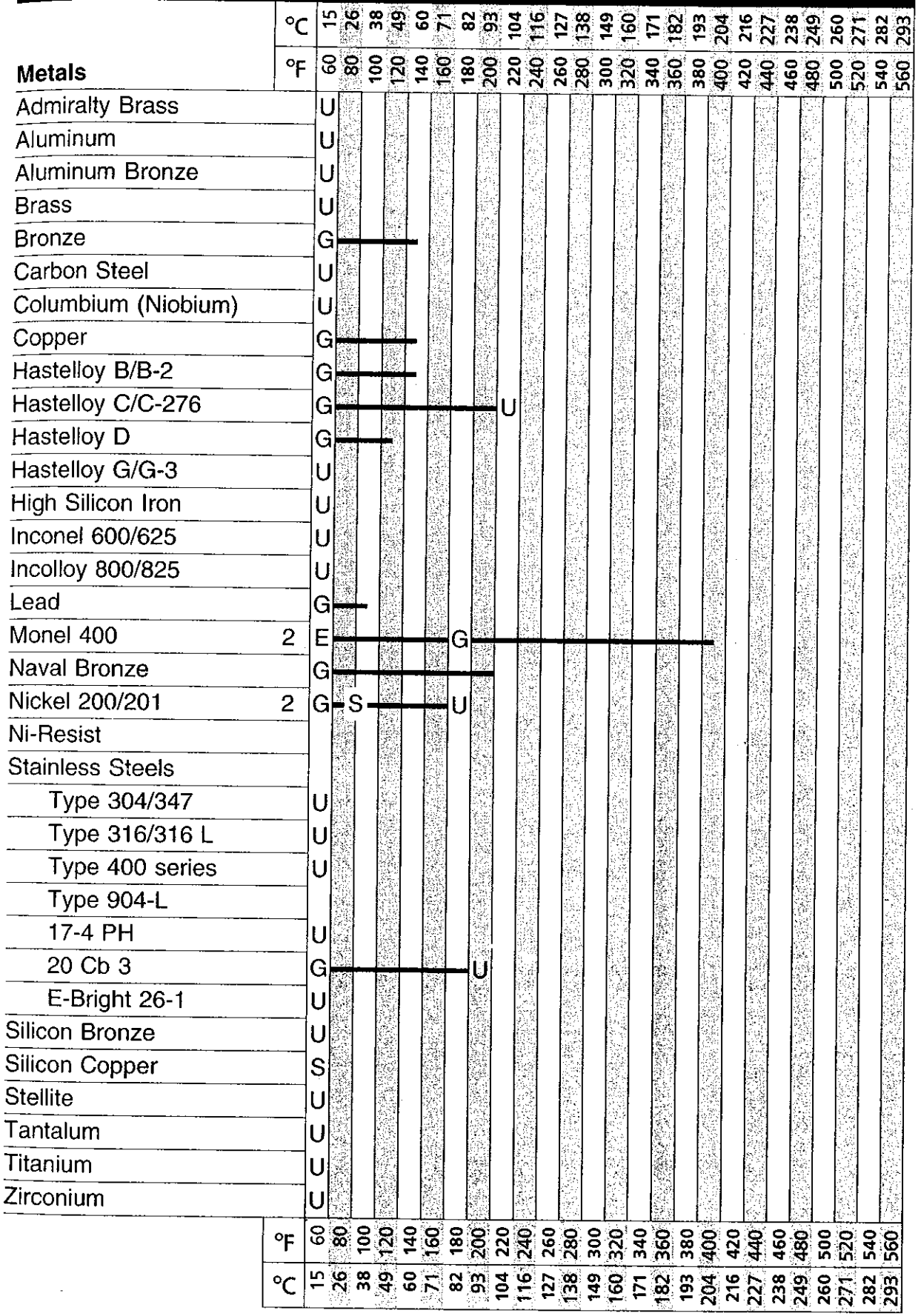
HYDROFLUORIC ACID DILUTE



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HYDROFLUORIC ACID 30%



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

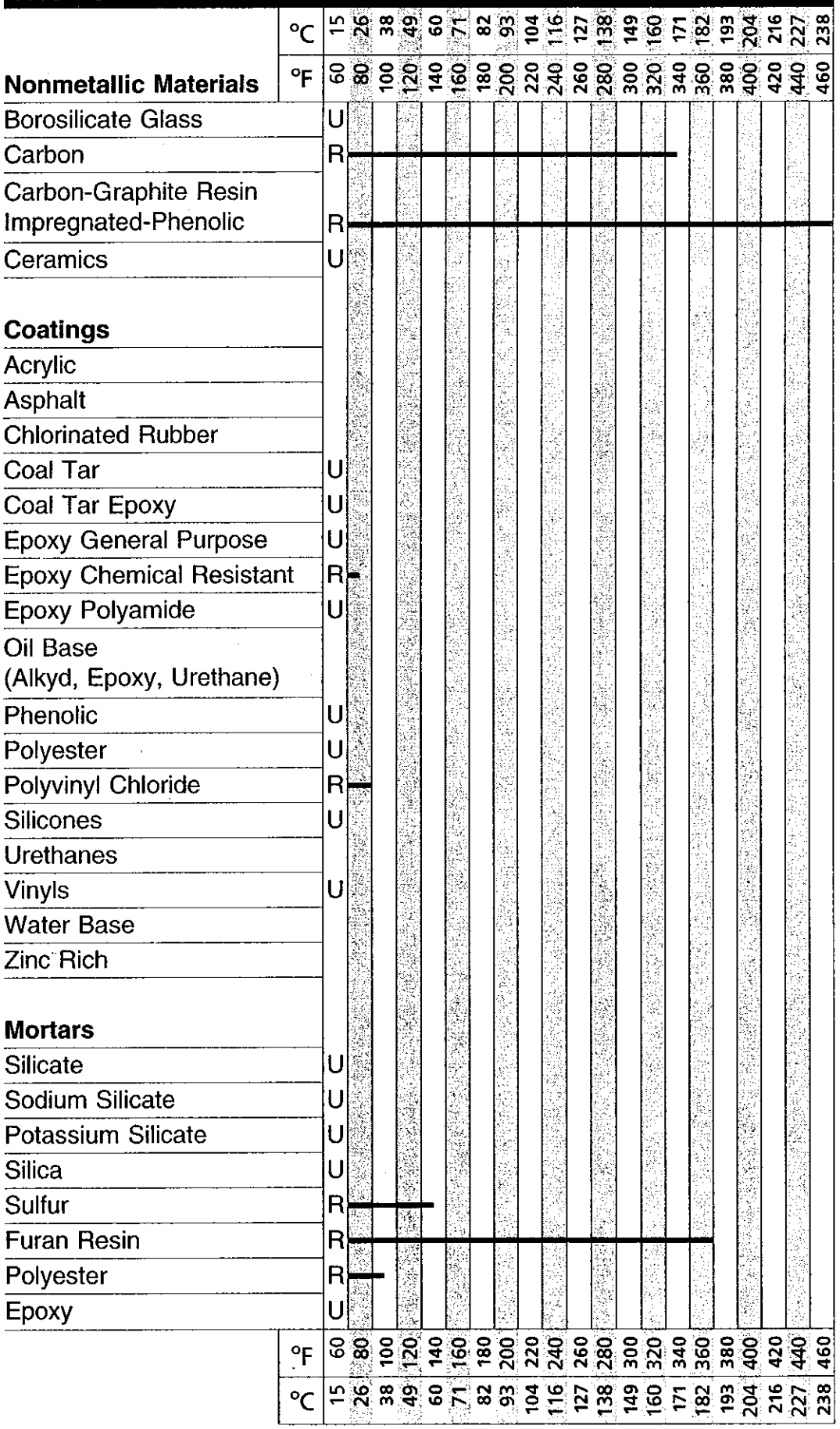
R = Resistant

U = Unsatisfactory

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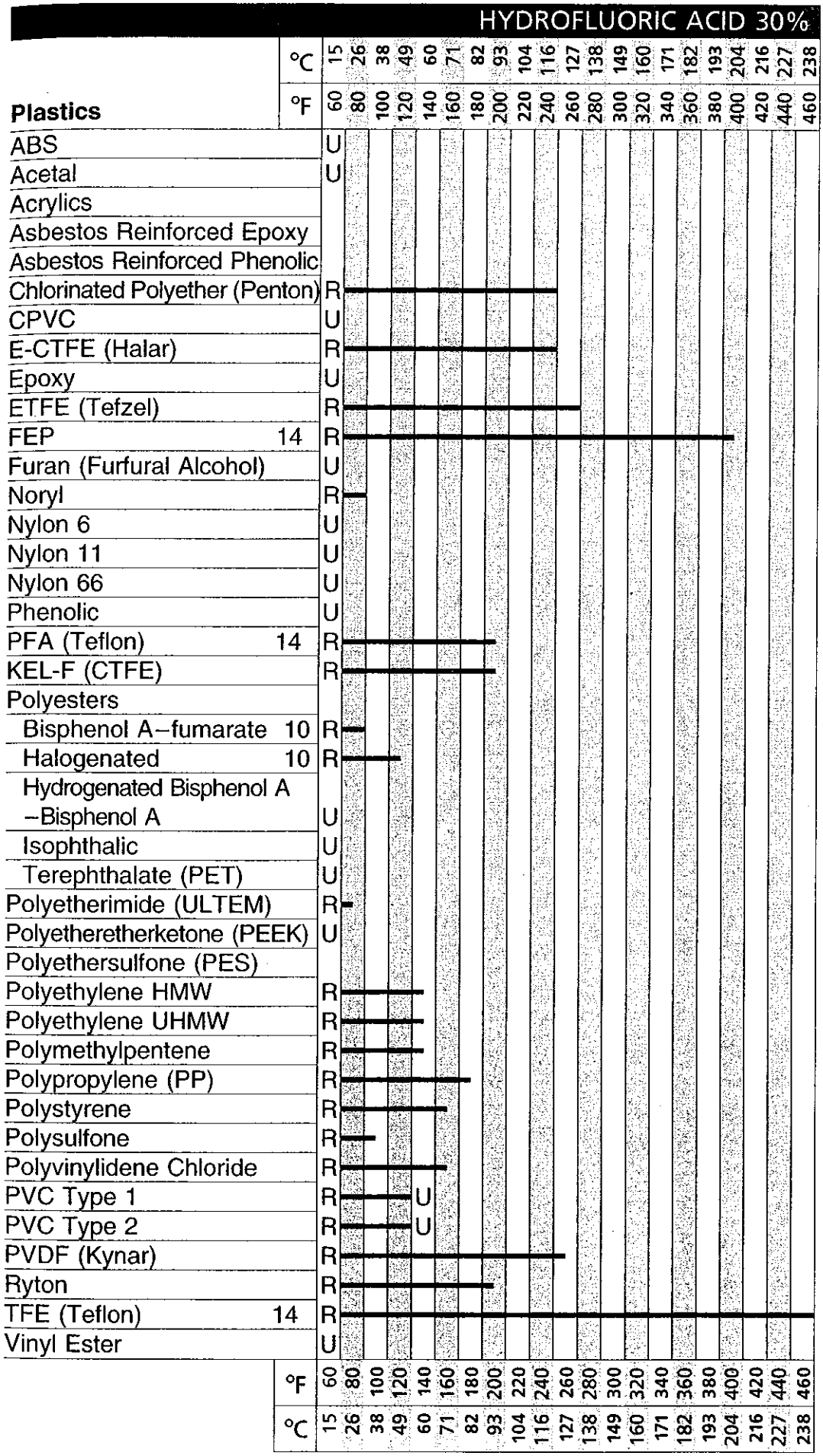
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HYDROFLUORIC ACID 30%



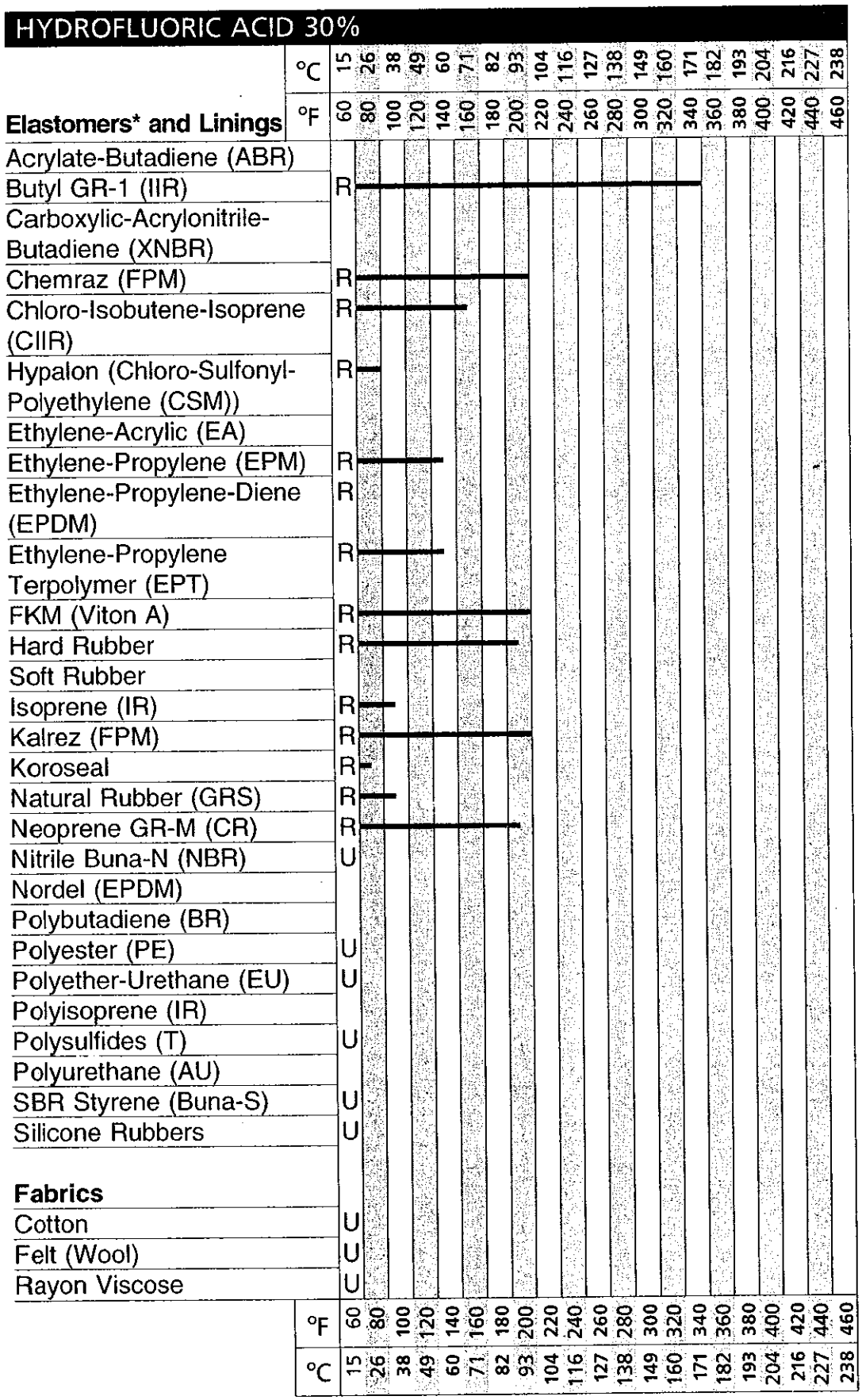
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HYDROFLUORIC ACID 30%



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HYDROFLUORIC ACID 30%



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HYDROFLUORIC ACID 40%

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass			U																									
Aluminum			U																									
Aluminum Bronze			U																									
Brass			U																									
Bronze			G																									
Carbon Steel			U																									
Columbium (Niobium)			U																									
Copper			G																									
Hastelloy B/B-2			E																									
Hastelloy C/C-276			G								U																	
Hastelloy D			E		G																							
Hastelloy G/G-3																												
High Silicon Iron			U																									
Inconel 600/625			U																									
Incolloy 800/825			U																									
Lead																												
Monel 400	2		E					G																				
Naval Bronze			G																									
Nickel 200/201	2		G		S			U																				
Ni-Resist																												
Stainless Steels																												
Type 304/347			U																									
Type 316/316 L			U																									
Type 400 series			U																									
Type 904-L																												
17-4 PH			U																									
20 Cb 3			U																									
E-Bright 26-1																												
Silicon Bronze			U																									
Silicon Copper			U																									
Stellite			U																									
Tantalum			U																									
Titanium			U																									
Zirconium			U																									
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

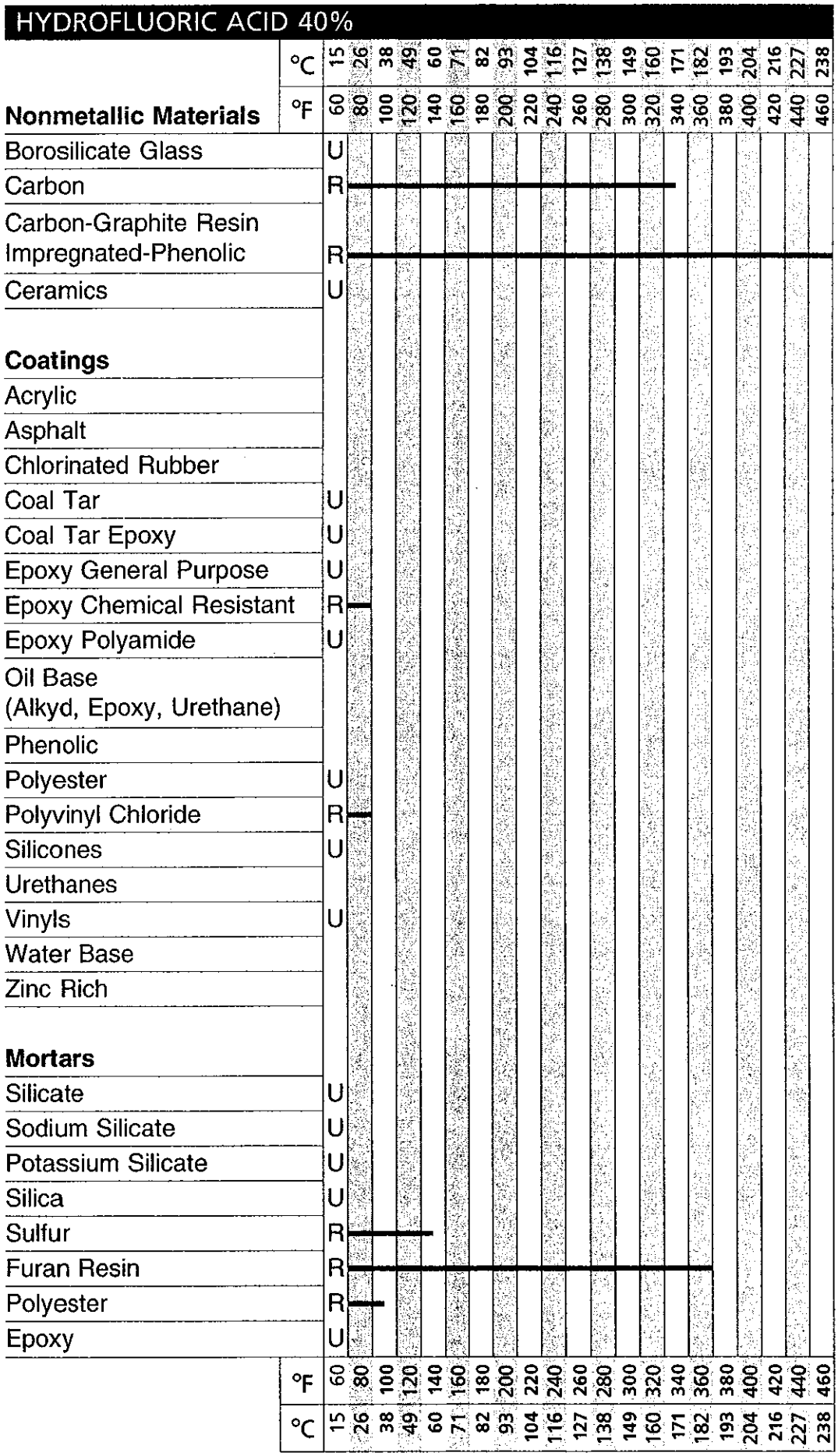
R = Resistant

U = Unsatisfactory

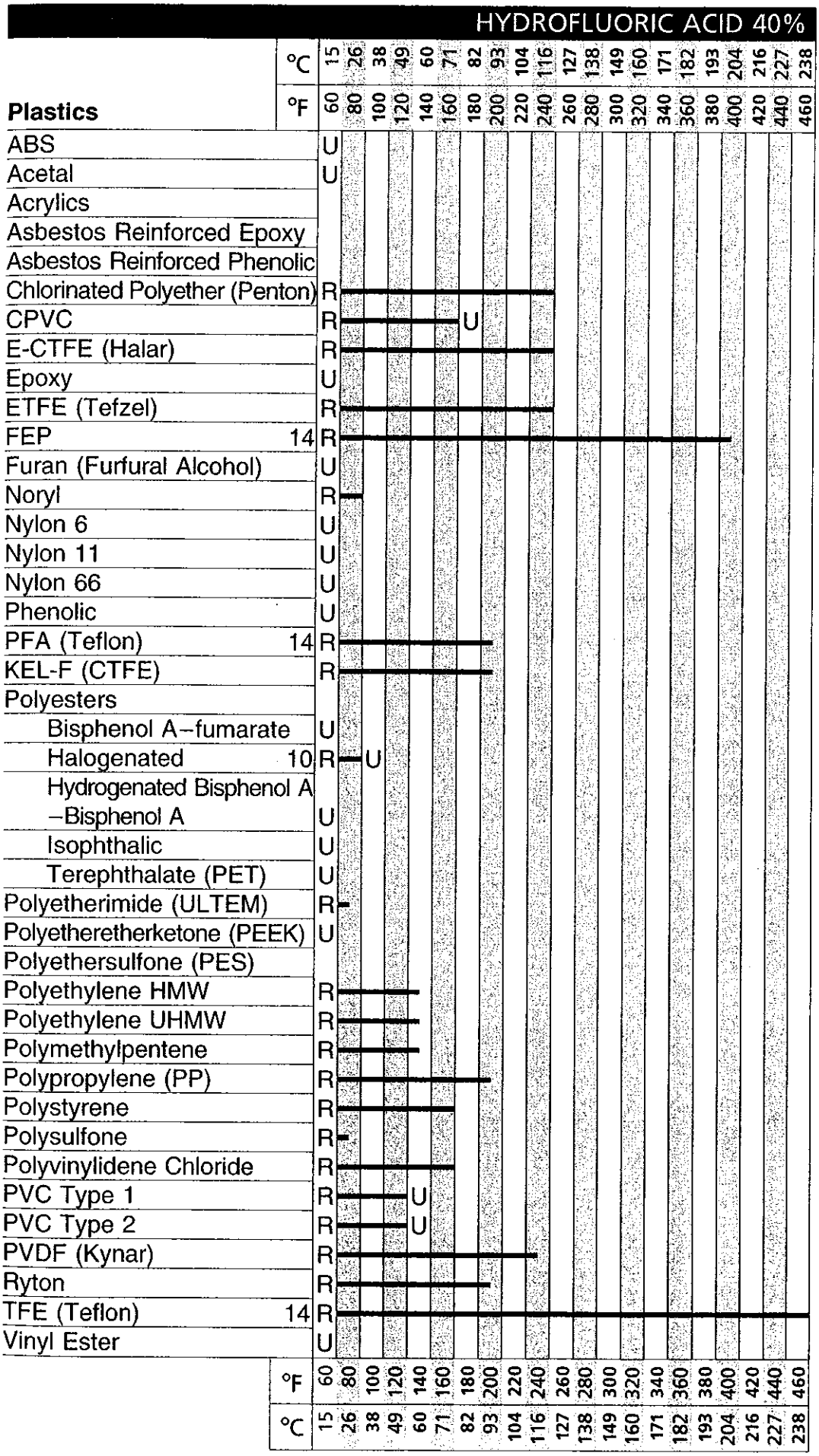
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HYDROFLUORIC ACID 40%

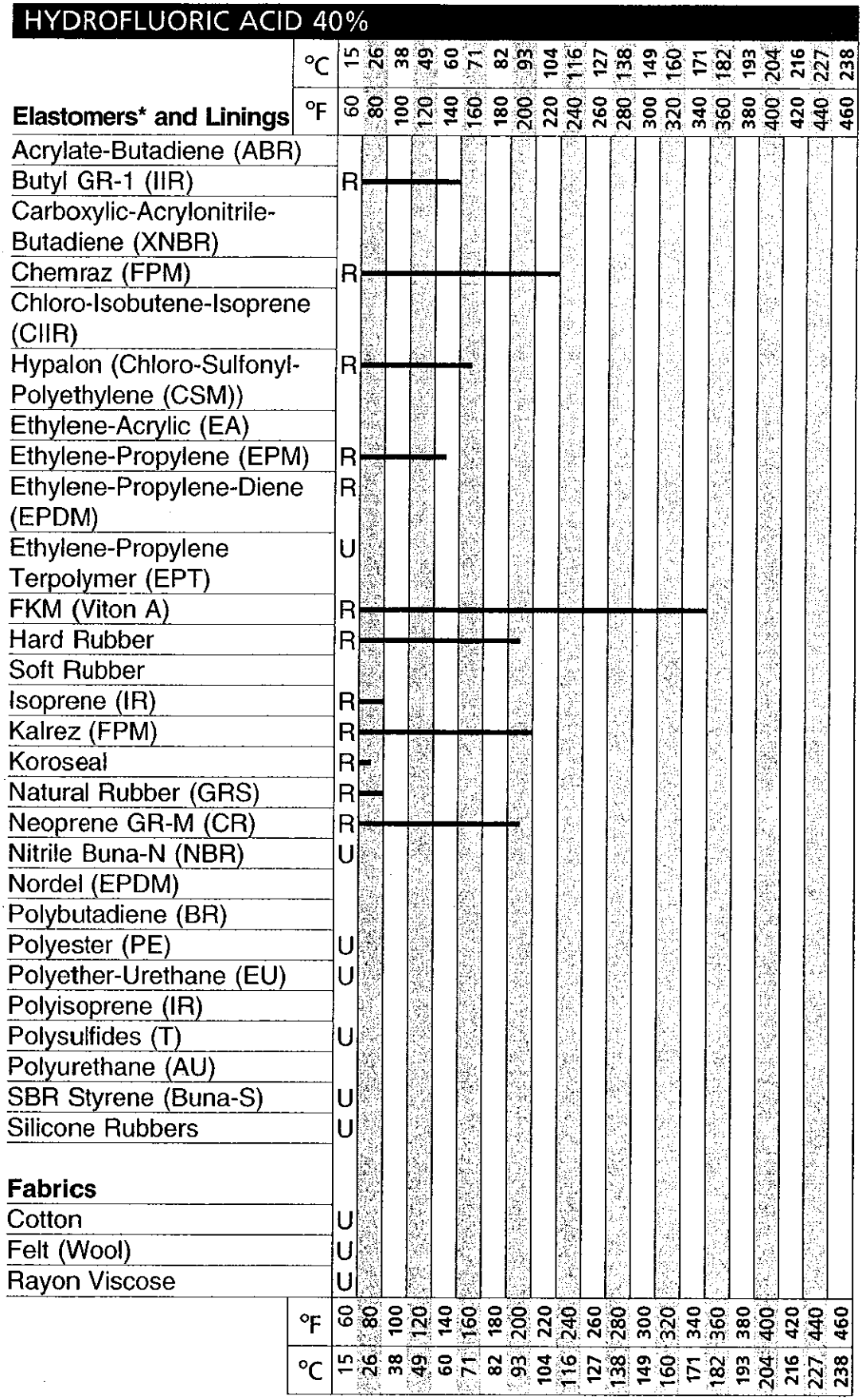


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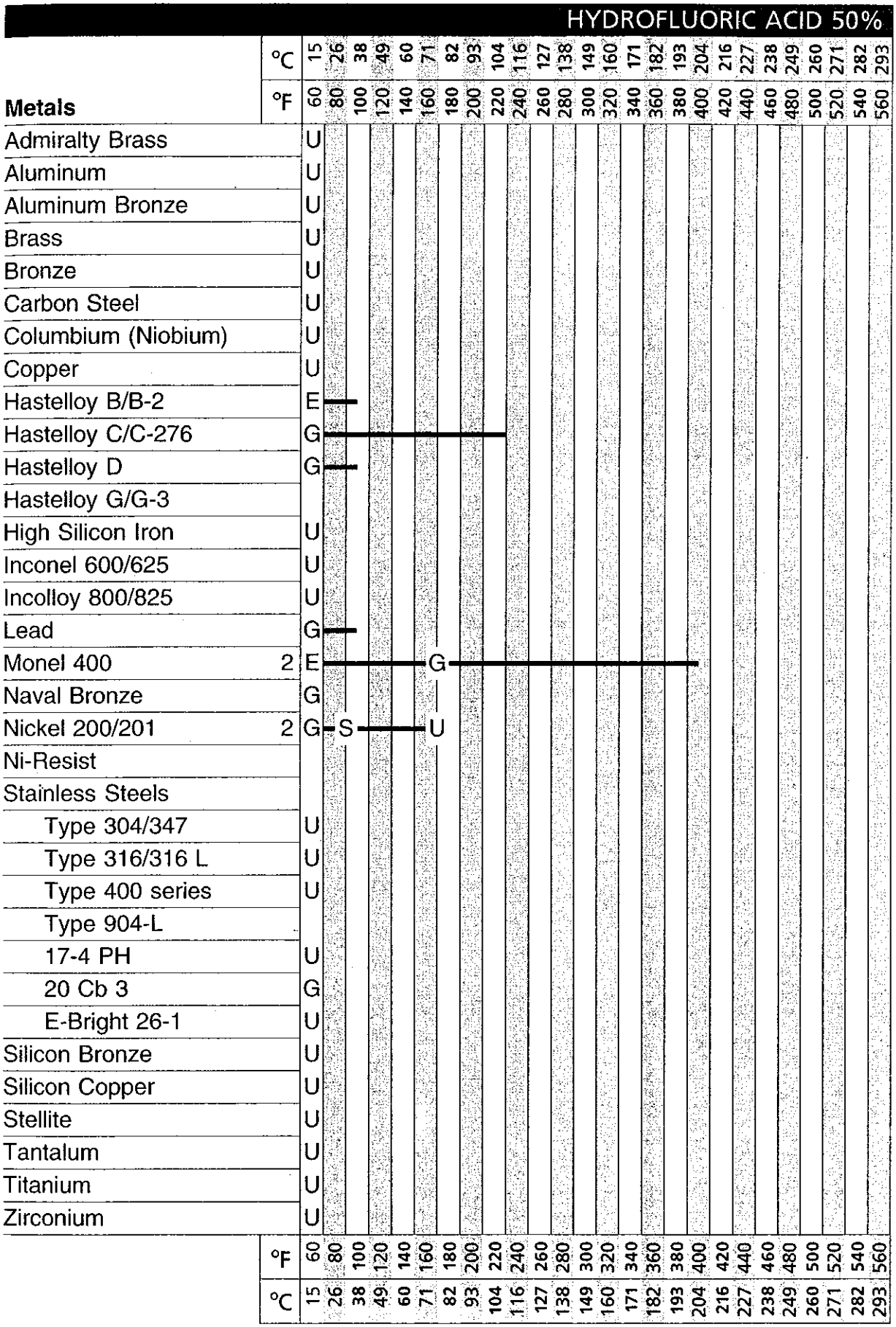
HYDROFLUORIC ACID 40%



*See also Nylon 11 under PLASTICS

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HYDROFLUORIC ACID 50%



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

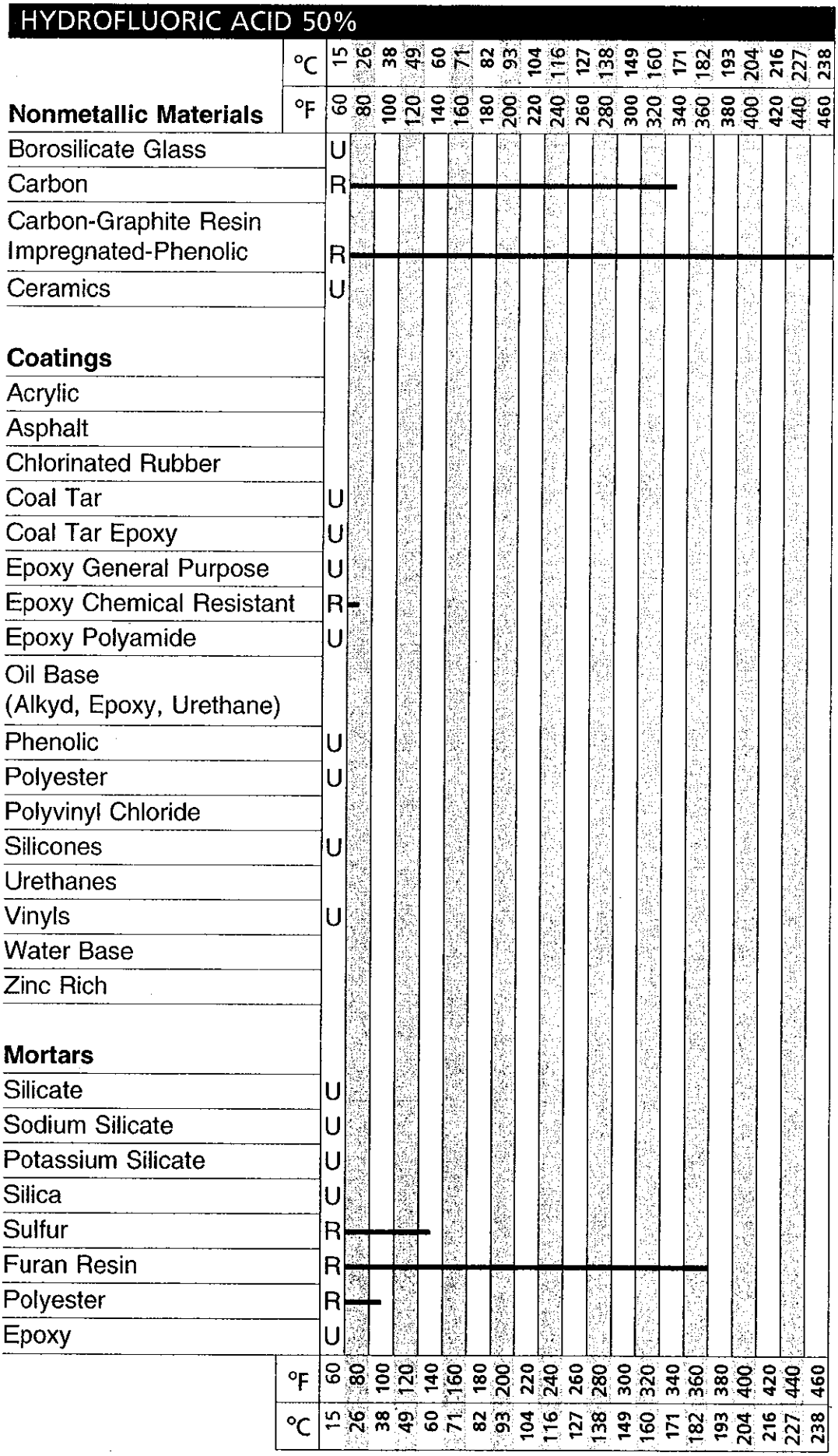
R = Resistant

U = Unsatisfactory

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HYDROFLUORIC ACID 50%



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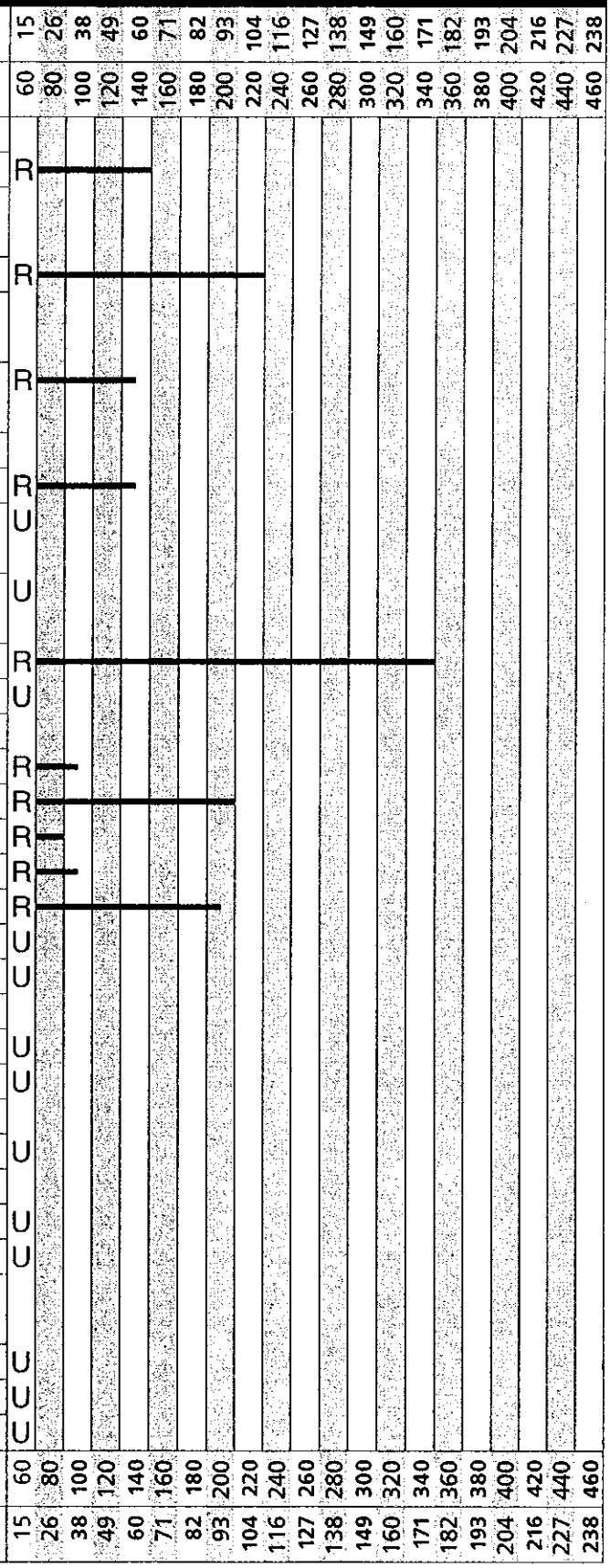
HYDROFLUORIC ACID 50%

Plastics		°C	°F
ABS	U	15	60
Acetal	U	26	80
Acrylics		38	100
Asbestos Reinforced Epoxy		49	120
Asbestos Reinforced Phenolic		60	140
Chlorinated Polyether (Penton)	R	71	160
CPVC	U	82	180
E-CTFE (Halar)	R	93	200
Epoxy	U	104	220
ETFE (Tefzel)	R	116	240
FEP 14	R	127	260
Furan (Furfural Alcohol)	U	138	280
Noryl	R	149	300
Nylon 6	U	160	320
Nylon 11	U	171	340
Nylon 66	U	182	360
Phenolic	U	193	380
PFA (Teflon) 14	R	204	400
KEL-F (CTFE)	R	216	420
Polyesters		227	440
Bisphenol A–fumarate		238	460
Halogenated 10	R		
Hydrogenated Bisphenol A –Bisphenol A	U		
Isophthalic	U		
Terephthalate (PET)	U		
Polyetherimide (ULTEM)	R		
Polyetheretherketone (PEEK)	U		
Polyethersulfone (PES)			
Polyethylene HMW	R		
Polyethylene UHMW	R		
Polymethylpentene	R		
Polypropylene (PP)	R		
Polystyrene			
Polysulfone (PSF)	R		
Polyvinylidene Chloride	R		
PVC Type 1	R U		
PVC Type 2	R U		
PVDF (Kynar)	R		
Ryton	R		
TFE (Teflon) 14	R		
Vinyl Ester	U		

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HYDROFLUORIC ACID 50%

Elastomers* and Linings	
Acrylate-Butadiene (ABR)	
Butyl GR-1 (IIR)	R
Carboxylic-Acrylonitrile-Butadiene (XNBR)	
Chemraz (FPM)	R
Chloro-Isobutene-Isoprene (CIIR)	
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	R
Ethylene-Acrylic (EA)	
Ethylene-Propylene (EPM)	R
Ethylene-Propylene-Diene (EPDM)	U
Ethylene-Propylene Terpolymer (EPT)	U
FKM (Viton A)	R
Hard Rubber	U
Soft Rubber	
Isoprene (IR)	R
Kalrez (FPM)	R
Koroseal	R
Natural Rubber (GRS)	R
Neoprene GR-M (CR)	R
Nitrile Buna-N (NBR)	U
Nordel (EPDM)	U
Polybutadiene (BR)	
Polyester (PE)	U
Polyether-Urethane (EU)	U
Polyisoprene (IR)	
Polysulfides (T)	U
Polyurethane (AU)	
SBR Styrene (Buna-S)	U
Silicone Rubbers	U
Fabrics	
Cotton	U
Felt (Wool)	U
Rayon Viscose	U



*See also Nylon 11 under PLASTICS

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HYDROFLUORIC ACID 70%

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass			U																									
Aluminum			U																									
Aluminum Bronze			U																									
Brass			U																									
Bronze			U																									
Carbon Steel			U																									
Columbium (Niobium)			U																									
Copper			U																									
Hastelloy B/B-2			G																									
Hastelloy C/C-276			G																									
Hastelloy D																												
Hastelloy G/G-3			U																									
High Silicon Iron			U																									
Inconel 600/625			U																									
Incolloy 800/825			U																									
Lead			U																									
Monel 400	2		E	G																								
Naval Bronze			U																									
Nickel 200/201	2		G																									
Ni-Resist																												
Stainless Steels																												
Type 304/347			U																									
Type 316/316 L			U																									
Type 400 series			U																									
Type 904-L																												
17-4 PH																												
20 Cb 3			U																									
E-Bright 26-1			U																									
Silicon Bronze			U																									
Silicon Copper			U																									
Stellite																												
Tantalum			U																									
Titanium			U																									
Zirconium			U																									
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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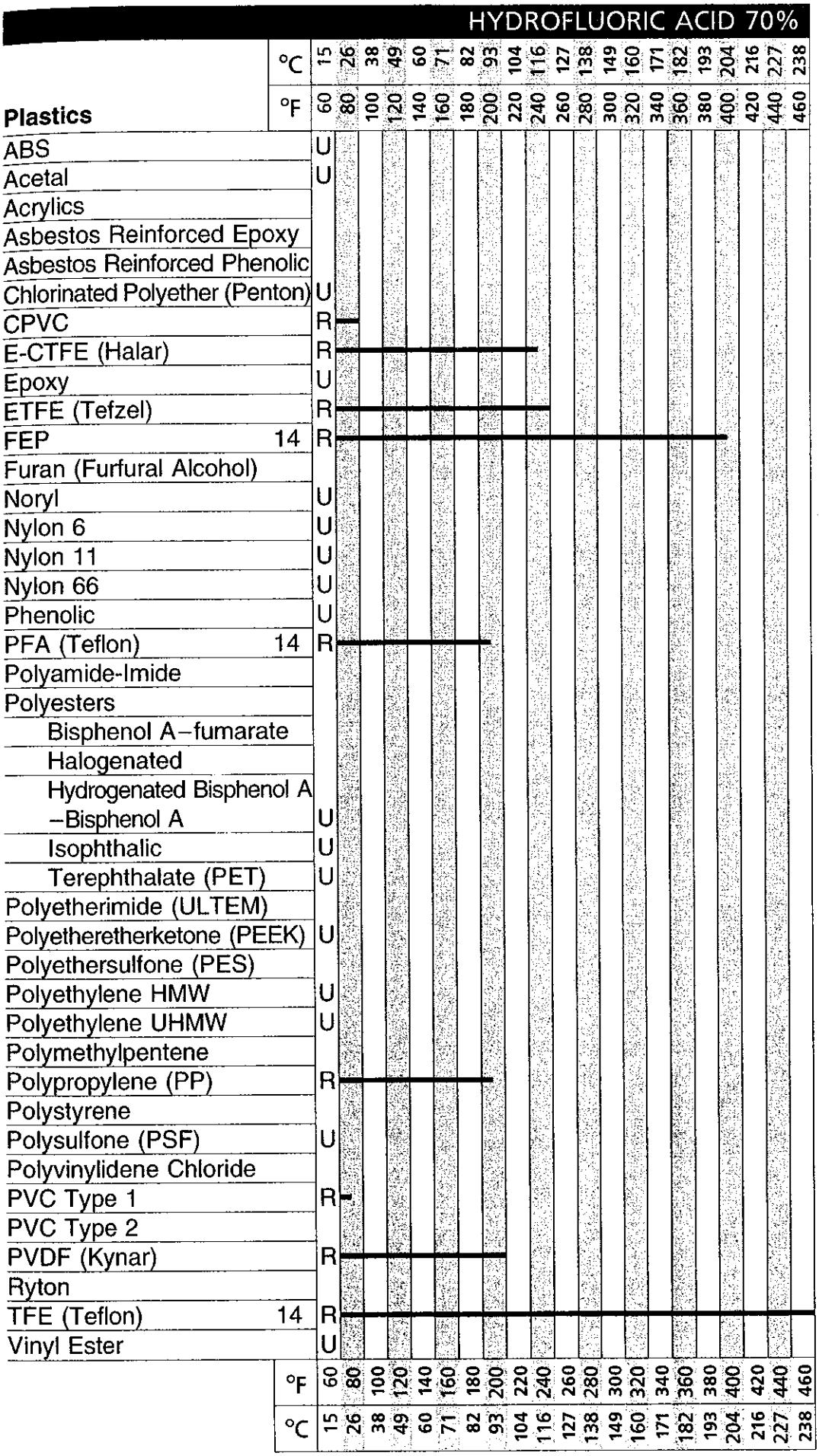
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HYDROFLUORIC ACID 70%

Nonmetallic Materials	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass	U																				
Carbon	U																				
Carbon-Graphite Resin Impregnated	U																				
Ceramics	U																				
Coatings																					
Acrylic																					
Asphalt																					
Chlorinated Rubber																					
Coal Tar	U																				
Coal Tar Epoxy	U																				
Epoxy General Purpose	U																				
Epoxy Chemical Resistant	R																				
Epoxy Polyamide	U																				
Oil Base (Alkyd, Epoxy, Urethane)																					
Phenolic	U																				
Polyester	U																				
Polyvinyl Chloride																					
Silicones	U																				
Urethanes																					
Vinyls	U																				
Water Base																					
Zinc Rich																					
Mortars																					
Silicate	U																				
Sodium Silicate	U																				
Potassium Silicate	U																				
Silica	U																				
Sulfur	U																				
Furan Resin	U																				
Polyester																					
Epoxy	U																				
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDROFLUORIC ACID 70%



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HYDROFLUORIC ACID 70%

Elastomers* and Linings	°C 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 / °F 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460
Acrylate-Butadiene (ABR)	
Butyl GR-1 (IIR)	R
Carboxylic-Acrylonitrile-Butadiene (XNBR)	
Chemraz (FPM)	R
Chloro-Isobutene-Isoprene (CIIR)	U
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	R
Ethylene-Acrylic (EA)	
Ethylene-Propylene (EPM)	
Ethylene-Propylene-Diene (EPDM)	U
Ethylene-Propylene Terpolymer (EPT)	U
FKM (Viton A)	R
Hard Rubber	U
Soft Rubber	U
Isoprene (IR)	U
Kalrez (FPM)	R
Koroseal	R
Natural Rubber (GRS)	U
Neoprene GR-M (CR)	R
Nitrile Buna-N (NBR)	U
Nordel (EPDM)	U
Polybutadiene (BR)	
Polyester (PE)	U
Polyether-Urethane (EU)	U
Polyisoprene (IR)	
Polysulfides (T)	U
Polyurethane (AU)	
SBR Styrene (Buna-S)	U
Silicone Rubbers	U
Fabrics	
Cotton	U
Felt (Wool)	U
Rayon Viscose	U

*See also Nylon 11 under PLASTICS

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HYDROFLUORIC ACID 100%

Metals		°C 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293
		°F 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560
Admiralty Brass		U
Aluminum		U
Aluminum Bronze		U
Brass		U
Bronze		G
Carbon Steel		G S U
Columbium (Niobium)		U
Copper		U
Hastelloy B/B-2		G
Hastelloy C/C-276		G
Hastelloy D		G
Hastelloy G/G-3		U
High Silicon Iron		U
Inconel 600/625		G
Incolloy 800/825		U
Lead		U
Monel 400	2	E G
Naval Bronze		U
Nickel 200/201	2	G
Ni-Resist		
Stainless Steels		
Type 304/347		U
Type 316/316 L		G
Type 400 series		U
Type 904-L		
17-4 PH		
20 Cb 3		G
E-Bright 26-1		U
Silicon Bronze		U
Silicon Copper		U
Stellite		
Tantalum		U
Titanium		U
Zirconium		U
		°F 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560
		°C 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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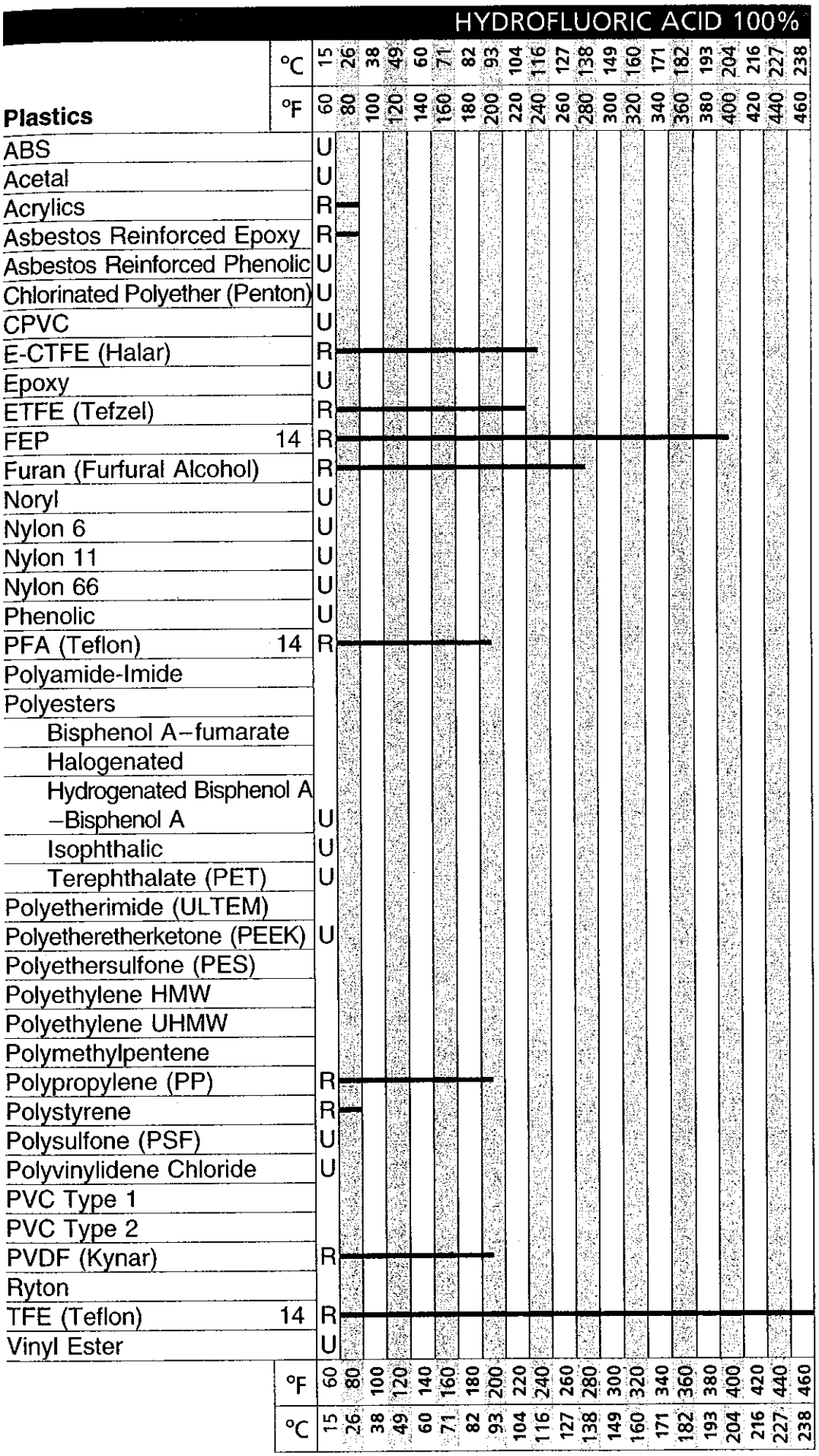
HYDROFLUORIC ACID 100%

Nonmetallic Materials	
Borosilicate Glass	U
Carbon	U
Carbon-Graphite Resin Impregnated	U
Ceramics	U
Coatings	
Acrylic	
Asphalt	
Chlorinated Rubber	
Coal Tar	U
Coal Tar Epoxy	U
Epoxy General Purpose	U
Epoxy Chemical Resistant	R
Epoxy Polyamide	U
Oil Base (Alkyd, Epoxy, Urethane)	
Phenolic	U
Polyester	U
Polyvinyl Chloride	
Silicones	U
Urethanes	
Vinyls	U
Water Base	
Zinc Rich	
Mortars	
Silicate	U
Sodium Silicate	U
Potassium Silicate	U
Silica	U
Sulfur	U
Furan Resin	U
Polyester	
Epoxy	U

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460

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HYDROFLUORIC ACID 100%



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HYDROFLUORIC ACID 100%

Elastomers* and Linings	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																					
Butyl GR-1 (IIR)	U																				
Carboxylic-Acrylonitrile-Butadiene (XNBR)																					
Chemraz (FPM)	R																				
Chloro-Isobutene-Isoprene (CIIR)																					
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	R																				
Ethylene-Acrylic (EA)																					
Ethylene-Propylene (EPM)																					
Ethylene-Propylene-Diene (EPDM)	U																				
Ethylene-Propylene Terpolymer (EPT)	U																				
FKM (Viton A)	R	U																			
Hard Rubber	U																				
Soft Rubber																					
Isoprene (IR)	U																				
Kalrez (FPM)	R																				
Koroseal	R																				
Natural Rubber (GRS)	U																				
Neoprene GR-M (CR)	U																				
Nitrile Buna-N (NBR)	U																				
Nordel (EPDM)	U																				
Polybutadiene (BR)																					
Polyester (PE)	U																				
Polyether-Urethane (EU)	U																				
Polyisoprene (IR)																					
Polysulfides (T)	U																				
Polyurethane (AU)																					
SBR Styrene (Buna-S)	U																				
Silicone Rubbers	U																				
Fabrics																					
Cotton	U																				
Felt (Wool)	U																				
Rayon Viscose	U																				
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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HYDROFLUORIC ACID VAPORS

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass		U																									
Aluminum		U																									
Aluminum Bronze		G																									
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper		U																									
Hastelloy B/B-2		E																									
Hastelloy C/C-276		E																									
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625		E																									
Incolloy 800/825		U																									
Lead																											
Monel 400		E																									
Naval Bronze		U																									
Nickel 200/201		E																									
Ni-Resist																											
Stainless Steels																											
Type 304/347		U																									
Type 316/316 L		U																									
Type 400 series		U																									
Type 904-L																											
17-4 PH		U																									
20 Cb 3		U																									
E-Bright 26-1		U																									
Silicon Bronze		U																									
Silicon Copper		U																									
Stellite																											
Tantalum		U																									
Titanium																											
Zirconium		U																									
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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HYDROFLUORIC ACID VAPORS

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass		U																				
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy		R	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Epoxy General Purpose																						
Epoxy Chemical Resistant		R	—	—																		
Epoxy Polyamide		R	—	—	—																	
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride																						
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

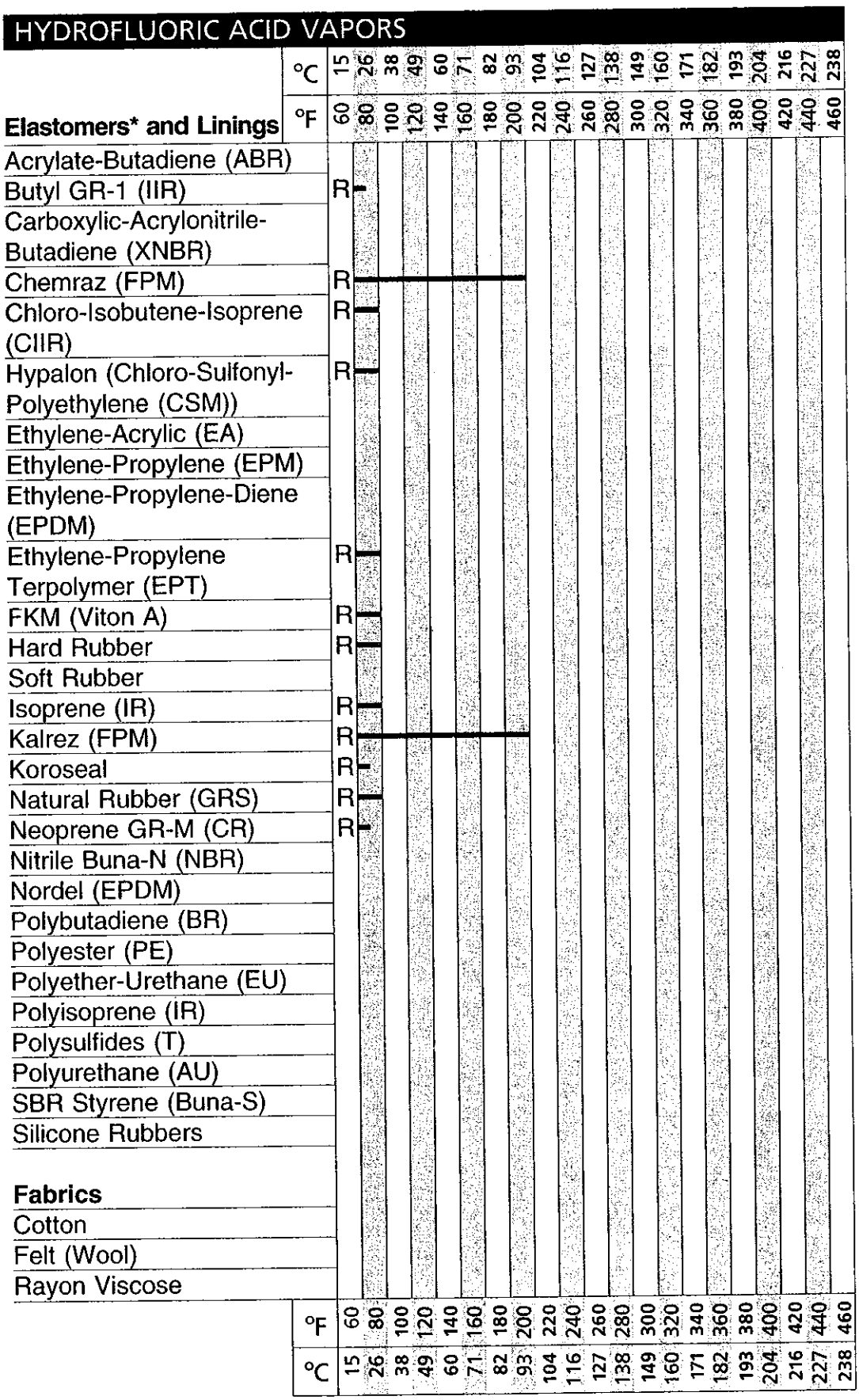
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HYDROFLUORIC ACID VAPORS

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)	R																					
Epoxy																						
ETFE (Tefzel)																						
FEP	R																					
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)																						
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)																						
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)																						
Ryton																						
TFE (Teflon)	R																					
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDROFLUORIC ACID VAPORS



*See also Nylon 11 under PLASTICS

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HYDROFLUOSILICIC ACID 10–50%

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass			G																									
Aluminum			U																									
Aluminum Bronze			G																									
Brass			G																									
Bronze			U																									
Carbon Steel			U																									
Columbium (Niobium)																												
Copper			G																									
Hastelloy B/B-2			G																									
Hastelloy C/C-276	35%		G																									
Hastelloy D			E																									
Hastelloy G/G-3			G																									
High Silicon Iron			U																									
Inconel 600/625			G																									
Incolloy 800/825			G																									
Lead			G																									
Monel 400			G																									
Naval Bronze Air Free			G																									
Nickel 200/201			U																									
Ni-Resist	10–20%		E																									
Stainless Steels																												
Type 304/347			U																									
Type 316/316 L			G				U																					
Type 400 series	10%		G																									
Type 904-L																												
17-4 PH																												
20 Cb 3			G																									
E-Bright 26-1																												
Silicon Bronze			U																									
Silicon Copper			U																									
Stellite																												
Tantalum			U																									
Titanium			U																									
Zirconium			U																									
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

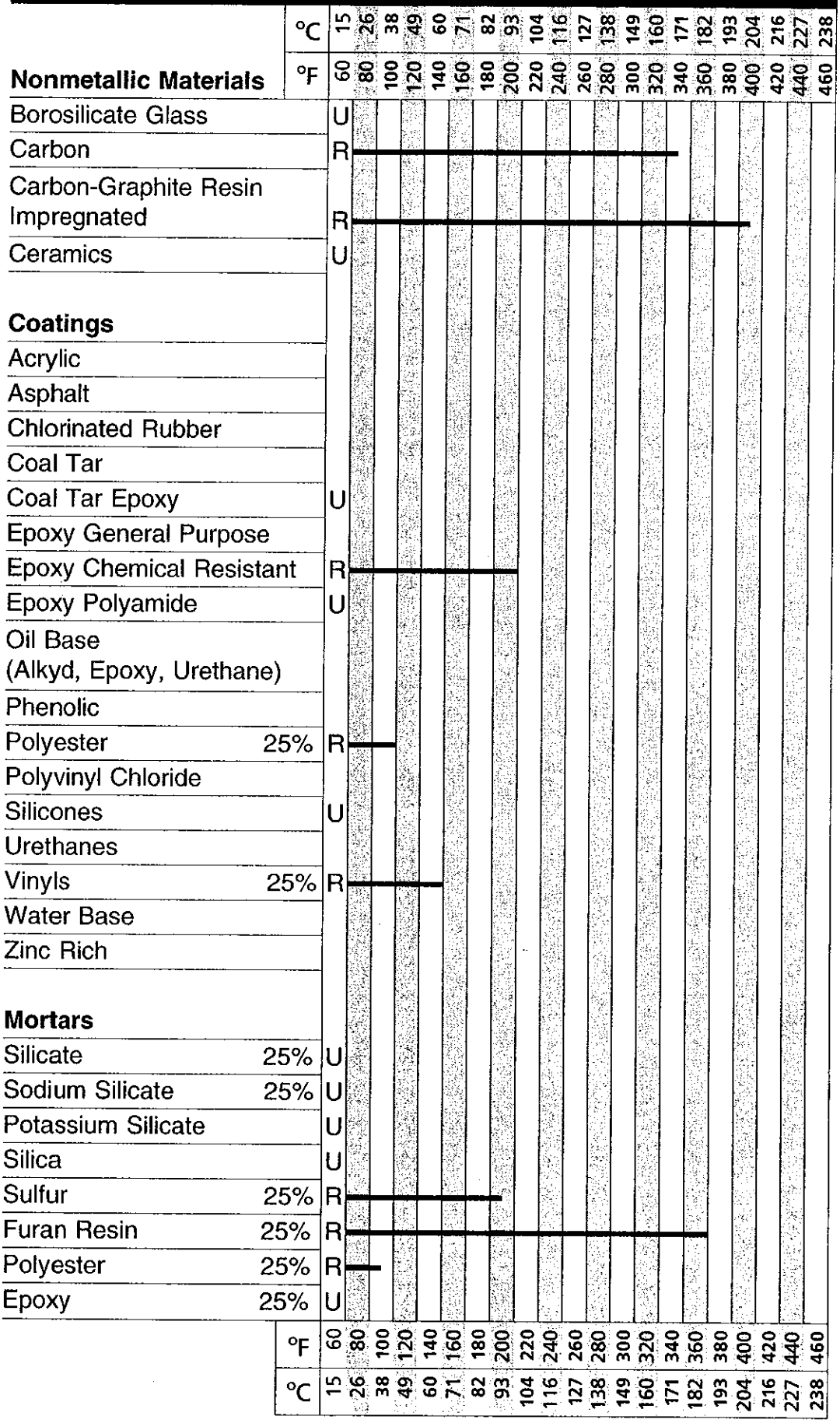
R = Resistant

U = Unsatisfactory

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HYDROFLUOSILICIC ACID 10–50%



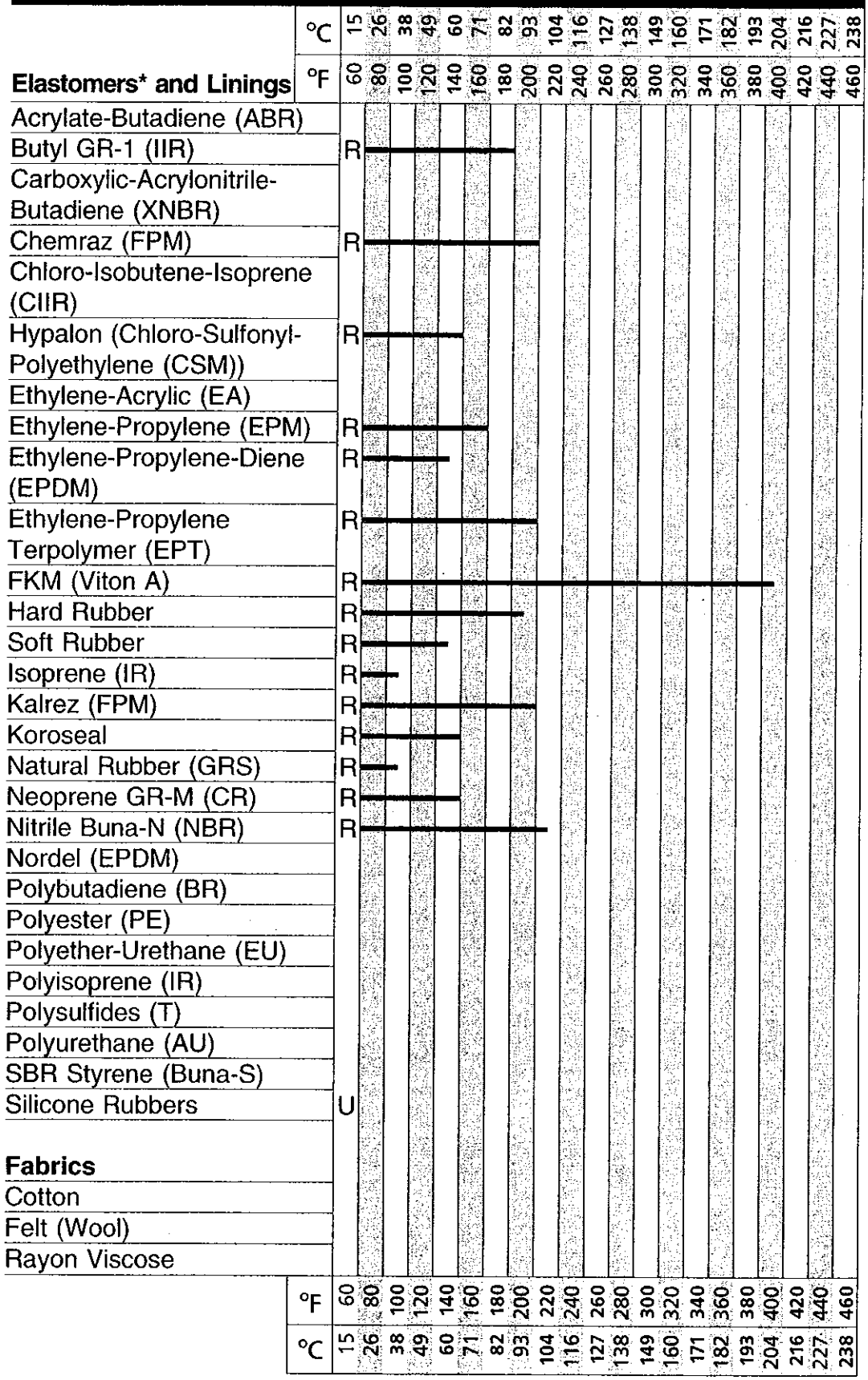
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HYDROFLUOSILICIC ACID 10–50%

Plastics			°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
			°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS	25%			R																				
Acetal																								
Acrylics				R																				
Asbestos Reinforced Epoxy																								
Asbestos Reinforced Phenolic																								
Chlorinated Polyether (Penton)				R																				
CPVC	30%			R																				
E-CTFE (Halar)				R																				
Epoxy	30%			R																				
ETFE (Tefzel)				R																				
FEP				R																				
Furan (Furfural Alcohol)	30%			R																				
Noryl				R																				
Nylon 6				U																				
Nylon 11				U																				
Nylon 66				U																				
Phenolic																								
PFA (Teflon)				R																				
Polyamide-Imide																								
Polyesters																								
Bisphenol A–fumarate	10%	10		R																				
Halogenated	10%	10		R																				
Hydrogenated Bisphenol A –Bisphenol A																								
Isophthalic	30%			U																				
Terephthalate (PET)																								
Polyetherimide (ULTEM)																								
Polyetheretherketone (PEEK)																								
Polyethersulfone (PES)																								
Polyethylene HMW	32%			R																				
Polyethylene UHMW	10%			R																				
Polymethylpentene																								
Polypropylene (PP)				R																				
Polystyrene																								
Polysulfone				R																				
Polyvinylidene Chloride				R																				
PVC Type 1				R																				
PVC Type 2				R																				
PVDF (Kynar)				R																				
Ryton	35%			R																				
TFE (Teflon)				R																				
Vinyl Ester	35%	10		R																				
			°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
			°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

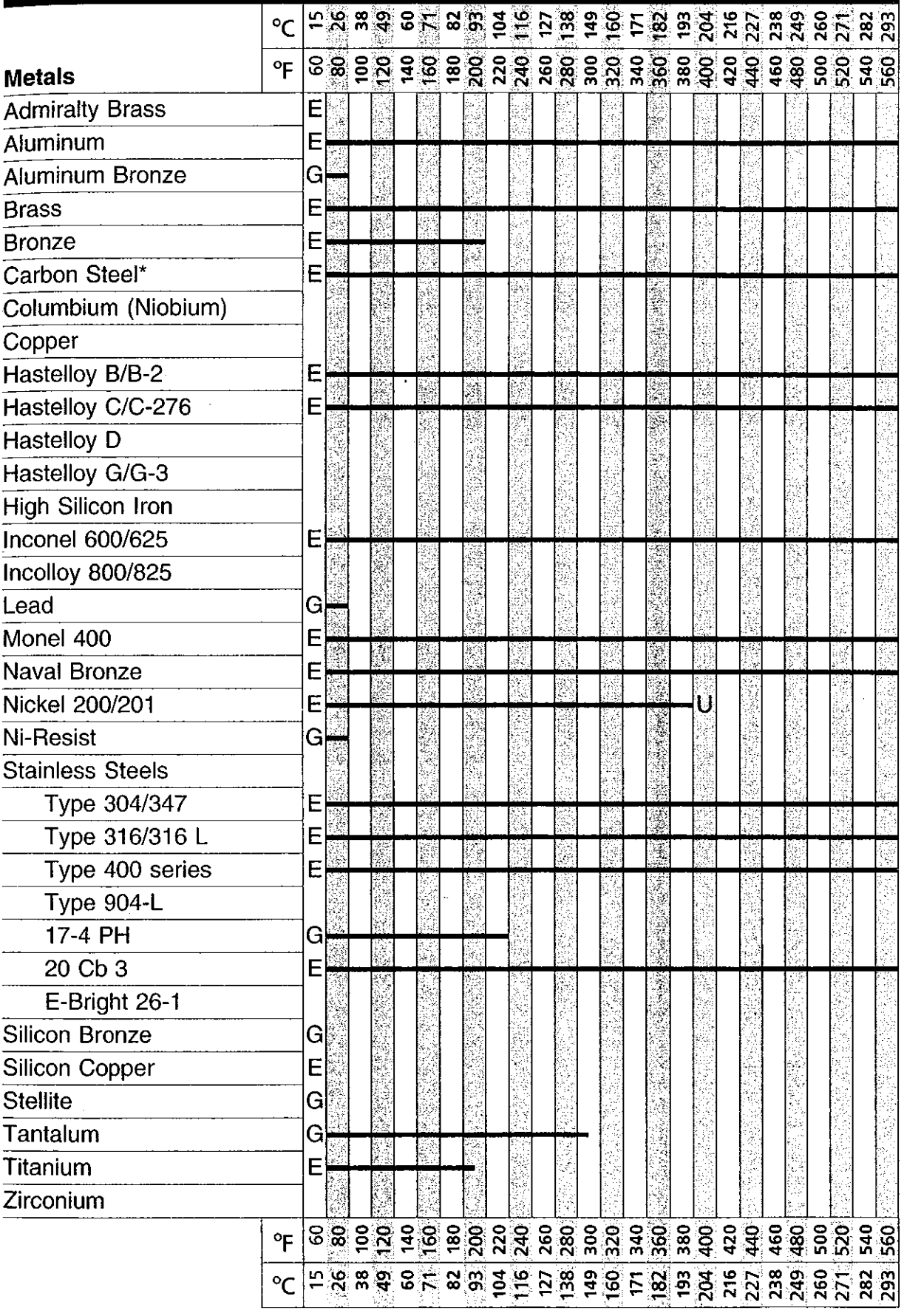
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HYDROFLUOSILICIC ACID 10–50%



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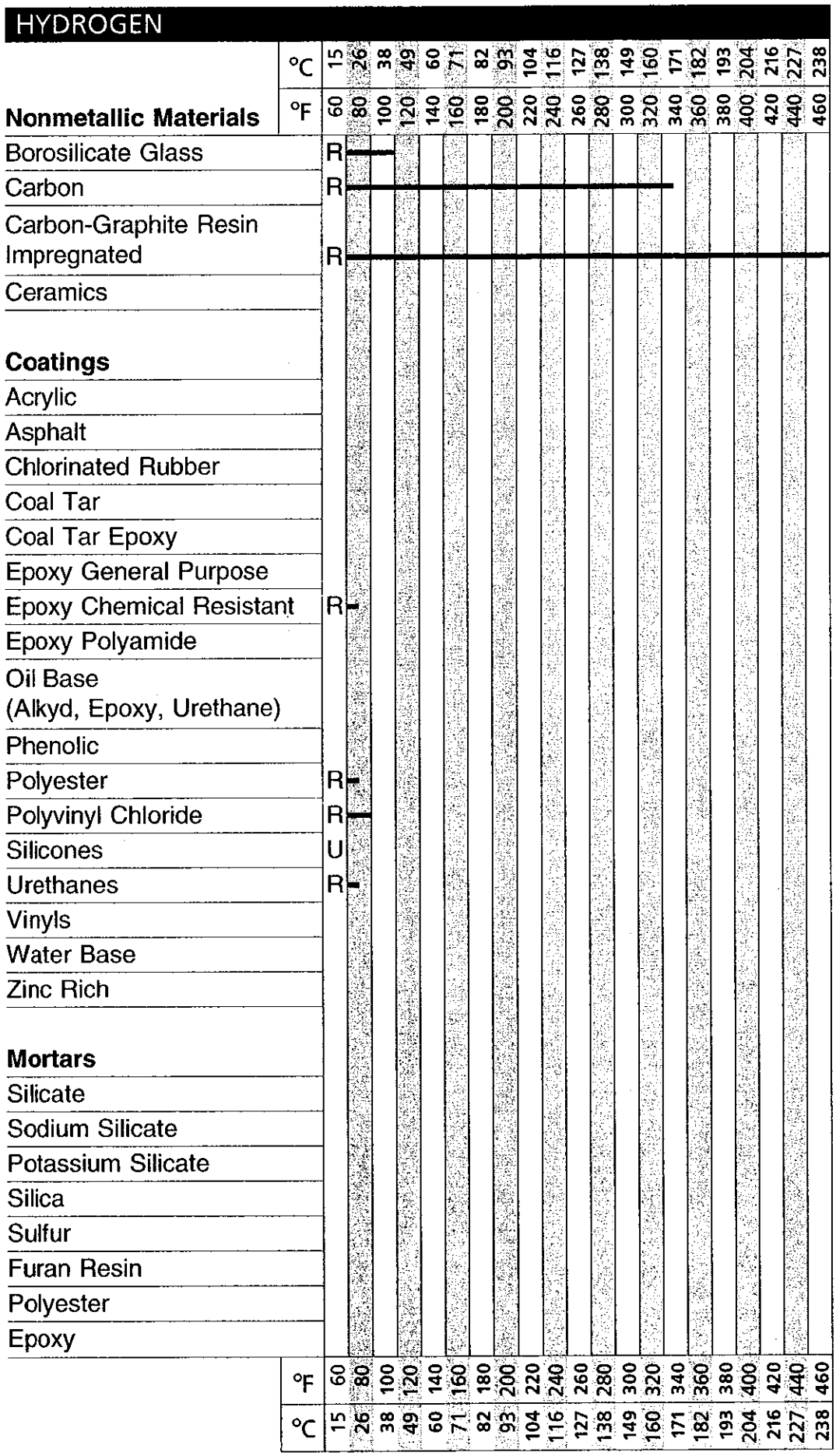


FOR METALS
E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year
S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year
*Depending upon conditions, hydrogen embrittlement may occur

FOR NONMETALLICS
R = Resistant
U = Unsatisfactory

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HYDROGEN



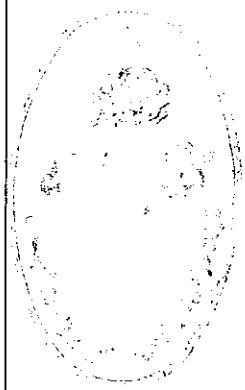
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HYDROGEN

Plastics	°C	°F
ABS	R	
Acetal	U	
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)	R	
CPVC	U	
E-CTFE (Halar)	R	
Epoxy	R	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)		
Noryl	R	
Nylon 6	R	
Nylon 11		
Nylon 66	R	
Phenolic		
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	R	
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	R	
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW	R	
Polyethylene UHMW	R	
Polymethylpentene		
Polypropylene (PP)	R	U
Polystyrene		
Polysulfone	R	
Polyvinylidene Chloride	R	
PVC Type 1	R	
PVC Type 2	R	
PVDF (Kynar)	R	
Ryton		
TFE (Teflon)	R	
Vinyl Ester	R	

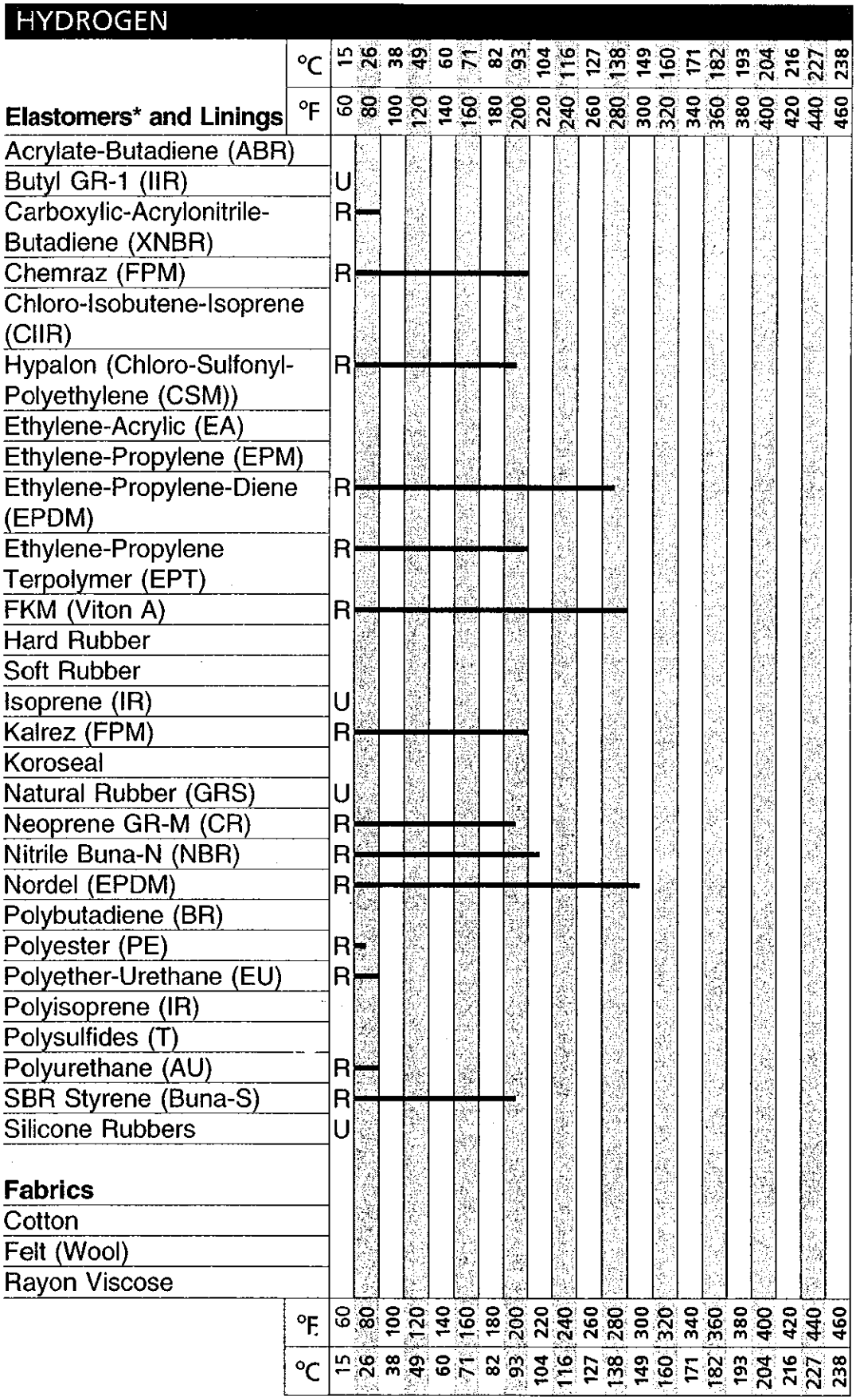
°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460



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HYDROGEN



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HYDROGEN CHLORIDE GAS DRY

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																												
Aluminum			U																									
Aluminum Bronze																												
Brass			G																									
Bronze																												
Carbon Steel			G																									
Columbium (Niobium)																												
Copper			U																									
Hastelloy B/B-2			E																									
Hastelloy C/C-276			E																									
Hastelloy D			U																									
Hastelloy G/G-3																												
High Silicon Iron			G																									
Inconel 600/625			E																									
Incolloy 800/825																												
Lead																												
Monel 400			E																									
Naval Bronze			G																									
Nickel 200/201			E																									
Ni-Resist			S																									
Stainless Steels																												
Type 304/347	2		E																									
Type 316/316 L	2		E																									
Type 400 series			U																									
Type 904-L																												
17-4 PH																												
20 Cb 3			E																									
E-Bright 26-1																												
Silicon Bronze																												
Silicon Copper																												
Stellite																												
Tantalum			G																									
Titanium			E																									
Zirconium			E																									
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

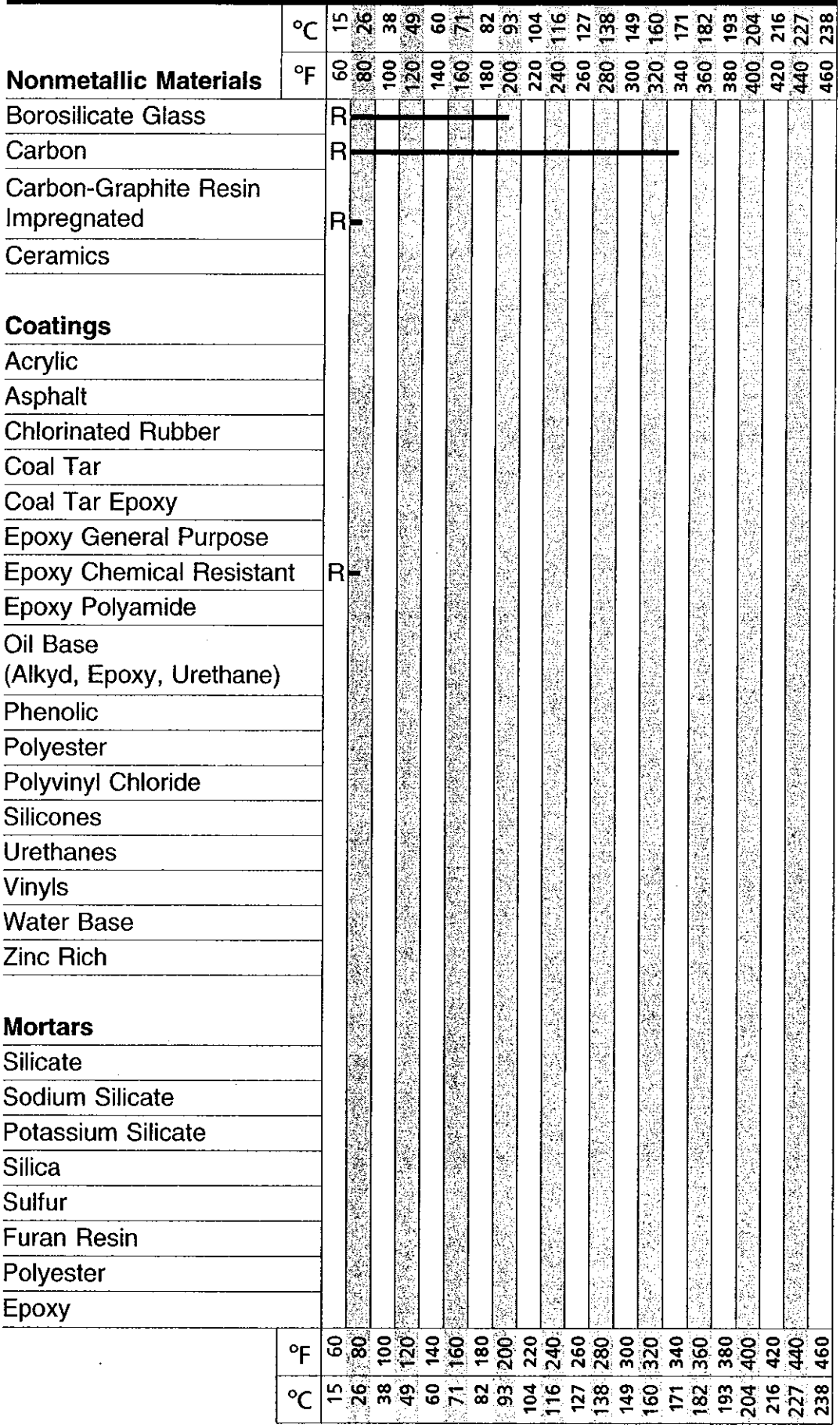
R = Resistant

U = Unsatisfactory

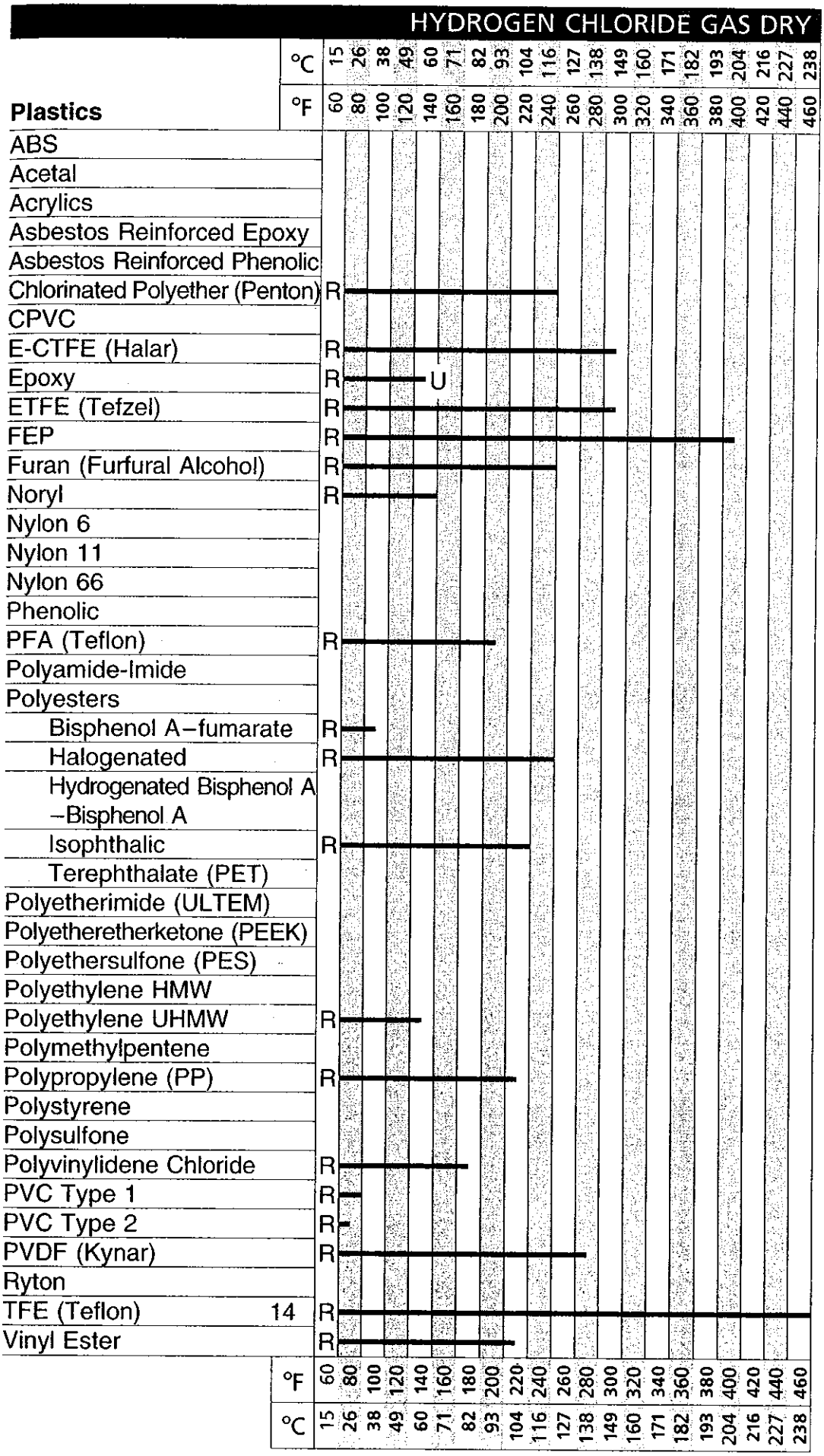
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HYDROGEN CHLORIDE GAS DRY

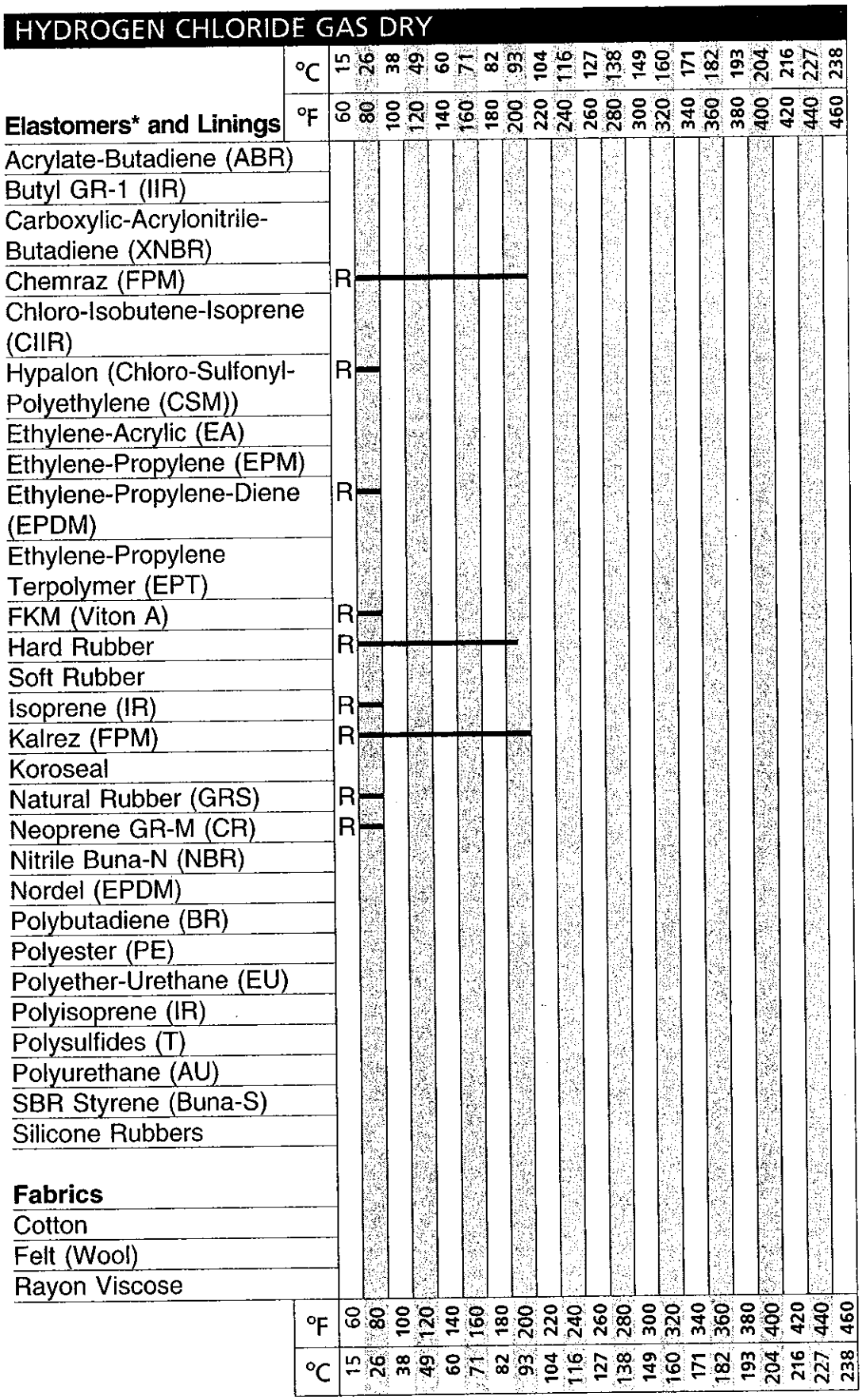


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HYDROGEN CHLORIDE GAS DRY



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HYDROGEN CHLORIDE GAS MOIST

Metals	°C	°F
Admiralty Brass		
Aluminum	U	
Aluminum Bronze		
Brass		
Bronze		
Carbon Steel	E	
Columbium (Niobium)		
Copper		
Hastelloy B/B-2	E	
Hastelloy C/C-276		
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625	U	
Incolloy 800/825		
Lead		
Monel 400	G	
Naval Bronze	E	
Nickel 200/201	G	
Ni-Resist		
Stainless Steels		
Type 304/347	G	U
Type 316/316 L	G	
Type 400 series	U	
Type 904-L		
17-4 PH		
20 Cb 3	G	
E-Bright 26-1		
Silicon Bronze		
Silicon Copper		
Stellite		
Tantalum	E	
Titanium		
Zirconium		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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HYDROGEN CHLORIDE GAS MOIST

Nonmetallic Materials	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass	R																				
Carbon																					
Carbon-Graphite Resin Impregnated	R																				
Ceramics																					
Coatings																					
Acrylic																					
Asphalt																					
Chlorinated Rubber																					
Coal Tar																					
Coal Tar Epoxy																					
Epoxy General Purpose																					
Epoxy Chemical Resistant																					
Epoxy Polyamide																					
Oil Base (Alkyd, Epoxy, Urethane)																					
Phenolic																					
Polyester																					
Polyvinyl Chloride																					
Silicones																					
Urethanes																					
Vinyls																					
Water Base																					
Zinc Rich																					
Mortars																					
Silicate																					
Sodium Silicate																					
Potassium Silicate																					
Silica																					
Sulfur																					
Furan Resin																					
Polyester																					
Epoxy																					
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDROGEN CHLORIDE GAS MOIST

Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC	R	
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)		
FEP	R	
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate	R	
Halogenated	R	
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic	R	
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW	R	
Polymethylpentene		
Polypropylene (PP)		
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1		
PVC Type 2		
PVDF (Kynar)	R	
Ryton		
TFE (Teflon)	R	
Vinyl Ester	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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HYDROGEN CHLORIDE GAS MOIST

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)	R																					
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)	R																					
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)																						
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)	R																					
Kalrez (FPM)	R																					
Koroseal																						
Natural Rubber (GRS)	R																					
Neoprene GR-M (CR)																						
Nitrile Buna-N (NBR)																						
Nordel (EPDM)	R																					
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDROGEN CYANIDE

Metals	°F	°C
Admiralty Brass		
Aluminum	E	
Aluminum Bronze		
Brass	G	
Bronze		
Carbon Steel	G	
Columbium (Niobium)		
Copper	G	
Hastelloy B/B-2		
Hastelloy C/C-276	E	
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625	G	
Incolloy 800/825		
Lead	G	
Monel 400	G	
Naval Bronze	G	
Nickel 200/201	G	
Ni-Resist		
Stainless Steels		
Type 304/347	G	
Type 316/316 L	E	
Type 400 series	S	
Type 904-L		
17-4 PH		
20 Cb 3	G	
E-Bright 26-1		
Silicon Bronze		
Silicon Copper	U	
Stellite		
Tantalum	G	
Titanium		
Zirconium		

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

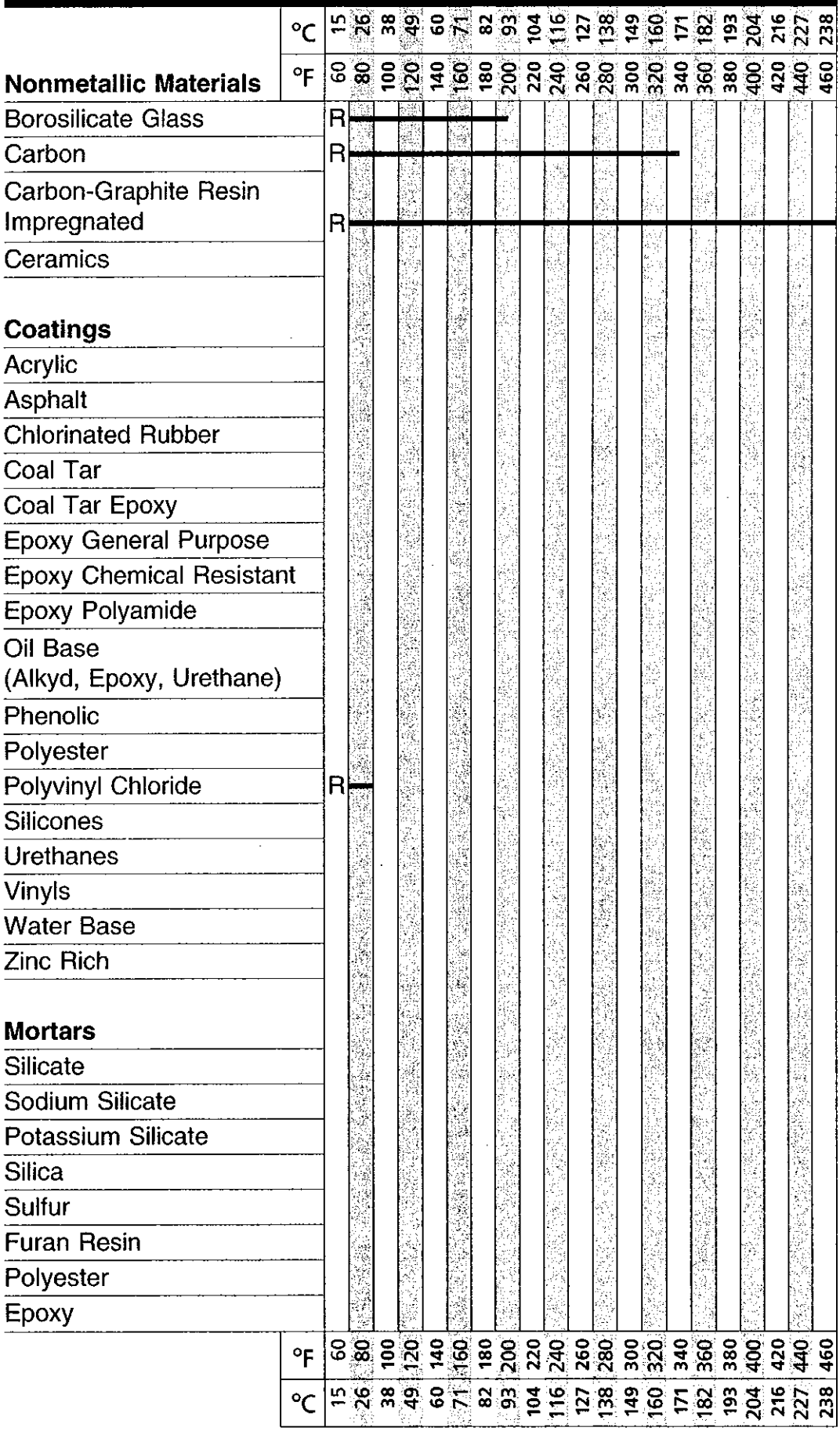
R = Resistant

U = Unsatisfactory

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HYDROGEN CYANIDE



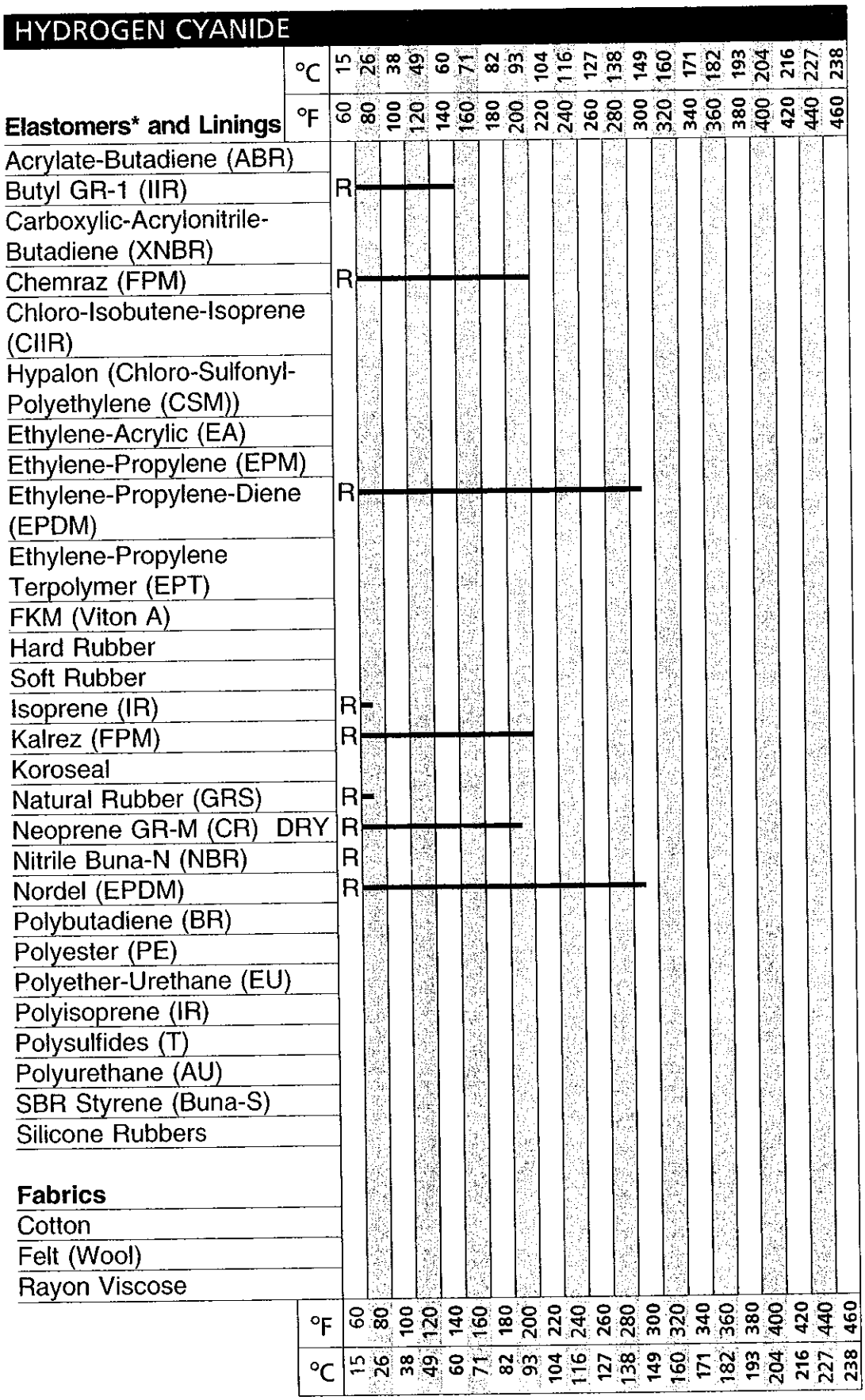
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HYDROGEN CYANIDE

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)	U																					
CPVC																						
E-CTFE (Halar)	R																					
Epoxy																						
ETFE (Tefzel)	R																					
FEP	R																					
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)	R																					
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW	R																					
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)	R																					
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride	U																					
PVC Type 1	R																					
PVC Type 2	R																					
PVDF (Kynar)	R																					
Ryton																						
TFE (Teflon)	R																					
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDROGEN CYANIDE



*See also Nylon 11 under PLASTICS

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HYDROGEN FLUORIDE

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																												
Aluminum			G			U																						
Aluminum Bronze	DRY		E																									
Brass			G																									
Bronze																												
Carbon Steel	20%		U																									
Columbium (Niobium)																												
Copper			G																									
Hastelloy B/B-2			E																									
Hastelloy C/C-276			G																									
Hastelloy D																												
Hastelloy G/G-3																												
High Silicon Iron																												
Inconel 600/625			G																									
Incolloy 800/825																												
Lead			G																									
Monel 400			G																									
Naval Bronze			U																									
Nickel 200/201			E			G																						
Ni-Resist																												
Stainless Steels																												
Type 304/347			E			G																						
Type 316/316 L			E			G																						
Type 400 series			S																									
Type 904-L																												
17-4 PH																												
20 Cb 3			E			G																						
E-Bright 26-1																												
Silicon Bronze																												
Silicon Copper			G																									
Stellite																												
Tantalum			U																									
Titanium			E																									
Zirconium			E																									
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

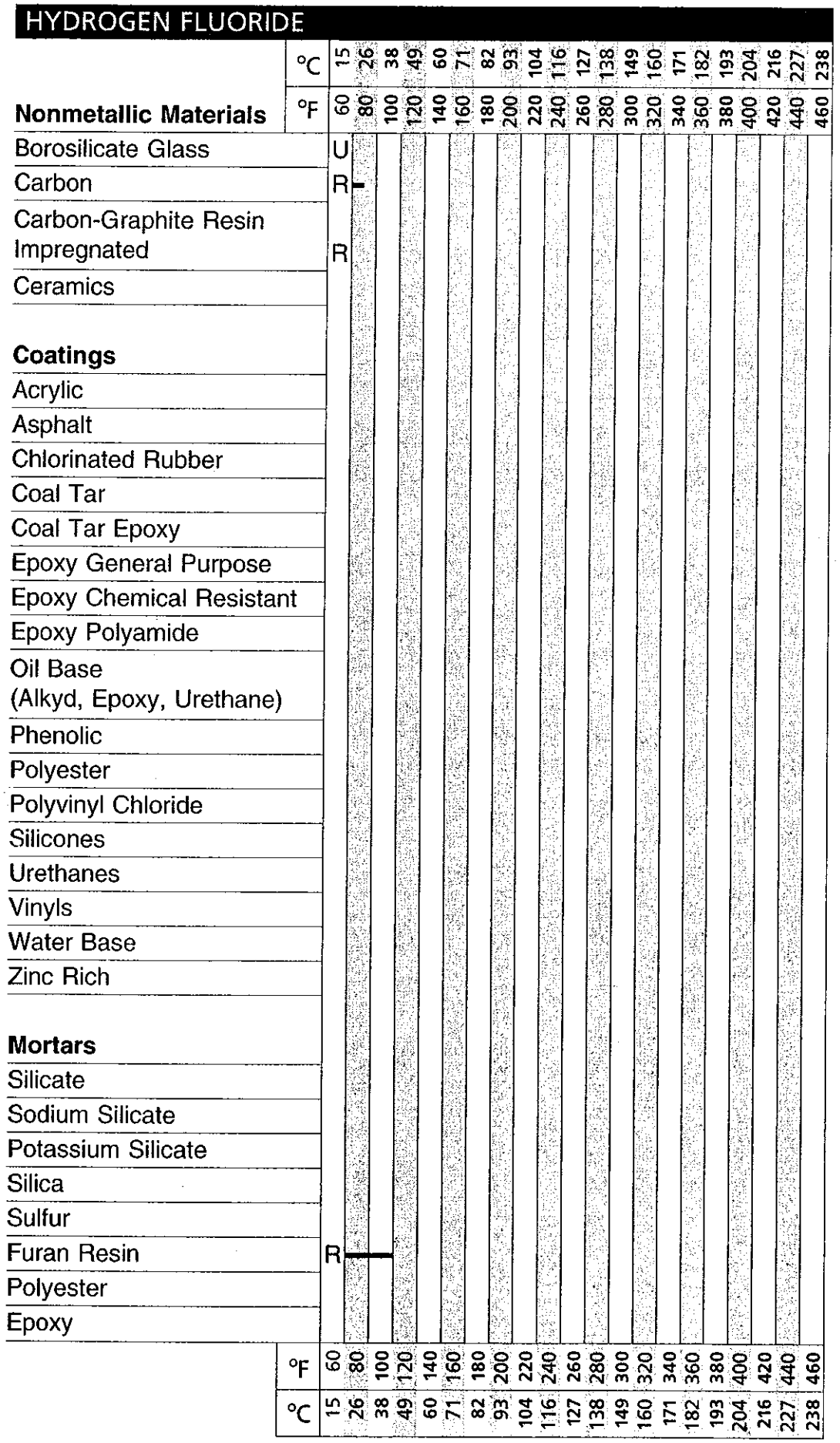
R = Resistant

U = Unsatisfactory

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HYDROGEN FLUORIDE



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HYDROGEN FLUORIDE

Plastics		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																							
Acetal																							
Acrylics																							
Asbestos Reinforced Epoxy																							
Asbestos Reinforced Phenolic																							
Chlorinated Polyether (Penton)																							
CPVC			U																				
E-CTFE (Halar)																							
Epoxy			R																				
ETFE (Tefzel)																							
FEP			R																				
Furan (Furfural Alcohol)			R																				
Noryl																							
Nylon 6																							
Nylon 11																							
Nylon 66																							
Phenolic																							
PFA (Teflon)																							
Polyamide-Imide																							
Polyesters																							
Bisphenol A–fumarate	10%	10	R																				
Halogenated	12%	10	R																				
Hydrogenated Bisphenol A –Bisphenol A																							
Isophthalic		10	R																				
Terephthalate (PET)																							
Polyetherimide (ULTEM)																							
Polyetheretherketone (PEEK)																							
Polyethersulfone (PES)																							
Polyethylene HMW			R																				
Polyethylene UHMW																							
Polymethylpentene																							
Polypropylene (PP)			R																				
Polystyrene																							
Polysulfone																							
Polyvinylidene Chloride																							
PVC Type 1			R																				
PVC Type 2																							
PVDF (Kynar)			R																				
Ryton																							
TFE (Teflon)			R																				
Vinyl Ester		10	R																				
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDROGEN FLUORIDE

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)		U																				
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)		U																				
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)																						
Ethylene-Propylene Terpolymer (EPT)		U																				
FKM (Viton A)		R																				
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)		U																				
Kalrez (FPM)		R																				
Koroseal																						
Natural Rubber (GRS)		U																				
Neoprene GR-M (CR)		U																				
Nitrile Buna-N (NBR)		R																				
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDROGEN IODIDE

Metals	°C	°F
Admiralty Brass		
Aluminum	U	
Aluminum Bronze		
Brass		
Bronze		
Carbon Steel		
Columbium (Niobium)		
Copper		
Hastelloy B/B-2	G	
Hastelloy C/C-276	G	U
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron	G	
Inconel 600/625		
Incolloy 800/825		
Lead		
Monel 400		
Naval Bronze		
Nickel 200/201	G	
Ni-Resist		
Stainless Steels		
Type 304/347	G	
Type 316/316 L	G	
Type 400 series		
Type 904-L		
17-4 PH		
20 Cb 3	G	
E-Bright 26-1		
Silicon Bronze		
Silicon Copper		
Stellite		
Tantalum	E	
Titanium		
Zirconium		

°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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HYDROGEN IODIDE

Nonmetallic Materials	°F	°C
Borosilicate Glass		
Carbon		
Carbon-Graphite Resin Impregnated		
Ceramics		
Coatings		
Acrylic		
Asphalt		
Chlorinated Rubber		
Coal Tar		
Coal Tar Epoxy		
Epoxy General Purpose		
Epoxy Chemical Resistant		
Epoxy Polyamide		
Oil Base (Alkyd, Epoxy, Urethane)		
Phenolic		
Polyester		
Polyvinyl Chloride		
Silicones		
Urethanes		
Vinyls		
Water Base		
Zinc Rich		
Mortars		
Silicate		
Sodium Silicate		
Potassium Silicate		
Silica		
Sulfur		
Furan Resin		
Polyester		
Epoxy		

°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDROGEN IODIDE

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS																						
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)																						
Epoxy																						
ETFE (Tefzel)																						
FEP	R																					
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)																						
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated	R																					
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic	R																					
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)																						
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)																						
Ryton																						
TFE (Teflon)	R																					
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDROGEN IODIDE

Elastomers* and Linings	°C	°F
Acrylate-Butadiene (ABR)		
Butyl GR-1 (IIR)		
Carboxylic-Acrylonitrile-Butadiene (XNBR)		
Chemraz (FPM)		
Chloro-Isobutene-Isoprene (CIIR)		
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))		
Ethylene-Acrylic (EA)		
Ethylene-Propylene (EPM)		
Ethylene-Propylene-Diene (EPDM)		
Ethylene-Propylene Terpolymer (EPT)		
FKM (Viton A)		
Hard Rubber		
Soft Rubber		
Isoprene (IR)		
Kalrez (FPM)	R	R
Koroseal		
Natural Rubber (GRS)		
Neoprene GR-M (CR)		
Nitrile Buna-N (NBR)		
Nordel (EPDM)		
Polybutadiene (BR)		
Polyester (PE)		
Polyether-Urethane (EU)		
Polyisoprene (IR)		
Polysulfides (T)		
Polyurethane (AU)		
SBR Styrene (Buna-S)		
Silicone Rubbers		
Fabrics		
Cotton		
Felt (Wool)		
Rayon Viscose		

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460

*See also Nylon 11 under PLASTICS

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HYDROGEN PEROXIDE DILUTE

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass			G																									
Aluminum	5		E																									
Aluminum Bronze			U																									
Brass			U																									
Bronze			U																									
Carbon Steel			U																									
Columbium (Niobium)			E																									
Copper			U																									
Hastelloy B/B-2			E																									
Hastelloy C/C-276			E																									
Hastelloy D																												
Hastelloy G/G-3																												
High Silicon Iron			G																									
Inconel 600/625	6		G																									
Incolloy 800/825	1–5%		G																									
Lead			U																									
Monel 400	8		G																									
Naval Bronze			U																									
Nickel 200/201	6		G																									
Ni-Resist																												
Stainless Steels																												
Type 304/347	8		G																									
Type 316/316 L	7		G																									
Type 400 series			U																									
Type 904-L																												
17-4 PH																												
20 Cb 3	8		G																									
E-Bright 26-1																												
Silicon Bronze			G																									
Silicon Copper																												
Galv. Stl.			G																									
Tantalum			G																									
Titanium			E																									
Zirconium			E																									
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

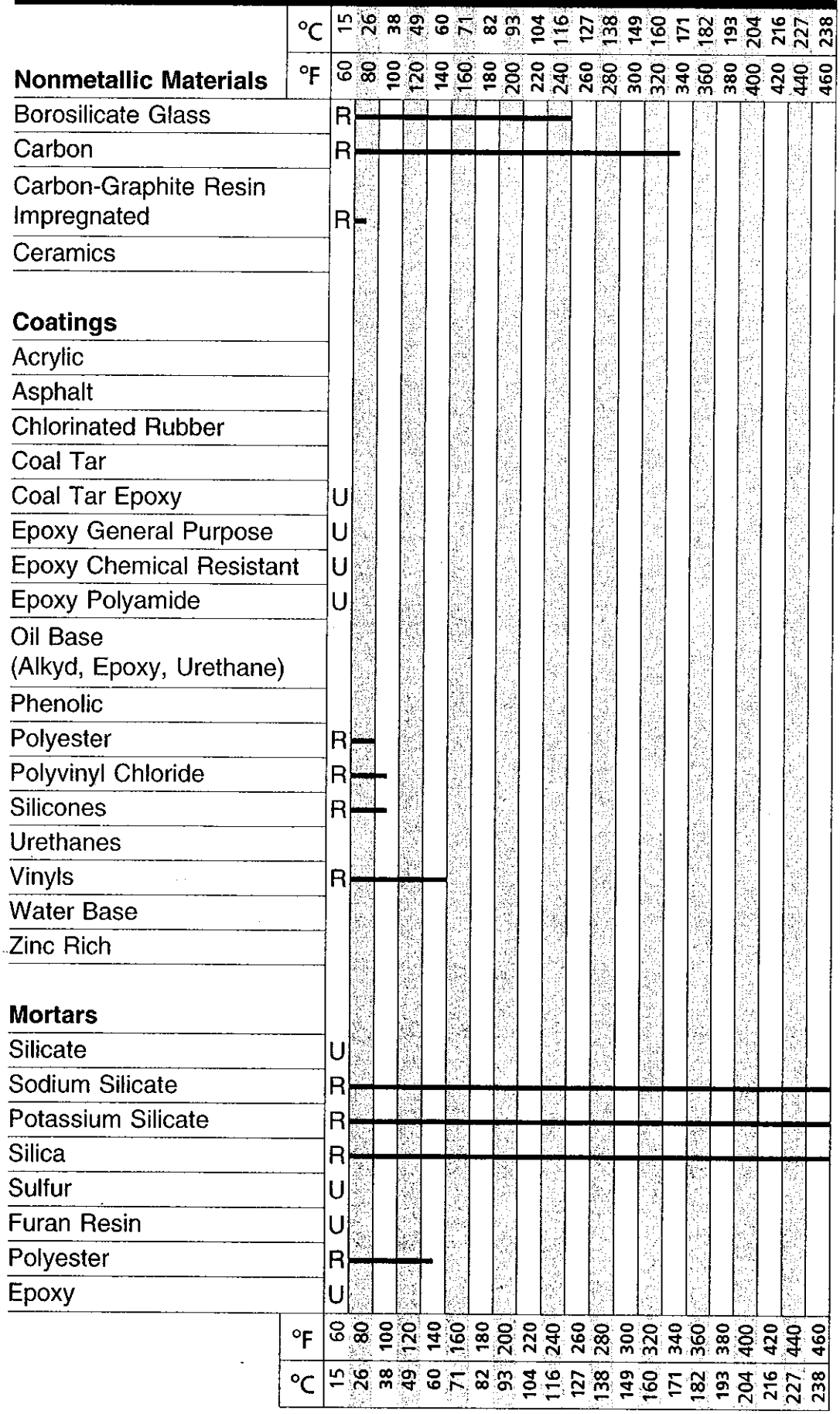
R = Resistant

U = Unsatisfactory

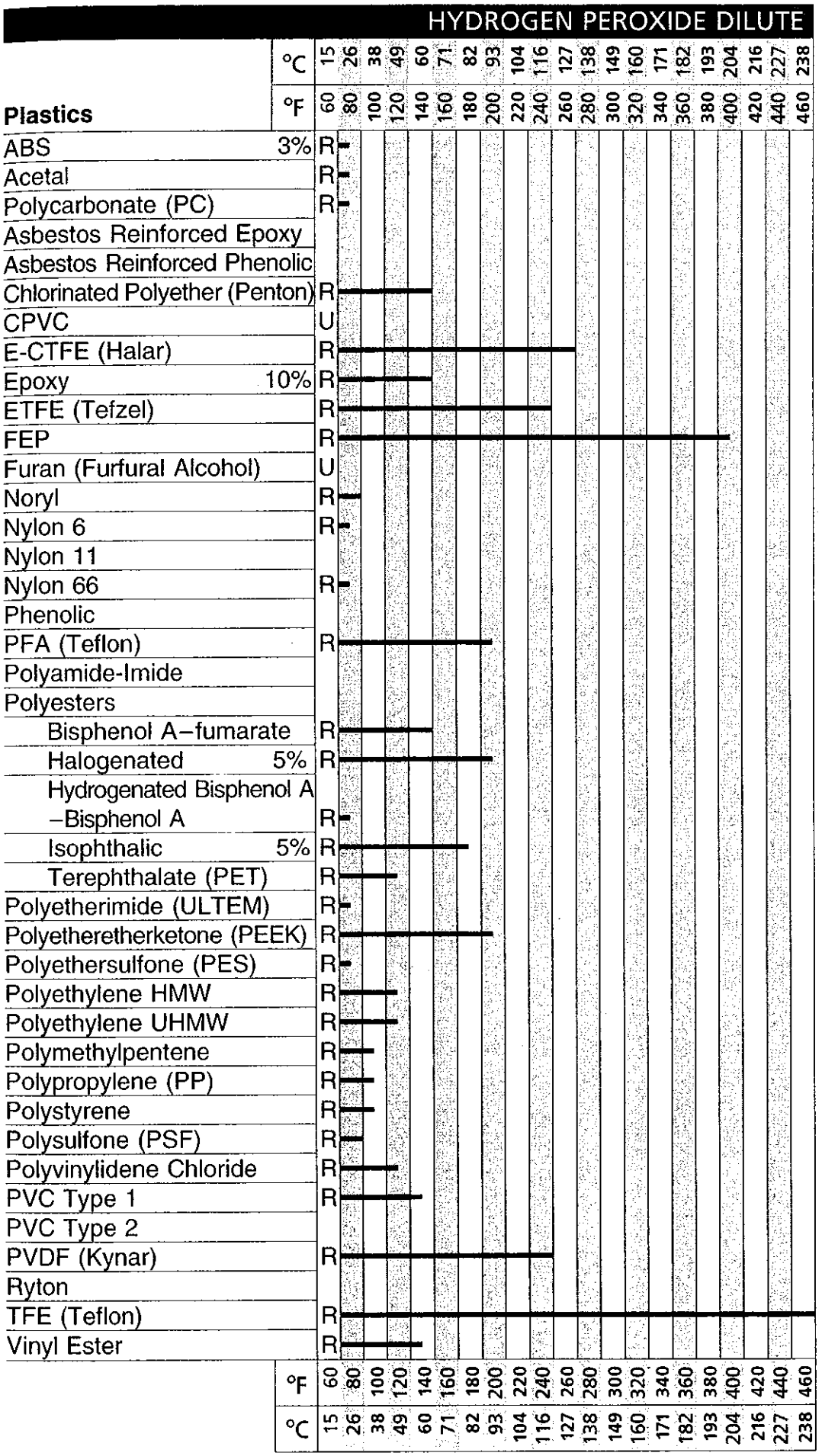
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HYDROGEN PEROXIDE DILUTE

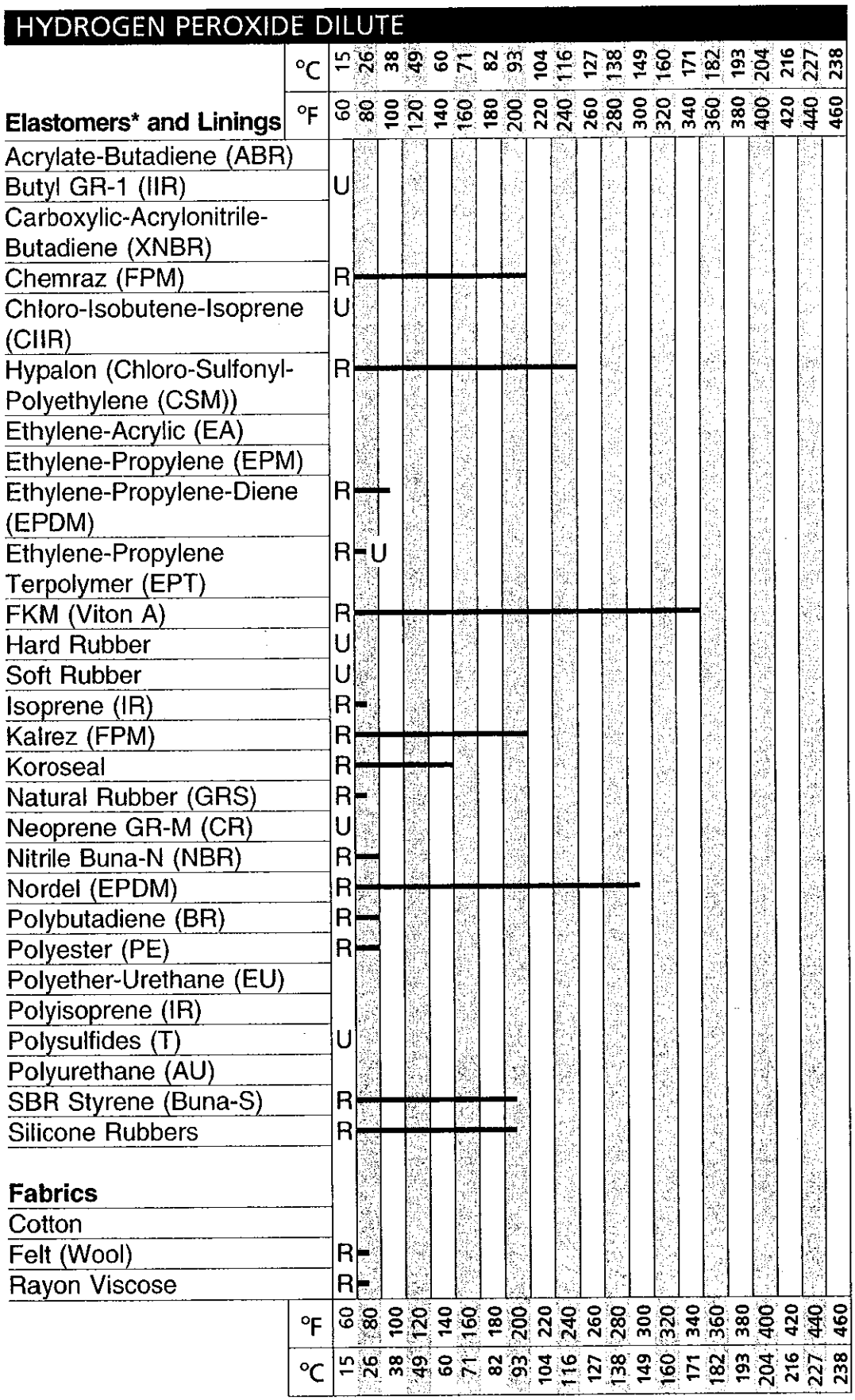


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HYDROGEN PEROXIDE DILUTE



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HYDROGEN PEROXIDE 30%

Metals		°F	°C
Admiralty Brass	G	60	15
Aluminum	5 E	80	26
Aluminum Bronze	U	100	38
Brass	U	120	49
Bronze	U	140	60
Carbon Steel	U	160	71
Columbium (Niobium)	E G	180	82
Copper	U	200	93
Hastelloy B/B-2	E	220	104
Hastelloy C/C-276	E	240	116
Hastelloy D		260	127
Hastelloy G/G-3		280	138
High Silicon Iron	G	300	149
Inconel 600/625	G	320	160
Incolloy 800/825		340	171
Lead	U	360	182
Monel 400	G	380	193
Naval Bronze	U	400	204
Nickel 200/201		420	216
Galv. Stl.	G	440	227
Stainless Steels		460	238
Type 304/347	8 G	480	249
Type 316/316 L	7 G	500	260
Type 410	G	520	271
Type 904-L		540	282
17-4 PH		560	293
20 Cb 3	7 G		
E-Bright 26-1			
Silicon Bronze			
Silicon Copper			
Stellite			
Tantalum	G		
Titanium	E		
Zirconium	E		

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

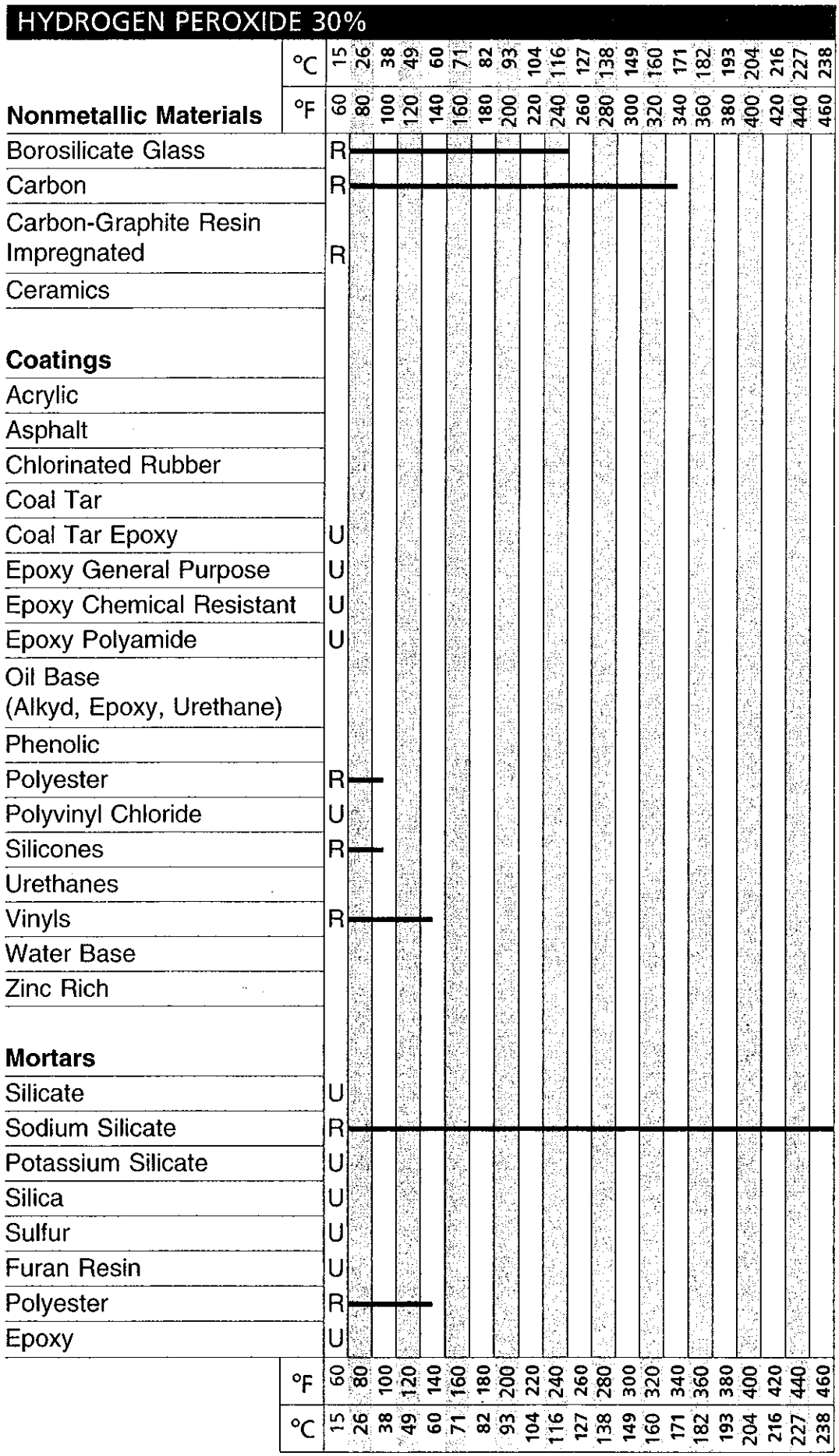
R = Resistant

U = Unsatisfactory

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HYDROGEN PEROXIDE 30%



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HYDROGEN PEROXIDE 30%

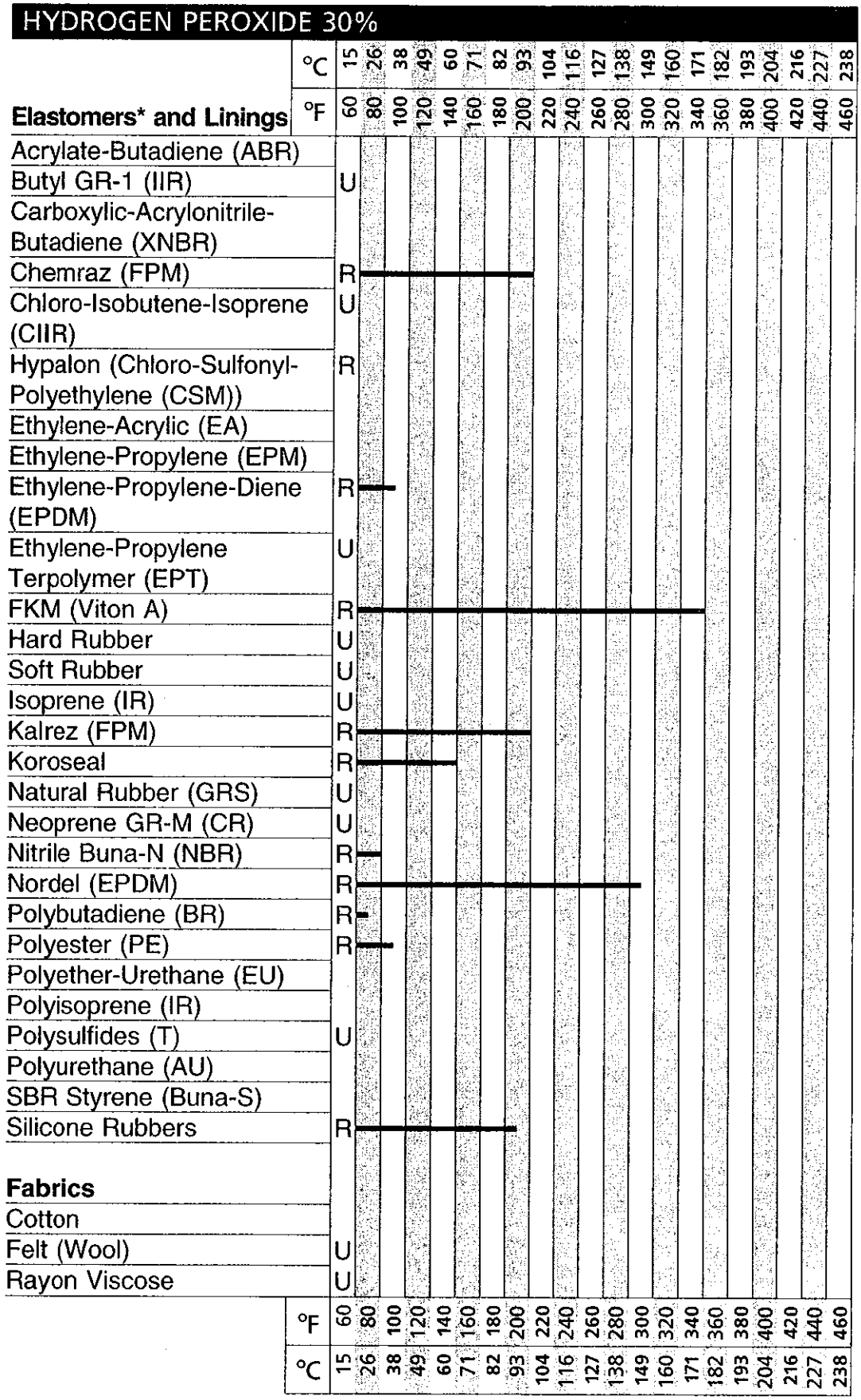
Plastics	
ABS	U
Acetal	U
Polycarbonate (PC)	R
Asbestos Reinforced Epoxy	
Asbestos Reinforced Phenolic	
Chlorinated Polyether (Penton)	R
CPVC	R
E-CTFE (Halar)	R
Epoxy	R
ETFE (Tefzel)	R
FEP	R
Furan (Furfural Alcohol)	U
Noryl	R
Nylon 6	R
Nylon 11	
Nylon 66	R
Phenolic	
PFA (Teflon)	R
Polyamide-Imide	
Polyesters	
Bisphenol A–fumarate	R
Halogenated	R
Hydrogenated Bisphenol A –Bisphenol A	R
Isophthalic	U
Terephthalate (PET)	R
Polyetherimide (ULTEM)	R
Polyetheretherketone (PEEK)	R
Polyethersulfone (PES)	R
Polyethylene HMW	R
Polyethylene UHMW	R
Polymethylpentene	R
Polypropylene (PP)	R
Polystyrene	U
Polysulfone (PSF)	R
Polyvinylidene Chloride	R
PVC Type 1	R
PVC Type 2	U
PVDF (Kynar)	R
Ryton	
TFE (Teflon)	R
Vinyl Ester	R

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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HYDROGEN PEROXIDE 30%



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HYDROGEN PEROXIDE 50%

Metals		°C	°F
Admiralty Brass		G	
Aluminum	5	E	
Aluminum Bronze		U	
Brass		U	
Bronze		U	
Carbon Steel		U	
Columbium (Niobium)			
Copper		U	
Hastelloy B/B-2		G	
Hastelloy C/C-276		G	
Hastelloy D			
Hastelloy G/G-3			
High Silicon Iron		G	
Inconel 600/625	6	E	
Incolloy 800/825			
Lead		U	
Monel 400		G	
Naval Bronze		U	
Nickel 200/201			
Ni-Resist			
Stainless Steels			
Type 304/347	8	G	
Type 316/316 L	7	G	
Type 400 series			
Type 904-L			
17-4 PH		G	
20 Cb 3	8	G	
E-Bright 26-1			
Silicon Bronze		U	
Silicon Copper			
Stellite			
Tantalum		G	
Titanium		E	
Zirconium		E	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

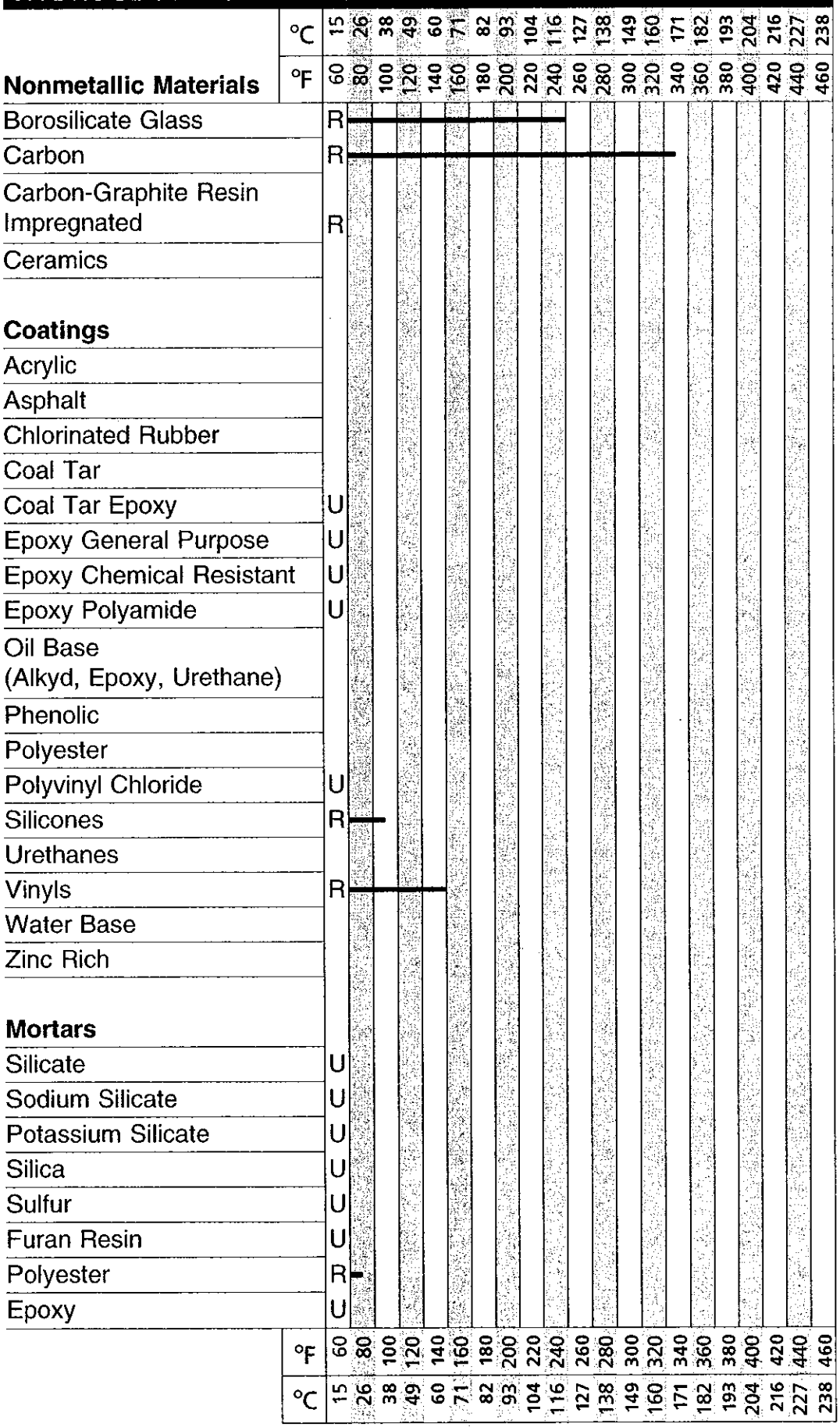
R = Resistant

U = Unsatisfactory

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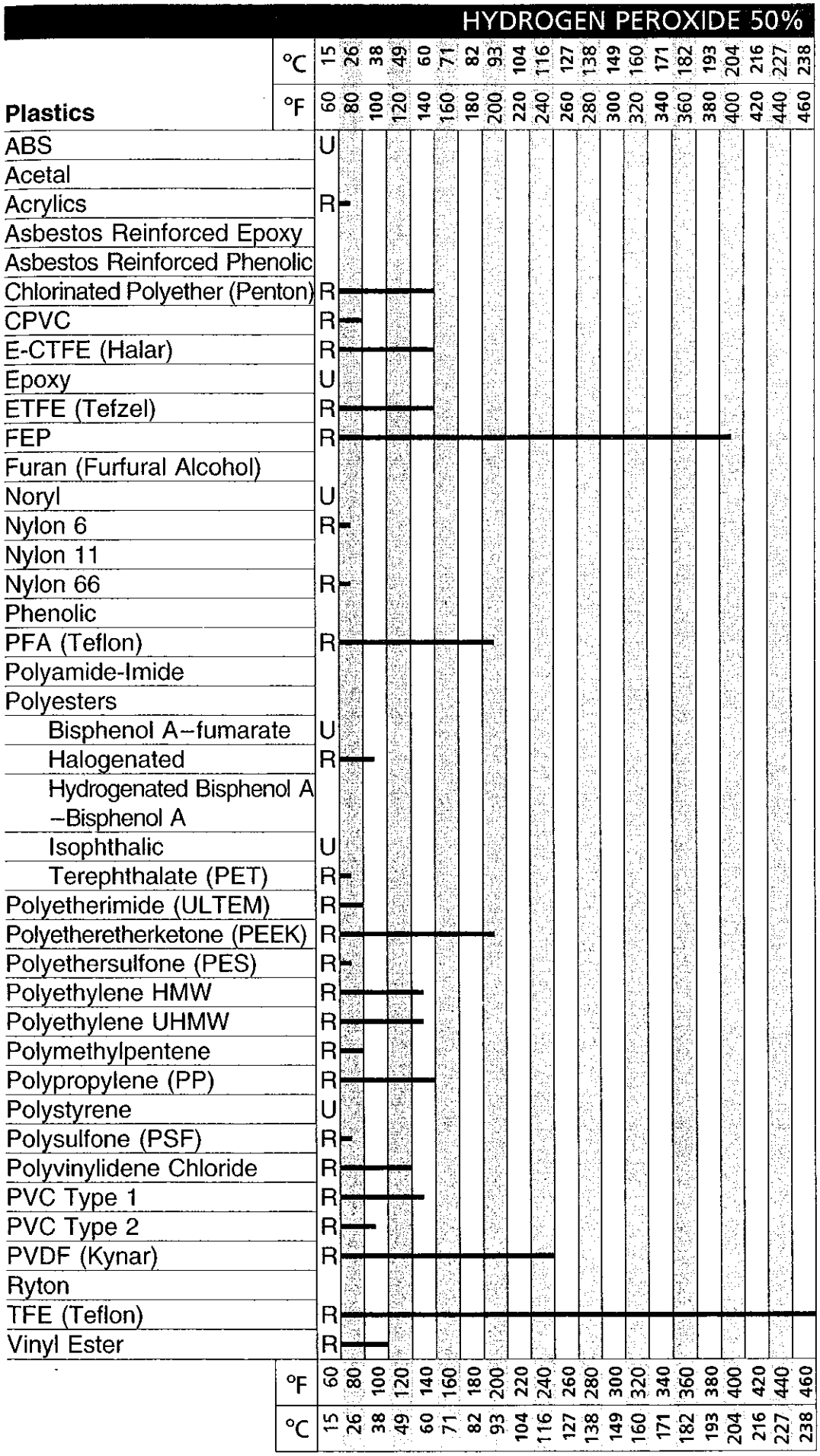
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HYDROGEN PEROXIDE 50%



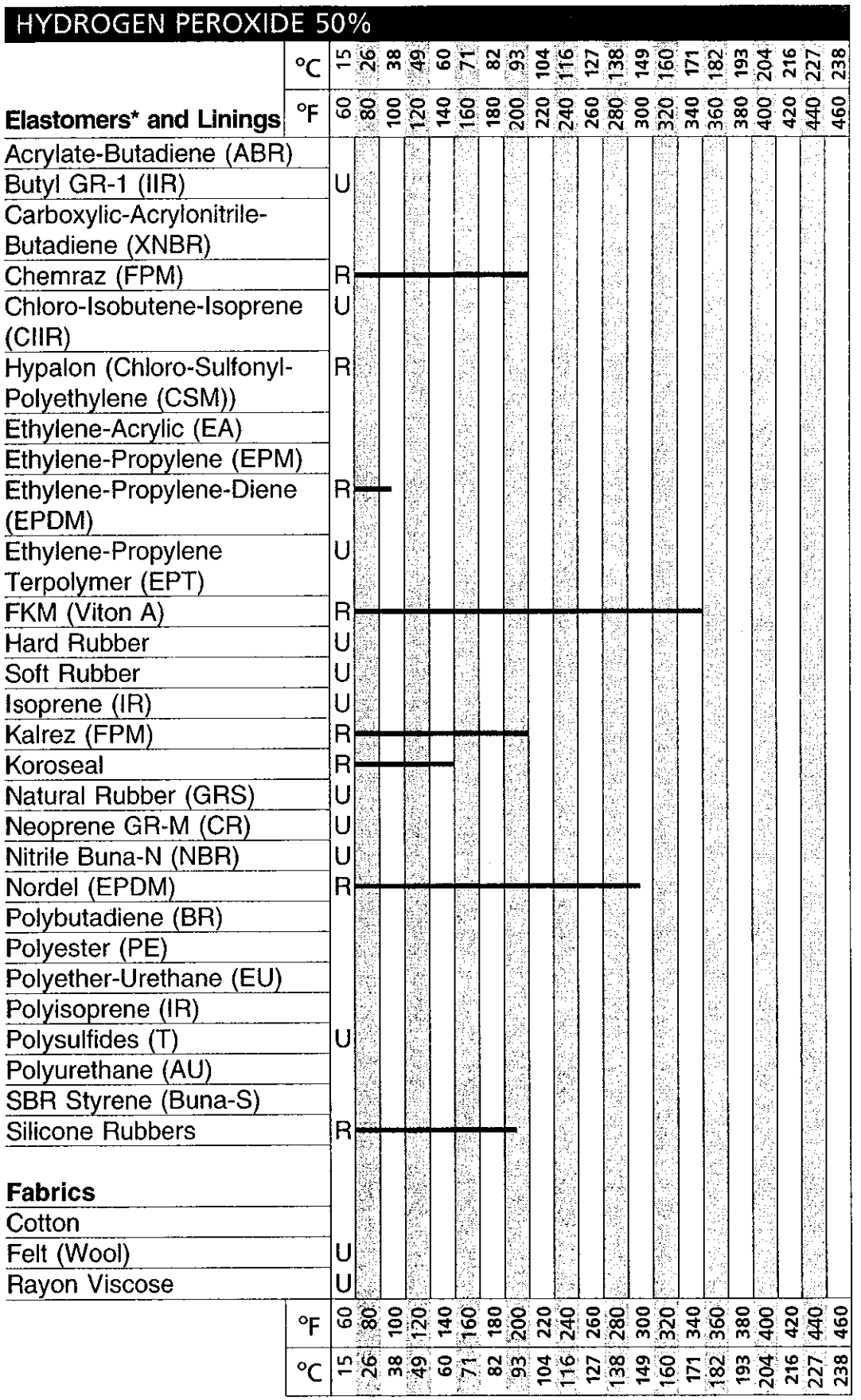
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HYDROGEN PEROXIDE 50%



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HYDROGEN PEROXIDE 90%

Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass			G																									
Aluminum	5		E																									
Aluminum Bronze			U																									
Brass			U																									
Bronze			S																									
Carbon Steel			U																									
Columbium (Niobium)																												
Copper			U																									
Hastelloy B/B-2			E																									
Hastelloy C/C-276			E																									
Hastelloy D																												
Hastelloy G/G-3																												
High Silicon Iron			G																									
Inconel 600/625	6		G																									
Incolloy 800/825																												
Lead			U																									
Monel 400	6		E																									
Naval Bronze			U																									
Nickel 200/201			G																									
Ni-Resist			E																									
Stainless Steels																												
Type 304/347	8		E			G				S																		
Type 316/316 L	7		E			G				S																		
Type 410			G																									
Type 904-L																												
17-4 PH			G																									
20 Cb 3	7		E																									
E-Bright 26-1																												
Silicon Bronze			U																									
Silicon Copper			S																									
Stellite																												
Tantalum			G																									
Titanium			G																									
Zirconium			E																									
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

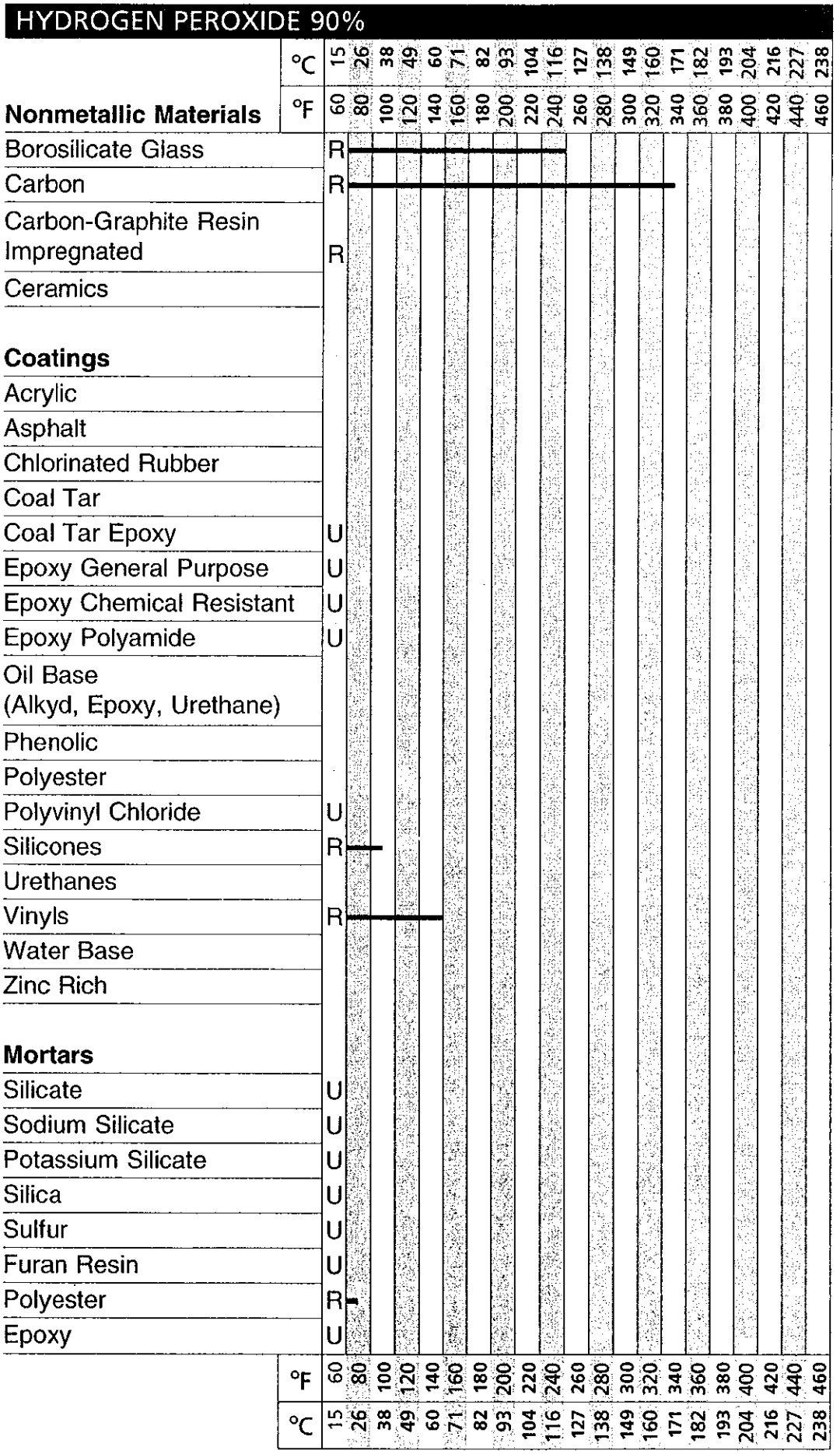
R = Resistant

U = Unsatisfactory

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HYDROGEN PEROXIDE 90%

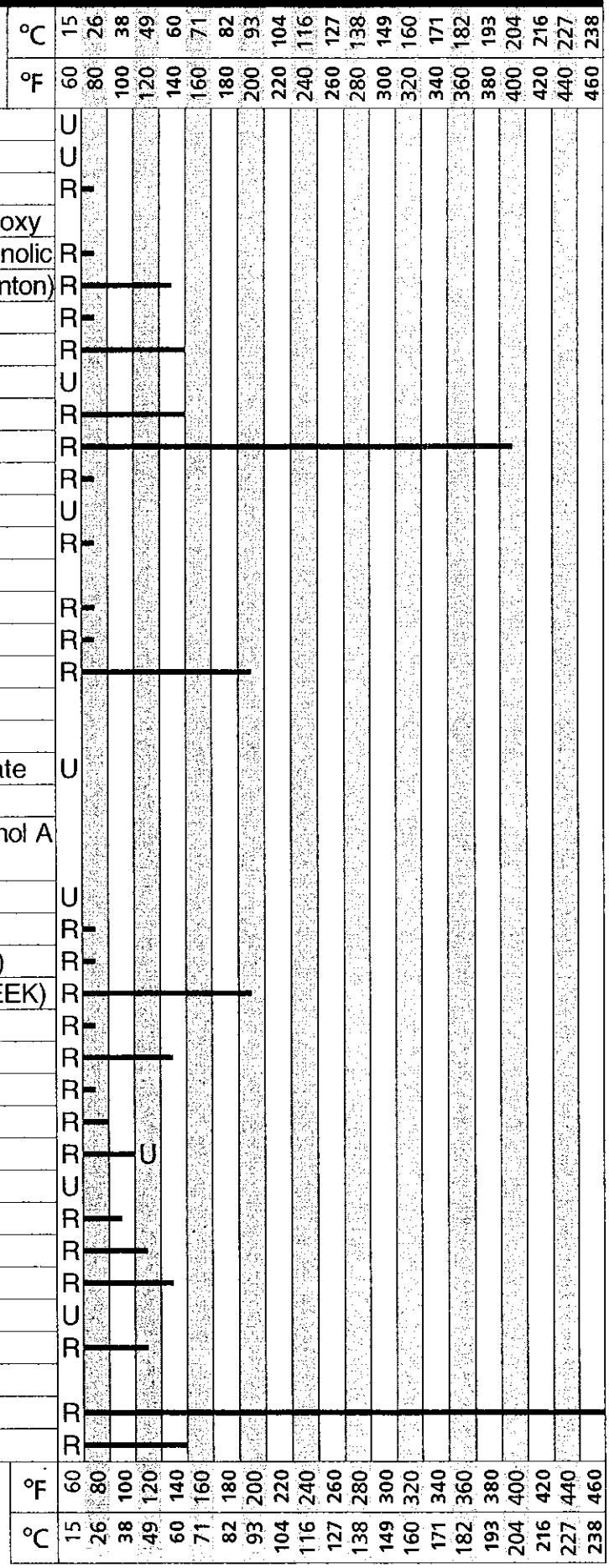


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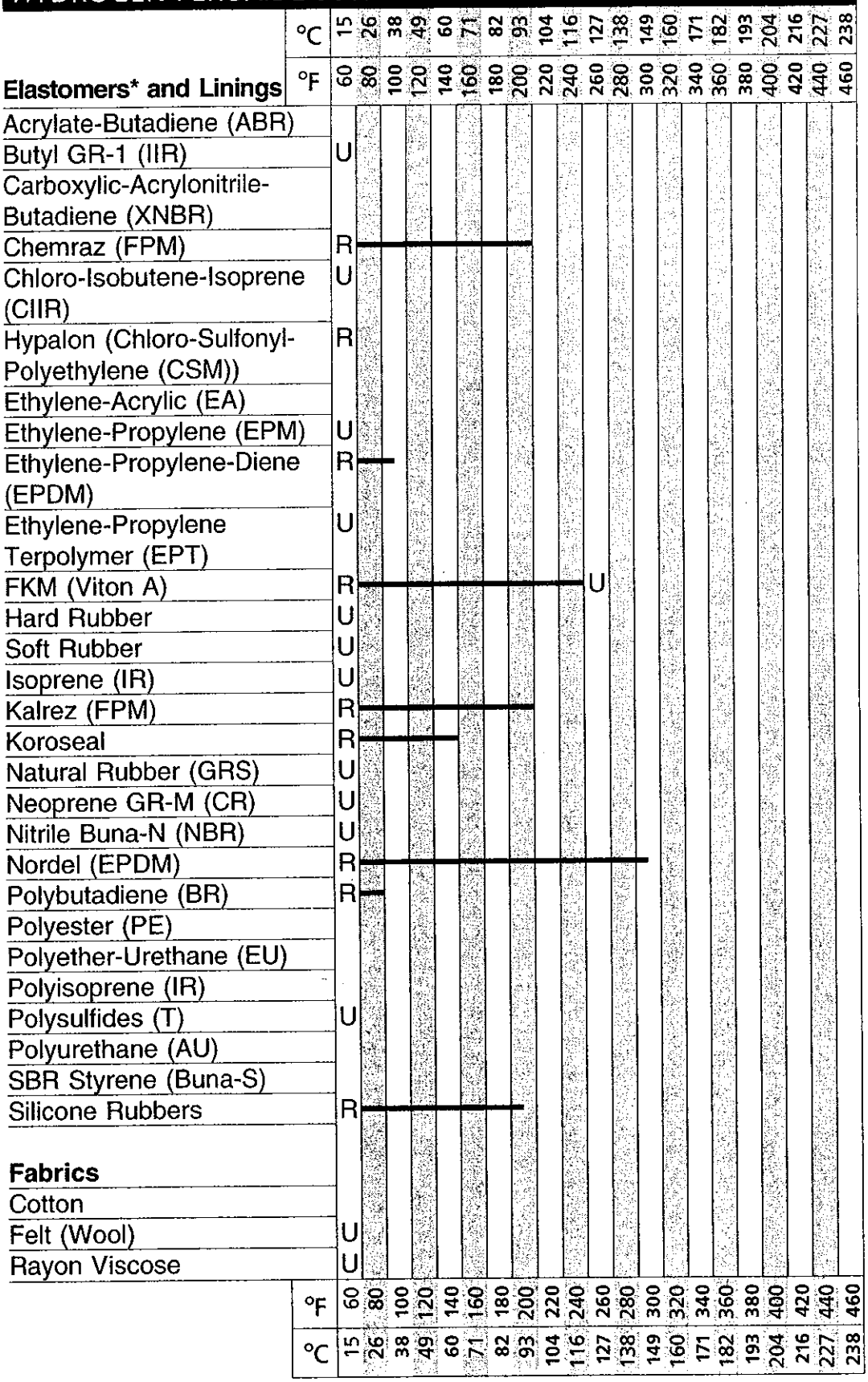
HYDROGEN PEROXIDE 90%

Plastics	
ABS	U
Acetal	U
Acrylics	R
Asbestos Reinforced Epoxy	
Asbestos Reinforced Phenolic	R
Chlorinated Polyether (Penton)	R
CPVC	R
E-CTFE (Halar)	R
Epoxy	U
ETFE (Tefzel)	R
FEP	R
Furan (Furfural Alcohol)	R
Noryl	U
Nylon 6	R
Nylon 11	
Nylon 66	R
Phenolic	R
PFA (Teflon)	R
Polyamide-Imide	
Polyesters	
Bisphenol A–fumarate	U
Halogenated	
Hydrogenated Bisphenol A –Bisphenol A	
Isophthalic	U
Terephthalate (PET)	R
Polyetherimide (ULTEM)	R
Polyetheretherketone (PEEK)	R
Polyethersulfone (PES)	R
Polyethylene HMW	R
Polyethylene UHMW	R
Polymethylpentene	R
Polypropylene (PP)	R
Polystyrene	U
Polysulfone (PSF)	R
Polyvinylidene Chloride	R
PVC Type 1	R
PVC Type 2	U
PVDF (Kynar)	R
Ryton	
TFE (Teflon)	R
Vinyl Ester	R



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HYDROGEN PEROXIDE 90%



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HYDROGEN PHOSPHIDE

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276																											
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
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Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium																											
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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HYDROGEN PHOSPHIDE

Nonmetallic Materials	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																						
Carbon																						
Carbon-Graphite Resin Impregnated																						
Ceramics																						
Coatings																						
Acrylic																						
Asphalt																						
Chlorinated Rubber																						
Coal Tar																						
Coal Tar Epoxy																						
Epoxy General Purpose																						
Epoxy Chemical Resistant																						
Epoxy Polyamide																						
Oil Base (Alkyd, Epoxy, Urethane)																						
Phenolic																						
Polyester																						
Polyvinyl Chloride		R	—																			
Silicones																						
Urethanes																						
Vinyls																						
Water Base																						
Zinc Rich																						
Mortars																						
Silicate																						
Sodium Silicate																						
Potassium Silicate																						
Silica																						
Sulfur																						
Furan Resin																						
Polyester																						
Epoxy																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDROGEN PHOSPHIDE

Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS		U																				
Acetal																						
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC		R				U																
E-CTFE (Halar)		R																				
Epoxy																						
ETFE (Tefzel)		R																				
FEP		R																				
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)																						
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide (ULTEM)																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW		R																				
Polyethylene UHMW		R																				
Polymethylpentene																						
Polypropylene (PP)		R																				
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1		R																				
PVC Type 2		R																				
PVDF (Kynar)		R																				
Ryton																						
TFE (Teflon)		R																				
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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HYDROGEN PHOSPHIDE

Elastomers* and Linings	°F	°C
Acrylate-Butadiene (ABR)		
Butyl GR-1 (IIR)		
Carboxylic-Acrylonitrile-Butadiene (XNBR)		
Chemraz (FPM)		
Chloro-Isobutene-Isoprene (CIIR)		
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))		
Ethylene-Acrylic (EA)		
Ethylene-Propylene (EPM)		
Ethylene-Propylene-Diene (EPDM)	R	
Ethylene-Propylene Terpolymer (EPT)	R	
FKM (Viton A)		
Hard Rubber		
Soft Rubber		
Isoprene (IR)		
Kalrez (FPM)		
Koroseal		
Natural Rubber (GRS)		
Neoprene GR-M (CR)		
Nitrile Buna-N (NBR)	U	
Nordel (EPDM)		
Polybutadiene (BR)		
Polyester (PE)		
Polyether-Urethane (EU)		
Polyisoprene (IR)		
Polysulfides (T)		
Polyurethane (AU)		
SBR Styrene (Buna-S)		
Silicone Rubbers		
Fabrics		
Cotton		
Felt (Wool)		
Rayon Viscose		

°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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HYDROGEN SULFIDE AQUEOUS SOLUTION

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2	G																										
Hastelloy C/C-276	G																										
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron	G																										
Inconel 600/625	G																										
Incolloy 800/825																											
Lead																											
Monel 400	G																										
Naval Bronze																											
Nickel 200/201	G																										
Ni-Resist																											
Stainless Steels																											
Type 304/347	U																										
Type 316/316 L	G																										
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3	G																										
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum	G																										
Titanium	G																										
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

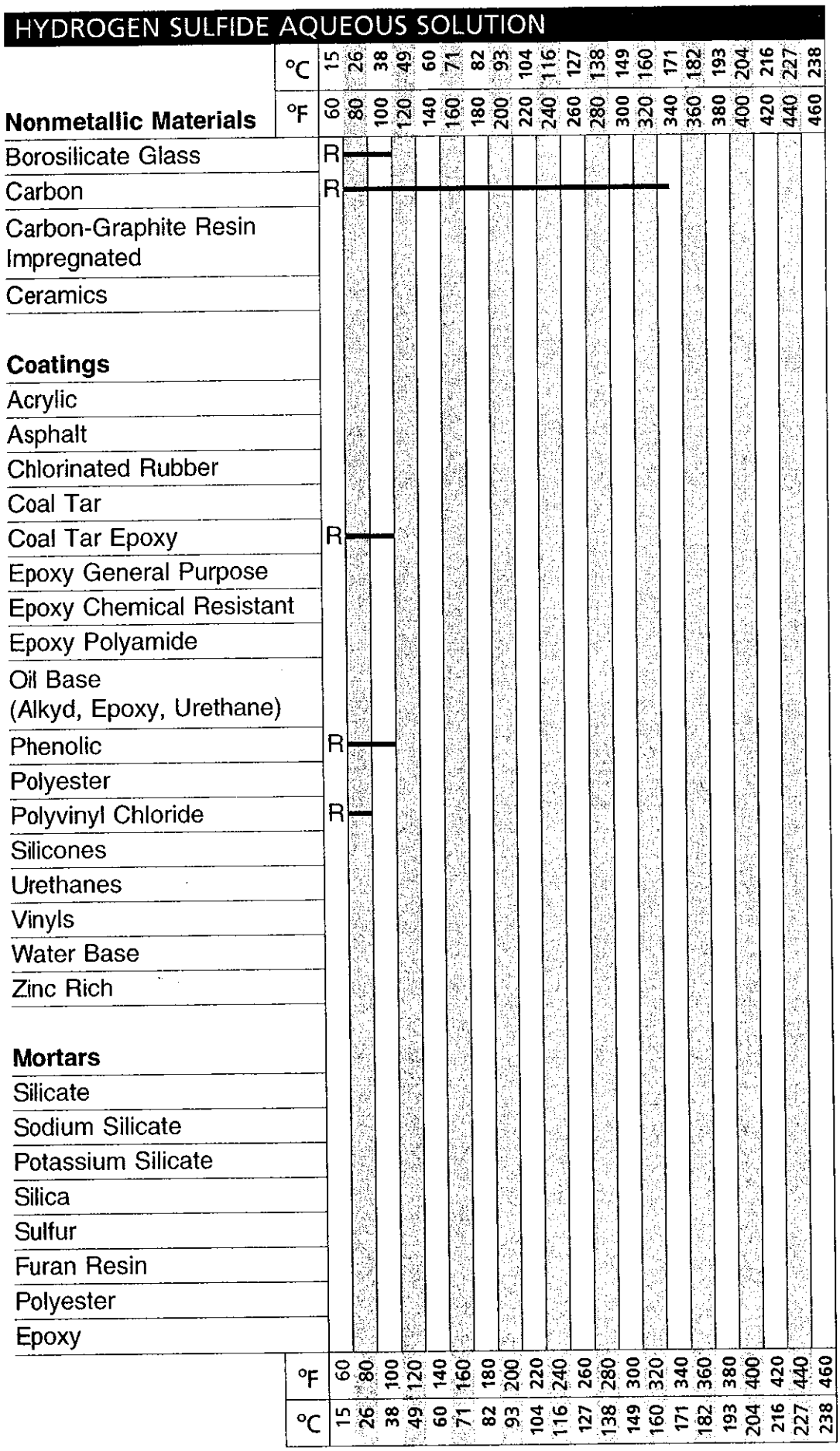
R = Resistant

U = Unsatisfactory

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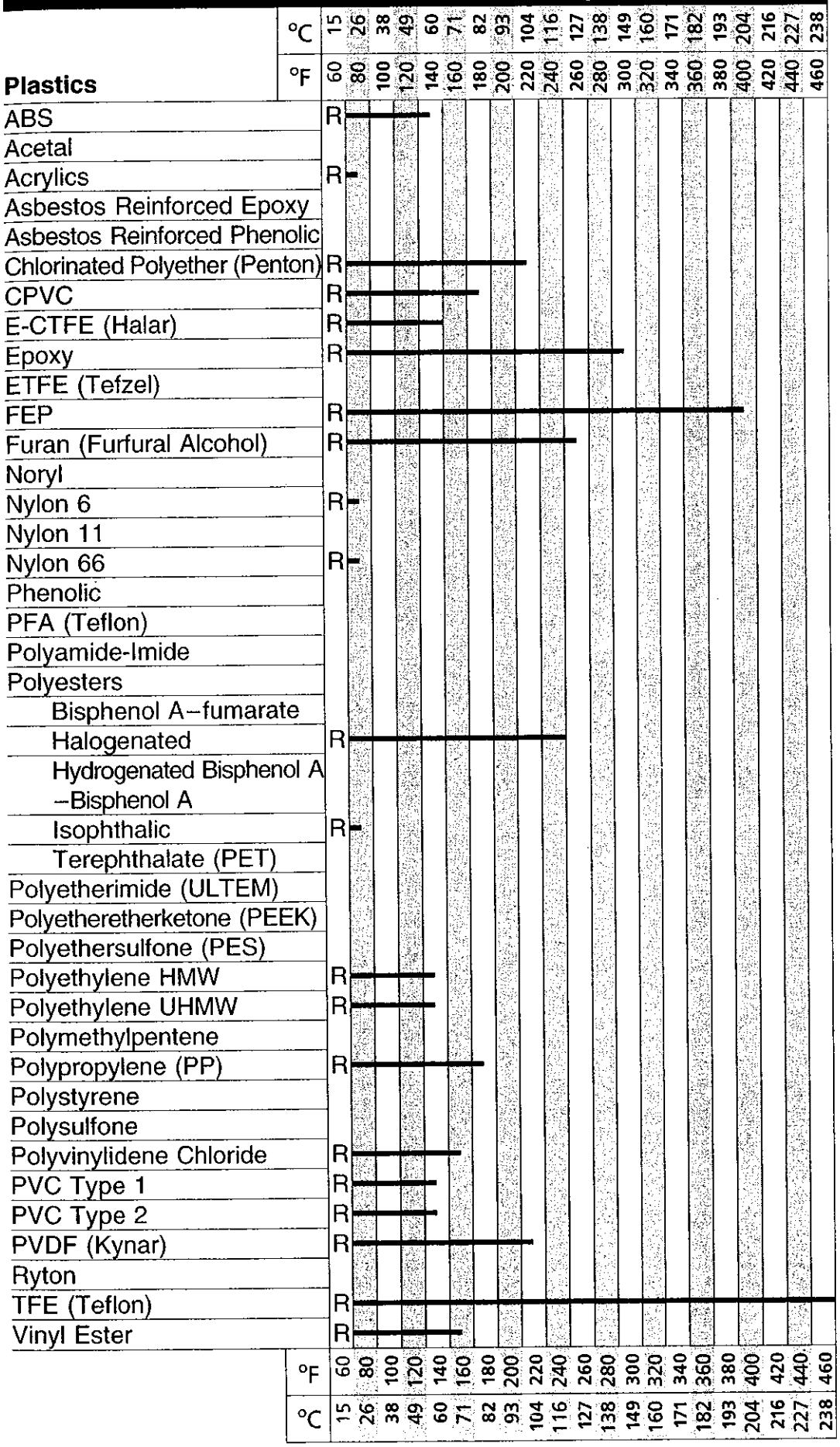
HYDROGEN SULFIDE AQUEOUS SOLUTION



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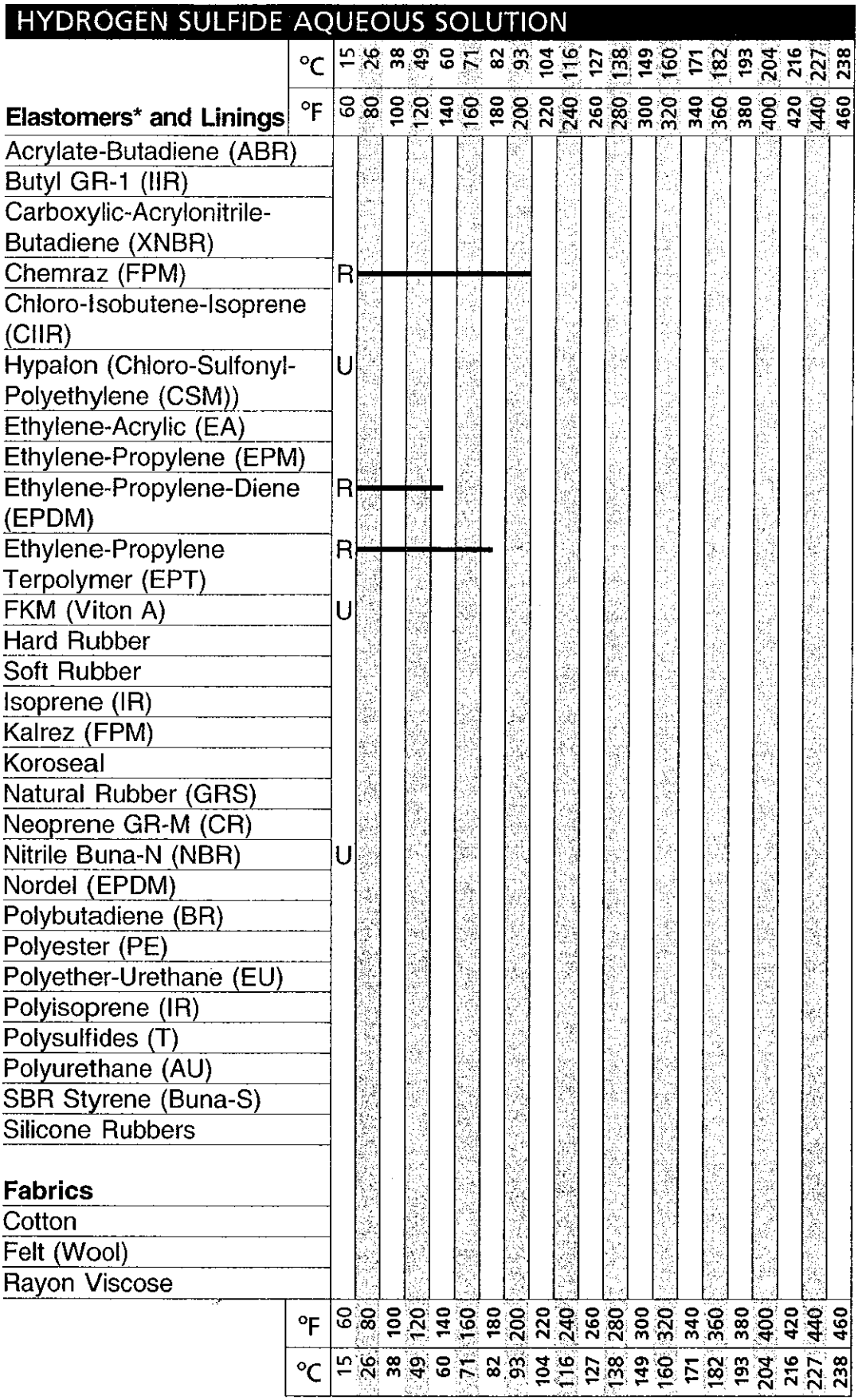
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HYDROGEN SULFIDE AQUEOUS SOLUTION



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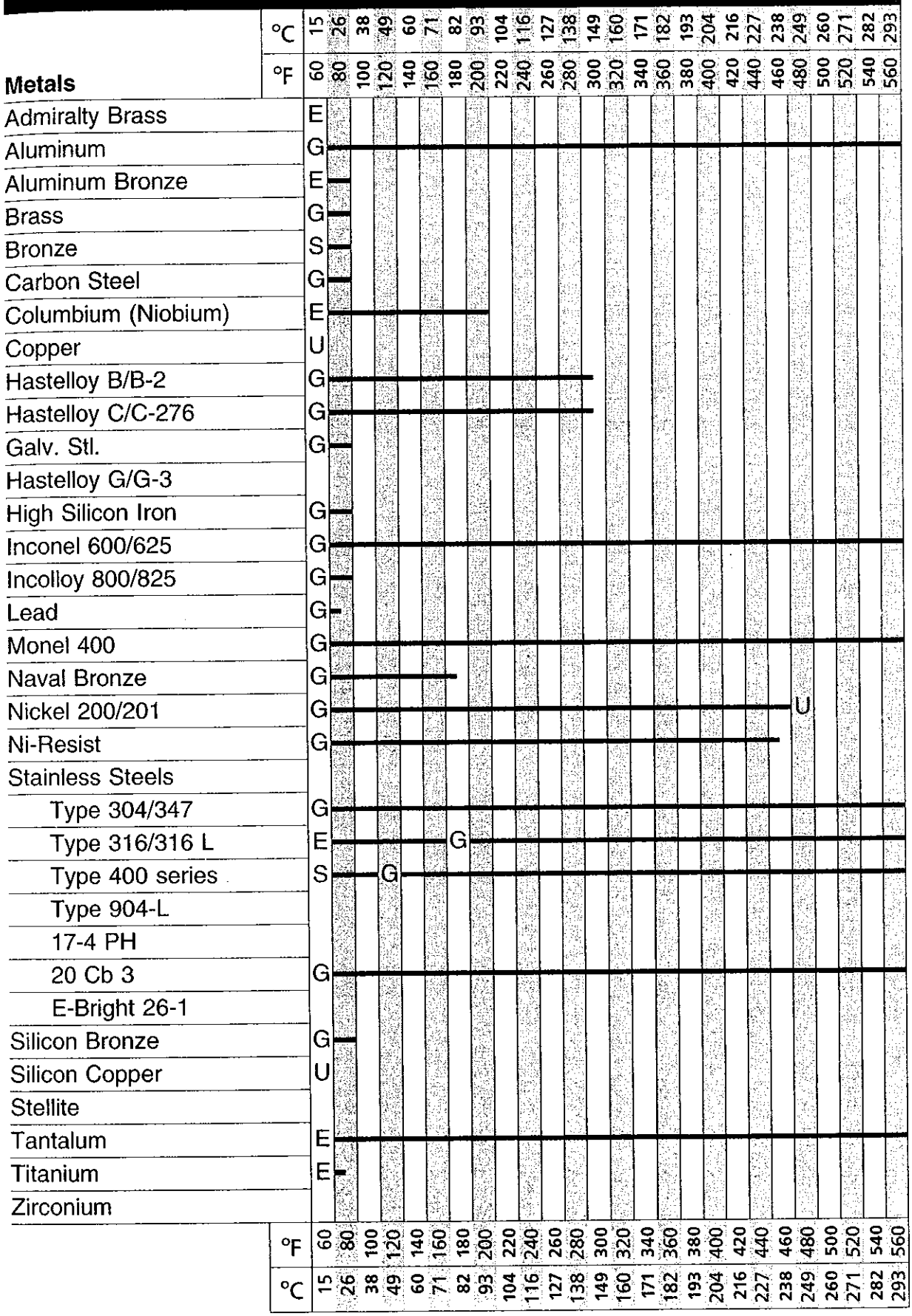
HYDROGEN SULFIDE AQUEOUS SOLUTION



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HYDROGEN SULFIDE DRY



FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

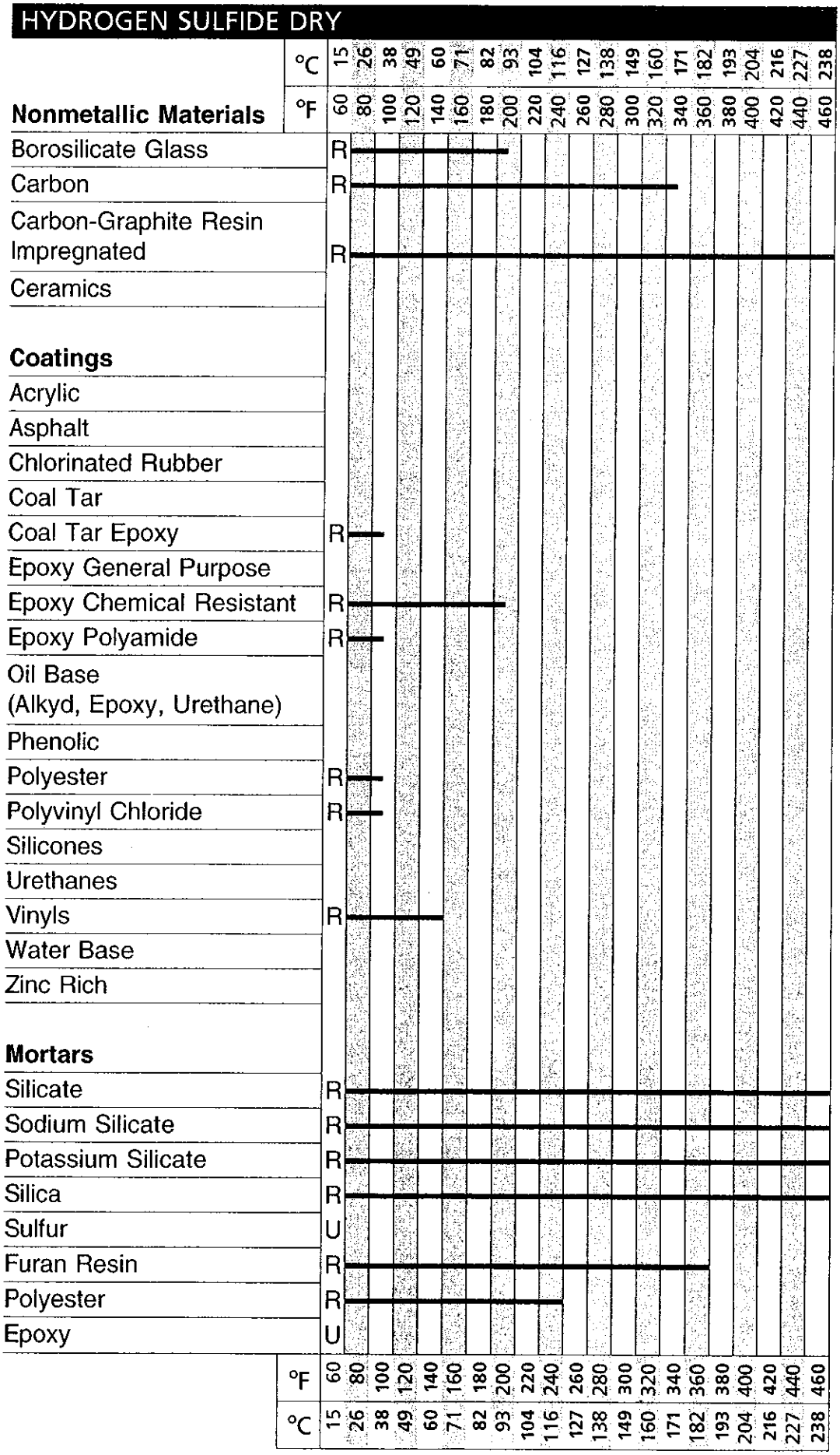
R = Resistant

U = Unsatisfactory

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HYDROGEN SULFIDE DRY



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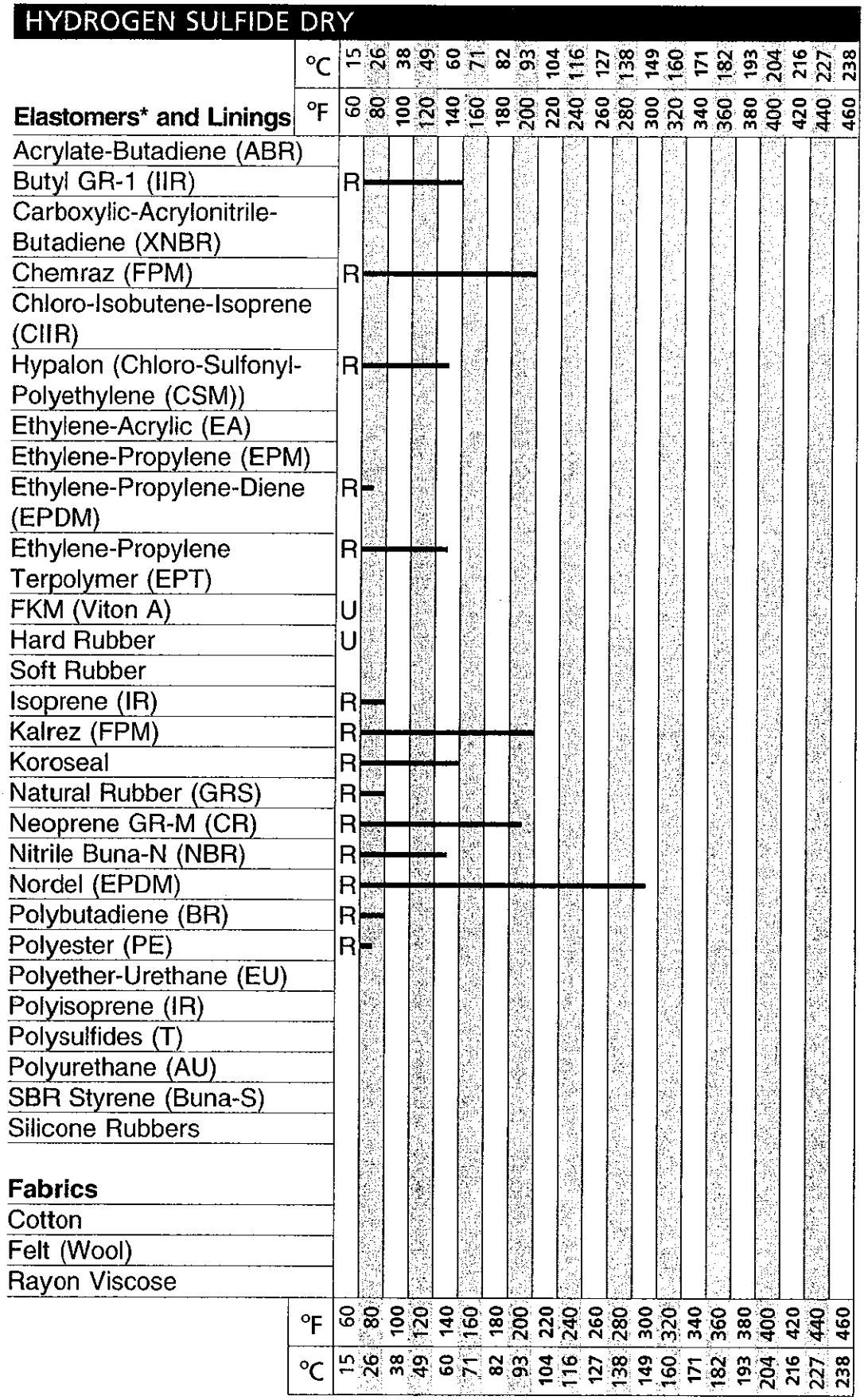
HYDROGEN SULFIDE DRY

Plastics	
ABS	R
Acetal	R
Acrylics	R
Asbestos Reinforced Epoxy	R
Asbestos Reinforced Phenolic	R
Chlorinated Polyether (Penton)	R
CPVC	R
E-CTFE (Halar)	R
Epoxy	R
ETFE (Tefzel)	R
FEP	R
Furan (Furfural Alcohol)	R
Polybutadiene	R
Nylon 6	U
Nylon 11	U
Nylon 66	U
Phenolic	R
PFA (Teflon)	R
Polyamide-Imide	
Polyesters	
Bisphenol A–fumarate	R
Halogenated	R
Hydrogenated Bisphenol A –Bisphenol A	
Isophthalic	R
Terephthalate (PET)	R
Polyetherimide (ULTEM)	
Polyetheretherketone (PEEK)	R
Polyethersulfone (PES)	R
Polyethylene HMW	R
Polyethylene UHMW	R
Polyphenylene Oxide (PPO)	R
Polypropylene (PP)	R
Polystyrene	R
Polysulfone	
Polyvinylidene Chloride	R
PVC Type 1	R
PVC Type 2	R
PVDF (Kynar)	R
Ryton	R
TFE (Teflon) 14	R
Vinyl Ester	R



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HYDROGEN SULFIDE DRY



*See also Nylon 11 under PLASTICS

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HYDROGEN SULFIDE WET

Metals	
Admiralty Brass	U
Aluminum	G
Aluminum Bronze	U
Brass	U
Bronze	U
Carbon Steel*	G
Columbium (Niobium)	E
Copper	U
Hastelloy B/B-2	G
Hastelloy C/C-276	E G
Hastelloy D	
Hastelloy G/G-3	
High Silicon Iron	G
Inconel 600/625	G
Incolloy 800/825	
Lead	U
Monel 400	U
Naval Bronze	S U
Nickel 200/201	U
Ni-Resist	E G
Stainless Steels	
Type 304/347	U
Type 316/316 L	G
Type 400 series	S
Type 904-L	
17-4 PH	U
20 Cb 3	G
E-Bright 26-1	
Silicon Bronze	U
Silicon Copper	U
Stellite	
Tantalum	E
Titanium	E
Zirconium	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

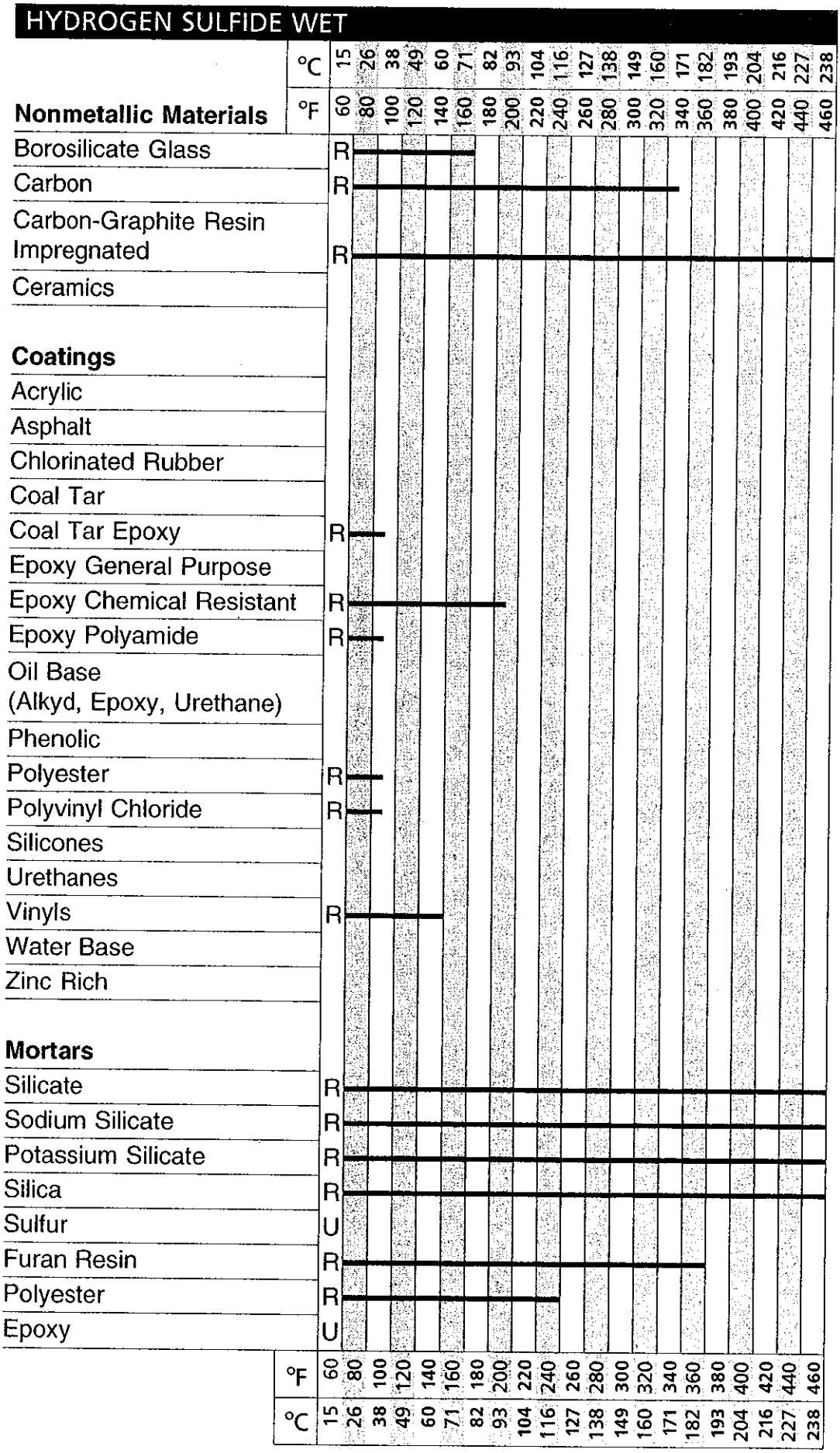
°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS
E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year
S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year
*Depending upon conditions, hydrogen embrittlement may occur

FOR NONMETALLICS
R = Resistant
U = Unsatisfactory

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HYDROGEN SULFIDE WET



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HYDROGEN SULFIDE WET

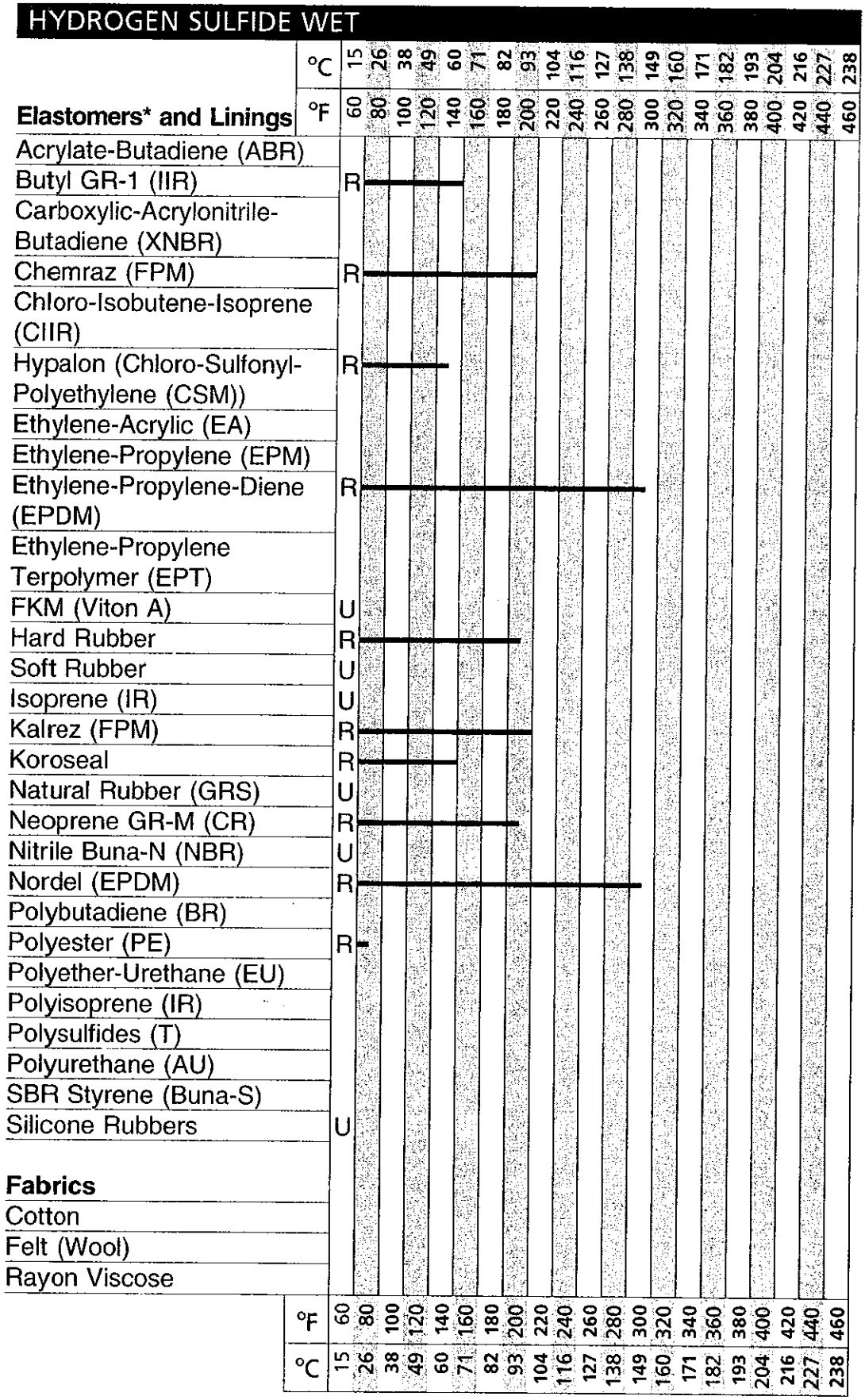
Plastics	
ABS	
Acetal	U
Acrylics	R
Asbestos Reinforced Epoxy	
Asbestos Reinforced Phenolic	
Chlorinated Polyether (Penton)	R
CPVC	
E-CTFE (Halar)	R
Epoxy	R
ETFE (Tefzel)	R
FEP	R
Furan (Furfural Alcohol)	R
Noryl	U
Nylon 6	U
Nylon 11	U
Nylon 66	U
Phenolic	R
PFA (Teflon)	R
Polyamide-Imide	
Polyesters	
Bisphenol A–fumarate	R
Halogenated	R
Hydrogenated Bisphenol A –Bisphenol A	
Isophthalic	R
Terephthalate (PET)	R
Polyetherimide (ULTEM)	
Polyetheretherketone (PEEK)	R
Polyethersulfone (PES)	R
Polyethylene HMW	R
Polyethylene UHMW	R
Polyphenylene Oxide (PPC)	R
Polypropylene (PP)	R
Polystyrene	
Polysulfone	
Polyvinylidene Chloride	R
PVC Type 1	R
PVC Type 2	R
PVDF (Kynar)	R
Ryton	
TFE (Teflon) 14	R
Vinyl Ester	R

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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HYDROGEN SULFIDE WET



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Metals	°C	°F
Admiralty Brass	U	
Aluminum	U	
Aluminum Bronze	U	
Brass	U	
Bronze	U	
Carbon Steel		
Columbium (Niobium)		
Copper		
Hastelloy B/B-2		
Hastelloy C/C-276		
Hastelloy D		
Hastelloy G/G-3		
High Silicon Iron		
Inconel 600/625		
Incolloy 800/825		
Lead		
Monel 400	G	
Naval Bronze		
Nickel 200/201		
Ni-Resist		
Stainless Steels		
Type 304/347		
Type 316/316 L	G	
Type 400 series	U	
Type 904-L		
17-4 PH		
20 Cb 3	G	
E-Bright 26-1		
Silicon Bronze	U	
Silicon Copper		
Stellite		
Tantalum		
Titanium		
Zirconium		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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HYDROGEN SULFITE

Nonmetallic Materials
Borosilicate Glass
Carbon
Carbon-Graphite Resin Impregnated
Ceramics

Coatings
Acrylic
Asphalt
Chlorinated Rubber
Coal Tar
Coal Tar Epoxy
Epoxy General Purpose
Epoxy Chemical Resistant
Epoxy Polyamide
Oil Base (Alkyd, Epoxy, Urethane)
Phenolic
Polyester
Polyvinyl Chloride
Silicones
Urethanes
Vinyls
Water Base
Zinc Rich

Mortars
Silicate
Sodium Silicate
Potassium Silicate
Silica
Sulfur
Furan Resin
Polyester
Epoxy

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460

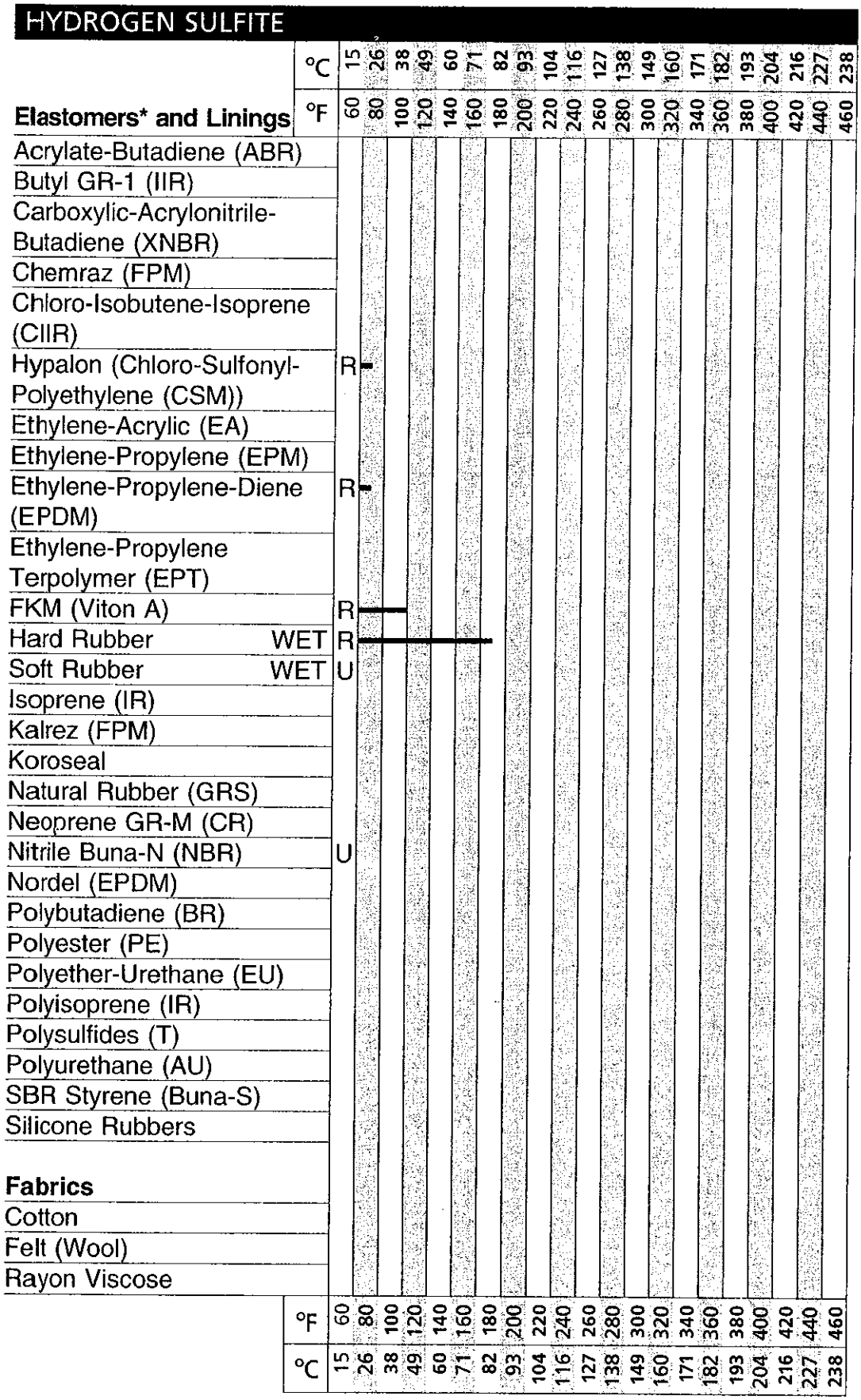
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HYDROGEN SULFITE

Plastics	°C	°F
ABS	15–238	60–460
Acetal	15–238	60–460
Acrylics	15–238	60–460
Asbestos Reinforced Epoxy	15–238	60–460
Asbestos Reinforced Phenolic	15–238	60–460
Chlorinated Polyether (Penton)	15–238	60–460
CPVC	15–238	60–460
E-CTFE (Halar)	15–238	60–460
Epoxy	15–238	60–460
ETFE (Tefzel)	15–238	60–460
FEP	15–238	60–460
Furan (Furfural Alcohol)	15–238	60–460
Noryl	15–238	60–460
Nylon 6	15–238	60–460
Nylon 11	15–238	60–460
Nylon 66	15–238	60–460
Phenolic	15–238	60–460
PFA (Teflon)	15–238	60–460
Polyamide-Imide	15–238	60–460
Polyesters	15–238	60–460
Bisphenol A–fumarate	15–238	60–460
Halogenated	15–238	60–460
Hydrogenated Bisphenol A –Bisphenol A	15–238	60–460
Isophthalic	15–238	60–460
Terephthalate (PET)	15–238	60–460
Polyetherimide (ULTEM)	15–238	60–460
Polyetheretherketone (PEEK)	15–238	60–460
Polyethersulfone (PES)	15–238	60–460
Polyethylene HMW	15–238	60–460
Polyethylene UHMW	15–238	60–460
Polymethylpentene	15–238	60–460
Polypropylene (PP)	15–238	60–460
Polystyrene	15–238	60–460
Polysulfone	15–238	60–460
Polyvinylidene Chloride	15–238	60–460
PVC Type 1	15–238	60–460
PVC Type 2	15–238	60–460
PVDF (Kynar)	15–238	60–460
Ryton	15–238	60–460
TFE (Teflon)	15–238	60–460
Vinyl Ester	15–238	60–460

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HYDROGEN SULFITE



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HYDROIODIC ACID (49% + 12% IODINE)

Metals	
Admiralty Brass	
Aluminum	U
Aluminum Bronze	
Brass	U
Bronze	
Carbon Steel	
Columbium (Niobium)	
Copper	U
Hastelloy B/B-2	G
Hastelloy C/C-276	G
Hastelloy D	
Hastelloy G/G-3	
High Silicon Iron	U
Inconel 600/625	U
Incolloy 800/825	
Lead	
Monel 400	U
Naval Bronze	
Nickel 200/201	U
Ni-Resist	
Stainless Steels	
Type 304/347	U
Type 316/316 L	U
Type 400 series	
Type 904-L	
17-4 PH	
20 Cb 3	
E-Bright 26-1	
Silicon Bronze	
Silicon Copper	
Stellite	
Tantalum	E G
Titanium	S
Zirconium	E

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238 249 260 271 282 293

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

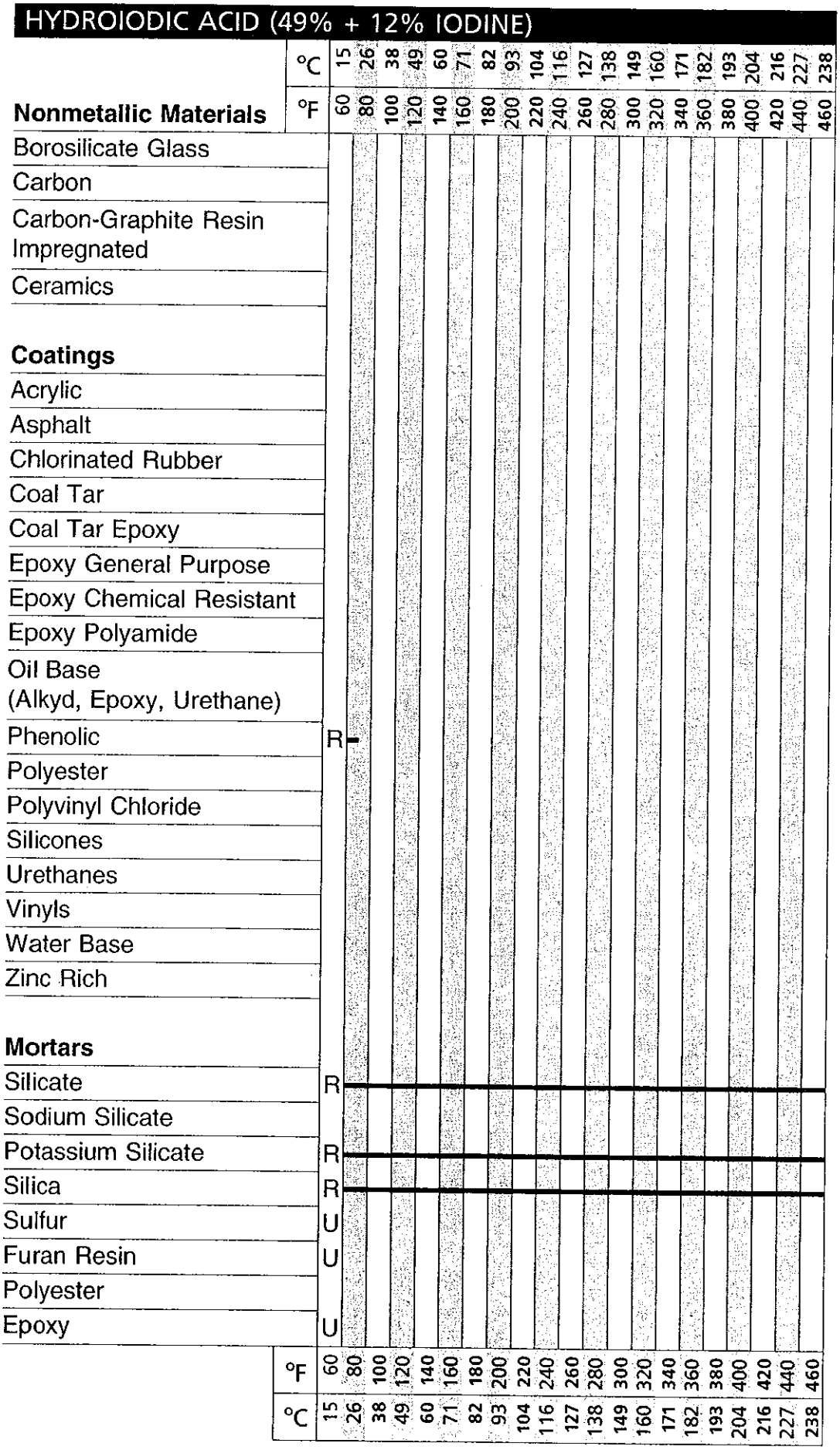
R = Resistant

U = Unsatisfactory

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HYDROIODIC ACID (49% + 12% IODINE)



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HYDROIODIC ACID (49% + 12% IODINE)

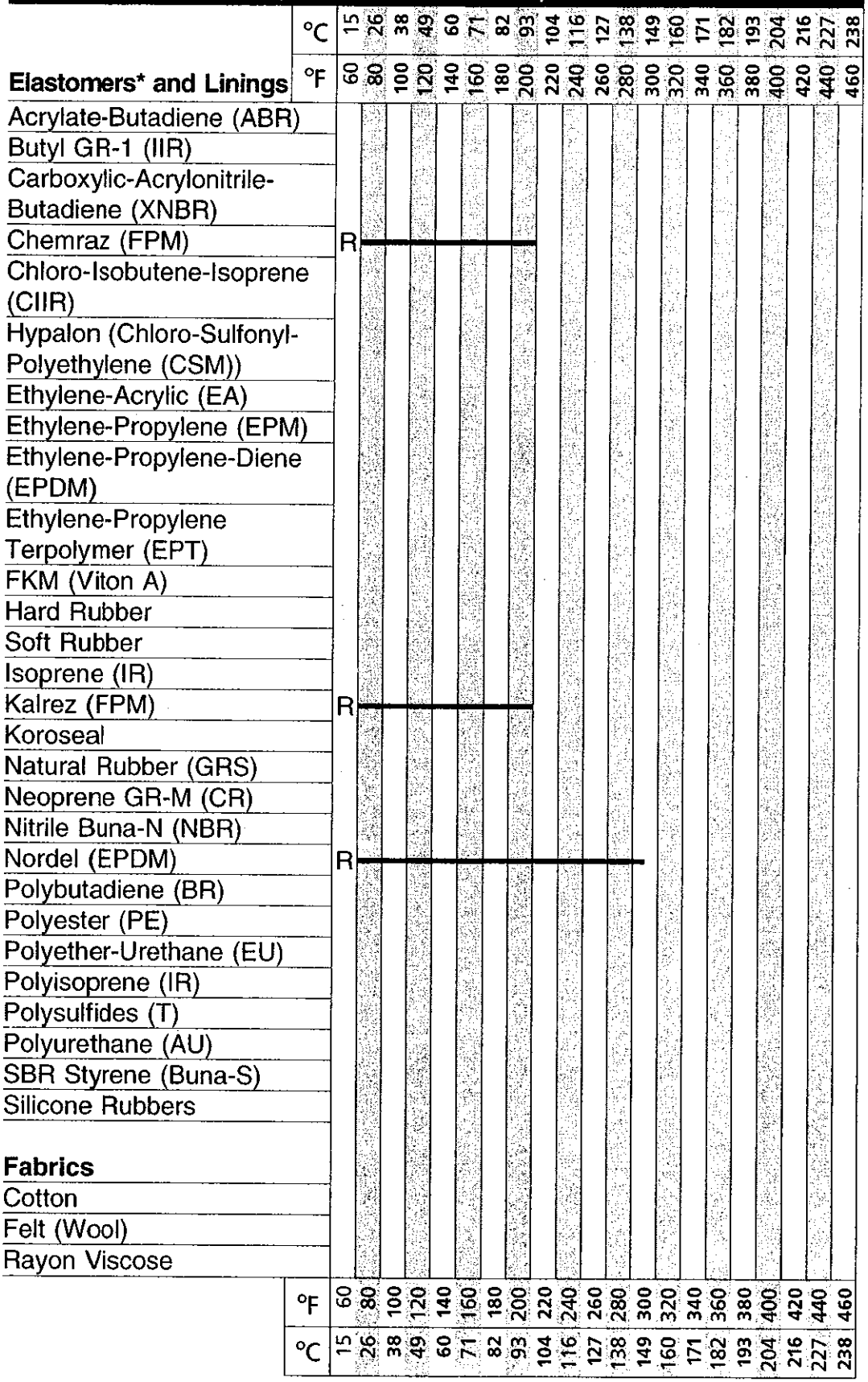
Plastics		°C	°F
ABS			
Acetal			
Acrylics			
Asbestos Reinforced Epoxy			
Asbestos Reinforced Phenolic			
Chlorinated Polyether (Penton)		R	
CPVC	20%	R	
E-CTFE (Halar)		R	
Epoxy			
ETFE (Tefzel)		R	
FEP		R	
Furan (Furfural Alcohol)		U	
Noryl			
Nylon 6			
Nylon 11			
Nylon 66			
Phenolic		R	
PFA (Teflon)			
Polyamide-Imide			
Polyesters			
Bisphenol A–fumarate	10%	R	
Halogenated	10%	R	
Hydrogenated Bisphenol A –Bisphenol A			
Isophthalic	10%	R	
Terephthalate (PET)			
Polyetherimide (ULTEM)			
Polyetheretherketone (PEEK)			
Polyethersulfone (PES)			
Polyethylene HMW			
Polyethylene UHMW			
Polymethylpentene			
Polypropylene (PP)		U	
Polystyrene			
Polysulfone			
Polyvinylidene Chloride		R	
PVC Type 1	20%	R	
PVC Type 2			
PVDF (Kynar)		R	
Ryton			
TFE (Teflon)		R	
Vinyl Ester	10%	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

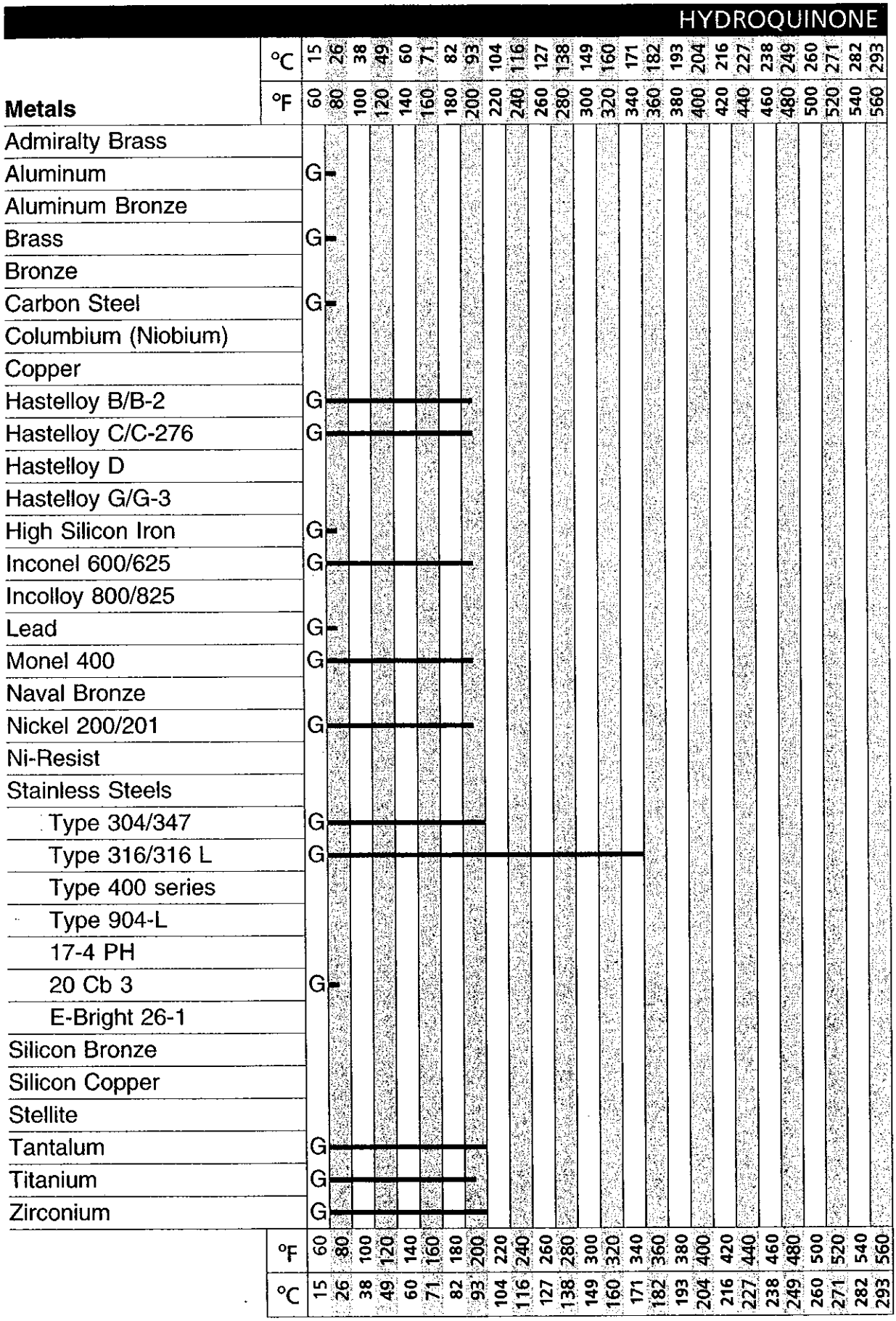
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HYDROIODIC ACID (49% + 12% IODINE)



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

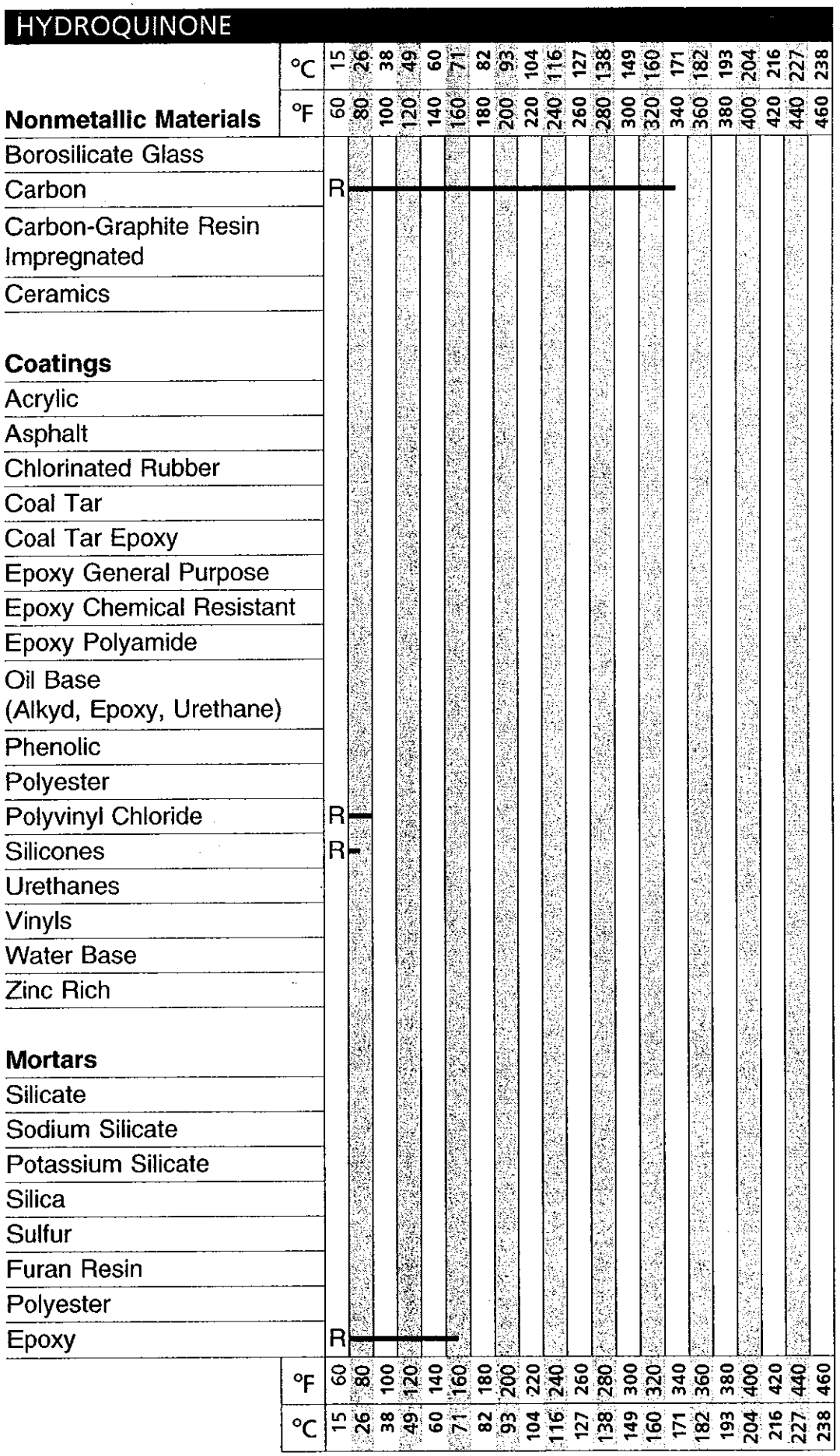
R = Resistant

U = Unsatisfactory

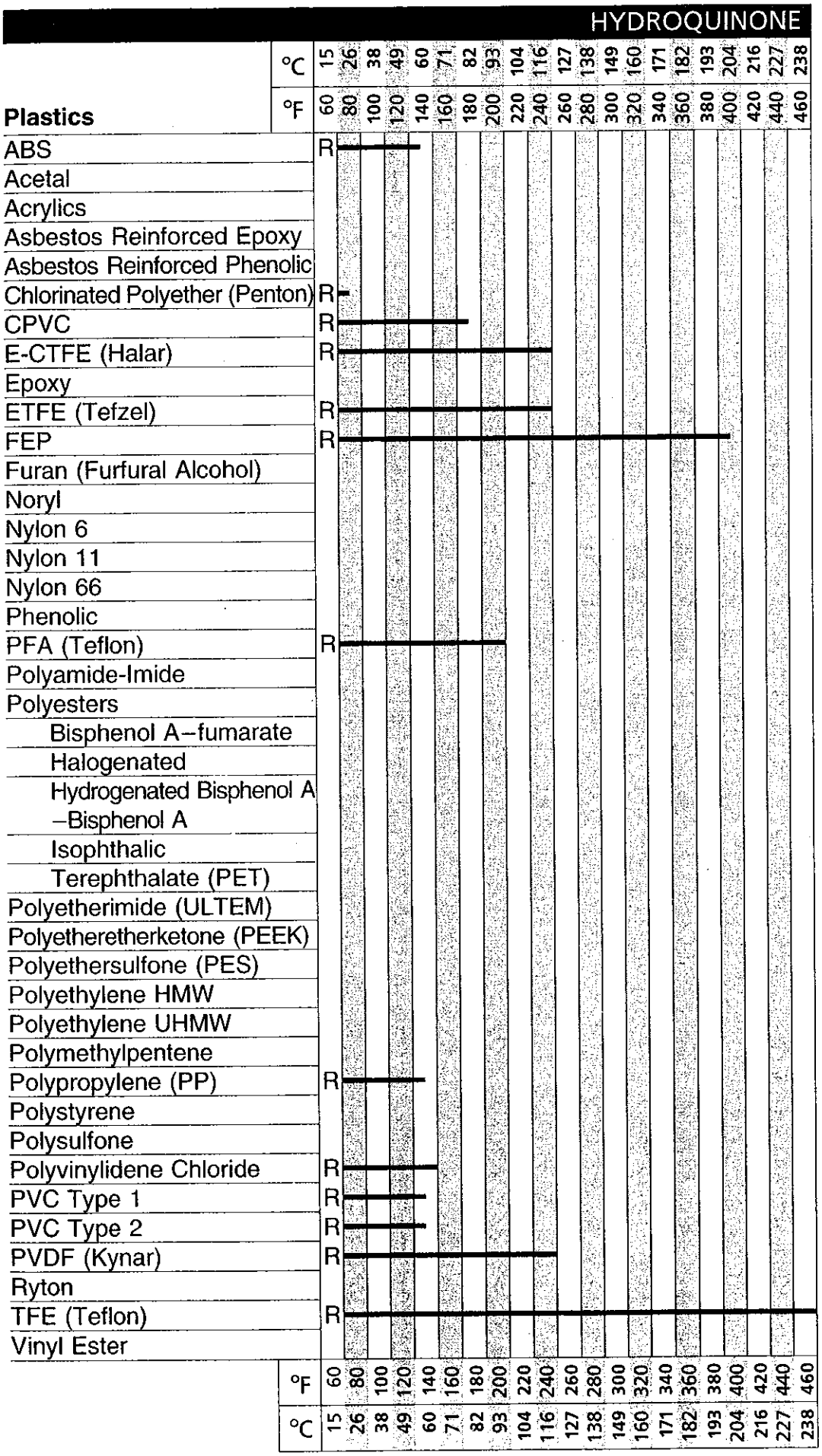
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HYDROQUINONE

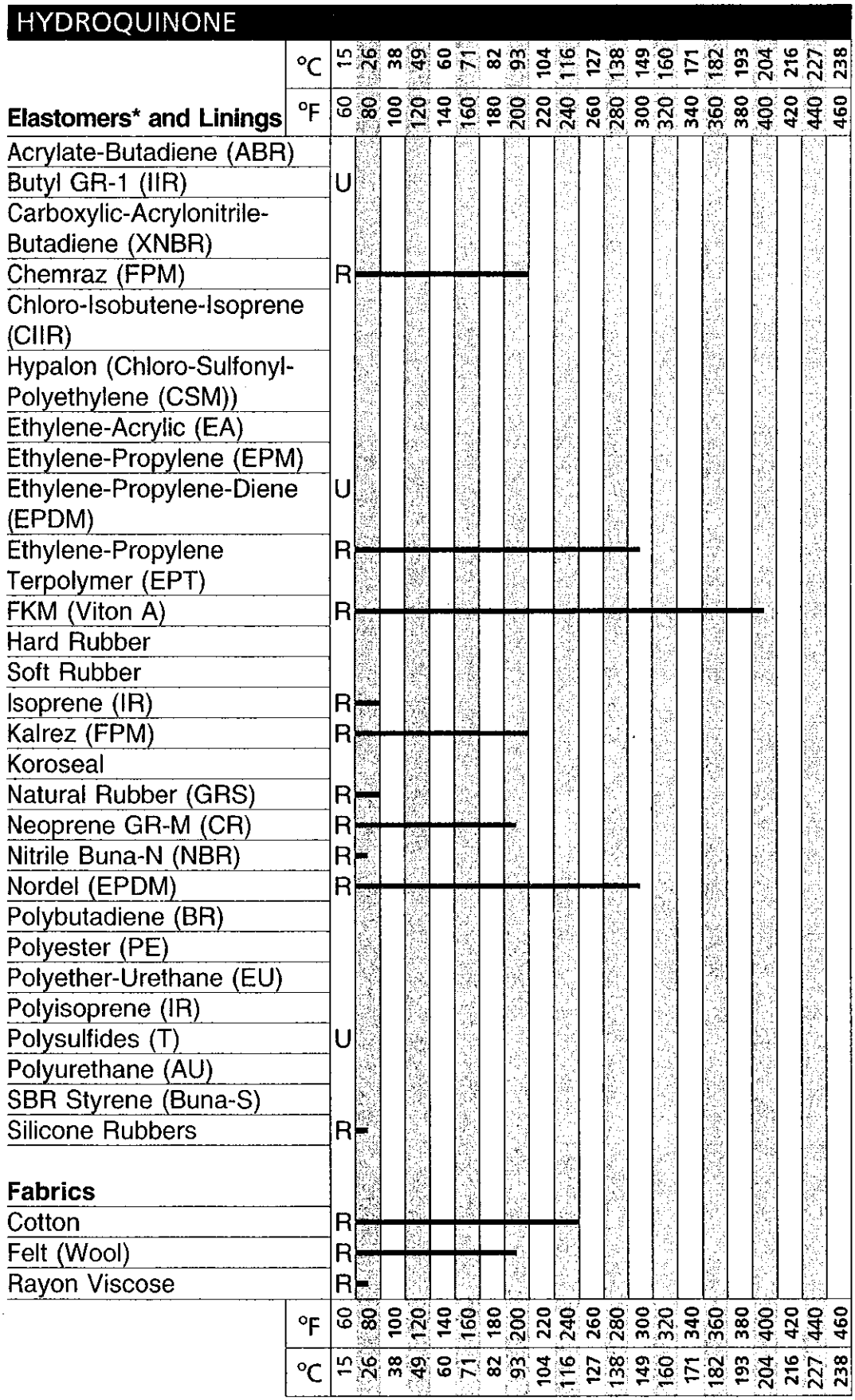


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HYDROQUINONE



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HYPOCHLOROUS ACID

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum		U																									
Aluminum Bronze																											
Brass		U																									
Bronze		U																									
Carbon Steel		U																									
Columbium (Niobium)																											
Copper		U																									
Hastelloy B/B-2		G																									
Hastelloy C/C-276		G																									
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead		U																									
Monel 400		U																									
Naval Bronze																											
Nickel 200/201		U																									
Ni-Resist																											
Stainless Steels																											
Type 304/347		U																									
Type 316/316 L		U																									
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3																											
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum		E																									
Titanium		G																									
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

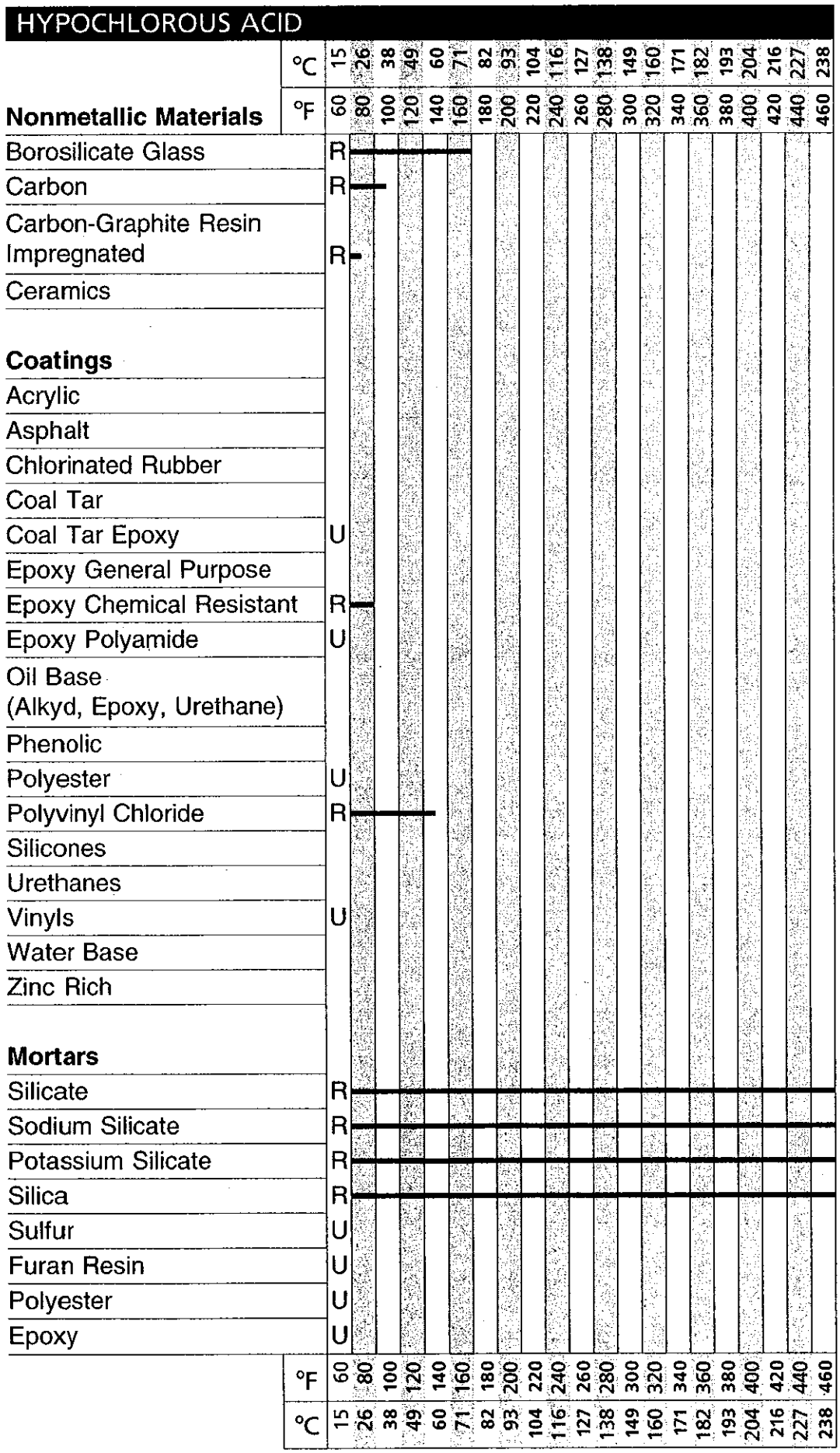
R = Resistant

U = Unsatisfactory

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HYPOCHLOROUS ACID



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HYPOCHLOROUS ACID

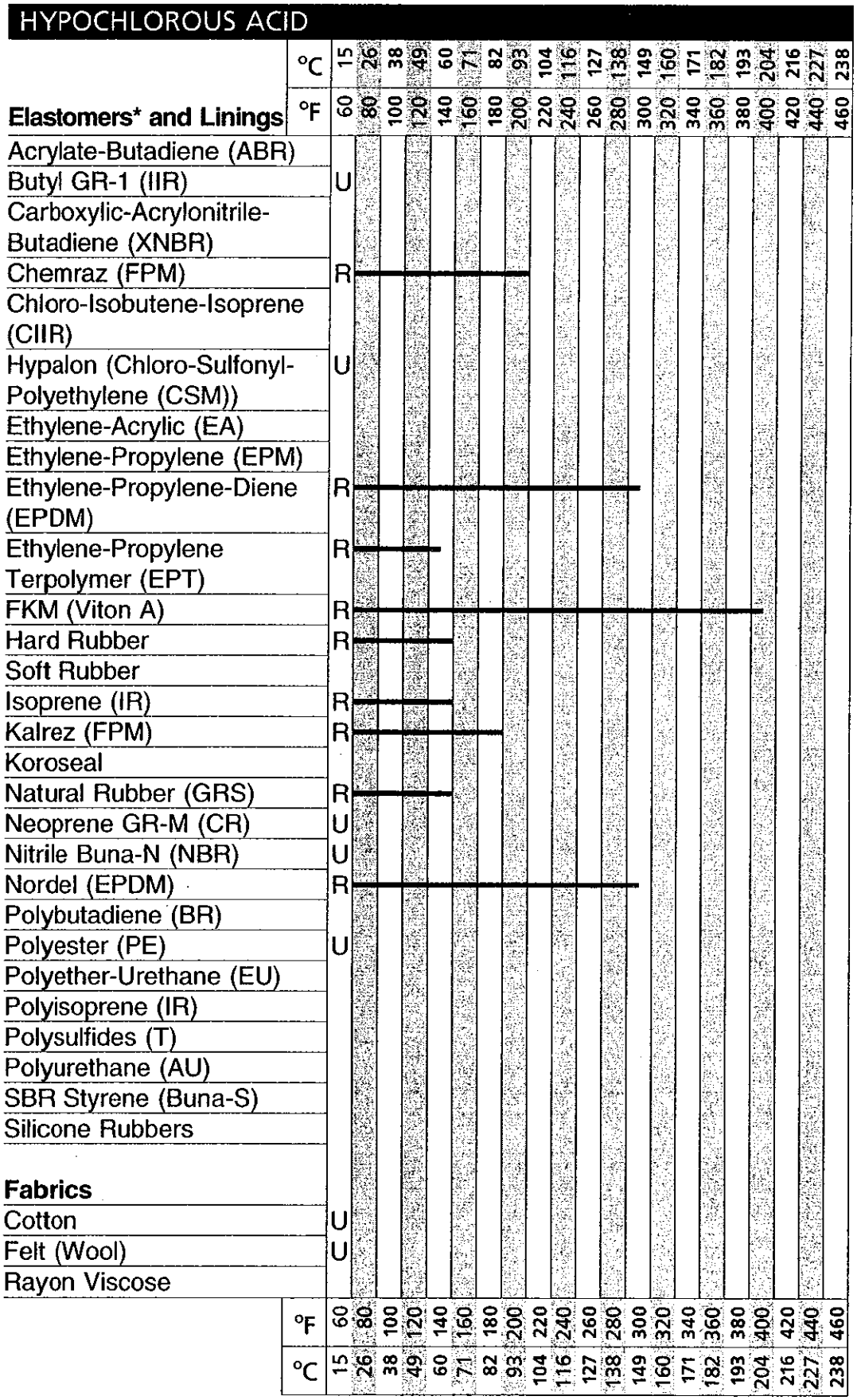
Plastics	°C	°F
ABS	R	
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)	R	
CPVC	R	
E-CTFE (Halar)	R	
Epoxy	R	
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol) 10%	U	
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate 20%	R	
Halogenated 10%	R	
Hydrogenated Bisphenol A –Bisphenol A 50%	R	
Isophthalic	R	
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW	R	
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)	R	
Polystyrene		
Polysulfone		
Polyvinylidene Chloride	R	
PVC Type 1	R	
PVC Type 2	R	
PVDF (Kynar)	R	
Ryton		
TFE (Teflon)	R	
Vinyl Ester 50%	R	

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

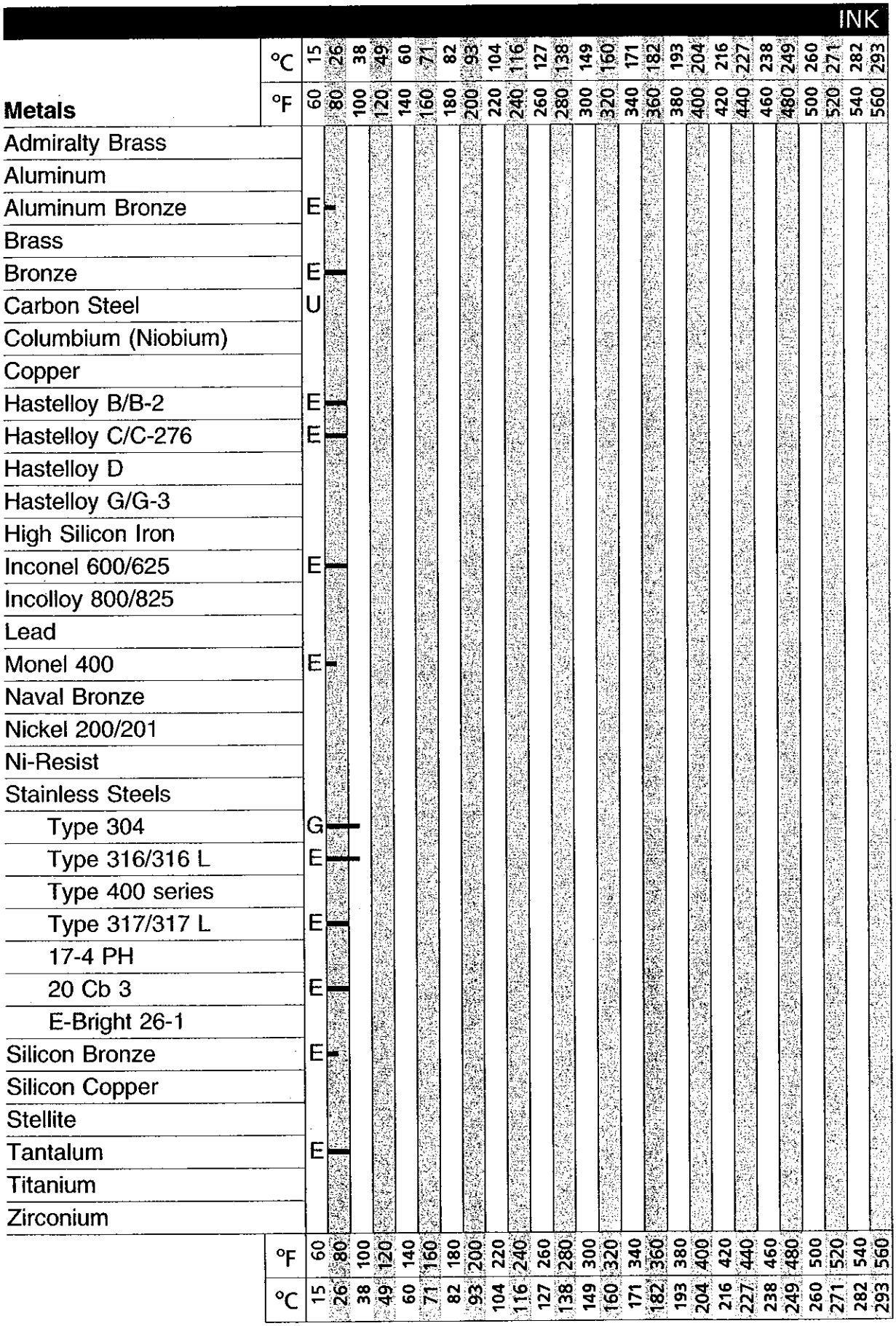
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HYPOCHLOROUS ACID



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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INK

Nonmetallic Materials
Borosilicate Glass
Carbon
Carbon-Graphite Resin Impregnated
Ceramics
Coatings
Acrylic
Asphalt
Chlorinated Rubber
Coal Tar
Coal Tar Epoxy
Epoxy General Purpose
Epoxy Chemical Resistant
Epoxy Polyamide
Oil Base (Alkyd, Epoxy, Urethane)
Phenolic
Polyester
Polyvinyl Chloride
Silicones
Urethanes
Vinyls
Water Base
Zinc Rich
Mortars
Silicate
Sodium Silicate
Potassium Silicate
Silica
Sulfur
Furan Resin
Polyester
Epoxy

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460

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Plastics	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Polybutylene Terephthalate		R																				
Polycarbonate		R																				
Acrylics																						
Asbestos Reinforced Epoxy																						
Asbestos Reinforced Phenolic																						
Chlorinated Polyether (Penton)																						
CPVC																						
E-CTFE (Halar)																						
Epoxy																						
ETFE (Tefzel)																						
FEP		R																				
Furan (Furfural Alcohol)																						
Noryl																						
Nylon 6																						
Nylon 11																						
Nylon 66																						
Phenolic																						
PFA (Teflon)		R																				
Polyamide-Imide																						
Polyesters																						
Bisphenol A–fumarate																						
Halogenated																						
Hydrogenated Bisphenol A –Bisphenol A																						
Isophthalic																						
Terephthalate (PET)																						
Polyetherimide																						
Polyetheretherketone (PEEK)																						
Polyethersulfone (PES)																						
Polyethylene HMW																						
Polyethylene UHMW																						
Polymethylpentene																						
Polypropylene (PP)																						
Polystyrene																						
Polysulfone																						
Polyvinylidene Chloride																						
PVC Type 1																						
PVC Type 2																						
PVDF (Kynar)																						
Ryton																						
TFE (Teflon)		R																				
Vinyl Ester																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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INK

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)																						
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)	R																					
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)	R																					
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)																						
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)	R																					
Nitrile Buna-N (NBR)	R																					
Nordel (EPDM)																						
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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Metals		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass			U																									
Aluminum			E																									
Aluminum Bronze			U																									
Brass			U																									
Bronze			U																									
Carbon Steel	20%		U																									
Columbium (Niobium)																												
Copper			U																									
Hastelloy B/B-2			U																									
Hastelloy C/C-276	1		E																									
Hastelloy D																												
Hastelloy G/G-3																												
High Silicon Iron			U																									
Inconel 600/625			U																									
Incolloy 800/825			U																									
Galv. Stl.	MOIST		U																									
Monel 400			E																									
Naval Bronze			G																									
Nickel 200/201			E																									
Ni-Resist																												
Stainless Steels																												
Type 304/347			U																									
Type 316/316 L			U																									
Type 400 series			U																									
Type 904-L																												
17-4 PH			U																									
20 Cb 3			G																									
E-Bright 26-1																												
Silicon Bronze			U																									
Silicon Copper			U																									
Stellite																												
Tantalum			G																									
Titanium			E																									
Zirconium	12%		E																									
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

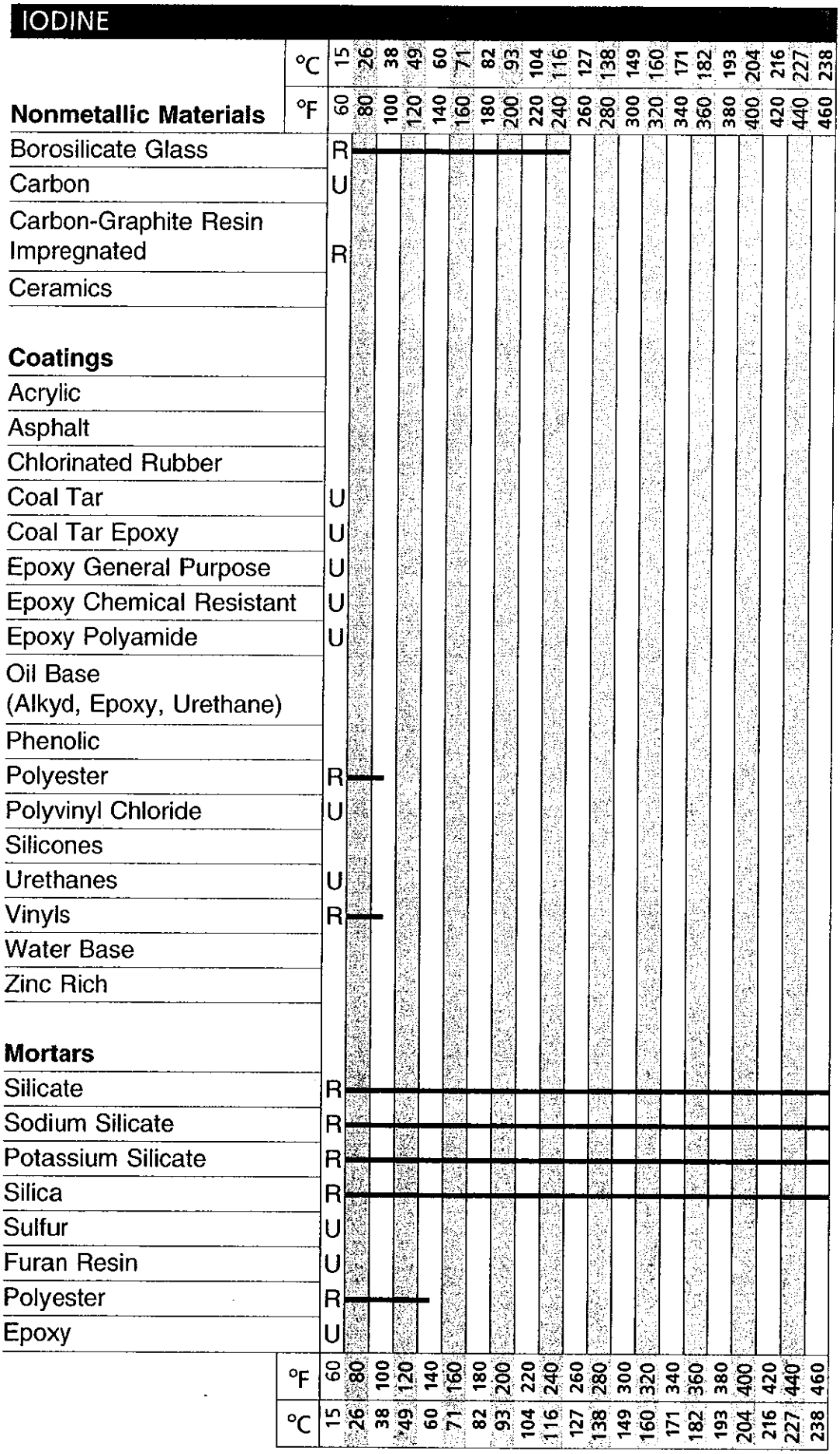
R = Resistant

U = Unsatisfactory

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IODINE



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IODINE

Plastics	
ABS	U
Acetal	
Acrylics	
Asbestos Reinforced Epoxy	
Asbestos Reinforced Phenolic	
Chlorinated Polyether (Penton)	R
CPVC	U
E-CTFE (Halar)	R
Epoxy	U
ETFE (Tefzel)	R
FEP	R
Furan (Furfural Alcohol)	U
Noryl	U
Nylon 6	U
Nylon 11	U
Nylon 66	U
Phenolic	U
PFA (Teflon) 14	R
Polyamide-Imide	
Polyesters	
Bisphenol A–fumarate	R
Halogenated	R
Hydrogenated Bisphenol A –Bisphenol A	
Isophthalic	R
Terephthalate (PET)	R
Polyetherimide (ULTEM)	
Polyetheretherketone (PEEK)	
Polyethersulfone (PES)	
Polyethylene HMW	R
Polyethylene UHMW	R
Polymethylpentene	
Polypropylene (PP)	U
Polystyrene	
Polysulfone	
Polyvinylidene Chloride GAS	R
PVC Type 1	U
PVC Type 2	U
PVDF (Kynar)	R
Ryton	R
TFE (Teflon)	R
Vinyl Ester	R

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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IODINE

Elastomers* and Linings	°C	°F
Acrylate-Butadiene (ABR)		
Butyl GR-1 (IIR)		
Carboxylic-Acrylonitrile-Butadiene (XNBR)		
Chemraz (FPM)	R	
Chloro-Isobutene-Isoprene (CIIR)		
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))	R	
Ethylene-Acrylic (EA)		
Ethylene-Propylene (EPM)		
Ethylene-Propylene-Diene (EPDM)	R	
Ethylene-Propylene Terpolymer (EPT)	U	
FKM (Viton A)	R	
Hard Rubber		
Soft Rubber		
Isoprene (IR)	U	
Kalrez (FPM)	R	
Koroseal		
Natural Rubber (GRS)	U	
Neoprene GR-M (CR)	U	
Nitrile Buna-N (NBR)	R U	
Nordel (EPDM)	R	
Polybutadiene (BR)		
Polyester (PE)		
Polyether-Urethane (EU)		
Polyisoprene (IR)		
Polysulfides (T)		
Polyurethane (AU)	U	
SBR Styrene (Buna-S)		
Silicone Rubbers		
Fabrics		
Cotton		
Felt (Wool)	U	
Rayon Viscose	U	

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460

*See also Nylon 11 under PLASTICS

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IODINE SOLUTION 10%

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum		U																									
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel		U																									
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276		G																									
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400		U																									
Naval Bronze		U																									
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347		U																									
Type 316/316 L		U																									
Type 430		U																									
Type 317/317 L		G																									
17-4 PH		U																									
20 Cb 3		U																									
Type 321		U																									
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium		E																									
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

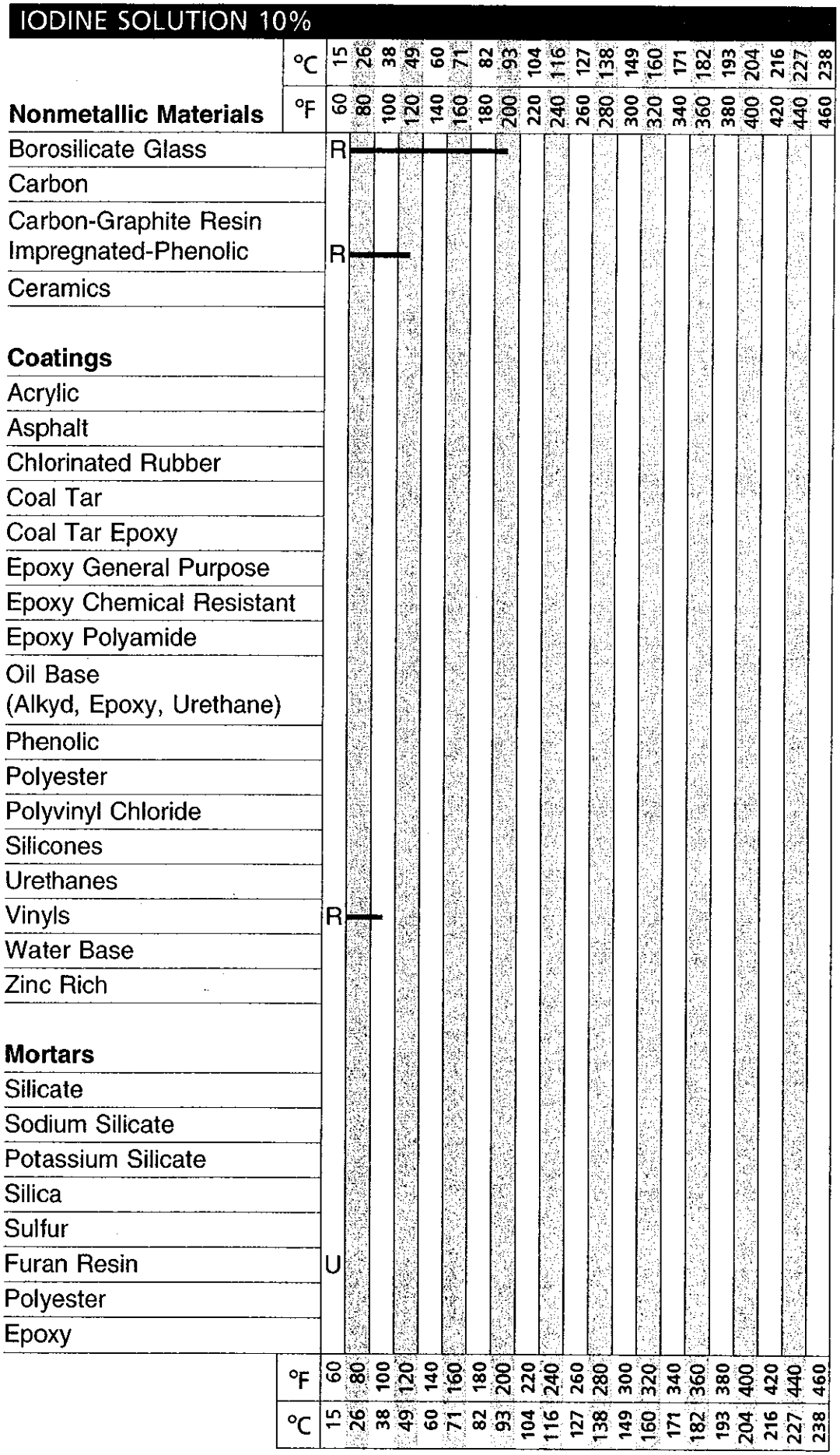
R = Resistant

U = Unsatisfactory

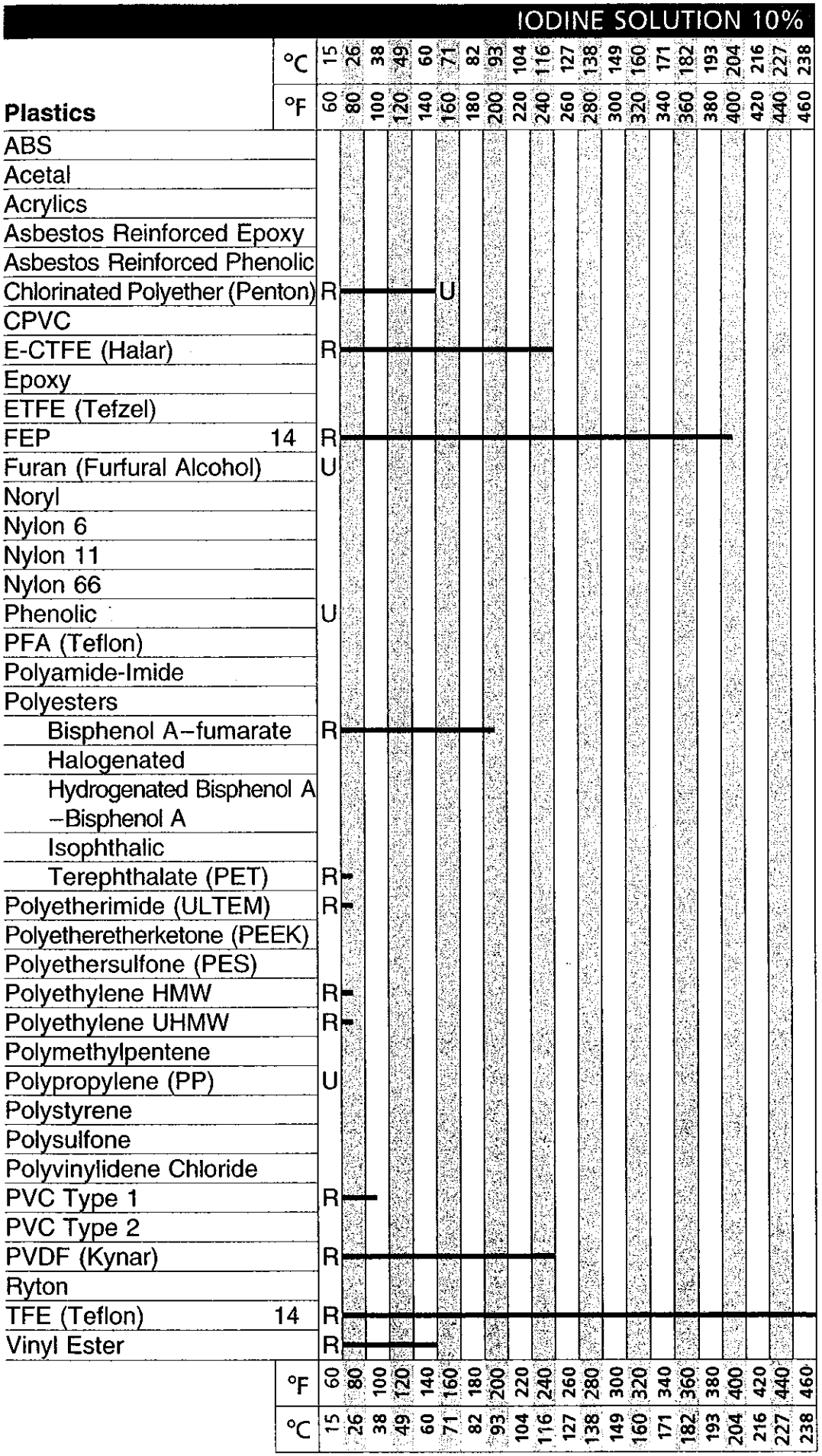
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IODINE SOLUTION 10%

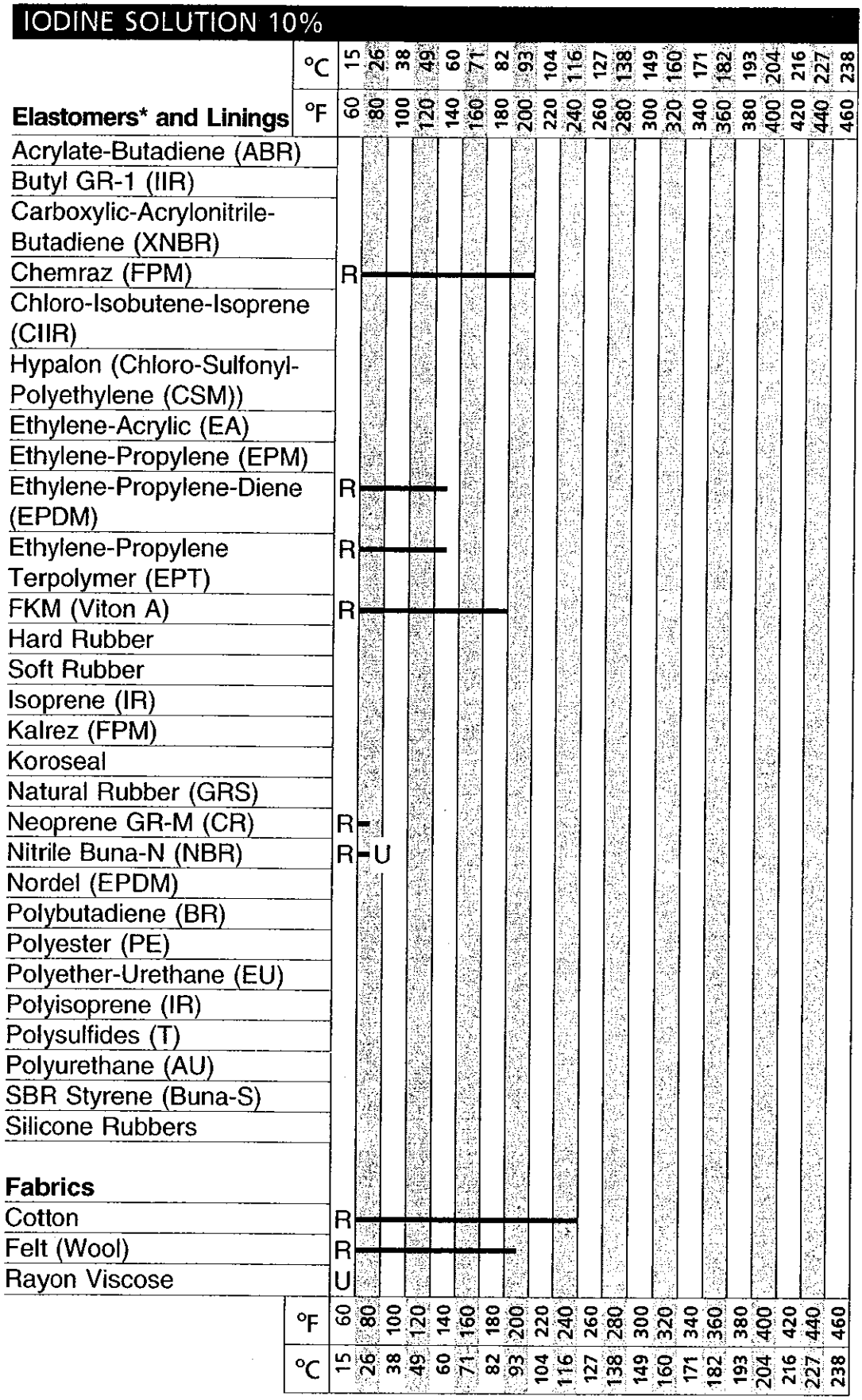


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IODINE SOLUTION 10%



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IODINE SOLUTION (SAT.)

Metals		°C	°F
Admiralty Brass	20%	U	
Aluminum		U	
Aluminum Bronze			
Brass			
Bronze			
Carbon Steel	20%	U	
Columbium (Niobium)			
Copper			
Hastelloy B/B-2	12%	G	
Hastelloy C/C-276	12%	G	
Hastelloy D			
Hastelloy G/G-3			
High Silicon Iron			
Inconel 600/625	20%	U	
Incolloy 800/825			
Lead			
Monel 400		U	
Naval Bronze		U	
Nickel 200/201	20%	U	
Ni-Resist			
Stainless Steels			
Type 304/347		U	
Type 316/316 L		U	
Type 400 series	20%	U	
Type 904-L			
17-4 PH		U	
20 Cb 3		G	
E-Bright 26-1			
Silicon Bronze			
Silicon Copper	20%	U	
Stellite			
Tantalum			
Titanium		G	
Zirconium	12%	E	

°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

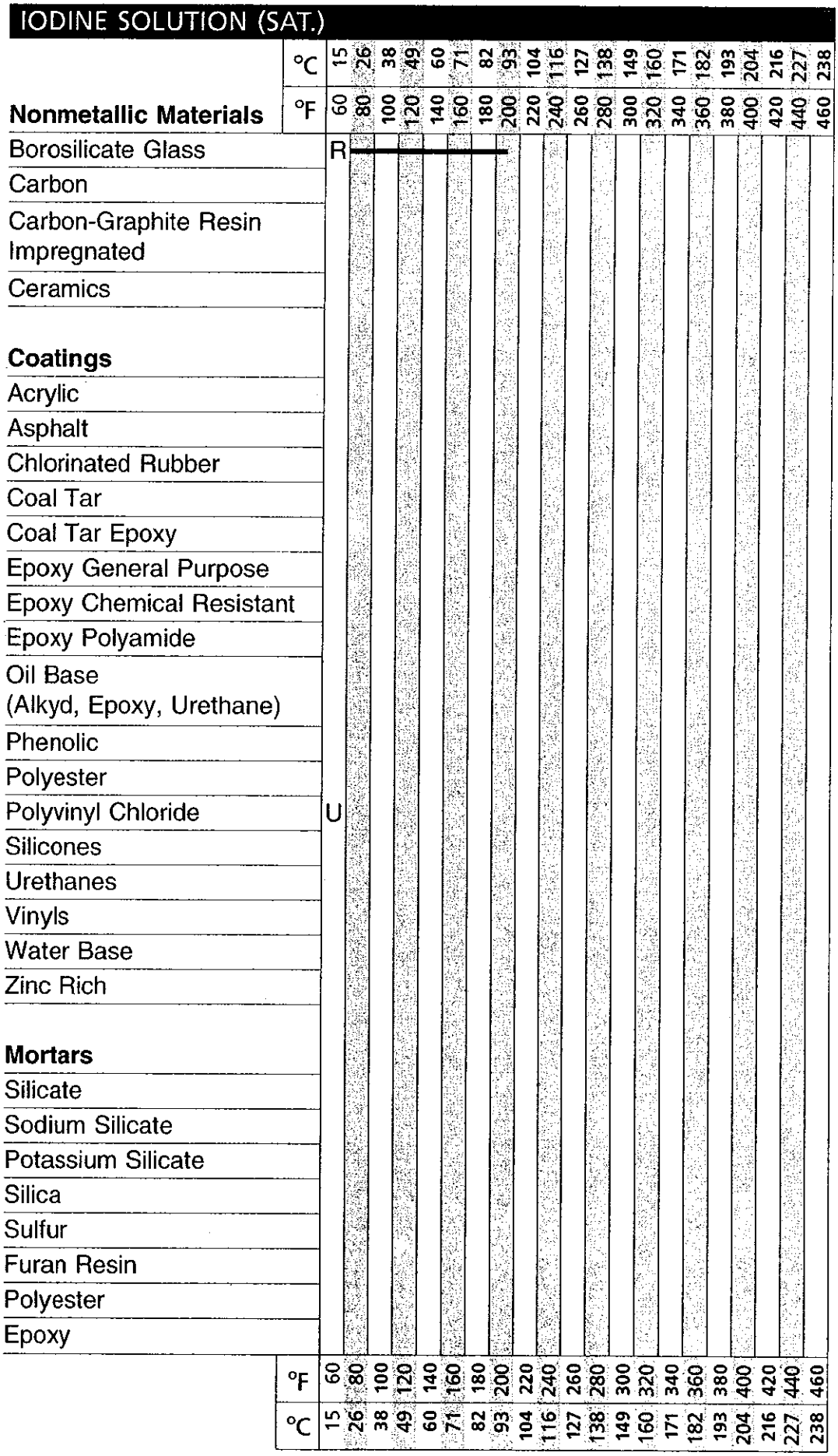
R = Resistant

U = Unsatisfactory

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IODINE SOLUTION (SAT.)



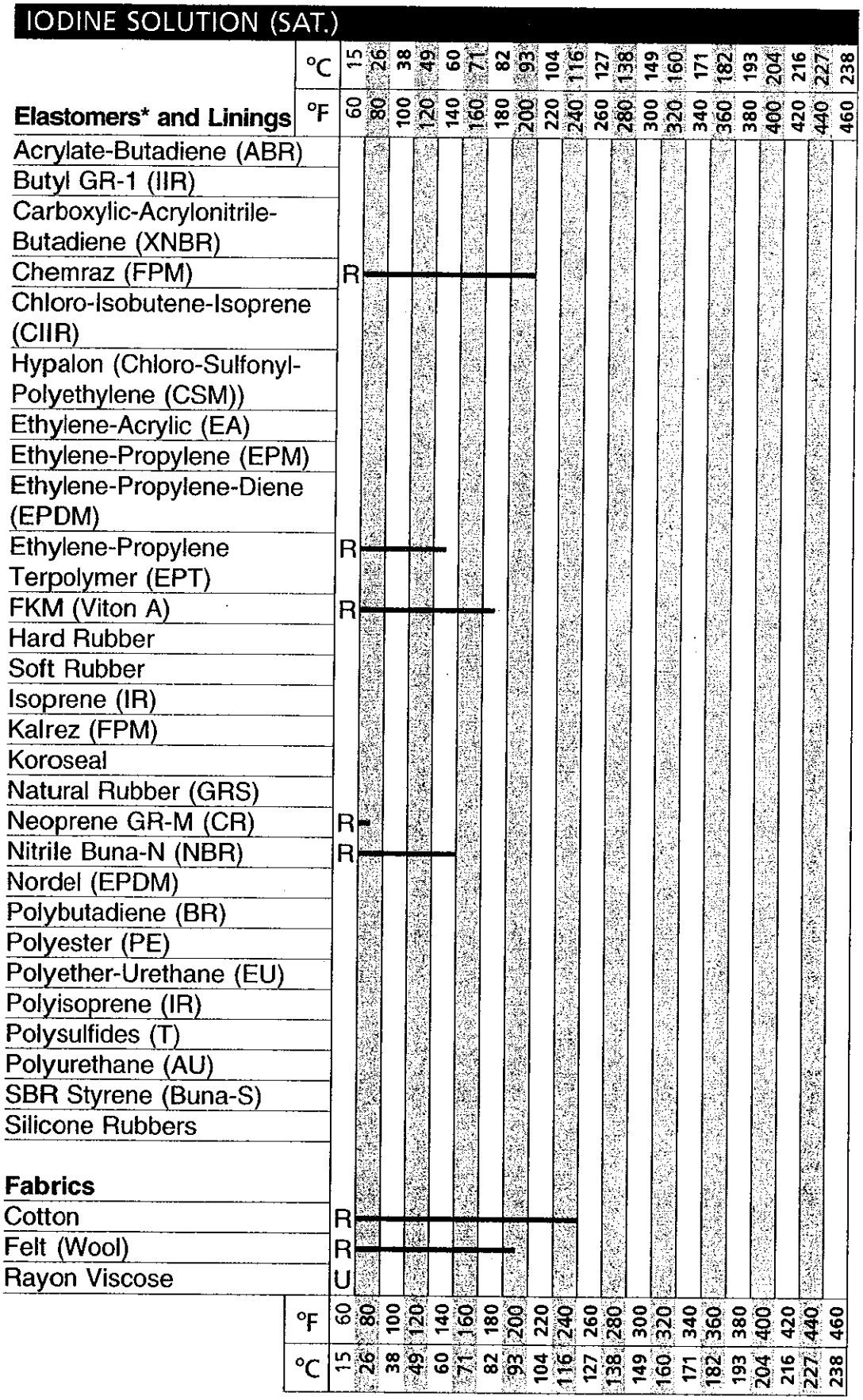
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IODINE SOLUTION (SAT.)

Plastics		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
ABS			U																				
Acetal																							
Acrylics																							
Asbestos Reinforced Epoxy																							
Asbestos Reinforced Phenolic																							
Chlorinated Polyether (Penton)																							
CPVC																							
E-CTFE (Halar)			R																				
Epoxy			R																				
ETFE (Tefzel)																							
FEP	14		R																				
Furan (Furfural Alcohol)			U																				
Noryl			U																				
Nylon 6			U																				
Nylon 11																							
Nylon 66			U																				
Phenolic			U																				
PFA (Teflon)																							
Polyamide-Imide																							
Polyesters																							
Bisphenol A–fumarate			R																				
Halogenated																							
Hydrogenated Bisphenol A –Bisphenol A																							
Isophthalic																							
Terephthalate (PET)																							
Polyetherimide (ULTEM)			R																				
Polyetheretherketone (PEEK)																							
Polyethersulfone (PES)																							
Polyethylene HMW			R																				
Polyethylene UHMW			R																				
Polymethylpentene																							
Polypropylene (PP)			U																				
Polystyrene																							
Polysulfone																							
Polyvinylidene Chloride																							
PVC Type 1			U																				
PVC Type 2			U																				
PVDF (Kynar)			R																				
Ryton																							
TFE (Teflon)	14		R																				
Vinyl Ester			R																				
		°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
		°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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IODINE SOLUTION (SAT.)



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IODINE IN ALCOHOL

Metals	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
Admiralty Brass																											
Aluminum																											
Aluminum Bronze																											
Brass																											
Bronze																											
Carbon Steel																											
Columbium (Niobium)																											
Copper																											
Hastelloy B/B-2																											
Hastelloy C/C-276	G																										
Hastelloy D																											
Hastelloy G/G-3																											
High Silicon Iron																											
Inconel 600/625																											
Incolloy 800/825																											
Lead																											
Monel 400																											
Naval Bronze																											
Nickel 200/201																											
Ni-Resist																											
Stainless Steels																											
Type 304/347																											
Type 316/316 L	G																										
Type 400 series																											
Type 904-L																											
17-4 PH																											
20 Cb 3	G																										
E-Bright 26-1																											
Silicon Bronze																											
Silicon Copper																											
Stellite																											
Tantalum																											
Titanium 1	G																										
Zirconium																											
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238	249	260	271	282	293

FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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IODINE IN ALCOHOL

Nonmetallic Materials	°C 15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F 60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Borosilicate Glass																					
Carbon																					
Carbon-Graphite Resin Impregnated																					
Ceramics																					
Coatings																					
Acrylic																					
Asphalt																					
Chlorinated Rubber																					
Coal Tar																					
Coal Tar Epoxy																					
Epoxy General Purpose																					
Epoxy Chemical Resistant																					
Epoxy Polyamide																					
Oil Base (Alkyd, Epoxy, Urethane)																					
Phenolic																					
Polyester																					
Polyvinyl Chloride	U																				
Silicones																					
Urethanes																					
Vinyls																					
Water Base																					
Zinc Rich																					
Mortars																					
Silicate																					
Sodium Silicate																					
Potassium Silicate																					
Silica																					
Sulfur																					
Furan Resin																					
Polyester																					
Epoxy																					
°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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IODINE IN ALCOHOL

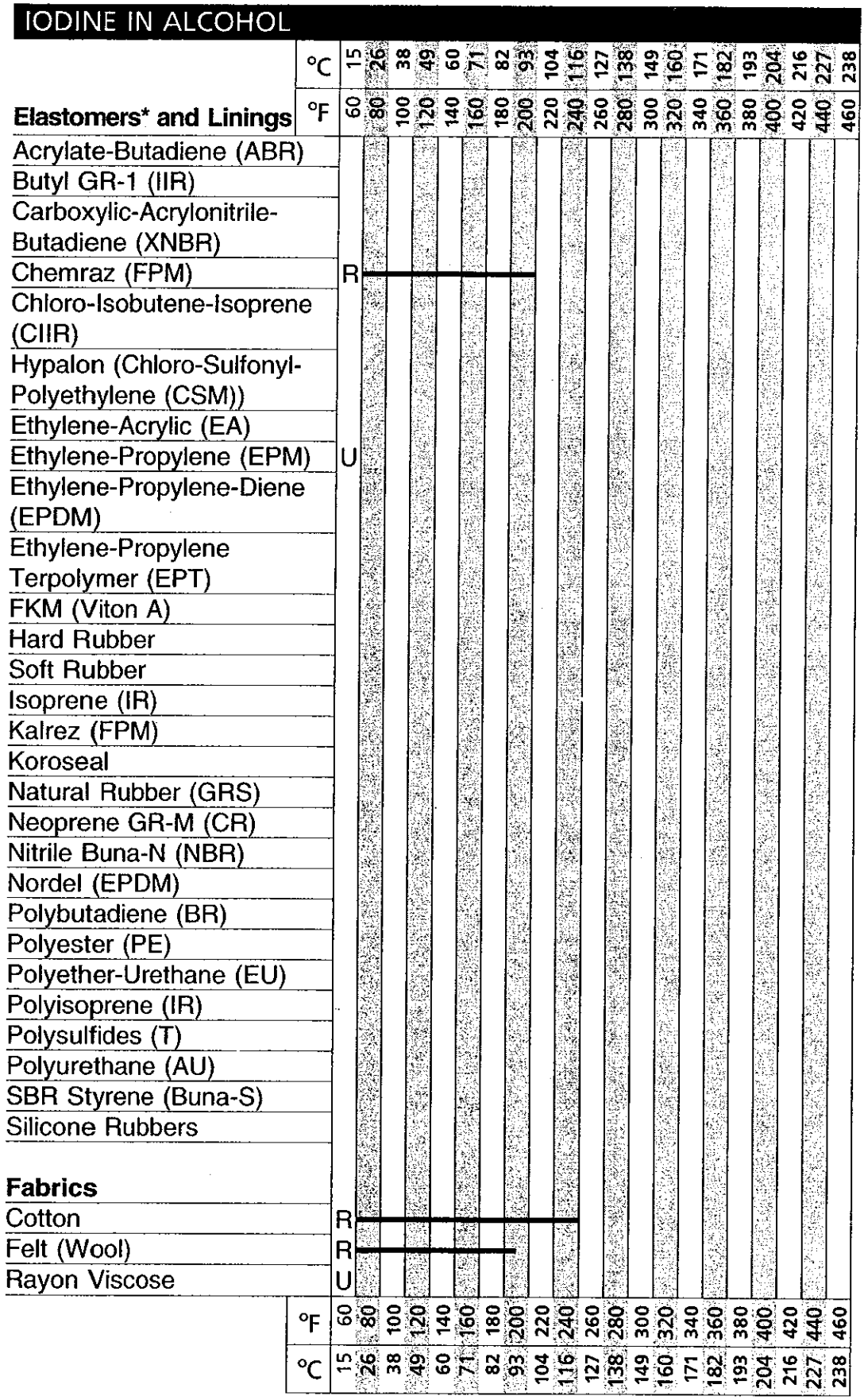
Plastics	°C	°F
ABS	U	
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)		
CPVC		
E-CTFE (Halar)	R	
Epoxy		
ETFE (Tefzel)		
FEP	R	
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)	R	
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated		
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic		
Terephthalate (PET)	R	
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW	R	
Polyethylene UHMW	R	
Polymethylpentene		
Polypropylene (PP)	U	
Polystyrene		
Polysulfone		
Polyvinylidene Chloride		
PVC Type 1	U	
PVC Type 2	U	
PVDF (Kynar)	R	
Ryton		
TFE (Teflon)	R	
Vinyl Ester		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

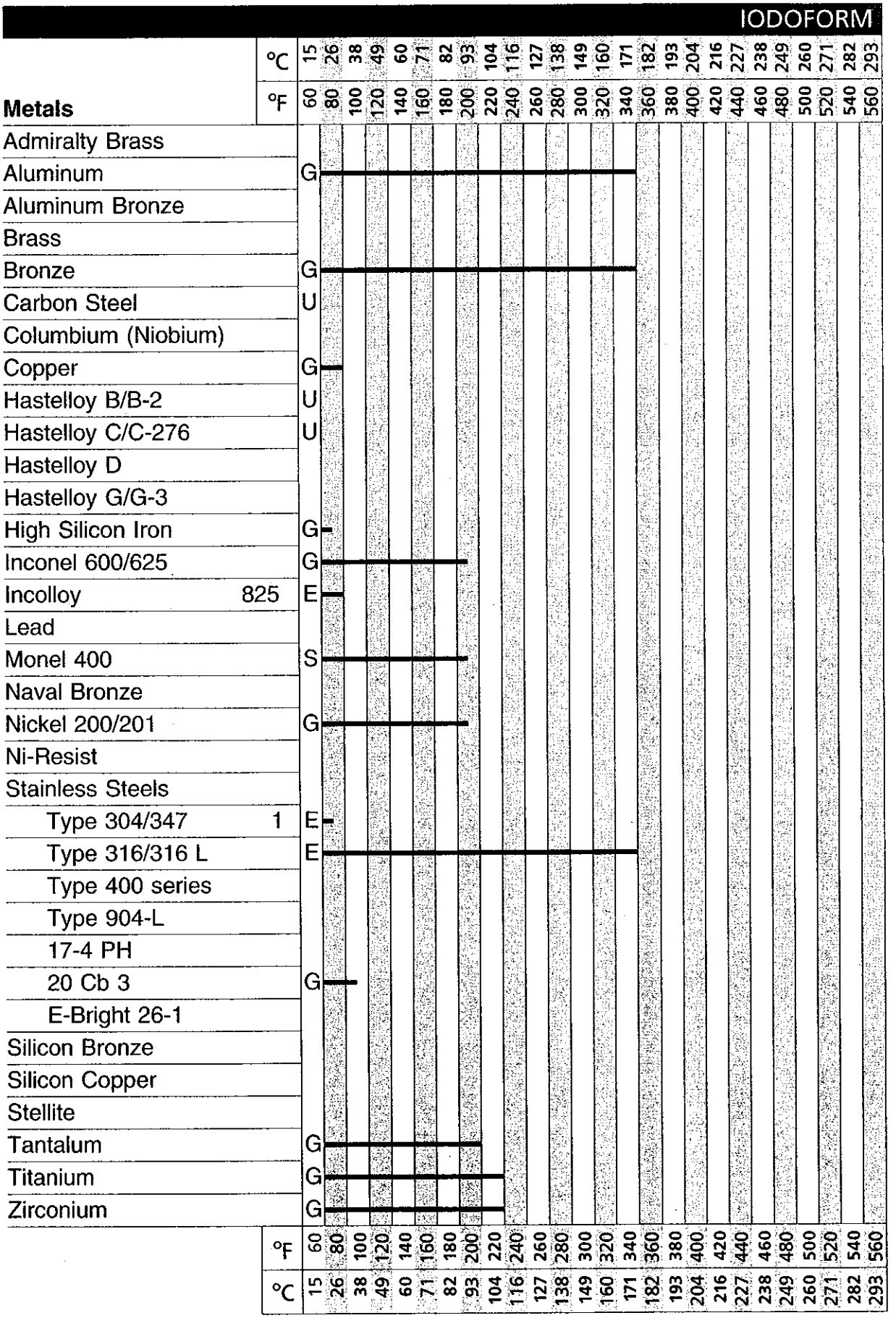
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IODINE IN ALCOHOL



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FOR METALS

E = < 2 Mils Penetration/Year; G = < 20 Mils Penetration/Year

S = < 50 Mils Penetration/Year; U = > 50 Mils Penetration/Year

FOR NONMETALLICS

R = Resistant

U = Unsatisfactory

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IODOFORM

Nonmetallic Materials	°F	°C
Borosilicate Glass		
Carbon		
Carbon-Graphite Resin Impregnated		
Ceramics		
Coatings		
Acrylic		
Asphalt		
Chlorinated Rubber		
Coal Tar		
Coal Tar Epoxy		
Epoxy General Purpose		
Epoxy Chemical Resistant		
Epoxy Polyamide		
Oil Base (Alkyd, Epoxy, Urethane)		
Phenolic		
Polyester		
Polyvinyl Chloride		
Silicones		
Urethanes		
Vinyls		
Water Base		
Zinc Rich		
Mortars		
Silicate	R	
Sodium Silicate		
Potassium Silicate	R	
Silica	R	
Sulfur	R	
Furan Resin	R	
Polyester		
Epoxy		

°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

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IODOFORM

Plastics	°C	°F
ABS		
Acetal		
Acrylics		
Asbestos Reinforced Epoxy		
Asbestos Reinforced Phenolic		
Chlorinated Polyether (Penton)	R	
CPVC		
E-CTFE (Halar)		
Epoxy		
ETFE (Tefzel)	R	
FEP	R	
Furan (Furfural Alcohol)		
Noryl		
Nylon 6		
Nylon 11		
Nylon 66		
Phenolic		
PFA (Teflon)		
Polyamide-Imide		
Polyesters		
Bisphenol A–fumarate		
Halogenated		
Hydrogenated Bisphenol A –Bisphenol A		
Isophthalic		
Terephthalate (PET)		
Polyetherimide (ULTEM)		
Polyetheretherketone (PEEK)		
Polyethersulfone (PES)		
Polyethylene HMW		
Polyethylene UHMW		
Polymethylpentene		
Polypropylene (PP)	R	
Polystyrene		
Polysulfone		
Polyvinylidene Chloride	R	
PVC Type 1		
PVC Type 2		
PVDF (Kynar)	R	
Ryton		
TFE (Teflon)	R	
Vinyl Ester		

°C: 15 26 38 49 60 71 82 93 104 116 127 138 149 160 171 182 193 204 216 227 238

°F: 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460

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IODOFORM

Elastomers* and Linings	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
Acrylate-Butadiene (ABR)																						
Butyl GR-1 (IIR)																						
Carboxylic-Acrylonitrile-Butadiene (XNBR)																						
Chemraz (FPM)	U																					
Chloro-Isobutene-Isoprene (CIIR)																						
Hypalon (Chloro-Sulfonyl-Polyethylene (CSM))																						
Ethylene-Acrylic (EA)																						
Ethylene-Propylene (EPM)																						
Ethylene-Propylene-Diene (EPDM)	U																					
Ethylene-Propylene Terpolymer (EPT)																						
FKM (Viton A)	R																					
Hard Rubber																						
Soft Rubber																						
Isoprene (IR)																						
Kalrez (FPM)	R																					
Koroseal																						
Natural Rubber (GRS)																						
Neoprene GR-M (CR)																						
Nitrile Buna-N (NBR)	U																					
Nordel (EPDM)	R																					
Polybutadiene (BR)																						
Polyester (PE)																						
Polyether-Urethane (EU)																						
Polyisoprene (IR)																						
Polysulfides (T)																						
Polyurethane (AU)																						
SBR Styrene (Buna-S)																						
Silicone Rubbers																						
Fabrics																						
Cotton																						
Felt (Wool)																						
Rayon Viscose																						
	°F	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
	°C	15	26	38	49	60	71	82	93	104	116	127	138	149	160	171	182	193	204	216	227	238

*See also Nylon 11 under PLASTICS

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Appendix 1: Chemical Synonyms

Synonym	Listed under
Acetic acid amine	Acetamide
Acetic acid crude	Pyroligneous acid
Acetic ether	Ethyl acetate
Acetol	Diacetone alcohol
Acetyl benzene	Acetophenone
Acetylene tetrachloride	Tetrachloroethane
Almond oil	Benzaldehyde
Aluminum hydrate	Aluminum hydroxide
Aluminum potassium chrome	Chrome alum
Alum potash	Aluminum potassium sulfate
Amino benzene	Aniline
Ammonium fluoride, acid	Ammonium bifluoride
Antimony chloride	Antimony trichloride
Baking soda	Sodium carbonate
Benzene carbonal	Benzaldehyde
Benzene carboxylic acid	Benzoic acid
Benzine	Petroleum ether
Benzol	Benzene
Benzyl ether	Dibenzyl ether
Boracic acid	Boric acid
Bromo-butane	Butyl bromide
Bromomethane	Methyl bromide
Butanol-1	Butyl alcohol
Butanol-2	Butyl alcohol, secondary
Butanoic acid	Butyric acid
Butanone	Methyl ethyl ketone
Butanthiol-1	Butyl mercaptan
Butter of antimony	Antimony trichloride
Butyl phthalate	Dibutyl phthalate
Calcium disulfide	Calcium bisulfide
Calcium sulfide	Lime sulfur
Carbamide	Urea
Carbolic acid	Phenol
Carbon oxychloride	Phosgene
Carbonyl chloride	Phosgene

Synonym	Listed under
Caustic potash	Potassium hydroxide
Caustic soda	Sodium hydroxide
Chlorinated polyphenol	Aroclor
Chlorobenzene	Monochlorobenzene
1-Chloro-butane	Butyl chloride
Chlorodifluoro-methane	Freon F-22
Chloroethane	Ethyl chloride
Chloroethanoic acid	Chloroacetic acid
Chloromethane	Methyl chloride
Chloropentane	Amyl chloride
3-Chloro-propene-1	Allyl chloride
Chlorotoluene	Benzyl chloride
Chromium trioxide	Chromic acid
Coal tar	Creosote
Corn syrup	Glucose
Cupric acetate	Copper acetate
Cupric carbonate	Copper carbonate
Cupric fluoride	Copper fluoride
Cupric nitrate	Copper nitrate
Cupric sulfate	Copper sulfate
Cuprous chloride	Copper chloride
Diacetone	Diacetone alcohol
Dibromoethane	Ethylene bromide
Dibutyl ether	Butyl ether
Dichloroethane	Ethylene dichloride
Dichloroethene	Dichloroethylene
Dichloromethane	Methylene chloride
Diethyl	Butane
Diethylene dioxide	Dioxane
Diethylene di-imide oxide	Morpholine
Dihydroxy benzene	Resorcinol
Dihydroxy ethane	Glycol, ethyleneglycol
Dimethyl benezene	Xylene
Dimethyl polysiloxane	Silicone oil
Dimethyl sulfate	Methyl sulfate
Diphenyl ether	Diphenyl oxide
Dipropyl	Hexane
Dipropyl ether	Isopropyl ether
Dodecyl chloride	Lauryl chloride
Dowtherm	Diphenyl
Epsom salt	Magnesium sulfate
Ethanal	Acetaldehyde
Ethanamide	Acetamide
Ethanoic acid	Acetic acid
Ethanoic anhydride	Acetic anhydride
Ethanonitrile	Acetonitrile
Ethanol	Ethyl alcohol
Ethanoyl chloride	Acetyl chloride
Ethoxy ethanol	Cellosolve
Ethylene chloride	Ethylene dichloride
Ethyl ether	Diethyl ether
Fluorosilicic acid	Hydrofluorosilicic acid

Synonym	Listed under
Formalin	Formaldehyde
Furfuraldehyde	Furfural
Furfurol	Furfural
Glucose	Dextrose, corn syrup
Glycerol	Glycerine
Glycol	Ethylene glycol
Glycol ether	Diethylene glycol
Glycol methyl ether	Methyl cellosolve
Hexamethylene	Cyclohexane
Hexamethylene tetramine	Hexamine
Hexandioic acid	Adipic acid
Hexose	Dextrose
Hexyl alcohol	Hexanol
Hydrogen iodide	Hydriodic acid
Hydroxy benzoic acid	Salicylic acid
Hypo photographic solution	Sodium thiosulfate
Isopropyl benzene	Cumene
Ligroin	Petroleum ether
Lime	Calcium oxide
Lime sulfur	Calcium sulfide
Lithic acid	Uric acid
Marsh gas	Methane
Methanal	Formaldehyde
Methane sulfonic acid	Methyl sulfonic acid
Methanoic acid	Formic acid
Methanol	Methyl alcohol
Methyl benzene	Toluene
Methyl chloroform	Trichloroethane
Methyl cyanide	Acetonitrile
Methyl ether	Dimethyl ether
Methyl phenol	Cresol
Methyl phenol ketone	Acetophenone
Methyl phthalate	Dimethyl phthalate
Methyl propane-2	Butyl alcohol, tertiary
Methyl sulfonic acid	Methane sulfonic acid
Nitrochloroform	Chloropicrin
Nitrogen oxide, tri-	Nitrous acid
Octanoic acid	Caprylic acid
Oil of mirbane	Nitrobenzene
Oil of wintergreen	Methyl salicylate
Oxalic nitrile	Cyanogen
Phenyl amine	Aniline
Phenyl bromide	Bromobenzene
Phenyl carbinol	Benzyl alcohol
Phenyl chloride	Chlorobenzene
Phenyl cyanide	Benzonitrile
Phenyl ethane	Ethyl benzene
Phosphine	Hydrogen phosphide
Pimelic ketone	Cyclohexanone
Pinene	Dipentene
Polyphenylene sulfide	Ryton
Propanoic acid	Propionic acid

Synonym	Listed under
Propanol	Propyl alcohol
Propanone	Acetone
Propanyl alcohol	Allyl alcohol
Propenoic acid	Acrylic acid
Propyl acetate	Isopropyl acetate
Prussic acid	Hydrocyanic acid
Pyrogallol	Pyrogallic acid
Red oil	Oleic acid
Salammoniac	Ammonium chloride
Sodium borate, tetra	Borax
Sodium phosphate, dibasic	Disodium phosphate
Starch gum	Dextrin
Sugar of lead	Lead acetate
Sulfoanthraquinone	Anthraquinone sulfuric acid
Sulfuric chlorohydrin	Chlosulfonic acid
Tannin	Tannic acid
Tetrachloroethylene	Perchlorethylene
Tetrachloromethane	Carbon tetrachloride
Tetrahydronaphthalene	Tetralin
Toluol	Toluene
Trichloroacetic aldehyde	Chloral hydrate
Trichloromethane	Chloroform
Trihydroxy benzene	Pyrogallic acid
Trihydroxy benzoic acid	Gallic acid
Trinitrophenol	Petrolatum
Vaseline	Picric acid
Vinyl cyanide	Acrylonitrile
Water glass	Sodium silicate

Appendix 2: Cross-Reference of Trade Names to Generic Names

Trade name/designation	Generic name
Adiprene[a]	Urethane (AU)
Bayprene[b]	Polychloroprene (CR)
Baysilone[b]	Silicone rubber (SI)
Baytec[b]	Urethane (AU)
Blue-sil[n]	Silicone rubber (SI)
Buna-85	Polybutadiene (BR)
Buna-CB[b]	Polybutadiene (BR)
Buna-N	Butadiene-acrylonitrile (NBR)
Buna-S	Butadiene-styrene-elastomer (SBR)
Chemraz[j]	Perfluoroelastomers (FPM)
Cohrplastic[o]	Silicone rubber (SI)
Conathane[p]	Urethane (AU)
CSM	Chlorosulfonated polyethylene
Cycolac[ac]	Acrylonitrile-butadiene-styrene (ABS)
Duracryn[a]	Thermoplastic elastomer (TPE)
Dutral[i]	Ethylene-propylene-diene (EPDM)
Flexsorb[q]	Thermoplastic elastomer (TPE)
Fluorel[f]	Fluoroelastomers (FKM)
Foraflon[f]	Polyvinylidene fluoride (PVDF)
Futura-thane[k]	Urethane (AU)
Geolast[r]	Thermoplastic elastomer (TPE)
GR-1	Butyl rubber (IIR)
Green-sil[n]	Silicone rubber (SI)
GR-S	Butadiene-styrene elastomer (SBR)
Halar[j]	ECTFE
Halon-ET[d]	Ethylene-tetrafluorethylene (ETFE)
Hypalon[a]	Chlorosulfonated polyethylene (CSM)
Hytrel[a]	Polyester elastomer (PE)
Kalar[s]	Butyl rubber (IIR)
Kalrez[a]	Perfluoroelastomer (FPM)
Kel-F[f]	Perfluoroelastomer (FPM)
Kodapak[t]	Thermoplastic elastomer (TPE)
Kodar[t]	Polyester elastomer (PE)
Kraton-D[c]	Styrene-butadiene-styrene rubber (SBS)
Kraton-G[c]	Styrene-ethylene-butylene-styrene rubber (SEBS)
Kynar[g]	Polyvinylidene fluoride (PVDF)
Lennite[ad]	Ultra high molecular weight polyethylene (UHMW)
Milkon[af]	Polyphenylene sulfide
NBR	Butadiene-acrylonitrile rubber
Neoprene[a]	Polycloroprene (CR)
Nordel[a]	Ethylene-propylene-diene monomer (EPDM)
Noryl[aa]	Modified phenylene oxide
Nylon[a]	Polyamide

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Printed in the United States of America



MARCEL DEKKER, INC.
NEW YORK • BASEL

ISBN 0-8247-5674-6



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