

PARKER+AMCHEM: RODINE Acid Inhibitors for Industrial Cleaning:

RODINE formulations are designed to provide consistent, effective protection to the base metal of equipment during the acid cleaning operation while not retarding the removal of rust, metallic oxides and hard water scale.

RODINE 31A (Liquid):

Acid: Acetic, Citric, Formic, Sodium Bisulfate, Hydroxyacetic, Phosphoric, Sulfuric, Sulfamic, Oxalic

Temp.: to 180F

Required Amount of RODINE: 1.0 to 4.0 gallons per 100 gallons of concentrated liquid acid - or per 100 lbs. concentrated powdered acid.

RODINE 50 (Liquid):

Acid: Hydrochloric (Muriatic)

Temp.: to 180F

Required Amount of RODINE: 1.0 to 2.0 gallons of concentrated acid

RODINE 51 (Liquid):

Acid: Hydrochloric (Muriatic), Sulfuric, Hydrofluoric, Phosphoric, Sodium Bisulfate

Temp.: to 180F

Required Amount of RODINE: 1.0 to 2.0 gallons per 100 gallons of concentrated acid

RODINE 85/RODINE 95 (Liquids):

Acid: Sulfuric, Phosphoric, Acetic, Sulfamic, Citric, Oxalic, Sodium Bisulfate, Formic

Temp.: to 180F

Required Amount of RODINE: 1.0 to 4.0 gallons per 100 gallons of concentrated liquid acid - or per 100 lbs. concentrated powdered acid.

RODINE 100 (Powder):

Acid: Hydrochloric (Muriatic), Sulfamic

Temp.: to 150F

Required Amount of RODINE: 25 to 50 lbs per 1,000 gal. of diluted acid or 25 to 50 lbs. per 100 lbs. concentrated powdered acid.

RODINE 103 (Liquid):

Acid: Acetic, Citric, Hydrochloric, Oxalic, Phosphoric, Sodium Bisulfate, Sulfamic, Sulfuric, Tartaric

Temp.: 100F to 150F

Required Amount of RODINE: 2 gal. per 1,000 gal. of diluted acid

RODINE 145 (Powder):

Acid: Sulfamic

Temp.: to 120F

Required Amount of RODINE: 7.5 to 15.0 lbs. per 100 lbs. concentrated powdered acid

RODINE 213/214/RODINE 52 (Liquids):

Acid: Hydrochloric (Muriatic)

Temp.: to 180F

Required Amount of RODINE: 1.0 to 3.0 gal. per 1,000 gal. of diluted acid.

PARKER+AMCHEM: RODINE Inhibitors for Pickling Acids:

Whether your pickling operation utilizes hydrochloric acid or sulfuric acid, RODINE inhibitors provide a wide range of advantages, including:

- * Improved finish and appearance
- * Improved efficiency
- * Reduced iron build-up and spent acid
- * Elimination of over-pickling
- * Minimization of smutting, pitting and burning
- * Reduced fuming
- * Minimization of hydrogen embrittlement
- * Ability to maintain line speed

Acid: Hydrochloric (Muriatic)

Method: Batch Pickling

Temp.: To 140F

RODINE 50: Liquid, non-foaming

RODINE 51: Liquid, semi-foaming

Volume of RODINE Based on Concentrated Acid: 1 to 4 pints per 100 gallons

Medium strength inhibitors for general pickling. Excellent for pickling prior to plating.

Method: Continuous Strip Pickling

Temp.: To 210F

RODINE XL-1090: Liquid, non-foaming

RODINE 1150: Liquid, non-foaming

Volume of RODINE Based on Concentrated Acid: 1 to 3 pints per 100 gallons

Strong inhibitors for continuous pickling. Aids in attaining clean, bright pickled work. Superior performance in high-iron content pickle baths.

Acid: Sulfuric

Method: Batch Pickling

Temp.: To 190F

KLEANRITE 50: Powder, foaming

Volume of RODINE Based on Concentrated Acid: 100 pounds per 100 gallons

Provides an excellent surface for phosphating. Excellent wetting enables rapid, uniform pickling of tubing, coils or wire as well as rod and bundles of bars.

Method: Batch Pickling

Temp.: To 195F

RODINE 85: Liquid, low-foaming

Volume of RODINE Based on Concentrated Acid: 1 to 4 pints per 100 gallons

A very strong general purpose inhibitor. Superior stability at high pickling temperatures.

RODINE 95: Liquid, semi-foaming

Volume of RODINE Based on Concentrated Acid: 1 to 4 pints per 100 gallons

A strong inhibitor containing detergent. Stable at high-pickling temperatures. Improves rinseability; aids in attaining maximum cleanliness on pickled work.

Method: Continuous Strip Pickling

RODINE 95: Liquid, semi-foaming

**PMC SPECIALTIES: COBRATEC TT-50-S Sodium Tolyltriazole
Solution Corrosion Inhibitor:**

For Copper and Copper Alloys
Improves Performance of Other Inhibitors for Other Metals

COBRATEC TT-50-S is a corrosion inhibitor for copper and copper-base alloys. It is very similar to COBRATEC TT-100 in performance and mechanism of protection. It differs only in that it is an aqueous solution of the sodium salt of tolyltriazole. This permits faster make-up of treating solutions through simple dilution to the desired concentration.

COBRATEC TT-50-S functions by reacting with copper oxide on the surface of copper or copper alloys forming a strong, insoluble polymeric complex. This complex formation results in a protective layer or film on the copper surface, a few molecules thick, that provides both a mechanical and electrochemical barrier against corrosive attack. This protective layer has a high degree of thermal and oxidative stability and cannot be easily removed. COBRATEC TT-50-S complexes copper in solution, thereby preventing galvanic corrosion of other metals.

Suggested Uses:

COBRATEC TT-50-S can be used in most applications where COBRATEC 99 and COBRATEC TT-100 are effective.

Circulating Cooling Systems such as cooling towers, air conditioning systems, cutting and grinding fluids.

Functional Fluids such as hydraulic fluids, specialty lubricants and automotive coolants.

Corrosion Preventive Coatings such as water base lacquers and waxes.

Cleaners such as soaps, detergents and strong alkali or acid cleaners.

Description:

Chemical Name: Tolyltriazole, sodium salt

Molecular Wt.: 155.14

Formula: C₇H₆N₃Na

CAS Registry No.: 64665-57-2

Properties:

Appearance: Clear, red brown solution

Lb/gal (24C): 9.85-9.95

Crystal Point, C: -8.0

pH (10% solution): 12

Assay: 50%

PMC SPECIALTIES: COBRATEC TT-100 Tolyltriazole Corrosion Inhibitor:

For Copper and Copper Alloys

Improves Performance of Other Inhibitors for Other Metals

COBRATEC TT-100 is a corrosion inhibitor for copper and copper-base alloys. It is very similar to COBRATEC 99 in performance and mechanism of protection. It differs only in having an inert methyl group attached to the basic chemical structure which enhances its solubility in some organic solvents. COBRATEC TT-100 functions by reacting with copper oxide on the surface of copper or copper alloys forming a strong, insoluble polymeric complex. This complex formation results in a protective layer or film on the copper surface, a few molecules thick, that provides both a mechanical and electrochemical barrier against corrosive attack. This protective layer has a high degree of thermal and oxidative stability and cannot be easily removed. COBRATEC TT-100 complexes copper in solution, thereby preventing galvanic corrosion of other metals.

Suggested Uses:

COBRATEC TT-100 can be used in many applications for protecting copper and copper alloys. Functional substitution for COBRATEC 99 is possible. Some specific uses are:

Circulating Cooling Systems such as cooling towers and air conditioning systems.

Functional Fluids such as hydraulic fluids, specialty lubricants, automotive coolants and metal working fluids.

Wrapping Tissue and box board for wrapping, interleaving, shipping and storing mill products or fabricated items.

Corrosion Preventive Coatings such as lacquers and waxes.

Cleaners such as soaps, detergents and strong alkali or acid cleaners.

Description:

Chemical Name: Tolyltriazole

Synonyms: 1-H-Benzotriazole, methyl
Tolutriazole

Molecular Wt.: 133.16

Formula: C₇H₇N₃

CAS Registry No.: 29385-43-1

Properties:

Appearance: Tan to light-brown granules

Specific Gravity (100C/25C): 1.13

Assay: 99.5%

Moisture: 0.2%

Ash: 0.1%

Solution Color, Gardner: 7-9

Free Amine: 0.1%

Chloride: 30 ppm

PMC SPECIALTIES: COBRATEC 99 Benzotriazole Corrosion Inhibitor:

For Copper and Copper Alloys

Improves performance of other inhibitors for other metals

COBRATEC 99 is a corrosion inhibitor for copper and copper-base alloys. It functions by reacting with copper oxide on the surface of copper or copper alloys forming a strong, insoluble polymeric complex. This complex formation results in a protective layer or film on the copper surface, 10 to 20 molecules thick, that provides both a mechanical and electrochemical barrier against corrosive attack. This protective layer has a high degree of thermal and oxidative stability and cannot be easily removed. COBRATEC 99 complexes copper ions in solution, thereby preventing galvanic corrosion of other metals.

Suggested Uses:

COBRATEC 99 can be used in many applications for protecting copper and copper alloys.

Direct Treatment such as on mill products, fabricated and decorative items, statuary.

Circulating Cooling Systems such as cooling towers and air conditioning systems.

Functional Fluids such as hydraulic fluids, specialty lubricants, automotive coolants and metal working fluids.

Wrapping Tissue and box board for wrapping, interleaving, shipping and storing mill products or fabricated items.

Corrosion Preventive Coatings such as lacquers and waxes.

Cleaners such as soaps, detergents and strong alkali or acid cleaners.

Description:

Chemical Name: Benzotriazole

Synonyms: 1,2,3-Benzotriazole/Azimidobenzene/Benzene azimide

Molecular Wt.: 119.12

Formula: C₆H₅N₃

CAS Registry No.: 95-14-7

Properties:

Appearance: Off white to light yellow flake

Specific Gravity (100C/25C): 1.19

Assay: 99.5%

Ash: 0.2%

Moisture: 0.1%

Solubility, wt%, 25C:

Water: 1.98

Water (60C): 7.4

Other Forms Available:

CO-40-S: 40% Benzotriazole Sodium Salt in Water

CO-20-I: 20% Benzotriazole in Isopropanol

CO-45-I: 45% Benzotriazole in Isopropanol

CO-35-G: 35% Benzotriazole in Propylene Glycol

CO-20-EG: 20% Benzotriazole in Ethylene Glycol

PPG/MAZER CHEMICALS: MAZON Corrosion Inhibitors:

The MAZON RI product group is a series of corrosion inhibitors which are applicable in a wide variety of oil and water-soluble lubricants. They are free of nitrites, nitrates, chromates and phenolics and may be used in virtually every proposed application with maximum safety to the formulator and user.

The MAZON RI group of corrosion inhibitors are:

- * Effective at Low Concentrations
- * Safe to Workers and Environments
- * Low to Non-foaming
- * Free of Undesirable Deposits and Residues

RI 4:

Form @ 25C: Liquid
 Specific Gravity @ 25C: 1.245
 Viscosity @ 25C in cps: 6000
 pH 1% Aqueous: 9.6
 Protects: Brass/Copper: no
 Aluminum: no
 Steel: yes

RI 4A:

Form @ 25C: Liquid
 Specific Gravity @ 25C: 1.180
 Viscosity @ 25C in cps: 2000
 pH 1% Aqueous: 9.5
 Protects: Brass/Copper: no
 Aluminum: no
 Steel: yes

RI 6:

Form @ 25C: Liquid
 Specific Gravity @ 25C: 1.040
 Viscosity @ 25C in cps: 2500
 pH 1% Aqueous: 7.8
 Protects: Brass/Copper: yes
 Aluminum: yes
 Steel: yes

RI 7A:

Form @ 25C: Liquid
 Specific Gravity @ 25C: 1.095
 Viscosity @ 25C in cps: 200
 pH 1% Aqueous: 8.9
 Protects: Brass/Copper: no
 Aluminum: no
 Steel: yes

PPG/MAZER CHEMICALS: MAZON Corrosion Inhibitors (Continued):**RI 8A:**

Form @ 25C: Liquid
Specific Gravity @ 25C: 1.135
Viscosity @ 25C in cps: 330
pH 1% Aqueous: 9.4
Protects: Brass/Copper: no
Aluminum: no
Steel: yes

RI-8B:

Form @ 25C: Liquid
Specific Gravity @ 25C: 1.130
Viscosity @ 25C in cps: 950
pH 1% Aqueous: 9.6
Protects: Brass/Copper: no
Aluminum: no
Steel: yes

RI 9:

Form @ 25C: Liquid
Specific Gravity @ 25C: 1.090
Viscosity @ 25C in cps: 600
pH 1% Aqueous: 9.0
Protects: Brass/Copper: no
Aluminum: no
Steel: yes

RI 10:

Form @ 25C: Liquid
Specific Gravity @ 25C: 1.150
Viscosity @ 25C in cps: 1800
pH 1% Aqueous: 9.7
Protects: Brass/Copper: no
Aluminum: no
Steel: yes

RI 14:

Form @ 25C: Liquid
Specific Gravity @ 25C: 1.050
Viscosity @ 25C in cps: 1700
pH 1% Aqueous: 9.0
Protects: Brass/Copper: no
Aluminum: yes
Steel: yes

PPG/MAZER CHEMICALS: MAZON Corrosion Inhibitors (Continued):

RI 52:

Form @ 25C: Liquid
Specific Gravity @ 25C: 1.080
Viscosity @ 25C in cps: 600
pH 1% Aqueous: 7.35
Protects: Brass/Copper: no
 Aluminum: yes
 Steel: yes

RI 110:

Form @ 25C: Liquid
Specific Gravity @ 25C: 1.095
Viscosity @ 25C in cps: 400
pH 1% Aqueous: 8.1
Protects: Brass/Copper: yes
 Aluminum: yes
 Steel: yes

RI 325:

Form @ 25C: Liquid
Specific Gravity @ 25C: 1.130
Viscosity @ 25C in cps: 50
pH 1% Aqueous: 8.87
Protects: Brass/Copper: no
 Aluminum: yes
 Steel: yes

PPG/MAZER CHEMICALS: MAZTREAT Cooling Water Additives:

Cooling water systems are generally divided into three parts; once through (including potable water systems), open recirculating, and closed systems.

Once through and potable water systems have heat exchangers taking in fresh water at the inlet side and discharging the water into a river or pond at the outlet side.

Open recirculating cooling water systems provide cooling to heat exchangers through the evaporation of water.

Closed systems include water-cooled refrigeration equipment, closed hot water heating systems, high temperature hot water heating systems, and engine jackets (radiators).

Problems that typically offset these systems include scale, corrosion, fouling and microbiological contamination.

CA Powder:

Purpose of Treatment: Alkalinity reducer

Recirculating cooling towers: yes/Heavy metals: no

CC Liquid:

Purpose of Treatment: Corrosion inhibitor

Closed systems: yes/Heavy metals: no

CC Powder:

Purpose of Treatment: Corrosion inhibitor

Closed Systems: yes/Heavy metals: no

CDS:

Purpose of Treatment: Antiscalant/Antifoulant

Recirculating Cooling Towers: yes/Once Through Systems: yes/
Heavy metals: no

COM:

Purpose of Treatment: Corrosion inhibitor/Antiscalant/Anti-foulant

Recirculating Cooling Towers: yes/Heavy Metals: no

COM CONC:

Purpose of Treatment: Corrosion inhibitor/Antiscalant

Recirculating Cooling Towers: yes/Heavy Metals: no

COP:

Purpose of Treatment: Corrosion inhibitor/Antiscalant

Recirculating Cooling Towers: yes/Heavy metals: yes

CPP:

Purpose of Treatment: Corrosion inhibitor/Antiscalant

Once Through Systems: yes/Potable water: yes/Heavy Metals: no

CPS Liquid:

Purpose of Treatment: Descaler

Recirculating Cooling Towers: yes/Once Through Systems: yes/

Closed Systems: yes/Heavy Metals: no

CPS Powder:

Purpose of Treatment: Descaler

Recirculating Cooling Towers: yes/Once Through Systems: yes/

Closed Systems: yes/Heavy Metals: no

CPZ:

Purpose of Treatment: Corrosion inhibitor

Recirculating Cooling Towers: yes/Heavy Metals: yes

DS2:

Purpose of Treatment: Antiscalant// Recirculating Cooling

Towers: yes/Once Through Systems: yes/Heavy Metals: no

THE PQ CORPORATION: Soluble Silicates:

Protection of Water Systems from Corrosion with PQ Soluble Silicates

Because of a growing need to eliminate environmental discharges of phosphates, and a desire to reduce the cost of corrosion protection additives, municipalities are switching from glassy phosphates to soluble sodium silicates.

Liquid sodium silicate is used successfully to control corrosion in hot and cold water lines. As the water flows through the pipe, silica from the silicate is adsorbed on the metal surface to form a thin tenacious film along the interior of the pipe. As long as treatment is continued the film is maintained and protects metal from the corrosive attack of water. It is important to recognize that this film does not build on itself to form a scale and therefore does not obstruct the flow of water; neither does it obstruct the transfer of heat. Corrosion control by the silicate method is particularly needed in naturally soft or zeolite-softened water which rapidly attacks metal.

Protection by PQ sodium silicate is not dependent on alkalinity or on the pH value, but rather on the silica content of the silicate. Normally, when small amounts of silicate are added to water the pH is not affected greatly. Protection is obtainable in both acidic waters and in slightly alkaline waters (pH generally not above 8.5).

Several municipalities have replaced phosphate-based corrosion inhibitors with sodium silicate. The silicates do not promote eutrophication and are generally recognized as safe (GRAS) by the U.S. Food and Drug Administration.

Materials Protected:

Metals:

Silicate treatment is effective with many different metals, including systems made up of several varieties which normally would be quite susceptible to corrosion:

Iron * Steel * Galvanized Steel * Red Brass * Yellow Brass
Copper * Lead * Bronze * Nickel Alloys

Non-Metals:

Cementitious water conduits also are protected from long term deterioration by the addition of sodium silicate. The silicate reacts with available calcium to form insoluble calcium silicates.

Universal Applications:

Industrial Plants * Textile Mills * Laundries
Office Buildings * Municipalities * Oil Refineries
Apartment Houses & Hotels * Private Residencies

PRICE-DRISCOLL CORP.: Rust Inhibitor:

Rust Inhibitor is a corrosion preventive suitable for use on all metals. It will give indefinite indoor protection if the film is not broken.

This product is a corrosion inhibitor suitable for use on all metals. Dispensed as a light penetrating spray, it forms a viscous protective film when dry. As long as the film remains unbroken, Rust Inhibitor will prevent corrosion. It is packaged in an aerosol container holding 18 ounces. As Rust Inhibitor contains a fingerprint neutralizer, it is not necessary to clean off fingerprints prior to application. Because of its water displacing properties, it may be applied to dies that are wet with water or soluble cutting oil emulsions or to parts that have been washed with water such as garden tools.

This product prevents corrosion on battery terminals, out-board motors, marine fittings and washing machines. It will free frozen fastenings and remove moisture from ignition systems.

PROCESS RESEARCH PRODUCTS: Metalworking Products: Rust Preventatives:

MULTIFIX:

Is a moisture displacing rust preventative and penetrating oil which forms a tough, but completely flexible, rust protective film resistant to removal by pressure, water splashing, high heat and friction. Excellent as a wire rope lubricant and to protect wire cable from moisture damage and friction. MULTIFIX penetrates the smallest crevices.

ARSK-1:

Is a water displacing and finger print neutralizing rust preventative. It will remove water film and water droplets from ferrous and non-ferrous metal parts. The displaced water separates from ARSK-1 quickly to form a layer at the bottom of the dip tank. Recommended also for highly polished surfaces such as lapped and polished bearing balls, rollers and race parts.

A-RUST (RP) SCS-40:

Is a wax modified, solvent based rust preventative concentrate which will leave a wax-like film. The complex is polar and forms a strong bond with ferrous metals and alloys.

PROFESSIONAL TECHNICAL CHEMICAL CO. INC.: PRO-TECH Corrosion Inhibitors:

22-2L:

An outstanding water displacing non-staining rust preventive which will rapidly separate water displaced from metal surfaces after machining operations or after cleaning. Good indoor and outdoor protection with lubrication. Medium film, brown in color. Soft tacky film. Will pass 60 days humidity cabinet on polished steel panels.

22-4L:

An effective water emulsion rust preventive. Mix with water 10% to 50% depending on amount of protection desired. Heat solution for fast drying time. Film is an oily lubricating indoor protection type.

22-5L:

Heavy Duty dark colored resilient product which is used to provide long term protection of metal surfaces. 22-5L is highly resistant to salt spray. Good 3 to 4 years outdoor protection.

22-9L:

Solvent base. Cleans surface and leaves a light-oily, soft-tacky, lubricating film. Excellent for start up lubrication and when constant corrosion protection and lubrication is needed. Contains molybdenum type lubrication and water displacing, non-staining rust preventive.

22-11L:

Designed to be mixed with water 10% to 30% by volume and used as final rinse before indoor storage on steel parts. Invisible dry film. Easily rinsed off before final finishing operations. Works well and easy to use.

22-12L:

Similar to 22-2L but lighter film. Dry, non-tacky, invisible, water displacing features. Provides light lubrication. Ultra-thin, light brown in color but good humidity cabinet protection of 60 days.

22-14P:

Powdered version of 22-11L. Highly concentrated powder to be mixed with water at 2 to 4 ounces per gallon. Potent formula allows economy. Good rinsing. 90 to 120 day indoor protection.

22-15L:

Good indoor and outdoor protection. Used on rough ferrous castings. Cleans off with solvent wash such as mineral spirits. Soft medium brown film. 6 month outdoor protection even in high heat and humidity. Controls climate contrast conditions.

PROFESSIONAL TECHNICAL CHEMICAL CO. INC.: PRO-TECH Corrosion Inhibitors (Continued):

22-16L:

Long term outdoor protection. Hard non-tacky, noticeable water displacing, film. Heavy film will give 24 months outdoor protection. Film provides lubrication for light machining and sizing operations.

22-18L:

Very similar to 22-16L but lighter film. Approximately 3 months less outdoor storage time. A little harder film than 22-16L with all the same properties.

22-19L:

Very similar to 22-12L with a little heavier film to provide 3 to 4 months more protection. All other properties are the same. Formulation increased by 5% for intermediate corrosion protection between 22-2L and 22-12L.

22-20L:

Excellent outdoor protection. Same as 22-5L with just a little less protection. Use where 3 to 4 months less protection and more economy is desired.

22-21L:

This product was developed to give an oily lubricated residue and control corrosion. Provides medium film for indoor and outdoor protection.

22-22L:

Similar to 22-12L but designed for lighter film for indoor use. Use where indoor protection is needed and an invisible film is desired.

22-23L:

Water displacing, heavy oily film. Non-emulsifiable, non-staining. Use where oily film is desired. Similar protection as 22-19L except oily finish instead of dry film.

22-24L:

Similar to 22-23L but with medium oily film. Slightly less protection. Equal properties as 22-23L for lubrication and corrosion protection.

22-28L:

Black, Heavy, Dry, outdoor film. Carbon black added for color for identification and beauty. More protection than 22-18L and less than 22-16L.

PROFESSIONAL TECHNICAL CHEMICAL CO. INC.: PRO-TECH Corrosion Inhibitors (Continued):

22-30L:

Heaviest film available for outdoor protection. Prevents cracking of film with self healing properties. Excellent outdoor heavy film. Use to protect precious materials like polished die set in outdoor storage for 3 to 4 years.

22-31L:

Heavy film like 22-30L but harder. Cracking does happen due to heavy hard film but no loss in protection. Apply by brush, roller or dip.

22-32L:

Good corrosion protection and excellent lubrication. Contains Moly lubricants. Semi-dry, waxy, water displacing film for 2 years indoor use. Use where good lubrication and corrosion protection is needed.

22-33L:

Light, soft, slightly oily lubricating, water displacing film for indoor or outdoor storage. Use where light oily surface is desired. Easily cleaned for future operations.

22-34L:

Heavy, long term protection film with semi-dry oily surface. Especially good on rough castings. Lubricating film for machining and removable.

22-35L:

Red oxide base coat for extended corrosion protection. Will serve as primer coat and corrosion inhibitor. Top coat of most any finish can be applied. Hard dry paintable film. Used as base coat or primer on sea going ships. Excellent protection for indoor or outdoor storage. Good humidity barrier.

22-36L:

Glossy black finish. Use as top coat over base coat or by itself. Superior protection where moisture is a problem. Hard, dry film with high humidity and salt spray protection. Use as decorative finish for indoor or outdoor use. Available in other colors and gloss preference.

22-38L:

Clear, glossy, hard urethane finish. Use as top coat for added protection and glossy finish or use by itself. Use where present film protection is needed or clear glossy finish is desired.

PROFESSIONAL TECHNICAL CHEMICAL CO., INC.: PRO-TECH Corrosion Inhibitors (Continued):

22-40L:

Similar to 22-35L but in grey finish. Use as base coat when long term protection is needed and a top coat will be applied later. Good for metal window frames or door frames, outdoor furniture or boat bottoms.

22-43L:

Flat black, hard finish. Available in other colors and gloss finish. Use as base coat or primer. Use when water base corrosion protection films are desirable.

22-47L:

Use on wire rope or cable application where lubrication and corrosion protection is needed. Will not drip off vertical surfaces. Designed to stay where applied. Long term outdoor protection from rust with good lubrication.

22-48L:

Use of Top Coat aluminum film is needed for long term outdoor protection. Silver like film designed to dry from bottom to top. Reduces heat to metal surfaces. Use on tanks, roofs or where sun's hot rays should be reflected. Ten year protection outdoor has been experienced on steel fence.

QUES INDUSTRIES, INC.: Corrosion Inhibitors:

Corrosion Inhibitor 4104 for Diesel Engine Cooling Systems:

A nonchromate liquid blend of inorganic nitrite, silicate and borate combined with organic copper corrosion inhibitors.

Corrosion Inhibitor 4104 is used to provide extensive protection of metals found in cooling systems of diesel engines. When used at the recommended dosage, formula 4104 will minimize system corrosion.

Physical State: Liquid
Color: Yellow-green
Density: 9.84#/gallon
pH: 11.1

Various metals in contact with each other in an aqueous environment will exhibit electrolysis, a corrosion of the least noble metal. Corrosion inhibitors such as formula 4104 will minimize this chemical activity.

Corrosion Inhibitor 4104 should be used at 2 1/2 ounces per gallon of system capacity. The softest water available should be used for system make-up. The system should be monitored periodically using a conductivity meter (4300-5000 ppm) or nitrite test kit. Nitrite concentrations should be between 1300 and 1500 ppm.

Corrosion Inhibitor 4104 for Closed Heating or Cooling Systems:

Ques Industries 4104 is a nonchromate liquid blend of inorganic nitrite, silicate and borate combined with organic copper corrosion inhibitors.

Corrosion Inhibitor 4104 is used to provide complete protection to closed water systems containing a variety of dissimilar metals. When used at the recommended dosage, formula 4104 will keep systems free of damaging corrosion. Formula 4104 is compatible with ethylene glycol systems.

Various metals in contact with each other in an aqueous environment will exhibit electrolysis, a corrosion of the least noble metal. Corrosion inhibitors such as formula 4104 will minimize this chemical activity.

Corrosion Inhibitor 4104 should be introduced to the system at 1% of total capacity. Use the softest water available in the system. The system should be monitored periodically using a nitrite test kit. Nitrite concentrations should be between 800 and 1000 ppm.

QUES INDUSTRIES, INC.: Corrosion Inhibitors (Continued):

Iron Sequestrant 4110:

Ques Industries Iron Sequestrant 4110 is used to reduce or eliminate iron staining due to dissolved iron precipitation in potable water, irrigation systems and other areas where unsightly iron staining is to be prevented. It will sequester hardness thus preventing precipitation of insoluble salts. All ingredients in formula 4110 are listed by the Food and Drug Administration (FDA) as GRAS (Generally Accepted as Safe) materials. Iron Sequestrant 4110 may be used in potable water up to a level of 125 ppm.

Physical State: Liquid
Color: Colorless
Density: 9.2#/gallon
pH: 6.6

Iron Sequestrant 4110 can be fed directly from the drum or diluted to any appropriate level prior to addition to the system. Inject formula 4110 or solutions into the system as close to the water source as possible to allow maximum sequestration of the iron. Feed 4110 at a rate of 20 ppm/ppm of soluble iron. Water containing appreciable iron and high calcium or magnesium ions may require elevated feed levels.

Corrosion Inhibitor 4111 for Closed Heating or Cooling Systems:

Ques Industries 4111 is a nonchromate liquid blend of inorganic nitrite, silicate and borate combined with organic copper corrosion inhibitors.

Corrosion Inhibitor 4111 is used to provide complete protection to closed water systems containing a variety of dissimilar metals. When used at the recommended dosage, formula 4111 will keep systems free of damaging corrosion. Formula 4111 is compatible with ethylene glycol systems.

Physical State: Liquid
Color: Light straw
Density: 10.34#/gallon
pH: 12.0

Various metals in contact with each other in an aqueous environment will exhibit electrolysis, a corrosion of the least noble metal. Corrosion inhibitors such as formula 4111 will minimize this chemical activity.

Corrosion Inhibitor 4111 should be introduced to the system at 0.50% total capacity. Use the softest water available in the system. The system should be monitored periodically using a nitrite test kit. Nitrite concentrations should be between 800 and 1000 ppm.

QUES INDUSTRIES, INC.: Corrosion Inhibitors (Continued):

Potable Water Corrosion Control 4114:

Ques Industries Corrosion Control 4114 is designed to reduce or eliminate corrosion in potable water systems.

Corrosion Control 4114 is used to sequester hardness, thus preventing precipitation of insoluble salts leading to corrosion protection. All ingredients of formula 4114 are listed by the Food and Drug Administration (FDA) as GRAS (Generally Recognized as Safe) materials. Formula 4114 may be used in potable water up to a level of 10 ppm as phosphate.

Physical State: Liquid
Color: Water white
Density: 8.8#/gallon
pH (1% solution): 8.5-9.5

Corrosion Control 4114 should be fed at a rate of 1 pint to 1 quart per 1000 gallons of water. Maximum treatment should not exceed 10 ppm as phosphate from the tap. Dosages higher than 1 quart per 1000 gallons should be monitored regularly to avoid overtreatment. Formula 4114 should be injected at the source of the water supply using a chemical feed pump and metering system.

Rust Inhibitor 6161:

Ques Industries Rust Inhibitor 6161 is a liquid concentrate designed for use in the final rinse of multistage parts washer. When used as directed, ferrous parts treated with formula 6161 will remain rust-free during in-plant/in process storage.

Physical State: Liquid
Color: Light yellow
Density: 8.91#/gallon
pH: 10.4

Dilute Rust Inhibitor 6161 to approximately a 2% level in the final stage of the washer. Allow parts removed from the washer to air dry in a low humidity area. Store the parts in a relatively low humidity area away from corrosive fumes. Rust-free in-plant storage of parts for up to six months can be expected.

RAWN CO., INC.: Rust Preventatives, Lubricants, Moisture Displacers:

Penetrating Lubricant:

RIP-1 is a penetrating lubricant which can be used effectively in many industries and service applications today. RIP-1 penetrates to loosen rust and frozen parts. Loosens rust and scale for easy removal, and penetrates in and around all metal surfaces with a protective lubricant which will not change tolerances.

Rust Preventative - Moisture Displacer Lubricant RIP-2:

RIP-2 is a moisture-displacing, corrosion-preventative lubricant, and is truly the most effective product of its type on the market today. Uses are marine, electrical motors, farm equipment, heavy equipment and uses in moisture and corrosion preventative applications. RIP-2 penetrates down under ice and moisture lifting it away from the surface. Dries out wet ignitions, and leaves a film on metal surfaces which prevents corrosion and protects metals outdoors from rust and corrosion up to one year.

Military Specifications: MIL Spec. C-23411A

Heavy-Duty Rust Preventative and Lubricant RIP-3:

RIP-3 provides better outdoor rust prevention than RIP-1 and RIP-2, and also gives excellent lubrication. RIP-3 was developed at the request of electrical engineers for a truly long-term rust preventative and lubricant for use in severe climatic conditions for protecting outdoor equipment and marine use.

Long-Term Outdoor Rust Preventative RIP-4:

RIP-4 is a heavy waxy coating used in undercoating auto and truck bodies. Will outlast all asphalt-type body undercoatings against salt spray. This coating will give the longest protection for equipment in the severest climatic conditions. Clear to light amber in color and consequently can be used on equipment where asphalt-type coatings would be objectionable. RIP-4 can be easily removed with Rawn's Chloro-Clean or other solvents.

TREFRAWN Lubricant:

TREFRAWN Lubricant is a far better metal lubricant than silicone or petroleum lubricants. TREFRAWN is a synthetic lubricant with micron particles of TEFLON. TREFRAWN has penetrating properties, corrosion inhibitors and solvents to remove dirt and corrosion giving super lubrication. This lubricant works long after other lubricants fail.

E-Z Slip Lubricant:

This product may be used for metal, wood, glass, rubber, chrome, leather, etc. Stops squeaks, prevents rust and lubricates all at the same time.

RAYBO CHEMICAL CO.: RAYBO 60-NORUST:

Eliminates Can Corrosion and Flash Rusting

Features: Eliminates Can Corrosion and Nailhead Rust

System: Water

Comments: Versatile Rust Inhibitor

Usage (%): 0.5-2% of Total Weight

Physical Data:

Gardner Viscosity: A-3

Weight/Gallon (lbs.): 9.3

Specific Gravity (25/25C): 1.14

pH: 9.35

Solids: 21-23%

Appearance: Straw-colored, clear

RAYBO 85-RUSTIB:

Prevents Metal Corrosion

Features: Stops Rusting Under Paints

System: Solvent

Comments: Cationic Wetting

Usage (%): 0.5% of Solids

Performance:

RAYBO 85-RUSTIB is a cationic wetting agent which is preferentially attracted to steel and arranges itself in a monomolecular film at the film-metal interface to produce the ultimate in corrosion resistance. Settling in packaged primers, which is often caused by poor wetting, is also profoundly improved where RAYBO 85 is used.

Basic Concepts:

Red lead and zinc chromate are widely used as pigments in primers since their action, either singly or combined, at the film interface is antagonistic to rusting. Nevertheless, rusting, corrosion, and under-cutting do occur when moisture find its way between the film and the steel. Rusting of steel is a progressive action and, once started, proceeds to consume the metal entirely.

RAYBO 85 is especially useful wherever it is desirable to wet fibers, such as asbestos fibers, in asphalt paints.

Recommendations:

To the finished paint, add 1/2% RAYBO 85 by weight (based on total paint solids).

Physical Data:

Specific Gravity (25/25C.): 0.89-0.90

Weight/Gallon: 7.5 lbs.

Consistency: Paste

Melting Point: 70-80F.

RHEOX, INC.: NALZIN ZP Anticorrosive Pigment:

NALZIN ZP is a micronized zinc phosphate (dihydrate) pigment which provides the paint formulator with an anticorrosive pigment having extremely broad compatability. Manufacturers of two part epoxy, latex, water reducible, alkyd and chlorinated rubber coatings can use NALZIN ZP to formulate durable, cost effective coatings without the use of lead, chrome, strontium or barium.

NALZIN ZP anticorrosive pigment gives the formulator broad resin compatibility with rapid and clean dispersion, and long shelf stability in Industrial, Maintenance and Trade Sales Coatings.

Advantages:

- * Excellent anticorrosion performance
- * Non-toxic
- * Broad range of resin system compatability
- * Low water solubility allows:
 - * Long term protection
 - * Stability
 - * Minimized water sensitivity
- * Very cost effective
- * Provides for rapid and clean dispersion
- * Increased formulating flexibility due to low oil absorption
- * Low water and dispersant demands
- * White color with low tint strength permits formulation of any color

Typical Properties:

Composition: Micronized zinc phosphate
Color: White
Tinting Strength: Low
Specific Gravity: 3.25
Density (lbs./U.S. Gallon): 27.4
Oil Absorption (g/100g): 17-21
Conductivity (micromhos/cm): 50-150
pH: 7-9

Application:

NALZIN ZP is a cost effective, non-toxic choice for formulating long lasting Industrial, Maintenance or Trade Sales Coatings in either solvent or water systems.

NALZIN ZP zinc phosphate, has one of the broadest compatibilities of all anticorrosive pigments. It is an effective non-toxic replacement for chrome, barium and lead products. NALZIN ZP is especially effective in two part epoxy primers, chlorinated rubber, short oil alkyds and water reducible systems. Its low oil absorption also aids in the formulation of high solids systems.

Levels of Use:

The usage level of NALZIN ZP pigment depends on the level of corrosion protection desired and on the specific resin system in which it is used.

RHEOX, INC.: NALZIN 2 Corrosion Inhibitive Pigment:

NALZIN 2 is a new generation anticorrosive pigment which uses the proven long term durability of zinc hydroxy phosphite. Manufacturers of Industrial, Maintenance and Trade Sales Coatings can now formulate durable, cost-effective anticorrosive paints without the use of lead, chrome or strontium.

The versatility of NALZIN 2 pigment allows its use in both solvent and water based paints. Manufactured by a new process, NALZIN's excellent pigmentary properties give rapid and clean dispersion, high gloss, long shelf stability and flexibility in formulating and production.

Advantages:

- * High corrosion inhibition activity.
- * Very cost effective.
- * Non-toxic.
- * Low water solubility; gives both long term protection and stability.
- * Small particle size; allows grind and high gloss.
- * Easy deagglomeration for rapid and clean dispersion.
- * Low oil absorption increases formulating flexibility.
- * Low water and dispersant demands.
- * White color with low tint strength permits formulation of any color.
- * Minimizes tendency of latex paints to flash rust.

Typical Properties:

Composition: Zinc Hydroxy Phosphite

Chemical Class Type: Basic

Color: White

Tinting Strength: Low; Equal to Magnesium Silicate

Specific Gravity: 3.96

Density, (lbs./U.S. Gallon): 33.0

Oil Absorption (g/100g): 15-20

Particle Size, Median, Microns: 2-3

% Through 325 Mesh: 99.5

pH, 2% Slurry: 6.5-7.5

Water Solubility (g/100ml): 0.004

Application:

When formulating Industrial, Maintenance or Trade Sales Coatings with non-toxic pigments, NALZIN 2 is the cost effective choice for maximum long term corrosion protection-in solvent and water systems, alike.

High gloss, direct-to-metal, original equipment finishes with enhanced product durability are now possible using NALZIN 2.

Light to heavy duty coatings containing anticorrosive performance in acrylic and styrene acrylic latexes. It is also useful in automotive and machinery refinish primers.

**RHONE-POULENC: Additives for Metalworking Fluids: Function:
Corrosion Inhibitor:**

Anionics:

ANTARA HR-719:

Flash Pt. >200C: Yes
Pounds Per Gallon: 10.912
% Active: 90
Biodegradable

ANTARA LB-400:

Flash Pt. >200C: Yes
Pounds Per Gallon: 8.663
% Active: 98
Excellent E.P. Properties

ANTARA LE-500:

Flash Pt. >200C: Yes
Pounds Per Gallon: 9.246
% Active: 100

ANTARA LE-700:

Flash Pt. >200C: Yes
Pounds Per Gallon: 9.330
% Active: 100
Water Soluble

ANTARA LL-550:

Flash Pt. >200C: Yes
Pounds Per Gallon: 8.630
% Active: 98
Excellent E.P. Properties

ANTARA LM-400:

Flash Pt. >200C: Yes
Pounds Per Gallon: 8.746
% Active: 100

ANTARA LM-600:

Flash Pt. >200C: Yes
Pounds Per Gallon: 8.830
% Active: 100

**RHONE-POULENC: Additives for Metalworking Fluids: Function:
Corrosion Inhibitor (Continued):**

ANTARA LO-529:

Flash Pt. >200C: Yes
Pounds Per Gallon: 9.163
% Active: 88

ANTARA LP-700:

Flash Pt. >200C: Yes
Pounds Per Gallon: 9.996
% Active: 100
Low Foam

Nonionics:

ALCODET MC-2000:

% Active: 98
Excellent Cleaner 48F CP

ALKAMULS GMO-45LG:

Flash Pt. >200C: Yes
Pounds per Gallon: 8.163
% Active: 45
Rust Preventative

CYCLOMIDE DC-212/5E:

Flash Pt. >200C: Yes
Pounds per Gallon: 8.2
% Active: 100
Foam Stabilizer

CYCLOMIDE DC-212M:

Flash Pt. >200C: Yes
Pounds per Gallon: 8.25
% Active: 100

CYCLOMIDE DS 28D:

Flash Pt. >200C: Yes
Pounds per Gallon: 8.33
Pour Point: 36C
% Active: 100

**RHONE-POULENC: Additives for Metalworking Fluids: Function:
Corrosion Inhibitor (Continued):**

Nonionics (Continued):

IGEPAL CO-630:

Flash Pt. >200C: Yes
Pounds Per Gallon: 8.830
% Active: 100

Cationics:

KATAPOL PN-430:

Flash Pt. >200C: Yes
Pounds Per Gallon: 7.830
% Active: 100
P.O.E. (5) Tallowamine

MIRAMINE OC:

Flash Pt. >200C: Yes
Pounds Per Gallon: 7.747
% Active: 99
Imidazolines, Oleyl

**SANDOZ CHEMICALS CORP.: SANDOCORIN Corrosion Inhibitors:
Water Treatment by Inhibition:****SANDOCORIN 8015 Liquid:**

Temperature stability (solution): 120C
Protective film can be removed: yes
pH (undiluted): 10.7
Solubility in water (C): 15
Viscosity (undiluted) cP at 20C: 190
Density at 20C: 1.19
Solidifying point: none
Flash point: none
Visual assessment: invisible, dry
Film thickness (1 application): about 5-10 u
Test Indicator: yes

SANDOCORIN 8132 Liquid:

Temperature stability (solution): 130C
Protective film can be removed: yes
Appearance of the undiluted product: solutions
pH (undiluted): 8.2
Solubility in water (C): 15
Viscosity (undiluted) cP at 20C: 200-300
Density at 20C: 1.19
Solidifying point: none
Visual assessment: invisible, dry
Film thickness (1 application): about 5-10 u
Film thickness (2 applications): about 7-12 u
Test indicator: yes

SANDOCORIN 8132 B Liquid:

Temperature stability (solution): 160C
Protective film can be removed: yes
Appearance of the undiluted product: solutions
pH (undiluted): 7.4
Solubility in water (C): 15
Viscosity (undiluted) cP at 20C: 50-150
Density at 20C: 1.18
Solidifying point: none
Flash point: none
Visual assessment: invisible, dry
Film thickness (1 application): about 5-10 u
Film thickness (2 applications): about 7-12 u
Test indicator: yes

SANDOCORIN 8160 Liquid:

Temperature stability (solution): 130C
Protective film can be removed: yes
Appearance of the undiluted product: solutions
pH (undiluted): 8.3
Solubility in water (C): 15
Density at 20C: 1.19
Solidifying point: none
Flash point: none
Visual assessment: invisible, dry
Film thickness (1 application): about 5-10 u
Film thickness (2 applications): about 7-12 u
Test indicator: yes

**SANDOZ CHEMICALS CORP.: SANDOCORIN Corrosion Inhibitors:
Surface Protection by Film Formation and Inhibition:**

SANDOCORIN TP Liquid:

Temperature stability (solution): 70
Melting point (film surface): 90-100C
Protective film can be removed: yes
Appearance of the undiluted product: disp.
pH (undiluted): 9.3+-0.5
Solubility in water (C): 25
Viscosity (undiluted) cP at 20C: 500+-200
Density at 20C: 1.01
Solidifying point: -4
Flash point: none
Visual assessment: invisible, dry
Film thickness (1 application): 40-80 u
Film thickness (2 applications): 80-120 u

SANDOCORIN PP Liquid:

Temperature stability (solution): 70
Melting point (film surface): none
Protective film can be removed: no
Appearance of the undiluted product: emul.
pH (undiluted): 8.2
Solubility in water (C): 25
Viscosity (undiluted) cP at 20C: 500+-200
Density at 20C: 1.03
Solidifying point: -3
Flash point: none
Visual assessment: invisible, dry
Film thickness (1 application): 40-80 u
Film thickness (2 applications): 80-120 u

SANDOCORIN W Liquid:

Temperature stability (solution): 70
Melting point (film surface): 85-95
Protective film can be removed: yes
Appearance of the undiluted product: disp.
pH (undiluted): 9.3+-0.3
Solubility in water (C): 25
Viscosity (undiluted) cP at 20C: 800+-200
Density at 20C: 1.00
Solidifying point: -5
Flash point: none
Film thickness (1 application): 40-80 u
Film thickness (2 applications): 120-160 u

SHEREX CHEMICAL CO., INC.: REWOCOROS AC-100:

REWOCOROS AC-100 is a fatty acid condensation product, which has been modified.

REWOCOROS AC-100 is used as a corrosion inhibitor in cutting, drilling, and grinding fluid. It forms an emulsion with water and is clearly soluble in mineral oils under the addition of nonionic surfactants.

Advantages:

- * Anti-corrosive properties
- * No detectable NDELA (detection limit of 10 ppb)
- * Biodegradability 90%, Closed Bottle Test OECD 301D

Typical Properties:

Appearance @ 77F: Clear liquid
Amine value: 190 mg KOH
Acid value: 27 mg KOH/g
Water content: 2%
Color, Gardner: 11

VARAMIDE AC-28C:

A modified mixed diethanolamide.
CAS Number: 68648-22-6

Application:

A mixed modified 2:1 diethanolamide which has shown to be an anti-corrosive in household and industrial formulations which come in contact with metal.

Advantages:

- * Anti-corrosive properties
- * Low fatty acid content

Typical Properties:

Appearance @ 77F: hazy liquid
Solids: 100%
Color, Gardner: 9
Free Acid: 2%
Free Amine: 27%

SKS INDUSTRIES, INC.: Wrap Out Rust:

ANOX VCI:

ANOX VCI (Volatile Corrosion Inhibitors) eliminates oxygen in its immediate environment (up to 12 inches) through the slow vaporization of its VCI chemicals. Without oxygen, rust cannot occur. ANOX eliminates the expensive labor-intensive tasks of greasing, degreasing, spraying or dipping ferrous metals to protect them from corrosion. Virtually all metals can be protected with one of the grades of ANOX protective paper no matter what size, shape or surface finish.

ANOX 60M:

60 lb. natural kraft, VCI impregnated, conforms to military specifications MIL-P3420 Class 1, Style A, Form B

ANOX 35M:

35 lb. natural kraft, VCI impregnated, conforms to military specifications MIL-P3420 Class 3, Style A, Form B.

ANOX 60 Wax:

60 lb. natural kraft, 8 lb. of wax barrier one side.

ANOX 60:

60 lb. natural kraft, VCI impregnated

ANOX 352:

35 lb. natural kraft, impregnated with 2 grams VCI for added protection

ANOX Wax:

30 lb. natural kraft, 8 lb. of wax barrier one side

ANOX VCI:

30 lb. natural kraft, VCI impregnated

ANOX MPI:

ANOX MPI (Multi-Purpose Inhibitor) papers are specially formulated to protect a wide range of both ferrous and non-ferrous metals including steel, iron, copper, brass, zinc, cadmium and aluminum. Perfect for shipping or storing your inventory anywhere in the world. ANOX VCI and ANOX MPI papers are approved for industrial and military applications and are available with a protective coating on one side for added protection.

ANOX MPI:

30 lb. natural kraft, multi-purpose inhibitor for use on both ferrous and non-ferrous metals.

ANOX MPI Wax:

30 lb. natural kraft, wax barrier coating one side, multi-purpose inhibitor for use on both ferrous and non-ferrous metals.

STEPAN CO.: Metalworking Surfactants:

Alkanolamide:

NINOL 201:

Oleic diethanolamide
Fatty Acid: Oleic
% Free Fatty Acid: 7.5
% Free Amine: 26.0
Liquid

NINOL 1281:

Modified fatty alkanolamide
Fatty Acid: Proprietary
% Free Fatty Acid: 19.0
% Free Amine: 19.0
Liquid

NINOL 1301:

Modified fatty alkanolamide
Fatty Acid: Proprietary
Paste

NINOL 11-CM:

Coconut diethanolamide
HLB: 14.5
Fatty Acid: Coconut
% Free Fatty Acid: 16.0
% Free Amine: 27.0
Liquid

NINOL SR-100:

Oleic diethanolamide
Fatty Acid: Oleic
% Free Fatty Acid: 50.0
% Free Amine: 20.0
Liquid

These products are either water soluble or dispersable and are normally used as emulsifier and corrosion inhibitors in cutting fluids, drawing compounds, and cleaners. NINOL 1301 does not contain excess fatty acids or amine soaps.

Nonionics:

MAKON NF-5:

Polyalkoxylated aliphatic base
% Actives: 97
pH 1%: 10.5
Liquid

MAKON NF-12:

Polyalkoxylated aliphatic base
% Actives: 100
pH 1%: 10.0
Cloud Point: 15C
Liquid

STEPAN CO.: Metalworking Surfactants (Continued):

Nonionics (Continued):

MAKON 8240:

Polyoxyethylated (36) castor oil

HLB: 13.0

% Actives: 100

pH 1%: 5-7

Liquid

These products are used due to their superior wetting, lubricity, coupling and defoaming properties for the manufacture of cutting fluids, drwaing compounds, and corrosion inhibitors.

Anionics:

NINATE 411:

Amine alkylbenzene sulfonate

% Actives: 92

Liquid

BIO-TERGE PAS-85:

Sodium 1-octane sulfonate

% Actives: 35

pH 1%: 6.0

Cloud Point: 15C

Liquid

STEPFAC 8170:

Ethoxylated nonyl phenol phosphate

% Actives: 99

pH 1%: 2.0

Liquid

ALPHA-STEP ML-40:

Sodium alpha sulfdo methyl laurate

% Actives: 37

pH 1%: 7.0

Liquid

Emulsion, oil-soluble sulfonate. Effective wetting, surface tension reducer and defoamer over a wide pH range.

Methyl Esters:

STEPAN C-40:

Methyl laurate

Iodine value: 0.1

Acid Value: 0.5

Sap. Value: 264

Liquid

STEPAN C-65:

Methyl palmitate/oleate

Iodine Value: 50.0

Acid Value: 2.0

Sap. Value: 203

Liquid

**3M INDUSTRIAL TAPE AND SPECIALTIES DIVISION: Metal
Degreaser:**

Features:

- * Nonflammable
- * Noncorrosive
- * Nonstaining
- * Quick drying
- * Won't damage most painted surfaces or plastics

Application Ideas:

- * Cleans dirty, greasy metal
- * Prepares parts for adhesive bonding
- * Flushes out thread holes after tapping
- * Reactivates many adhesives

UNION CAMP CORP.: UNIDYME 22 Dimer Acids:

A dimerized fatty acids product.

Major Uses: Polyamides
Polyesters
Alkyds
Corrosion inhibitors for oil field uses.
Rust preventives in lubricants and fuels.

Composition, Percent by Weight:

Monomer Acids: 2
Dimer Acids: 83
Trimer and Higher Acids: 15

Properties:

Amber viscous liquid
C18 Monomer Acids by GC, %: 2
Acid Number: 193
Saponification Number: 200
Unsaponifiables, %: 0.3
Color, Gardner: 7+
Viscosity, centistokes at 25C: 7,900
Specific Gravity, 25/25C: 0.95
Flash Point, C: 271 (520F)
Fire Point, C: 302 (575F)

UNIDYME 35 Dimerized fatty acids product.

Major Uses: Corrosion inhibitors in oil field production.
Rust preventives in lubricants and fuels.

Composition, Percent by Weight:

Monomer Acids: 2
Dimer Acids: 84
Trimer and Higher Acids: 14

Properties:

Viscous liquid
C18 Monomer Acids by GC: 0.5
Acid Number: 194
Saponification Number: 200
Unsaponifiables, %: 0.4
Color, Gardner: 10
Viscosity, centistokes at 25C (77F): 10,000
Specific Gravity, 25/25C: 0.96
Flash Point, C: 270 (518F)

CAS Registry Number: 61788-89-4

UNIROYAL CHEMICAL CO., INC.: MBT-UO Mercaptobenzothiazole:

MBT-UO is used as a copper deactivator and corrosion inhibitor for greases, cutting oils, and temporary and permanent antifreezes.

It has mild anti-wear properties.

The sodium salt is water soluble and is a corrosion inhibitor in aqueous cooling systems (See Sodium MBT 50% aqueous solution.)

Physical Properties:

Form: Powder

Melting Range: 326-354F (163-179C)

Specific Gravity: 1.42

Solubility: Soluble in acetone and strong bases such as sodium hydroxide. Slightly soluble in ethylene dichloride, benzene and petroleum products. Insoluble in water.

Sodium MBT:

Sodium MBT is a 50% aqueous solution of sodium mercaptobenzothiazole. Its primary use is to inhibit copper corrosion in aqueous systems. Sodium MBT is particularly useful in ethylene glycol based antifreeze formulations for automotive cooling systems.

Typical Properties:

Color: Not darker than 10 (Gardner Standards)

Specific Gravity @ 25/15C: 1.25

Density, lbs./gallon: 10.50

kilogram/cubic meter: 1260

Sodium MBT content: 50.0%

Free Alkalinity (as NaOH): 0.3%

**R.T. VANDERBILT CO., INC.: VANCORR 073 Corrosion Inhibitor
For Paint:**

VANCORR 073, a calcium sulfonate corrosion inhibitor was incorporated into a water-reducible alkyd formula used as an autobody undercoat. The VANCORR 073 was added at 18.0 lb/100 gallons in both the let down and the grind stage of paint manufacture to determine the effect of the method of incorporation upon performance. A commercially available calcium sulfonate was tested for comparison. The corrosion resistance of these coatings on scribed panels and the effect of the corrosion inhibitor on paint stability were determined.

Results:

On scribed panels, VANCORR 073 showed equivalent corrosion inhibition as compared to the competitive calcium sulfonate. No significant difference in performance of either material was seen due to incorporation in the grind versus let down.

In the black gloss formula, VANCORR 073 and the competitive calcium sulfonate both increased the initial viscosity and additional water was required to obtain viscosity equivalent to the blank. From the shelf stability testing, the competitive calcium sulfonate paints (grind and let down) had a greater increase in viscosity than the VANCORR 073 paints as compared to the blank formula. Upon oven exposure of the grind paints, the opposite effect was observed. The pH of all formulas decreased, accelerated by oven exposure.

Conclusion:

The hours of exposure to failure were about 2.5x longer for the VANCORR 073 formula at an 18.0 lb/100 gallon loading than for the blank formula. The performance of VANCORR 073 was equivalent to the competitive calcium sulfonate. The method of incorporation did not affect the performance of either material. Both VANCORR 073 and the competitive calcium sulfonate affected paint stability, as measured by viscosity and pH.

R. T. VANDERBILT CO., INC.: VANDERBILT Lubricant Additives:**CUVAN 80:**

Function: Metal deactivator

Formula: Proprietary

Chemical Composition: N,N'-disalicylidene-1,2-propanediamine in xylene

Physical State: Liquid

Color: Dark amber

Density at 25C Mg/m³ (lbs./gal.): 1.07 (9.1)

Viscosity at 40C cSt (SUS): 19 (93)

Flash Point, COC, C(F): 40(100)

Pour Point, C(F): -29(-20)

Solubility: Soluble in most hydrocarbon fuels, insoluble in water.

Use Conc., % mass: 0.01 to 0.5

Typical Uses: CUVAN 80 is designed to protect copper in fuel delivery systems. It can also be used as a corrosion inhibitor in greases.

CUVAN 484:

Function: Copper corrosion inhibitor

Formula: Proprietary

Chemical Composition: 2,5 dimercapto-1,3,4-thiadiazole derivative

Physical State: Liquid

Color: Amber

Density at 25C Mg/m³ (lbs./gal.): 1.09 (9.08)

Viscosity at 100C cSt (SUS): 9.0 (56)

Flash Point, COC, C (F): 149 (300)

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % mass: 0.10 to 0.50

CUVAN 484 is an ashless oil-soluble corrosion inhibitor and metal deactivator for non-ferrous metals, particularly for copper. Useful in industrial and automotive oils and greases, metalworking fluids, etc. CUVAN 484 may also enhance antiwear and oxidation properties of lubricants.

CUVAN 826:

Function: Copper corrosion inhibitor metal deactivator, hydrogen sulfide suppressor

Formula: Proprietary

Chemical Composition: 2,5 dimercapto-1,3,4-thiadiazole derivative

Physical State: Liquid

Color: Amber

Density at 25C Mg/m³ (lbs./gal.): 1.03 (8.7)

Viscosity at 100C cSt (SUS): 3.85 (40.0)

Flash Point, COC, C(F): 215 (419)

Solubility: Soluble in petroleum lubricating bases.

Use Conc., % mass: 0.10 to 0.50

Typical Uses: CUVAN 826 is an ashless oil-soluble corrosion inhibitor and metal deactivator for non-ferrous metals, particularly for copper. Useful in industrial and automotive oils and greases, metalworking fluids, etc. CUVAN 826 is capable of suppressing the corrosive action of hydrogen sulfide.

**R.T. VANDERBILT CO., INC.: VANDERBILT Lubricant Additives
(Continued):**

NACAP:

Function: Corrosion inhibitor, metal deactivator, alkaline buffer

Chemical Composition: Sodium 2-mercaptobenzothiazole, 50% aqueous solution

Physical State: Liquid

Color: Light amber

Density at 25C Mg/m³ (lbs./gal.): 1.25 (10.4)

Solubility: Soluble in water, alcohols and glycols. Insoluble in petroleum hydrocarbons.

Use Conc., % Mass: 0.1 to 0.6

Typical Uses: NACAP is a corrosion inhibitor for water, alcohol and glycol systems. Particularly effective in preventing corrosion of copper and brass. Widely used in anti-freeze where it functions as a copper corrosion inhibitor and alkaline buffer. It is an excellent corrosion inhibitor for aluminum in systems where aluminum is used in the presence of copper and copper alloys. NACAP is the standard copper corrosion inhibitor for the anti-freeze industry. Used as a chemical intermediate.

ROKON:

Function: Corrosion inhibitor, metal deactivator, mild extreme pressure agent.

Chemical Composition: 2-mercaptobenzothiazole

Physical State: Powder

Color: Light yellow to light buff

Density at 25C Mg/m³ (lbs./gal.): 1.50

Melting Point, C (F): 164 to 175

Solubility: Approximately 25% in Cellosolve, 20% in Butyl Cellosolve, 30% in Carbitol, 1.5% in toluene and less than 5% in highly aromatic oils. Slightly soluble in water and gasoline. Strong polar solvents are best.

Use Conc., % mass: 0.0002 to 0.25

Typical Uses: Used at 0.5 to 5 lbs./1000 bbls. as copper corrosion inhibitor in fuels containing corrosive sulfur compounds. Copper corrosion inhibitor or deactivator in numerous industrial lubricants such as heavy-duty cutting and metal working oils, hydraulic oils, and lubricating greases. A corrosion inhibitor in automotive chemicals, industrial cleaners, and various chemical specialties requiring copper deactivator.

**R.T. VANDERBILT CO., INC.: VANDERBILT Lubricant Additives
(Continued):**

VANCHEM NATD:

Function: Corrosion inhibitor, and chemical intermediate

Chemical Composition: Disodium 2,5-dimercaptothiadiazole,
30% aqueous solution

Physical State: Liquid

Color: Amber to brown

Density at 25C Mg/m³ (lbs./gal.): 1.22 (10.2)

Solubility: Soluble in water.

Use Conc., % mass: 0.1 to 0.25

Typical Uses: VANCHEM NATD is a corrosion inhibitor and metal deactivator for nonferrous metals in aqueous systems. VANCHEM NATD is suggested particularly for protecting solder, aluminum, copper and copper alloys. It is stable and active at lower pH than many mercapto compounds. VANCHEM NATD as a chemical intermediate is a stable reactive dimercaptide which is readily alkylated, oxidized to the disulfide, or converted to metal salts.

VANLUBE AZ:

Function: Antioxidant, metal deactivator, corrosion inhibitor, color stabilizer, antiwear agent.

Chemical Composition: Zinc diamyldithiocarbamate

Physical State: Liquid

Color: Straw

Density at 25C Mg/m³ (lbs./gal.): 0.98 (8.2)

Viscosity at 100C cSt (SUS): 9.5 (57)

Flash Point, COC, C (F): 171 (340)

Pour Point, C (F): -23 (-10)

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % mass: 0.25 to 1.5

Typical Uses: Used in engine oils, in industrial oils, and in soap and clay-thickened greases. Used in both gasoline and diesel engine crankcase oils to inhibit oxidation, bearing corrosion and wear. Used in combination with detergents, it inhibits corrosion and wear by inhibiting oxidation of the oil and also by the formation of protective films on metal surfaces. Used as a partial replacement for zinc dithiophosphates. Because of its effectiveness at high temperatures, it is a good additive for crankcase oils in heavy duty service. In industrial oils and automatic transmission fluids it functions as a high temperature oxidation and corrosion inhibitor. Used in lubricating greases both as an oxidation inhibitor and metal deactivator. An excellent copper corrosion inhibitor of the film-forming type.

**R.T. VANDERBILT CO., INC.: VANDERBILT Lubricant Additives
(Continued):**

VANLUBE RI-A:

Function: Rust inhibitor

Formula: Proprietary

Chemical Composition: Alkyl succinic acid derivative

Physical State: Liquid

Color: Amber

Density at 25C Mg/m³ (lbs./gal.): 0.96 (8.0)

Viscosity at 40C cSt (SUS): 650 (3030)

Flash Point, COC, C (F): 165.5 (330)

Pour Point, C (F): -15 (5)

Solubility: Soluble in petroleum lubricant bases.

Use Conc., % mass: 0.05 to 0.25

Typical Uses: VANLUBE RI-A is an oil soluble rust inhibitor recommended for steam turbine oils, circulating oils, and hydraulic oils. In industrial gear oils with EP additives, Vanderbilt recommends levels at approximately 0.25%. VANLUBE RI-A is most effective in greases when used with a sulfonate such as VANLUBE RI-BA in a 50/50 ratio.

VANLUBE RI-BA:

Function: Rust inhibitor

Formula: Proprietary

Chemical Composition: Barium petroleum sulfonate

Physical State: Liquid

Color: Dark brown

Density at 25C Mg/m³ (lbs./gal.): 1.00 (8.3)

Viscosity at 100C cSt (SUS): 90 (419)

Flash Point, COC, C (F): 175 (347)

Pour Point, C (F): -15 (5)

Solubility: Soluble in petroleum lubricant bases. Insoluble in water.

Use Conc., % mass: 0.05 to 0.15

Typical Uses: VANLUBE RI-BA is an oil soluble barium sulfonate with excellent rust inhibiting and water resistant properties. Useful in many industrial and automotive lubricant applications. VANLUBE RI-BA is compatible with additives such as antioxidants, EP and antiwear agents, and other corrosion inhibitors used in turbine, hydraulic, and circulating oil formulas. Useful in hard and soft rust preventative coatings.

**R.T. VANDERBILT CO., INC.: VANDERBILT Lubricant Additives
(Continued):**

VANLUBE RI-CA:

Function: Rust inhibitor

Formula: Proprietary

Chemical Composition: Calcium petroleum sulfonate

Physical State: Liquid

Color: Dark brown

Density at 25C Mg/m³ (lbs./gal.): 0.94 (7.8)

Viscosity at 100C cSt (SUS): 20 (99)

Flash Point, COC, C (F): 190 (374)

Pour Point, C (F): -29 (-20)

Solubility: Soluble in petroleum lubricant bases. Insoluble in water

Use Conc., % mass: 0.05 to 0.10

Typical Uses: VANLUBE RI-CA is an oil soluble calcium sulfonate with excellent rust inhibiting and water resistant properties.

VANLUBE RI-G:

Function: Rust inhibitor

Formula: Proprietary

Chemical Composition: Imidazoline reacted with a fatty acid

Physical State: Liquid

Color: Amber

Density at 25C Mg/m³ (lbs./gal.): 0.93 (7.75)

Viscosity at 100C cSt (SUS): 24 (116)

Flash Point, COC, C (F): 271 (520)

Solubility: Soluble in petroleum lubricant bases. Insoluble in water.

Use Conc., % mass: 0.25 to 0.50

Typical Uses: VANLUBE RI-G has been specifically designed to provide excellent rust inhibition for greases. It is compatible with other VANLUBE EP/AO/ and AW additives.

VANLUBE SS:

Function: Antioxidant, ashless

Chemical Composition: Octylated diphenylamines

Physical State: Friable powder

Color: Light tan

Density at 25C Mg/m³ (lbs./gal.): 1.02

Melting Point, C (F): 90

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % mass: 0.5 to 2.0

Typical Uses: A general purpose antioxidant. Used as a high temperature antioxidant in petroleum and synthetic lubricants. Used in hydraulic fluids, various industrial oils, automatic transmission fluids and in synthetic and petroleum based engine oils.

**R.T. VANDERBILT CO., INC.: VANDERBILT Lubricant Additives
(Continued):**

VANLUBE 71:

Function: Extreme pressure agent, antiscuff agent, anti-oxidant

Chemical Composition: Lead diamyldithiocarbamate

Physical State: Liquid

Color: Amber

Density at 25C Mg/m³ (lbs./gal.): 1.10 (9.2)

Viscosity at 100C cSt (SUS): 5.73 (45)

Flash Point, COC, C (F): 171 (340)

Pour Point, C (F): -23 (-10)

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % mass: 0.1 to 1.0 as antioxidant

2.0 to 4.0 as EP agent

Typical Uses: A multifunctional additive having the properties of a good EP agent and those of a good oxidation and corrosion inhibitor. Used in industrial lubricating oils and greases as both an EP agent and oxidation inhibitor. Often used in combination with sulfurized compounds or with lead naphthenate, lead oleate, etc. An outstanding general purpose additive for industrial gear oils and lubricating greases.

VANLUBE 73:

Function: Extreme pressure agent, antiscuff agent, antioxidant.

Chemical Composition: Antimony dialkyldithiocarbamate

Physical State: Liquid

Color: Dark amber

Density at 25C Mg/m³ (lbs./gal.): 1.01 (8.4)

Viscosity at 100C cSt (SUS): 7.25 (50)

Flash Point, COC, C (F): 171 (340)

Pour Point, C (F): -23 (-10)

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % mass: 0.1 to 1.0 as antioxidant

2.0 to 5.0 as EP agent

Typical Uses: One of the most versatile of the dithiocarbamate additives. VANLUBE 73 has excellent antiwear, extreme pressure and antioxidant properties. It is used as an antiwear additive, bearing corrosion inhibitor in motor oils, gas engine oils, compressor oils, etc. It is also used in combination with lead soaps in both automotive and industrial gear oils. It is used in lubricating greases of all types as an antioxidant, antiwear and extreme pressure additive. It is effective in preventing valve-tip wear in crankcase oils. As a partial replacement for zinc dithiophosphate in engine oils, it gives better rust performance as well as better antiwear and oxidation test results.

**R.T. VANDERBILT CO., INC.: VANDERBILT Lubricant Additives
(Continued):**

VANLUBE 81:

Function: Antioxidant, corrosion inhibitor, ashless

Chemical Composition: p,p'-dioctyldiphenylamine

Physical State: Powder

Color: Off-white

Density at 25C Mg/m³ (lbs./gal.): 1.01

Melting Point, C (F): 95

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % mass: 0.5 to 2.0

Typical Uses: VANLUBE 81 is similar chemically to VANLUBE SS but is a better high temperature oxidation inhibitor because of its high purity and high p,p'-dioctyldiphenylamine content. VANLUBE 81 can be used in a variety of petroleum and synthetic lubricants where an ashless oxidation inhibitor of good high temperature properties is needed. Effective in silane, siloxane, silicone and diester fluids at concentrations of 0.5 to 2.0% and temperatures of 400 to 500F. In lubricating greases VANLUBE 81 is effective in both oxidation bomb tests and in high speed spindle tests. Siloxane greases containing 2% VANLUBE 81 have given outstanding results in bearing performance tests at 350F. Has good color stability. Widely used as a high temperature antioxidant in jet engine oils.

VANLUBE 601:

Function: Metal deactivator, corrosion inhibitor, rust inhibitor, color stabilizer, extreme pressure agent, ashless.

Formula: Proprietary

Chemical Composition: Heterocyclic sulfur-nitrogen compound

Physical State: Liquid

Color: Dark amber

Density at 25C Mg/m³ (lbs./gal.): 0.96 (8.0)

Viscosity at 100C cSt (SUS): 12.96 (70)

Flash Point, COC, C (F): 149 (300)

Pour Point, C (F): -1 (30)

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % mass: 0.02 to 1.0

Typical Uses: A copper passivator, corrosion and rust inhibitor of the film-forming type. It shows synergistic properties with various metal organic EP additives such as the dithiocarbamates. Used in petroleum fuels and solvents at 1 to 10 pounds per 1,000 barrels to prevent copper stain and corrosion. Used in petroleum base oils and greases and in synthetic base greases at 0.02 to 0.5% to protect copper. In compounded EP greases and gear oils, VANLUBE 601 is often used as an EP synergist, rust inhibitor, and copper passivator with metal dithiocarbamates, such as VANLUBE AZ, VANLUBE 71, and VANLUBE 73. VANLUBE 601 has shown color-stabilizing properties in oils and greases stored at elevated temperatures. It is a useful E.P. synergist with a variety of extreme pressure and antiwear additives.

**R.T. VANDERBILT CO., INC.: VANDERBILT Lubricant Additives
(Continued):**

VANLUBE 648:

Function: Antiwear/antiscuff, corrosion inhibitor, antioxidant, extreme pressure agent

Chemical Composition: Antimony dialkylphosphorodithioate

Physical State: Liquid

Color: Amber

Density at 25C Mg/m³ (lbs./gal.): 1.05 (8.7)

Viscosity at 100C cSt (SUS): 6.33 (48)

Flash Point, COC, C (F): 163 (325)

Pour Point, C (F): -34 (-30)

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % Mass: 1.0 to 4.0

Typical Uses: Used as an antioxidant, antiwear and EP agent in crankcase oils, lubricating greases, automotive and industrial gear oils and metal working lubricants. A thermally stable antimony phosphorodithioate EP agent of low ash with antioxidant and bearing corrosion properties similar to those of the zinc dithiophosphates. Higher molecular weight than VANLUBE 622. Can be used with other EP agents to obtain desired performance features.

VANLUBE 664:

Function: Antioxidant, rust inhibitor, metal deactivator

Formula: Proprietary

Chemical Composition: Combination of oxidation and rust inhibitors and a metal deactivator.

Physical State: Liquid

Color: Light brown

Density at 25C Mg/m³ (lbs./gal.): 0.925 (7.7)

Viscosity at 100C cSt (SUS): 4.80 (42)

Flash Point, COC, C (F): 154 (310)

Pour Point, C (F): -21 (-5)

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % mass: 1.0 to 2.0

Typical Uses: Recommended for turbine, hydraulic, circulating and similar oils required to lubricate in the presence of moisture. VANLUBE 664 is a balanced blend of several additives in the correct ratio to give optimum performance with economical treating costs. Gives good oxidation, rust and demulsibility in base stocks of widely different quality levels and in stocks which often show poor response to conventional turbine and hydraulic oil antioxidants.

**R.T. VANDERBILT CO., INC.: VANDERBILT Lubricant Additives
(Continued):**

VANLUBE 691-C:

Function: Metal deactivator, chelating agent, ashless

Formula: Proprietary

Chemical Composition: Synergistic blend

Physical State: Liquid

Color: Brown

Density at 25C Mg/m³ (lbs./gal.): 1.11 (9.2)

Viscosity at 100C cSt (SUS): 11.55 (65)

Flash Point, COC, C (F): 200 (392)

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % mass: 0.05 to 0.25

Typical Uses: VANLUBE 691-C is a synergistic blend of polar additives capable of forming films or complexes on metal surfaces. It will chelate dissolved copper. It prevents corrosion of nonferrous metals such as copper and its alloys by active sulfur and sulfur compounds. It will enhance the effectiveness of antioxidants without detrimental side effects in oils for automotive engines, turbines and hydraulic systems.

VANLUBE 704:

Function: Metal deactivator, rust inhibitor

Formula: Proprietary

Chemical Composition: Synergistic blend

Physical State: Viscous liquid

Color: Dark brown

Density at 25C Mg/m³ (lbs./gal.): 1.03 (8.5)

Viscosity at 100C cSt (SUS): 80 (377)

Flash Point, COC, C (F): 166 (330)

Pour Point, C (F): 4 (40)

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % mass: 0.05 to 0.25

Typical Uses: Used in petroleum and synthetic lubricants as a multifunctional rust and corrosion inhibitor. VANLUBE 704 is a synergistic blend of polar additives capable of forming films or complexes on metal surfaces; particularly copper and copper alloys that might be exposed to free sulfur or active sulfur compounds. It is used in a variety of lubricants based on petroleum oils or synthetics. Economical concentrations enhance antioxidants by passivating catalytic metal surfaces in the lubricant system.

**R.T. VANDERBILT CO., INC.: VANDERBILT Lubricant Additives
(Continued):**

VANLUBE 719:

Function: Extreme pressure agent, antioxidant, antiwear agent, corrosion inhibitor - low ash - no heavy metals.

Formula: Proprietary

Chemical Composition: Blend of organic chemical additives.

Phosphorus content: 4.4%

Sulfur content: 0.34%

Physical State: Liquid

Color: Dark amber

Density at 25C Mg/m³ (lbs./gal.): 0.99 (8.2)

Viscosity at 100C cSt (SUS): 43.60 (204)

Flash Point, COC, C (F): 163 (325)

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % mass: 1.0 to 4.0

Typical Uses: VANLUBE 719 was developed primarily for steel mill and similar industrial gear oils. It gives good extreme pressure and antiwear properties, good high temperature stability, and good demulsibility. VANLUBE 719 at a concentration range of 2 to 3% will meet the requirements of most steel mill gear oil specifications. It is applicable to 2-cycle engine oils.

VANLUBE 739:

Function: Rust inhibitor

Formula: Proprietary

Chemical Composition: Synergistic blend of ashless rust inhibitors

Physical State: Liquid

Color: Yellow

Density at 25C Mg/m³ (lbs./gal.): 0.91 (7.8)

Viscosity at 100C cSt (SUS): 5.54 (44.4)

Flash Point, COC, C (F): 171 (340)

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % mass: 0.05 to 0.5

Typical Uses: VANLUBE 739 is designed to improve rust protection in lube oils and greases.

**R.T. VANDERBILT CO., INC.: VANDERBILT Lubricant Additives
(Continued):**

VANLUBE 804:

Function: Extreme pressure agent, antiwear agent, rust and corrosion inhibitor

Formula: Proprietary

Chemical Composition: Synergistic blend of additives

Physical State: Liquid

Color: Amber

Density at 25C Mg/m³ (lbs./gal.): 0.984 (8.2)

Viscosity at 100 cSt (SUS): 7.27 (50)

Flash Point, COC, C (F): 129 (265)

Pour Point, C (F): -15 (5)

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % mass: 1.0 to 3.0

Typical Uses: VANLUBE 804 is a multi-functional additive designed for use in USS 224 type gear oils and other industrial greases.

VANLUBE 818-D:

Function: Antioxidant, rust inhibitor

Formula: Proprietary

Chemical Composition: Synergistic blend of additives

Physical State: Liquid

Color: Dark amber

Density at 25C Mg/m³ (lbs./gal.): 1.03 (8.6)

Viscosity at 100C cSt (SUS): 14.86 (77)

Flash Point, COC, C (F): 179 (355)

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % mass: 0.5 to 2.0

Typical Uses: VANLUBE 818-D is designed for use in turbine oils, R & O Hydraulic oils, and other industrial lubricants. VANLUBE 818-D is 100% active.

VANLUBE 8816:

Function: Rust inhibitor

Formula: Proprietary

Chemical Composition: Mixture of organic acid salts

Physical State: Liquid

Color: Light yellow

Density at 25C Mg/m³ (lbs./gal.): 1.09 (9.1)

Solubility: Soluble in water and some synthetic fluids.

Use Conc. % mass: 0.5 to 5.0

Typical Uses: VANLUBE 8816 is a water soluble rust inhibitor for synthetic metal working fluids, and clay thickened greases.

**R.T. VANDERBILT CO., INC.: VANDERBILT Lubricant Additives
(Continued):**

VANLUBE 892:

Function: Corrosion Inhibitor

Formula: Proprietary

Chemical Composition: Alkylamine compound

Physical State: Liquid

Color: Dark amber

Density at 25C Mg/m³ (lbs./gal.): 0.96 (8.0)

Viscosity at 100C cSt (SUS): 21.4 (104.5)

Flash Point, COC, C (F): 150 (300)

Solubility: Soluble in petroleum and synthetic lubricant bases. Insoluble in water.

Use Conc., % mass: 0.02 to 1.0

Typical Uses: VANLUBE 892 is a corrosion inhibitor designed to protect against yellow metal corrosion in lubricating oils and greases.

JETCO CHEMICALS, INC.: JET AMINE Diamines-Polyamines:

JET AMINE diamines are all fatty propylene diamines. They have special applications because they have both a primary and a secondary amine group. These chemicals are used as gasoline detergents, corrosion inhibitors in petroleum products, dispersion agents for mineral pigments in organic vehicles, and asphalt emulsifiers.

JET AMINE DC:

Coco Diamine
TSCA Registration No.: 61791-63-7
Liquid
Total Amine Value: minimum: 408
Major Component typical %: 88
Gardner Color: maximum: 5
Iodine Value: 12 max
Moisture maximum %: 1

JET AMINE DO:

Oleyl Diamine
TSCA Registration No.: 7173-62-8
Liquid
Total Amine Value: minimum: 320
Major Component typical %: 88
Gardner Color: maximum: 6
Iodine Value: 60 min
Moisture maximum %: 1

JET AMINE DT:

Tallow Diamine
TSCA Registration No.: 61791-55-7
Paste
Total Amine Value: 330 minimum
Major Component typical %: 88
Gardner Color: maximum: 5
Iodine Value: 30 min
Moisture maximum %: 1

JET AMINE TRT:

Tallow Triamine
TSCA Registration No.: 61791-57-9
Paste
Total Amine Value: minimum: 415
Gardner Color: maximum: 7
Moisture maximum %: 1

**JETCO CHEMICALS, INC.: JET AMINE Diamines-Polyamines
(Continued):**

JET AMINE TET:

Tallow Tetramine
TSCA Registration No.: 68911-79-5
Paste
Total Amine Value: minimum: 470
Gardner Color: maximum: 7
Moisture maximum %: 1

JET AMINE TP:

Tallow Pentamine
TSCA Listed
Paste
Total Amine Value: minimum: 475
Gardner Color: maximum: 8
Moisture maximum %: 1

JETCO CHEMICALS, INC.: JET AMINE Primary Amines:

Jetco Chemicals manufactures primary amines from traditional fatty sources such as coco, soya, and tallow. In addition, JET AMINES are available from processed animal and vegetable products such as hydrogenated tallow and oleyl fatty acids. These amines are offered in both technical and distilled grades.

Technical grade amines are manufactured from distilled raw materials. Distilled grade products are made from technical amines by giving them a final distillation, achieving even higher purity.

Primary amines are used in a wide range of industrial applications, as pure amine or as alkoxylated or acid salt derivatives. Some of the most common uses include corrosion inhibition, anti-caking, pigment dispersion, fabric finishing, or ore flotation.

JET AMINE PC:

Coco Amine
TSCA Registration No.: 61788-46-3
Liquid
Total Amine Value: minimum: 272
Major Component minimum, %: 95
Gardner Color: maximum: 3
Iodine Value: 12 max
Moisture maximum %: 0.5

JET AMINE PCD:

Distilled Coco Amine
TSCA Registration No.: 61788-46-3
Liquid
Total Amine Value: minimum: 275
Major Component minimum %: 98
Gardner Color: maximum: 1
Iodine Value: 12 max
Moisture maximum %: 0.5

JET AMINE PHT:

Hydrogenated Tallow Amine
TSCA Registration No.: 61788-45-2
Waxy solid
Total Amine Value: minimum: 210
Major Component minimum %: 95
Gardner Color: maximum: 3
Iodine Value: 5 max
Moisture maximum %: 0.5

JETCO CHEMICALS INC.: JET AMINE Primary Amines (Continued):

JET AMINE PHTD:

Distilled Hydrogenated Tallow Amine
TSCA Registration No.: 61788-45-2
Waxy solid
Total Amine Value: minimum: 211
Major Component minimum %: 98
Gardner Color: maximum: 1
Iodine Value: 5 max
Moisture maximum %: 0.5

JET AMINE PO:

Oleyl Amine
TSCA Registration No.: 112-90-3
Liquid
Total Amine Value: minimum: 200
Major Component minimum %: 95
Gardner Color: maximum: 4
Iodine Value: 70 min
Moisture maximum %: 0.5

JET AMINE POD:

Distilled Oleyl Amine
TSCA Registration No.: 112-90-3
Liquid
Total Amine Value: minimum: 208
Major Component minimum %: 98
Gardner Color maximum: 1
Iodine Value: 70 min
Moisture maximum %: 0.5

JET AMINE PS:

Soya Amine
TSCA Registration No.: 61790-18-9
Semi solid
Total Amine Value: minimum: 200
Major Component minimum %: 95
Gardner Color: maximum: 4
Iodine Value: 90 min
Moisture maximum %: 0.5

JET AMINE PSD:

Distilled Soya Amine
TSCA Registration No.: 61790-18-9
Semi solid
Total Amine Value: minimum: 208
Major Component minimum %: 98
Gardner Color: maximum: 2
Iodine Value: 90 min
Moisture maximum %: 0.5

JETCO CHEMICALS, INC.: JET AMINE Primary Amines (Continued):

JET AMINE PT:

Tallow Amine
TSCA Registration No.: 61790-33-8
Solid
Total Amine Value: minimum: 208
Major Component minimum %: 95
Gardner Color: maximum: 5
Iodine Value: 38 min
Moisture maximum %: 0.5

JET AMINE PTD:

Distilled Tallow Amine
TSCA Registration No.: 61790-33-8
Solid
Total Amine Value: minimum: 210
Major Component minimum %: 98
Gardner Color maximum: 1
Iodine Value: 38 min
Moisture maximum %: 0.5

JETCO CHEMICALS, INC.: JET BASE Combination Corrosion and Scale Inhibitors:

Used primarily in water disposal and injection systems but can be used down hole in high water cut situations. Not recommended where corrosion is severe.

CSI 3410:

Amber Liquid
Density Lbs./Gal.: 9.1
Viscosity cps: 95.4
Flash Pt. F: 125
Pour Point F: 0
pH: 5.5
Water disposal system. For barium scale.

CSI 3430:

Amber Liquid
Density Lbs./Gal.: 7.8
Viscosity cps: 135
Flash Pt. F: 58
Pour Point F: 0
pH: 3.5
Squeeze applications. Phosphonate scale inhibitor.

CSI 3440:

Dark Liquid
Density Lbs./Gal.: 9.1
Viscosity cps: 28
Flash Point F: 215
Pour Point F: 0
pH: 6.0
Ideal for water floods. Excellent brine solubility.

**JETCO CHEMICALS, INC.: JET BASE Corrosion Inhibitors
Intermediates:**

These products are designed for the customers wishing to create their own formulations from basic raw materials. No neutralization, surfactant addition or winterization has been performed on these products.

WT 3254:

Semi-Solid
Density Lbs./Gal.: 8.30
Flash Pt. F: Above 200
Film forming water soluble.

WT 3255:

Liquid
Density Lbs./Gal.: 7.09
Viscosity cps: 17.5
Flash Pt. F: 53
Pour Point F: 40
pH: 6.6
Oil and water soluble.

CI 3222:

Viscous Liquid
Density Lbs./Gal.: 8.52
Viscosity cps: 7,500
Flash Pt. F: 140
Pour Point F: 68
Excellent film forming.

JETCO CHEMICALS, INC.: JET BASE Oil Soluble Corrosion Inhibitors:

Oil soluble water dispersible corrosion inhibitors are recommended for use in producing wells and gathering systems. Their high film persistency makes them ideal for batch treatments in addition to continuous injection. They are also used in dry gas and oil transportation systems.

CI 3200:

Dark Liquid
Density Lbs./Gal.: 7.42
Viscosity cps: 415
Flash Pt. F: 74
Pour Point F: +20
pH: 7.9
Versatile, good film persistency. For CO₂ & H₂S.

CI 3210:

Dark Liquid
Density Lbs./Gal.: 7.42
Viscosity cps: 310
Flash Pt. F: 70
Pour Point F: +10
pH: 9.0
Similar to CI 3200 greater dispersibility in brines.

CI 3211:

Dark Liquid
Density Lbs./Gal.: 7.58
Viscosity cps: 280
Flash Pt. F: 60
Pour Pt. F: -5
pH: 6.6
Excellent film persistency

CI 3212:

Dark Liquid
Density Lbs./Gal.: 7.80
Viscosity cps: 885
Flash Pt. F: 72
Pour Pt. F: +20
pH: 5.8
Highly oil soluble. Non Emulsifying.

CI 3213:

Amber Liquid
Density Lbs./Gal.: 7.41
Viscosity cps: 69
Flash Pt. F: 72
Pour Pt. F: 0
pH: 8.6
Oil or water soluble. High brine dispersibility.

**JETCO CHEMICALS, INC.: JET BASE Oil Soluble Corrosion
Inhibitors (Continued):**

CI 3220:

Dark Liquid

Density Lbs./Gal.: 7.42

Viscosity cps: 550

Flash Pt. F: 71

Pour Point F: -12

pH: 9.9

Excellent film persistency. Especially effective against
H₂S.

CI 3240:

Dark Liquid

Density Lbs./Gal.: 7.67

Viscosity cps: 69

Flash Pt. F: 155

Pour Point F: 0

pH: 5.6

Oil and water soluble components. For dry gas systems.

CI 3241:

Dark Liquid

Density Lbs./Gal.: 8.13

Viscosity cps: 130

Flash Pt. F: 144

Pour Point F: +10

pH: 9.1

Refinery overhead systems.

JETCO CHEMICALS, INC.: JET BASE Water Soluble Corrosion Inhibitors:

Water soluble and water dispersible corrosion inhibitors are recommended for use on a continuous injection basis at waterfloods, disposal wells and producing wells with high water cuts. They are also efficient in wet gas gathering systems.

WT 3250:

Amber Liquid

Density Lbs./Gal.: 8.19

Viscosity cps: 18

Flash Pt. F: 68

Pour Point F: 0

pH: 6.5

Water brine soluble. High surfactancy. Water disposal systems.

WT 3253:

Amber Liquid

Density Lbs./Gal.: 7.49

Viscosity cps: 28

Flash Pt. F: 65

Pour Point F: 0

pH: 6.7

Brine Soluble.

WT 3259:

Amber Liquid

Density Lbs./Gal.: 8.84

Viscosity cps: 16

Flash Pt. F: 65

Pour Point F: 0

pH: 7.9

Corrosion inhibitor--H₂S scavenger.

WT 3260:

Amber Liquid

Density Lbs./Gal.: 7.82

Viscosity cps: 74

Flash Pt. F: 68

Pour Point F: -10

pH: 7.5

Inhibitor--surfactant.

WT 3262:

Amber Liquid

Density Lbs./Gal.: 7.70

Viscosity cps: 40

Flash Pt. F: 77

Pour Point F: -30

pH: 7.5

High surface activity. For water handling systems.

JETCO CHEMICALS, INC.: JET BASE Water Soluble Corrosion Inhibitors (Continued):

WT 3266:

Dark Liquid

Density Lbs./Gal.: 8.12

Viscosity cps: 180

Flash Pt. F: 61

Pour Point F: -22

pH: 4.3

Excellent film persistency. Only brine soluble film forming product.

WT 3268:

Dark Liquid

Density Lbs./Gal.: 7.80

Viscosity cps: 69

Flash Pt. F: 71

Pour Point F: 0

pH: 7.5

Oil and water soluble. For wet gas systems.

WT 3269:

Amber Liquid

Density Lbs./Gal.: 8.36

Viscosity cps: 420

Flash Pt. F: 92

Pour Point F: -18

pH: 6.5

High surfactancy. Operates in presence of bacteria.

WT 3270:

Amber Liquid

Density Lbs./Gal.: 8.59

Viscosity cps: 7.50

Flash Pt. F: 110

Pour Point F: -14

pH: 6.6

Packer Fluid inhibitor.

WT 3272:

Dark Liquid

Density Lbs./Gal.: 8.72

Viscosity cps: 155

Flash Pt. F: 83

Pour Point F: 0

pH: 6.0

Soluble in almost all brines. Excels in H₂S environment.

KEIL CHEMICAL DIVISION: SYNKAD Rust Inhibitors:**SYNKAD 200:**

Chemistry: Boramide
End Use Level, %: 1.2
Acid Value: nil
Base Value: 365
pH, 1% in Water: 9.2
Viscosity, SUS @ 100F: 4200
Specific Gravity @ 25C: 1.21
Color, ASTM: 1.5
Pour Point, F (C): 40 (4)

SYNKAD 202:

Chemistry: Boramide with Lubricity
End Use Level, %: 0.6
Acid Value: nil
Base Value: 500
pH, 1% in Water: 9.6
Viscosity, SUS @ 100F: 5000
Specific Gravity @ 25C: 1.19
Color, ASTM: 1.5
Pour Point, F (C): 50 (10)

SYNKAD 204:

Chemistry: Improved Boramide
End Use Level, %: 0.7
Acid Value: nil
Base Value: 360
pH, 1% in Water: 9.4
Viscosity, SUS @ 100F: 3800
Specific Gravity @ 25C: 1.19
Color, ASTM: 1.5
Pour Point, F (C): 40 (4)

End Use Level % is highly dependent on water quality, pH, biological control, other additives, the metalworking operation, metallurgy, and work conditions.

These SYNKADS are water soluble corrosion inhibitors for metalworking coolants. They are used in synthetic and semi-synthetic metalworking coolant systems as a replacement for sodium nitrite and/or para-tertiary-butylbenzoic acid. Local water sources should be evaluated to determine foaming tendencies. All of these SYNKADS reduce rust on ferrous alloys and cast iron chips.

SYNKAD 204 yields superior results in reducing "white rust" corrosion on aluminum and in reducing galvanic corrosion of dissimilar metals.

KEIL CHEMICAL DIVISION: SYNKAD Rust Inhibitors (Continued):

SYNKAD 303:

Chemistry: Carboxylate Salt
End Use Level*, %: 0.3
Acid Value: 115
Base Value: 180
pH, 1% in Water: 7.6
Viscosity, SUS @ 100F: 220
Viscosity, cSt @ 40C: 40
Specific Gravity @ 25C: 1.08
Pounds per Gallon @ 77F: 9.0
Color, ASTM: 3.5
Pour Point, F (C): <10 (<-12)

SYNKAD 500:

Chemistry: Carboxylate Salt
End Use Level*, %: 0.2
Acid Value: 170
Base Value: 230
pH, 1% in Water: 8.2
Viscosity, SUS @ 100F: 1400
Viscosity, cSt @ 40C: 300
Specific Gravity @ 25C: 1.12
Pounds per Gallon @ 77F: 9.3
Color, ASTM: 1
Pour Point, F (C): <10 (<-12)

* End use level % is highly dependent on water quality, pH, biological control, other additives, the metalworking operation, metallurgy, and work conditions.

These SYNKADS are water soluble corrosion inhibitors for metalworking coolants. They are used in synthetic and semi-synthetic metalworking coolant systems as a replacement for sodium nitrite and/or para-tertiary-butylbenzoic acid. Local water sources should be evaluated to determine foaming tendencies. These organic rust inhibitors will leave a soft, non-tacky, rust-inhibiting film on the parts and machine. The use of water-soluble lubricity additives generally does not destroy the rust protection of these SYNKADS.

Storage of SYNKAD 500 below 70F may occasionally result in product crystallization. Warming SYNKAD 500 to 140F with thorough mixing will "reconstitute" the product with no adverse performance effects.

KEIL CHEMICAL DIVISION: SYNKAD Rust and Corrosion Inhibitors:**SYNKAD 6000:**

SYNKAD 6000, the complex derivative of a carboxylate salt, is a water soluble rust and corrosion inhibitor. It is used in synthetic drawing and stamping fluids, synthetic and semi-synthetic cutting and grinding fluids, high water based hydraulic fluids and for protection of parts during short-term indoor storage.

Appearance: Hazy amber liquid
 Chemical Family: Carboxylate
 Viscosity, SUS @ 100F: 530
 Viscosity, cSt @ 40C: 100
 pH, 1% in Water: 8.6
 S.G. @ 77F: 1.12
 Acid Number (mg KOH/g): 150
 Base Number (mg KOH/g): 240
 Pounds/Gal. @ 77F: 9.3
 Color, ASTM: 3 1/2
 Pour Point, F (C): <-20 (<-29)
 Stability (30F-130F): Pass 3 Cycles

SYNKAD 828 Corrosion Inhibitor:

SYNKAD 828 Corrosion Inhibitor is an amine-carboxylate which is competitive in both price and performance with other corrosion inhibitors available today. It is a suitable alternative to sodium nitrite in synthetic and semi-synthetic metalworking coolant systems.

SYNKAD 828 Corrosion Inhibitor has some distinct advantages which make it more effective on a performance basis than similar competitive products:

It offers better rust inhibition at lower use levels. It should be evaluated at use levels as low as 75% of the use levels of like competitive products.

The quantity of diethanolamine (DEA) in SYNKAD 828 Corrosion Inhibitor is below reportable levels under present federal regulations. This benefit reflects today's regulatory compliance concerns.

Appearance @ 77F (25C): clear, amber liquid
 Color, Gardner: 11
 Viscosity, SUS @ 100F (37.8C): 230
 Specific Gravity @ 77F (25C): 1.11
 Pounds per Gallon (kg/l): 9.26 (1.11)
 pH @ 1% in Tap Water (8 grains/gal): 8.7
 Hard Water Stability (1% in 30 grains/gal water): clear & stable

KING INDUSTRIES: NACORR Rust & Corrosion Inhibitors:

NACORRs are liquid materials which are metal salts of dinonylnaphthalene mono sulfonic acids. They are based on various metals to offer formulators the flexibility of being able to select the most effective product to match the surface being coated and the coating being applied.

All the NACORR products are 50% active in mineral spirits except for the zinc salt (NACORR 1552) which is 50% active in Butyl Cellosolve.

NACORR 1151:

Metal: Barium
Solvent: Mineral Spirits
Specific Gravity: 0.963
* Most compatible of the NACORRs
* Easiest to incorporate
* Highest metal content

NACORR 1351:

Metal: Calcium
Solvent: Mineral Spirits
Specific Gravity: 0.928
* More basic than other salts
* Most effective against acid atmosphere corrosion
* Superior in waterborne applications

NACORR 1552:

Metal: Zinc
Solvent: Butyl Cellosolve
Specific Gravity: 1.00
* More acidic than other NACORRs
* Catalytic in amino crosslinked systems
* Excellent pigment dispersant
* Good adhesion particularly to zinc-treated substrates
* May contribute to hardness in amino crosslinked systems

NACORR 1651:

Metal: Magnesium
Solvent: Mineral Spirits
Specific Gravity: 0.918
* Lowest metal concentration
* Forms hardest films in thermoset coatings
* Exhibits activity with amino crosslinkers

Benefits:

- * Reduction or elimination of anti-corrosion pigments
- * Improved gloss
- * Improved pigment dispersion
- * Enhanced cure rates
- * Better salt spray and corrosion resistance

KOP-COAT, INC.: KOP-COAT Protective Coatings: Alkyd:

KOP-COAT 622-LCF Primer:

Lead-free and chromium-free medium oil alkyd primer. Contains calcium borosilicate for excellent rust-inhibitive effect.

KOP-COAT 622-LCF offers several advantages over standard alkyd primers:

1. Excellent rust-inhibitive properties without the use of lead or chromium compounds.
2. Full compliance as supplied with current and proposed air pollution regulations.
3. High solids for economical coverage.
4. Very good brushability as supplied for use where spray application is restricted.
5. Quick drying for early handling and topcoating.
6. Will accept topcoating for up to one year after application.

RUSTARMOR 500:

Straight long-oil alkyd-resin enamel.

Protects steel, wood or pretreated galvanized metal against moderately corrosive exterior environments. Forms a tough, flexible elastic film that will withstand thermal shock on large metal surfaces and has excellent weathering properties. It is an ideal coating for structural steel, bridges, storage tanks, metal roofing, siding, sash and trim.

RUSTARMOR 500 Speed:

Medium to long oil alkyd resin coating.

Tough, high-gloss, flexible coating for wood, properly primed steel, and pre-treated nonferrous metal surfaces in moderately corrosive environments. It is an excellent substitute for traditional RUSTARMOR 500 for storage tanks, structural steel, bridges, metal roofing, siding, sashes, and trim where a more rapid dry time is desired or required. The product exhibits excellent weathering properties. The flexible but quick drying film properties facilitate rigging and make field work scheduling earlier.

GLAMORTEX 501 Enamel:

Medium to long oil alkyd resin coating.

Tough, durable, high-gloss, resilient coating, for non-submerged metal and wood. Is hard-wearing, weather-resistant and withstands normal condensation indoors and extreme temperature changes outside. Ideal for equipment in constant use: valve handles, railings, machinery and equipment, etc.

KOP-COAT, INC.: KOP-COAT Protective Coatings: Asphaltic:

INERTOL No. 49 Thick:

A blend of Gilsonite select, blown and steam distilled asphalt with chemical and water resistant fillers.

For protecting metal and concrete surfaces submerged in drinking water, such as interior of tanks, well casings, pumps and pipes, and other submerged steel and concrete surfaces.

For exterior surfaces of tanks, standpipes, topside of digester floating covers, gasholder crowns and metal roofs where a heavy black economical coating is needed. Does not alligator in the sunlight.

Protects against mechanical and chemical influences, including salt air, mild solutions of acetic acid, sulphurous acid, etc.

INERTOL Grease Coating:

A semi-drying, self-healing protective coating of grease-like consistency, based on rust-preventive oils, reinforced with bitumen and chemical rust-inhibitors.

Recommended for submerged moving parts where drying coatings cannot obtain good bond or effective film thickness because of many sharp edges. On ball and socket joints of pipelines, acts as lubricant as well as protects metal joints. Typical uses: chains, rails, conveyors, grates (underside), screws, nuts, bolts, shafts, gears, trickling filter arms. Also for non-submerged surfaces that will not be in contact with operating personnel.

KOP-COAT No. 99 Insulating Coating:

A heavy-duty Mastic containing selected asphalts in suitable solvents, granular cork and inert mineral fillers.

KOP-COAT No. 99 can be used on metal indoors and outdoors for both corrosion protection and moderate heat and sound insulation. When dry, KOP-COAT No. 99 is resistant to weather and to contact with condensation and most weak acids and alkalis.

KOP-COAT No. 99 is fire-resistant when dry. However, in its mastic state and until its solvents have been dissipated, the coating is combustible and should be treated accordingly.

KOP-COAT No. 99 should not be exposed to direct contact with oil, solvents or other chemicals which may soften the coating.

KOP-COAT, INC.: KOP-COAT Protective Coatings: Coal Tar:

BITUPLASTIC No. 28:

BITUPLASTIC No. 28, a mineral colloid stabilized coal tar emulsion, is a thick, heavy duty, cold applied protective coating. It contains no volatile organic solvent.

BITUPLASTIC No. 28 can be obtained in a winter grade which is fortified to protect the emulsion from freezing during shipment in cold weather.

For use as a protective coating for above ground structures subjected to atmospheric exposure in industrial areas. It may be also used to topcoat thoroughly cured solvent-based primers or BITUMASTIC coatings to prevent their alligatoring and prolong their life.

Not suitable for continuous immersion, however, its use is satisfactory in all ambient temperature and humidity ranges.

When a colored finish is desired, and after weathering at least one month, BITUPLASTIC No. 28 may be topcoated with KOP-COAT 600 Acrylic. Some discoloration of the topcoat may appear if applied too soon after the application and initial curing of BITUPLASTIC No. 28.

BITUPLASTIC No. 33:

BITUPLASTIC No. 33, a mineral colloid stabilized polymer modified coal tar emulsion, is a thick heavy duty, cold applied protective coating. It contains no volatile organic solvent.

It has a low perm rating and exhibits excellent adhesion and flexibility when dry.

BITUPLASTIC No. 33 can be obtained in a winter grade which is fortified to protect the emulsion from freezing during shipment in cold weather.

For use as a protective coating for above ground structures subjected to atmospheric exposure in industrial areas. It may be also used to topcoat thoroughly cured solvent-based primers or BITUMASTIC coatings to prevent their alligatoring and prolong their life.

BITUPLASTIC No. 33 has exhibited excellent service in the following areas.

1. Maintenance coating for steel and other structural materials exposed to splash and spills of most mineral acids and many organic acids in concentrations up to 30%, sea water and salt solutions in all concentrations, and petroleum products such as gasoline, naphtha, etc.
2. Coating corrugated siding and roofing.
3. Protection on concrete from the action of corrosive salts when used over primer.
4. Floor surfacing and deck coating (with sand).
5. Vapor barrier for insulation and plaster.

**KOP-COAT, INC.: KOP-COAT Protective Coatings: Coal Tar
(Continued):**

BITUMASTIC Black Solution:

A self-priming protective coating formulated with refined tars, special solvents and selected ingredients. It has a consistency of thin fluid paint or varnish and does not contain added fillers or fibers.

Recommended as a general maintenance coating to provide a water-proof finish for metal or concrete. It is designed for use under moderate corrosive conditions as experienced in the fumes of industrial acids, alkalis and chemicals.

Do not use on the interiors of potable water tanks or containers as BITUMASTIC Black Solution will impart taste to the water.

When exposed to sunlight and effects of weathering, the coating should be aged approximately 2 to 4 weeks then topcoated with BITUPLASTIC No. 28 or BITUPLASTIC No. 33. This minimizes weathering effects that result in alligatoring or cracking of coal tar films.

BITUMASTIC SUPER SERVICE Black:

A self-priming, heavy-duty, cold-applied, water resistant coating made from pitch derived from suitable tars, selected solvents, mineral fillers and special additives.

One of its outstanding features is providing a thick film that will protect metal and concrete from severe chemical fumes and corrosive vapors. It has proven especially effective in the sewage industry by protecting metal and concrete against the deteriorating effects of raw and industrial waste materials and hydrogen sulfide gas. It can be used on all metal and concrete surfaces which will be buried or immersed. It can be used directly on concrete without the need for a separate primer.

When exposed to sunlight and effects of weathering, the coating should be aged approximately 2 to 4 weeks, then topcoated with BITUPLASTIC No. 28 or BITUPLASTIC No. 33. This minimizes weathering effects that result in alligatoring or cracking of coal tar films.

Do not use for the interior of tanks, containers or pipelines designed for containing potable water.

**KOP-COAT, INC.: KOP-COAT Protective Coatings: Coal Tar
(Continued):**

BITUMASTIC No. 50:

BITUMASTIC No. 50 is a cold applied, black, thixotropic, heavy-duty protective coating. It is based on a blend of plasticized coal tar pitch, selected solvents and special fillers. As received, it has the appearance of a heavy paste, however, when stirred it thins out to a brushing, rolling, or spraying consistency without the use of thinners. On standing, after stirring, it returns to its original thixotropic state. It is self-priming on steel.

The unique properties of this coating make it especially suitable for use under unusually severe corrosive conditions. It can be applied easily to steel in exceptionally thick films without sagging. It is especially adaptable to underground and/or underwater installations. It is not recommended for use on concrete and masonry. Use BITUMASTIC SUPER SERVICE Black (self-primings) for concrete and masonry.

Meets the following specifications:

1. Department of Navy, Bureau of Yards and Docks--34 Yd.
2. Military Specification--MIL-C-18480B.
3. Bureau of Reclamation--CA-50.

BITUMASTIC SUPER TANK Solution--High Solids:

BITUMASTIC SUPER TANK Solution--High Solids is a revised version of one of the best known, most effective protective coatings for use as an interior lining on steel tanks and piping systems for potable and irrigation water services. It is a high build, cold applied, water resistant coal tar coating. It is self-priming on steel, provides required film thickness in two coats, dries by solvent evaporation, and is easy to recoat and repair. The dried coating will not sag or flow at maximum temperatures found in normal atmospheric exposure and will not crack at -20F.

Compared to preceding versions of the product, BITUMASTIC SUPER TANK Solution - High Solids:

1. Provides 10% to 20% higher coverage from the same volume of coating.
2. Contains up to 20% less solvent by volume.
3. Is still easily applied as supplied by brush, roller or spray, without the need to add thinner.
4. Meets all current and proposed air pollution standards for volatile organic compound content (VOC).

Applications has been made to the NSF for acceptance of this product.

BITUMASTIC SUPER TANK Solution--High Solids is designed for the long-term protection of the interior of large steel storage tanks and steel transmission pipelines for potable and irrigation water service.

KOP-COAT, INC.: KOP-COAT Protective Coatings: Epoxy:

KOP-COAT 340 Gold Primer:

A high solids, high build, durable, chemical-resistant universal primer. It is based on a polyamide-cured epoxy resin, and shipped as a two-component system. Mix ratio is 1:1 by volume.

As a primer for metal, with a neutral high contrast color and a designed-in surface texture, for use in shop and field, that can be topcoated up to one year after application with epoxies, urethanes, alkyds and emulsions.

BITUMASTIC No. 300-M:

BITUMASTIC No. 300-M is a two-component, self-priming, chemically-cured, catalyzed coal tar epoxy protective coating.

BITUMASTIC No. 300-M is designed for immersion, interior or exterior exposures and combines the outstanding corrosion resistance characteristics of selected coal tar pitch with those of epoxy resin.

BITUMASTIC No. 300-M is designed to be applied in moderately heavy films for the economical protection of metal, masonry or wood structures exposed to chemical plant environments, water flood gates and dam faces, sewage plants, storage tank linings, bridges, pipeline interiors and exteriors, immersion and atmospheric exposures where a tough, abrasion and chemical resistant film is necessary to insure long-term substrate integrity and strength. No. 300-M can be utilized in every industry including chemical processing, pulp and paper, marine, flood processing, water and sewage, offshore drilling, nuclear energy, textile, petroleum, plating, steel, public utilities, fertilizer, and space facilities.

Although 300-M exhibits self-priming characteristics, it also functions well on metal surfaces on which compatible primers and zinc rich primers have been applied.

BITUMASTIC No. 300-M High Build:

BITUMASTIC No. 300-M High Build is a version of BITUMASTIC No. 300-M Coal Tar Epoxy, modified to produce a thicker film in fewer coats. It is self-priming and chemically cured. One coat can provide up to 30 to 35 dry mils for protection of steel and concrete in extremely corrosive environments. One coat of BITUMASTIC No. 300-M High Build will do the work of two or more coats of conventional coal tar epoxies with significant savings of material and labor costs, while also eliminating the possibility of intercoat delamination.

BITUMASTIC No. 300-M High Build is supplied as a two component coating. The complete protective coating is ready for application after Components A and B are mechanically and thoroughly mixed together. The cured coating will withstand considerable physical damage, such as impact, abrasion, flexing.

KOP-COAT, INC.: KOP-COAT Protective Coatings: Epoxy (Continued):

KOP-COAT Epoxy Block Filler:

A high solids, high build polyamide-cured epoxy resin block filler 1:1 volume mix, shipped as a two component system. Both components are pigmented.

Primarily for use on concrete and masonry surfaces which will be submerged and which have been cured 28 days or longer. Highly resistant to alkali, and mild acids.

On concrete or masonry surfaces in steel mills, pulp and paper mills, petroleum refineries, marine facilities, sewage plants and similar severe chemical environments. Has excellent resistance to chemical fumes; splash and spillage of alkalis; vegetable, animal or mineral oils; solvents such as xylol, methyl isobutyl ketone, JP-4 Fuel; also mild acids such as hydrochloric and hydraulic fluids.

It can be used to seal pores of unpainted cinder block, cement block, and rough masonry prior to application of most coatings including epoxies, rubber base, urethanes, etc. Do not use on areas subjected to hydrostatic pressure. Filler meets both present and anticipated air regulations.

GLAMORGLAZE 200 Epoxy:

A high solids polyamide-cured epoxy resin coating, shipped as a two-component system.

For use on metal and concrete surfaces to be submerged. Exhibits very good resistance to water, salt solutions, petroleum products and other aggressive chemicals. Can be used in contact with potable water.

For use on metal, concrete and masonry, and wood surfaces in steel mills, pulp and paper mills, petroleum refineries, marine industry, sewage plants and similar severe chemical environments. Has excellent resistance to abrasion, chemical fumes, splash and spillage of alkalis and vegetable, animal or mineral oils, and solvents such as xylol.

As a maintenance coating, can be used to upgrade most previously coated surfaces without the necessity of removing the old finish.

HI-GARD Epoxy Coating:

A high solids, high build polyamide-cured epoxy resin coating 1:1 volume mix, shipped as a two-component system. Both components are pigmented.

For use on steel, concrete, wood and non-ferrous metals. Can be used in contact with potable water. Can also be top-coated with other KOP-COAT coatings such as GLAMORGLAZE 200 Epoxy and 1122 BRS Polyurethane.

For use on bridges, in steel mills, pulp and paper mills, petroleum refineries, marine facilities, sewage plants and similar severe chemical environments. Has excellent resistance to chemical fumes, splash and spillage of alkalis and vegetable, animal or mineral oils, and solvents such as xylol, MIBK, JP-4 Fuel, also mild acids such as HCl and Hydraulic Fluids.

KOP-COAT, INC.: KOP-COAT Protective Coatings: Epoxy (Continued):

SUPER HI-GARD Epoxy Coating:

A very high solids, high build chemically cured epoxy resin coating 1:1 volume mix, shipped as a two component system. Both components are pigmented.

Provides a high-gloss, easy-cleaning finish for use on steel, concrete, wood and non-ferrous metals. Can be used in contact with potable water. Can also be topcoated with other KOP-COAT coatings such as 1122 BRS Polyurethane to provide for long term gloss retention.

For use on bridges, in steel mills and paper mills, petroleum refineries, marine facilities, sewage plants, water tanks, and similar severe chemical environments. Has excellent resistance to chemical fumes, splash and spillage of alkalis and vegetable, animal or mineral oils, and solvents such as xylol, MIBK, JP-4 Fuel, also mild acids such as HCl, and Hydraulic Fluids.

A-788 Splash Zone Compound:

Two Component, 100% Solids (no volatile solvents) Epoxy-Polyamide Mastic. Does not contain asbestos, lead or other toxic metals.

A-788 Splash Zone Compound was originally designed to provide protection against corrosion of metals and erosion and deterioration of concrete and wood at, above and below the waterline in splash zones. Now it is not only used on steel or wood pilings and pier supports, but also as a coating repair of boat hulls and buoys, on bridge abutments, and on any surface subject to erosion and corrosion in salt or fresh water. It is used for many patching and grouting applications that are not submerged, and on surfaces which subsequently are buried in soil.

A-788 can be mixed and applied underwater and will cure underwater as well as in air. It adheres to any clean sound surface, either wet or dry, including aluminum, galvanized steel, concrete, wood, fiberglass and existing coatings. It cures to an extremely hard coating which is abrasion and impact resistant, and which will substantially retard further erosion and corrosion.

KOP-COAT Aluminum Epoxy Mastic:

A high solids high build epoxy pigmented with aluminum. It is furnished as a two component system with a 1:1 volume mix.

Primarily designed for use over steel which is free of grease and oil and has been suitably prepared by hand or power tool cleaning. Also may be used over rusted and pitted steel when sandblasting is not possible or feasible.

It can be applied over aged coatings such as alkyds, oleo-resinous, phenolics and epoxies providing that the coatings are soundly adherent. On structural steel, tank exteriors, bridges, fences, metal buildings it can be used as a primer/topcoat system.

KOP-COAT, INC.: KOP-COAT Protective Coatings: Urethane:

KOP-COAT 1122 BRS Linear Polyurethane:

An aliphatic polyurethane, two component high gloss coating (4:1 volume mix) that can be applied by brush, roller or spray to provide the appearance of a high quality enamel and the performance of a chemically cured coating.

Protects metal surfaces in marine atmospheres, chemical plants and many other corrosive environments. Protects and beautifies transportation vehicles, storage tanks, structural steel, metal siding, and walls. Exhibits excellent adhesion to properly prepared fiberglass and PVC surfaces. Can be used to upgrade existing alkyl enamel systems. Not recommended for continuous immersion.

BITUMASTIC C.T. Urethane - Type I:

A fast curing, two component (1:1 volume mix), chemically cured, coal tar urethane coating that combines the known water resistant protection and long term stability of coal tar enamels, with excellent low temperature flexibility and high temperature resistance to flow found in urethanes. It is resistant to chemical and bacteriological attack typically found underground. This coating provides superior electrical insulation to the exterior of piping, tanks and structural steel to prevent corrosion and keep the cost of cathodic protection down.

Although BITUMASTIC C.T. Urethane--Type I exhibits self-priming characteristics, it also functions well over compatible KOP-COAT primers to provide superior corrosion protection. The flexibility and toughness of the coating alleviate problems associated with handling coated items, piling, or tanks. When coated piece is stored above-ground, slight natural chalking will occur.

KOP-COAT, INC.: KOP-COAT Protective Coatings: Zinc:

KOP-COAT P-1500 Inorganic Zinc:

A two-component, water-based, self-curing, pure inorganic zinc-rich coating.

KOP-COAT P-1500 Inorganic Zinc is a high performance coating employing high purity, ultra-small particle zinc metal dispersed in a selected metallic silicate. Although the dried coating shows porosity typical of inorganic zincs, the pore size is extremely small in comparison.

On steel surfaces, submerged or nonsubmerged, subject to severe weathering or high salt concentrations, such as bridges, ballast tanks, offshore platforms, cargo holds, piping, storage and process tanks. Has excellent abrasion, temperature, and weather resistance, as well as complete resistance to aliphatic hydrocarbons (oil), aromatic hydrocarbons (toluol and xylol), alcohols, ketones, and esters. Protects cathodically and serves as "permanent" primer for coatings that will be subject to chemical exposure. Can be topcoated with vinyls, epoxies, acrylics, alkyds, and certain coal tar coatings. An intermediate coating may be needed. Do not use in areas subject to splash or spillage of acid or alkali solutions, or for complete immersion in these solutions outside a pH range of 5 to 9.

P-1500 Inorganic Zinc meets or exceeds all requirements of Military Specification MIL-P-23236, Type I, Class 3.

Volatile organic Compound (VOC) as supplied. No thinning is recommended.

Technical Data:

Weight per Gallon: 27.71 pounds (mixed)

Liquid: 6.46 pounds net

Powder: 21.25 pounds net

Solids content: 82+-1% by weight

% zinc in dry applied film: 94+-1%

Viscosity (Stormer): 70+-2 KU

Flash Point: None (non-flashing)

Color: Gray

Shelf life: 1 year minimum.

Pot life: 16 hours

Service temperature limits: dry: 800F./wet.: 130F.

KOP-COAT, INC.: KOP-COAT Protective Coatings: Miscellaneous:

BITUMASTIC 2CB:

A special Surface Conditioner for use with BITUMASTIC No. 300-M, and similar types of bituminous epoxy coatings.

Chemically cured coatings of the coal tar epoxy type cure rapidly at ambient temperatures producing a hard film which is highly resistant to solvents. The exceptional solvent resistance of coatings like BITUMASTIC No. 300M is such that, once cured, they are not attacked by their own solvent and if application of a second or subsequent coat is delayed for longer than 24 hours, at temperatures of 70F or higher, delamination can occur. At temperatures over 90F, it may not be possible to obtain satisfactory adhesion of the second or subsequent coat after an interval as short as 6 hours. The coating is too smooth and hard to supply a "tooth" for the second coat to bond and its solvent resistance is such that it cannot be softened by the second coat. The problem is even greater when it is necessary to touch up or to repair coatings which have suffered physical damage by chipping or impact. The only recognized method of obtaining adhesion of such patch coats or delayed topcoats is by sanding or brush, sandblasting the surface of the first coat to obtain sufficient roughness for mechanical adhesion.

Now KOP-COAT has developed a special surface conditioner, BITUMASTIC 2CB, as an alternate to sandblasting or sanding. Used properly BITUMASTIC 2CB will permit application of subsequent coats of BITUMASTIC 300-M, and similar bituminous epoxy coatings, to an existing application that is up to one year old with adequate adhesion.

KOP-COAT 40 Passivator:

A two-component wash primer formulated with a zinc chromate pigmented polyvinyl butyral resin and phosphoric acid.

Pretreatment for non-ferrous metals prior to priming. May also be used on blasted clean steel surfaces with some vinyl coating systems. Also suitable for use on galvanized metal prior to application of primers except KOP-COAT P-1500 Inorganic Zinc and similar zinc primers.

Volatile Organic Compound (VOC) as supplied is 745 grams/liter (6.2 lbs./gl.).

LOCTITE CORP.: EXTEND Rust Treatment 754 (Industrial Grade):

EXTEND Rust Treatment is used on rusted steel and iron to stop rust, protect the surface and act as a primer for various topcoat covering on:

- * Pipes, valves, fittings in refineries, tankers, power plants, domestic and commercial heating/cooling plants.
- * Truck trailers, storage tanks.
- * Fences, guard rails, conveyors, supports.
- * Overhead cranes, booms, floor gratings, ductwork.
- * Outdoor advertising sign supports/frames, municipal and highway sign posts and frames.
- * Bulkheads, overheads, decks, hatch covers, stacks on ships.
- * Agricultural equipment, harvesters, plows, discs, tractors, corn pickers, etc.
- * Snow removal equipment in highway department maintenance yards
- * Paper mills, chemical plants, steel mills, utilities for maintenance of pipes, tanks, support steel, valves.
- * Castings and stampings before final machining.

Product Benefits:

- * Easy to use. No sandblasting. Just wire brush to remove loose rust, clean off any oil, dirt or grease, brush or spray EXTEND Rust Treatment on surface. It does the rest!
- * Converts and primes in one operation. Two coats for maximum durability.
- * Replaces conventional primer for most industrial finish paints.
- * Works on damp, rusty metal.
- * Safe, non-flammable, low toxicity, can be used on deteriorated galvanized metal.
- * USDA Acceptance.

Composition: Synthetic latex resin/organic acid/glycol ethers/glycols/water

Solids Content: 50% by weight/39% by volume

Viscosity: 750 cP

Flash Point: Above 200F (93C)

Coverage: 625 sq.ft. per gallon at 1 mil DFT (dry film thickness)
250 sq.ft. per gallon at 2 1/2 DFT (dry film thickness)

Speed of Cure: Dry to touch, 15-30 minutes

Recoat time, 15-30 minutes

Topcoat time, 24-72 hours

Weight per Gallon: 10.6 lbs.

Specific Gravity: 1.3

Appearance: Milky off-white liquid with mild odor

Type: Fast drying latex. Converts from off-white liquid to black coating in presence of iron oxides. Cures by evaporation and coalescence.

Dry Time (77F): Dry to touch 15-30 minutes

Recoat time 15-30 minutes

Topcoat time 24 hours or longer

LONZA INC.: Alkanolamides: CARSAMIDE-1:1 Super Amides/UNAMIDE-Ethoxylated, 2:1 Amides and Super Amides:

Lonza alkanolamides function primarily as foam boosters, stabilizers and viscosity builders in a wide variety of applications within the Personal Care and Household/Industrial business areas. They may also function as surfactants, emulsifiers, opacifiers, gelling agents, corrosion inhibitors, lubricants and conditioning agents. CARSAMIDE super amides are most often recommended for Personal Care applications, while UNAMIDE products find their greatest use in Household/Industrial products.

1:1 Super Amides:**CARSAMIDE AMEA:**

N-Acetyl Ethanolamide

CTFA Designation: Acetamide MEA

Liquid

% Activity: 70

Comments: Hair conditioner and antistat.

CARSAMIDE CA:

1:1 Coco Diethanolamide

CTFA Designation: Cocamide DEA

Liquid

% Activity: 100

Comments: Coco oil based foam booster.

CARSAMIDE CMEA:

1:1 Coco Monoethanolamide

CTFA Designation: Cocamide MEA

Flakes

% Activity: 100

Comments: Very efficient thickening agent.

CARSAMIDE SAC:

1:1 Coco Diethanolamide

CTFA Designation: Cocamide DEA

Liquid

% Activity: 100

Comments: Excellent viscosity modifier.

CARSAMIDE SAL-7:

1:1 Lauric/Myristic Diethanolamide

CTFA Designation: Lauramide DEA

Solid

% Activity: 100

Comments: Excellent viscosity modifier.

LONZA INC.: Alkanolamides: CARSAMIDE-1:1 Super Amides/UNAMIDE-Ethoxylated, 2:1 Amides and Super Amides (Continued):

1:1 Super Amides (Continued):

CARSAMIDE SAL-9:

1:1 Lauric Diethanolamide
CTFA Designation: Lauramide DEA
Solid
% Activity: 100
Comments: Excellent viscosity modifier

2:1 Amides, Ethoxylated Amides, Super Amides:

UNAMIDE C-72-3:

2:1 Coco Diethanolamide
Liquid
% Activity: 100
Comments: Industrial/Household applications.

UNAMIDE C-5:

Ethoxylated Coco Monoethanolamide
CTFA Designation: PEG 6 Cocamide
Liquid
% Activity: 100
Comments: pH stable - useful in all areas.

UNAMIDE D-10:

Modified Coco Diethanolamide
CTFA Designation: Cocamide DEA
Liquid
% Activity: 100
Comments: Industrial/Household applications.

UNAMIDE LDL:

1:1 Coco Diethanolamide
CTFA Designation: Cocamide DEA
Liquid
% Activity: 100
Comments: Superamide for industrial uses.

LONZA INC.: Organic Phosphonates: UNIHIB:

This family of organic phosphonates inhibits corrosion and scale deposition. They are hydrolytically stable over a wide pH range even at elevated temperatures. The UNIHIBS are utilized in cooling tower; boiler treatment and oil field applications.

UNIHIB 305 - LC:

Amino Tri(Methylene Phosphonic Acid) (AMP)
Liquid
Chelation Values mg CaCO₃/g Product: 400
% Solid: 50

UNIHIB 314:

Penta Sodium Salt of AMP
Liquid
Chelation Values mg CaCO₃/g Product: 290
% Solid: 40

UNIHIB 106:

1-Hydroxyethylidene-1, 1-Diphosphonic Acid
Liquid
Chelation Values mg CaCO₃/g Product: 522
% Solid: 60

UNIHIB 905:

Diethylene Triaminepenta (Methylene Phosphonic Acid)
Liquid
% Solid: 50

UNIHIB 1324:

Diammonium Salt of Cocoamine-Di-(Methylene Phosphonic Acid)
Form: Liquid
% Solid: 40

UNIHIB 1704:

Bis-Hexamethylene Triamine Phosphonic Acid
Liquid
% Solid: 45

THE LUBRIZOL CORP.: LUBRIZOL 2064 Calcium Sulfonate Corrosion Inhibitor:

Product Advantages:

- * 100% Non-volatile
- * Provides outstanding corrosion inhibition on steel surfaces
- * May function as a secondary plasticizer providing film flexibility
- * Liquid product for easier incorporation
- * Exhibits good package stability
- * Can be used as a substitute for corrosion inhibitive pigments

Typical Application:

Formulation of clear or pigmented water-based latex coatings

Typical Chemical and Physical Characteristics:

Appearance: Light Tan Gel

Density @ 60F (15.6C):

Pounds per U.S. Gallon: 9.50

Kilograms per Liter: 1.14

Viscosity (cps): 150,000

Calcium, Weight Percent: 13.7

Sulfur, Weight Percent: 0.6

Total Base Number: 375

Flash Point, PMCC, C: 185

DAVISON CHEMICAL DIVISION: SHIELDEX Calcium Ion-Exchanged Silica:

The NonToxic, Superior Anti-Corrosion Pigment

Silica (Amorphous) Content: 94% wt. d.b.
Calcium Content: 6% wt. d.b.
Total Volatiles at 1750F: less than 10% wt.
Refractive Index: 1.46
Avg. Particle Size: 3 microns
*Specific Gravity: 1.8
*Oil Absorption: 50 lbs./100 lbs.
pH: 9.0-9.3

*Note: The specific gravity of SHIELDEX is 1.8 versus 3.2 to 4.0 for other anti-corrosion pigments. Replace your current anti-corrosion pigment with SHIELDEX at equal volume which is 50% by weight. The equivalent oil demand will be 25 lbs. per 100 lbs. because you use only half as much SHIELDEX.

SHIELDEX is calcium ion-exchanged on an amorphous silica gel, which meets FDA requirements.

How SHIELDEX Works:

- * When an aggressive (corrosion causing) ion enters the film, it contacts the silica and an ion-exchange occurs.
- * The aggressive ion is locked onto the silica and a corresponding calcium ion is released to the metal surface.
- * The ion-exchange process is continuously available. Each time an aggressive ion enters, layers of calcium ions are formed at the coating and metal interface.
- * In a short amount of time, the layer of calcium ions at the metal/coating interface forms a barrier which prevents corrosion causing ions from getting to the metal surface.

SHIELDEX Benefit Highlights:

- * Performance: SHIELDEX is the only nontoxic A/C pigment that demonstrates performance equal to Chromates and superior to all other nontoxic alternatives.
- * Nontoxic: SHIELDEX consists on Calcium Ion-exchanged of an amorphous Silica Gel which has been cleared by the FDA for use in foods.
- * Reduced Film Permeability: Because SHIELDEX is insoluble, no voids are formed in the paint film.
- * Dispersability: The small particle size (3 microns) of SHIELDEX and its low Specific Gravity (S.G.=1.8) means SHIELDEX can be dispersed by common high speed dispersers such as Cowles.
- * Long Film Life: The ion exchange only occurs when an aggressive ion permeates the paint film.
- * Colorless: The refractive index of SHIELDEX is 1.46 which means it is colorless when dispersed in a paint system.

DIVERSEY WATER TECHNOLOGIES INC.: ALL-ORGANIC PLUS
Cooling Water Treatment:

Do you use "chromate" treatments?

Do you use "non-chromate" treatments?

Do you need to maximize "cycles" and minimize water use with little or no acid?

Have your safety and handling concerns increased?

Do you require optimum deposition and corrosion control?

Do you need chlorine or bromine compatibility?

If you answer yes to any of these questions, an ALL-ORGANIC PLUS treatment is recommended!

ALL-ORGANIC PLUS cooling water treatment is available in a variety of choices to meet your needs.

Commercial, industrial and institutional operations share a similar need for cooling system efficiency. But with all of the stringent pollution control regulations in existence, maintaining that efficiency can be a problem. That is, unless you use a water treatment agent that combines corrosion inhibiting features with pollution control capabilities.

MOGUL's ALL-ORGANIC PLUS program provides the benefits of cooling system efficiency and environmental acceptability. It's the industry's latest and most advanced non-polluting inhibitor.

ALL-ORGANIC PLUS provides effective dispersant action and superior protection against corrosion, pitting and scale deposits. Not only does this improve the efficiency of the cooling system, but it extends system life, keeping downtime to a minimum. And by maintaining clean heat exchanger surfaces, ALL-ORGANIC PLUS products maximize cooling system performance.

The superior scale and deposit control treatment in ALL-ORGANIC PLUS maximizes cycles and minimizes water and chemical use.

Significant additional benefits to your plant operation result from what ALL-ORGANIC PLUS products do NOT contain. There are no phosphates in the formulation to aggravate microbial or deposit problems. Nor are there chromates, phosphates, or other "priority" pollutants. Because ALL-ORGANIC PLUS products contain virtually no toxic chemicals, there are no EPA discharge limits. And, they are compatible with oxidizing biocides such as chlorine.

No special feeding or handling equipment is required to use ALL-ORGANIC PLUS, although MOGUL's MICROCHEM equipment is recommended for maximum efficiency and results. The easy-to-dispense and easy-to-test ALL-ORGANIC PLUS inhibitors are available in economical dosages for commercial, industrial and institutional applications.

DOW CORNING CORP.: DOW CORNING Metal Protective Coating:

DOW CORNING metal protective coating is a transparent, dry, wax-like coating that protects metal parts against corrosion. The coating has good inherent lubricating properties and usually does not require removal prior to any subsequent machining, assembly or start-up of equipment. If necessary, DOW CORNING metal protective coating may be removed with mineral spirits, chlorinated solvents or steam cleaning.

Typical uses for DOW CORNING metal protective coating include:

- * Manufacturing
- * Machine shop and tool room
- * Maintenance
- * Finished products

Type: Corrosion-protective coating

Physical Form:

as supplied: Liquid and aerosol

as applied: Clear, dry, wax-like film

Special Properties:

Good corrosion protection in thin film, colorless; non-oily; compatible with most lubricants and rubbers

Primary Uses:

For preventing corrosion on metal parts in storage, overseas shipments and other high-humidity, long-term exposure

Typical Properties:

Appearance: Opaque, yellow liquid

Density, pounds per gallon: 6.8

Boiling Point, F (C): 240 (115)

Flash Point, F (C): 82 (28)

Surface Coverage, square feet per gallon, film thickness of:

0.0001 inch: 2100

0.0002 inch: 1100

0.0003 inch: 700

Drying Time, minutes:

bulk: 90

aerosol spray: 5 to 10

Solvent:

bulk: Mineral spirits

aerosol spray: Mineral spirits plus nonchlorofluorohydro-carbon propellant

As Applied:

Appearance: Colorless, non-oily wax

Softening Point, F (C): 150 (65)

Service Temperature Range, F (C): -40 to 150 (-40 to 65)

Single Dip Film Thickness at 68F (19.9 C), mils: 0.4

Corrosion Resistance, mild steel:

5 percent salt spray, dipped from bulk, hours: 200+

Lubrication: Pass, no stick-slip

Coefficient of Friction: 0.10

DUPONT CO.: DUPONT Corrosion Inhibitors:

DCI-4A:

Gasoline: Secondary Use
Jet Fuel: Primary Use
Distillate Fuel: Secondary Use

DCI-6A:

Gasoline: Primary Use
Jet Fuel: Secondary Use
Distillate Fuel: Primary Use

DCI-11:

Gasoline Oxygenates: Primary Use
Crude P/L: Primary Use

ELF ATOCHEM NORTH AMERICA INC.: Alkyl Alkanolamines:

Certain alkyl alkanolamines have inherent properties as corrosion inhibitors and have proven to be effective as such. Inhibitors are chemical substances which retard the corrosion of metals when added in small concentrations to fluids contacting the metals.

Methylethanolamine/MEA:**Methylaminoethanol/MAE:**

Molecular Weight: 75.1
Viscosity @ 20C Centipoise: 13
Vapor Pressure @ 20C mm Hg: 0.5
Freezing Point C: -4.5
Flash Point F: 160
Ionization Constant $K_b \times 10^{-5}$: 6.3
Wt. Lbs./Gal.: 7.8

Methyldiethanolamine/MDEA:

Molecular Weight: 119.2
Viscosity @ 20C Centipoise: 101
Vapor Pressure @ 20C mm Hg: 0.1
Freezing Point C: -21
Flash Point F: 240
Heat of Vaporization Cal/Gram: 123.9
Wt. Lbs./Gal.: 8.7

Dimethylaminoethanol/DMAE:**Dimethylethanolamine/DMEA:**

Molecular Weight: 89.1
Viscosity @ 20C Centipoise: 101
Vapor Pressure @ 20C mm Hg: 4.0
Freezing Point C: -59
Flash Point F: 104
Ionization Constant $K_b \times 10^{-5}$: 0.63
Heat of Vaporization Cal/Gram: 94.8
Wt. Lbs./Gal.: 7.4

Ethylaminoethanol/EAE:**Ethylaminolamine/EEA:**

Molecular Weight: 89.1
Viscosity @ 25C Centipoise: 12.4
Vapor Pressure @ 20C mm Hg: 1
Freezing Point C: -9
Flash Point F: 162
Ionization Constant $K_b \times 10^{-5}$: 96
Heat of Vaporization Cal/Gram: 103.0
Wt. Lbs./Gal.: 7.5

**ELF ATOCHEM NORTH AMERICA INC.: Alkyl Alkanolamines
(Continued):**

Ethylaminoethanols (Mixed):

Molecular Weight: 109-119 combining wts.
Viscosity @ 20C Centipoise: 60
Vapor Pressure @ 20C mm Hg: 1
Flash Point F: 180
Ionization Constant KbX10 -5: 4.0
Wt. Lbs./Gal.: 8.1

Diethylaminoethanol/DEAE:

Diethylethanolamine/DEEA:

PENNAD 150:

Molecular Weight: 117.2
Viscosity @ 20C Centipoise: 3.5
Vapor Pressure @ 20C mm Hg: -56
Freezing Point C: -56
Flash Point F: 125
Ionization Constant KbX10 -5: 5.0
Heat of Vaporization Cal/Gram: 77.9
Wt Lbs./Gal: 7.4

Diisopropylaminoethanol/DIPAE:

Diisopropylethanolamine/DIPEA:

Molecular Weight: 145.2
Viscosity @ 20C Centipoise: 25
Vapor Pressure @ 20C mm Hg: 1
Freezing Point C: -39
Flash Point F: 153
Heat of Vaporization Cal/Gram: 74.4
Wt. Lbs./Gal: 7.3

Isopropylaminoethanols (Mixed):

Molecular Weight: 114.5-117.5
Viscosity @ 20C Centipoise: 50.8
Vapor Pressure @ 20C mm Hg: 2
Freezing Point C: -50 (glassy)
Flash Point F: 168
Ionization Constant KbX10 -5: 158
Wt. Lbs./Gal.: 7.8

Butyldiethanolamine/BDEA:

Molecular Weight: 161.2
Viscosity @ 20C Centipoise: 8
Vapor Pressure @ 20C mm Hg: 1 @ 25C
Flash Point F: 295
Wt. Lbs./Gal: 8.1

**ELF ATOCHEM NORTH AMERICA INC.: Alkyl Alkanolamines
(Continued):**

Dibutylaminoethanol/DBAE:

Dibutylethanolamine/DBEA:

Molecular Weight: 173.3

Viscosity @ 20C Centipoise: 6.5 @ 25C

Vapor Pressure @ 20C mm Hg: 0.1

Freezing Point C: -75 (glassy)

Flash Point F: 195

Ionization Constant KbX10 -5: 5.0

Heat of Vaporization Cal/Gram: 60.9

Wt. Lbs./Gal: 7.2

Dimethylamino-2-propanol/DMA-2-P:

N,N-Dimethylisopropanolamine/DMIPA:

Molecular Weight: 103.2

Viscosity @ 20C Centipoise: 1.5

Vapor Pressure @ 20C mm Hg: 8

Freezing Point C: -85

Flash Point F: 82 (77%-99) (70%-104)

Ionization Constant KbX10 -5: 190

Wt. Lbs./Gal: 7.1

Diethylaminoethoxyethanol:

Molecular Weight: 157-170

Viscosity @ 20C Centipoise: 11.1

Vapor Pressure @ 20C mm Hg: 1

Freezing Point C: -70

Flash Point F: 201

Wt. Lbs./Gal.: 7.8

EXXON CHEMICAL CO.: Amphoteric N:

TOMAH Amphoteric N is a unique amphoteric surfactant with exceptionally high foaming properties in the presence of many other surfactants and components typically used in shampoos and personal care products. Amphoteric N is a modified dipropionate amphoteric supplied as a 35% aqueous solution of the partial sodium salt. TOMAH Amphoteric N is listed on the TSCA Inventory and has been assigned a CTFA name of Sodium C12-15 Alkoxypropyl Iminodipropionate.

Appearance: Clear, Light Amber Liquid
 % Solids: 35%
 pH (5%): 6
 SpG 25/25C: 1.04

Amphoteric SC:

Amphoteric SC is a unique 35% active amphoteric designed for use in alkaline and acid cleaners. It offers excellent coupling, stability, foaming and wetting and is compatible in a wide range of systems: anionic, nonionic, and cationic. Amphoteric SC has been specifically designed to compete with certain imidazoline amphoterics. Although chemically different, Amphoteric SC provides similar coupling and foaming, yet has better wetting.

Solids, %: 35-38%
 Color, Gardner: 2-7
 pH, 5% Solution: 5-8
 Appearance: Clear, light amber liquid
 Pour Point: 30F
 Surface Tension, 0.1% solution: 30 dynes
 Specific Gravity @ 25C: 1.06

Amphoteric 400:

Amphoteric 400 is an extremely low foam amphoteric surfactant designed for use in hard surface alkaline cleaning formulations where no foam is desired, such as in continuous metal cleaning with pressure spray. Amphoteric 400 is an iminodipropionate amphoteric supplied as a 50% solution of the partial sodium salt. TOMAH Amphoteric 400 is on the TSCA Inventory.

Appearance: Yellow Liquid
 % Solids: 50%
 pH (5%): 6
 SpG 25/25C: 1.09

EXXON CHEMICAL CO.: Ether Amines:

TOMAH PA and DA synthetic ether amines are based on unique chemistry that can utilize either petroleum or fat and oil based raw materials. Unlike conventional fatty amines, the PA and DA amines exhibit a broad range of physical and performance properties as the alkyl group varies from C-9 to C-19.

The combination of low cost, versatility, functional performance, and liquidity are major advantages of the PA and DA amines. Commercially available products are:

PA-10:

Hexyloxypropylamine, a light amber liquid with 1% water solubility, useful as a combination aqueous-vapor phase corrosion inhibitor and for antistatic formulations.

PA-14:

Isodecylcycloxypropylamine, a colorless to light amber liquid with pour point below -30F, used as an antistat, for corrosion inhibition, and as a flotation reagent in place of coco amine.

PA-16:

Isododecyloxypropylamine, a light amber liquid with pour point of -30F. Useful as a replacement for coco amine for emulsification, flotation, and as a chemical intermediate.

PA-17:

Isotridecyloxypropylamine, a colorless to light amber liquid with pour point below -30F, used in corrosion inhibition, cationic emulsification, and as a replacement for oleyl and soya amines.

PA-19:

Linear alkyloxypropylamine, a light to amber liquid with pour point of 50F. Used as an intermediate in textile chemicals.

DA-14:

N-isodecylcycloxypropyl-1,3-diaminopropane-100% active light amber liquid with 90% min. diamine content and 295 typical molecular weight. Useful in corrosion inhibition and other chemical intermediate areas.

DA-17:

N-isotridecyloxypropyl-1,3-diaminopropane, an amber liquid with pour point below -30F, useful in oilfield chemicals, corrosion inhibitor formulations, and as a replacement for coco, soya, or oleyl diamine.

EXXON CHEMICAL CO.: Ethoxylated Fatty Amines:

Tomah's ethoxylated fatty amines are high molecular weight aliphatic amines reacted with various amounts of ethylene oxide to modify emulsification, surface tension, solubility, and cationic strength properties of the base amines. Major uses are cationic emulsification, corrosion inhibition, and textile processing.

E-14-2:

R: C10OC3

n: 2

E-14-5:

R: C10OC3

n: 5

E-S-15:

R: Soya

n: 15

E-18-2:

R: C18

n: 2

E-18-5:

R: C18

n: 5

E-18-8:

R: C18

n: 8

E-18-10:

R: C18

n: 10

E-18-15:

R: C18

n: 15

E-T-2:

R: Tallow

n: 2

E-T-5:

R: Tallow

n: 5

E-T-15:

R: Tallow

n: 15

E-DT-3:

R: "Tallow Diamine"

n: 3

EXXON CHEMICAL CO.: Inhibitor 60S:

Inhibitor 60S is a versatile and effective corrosion inhibitor for acid cleaning and pickling. The superior inhibiting, solubility, and stability properties of Inhibitor 60S in a variety of acids, at different use conditions are a major advantage to companies producing several acid products. Inhibitor 60S, an amber liquid, provides excellent protection in specific situations.

Suggested Uses:**Pickling:**

For batch pickling in 10% HCl, use 1 1/2 lb. Inhibitor 60S per 100 gallons to achieve 99.7% inhibition. If faster speed and less protection is desired, reduce the use level to 1/2 to 3/4 lb. One pound Inhibitor 60S in 100 gallons of 10% H₂SO₄ provides 98% protection. After pickling, prior to plating, a rinse is required and alkaline cleaning is suggested. Inhibitor 60S will not promote hydrogen embrittlement. Inhibitor 60S is soluble in high concentrations of ferric ions.

Industrial Cleaning:

Inhibitor 60S was designed to provide the versatility, solubility, and effectiveness needed in acid cleaning. Use 1% Inhibitor 60S based on 100% hydrochloric, sulfuric, acetic, phosphoric, or hydrofluoric acid. Use 0.5% Inhibitor 60S based on 100% oxalic, citric, or sulfamic acids. Cleaning of cast iron requires much higher levels of Inhibitor 60S. Inhibitor 60S is especially useful for cleaning boilers, ship tanks, concrete trucks, and rust equipment.

Consumer Products:

Use 0.1% Inhibitor 60S in 9% HCL bowl cleaners. Use 1% Inhibitor 60S in dark, 98% sulfuric acid drain openers.

Do not use Inhibitor 60S in acid or to protect galvanized metal or copper alloys.

Acid Thickener:

Acid Thickener is a cationic surfactant that acts as a viscosity builder for acid-based cleaners.

Appearance @ 25C: amber paste

Weight/gallon @ 25C: 7.6 lb.

Specific Gravity @ 25C: 0.91

Pour Point: 80F approx.

Flash Point: over 200F

Viscosity of 9.5% HCl with 3% Acid Thickener: 5,000 cps

Corrosion Inhibition:

The Acid Thickener itself offers excellent corrosion inhibition on mild and stainless steel.

EXXON CHEMICAL CO.: Quaternaries:

TOMAH quaternaries are based on the reaction of high molecular weight aliphatic tertiary amines with an alkylating agent such as methyl chloride.

Q-14-2:

75% isodecyloxypropyl dihydroxyethyl methyl ammonium chloride

Q-S:

50% mono soya ammonium chloride quaternary

Q-17-2:

75% isotridecyloxypropyl dihydroxyethyl methyl ammonium chloride

Q-17-2(PG):

75% isotridecyloxypropyl dihydroxyethyl methyl ammonium chloride in propylene glycol

Q-18-2 (50%):

50% octadecyl dihydroxyethyl methyl ammonium chloride

Q-18-15:

100% octadecyl poly(15)oxyethylene methyl ammonium chloride

Q-D-T:

50% tallow diamine quaternary dichloride

Q-D-T-HG:

70% tallow diamine quaternary dichloride in hexylene glycol solvent

Q-C-15:

100% coco poly(15)oxyethylene methyl ammonium chloride

Q-14-2:

Combining Weight typical: 370

% Solids: 74 min.

Q-S:

Combining Weight typical: 410

% Solids: 49 min.

Q-17-2:

Combining Weight typical: 410

% Solids: 74 min.

Q-17-2(PG):

Combining Weight typical: 410

% Solids: 75 min.

Q-18-2(50%):

Combining Weight typical: 415

% Solids: 49 min.

Q-18-15:

Combining Weight typical: 980

% Solids: 97 min.

Q-D-T:

Combining Weight typical: 525

% Solids: 49 min.

Q-D-T-HG:

Combining Weight typical: 525

% Solids: 70 min.

Q-C-15:

Combining Weight typical: 915

% Solids: 97 min.

EXXON CHEMICAL CO.: Tallow Amines:

Tomah produces tallow based fatty amines, the most economical aliphatic amines available. Over 60% of all aliphatic amines produced and sold are based on tallow, primarily due to their low cost.

Major uses of tallow amines are:

- * Ore flotation
- * Asphalt emulsifiers
- * Corrosion inhibitors
- * Oil production
- * Petroleum product additives

Tallow Amine:

Amine Value: 205-215
Secondary and Tertiary Amine Value: 10 max.
Iodine Value: 35 min.
Typical Combining Weight: 265

Tallow Diamine:

Amine Value: 320-350
Secondary and Tertiary Amine Value: 145-175
Iodine Value: 30 min.
Typical Combining Weight: 165

Tallow Triamine:

Amine Value: 380-440
Secondary and Tertiary Amine Value: 210-260
Iodine Value: 20 min.
Typical Combining Weight: 140

Tallow Tetramine:

Amine Value: 440-485
Secondary and Tertiary Amine Value: 290-340
Iodine Value: 15 min.
Typical Combining Weight: 120

Hyd. Tallow Amine:

Amine Value: 205-215
Secondary and Tertiary Amine Value: 9 max.
Iodine Value: 7 max.
Typical Combining Weight: 265

Tallow Diamine Dioleate:

Amine Value: 115-130
Iodine Value: 55 min.

W.R. GRACE & CO.-CONN.: DCI Corrosion Inhibitor:

The addition of DCI corrosion inhibitor will significantly reduce the corrosion rate of reinforcing steel subjected to chloride ion attack. Simply stated, DCI in concrete is an application of the inhibitor concept that has been used for over 50 years to protect metals from corrosion. DCI corrosion inhibitor has become an established alternative to epoxy-coated rebar, concrete surface coatings and modified concretes.

DCI corrosion inhibitor is a calcium nitrite-based liquid which chemically blocks the corrosive action of chloride salts. It is added to a concrete mix during the batching process or at the job site and disperses uniformly through the concrete.

Once the concrete is placed, DCI promotes the stabilization of the passivating layer of oxide normally found on the reinforcing steel in concrete. A simplified explanation of DCI's protective mechanism is that it repairs the defects that usually occur in this oxide structure, thus preventing chloride ions from penetrating to the pure iron metal. Corrosion occurs when the chloride reaches the steel, forming soluble iron chloride which migrates from the rebar surface to create the expanding insoluble iron oxides in the concrete. DCI's ability to heal these defects inhibits this corrosion process. It is a chemical solution to a chemical problem.

Advantages for the DCI system:

1. DCI concrete gives effective corrosion protection to both mats of rebar providing extensive system longevity compared to unprotected reinforced concrete.
2. DCI is easy to use: it is added to the concrete during batch mixing or at the job site and is compatible with portland cement concretes.
3. DCI avoids costly on-site handling problems and other hidden costs.
4. DCI requires no maintenance after installation.
5. DCI can be used in all forms of reinforced concrete including conventionally reinforced as well as precast and prestressed concrete.
6. DCI compares favorably with other corrosion protection systems in: protection effectiveness, cost-effectiveness, ease of application and versatility and has advantages over all competitive methods.

Suggested Applications:

DCI corrosion inhibitor is recommended for all steel-reinforced concrete that will come in contact with chlorides during its service life. Particularly vulnerable to chloride attack are structures exposed to deicing salts, such as bridge and parking decks along with their supporting beams and columns.

HALOX PIGMENTS: Calcium Borosilicate Pigments:**HALOX CW-2230 Calcium Borosilicate Pigment:**

HALOX CW-2230 is a white, non-refractive, corrosion inhibiting pigment used in protective coating systems. It is generically identified as calcium borosilicate and involves the use of no "toxic compounds," such as hexavalent chromium or lead, in its manufacture. HALOX CW-2230, with its higher B2O3 content, is the highest performing pigment in the HALOX borosilicate product line.

References:

HALOX CW-2230 complies with the following references and standards:

- * USDA Approved
- * ASTM Specification D 4288-83, Type II
- * TSCA Chemical Substances Inventory listing under CAS #(59794-15-19)

Theoretical Chemical Composition:

CaO: 44.2%
SiO2: 34.2
B2O3: 15.6
L.O.I. (450C): 6.0

HALOX CW-291 Calcium Borosilicate Pigment:

HALOX CW-291 is a white, non-refractive, corrosion inhibiting pigment used in protective coating systems. It is generically identified as calcium borosilicate and involves the use of no "toxic compounds," such as hexavalent chromium or lead, in its manufacture. HALOX CW-291 has the lowest oil absorption in the HALOX borosilicate product line.

References:

HALOX CW-291 complies with the following references and standards:

- * USDA Approved
- * ASTM Specification D 4288-83, Type 1, Class B
- * TSCA Chemical Substances Inventory listing under CAS #(59794-15-19)

Theoretical Chemical Composition:

CaO: 45.4%
SiO2: 39.8
B2O3: 10.6
L.O.I. (450C): 4.2

HALOX PIGMENTS: Phosphosilicates:

HALOX BW-111:

Calcium Barium Phosphosilicate Pigment

HALOX BW-111 is a white, non-refractive, corrosion inhibiting pigment used in protective coating systems. It is generically identified as calcium barium phosphosilicate and does not involve the use of hexavalent chromium or lead based compounds in its manufacture.

References:

HALOX BW-111 complies with the following references and standards:

- * USDA Approved
- * TSCA Chemical Substances Inventory under CAS #(66402-68-4)

Theoretical Chemical Composition:

SiO₂: 40.1%
CaO: 37.4
BaO: 13.4
P₂O₅: 6.1
L.O.I. (450C): 3.0

HALOX BW-191:

Calcium Barium Phosphosilicate Pigment

HALOX BW-191 is a white, non-refractive, corrosion inhibiting pigment used in protective coating systems. It is generically identified as calcium barium phosphosilicate and does not involve the use of hexavalent chromium or lead based compounds in its manufacture. HALOX BW-191 has the lowest oil absorption in the HALOX phosphosilicate product line.

References:

HALOX BW-191 complies with the following references and standards:

- * USDA Approved
- * TSCA Chemical Substances Inventory listing under CAS #(66402-68-4)

Theoretical Chemical Composition:

SiO₂: 40.1%
CaO: 37.4
BaO: 13.4
P₂O₅: 6.1
L.O.I. (450C): 3.0

HALOX PIGMENTS: Phosphosilicates (Continued):**HALOX SW-111 Calcium Strontium Phosphosilicate Pigment:**

HALOX SW-111 is a white, non-refractive, corrosion inhibiting pigment used in protective coating systems. It is generically identified as calcium strontium phosphosilicate and involves the use of "no toxic compounds," such as hexavalent chromium or lead, in its manufacture.

References:

HALOX SW-111 complies with the following refernces and standards:

- * USDA Approved
- * TSCA Chemical Substances Inventory listing under CAS #[66402-68-4]

Theoretical Chemical Composition:

SiO₂: 39.7%
CaO: 37.0
SrO: 11.5
P₂O₅: 7.8
L.O.I. [450C]: 4.0

HALOX SZP-391:

Calcium Strontium Zinc Phosphosilicate Pigment

HALOX SZP-391 is a white, non-refractive, corrosion inhibiting pigment used in protective coating systems. It is generically identified as calcium strontium zinc phosphosilicate and involves the use of no "toxic compounds," such as hexavalent chromium or lead, in its manufacture. HALOX SZP-391 exhibits a narrow particle size distribution; with a mean particle size of 2 microns.

References:

TSCA Chemical Substances Inventory listing under CAS # (66402-68-4)

Theoretical Chemical Composition:

ZnO: 41.9%
CaO: 14.7
SrO: 4.5
SiO₂: 14.7
P₂O₅: 17.7
L.O.I. (450C): 5.5

HALOX PIGMENTS: Zinc Phosphate Pigment:

HALOX Zinc Phosphate is a white, non-refractive, corrosion inhibiting pigment used in protective coating systems. It is generically identified as zinc phosphate-dihydrate and involves the use of no "toxic compounds," such as hexavalent chromium or lead, in its manufacture. HALOX Zinc Phosphate is low in lead content [<20 ppm] and exhibits a narrow particle size distribution; upper particle size limit of 10 microns, mean particle size 1.8 microns.

Application:

HALOX Zinc Phosphate is a pigment with a high degree of versatility. It is the inhibitor of choice for most high performance resin systems such as vinyls, chlorinated rubbers, and epoxies. It is recommended for high gloss systems (low PVC), high acid number resins, catalyzed baking systems, and vinylidene chloride latexes. HALOX Zinc Phosphate is also the inhibitor of choice in thin film applications (1 mil).

References:

HALOX Zinc Phosphate complies with the following references and standards:

- * $\text{Zn}_3(\text{PO}_4)_2 \cdot 2\text{H}_2\text{O}$
- * USDA Approval
- * TSCA Chemical Substances Inventory listing under CAS # (7779-90-0)

Typical Physical Properties:

Color: White
pH: 7.9
Oil Absorption ($\#/100\#$): 36.0
Water Absorption ($\#/100\#$): 51.0
Water Solubility (g/100 ml): 0.02
Moisture: 2.0%
Specific Gravity: 3.20
Weight per Gallon: 26.6
Mean Particle Size (microns): 1.8
Refractive Index: 1.6
Hegman Grind: 6.0

Theoretical Chemical Composition:

(percent by weight):
ZnO: 57.6%
P₂O₅: 32.4
L.O.I. (450C): 10.0

PERCY HARMS CORP.: SLIDE Rust Preventatives:

PENETRANT PLUS:

Short term rust preventative

- * CFC-free * Choice of spray or steam * Dust free
- * Non-staining * Harmless to most plastics, rubber, paint, etc
- * Cleans and dries out electrical equipment

Mono-molecular penetrating film frees rust-frozen parts. Lifts and replaces moisture with protective film. Lubricates without affecting performance of electrical equipment. Non-conductive--has high dielectric strength and lubricates delicate electronic equipment. Protects up to six months under normal conditions.

Conforms to MIL-C-23411.

MOLD SHIELD:

Medium term "dry" rust preventative

- CFC-free * Non-penetrating * Will not bleed out and mark parts
- * Neutralizes fingerprints * Non-silicone * Self-cleaning in start-up * Seals out condensation

A unique rust preventative formulation. Designed, through a special extra-dry spray package, to deliver a dry mist spray which will not penetrate into moving mold parts, including injector pin holes, slides, cams, etc. This special feature prevents marking of plastic parts when molds are put back in service, where normally a conventional rust preventative may leach out of mold crevices and mark parts, resulting in lost production time and rejected parts. Protects up to two years under normal conditions.

NO-RUST:

Long term rust preventative

- CFC-free * Non-silicone * Plastic molding dies * Stamping dies
- * Stripper plates * Jigs and fixtures * Rubber mold dies
- * Die casting dies * Precision instruments * Machine tool storage
- * Machined or ground steel of all kinds

Ideal for plastic mold protection. Self cleaning. Guarantees positive protection by displacing moisture from metal surfaces. Adheres tightly. Accurate spray pattern spray concentrates protection in normally inaccessible crevices. Neutralizes fingerprint acids. Protects up to five years under normal conditions

Conforms to MIL-C-23411.

PERCY HARMS CORP.: SLIDE Rust Preventatives (Continued):

Acid Vapor Neutralizer:

Protection when molding PVC and flame-retardant resins

CFC-free * The one-step rust preventative

Formulated to protect plastic molding dies while in storage from corrosive attack by hydrochloric and hydroboric acids plus protect molds from most common corrosive damage that is found in the atmosphere. Protects against fingerprint acid. Acid vapors produced during molding will be neutralized when they come in contact with Acid Vapor Neutralizer. Length of protection is dependent on the amount of PVC and F/R being molded.

HEATBATH PARK METALLURGICAL CORP.: Rust Inhibitors:**PARKOTE 34:**

PARKOTE 34 is a general purpose, solvent based, rust preventive. It may be used for alkaline water displacing, or finger print neutralizing where a minimum of 6 mths. indoor storage is required.

Physical Properties:

Specific Gravity: 0.798 g./ml.
 Weight per Gallon: 6.65 pounds
 Flash Point (tag closed cup): 105F
 Viscosity: 33 SUS
 Non-Toxic Film

Application Data:

Apply by: Dipping or brushing (May be sprayed if adequate ventilation is provided)
 Dilutions: For water displacing, use as received. For finger-print neutralization and general purpose rust preventive, may be diluted 1 part to 2 parts Mineral Spirits.
 Recommended Use: Highly finished packaged parts, parts in transit, blackened parts, general purpose rust preventive.
 Application Temperature Range: 70-100F
 Type Film: Soft, Thixotropic

PARKOTE 505-C Rust Preventive:

PARKOTE 505-C is an excellent solvent based rust preventive; which may also be used for displacing alkaline water solutions, and for finger print neutralization.

Under actual plant conditions PARKOTE 505-C has protected highly finished packaged parts for several years. It is recommended for anti-friction bearings where gumming and sticking cannot be tolerated. These bearings need not be cleaned before placing in service.

Physical Properties:

Specific Gravity: 0.8
 Weight per gallon: 6.69 pounds
 Flash Point (tag closed cup): 105F
 Viscosity at 100F: 33.5 SUS
 Cloud Point: 92F
 MAC of solvent: 500 ppm
 Non-Toxic Film

Application Data:

Apply by: Dipping, brushing or spraying (Spray only if adequate ventilation is provided)
 Dilution: Used as received
 Recommended Use: Highly finished packaged parts, blackened parts, and general purpose rust and stain.
 Water Displacing: Yes
 Finger Print Neutralization: Yes
 Recommended Application Temperature Range: 70-100F

**HEATBATH PARK METALLURGICAL CORP.: Rust Inhibitors
(Continued):**

PARKOTE 511-C:

PARKOTE 511-C is an outstanding water soluble rust preventative. The product is especially suited for operations that involve fogging or spraying of the water emulsion. The volatile emulsifiers evaporate and leave a semi-dry, rust inhibiting film. PARKOTE 511-C will not harm rubber or plastic and is non-corrosive to copper and aluminum. PARKOTE 511-C is also an excellent post-treatment for zinc and iron phosphate at 15% in water.

If desired, PARKOTE 511-C may be used as received or diluted in either mineral spirits or light mineral oils.

Physical Properties:

Specific Gravity: 0.932

Weight per gallon: 7.78 pounds

Flash Point (C.O.C.): 225F

Viscosity (at 100F): 270 (SUS)

pH (10% in water): 7.3-7.3

Emulsion Stability (24 hrs., 10% in water): 2% Cream on top

Non-Toxic

Application Data:

Apply by: Fogging, spraying or dipping

Recommended Use: Rust preventative for phosphate coated parts, blackened parts, metal parts for both in-plant in-door, and covered in-transit storage, and new car engine compartment protection.

PARKOTE 623 Rust Preventive:

PARKOTE 623 is a water soluble rust preventive used where temperatures may approach the boiling point of water. The emulsion is stable and will not oil or cream out at these elevated temperatures.

Physical Properties:

Specific Gravity: 0.938

Weight per Gallon: 7.8 pounds

Flash Point (C.O.C.): 240F

Viscosity at 100F: 275 SUS

Non-Toxic

Application Data:

Apply By: Dipping, fogging, spraying

Recommended Use: Finished parts in transit, blackened parts

Recommended Application Temperature Range: 70-212F

Type Film: Semi-dry, transparent

Expected Indoor Protection: 90 days

Water Displacing: Yes, when diluted

Finger Print Neutralizing: No

**HEATBATH PARK METALLURGICAL CORP.: Rust Inhibitors
(Continued):****BLUE ICE-M:**

BLUE ICE-M is a combination of alkaline detergents and water soluble rust inhibitors which is widely used as a coolant in many steel grinding applications. Ground parts can be protected from rusting indoors for 1-2 weeks by allowing the coolant to dry on the work. Solutions of BLUE ICE-M are pale blue and water clear, allowing a clear view of the work in process. Grinding residues fall out of the coolant quickly, keeping the work and machine parts clean and free of deposits. It does not emulsify tramp oil. No phosphates, nitrates, or nitrites are used in its formulation.

Description:

Specific Gravity @ 60F: 1.072
Weight per gallon: 8.95 pounds
Color: Blue
Odor: Pleasant
Flash Point: None
Viscosity @ 100F: 34 S.U.S.
Hard Water Stability: Excellent
pH of 25:1 dilution: 9.3-9.6
Foam: Very slight-Fast breaking

KEM-CUT 317 N.S.:

KEM-CUT 317 N.S. is a nitriteless synthetic coolant. It is a true synthetic in that it contains no mineral oils. KEM-CUT 317 N.S. produces a translucent solution that is sufficiently clear for visibility of work.

As an additive to soluble oil emulsions, KEM-CUT 317 N.S. will increase rust protection, and improve lubricity without causing "splitting".

By itself, KEM-CUT 317 N.S. may be used as:

1. A short term rust preventative especially suited for stacked parts,
2. A coolant for light duty machining of ferrous and non-ferrous alloys,
3. A coolant for "cut-off" wheels,
4. A grinding coolant for soft metals.

This product is biodegradable at disposal concentrations. At operating levels of 40:1 to 60:1, it has outstanding resistance to bacterial attack, which means longer life.

Physical Properties:

Specific Gravity: 1.05 g/ml.
Weight per Gallon: 8.66 lbs.
Color of Concentrate: Straw Yellow
Viscosity @ 100F: 42.9 S.U.S.
Flash Point: None
Freeze-Thaw Stability: Excellent
pH of Concentrate: 8.5
pH Diluted to 40:1: 7.7

HEATBATH PARK METALLURGICAL CORP.: Rust Inhibitors (Continued):

Rust Inhibitor M:

Rust Inhibitor M will passivate steel surfaces due to the presence of selected corrosion inhibitors. Parts dipped in Rust Inhibitor M will after drying be protected or inhibited against corrosion. A few examples where such a dip is required is in the final rinse after plating, cleaning, pickling, phosphating, black oxidizing, tumbling, vapor blasting, wet grinding, heat treating or general machine shop use between operations. Rust Inhibitor M does not contain any nitrites.

Form:

Alkaline liquid weighing 1033 grams/liter (8.61 lbs./gallon).

Equipment:

Tanks for Rust Inhibitor M can be made of mild steel. Heating coils can also be of steel construction.

Operation:

Concentration: 1-5% by volume
Temperature: 21C-66C (70F-150F)
Time: 15-30 seconds

HERCULES INC.: POLYRAD 0515A and 1110A Inhibitors for Hydrochloric Acid:

POLYRAD 0515A and 1110A filming amines are organic bases that are especially effective for inhibiting hydrochloric (muriatic) acid. Chemically, they are 5- and 11-mole ethylene oxide adducts of a rosin-derived primary amine to which are added, respectively, 15 and 10% of unadducted amine. They are marketed as 70% solids solutions in isopropanol; this permits ease of handling at below-freezing temperatures. Recommended rates of use are on an as-received basis.

In commercial uses for hydrochloric acid such as industrial cleaning, sanitary chemicals, and oil- and water-well acidizing, the acid comes in direct contact with metals, upon which it normally has a highly corrosive effect. In these applications, the addition of small amounts of POLYRAD to the hydrochloric acid inhibits this attack, but allows the desired action of the acid to proceed. In theory, POLYRAD inhibitors adsorb onto metal surfaces, forming an organic film that, under use conditions, acts as a protective barrier between the hydrochloric acid and the metal.

0515A:

Color, Gardner: 7
Specific gravity at 25/15.6C: 0.963
Viscosity, poises:
 At 77F (25C): 0.9
 At -10F (-23.3C): 258
Nitrogen, %: 2.03
Neutralization equivalent: 690
Solids content, %: 70
Isopropyl alcohol, %: 30
Weight per gal, lbs (kg): 8 (3.6)
Flashpoint, C (F): 16 (61)

1110A:

Color, Gardner: 7
Specific gravity at 25/15.6C: 0.974
Viscosity, poises:
 At 77F (25C): 0.6
 At -10F (-23.3C): 10
Nitrogen, %: 1.42
Neutralization equivalent: 984
Solids content, %: 70
Isopropyl alcohol, %: 30
Weight per gal, lbs (kg): 8.1 (3.62)
Flashpoint, C (F): 16 (61)

HUMKO CHEMICAL DIVISION: KEMAMINE: Benzyl and Methyl Chloride Quaternaries:

The fatty quaternary ammonium chlorides are salts of ammonia formed by the alkylation of the corresponding tertiary amines. As such, they exhibit strong cationic characteristics. Unlike the amines, they are water-miscible or -dispersible. They are extensively used as antistats, textile-softening agents, dyeing aids, corrosion inhibitors and emulsifiers.

KEMAMINE Q-2802C:

CTFA: Dibehenyl Dimonium Chloride
 % Active Min: 75
 % Amine Max: 2
 % Amine HCl Max: 2
 Color Gardner, 1963 Max: 4
 Molecular Weight: 690
 % Ash Max: 0.2

KEMAMINE Q-9702C:

CTFA: Quaternium-18
 % Active Min: 75
 % Amine Max: 1.5
 % Amine HCl Max: 0.5
 Color Gardner, 1963 Max: 2
 Molecular Weight: 575
 % Ash Max: 0.2

KEMAMINE Q-9743CHGW:

CTFA: Tallow Trimonium Chloride
 % Active Min: 65
 % Amine Max: 1.5
 % Amine HCl Max: 0.5
 Color Gardner, 1963 Max: 4
 Molecular Weight: 335-355
 % Ash Max: 0.5

KEMAMINE Q-9743C:

CTFA: Tallow Trimonium Chloride
 % Active Min: 65
 % Amine Max: 1.5
 % Amine HCl Max: 0.5
 Color Gardner, 1963 Max: 4
 Molecular Weight: 335-355
 % Ash Max: 0.5

KEMAMINE BQ-9742C:

CTFA: Tallow Alkonium Chloride
 % Active Min: 75
 % Amine Max: 1.5
 % Amine HCl Max: 0.5
 Color Gardner, 1963 Max: 6
 Molecular Weight: 420
 % Ash Max: 0.2

HUMKO CHEMICAL DIVISION: KEMAMINE: 1,3-Propylenediamines:

The 1,3-propylenediamines are derived from hydrogenation of the cyanoethylated fatty primary amines. The products have both a primary and secondary amine group and have greater cationic character than the primary amine alone. Typical applications include use as gasoline detergents, corrosion inhibitors in petroleum products, dispersing aids and cationic asphalt emulsifiers.

KEMAMINE D-190:

N-90% Behenyl-Arachidyl

% Diamine: 88 Typ

Amine values:

1: 150 Typ

2: 120 Typ

3: 10 Typ

Total: 280 Min

Color Gardner, 1963 Max: 9

% H₂O: 0.5

Iodine Value: 10 Max

KEMAMINE D-999:

N-Oleic-Linoleic

% Diamine: 88 Typ

Amine values:

1: 150 Min

2: 140 Min

3: 10 Max

Total: 300 Min

Color Gardner, 1963 Max: 8

% H₂O Max: 0.5

Iodine Value: 70 Min

ICI SURFACTANTS: ATPET 200 Corrosion Inhibitor For Ferrous Surfaces:

ATPET 200 is an oil-soluble, non-metallic inhibitor that normally inhibits corrosion of ferrous surfaces when used at a concentration of 2 to 5%.

Chemical Nature: Sorbitan fatty acid ester (nonionic).

General Characteristics:

Form: Oily liquid
Activity: Essentially 100%
Specific gravity at 25C: Approx. 1.0
Viscosity at 77F: Approx. 1200 cps.
Viscosity at 100F: Approx. 2000 SUS
Flash point: Approx. 440F
Fire point: Approx. 500F
Pour point: Approx. 0F
Color: Dark reddish brown
HLB value: 4.3

Specifications:

Acid number: 8.0 max.
Saponification number: 135-150
Hydroxyl number: 180-210
Water content, %: 1.0 max.

Benefits of ATPET 200:

- * Effective Rust Inhibition
- * Uniformity in Rust Inhibitor Formulations
- * Elimination of Build-up of Metallic Deposits
- * No Adverse Effect on Pour Point of Rust Inhibitor Compositions
- * Easy to Use
- * Elimination of Cold Weather Handling Problems
- * Versatility
- * Low Cost

Laboratory results indicate the usefulness of ATPET 200 as an oil additive for rust prevention of ferrous surfaces, such as internal and external parts of stored aircraft engines, diesel and gasoline engines, turbines, tools, and component parts during processing or assembly.

1. General
2. Military Specifications
MIL-1-644A/MIL-L-3503/MIL-C-5545A/MIL-C-15167B/
MIL-H-6083B/MIL-L-6085A/MIL-L-10324A/MIL-C-15348A/
MIL-C-16173B/MIL-G-16908/MIL-L-21260/VV-O-601
3. Several applications and advantages of ATPET 200 may be inferred from patents which refer to sorbitan monooleate and other polyhydric alcohol esters as petroleum additives.

ICI SURFACTANTS: ATRUST Anticorrosives for Lubricating Greases:**ATRUST 9650 Anticorrosive**

When incorporated into organo-clay lubricating grease, ATRUST 9650 anticorrosive offers greater protection against rusting than conventional rust preventatives. Unlike the salts of aliphatic acids and sodium nitrite, which have found use in organo-clay grease, ATRUST 9650 anticorrosive brings a new approach to rust prevention, employing a high performance chemical chelator that interacts with the metal surface to form an organic protective layer. This newly-developed product is compatible with grease processing and operating conditions and does not affect other grease properties adversely.

Benefits:

ATRUST 9650 anticorrosive offers:

- * greater protection against rusting than conventional rust preventative products
- * good storage stability of formulated organo-clay grease
- * minimal adverse effects on grease properties
- * low dosage rates
- * compatibility with normal processing and operating conditions

Typical physical properties:

Chemical description: Sodium salt of aromatic acid

Color: pale yellow

Form at 25C: powder

Melting point, C: >300

pH of 1% solution in water: approx. 8.5

ATRUST 9100 Rust Preventative:

ATRUST 9100 is a newly developed polyester amine rust preventative. It can be formulated into conventional temporary protective coating compositions such as oil, grease, lanolin, petrolatum and wax to provide good rust protection.

Benefits:

- * Interacts with ferrous metals to provide an intimate hydrophobic barrier film.
- * Non-staining, non-discoloring anti-corrosive for ferrous metals.
- * Readily soluble in oil and in most organic solvents such as xylene, butyl acetate, kerosene, mineral spirits and others.
- * Effective at low usage rates, often 1.0-10.0% in a variety of coating compositions.

Typical Properties:

Chemical description: polyester derivatives

Appearance: amber to light brown

Form: waxy paste or liquid

Density (25C) g/ml: 0.90

Viscosity (35C) poise: 20

Flash point (PMCC): higher than 250C

IDEAS INC.: IDA-SOIL Rust Preventives:

IDA-SOIL D-177:

This product can be used to manufacture no staining rust preventives.

Acid #: 2
Color: Dark Amber
Saponification Number: 12
Viscosity @ 100F.: 2000 SUS
Weight per Gallon: 8.0 Lbs.

IDA-SOIL D-177 is an easy to handle liquid rust preventive additive. It is soluble in oils or solvents. Levels of 5% to 20% by weight can be used to make general purpose indoor non staining rust preventives.

IDA-SOIL D-213/IDA-SOIL D-244:

These products are intended for usage in a wide variety of general purpose rust preventives and industrial oils.

IDA-SOIL D-213:

Acid Number: 3
Flash Point: 525F
Melting Point: 105F
Pounds per Gallon: 8
Saponification Number: 6
Specific Gravity @ 60F: .96

IDA-SOIL D-244:

Acid Number: 45
Flash Point: 140F
Melting Point: Heavy Liquid
Pounds Per Gallon: 7.6
Specific Gravity @ 60F: .92

Applications:

General Purpose Rust Preventive:

These products can be used to formulate shop and household type rust preventives. 5% to 20% by weight in oil or solvent is normally recommended. Both of these products exhibit penetrating properties.

IDEAS INC.: IDA-SOIL Rust Preventives (Continued):

IDA-SOIL D-274/IDA-SOIL D-772:

These products are corrosion inhibitors designed primarily for the manufacture of oil or solvent based rust preventives.

IDA-SOIL D-274:

Acid Number: 10
Flash Point: 425F (Min.)
Pour Point: +80F
Sap. Number: 20
Specific Gravity: 1.03
Viscosity: Heavy

IDA-SOIL D-772:

Acid Number: 10
Flash Point: 425F (Min.)
Pour Point: 40F
Specific Gravity: 0.96
Viscosity: Heavy

Applications:

Rust Preventives
Metal Working Compounds
Slushing Oils

Type:

IDA-SOIL D-274: Is considered an in-door light duty general purpose corrosion inhibitor. Its residual film will vary depending on the diluent that is used.

IDA-SOIL D-521/IDA-SOIL D-531/IDA-SOIL D-551/IDA-SOIL D-571:

These products are suggested for use in the manufacture of outdoor rust preventives that must survive severe atmospheric conditions.

D-521:

Activity: 100%
Color: Amber
Flash Point COC: 400F
Pounds per Gallon: 7.3
Solids %: 100
Viscosity: Lt. Gel

D-531:

Activity: 100%
Color: Cream
Flash Point COC: 105F
Pounds per Gallon: 8.5
Solids %: 62
Viscosity: Gel

IDEAS INC.: IDA-SOIL Rust Preventives (Continued):

IDA-SOIL D-521/IDA-SOIL D-531/IDA-SOIL D-551/IDA-SOIL D-571
(Continued):

D-551:

Activity: 100%
Color: Cream
Flash Point COC: 105F
Pounds per Gallon: 8.6
Solids %: 70
Viscosity: Gel

D-571:

Activity: 100%
Color: Cream
Flash Point COC: 105F
Pounds per Gallon: 8.0
Solids %: 50
Viscosity: Gel

Properties:

- | | |
|--------------------|---------------------|
| * Thixotropic | * Self Healing Film |
| * Thermally Stable | * Removable |
| * Pigmentable | * Adheres to Rust |

IDA-SOIL D-727:

IDA-SOIL D-727 is a corrosion inhibitor intended for use in the manufacture of outdoor rust prevention to protect most surfaces.

Color: Amber
Pounds per Gallon: 7.9
Specific Gravity: .953
Viscosity @ 100F: 1800 SUS

Applications:

- * Metal Working Compounds
- * Outdoor Rust Preventives

Advantages:

- | | |
|--|-----------------|
| * Hard paintable surface | * Clear coating |
| * Water displacing properties | * Non toxic |
| * Acid atmosphere resistant coating | |
| * Melting point of coating in excess of 175F | |
| * Coating can be removed if desired | |

IDEAS INC.: IDA-SOIL Rust Preventives (Continued):

IDA-SOIL D-802B/IDA-SOIL D-802C/IDA-SOIL D-802E/IDA-SOIL D-802W:

These products are corrosion inhibitors designed for the manufacture of non staining dry to the touch rust preventives with water displacing properties.

D-802B:

Acid Number: 4
Flash Point: 300F
Melting Point: 95F
Sap. Number: 68
Weight per Gallon: 8.0

D-802C:

Acid Number: 4
Flash Point: 300F
Melting Point: 95F
Sap. Number: 68
Weight per Gallon: 8.0

D-802E:

Acid Number: 3
Flash Point: 105F
Melting Point: Heavy Liquid
Sap. Number: 60
Weight per Gallon: 7.9

D-802W:

Flash Point: None
Melting Point: Heavy Liquid
Weight per Gallon: 8.3

Applications:

In Line Processing
Industrial Rust Preventive

IDA-SOIL D-821/IDA-SOIL D-275:

These products are corrosion inhibitors designed primarily for the manufacture of oil or solvent based rust preventives.

IDA-SOIL D-821:

Acid Number: 10
Flash Point: 425F (Min.)
Pour Point: +80F
Sap. Number: 20

IDA-SOIL D-275:

Acid Number: 10
Flash Point: 435F (Min.)
Pour Point: +80F
Sap. Number: 20

IDEAS, INC.: IDA-SOIL Rust Preventives (Continued):

IDA-SOIL D-903/IDA-SOIL D-906:

These corrosion inhibitors are designed for the manufacture of heavy duty indoor and short term exterior rust preventives.

Acid Number: 45
Flash Point: 410F (min)
Melting Point: 115F (min)
Pounds per Gallon: 8.0
Sap. Number: 58

Applications:

Rust Preventives
Acid Atmosphere
Sand Blasted Parts

IDA-SOIL E-921/IDA-SOIL E-752:

These products are sulfur stain inhibitors that prevent the corrosion of non-ferrous metals.

E-921:

Specific Gravity @ 60F.: 1.11
Lbs./Gal. @ 60F., (U.S.): 9.25
Viscosity @ 210F, cSt. (SUS): 5.1 (43)
Flash Point, F (C.O.C.): 390
Sulfur, Wt. %: 34
Nitrogen, Wt. %: 6.0

E-752:

Specific Gravity @ 60F.: 1.12
Lbs./Gal. @ 60F., (U.S.): 9.33
Viscosity @ 210F., cSt. (SUS): 13
Flash Point, F (C.O.C.): 150
Sulfur, Wt. %: 33
Nitrogen, Wt. %: 6.0

IDA-SOIL D-983:

This product is intended for usage in systems where vapor phase rust protection is required.

Color: Amber
Flash Point COC: 120F.
Pounds per Gallon: 7.5
Specific Gravity: .899
Viscosity @ 100F.: 125 SUS

Applications:

Products containing IDA-SOIL D-983 will give contact and vapor phase rust protection. A solvent or oil containing 10% IDA-SOIL D-983 will give adequate results.

IDEAS, INC.: IDA-SOIL Rust Preventives (Continued):

IDA-SOIL M-140:

This product is a modified glyceryl ester intended for oil emulsification without affecting rust protection.

Acid Value: 5
Appearance: Amber Liquid
Pounds per Gallon: 7.9
Saponification Number: 150
Titer: 0C

Applications:

Water-Oil-Emulsions: Coupler
Oil-in-Water Emulsions: Rust Preventives
Chlorinated Paraffins: Drwaing Oils
Cleaners: Metalworking Compounds

Solubilities:

Alcohols
Aromatic and Aliphatic Hydrocarbons
Mineral Oils
Vegetable Oils

General Information:

IDA-SOIL M-140 is a non-ionic that is ash free and will not stain metallic surfaces. This product is highly surface active and imparts rust preventive properties. Use levels range from 2% to 5% by weight

IDEAS INC.: IDA-SOL Rust Preventives:

IDA-SOL B-90:

This product is designed to prevent the chemical change and oxidation of non-ferrous metals.

Appearance: Red-Brown Liquid

Freezing Point: 15F

pH: 13.2

Pounds per Gallon: 9.9

Specific Gravity: 1.19

Application:

Usage levels of .1% to .5% are recommended. IDA-SOL B-90 can be used in metalworking coolants, conversion coatings, and in cooling water systems. This product can also be used in water based coatings for copper and aluminum passivations.

IDA-SOL D-374:

IDA-SOL D-374 is a corrosion inhibitor designed primarily for the manufacture of water based rust preventatives.

Acid Number: 10

Pour Point: +40F

Sap. Number: 27

Specific Gravity: 1.03

Viscosity @ 100F: 3500 SUS

IDA-SOL D-374 can be formulated into two types of water based rust preventives.

Emulsion Type

Translucent Type

IDA-SOL D-581:

This product is a water based outdoor rust preventive.

Color: Amber

Pounds per Gallon: 7.9

Viscosity: Thixotropic

Applications:

Outdoor Rust Preventive

Indoor Rust Preventive

Lubricants

Chain Lubes

The viscosity of IDA-SOL D-581 can be reduced by adding Butyl Carbitol or Butyl Cellusolve. IDA-SOL D-581 can be extended by the addition of water. IDA-SOL D-581 dries to a waxy film.

IDEAS INC.: Rust Preventives:

Alkanolamides:

These fat based products are designed for use in various applications where low foam and rust protection are of prime importance.

IDA-MID S-680:

Acid Number: 18
Color: Amber
Specific Gravity @ 60F.: 1.015
Viscosity: Pourable Liquid at Room Temp.

IDA-MID S-685:

Acid Number: 14
Color: Amber
Specific Gravity @ 60F.: .976
Viscosity: Pourable Liquid at Room Temp.

Advantages:

- * Lower Foaming Properties
- * Low Cost
- * Excellent Rust Protection
- * Good Lubricity

IDA-MID S-685:

Is a modified amide that can be built into most chemical systems by proper formulating.

IDA-MID S-680:

Is chemically soaped to allow ease of emulsification.

Anti-Freeze Inhibitor (IDA-FREEZE):

This corrosion inhibitor is intended for use in Automotive and truck anti-freeze formulas.

Color: Light Amber
pH: 9.0
Pounds per Gallon: 9.0
Specific Gravity: 1.1
Viscosity @ 100F: 400 SUS

Anti-Freeze formulas containing IDA-FREEZE inhibitor can pass and exceed ASTM test procedures D-3306, D-1384, and D-4340.

Advantages:

Anti-Freeze formulas manufactured with IDA-FREEZE inhibitor will be free from silicates and borates which eventually build up on the inside surfaces of the cooling lines. The elimination of build-up improves cooling capacity.

IDEAS INC.: Rust Preventives (Continued):

Barium Compound S:

These products are useful in the manufacture of rust preventives.

IDA-SOIL D-839:

Barium Content: 6%
Color: Dark Amber
Flash Point (F) C.O.C.: 300 Min.
Pounds per Gallon: 8.13
Type: Barium Naphthenate

IDA-SOIL D-666:

Barium Content: 6%
Color: Dark Amber
Flash Point (F) C.O.C.: 350 Min.
Pounds per Gallon: 8.5
Type: Barium Sulfonate Neutral

Applications:

- * Dispersants
- * Rust Preventives
- * Prevents Black Rust

IDA-KOTE:

This product is a conversion coating and is intended to be used over rusted surfaces. IDA-KOTE acts as a supplied primer rather than a top coat.

Appearance: Liquid Cream Shade
Coverage: 800 sq. ft./gal.
Drying Time: Approximately 3 hours
Diluent: Water
Flash F: None
pH: 2
Pounds per Gal.: 8.51
Specific Gravity: 1.02
Viscosity @ 80F: 75 SUS

Since residual rust can encourage further underfilm corrosion and with rust removal becoming costly and environmentally unacceptable, an ideal solution would be to completely passivate the tightly bound rust by chemically preventing further corrosion. IDA-KOTE has been developed utilizing this principal. IDA-KOTE neutralizes the corrosion process by reacting quickly with rust transforming iron oxide into a stable and insoluble organometallic complex. The resulting surface is considered primed/treated for top coating.

IDA-KOTE is a surface treatment rather than a paint or coating.

IDEAS INC.: Rust Preventives (Continued):

IDOX:

This group of oxidized hydrocarbons (oxidates) are intended for use in various rust preventives and metalworking formulas.

IDOX W (TC-5416):

Acid Number: 15
Color: Amber
Flash: 350
Melting Point (F): 120
Pounds per Gal. (60F): 7.0
Sap. No.: 33

IDOX P (TC-9442):

Acid Number: 45
Color: Dark Amber
Flash: 350
Melting Point (F): 110
Pounds per Gal. (60F): 7.0
Sap. No.: 100

IDOX WE (TC-6214):

Acid Number: 13
Color: Dark Amber
Flash: 350
Melting Point (F): 110
Pounds per Gal. (60F): 7.0
Sap. No.: 120

IDOX WES:

Acid Number: 10-30
Color: Dark Amber
Flash: 350
Melting Point (F): 105-135
Pounds per Gal. (60F): 7.0
Sap. No.: 80-130

Application:

IDOX W:

Corrosion-preventive additive for use in solvent and naphthenic oils at 1-15(w)% concentration.

IDOX P:

Low-cost source of mixed surface-active agents (primarily acids and esters) and can be used as a rust-preventive additive, or as an intermediate application in the formulation of rust preventives and metal working performance basis.

IDOX WE:

This product is an ester of IDOX W.

IDOX WES:

Is an economical wide specification version of IDOX WE.

IDEAS INC.: Water Soluble Corrosion Inhibitors:

IDA-SOL D-804/IDA-SOL D-854:

These products are designed for usage as corrosion inhibitors in various water based systems and synthetic coolants.

IDA-SOL D-804:

Color: Amber

pH: 9

Specific Gravity: 1.2

Viscosity @ 100F. (SUS): Heavy Pourable Liquid

IDA-SOL D-854:

Color: Amber

pH: 9.0

Specific Gravity: 1.1

Viscosity @ 100F. (SUS): 300

Applications:

Synthetic Coolants

Rust Preventives

Other Uses

IDA-SOL D-820/IDA-SOL W-827:

This family of water soluble corrosion inhibitors can be used in various water based systems and coolants.

IDA-SOL D-820:

Color: Dark Amber

pH: 8.0

Specific Gravity: 1.07

Viscosity @ 100F (SUS): 1400

IDA-SOL W-827:

Color: Light Amber

pH: 8.0

Specific Gravity: 1.08

Viscosity @ 100F (SUS): 1100

IDA-SOL D-820:

For applications where color is not a factor, this product offers excellent low cost performance.

IDA-SOL W-827:

For systems where non-ferrous metals are involved, this is the product of choice.

IDEAS INC.: Water Soluble Corrosion Inhibitors (Continued):

IDA-SOL M-836/IDA-SOL D-845/IDA-SOL D-890:

This family of water soluble corrosion inhibitors can be used in various water based systems and coolants.

IDA-SOL M-836:

Color: Light Amber

pH: 9.0

Specific Gravity: 1.1

Viscosity @ 100F (SUS): 400

IDA-SOL D-845:

Color: Light Amber

pH: 9.0

Specific Gravity: 1.1

Viscosity @ 100F (SUS): 400

IDA-SOL D-890:

Color: Amber

pH: 9.0

Specific Gravity: 1.15

Viscosity @ 100F (SUS): 1000

For best results, one part of these products should be used with two parts of Triethanolamine. These products contribute to lubricity and general metalworking properties.

IDA-SOL M-836:

This product is very similar to IDA-SOL D-845. However, it exhibits 10-20% greater rust protection at equal dosage levels.

IDA-SOL D-845:

This product is the best choice for most general purpose systems.

IDA-SOL D-890:

This product is a concentrate version of IDA-SOL D-845 that contains a minimum of ninety percent solids.

These products do not contain Sodium Nitrite, Boron, or para Tertiary Butyl Benzoic Acid.

IDEAS, INC.: Water Soluble Corrosion Inhibitors (Continued):

IDA-SOL D-900/IDA-SOL D-901:

IDA-SOL D-900:

Activity: 90%
Color: Amber
pH: 8.6
Specific Gravity: 1.15
Viscosity @ 100F (SUS): 350

IDA-SOL D-901:

Activity: 80%
Color: Amber
pH: 8.6
Specific Gravity: 1.09
Viscosity @ 100F (SUS): 900

Application:

These products are effective at levels as low as .2 of a percent in most water solutions. For best results, one part of IDA-SOL D-900 or IDA-SOL D-901 should be used with two parts of Triethanolamine. IDA-SOL D-901 has improved vapor phase protection and resistance to leaching.

Advantages:

- * Low Foaming Tendencies
- * Ferrous and Non-Ferrous Metal Protection
- * Bacterial Resistant
- * Hard Water Tolerance

These products do not contain Sodium Nitrite, Boron or Para Tertiary Butyl Benzoic Acid.

ITW DEVCON CORP.: RUSTLICK Corrosion-Control Products:

- * RUSTLICK B water-soluble rust inhibitor for ferrous metals.
- * RUSTLICK B-5J water-soluble corrosion inhibitor for any metal.
- * RUSTLICK 606 moisture-absorbing rust preventive.
- * RUSTLICK 631 moisture-displacing rust preventive.

Advantages:

RUSTLICK B inhibitor:

- * Prevents in-process rusting of ferrous metals when added to water solutions, used for hydrostatic testing and vibratory finishing.
- * Does not require removal prior to plating, painting or assembly.
- * Biodegradable, transparent, non-irritating, and not subject to bacterial decomposition or rancidity.

RUSTLICK B-5J inhibitor:

- * Prevents in-process corrosion of all metals when added to rinse, test, wash, tumbling, or soluble oil water solutions.
- * Does not require removal prior to plating, painting or assembly.
- * Prevents chemical reactions between dissimilar metals.
- * Transparent, non-irritating and not subject to bacterial decomposition or rancidity.

RUSTLICK 606 Corrosion Preventive:

- * Moisture-absorbing, may be applied to porous, wet surfaces, reducing surface preparation time.
- * Thin-film, transparent corrosion prevention on all metals during indoor storage.
- * Applied by spray or brush; leaves light, self-healing oily film.
- * Easily removed, if desired, by wiping, alkaline washing or vapor degreasing.
- * Use on machine tables and ways.

RUSTLICK 631 Corrosion Preventive:

- * Moisture-displacing, with higher concentration of active rust preventives than conventional sprays.
- * For long-term indoor protection of all metals, even when exposed to acid or salt vapors.
- * Non-conductive, insulates electrical equipment against water.
- * Applied by spray dip or brush, leaves a light, self-healing oily film, yet is easily removed.

Suppliers' Addresses

Abatron, Inc.
33 Center Drive
Gilberts, IL 60136
(708)-426-2200/(800)-445-1754

Air Products and Chemicals
Allentown, PA 18195
(800)-345-3148

Akzo Chemicals Inc.
300 South Riverside Plaza
Chicago, IL 60606
(312)-906-7538/(800)-257-8292

Albright & Wilson Americas
P.O. Box 26229
Richmond, VA 23260
(804)-550-4300/(800)-446-3700

Alcolac
3440 Fairfield Rd.
Baltimore, MD 21226
(301)-859-4900

Allied-Signal Inc.
Box 2332-101 Columbia Road
Morristown, NJ 07962
(201)-455-2145/(800)-222-0094

Alox Corp.
P.O. Box 517
Niagara Falls, NY 14302
(716)-282-1295

American Charcoal Div.
Amcol Corp.
13105 Prospect
Dearborn, MI 48126
(313)-846-3737

Amoco Petroleum Co.
231 South Bemiston Ave.
Clayton, MO 63105
(314)-854-8030/(800)-336-8888

Anedco., Inc.
10429 Koenig Road
Houston, TX 77034
(713)-484-3900

Angus Chemical Co.
2211 Sanders Road
Northbrook, IL 60062
(708)-498-6700/(800)-323-6209

Armite Laboratories
1845 Randolph St.
Los Angeles, CA 90001
(213)-587-7744

Ashland Industrial Products, Inc.
P.O. Box 14000
Lexington, KY 40512
(606)-264-7108/(800)-848-7485

Baroid Drilling Fluids, Inc.
3000 North Sam Houston Pkwy E.
P.O. Box 1675
Houston, TX 77251
(713)-987-5900

Bar's Leaks, Inc.
720 W. Rose St.
P.O. Box 187
Holly, MI 48442
(800)-345-6572

Beck Chemicals, Inc.
3350 West 137 St.
Cleveland, OH 44111
(216)-994-8355

Betz Industrial
1 Quality Way
Trevose, PA 19053
(215)-355-3300

Birchwood Laboratories, Inc.
7900 Fuller Road
Eden Prairie, MN 55344
(612)-937-7931

BIT Manufacturing, Inc.
State Highway 68
Copperhill, TN 37317
(615)-496-3331

Bond Chemicals Inc.
1500 Brookpark Rd.
Cleveland, OH 44109
(216)-741-6935/(800)-837-6500

The Brulin Corp.
P.O. Box 270
Indianapolis, IN 46206
(317)-923-3211/(800)-776-7149

Buckman Laboratories, Inc.
1256 North McLean Blvd.
P.O. Box 80305
Memphis, TN 38108
(901)-278-0330/(800)-727-2772

Butler Engineering Associates
764 Ramsey Ave.
Hillside, NJ 07205
(201)-688-3300

Calgon Corp.
Box 1346
Pittsburgh, PA 15230
(412)-787-6700/(800)-422-7266

Castrol Inc.
Bray Products Division
16715 Von Karman Ave.-Suite 230
Irvine, CA 92714
(714)-660-9414/(800)-621-0829

Castrol Industrial Inc.
630 W. Washington Blvd.
Chicago, IL 60606
(312)-454-1000/(800)-621-0829

Chemical Technologies Inc.
1610 Clara St.
Jackson, MI 49203
(517)-782-8262

Chem-Pak Inc.
11 Oates Ave.
Winchester, VA 22601
(703)-667-1341/(800)-336-9828

Ciba-Geigy Corp.
7 Skyline Drive
Hawthorne, NY 10532
(914)-785-2000/(800)-431-2360

Climax Molybdenum Co.
Bldg. 900, The Bourse
2275 Swallow Hill Road
Pittsburgh, PA 15220
(412)-279-4200

Climax Performance Materials
7666 West 63rd St.
Summit, IL 60501
(708)-458-8450/(800)-323-3231

Cortec Corp.
4119 White Bear Parkway
St. Paul, MN 55110
(612)-429-1100

Costec Inc.
P.O. Box 693
Palatine, IL 60078
(708)-359-5713

Crown
1500 McConnell Road
Woodstock, IL 60098
(815)-334-0020/(800)-766-7655

Crown Technology, Inc.
7513 E. 96th St.
P.O. Box 50426
Indianapolis, IN 46250
(317)-845-0045

Davison Chemical Division
W.R. Grace & Co.-Conn.
P.O. Box 2117
Baltimore, MD 21203
(303)-659-9000

Diversey Water Technologies
7145 Pine St.
P.O. Box 200
Chagrin Falls, OH 44022
(216)-247-5000/(800)-669-0053

Dow Corning Corp.
Midland, MI 48686
(517)-496-4000

DuPont Co.
1007 Market St.
Wilmington, DE 19898
(800)-441-7515/(800)-346-4748

Elf Atochem North America
Organic Chemicals Div.
Three Parkway
Philadelphia, PA 19102
(215)-587-7150/(800)-628-4453

Exxon Chemical Co.
Tomah Products
1012 Terra Drive
P.O. Box 388
Milton, WI 53563
(608)-868-6811/(800)-231-6633

W.R. Grace & Co.-Conn.
62 Whittemore Ave.
Cambridge, MA 02140
(617)-876-1400

Halox Pigments
2340 165th St.
Hammond, IN 46320
(219)-845-4599

Percy Harms Corp.
430 S. Wheeling Rd.
P.O. Box 156
Wheeling, IL 60090
(708)-541-7220/(800)-323-6433

Heatbath Park Metallurgical
8074 Military Ave.
Detroit, MI 48204
(313)-895-7215

Hercules Inc.
Hercules Plaza
Wilmington, DE 19894
(800)-247-4372

Humko Chemical Division
Witco Chemical Corp.
755 Crossover Lane-Ste. 216
Memphis, TN 38117
(901)-320-5800

ICI Surfactants
Wilmington, DE 19897
(302)-886-3000/(800)-456-3669

Ideas, Inc.
625 S. Main St.
Lombard, IL
(708)-620-2010

ITW Devcon Corp.
30 Endicott St.
Danvers, MA 01923
(508)-777-1100

Jetco Chemicals, Inc.
P.O. Box 1898
Corsicana, TX 75151
(908)-872-3011/(800)-477-5353

Keil Chemical Division
Ferro Corp.
3000 Sheffield Ave.
Hammond, IN 46320
(219)-931-2630/(800)-321-9946

King Industries, Inc.
Science Rd.
Norwalk, CT 06852
(203)-866-5551/(800)-431-7900

KOP-COAT, Inc.
Pittsburgh, PA 15219
(412)-227-2001/(800)-321-0987

Loctite Corp.
705 North Mountain Road
Newington, CT 06111
(203)-278-1280/(800)-LOC-TITE

Lonza Inc.
17-17 Route 208
Fair Lawn, NJ 07410
(201)-794-2400/(800)-631-3647

The Lubrizol Corp.
29400 Lakeland Blvd.
Wickliffe, OH 44092
(216)-943-4200

Martin Marietta Magnesia
Specialties, Inc.
Executive Plaza II
Hunt Valley, MD 21030
(410)-527-3700/(800)-648-7400

Maurer-Shumaker, Inc.
37025 Industrial Road
Livonia, MI 48150
(313)-591-0800

Mayco Oil & Chemical Co.
775 Louis Drive
P.O. Box 2809
Warminster, PA 18974
(215)-672-6600/(800)-523-3903

McGean-Rohco, Inc.
2910 Harvard Ave.
Cleveland, OH 44105
(216)-441-4900/(800)-932-7006

McIntyre Group Ltd.
1000 Governors Highway
University Park, IL 60466
(708)-534-6200

Metal Lubricants Co.
17050 Lathrop Ave.
Harvey, IL 60426
(708)-333-8900

Harry Miller Corp.
4th & Bristol Sts.
Philadelphia, PA 19140
(215)-324-4000

Mona Industries, Inc.
76 E. 24 St.
P.O. Box 425
Paterson, NJ 07544
(201)-345-8220

Morton International
100 North Riverside Plaza
Chicago, IL 60606
(312)-807-2000/(800)-367-3318

The Must for Rust Co.
P.O. Box 972
Cedar Ridge, CA 95924
(916)-273-8283

National Research & Chemical
15600 New Century Drive
Gardena, CA 90248
(213)-515-1700/(800)-367-3318

Northern Instruments Corp.
6680 N. Highway 49
Lino Lakes, MN 55014
(612)-784-1250

Parker+Amchem Div.
Henkel Corp.
300 Brookside Ave.
Ambler, PA 19002
(800)-235-2172

PMC Specialties Group
20525 Center Ridge Road
Rocky River, OH 44116
(216)-356-0700

PPG/Mazer Chemicals
3938 Porett Drive
Gurnee, IL 60031
(312)-244-3410/(800)-CHEM-PPG

The PQ Corp.
Valley Forge Executive Mall
P.O. Box 840
Valley Forge, PA 19482
(215)-293-7331

Price-Driscoll Corp.
75 Milbar Blvd.
Farmingdale, NY 11735
(516)-249-4200

Process Research Products
1013 Whitehead Road Extension
Trenton, NJ 08638
(609)-882-0400

Professional Technical Chemical
P.O. Box 254
Hales Corners, WI 53130
(414)-425-2379

Ques Industries, Inc.
5420 W. 140th St.
Cleveland, OH 44142
(216)-267-8989

Rawn Co., Inc.
P.O. Box 9
Spooner, WI 54801
(715)-635-8711/(800)-826-6791

Raybo Chemical Co.
P.O. Box 2155
Huntington, WV 25721
(304)-525-5171

RHEOX, Inc.
Wyckoff Mill Road
P.O. Box 700
Hightstown, NJ 08520
(609)-443-2000

Rhone-Poulenc
Prospect Plains Road
Cranbury, NJ 08512
(609)-395-8300/(800)-972-2189

Sandoz Chemicals Corp.
4000 Monroe Road
Charlotte, NC 28205
(704)-372-0210/(800)-631-8077

Sherex Chemical Co., Inc.
P.O. Box 646
Dublin, OH 43017
(614)-764-6500/(800)-366-6500

Stepan Co.
22 Frontage Rd.
Northfield, IL 60093
(708)-446-7500

SKS Industries
P.O. Box 828
951 Jones St. & Pulford
Howell, MI 48843
(517)-546-1117

3M Industrial Tape and
Specialties
3M Center
St. Paul, MN 55144
(612)-733-1110

Union Camp Corp.
1600 Valley Road
Wayne, NJ 07470
(201)-628-2000

Uniroyal Chemical Co.
Middlebury, CT 06749
(800)-322-3243/(800)-243-3024

R.T. Vanderbilt Co., Inc.
30 Winfield St.
Norwalk, CT 06855
(203)-853-1400

Watcon, Inc.
P.O. Box 2829
2215 S. Main St.
South Bend, IN 46680
(219)-287-3397

Welchem, Inc.
P.O. Box 920941
Houston, TX 77292
(713)-462-4783/(800)-231-0878

Western Water Management
1345 Taney
Box 7469
North Kansas City, MO 64116
(816)-842-0560

Witco Corp.
Allied-Kelite Div.
2701 Lake St.
Melrose Park, IL 60160
(312)-344-4300/(800)-634-4010

Witco Corp.
520 Madison Ave.
New York, NY 10022
(212)-605-3491/(800)-634-4010

MARTIN MARIETTA MAGNESIA SPECIALTIES INC.: FLOMAG**Magnesium Oxides:****FLOMAG G Granular Magnesium-Based Adsorbent for Water Treatment:**

FLOMAG G is a unique, granular magnesium-based adsorbent product specifically designed for waste water treatment.

Uses:

FLOMAG G is designed for applications involving moderate pH adjustment and the reduction of low levels of soluble, hazardous metals. Typical applications include waste water with a pH greater than 4 and metal concentrations up to 200 mg/l. In cases where the waste water is more acidic or contains higher metals concentrations, treatment with FLOMAG H magnesium hydroxide slurry or FLOMAG HP magnesium oxide powder is recommended.

The waste water is pumped through a column or filter bed of FLOMAG G at a flowrate controlled to meet the local discharge limits. FLOMAG G neutralizes the acids to form soluble salts and to precipitate the heavy metals. FLOMAG G also functions as a filter and/or adsorbent to capture the insoluble metals.

Mixed-metal oxide (proprietary formula): >97 wt.%

SiO₂: <.40 wt.%

Fe₂O₃: <.25 wt.%

Al₂O₃: <.15 wt.%

FLOMAG H Magnesium Hydroxide for Water Treatment:

Concentrated highly reactive magnesium hydroxide as a stabilized aqueous suspension with excellent flow and storage properties.

Uses:

Water treatment (acid neutralization, heavy metals removal), gas stream purification (sulfur dioxide, chloride removal), pulp and paper, sugar and chemical processing.

Aqueous Suspension:

Magnesium Hydroxide, Mg(OH)₂, %: 55 to 57

Bulk Density, lbs/gal: 12.1 to 12.4

Mg(OH)₂ contained, lbs/gal: 6.67 to 7.04

MgO contained, lbs/gal: 4.60 to 4.90

Viscosity, cps: 100 to 300

Dry Solids Basis:

Mg(OH)₂, %: 98.0 min.

CaO, %: 0.50-0.60

SiO₂, %: 0.18-0.22

Fe₂O₃, %: 0.08-0.12

Al₂O₃, %: 0.03-0.06

Cl, %: 0.25-0.35

SO₃, %: 0.01-0.04

Loss on Ignition: 30.5-32.0

**MARTIN MARIETTA MAGNESIA SPECIALTIES INC.: FLOMAG
Magnesium Oxides (Continued):**

FLOMAG HP Magnesium Oxide for Water Treatment

FLOMAG HP is a high reactivity magnesium oxide powder specifically suitable for waste water treatment.

Uses:

FLOMAG HP is recommended for acid neutralization, precipitation of heavy metals and stabilization of heavy metals in sludge. FLOMAG HP can be added directly to the waste water or sludge as a powder or as a slurry after hydration.

Composition:

MgO, % (Ignited basis): 98.0

Loss on Ignition, %: 2.0

Physical Properties:

Bulk Density, loose, lbs/ft³: 22

Mean particle size, μ : 5

Surface area, m²/g: 30

Screen Size, % Passing-325 Mesh: 99

FLOMAG HP-ER Magnesium Oxide for Water Treatment

FLOMAG HP-ER, a very highly reactive, magnesium oxide powder processed from magnesium-rich brine is specifically suitable for waste water treatment.

Uses:

FLOMAG HP-ER is recommended for acid neutralization and precipitation of heavy metals in waste water systems with short retention times; typically less than 10 minutes. FLOMAG HP-ER can be added directly to the waste water as a powder or as a slurry after hydration.

Composition:

Magnesium Oxide, MgO, % (Ignited basis): 98.0

Loss on Ignition, %: 2.0

Physical Properties:

Bulk density, loose, lb/ft³: 22

Mean particle size, microns: 5

Surface area, m²/gram: 50

Activity index, seconds: 8

Screen Size, % passing - 325 mesh, wet: 99

MARTIN MARIETTA MAGNESIA SPECIALTIES INC.: FLOMAG
Magnesium Oxides (Continued):

FLOMAG HAC (High Adsorbent Capacity):

The FLOMAG HAC product line is a series of aqueous anionic adsorbents. The FLOMAG HAC grades have a very high adsorbent capacity for anions and are particularly selective for multivalent anions.

FLOMAG HAC-P is available as a powder which can be used in conventional neutralization/precipitation treatment systems. FLOMAG HAC-GC and FLOMAG HAC-GF are granular products for use in cannister or fluid bed treatment systems as a polishing filter downstream of an existing unit or as the primary treatment system.

Uses:

The FLOMAG HAC is recommended for wastewater treatment in the metal finishing, steel, mining, electrical generation and electronic industries. Among the chemical species adsorbed by FLOMAG HAC are hexavalent chrome, arsenate, vanadates, chelated metals, cyanide and other anions.

Preparation:

FLOMAG HAC products must be rehydrated in order to be effective in anion removal from waste streams. For FLOMAG HAC-P powder, hydration can be performed as a pretreatment step prior to addition to the waste stream or it can be added directly as a powder depending on process conditions. The granular FLOMAG HAC products must first be hydrated prior to packing the column or filter due to an expansion and heat generation.

FLOMAG HAC-P:

Mixed Metal Oxides, %: 97
 CaO, %: 0.5
 SiO₂, %: 0.4
 Na₂O, %: 0.3
 Fe₂O₃, %: 0.2
 Free Moisture, %: 1.0
 LOI, %: 1.0

FLOMAG HAC-GC:

Mixed Metal Oxides, %: 97
 CaO, %: 0.5
 SiO₂, %: 0.4
 Na₂O, %: 0.3
 Fe₂O₃, %: 0.2
 Free Moisture, %: 1.0
 LOI, %: 1.0

FLOMAG HAC-GF:

Mixed Metal Oxides, %: 97
 CaO, %: 0.5
 SiO₂, %: 0.4
 Na₂O, %: 0.3
 Fe₂O₃, %: 0.2
 Free Moisture, %: 1.0
 LOI, %: 1.0

MAURER-SHUMAKER, INC.: Corrosion Preventive Coatings:

Corrosion Inhibiting Oils:

ULTRAMATE 2400:

Water emulsifiable oil. 96-120 hrs. salt spray

ULTRAMATE 2800:

Water emulsifiable oil & wax. 168-240 hrs. salt spray

ULTRAMATE 2800S:

Solvent based corrosion inhibitor (fast dry)

ULTRAMATE 2800N:

Solvent based corrosion inhibitor (slow dry)

ULTRAMATE 2835:

Water emulsifiable oil & wax. 240-320 hrs. salt spray

ULTRAMATE 2900:

Water emulsifiable polymeric oil. 336 hrs. salt spray

Phosphate Coatings:

ULTRAPHOS 1000:

Heavy manganese phosphate for immersion

ULTRAPHOS 1100:

Heavy immersion zinc phosphate for ferrous metal parts

ULTRAPHOS 1200:

Heavy zinc phosphate for immersion

ULTRAPHOS 1220:

Medium coating weight zinc phosphate for immersion, 1400-1500 mg/ft²

ULTRAPHOS 1235:

Light coating zinc phosphate for immersion or spray. 200-400 mg/ft²

ULTRAPHOS 1236:

Sodium Nitrite solution. Accelerator for light zinc phosphate coating

ULTRAPHOS 1300:

1 package light zinc phosphate for immersion coatings, calcium modified

**MAURER-SHUMAKER, INC.: Corrosion Preventive Coatings
(Continued):**

Phosphate Coatings (Continued):

ULTRAPHOS 1310:

Light zinc phosphate, 1000 mg/ft² maximum

ULTRAPHOS 5500:

Powdered iron phosphate for spray or immersion

ULTRAPHOS 5550:

Liquid iron phosphate for spray or immersion, 5 stage system

ULTRAPHOS 5553:

Liquid cleaner/iron phosphate for spray or immersion, 3 stage system

Immersion & Spray Cleaners:

MAKERCLEAN 3000:

Liquid for soak, electro or spray cleaning of buffing compounds

MAKERCLEAN 3030:

Alkaline powdered low temp. soak & electrocleaner. Low foam

MAKERCLEAN 3050:

Liquid electro-cleaner

MAKERCLEAN 3153:

Non-chelated heavy-duty powder soak cleaner

MAKERCLEAN 3166:

Powder soak cleaner

MAKERCLEAN 3176:

Heavy-duty alkaline powdered soak cleaner for steel stampings, fasteners

MAKERCLEAN 3510:

Liquid heat treat cleaner for spray or immersion

MAKERCLEAN 3520:

Liquid neutral iron phosphate cleaner for spray or immersion

MAKERCLEAN 3530:

Emulsion degreasing cleaner. Low temp

**MAURER-SHUMAKER, INC.: Corrosion Preventive Coatings
(Continued):**

Immersion & Spray Cleaners (Continued):

MAKERCLEAN 3544:

Heavy duty liquid soak cleaner

MAKERCLEAN 3545:

Non-chelated liquid soak cleaner

MAKERCLEAN 3560:

Liquid oil displacing cleaner

MAKERSTRIP 4020:

Alkaline powdered deruster & descaler

MAKERSTRIP 4520:

Liquid alkaline deruster & descaler

ALTRASEAL Organic Coatings:

Dip drain or electrostaic spray, highly corrosion resistant organic finishes, applied by dip-spin, for fasteners, clips, and small parts in appliance & automotive market.

Water based:

ALTRASEAL 6166 Black (gloss)

ALTRASEAL 6174 Black (flat)

ALTRASEAL 6176 Blue

ALTRASEAL 6178 Metallic

ALTRASEAL 6192 yellow

ALTRASEAL 6194 Maroon

ALTRASEAL 6197 Red Oxide

Solvent based:

ALTRASEAL 6566 Hi-Gloss

ALTRASEAL 6574 Black

ALTRASEAL 6576 Blue

ALTRASEAL 6580 Olive Drab

ALTRASEAL 6674 High Solids

Special Application Paints:

ALTRASEAL 6755:

Black, solvent base, abrasion resistant, excellent salt spray

ALTRASEAL 6177:

Old Grant Blue

**MAURER-SHUMAKER, INC.: Corrosion Preventive Coatings
(Continued):**

Special Application Paints (Continued):

ALTRASEAL 6280:

Olive Drab/1 pkg. paint & oil

ALTRAGARD 6300:

Clear for S-55

ALTRAGARD 6111:

Metallic Gray, zinc rich

ALTRASEAL 6350:

Black/Air dry/1 pkg. paint & oil

ALTRAGARD 6355:

Black (gloss)/S-55 specification

MS 6302:

Water based clear for aluminum, aircraft applications

MS 7000:

Black, one coat, dry, good torque & salt spray

ULTRAZINC:

Clear dip for zinc

ULTRAGANIC:

Black or clear for ultrazinc system

MAYCO OIL & CHEMICAL CO.: Rust Preventives:

MAYCO Base RP-8329:

Water Soluble Rust Preventive Concentrate

Gravity, API: 7.9
Pounds/gallon: 8.45
Flash Point, F: 410
Acid Number: 3

MAYCO Base RP-8329 is a highly effective water emulsifiable rust preventive concentrate. It can be used to either manufacture water soluble rust inhibitors or as an additive to be used in soluble cutting oils.

MAYCO Base RP-8553:

Oil-Solvent Soluble Rust Preventive Concentrate

Gravity, API: 17.5
Pounds/gallon: 7.9
Flash Point, F: 300
Melt Point, F: 98
Acid Number: 6

MAYCO Base RP-8553 is a premium rust preventing concentrate developed to be cut back with either oil, solvent or kerosene. General purpose rust preventives can be formulated by blending between 5% and 20% of MAYCO Base RP-8553 into either a solvent or base oil. Such products will have superior water displacing, fingerprint neutralizing and non-staining characteristics.

MAYCO Base RP 8765:

Synthetic Rust Inhibitor

Clear light amber
Color, ASTM D1500: 2.0
Specific Gravity (60/60F): 1.07
Density @ 20C: 1.07
Acid Value (meqKOH/g): 190-200
pH @ 10% Solution: 7.8
High Temperature, 170F, (77C) Stability: Clear; no fallout
Low Temperature, 20F, (-5C) Stability: Clear; no fallout
Residual Film: Soft, nontacky

MAYCO Base RP 8765 is a corrosion inhibitor formulated for use in synthetic and semi-synthetic metalworking coolants. It can be utilized in both oil-absorbing and oil-rejecting synthetic fluid types. It is completely water soluble in all proportions and the resulting solution has a very light colored transparent appearance.

MCGEAN-ROHCO, INC.: Corrosion Inhibitors:

NORSOL Soluble Oil 931-U:

Corrosion Inhibiting Oil

NORSOL Soluble Oil 931-U is a blend of emulsifiers, corrosion inhibitors and stabilizers in an oil base. When diluted with water, NORSOL Soluble Oil 931-U makes an excellent immersion coating soluble oil for protecting bare steel, rolled steel, and heavy zinc phosphate coatings on steel. It is non-staining to aluminum, brass and copper, and will provide corrosion protection to these metals.

NORTEX Corrosion Inhibitor 3015:

NORTEX Corrosion Inhibitor 3015 is a water soluble liquid concentrate that provides cooling and corrosion protection of cast iron and steel. This product does not contain nitrites, nitrates, or chromates.

NORTEX Corrosion Preventive 100:

A viscous, brown liquid which, when applied to metal surfaces, produces a hard film.

NORTEX Corrosion Preventive 2410:

A highly concentrated, water displacement, corrosion protective oil.

NORTEX Inhibitors SS-22 & SS-1020:

NORTEX SS-22 & SS-1020 are low cost corrosion inhibitors for ferrous and non-ferrous metals when used as water displacement oils. They are low viscosity, non-drying compounds containing a high-molecular weight, petroleum sulfonate neutralized with an amine. NORTEX SS-1020 is superior on ferrous metals; NORTEX SS-22 is superior on non-ferrous metals.

NORTEX Corrosion Preventive SS-2022-A:

A highly concentrated, water displacement, corrosion protective oil.

NORTEX Corrosion Preventive SS-2022-B:

A concentrated, water displacement, corrosion protective oil.

MCGEAN-ROHCO, INC.: Corrosion Inhibitors (Continued):

NORTEX Corrosion Preventive SS-2022-P:

NORTEX Corrosion Preventive SS-2022-P is a highly concentrated, water displacement, corrosion protective oil. It is especially formulated to leave non-tacky residues upon drying.

NORTEX Corrosion Preventive SS-2025:

NORTEX Corrosion Preventive SS-2025 is a highly concentrated, water displacement, corrosion protective oil. It is especially formulated to leave a non-tacky fluid film on drying.

RUST-SHIELD Protector 250-C:

RUST-SHIELD Protector 250-C is a brown liquid with a combination of corrosion inhibitors, emulsifiers, spreading agents in an oil base. When added to water, it may be used as an immersion rustproofing liquid emulsion. The special corrosion inhibitors and emulsifiers are synergistic in their ability to impart corrosion protection on any metal part it is applied on.

MCINTYRE GROUP LTD.: MACKAM Surfactants:**MACKAM CBS-50G:**

CAS No. 68139-30-0

Cocamidopropyl Hydroxysultaine

MACKAM CBS-50G is a high performance zwitterionic surfactant that is stable over a wide pH range. It is compatible with anionic, nonionic, amphoteric and cationic surfactants. MACKAM CBS-50G exhibits high foaming even in high electrolyte solutions and is stable in 19% sodium hydroxide. When compared to cocamidopropyl betaine, MACKAM CBS-50G exhibits better flash foam and viscosity building characteristics with lauryl sulfates and alpha olefin sulfonates. MACKAM CBS-50G is produced from the highest grade of coconut oil available and is fully biodegradable. Superior mild shampoos, high foaming bath products and liquid soaps may all be formulated with this product.

Clear, Thin, Yellow Liquid

Concentration, %: 50

Color (Gardner): 5 Maximum

Odor: Bland

pH, 10% Solution: 8

Sodium Chloride, %: 6.5

Density (lbs./gal.): 8.7

Viscosity @ 25C: 200 cps

MACKAM CS:

Sodium Cocoamphohydroxypropylsulfonate

MACKAM CS is a biodegradable, mild foam cleansing agent that possesses excellent solubility and solubilizing properties. It has a high tolerance for inorganic salts and is stable over a wide pH range. MACKAM CS is used in cold water wool and fine fabric detergents as well as in other household items such as metal polish. Additionally, MACKAM CS has excellent corrosion inhibition properties, making it useful in steel pickling baths and other acid systems.

Thin amber liquid

Non-volastiles: 45%

pH (10% AQ): 8.0

Sodium Chloride: 7.0%

MACKAM JS:

Sodium Capryloamphohydroxypropylsulfonate

MACKAM JS is a biodegradable low-foam wetting agent and coupler useful in both high alkali and acid systems. It has a high tolerance for inorganic salts and is soluble in up to 35% caustic soda. Additionally, MACKAM JS has excellent corrosion inhibition properties, making it useful in steel pickling baths and other acid systems.

Thin Amber Liquid

Non-Volatiles: 49%

pH, (As Is): 8.0

Sodium Chloride: 8.7%

METAL LUBRICANTS CO.: MELCOTE 502 Series:

A complete series of ultra thin, "dry" film, water displacing rust preventives that vary in film thicknesses and flash points.

Special Features:

- * Water Displacing
- * Protection against "Black Stain"
- * Easy Application -Spray-Dip-Brush
- * Easy Removal where Necessary
- * Films Do Not Attract Dirt
- * Films Compatible with Most Lubricating Oils

MELCOTE 50233-X:

Physical State: liquid
ASTM Color: 2
Viscosity @ 40C. CST: 1.02
Specific Gravity: .787
Weight, lbs/gal. @ 60F.: 6.57
Flash Point, F. TCC: 105
Freeze/Thaw Cycle: pass
Humidity Cabinet (days): 15+
Duration of Protection/Indoor Storage: 4-6 mos
Nature of Film: dry, semi-waxy
Water Displacing: pass

MELCOTE 50233-HF:

Physical State: liquid
ASTM Color: 2
Viscosity @ 40C. CST: 1.02
Specific Gravity: .799
Weight, lbs/gal @ 60F.: 6.66
Flash Point, F, TCC: 140 min.
Freeze/Thaw Cycle: pass
Humidity Cabinet (days): 15+
Duration of Protection/Indoor Storage: 4-6 mos.
Nature of Film: dry, semi-waxy
Water Displacing: pass

MELCOTE 50265-X:

Physical State: liquid
ASTM Color: 2
Viscosity @ 40C. CST: 1.25
Specific Gravity: .799
Weight, lbs/gal. @ 60F.: 6.67
Flash Point, F. TCC: 105
Freeze/Thaw Cycle: pass
Humidity Cabinet (days): 30+
Duration of Protection/Indoor Storage: 12 mos.+
Nature of Film: dry, semi-waxy
Water Displacing: pass

METAL LUBRICANTS CO.: MELCOTE 502 Series (Continued):**MELCOTE 50265-HF:**

Physical State: liquid
ASTM Color: 2
Viscosity @ 40C. CST: 1.25
Specific Gravity: .811
Weight, lbs/gal. @ 60F.: 6.76
Flash Point, F. TCC: 140 min.
Freeze/Thaw Cycle: pass
Humidity Cabinet (days): 30+

MELCOTE 50276-X:

Physical State: liquid
ASTM Color: 2 1/2
Viscosity @ 40C. CST: 2
Specific Gravity: .804
Weight, lbs/gal. @ 60F.: 6.71
Flash Point, F. TCC: 105
Freeze/Thaw Cycle: pass
Humidity Cabinet (days): 60+

MELCOTE 50276-HF:

Physical State: liquid
ASTM Color: 2 1/2
Viscosity @ 40C. CST: 2
Specific Gravity: .815
Weight, lbs/gal. @ 60F.: 6.80
Flash Point, F. TCC: 140 min.
Freeze/Thaw Cycle: pass
Humidity Cabinet (days): 60+

MELCOTE 50286-X:

Physical State: liquid
ASTM Color: 2 1/2
Viscosity @ 40C. CST: 2.01
Specific Gravity: .809
Weight, lbs/gal. @ 60F.: 6.74
Flash Point, F. TCC: 105
Freeze/Thaw Cycle: pass
Humidity Cabinet (days): 60+

MELCOTE 50286-HF:

Physical State: liquid
ASTM Color: 2 1/2
Viscosity @ 40C. CST: 2.01
Specific Gravity: .819
Weight, lbs/gal. @ 60F.: 6.83
Flash Point, F. TCC: 140 min
Freeze/Thaw Cycle: pass
Humidity Cabinet (days): 60+

HARRY MILLER CORP.: ACTIVOL: For Acid Cleaning and Pickling:

A series of synthetic additives for organic or inorganic acids, including hydrochloric and sulfuric, to improve cleaning or pickling, while inhibiting base metal attack. Produces cleaner, brighter steel for subsequent finishing. ACTIVOLS are compatible with all known acid regeneration or reclamation processes. Can be pre-inhibited in concentrated acid.

ACTIVOL 1803-HCl:

Miller's highest efficiency hydrochloric acid inhibitor. It offers complete rinsability, acid savings, fume reduction, stability, and a clean uniform surface. For batch or continuous pickling, and pre-galvanizing baths.

ACTIVOL 1874-H₂SO₄:

For sulphuric acid batch and continuous pickling, provides strong inhibition, penetration of scale, and fume control. Reduces hydrogen embrittlement. Effective in phosphoric and organic acids also. Available in non-foaming grade.

ACTIVOL 7711:

A powerful hydrochloric acid inhibitor for boiler tube or paper digester cleaning. Also is an oil well acidizing inhibitor where secondary acid oil recovery is utilized.

ACTIVOL 1658:

A nitric-hydrofluoric acid foam blanket additive for fume control and reduction of nitrogen oxides in stainless steel pickling.

HARRY MILLER CORP.: IMMUNOL: Cleans, Degreases, Rustproofs:

A family of non-toxic, non-flammable, odorless, synthetic detergent, rust inhibiting liquids that clean, degrease, and rustproof metal surfaces in one operation; available for spray and immersion applications, hot or cold, and removal of virtually all types of soil.

IMMUNOL (Regular):

For immersion cleaning of all steel. Emulsifies and removes oily soils and prevents rust.

IMMUNOL S, S-6:

For immersion or vibratory cleaning on all ferrous and non-ferrous metals. Biodegradable and environmentally acceptable.

IMMUNOL NF, 791:

Suited for use in washing machines, spray washing: for mild cleaning and rust protection to ferrous metals.

IMMUNOL 985 Series:

For hot and cold cleaning in single and multiple stage power spray washers to replace alkalies and solvents. Grades for ferrous and non-ferrous metals available.

IMMUNOL S-6-H:

An immersion cleaner useful for heavy drawing lube and pigmented soil removal.

STEELGARD Prelubes/Slushing Oils:

Other Mill Applied Coatings

STEELGARD 1943:

A specialty rust preventive oil for final application after temper rolling.

STEELGARD 1984:

A prelube oil for application as final shipping oil, which provides needed rust protection and drawability for automotive body part protection.

HARRY MILLER CORP.: STEELGARD for Any Situation Rust Protection:

A family of highly efficient rust preventives built to protect any metal from corrosion, for short or long periods. For application to basic steels, bearings, machined parts, and non-ferrous metals; they are available as synthetics, solvent types or oils.

STEELGARD 1301-NL:

A long-term indoor storage, dry film, rust preventive, water or solvent soluble, for ferrous and non-ferrous metals. Also prevents "white" rust on zinc or galvanized products. Also used for general machining.

STEELGARD 1926:

An updated, long-term, indoor storage rust preventive for ferrous and non-ferrous metals, containing no EPA restricted substances. Is water or oil soluble.

STEELGARD 1302:

A synthetic water-soluble product for indoor storage of ferrous metals, including cast and malleable iron, and for spray washer application for mild cleaning and rust protection.

STEELGARD 1505 Series:

Long-term, dry film, solvent type indoor storage rust preventives for ferrous and non-ferrous metals. 1-2 year protection possible. Several grades available depending on drying time, flash point, and water displacing requirements.

STEELGARD 20-M-1 Series:

Long-term, oily film rust preventives for all metals, providing water displacement and anti-stain properties.

STEELGARD X-238 Series:

Long-term, oily film rust preventives for requirements of bearings and highly finished surfaces. Water displacing, fingerprint suppressing, non-staining.

STEELGARD X-267-B, 1861:

Heavy film outdoor rust preventives for protection of all metals up to 2 years. Pass 1000 hour salt spray tests.

STEELGARD 1854 Series:

Water based polymers for tubing, hardware, and truck axle parts. Non-flammable, provide hard films, replace flammable solvent lacquers.

MONA INDUSTRIES, INC.: MONACOR Series:**MONACOR BE:**

MONACOR BE is a non-foaming, water soluble corrosion inhibitor for cast iron, steel and non-ferrous metals such as aluminum and copper. It is recommended as a replacement for sodium nitrite, especially in cutting and grinding fluids. MONACOR BE has proven to be an extremely effective corrosion inhibitor for aerosol formulations containing water.

Appearance: Clear to Slightly Hazy Viscous Liquid

pH (1% Solution): 9.6

Specific Gravity: 1.11

Lbs./Gal.: 9.2

MONACOR TEH:

MONACOR TEH is an oil soluble corrosion inhibitor with unique multi-functional properties. In humidity cabinet tests, MONACOR TEH outperformed barium dinonylnaphthalene sulfonate as a rust inhibitor. MONACOR TEH can be considered as a replacement for chlorinated paraffins in sulfo-chlorinated metal-working fluids. Falex data shows MONACOR TEH to be superior to chlorinated paraffins as an EP additive by significantly lowering the torque at high applied loads.

Features:

- * Long-lasting rust protection
- * No metallic residues
- * Improves anti-wear properties
- * Contributes to effective boundary lubrication
- * Meets most demulsibility requirements.

Applications:

MONACOR TEH is an ideal component in:

- | | |
|--------------------------|-----------------------|
| * slushing oils | * drawing compounds |
| * temper mill lubricants | * press oils |
| * turbine oils | * rolling oils |
| * hydraulic oils | * metalworking fluids |

Typical Properties:

Chemical Classification: Organic Amine Phosphate

Appearance: Amber Viscous Liquid

Activity: 100

Color: 4 Gardner

Acid #: 136

Alkali #: 68

Wt./Gal.: 7.83

MONA INDUSTRIES, INC.: MONALUBE Series:**MONALUBE 105:**

MONALUBE 105 is an ultra long chain length, non-foaming, alkanolamide. This product is soluble in naphthenic oils and dispersible in water, forming a chemical emulsion. MONALUBE 105 provides excellent corrosion protection and by nature of its chemical makeup, has antiwear and EP properties. Because of this product's unique thickening properties, metalworking fluids with desired viscosities can be developed by controlling the concentration.

Appearance: Amber Liquid

pH (10% Solution): 12

Specific Gravity: 0.99

Lbs./Gal.: 8.3

% Activity: 100

Alkali #: 105

MONALUBE 110:

MONALUBE 110 is a low foaming lard oil based alkanolamide. This product is dispersible in water, forming a chemical emulsion. MONALUBE 110 provides excellent corrosion protection and by nature of its chemical make up, contributes antiwear and EP properties.

MONALUBE 110 can be readily formulated for use in synthetic, semi-synthetic, and oil based metalworking fluids.

Because of its unique thickening properties in water, lubricants with specifically controlled viscosities can be developed.

Appearance: Clear Amber Liquid

pH (5% Solution): 9.5

Specific Gravity: 0.99

Lbs./Gal.: 8.3

% Activity: 100

Alkali #: 170

MONALUBE 115:

MONALUBE 115 is a tall oil fatty alkanolamide that is dispersible in water, forming a chemical emulsion. It provides excellent corrosion protection, and contributes antiwear and EP properties to synthetic or semi-synthetic metalworking fluids. Since MONALUBE 115 thickens water, desired viscosities can be obtained by controlling the concentration. Because of this unique property, MONALUBE 115 is highly recommended for use in water-based drawing compounds.

Appearance: Amber Liquid

pH (1% Solution): 9.5

Specific Gravity: 0.99

Lbs./Gal.: 8.3

% Activity: 100

Alkali #: 135

MONA INDUSTRIES, INC.: MONALUBE Series (Continued):**MONALUBE 205:**

MONALUBE 205 is an aliphatic phosphate ester that provides strong EP properties, rust protection and low surface tension to metalworking fluids. In its unneutralized form, it is soluble in both paraffinic and naphthenic oils and dispersible in water. By neutralizing with alkanolamines, MONALUBE 205 may be readily solubilized in water.

Appearance: Clear Amber Liquid

pH (10% IPA/H₂O): 2.5

Specific Gravity: 1.03

Lbs./Gal.: 8.6

% Phosphorus: 13

% Activity: 100

MONALUBE 210:

MONALUBE 210 is an aromatic phosphate ester specifically designed for use in synthetic metalworking fluids. After neutralization with an alkanolamine, MONALUBE 210 provides outstanding rust protection, strong EP properties, good wetting and very low foam to metalworking fluids. It is especially recommended for all grinding applications.

Appearance: Clear Liquid

pH (as is): <2.5

Specific Gravity: 1.19

Lbs./Gal.: 9.9

% Activity: 100

MONALUBE 335:

MONALUBE 335 is the glycerol monoester of oleic acid. Because of its unique combination of properties, it is a key ingredient in a wide variety of metalworking formulations. In addition to providing outstanding low HLB emulsification properties, MONALUBE 335 has also been found to improve the stability of emulsion systems during fluctuating storage conditions. Additionally, it will improve the rust protection of most metalworking fluids, while enhancing their overall lubrication properties. For most applications, MONALUBE 335 is most effective when used at a level of 2-10%.

Appearance: Clear liquid @ 25C

Specific Gravity: 0.96

Lbs./Gal.: 8.0

% FFA as Oleic Acid: 1.0

Saponification Value: 160

HLB: 4.0

MONA INDUSTRIES, INC.: MONALUBE Series (Continued):

MONALUBE 605:

MONALUBE 605 is a soluble oil base designed to emulsify low viscosity naphthenic and paraffinic oils in the viscosity range of 70 to 300 SUS @ 100F. MONALUBE 605 is a balanced formulation of high molecular sodium sulfonates with auxiliary emulsifiers and coupling agents to give outstanding emulsification, low foam and excellent rust protection in both hard and soft water.

Appearance: Brown liquid

Specific Gravity: 1.03

Lbs./Gal.: 8.6

Total Acid Value (mg KOH/gm): 3.0

pH (5% in water): 9.5

MONA INDUSTRIES, INC.: MONATERIC 1000:

MONATERIC 1000 represents a new type of amphoteric surfactant based on alkyl imidazolines offering exceptional corrosion inhibiting properties in aqueous systems which compare favorably with those of sodium nitrite.

MONATERIC 1000 was compared with sodium nitrite for corrosion inhibiting properties on both cold rolled steel panels and cast iron chips.

MONATERIC 1000 passes the Herbert Test at 5% concentration.

This suggests that MONATERIC 1000 be evaluated as a replacement for sodium nitrite in the following applications:

- | | |
|------------------------|-------------------------------------|
| * Cutting Fluids | * Burnishing Compounds |
| * Synthetic Lubricants | * Water Containing Aerosols |
| * Metal Cleaners | * Liquid Detergents (unlined pails) |

Physical Appearance: Light Amber Liquid

Activity: 50% Aqueous Solution

Specific Gravity (25C): 1.05

Weight/Gallon: 8.8 lbs.

pH 10% Solution: 11

MONAMULSE CI:

MONAMULSE CI is a uniquely modified imidazoline offering excellent corrosion inhibiting properties at low concentrations in greases and a broad range of oil based lubrication systems.

Lithium soap greases containing approximately 0.5% MONAMULSE CI will pass the ASTM Corrosion Test #D-1743-64. The addition of MONAMULSE CI improves the water resistance of greases, and will have no detrimental effects on other grease properties.

In soluble oil formulations, at concentrations of 2% or less, MONAMULSE CI offers excellent corrosion inhibition on cast iron. It also imparts lubricating and penetrating properties and, in many systems, improves emulsion stability.

Physical Appearance: Clear to hazy amber liquid

Color (GVCS-1933): 8

Specific Gravity @ 25C: 0.96

Acid Number: 1.0

Alkali Number: 118

MORTON INTERNATIONAL: THIOKOL Coatings and Sealants:

THIOKOL Fabric Reinforced RLP-2378-G Chemical Resistant Liner:

In addition to concrete coatings, Morton International has developed a unique coating system for application over earthen containment areas, as well as concrete surfaces. The RLP-2378-G coating system comprises a fabric precoated with LP liquid polysulfide which serves as the base for spray-applying RLP-2378-G chemical resistant elastomer coating. The result is a seamless liner. This means that containment can be accomplished without the need for major construction or extensive renovation of existing concrete structures.

Typical Properties:

- Hardness, Shore A: 46
- Tensile Strength, psi: 125
- Elongation, %: 440
- Modulus @ 200%E, psi: 110
- Low Temperature Flexibility: N.A.

Properties of Complete RLP-2378-G System:

- (50 mil thick unsupported liner)
- Hardness, Shore A: 75
- Ultimate Tensile Strength, psi: 1880
- Elongation, %: 57
- Tear Strength, "C" (#/in.): 296
- Puncture Resistance, lbs: 4.5 m

Description:

- Type: Reinforced liquid polysulfide polymer
- Color: Gray
- Solids: 100%, by weight
- Density: 14.282 lbs./gal.
- Specific Gravity: 1.713

ASTM D-635, Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position:

- Time of Burning: <34 seconds
- Extent of Burning: <0.6 inches
- Test conducted on 0.040" unsupported film.

MORTON INTERNATIONAL: THIOKOL Coatings and Sealants (Continued):

RLP-2078:

RLP-2078 is a reinforced polysulfide, two-component system based on LP liquid polysulfide. When mixed, RLP-2078 coating cures by chemical reaction to form a tough, flexible, chemically resistant lining that acts as a leak-proof barrier.

When RLP-2078 is applied to properly prepared concrete surfaces, or other compatible substrates, it provides a highly elastomeric membrane that is ideally suited as a coating for structures which must retain - or exclude - water, sewage, oils, fuels, solvents and many other chemicals.

Performance Advantages:

- * Excellent resistance to a wide range of chemicals, fuels, oils, solvents and sewage.
- * Ability to bridge non-structural cracks in concrete substrates.
- * Excellent physical properties, flexible to -65F.
- * Excellent adhesion to a wide variety of substrates.
- * Excellent adhesion to itself - coat to coat.
- * Low permeability to solvent vapor, gases and water vapor.
- * Shrinkage is virtually zero.
- * Excellent UV resistance.
- * High tear strength.
- * Competitively priced.

Typical Properties:	Gray	Black
Hardness, Shore A	40	41
Tensile Strength	200	350 psi
% Elongation	400	490
Modulus @ 200%E	100	170 psi
Permeability	1.23x10 ⁻⁹ cm/sec for gasoline	
	6.8x 10 ⁻¹⁰ cm/sec for water	

Abrasion Resistance:

Taber Abraser -	
CS10 wheel, 500 g wt.	
(wt. loss)	0.53 grams/300 cycles

Description:

Type: Reinforced liquid polysulfide polymer
 Color: Black, gray
 Solids: 100% by weight
 Density: 11.8 lbs./gal.
 Specific Gravity: 1.42
 Application: Airless Spray (recommended method), Roller, Squeegee
 Temp. Range: 40-110F
 Coverage (40 mils): 40 sq.ft./gal.
 Work Time @ 70F: 60+ mins.
 Cure @ 70F: 2 hrs., tack free

MORTON INTERNATIONAL: THIOKOL Coatings and Sealants (Continued):

FEC-2000 Series Flexibilized Epoxy Coatings:

FEC-2000 coatings complement RLP-2078 and are ideal for use in applications where abrasion resistance, as well as chemical resistant properties is a concern. FEC-2000 coatings are appropriate for use in secondary containment, drum storage and truck unloading areas. The three different formulations listed below provide varying degrees of flexibility, elongation and impact resistance properties.

FEC-2000 flexibilized epoxy coatings are also appropriate for application to the inside steel bottom of fuel storage tanks.

Flexible epoxy coatings and sealants are a unique blend of LP liquid polysulfide and epoxy resin. The resulting finished products have these unique properties, in addition to excellent chemical resistance, when compared to standard epoxy products:

- * Flexibiilty to -15F.
- * Elongation exceeding 50%.
- * Significantly improved impact resistance.
- * Self-priming over concrete or steel substrates.

Typical Properties:

2232 (Rigid):

Pot Life @ 70-75: 45-60 mins.
Working Time (Application Time @ 70-75F): 45 mins.
Cure Time @ 70-75F:
 A. Foot Traffic: Overnight/16 hrs.
 B. Light Vehicular Traffic: 1-2 days
 C. Service: 3-7 days
Hardness, Shore D: 75-85
Tensile Strength, psi: 4,500+
Elongation % @ Break: 35-45
Modulus (psi @ 10% elongation): 4,000+

2233 (Flexible):

Pot Life @ 70-75: 45-60 mins.
Working Time (Application Time @ 70-75F): 45 mins.
Cure Time @ 70-75F:
 A. Foot Traffic: Overnight/16 hrs.
 B. Light Vehicular Traffic: 1-2 days
 C. Service: 3-7 days
Hardness, Shore D: 65-75
Tensile Strength, psi: 2,000+
Elongation % @ Break: 90-100
Modulus (psi @ 10% elongation): 1500+

2234 (Elastomeric):

Pot Life @ 70-75: 1-1 1/2 hrs.
Working Time (Application Time @ 70-75F): 1 hrs.
Cure Time @ 70-75F:
 A. Foot Traffic: Overnight/16 hrs.
 C. Service: 3-7 days
Hardness, Shore D: 55-65
Tensile Strength, psi: 1,200+
Elongation % @ Break: 120-130

**MORTON INTERNATIONAL: THIOKOL Coatings and Sealants
(Continued):**

MC-2027 Masonry Coating:

MC-2027 coating is a single-component, water dispersion based on LP liquid polysulfide polymer technology. MC-2027 dries quickly to the touch, providing a film with excellent resistance to many common solvents, chemicals, water and salt spray.

Advantages of MC-2027 Coating:

- * Excellent barrier coating for reducing water, gas and vapor permeability of concrete/masonry surfaces.
- * Excellent moisture and air barrier on above or below ground concrete block surfaces.
- * Excellent salt spray resistant barrier coating for concrete, or other substrates, in highway and coastal area applications.
- * Resistant to freeze/thaw cycles - passing 112 cycles with no visible effect.
- * Seamless, non-toxic, rapid drying, quick and easy to install.
- * Reduced tack and easy clean-up.

Typical Properties:

Hardness, Shore A: 68
Tensile Strength, psi: 280
% Elongation: 250
Modulus @ 100% E, psi: 190
Water Vapor Transmission (cc/100 in 2/24 hrs): 0.4
Gas Permeation:
 Carbon Monoxide: 1.6
 Methane: 0
Abrasion Resistance: 50mg/1000 rev

Description:

Type: Liquid polysulfide water dispersion
Color: Off white
Solids: 55% by weight
Specific Gravity: 1.25

Application : Rollercoat, Spray or Brush

Temp. Range: 40-110F
Coverage (25 mils): 45-50 sq.ft./gal.

THE MUST FOR RUST CO.: MP-7: Dissolves Existing Rust/Prevents Rust:

Meets or exceeds MIL-C-10578C

Kills Rust Safely:

- * No muriatic acid
- * No burning of skin
- * No noxious fumes
- * Non-inflammable
- * Non-polluting

How It Works:

MP-7 is the liquid chemical compound which reverses the chemical process that allows rusting and oxidation. MP-7 dissolves these oxides, destroys the corrosive agents that support oxidation, and delivers clean, rust free metal surfaces. During this action, minute inert elements are formed integral with the metal surface, preventing further oxidation and providing additional bonding for paints and coatings. (No metal tolerance change.)

Proper use of MP-7 completely eliminates all paint failures which result from improper or incomplete cleaning of metals. MP-7 is for use on both ferrous and non-ferrous metals.

Application:

MP-7 can be sprayed, brushed or dipped (It's re-usable.)

Users Include:

Refineries--Plating Shops--Air Force Bases--Metal Fabricators--Auto Dealers--Welding Shops--Auto Firms--Atomic Energy Labs--Auto Accessories--Canneries--Irrigation Districts--Metal Can Mfgs.--School Districts--Maintenance Firms--Highway Depts.--Turbine Mfgs.--Oil Drilling Rigs--Marine Salvage--Boiler Cleaning --and many others.

The Japanese Import MP-7!

Dip small parts--save MP-7 for later use!

Full Strength:

MP-7 is packed full strength. Dilute with potable water to suit the job at hand. (Why buy water? You can supply it and save!) Start with a 50-50 solution for all non-ferrous metal surfaces.

If oxidizing metals are a problem--MP-7 is the answer!

- * Oxidation damage can be eliminated
- * Paint lasts longer
- * Being a chemical reaction--MP-7's reaction can be accelerated by heating

MP-7 Beats the Jellies

It's safe. Economical and re-usable. A stable compound--MP-7 never spoils.

NATIONAL RESEARCH & CHEMICAL CO.: TYFOSEAL 505 Flotation and Spray-Type Corrosion Inhibitor:

A new liquid corrosion inhibitor developed to stop the rusting of double-bottom and ballast tanks subjected to constant contact with salt water. TYFOSEAL 505 may also be used as a corrosion inhibitor in the telescoping sections of water-sealed natural gas tanks. TYFOSEAL 505 penetrates existing corrosion buildup and, because of its intrinsic polar characteristics, plates metal surfaces evenly and thoroughly. TYFOSEAL 505 forms a lasting molecular film barrier which gives double-bottom and ballast tanks maximum protection against corrosion.

TYFOSEAL 505 may be used as a flotation-type protective coating where usual surface preparation and the application of conventional paints or rust preventives is neither practical nor effective. TYFOSEAL 505 may be applied simply as a film floating on top of the water. No preliminary scraping, drying or other preparation is necessary.

TYFOSEAL 505 may be used in two ways: First, as a flotation-type protective coating; and second, as a spray-type protective coating.

TYFOSEAL 505 is a polymeric amine salt.

TYFOSEAL 507 Boiler Corrosion-Inhibiting Spray:

TYFOSEAL 507, a new boiler corrosion-inhibiting liquid spray simplifies cleaning combustion deposits from marine and fixed boiler systems. TYFOSEAL 507 also removes light combustion deposits from boiler areas not cleaned by hand-scraping.

Boiler combustion deposits are normally removed by water-washing, steam-cleaning, or hand-scraping during the inspection and repair period. The introduction of water or steam into the boiler system during water-washing or steam-cleaning tends to cause corrosion of boiler tubes and other parts of the boiler system. Even after hand-scraping, the system is highly vulnerable to corrosion due to air moisture.

TYFOSEAL 507 provides corrosion protection throughout the entire boiler system during the shut-down period, whether the system is cleaned by water-washing, steam-cleaning, or hand-scraping.

TYFOSEAL 507 is a double-acting inhibitor, effective against both rust and acid corrosion. TYFOSEAL 507 contains rust preventives in an oil base and an alkaline compound which helps to neutralize acids that may have formed during boiler shutdown.

After the boiler is re-fired, TYFOSEAL 507 burns off carbon and slag deposits, leaving boiler tubes clean and free of harmful corrosion.

TYFOSEAL 507 is economical to use and reduces operating costs by prolonging the service life of the boiler.

NORTHERN INSTRUMENTS CORP.: AXXADRY Metal Protector:

AXXADRY Metal Protector forms a transparent, clean and non-slippery coating that protects both ferrous and nonferrous metals against moisture and oxidation. It is used primarily for protection during production, storage and overseas and domestic shipments. AXXADRY contains a nonflammable chlorinated solvent making it ideal for cleaning oily or greasy tools. Upon drying it leaves behind a non-slippery protected surface that eliminates fingerprint corrosion. It can be used on assembled machinery as well as components including bearings, gears, shafts and other finished parts. The dry coating is compatible with most lubricants, rubbers and plastics and usually need not be removed. With AXXADRY the need for heavy, sticky, oily or hard to handle/hard to remove coatings is ended.

Special Features:

- * Protects steel, copper, aluminum, brass and solder
- * Tolerant of humid, salt and industrial atmospheres
- * Displaces moisture - no surface preparation needed
- * Removes grease, oil and fingerprints
- * Clean, clear, fast drying film
- * Leaves non-slippery finish
- * Treated surfaces do not collect dust
- * Nonflammable liquid
- * Need not be removed in most applications
- * You don't know its there and working

Properties:

Appearance: Thin, amber liquid

Density: 10.5 pounds/gallon

Viscosity: 3 cps

Flash Point: solution - none

coating - above 230 degrees Fahrenheit

Accelerated Corrosion Test:

ASTM D-1735-62 (water fog):

Single panel-No corrosion-exceeds 4 weeks

Stacked panels-No corrosion-typical 168 hrs.

No staining-typical 168 hrs.

ASTM B-117-73 (salt spray):

Single panel-no corrosion-typical 4 days

Application: Spray, brush or dip

Coverage: 5000 square feet/gallon-30 second drain

Removal: Mineral spirits, chlorinated solvents

NORTHERN INSTRUMENTS CORP.: AXXACOAT 42 Bituminous Coating:

AXXACOAT 42 is a solvent cutback, bituminous coating for heavy duty protection of steel and cast iron in severe exposure situations. It is water displacing. It has a paint like consistency which allows it to be applied by spraying, brushing or dipping with no temperature restrictions, and, simultaneously offers superior coverage for this type of product. AXXACOAT 42 dries to a tough, attractive, matte black film, which is especially effective in conditions of high humidity and salt spray.

Special Features:

- * High performance
- * Low cost
- * Excellent coverage
- * Water displacing

Properties:

Appearance: Black liquid
 Density: 6.9 pounds/gallon
 Viscosity: 220-250 cps at 70F
 Flash Point: 62F C.O.C.
 Accelerated Corrosion Test: ASTM B-117-73 (Salt Spray)
 Single panel-no corrosion-typical 15 days
 Application: Spray, brush or dip
 Coverage: 1100 square feet/gallon-drained
 260 square feet/gallon-30 second drain

AXXATEC 77C Water Displacing Concentrate:

AXXATEC 77C is a water dilutable, water displacing concentrate for the protection of metals in shipping and storage. The concentrate can be diluted up to 1:49 with water, depending on the amount of protection required. AXXATEC 77C provides an easy to apply, fast drying and cost effective coating for the long term indoor protection and sheltered outdoor protection of iron, steel, aluminum, brass, copper and zinc in highly humid environments.

Most importantly AXXATEC 77C has been designed to retain its full effectiveness even if subjected to freeze/thaw cycles.

Properties:

Appearance: Clear, viscous liquid
 Specific Gravity: 1.15 (9.6 lbs./gal)
 Freeze Point: 14F (-10C)
 Dilution: Tap water or Deionized water
 Accelerated Corrosion Test: ASTM-D-1736-62 (Water Fog)
 Dilution 1:9/Single panel-no corrosion-3 weeks
 Dilution 1:24/Single panel-no corrosion-2 weeks
 Dilution 1:49/Single panel-no corrosion-5 days
 Control Panel-corrosion-2 days
 Application: Spray, brush or dip
 Drying Time: 15 minutes

NORTHERN INSTRUMENTS CORP.: AXXANOL 10 Antirust Lubricant:

AXXANOL 10 is a premium antirust lubricant that combines features not found in light lubricant products. As an example, the carrier solvent has no flash point. This allows AXXANOL 10 to be applied near flames and sparks. It provides all commonly used metals and alloys with a high degree of protection against severe humid, salt and industrial environments. Its solvents permit it to penetrate narrow crevices to stop squeaks and loosen rusty, frozen parts. AXXANOL 10 is an excellent surface cleaner leaving behind a light, high-performance film which lubricates and adheres under normal handling without fingerprint corrosion.

Special Features:

- * Nonflammable liquid
- * Displaces moisture
- * Protects steel, copper, aluminum, brass and solder
- * High tolerance to humid, salt and industrial environments
- * Excellent surface cleaner
- * Neutralizes fingerprints
- * Penetrates and lubricates

Properties:

Appearance: Thin, amber liquid

Density: 9.6 pounds/gallon

Viscosity: 6.5 cps

Flash Point: Solution-none

Coating-above 230 degrees Fahrenheit

Accelerated Corrosion Test:

ASTM D-1735-62 (water fog):

Single panel-No corrosion-typical 20 days

Stacked panels-No corrosion-typical 168 hrs.

No staining-typical 168 hrs.

ASTM B-117-73 (salt spray):

Single panel-no corrosion-typical 4 days

Application: Spray, brush or dip

Coverage: 3600 square feet/gallon-30 second drain

Removal: Mineral spirits, chlorinated solvents

NORTHERN INSTRUMENTS CORP.: AXXANOL 33 Corrosion Preventive Coating Oil:

AXXANOL 33 is a corrosion preventive coating oil developed especially for protecting cold rolled sheet and coils, wire bar, cast and machined ferrous and non-ferrous metals during shipping and storage. For sheet and coil applications it can be applied uniformly at high rolling speeds and maintains uniform coverage under extreme pressure. AXXANOL 33 can be sprayed, slushed, dipped, brushed or wiped on with no special handling by workers. It is particularly effective in protecting iron, steel, aluminum, brass, copper, zinc and solder subjected to salt containing atmospheres, yet it can be removed readily by standard cleaning methods.

Special Features:

- * Highly tolerant of salt containing atmospheres
- * Readily removed by alkaline phosphate cleaners
- * Protects iron, steel, aluminum, brass, copper, zinc and solder

Properties:

Appearance: Thin, amber liquid

Density: 7.4 pound/gallon

Viscosity: 90-130 SUS at 100F

Flash Point: 350F

Accelerated Corrosion Test:

ASTM-D-1735-62 (Water Fog)

Single panel-No corrosion-typical 168 hrs.

Stacked panels-No corrosion-typical 168 hrs.

No staining-typical 168 hrs.

ASTM B-117-73 (Salt spray):

Single panel-No corrosion-typical 9 hours

Application: Spray, brush or dip

Coverage: 3000 square feet/gallon-drained

500 square feet/gallon-30 second drain

Removal: Alkaline cleaner

NORTHERN INSTRUMENTS CORP.: ZERUST Products:

The ZERUST line of protective packaging products feature innovative utilization of proprietary formulations of volatile and contact corrosion inhibitors. ZERUST products may be used independently or in combination to deliver protection precisely where it is needed, unobtrusively, in the desired strength.... and for the specific period needed. They additionally offer the opportunity to tailor make solutions to corrosion problems throughout the production, shipping, storage, and in-service life cycle of metal products.

In the great majority of applications, use of ZERUST products have resulted in significant packaging cost savings.

The ZERUST line includes the following protective packaging products:

- * ZERUST Bag and Shroud Film
- * ZERUST Skin Packaging Film and Board
- * ZERUST Shrink Film
- * ZERUST Stretch Film
- * ZERUST Paper
- * ZERUST Chipboard, Corrugated and Solid Fibre Boxes, Partition, and Dividers
- * ZERUST Polyethylene Foam
- * ZERUST Dunnage Trays and Bins
- * ZERUST Corrugated and Profile Plastic
- * ZERUST Woven and Non-woven Scrim
- * ZERUST Bubble Cushioning
- * ZERUST Blow Molded and Injection Molded Products
- * ZERUST Vapor Capsules
- * ZERUST Tablets
- * ZERUST Powders and Additives

ZERUST Vapor Capsules:

The ZERUST Vapor Capsules are a family of Volatile Corrosion Inhibitors designed to protect metallic surfaces within an enclosure against airborne corrosion. By simply placing these self-contained capsules inside an enclosure, the vapors readily permeate every point, passivating all metallic surfaces.

The proprietary VCI (Volatile Corrosion Inhibitor) formulation in combination with a ruggedly designed package (U.S. Pat. #3,836,077), makes the ZERUST Vapor Capsules a remarkably practical solution to many corrosion problems.

How It Works:

ZERUST Vapor Capsules contain a unique vapor phase inhibitor. When the capsule is removed from its sealed package, it begins to emit an invisible, odorless, non-toxic vapor which is diffused throughout the surrounding atmosphere until the air is saturated. The vapor then passivates the metal surfaces against atmospheric corrosion by reducing the electro-chemical activity of the metal surfaces.

CALGON CORP.: Boiler Products:

BOILERGUARD HC:

Patented Blend of Chelant Plus Polymeric Conditioners and Dispersants Assures Deposit-Free Waterside Surfaces Without Risk of Chelant Attack

- * Most cost effective approach to deposit-free boilers.
- * Assures clean heat exchange surfaces despite moderate upsets in feedwater hardness.
- * Provides double protection against hardness upsets.
- * Separate dispersant feed is not required.
- * Patented oxygen scavenger assures maximum product utilization by eliminating trace levels of oxygen in the feed tank and at the point of injection.
- * Accurate boiler water control test assures optimum product cost performance and maximum protection from chelant corrosion, and deposition.
- * This product has been approved by the USDA under Category G6 for use in boilers where the steam may contact edible products.

BOILERGUARD 4520:

High Polymer Chelant Product Eliminates the Need for Supplemental Polymer Feed in Boilers

BOILERGUARD 4520 is a patented, liquid formulation of chelants, low molecular weight polymers and a proprietary oxygen scavenger. The product is approved for use in plants regulated by the F&DA.

- * Low level chelant reserve eliminates the possibility of chelant attack.
- * Separate dispersant feed is not required.
- * Proven chelant blend provides superior effectiveness for control of scale formation.
- * Patented polymer reserve effectively complements the chelants to handle feedwater hardness fluctuations.
- * Patented oxygen scavenger assures maximum chelant utilization by eliminating trace levels of oxygen in the feed tank and at the point of injection.
- * Accurate boiler water residual test assures optimum product cost performance.

BUROLOCK 1110:

Boiler Deposit Control Treatment

CALGON BUROLOCK 1110 is a liquid formulation used to prevent scale and sludge accumulations in steam boilers. When added to the boiler water in controlled amounts, it virtually eliminates calcium carbonate and sulfate scale and sludge deposits by promoting the formation of properly conditioned calcium phosphate particulates which are readily removed via blowdown.

- * Improved Profitability by Reducing Cleanup Time During Routine Plant Shutdown
- * Reduces Energy Losses
- * FDA/USDA Accepted

CALGON CORP.: Boiler Products (Continued):

BUROLOCK 4441:

Boiler Deposit Control Treatment

CALGON BUROLOCK 4441 Boiler Deposit Control Treatment is a blend of polymeric sludge conditioners and scale inhibitors developed for use in steam boiler systems. When added to the boiler water in closely controlled amounts, it provides the correct ratio of polymers to phosphate to optimize treatment effectiveness. Calcium sulfate scale and adherent sludge deposits are virtually eliminated by formation of well conditioned calcium phosphate particulates and iron compounds which are readily removed via blowdown.

- * Boilers Come Down Cleaner
- * Forgiving of Upset Conditions
- * Supplemental Polymer Feed Not Required

CONQUOR 3502:

Combination of Neutralizing Amine and Passivating Agent Yields Exceptional Corrosion Control in Industrial Condensate Systems

CONQUOR 3502 is a concentrated solution of morpholine and a volatile passivating agent for protection of boiler systems wherever steam condenses. The ingredients in CONQUOR 3502 are highly volatile and easily transported by the steam. At the point of condensation, the neutralizing component in CONQUOR 3502 elevates the pH of the condensate while the volatile passivating agent promotes the formation of a protective passive oxide film separating the metal from the corrosive condensate. CONQUOR 3502 provides excellent treatment results in industrial boiler systems.

- * Contributes no dissolved solids to the boiler water.
- * Enhances magnetite film formation resulting in lower iron levels returned with the condensate
- * Does not affect the quality of attemperating water.
- * Easy to feed liquid; preparation of a feed solution is not required.
- * Can be utilized for effective wet standby protection.

CALGON CORP.: Boiler Products (Continued):

CONQUOR 3583:

A Combination of Neutralizing Amines and Passivating Agent Yields Exceptional Corrosion Control in Industrial Condensate Systems

CONQUOR 3583 is a concentrated solution of neutralizing amines and a volatile passivating agent for protection of boiler systems wherever steam condenses. The ingredients in CONQUOR 3583 are highly volatile and easily transported by the steam. At the point of condensation, the neutralizing component in CONQUOR 3583 elevates the pH of the condensate while the volatile passivating agent promotes the formation of a protective passive oxide film separating the metal from the corrosive condensate. CONQUOR 3583 provides excellent treatment results in industrial boiler systems.

- * Contributes no dissolved solids to the boiler water.
- * Enhances magnetite film formation resulting in lower iron levels returned with the condensate.
- * Does not affect the quality of attemperating water.
- * Easy to feed liquid; preparation of a feed solution is not required.
- * Can be utilized for effective wet standby protection.

ULTRAMINE 120:

Condensate Corrosion Inhibitor

CALGON ULTRAMINE 120 Condensate Corrosion Inhibitor is a liquid blend of volatile amines that is highly effective for protecting boiler condensate systems from the costly corrosive effects of carbon dioxide. It provides excellent protection to after-boiler piping and equipment during standby periods, a time when corrosion is most frequently encountered. By reducing corrosion in the return system, the migration of corrosion products to the boiler is minimized--a condition which is essential to safe and efficient operation.

- * Easy to feed liquid--and pre-mixing is not required.
- * A cost-effective approach for minimizing boiler iron and copper deposits.
- * Combines today's best available technology, a custom approach for various systems.
- * Permits maximum return of condensate to the boilers.

CALGON CORP.: Boiler Products (Continued):

CALGON ULTRAMARINE 134:

Condensate Corrosion Inhibitor

CALGON ULTRAMARINE 134 Condensate Corrosion Inhibitor is a liquid blend of volatile amines that is highly effective for protecting boiler condensate systems from the costly corrosive effects of carbon dioxide. It provides excellent protection to after-boiler piping and equipment. By reducing corrosion in the return system, the migration of corrosion products to the boiler is minimized--a condition which is essential to safe and efficient operation.

- * FDA approved
- * Maximizes neutralizing power to FDA limits with a single product
- * Provides a spread of distribution ratios for system wide protection
- * A cost-effective approach for minimizing boiler iron and copper deposits
- * Permits maximum return of condensate to boilers
- * Easy-to-feed liquid - premixing is not required

LCS-38:

Closed System Treatment

By producing a protective coating on exposed metal surfaces, CALGON LCS-38 Closed System treatment effectively controls corrosion attack on piping, valves, pumps and heat exchangers in low makeup, closed cooling and heating systems. This product is effective even under adverse conditions such as high oxygen and low flow velocities.

- * Compatible with solution of alcohol and glycol-base antifreezes.
- * Contains no chromate or other color-producing chemicals.
- * Insures maximum heat transfer at lower maintenance and operating costs.
- * Safe for use in both low and high temperature water systems.
- * Easy-to-feed liquid.

CALGON CORP.: Boiler Products (Continued):**MCS PLUS Closed System Treatment:**

Molybdate-Based Liquid Product Controls Corrosion on Ferrous and Non-Ferrous Surfaces in Closed Heating and Cooling Systems Under Wide Range of Conditions

CALGON MCS PLUS is a liquid blend of inorganic inhibitors including molybdate, and proprietary dispersants, which act synergistically to control corrosion of ferrous and non-ferrous metal and alloy surfaces in low-makeup closed cooling and heating systems.

- * Controls corrosion of both ferrous and non-ferrous metals. MCS PLUS provides superior protection by promoting formation of a protective film on all exposed metal surfaces.
- * Compatible with solutions of alcohol and glycol-based anti-freezes. MCS PLUS can effectively control corrosion and deposition in alcohol or glycol-based systems.
- * Reduces maintenance and operating costs by insuring maximum heat transfer.
- * A treatment program which is simple to maintain: MCS PLUS closed system treatment contains a borate buffering agent which automatically adjusts pH at the preferred level. This product maintains effective corrosion and deposit protection even under adverse conditions such as high oxygen or low flow velocities.
- * Easy-to-feed liquid requires no premixing. MCS PLUS may be fed directly from the shipping container as received. Operator time and involvement are minimized.

PRE-TECT 2000:

Neutralizing Amine Yields Exceptional Iron and Copper Control in Utility Systems

PRE-TECT 2000 is highly effective in reducing the levels of iron and copper throughout a pre-boiler system. Based on methoxypropylamine, it has proven to be superior to both cyclohexylamine and morpholine.

- * At pressures up to 2800 psig, generates little or no ammonia.
- * Particularly effective in peaking and cycling stations.
- * No harmful impact on ion exchange resins.
- * Blended with demineralized water, therefore contributes no dissolved solids to the cycle.
- * Provides effective standby protection when used in combination with a reducing agent.
- * A distribution ratio of 1.0 assures uniform protection throughout the pre-boiler system.

CALGON CORP.: Cooling Water Chemicals:

CL-5 Corrosion Inhibitor:

Liquid Organic Inhibitor Protects Copper and Copper Alloys
Against Corrosive Attack in Cooling Water Systems

CL-5 Corrosion Inhibitor helps to assure the continued operational reliability of once-through or recirculating cooling water systems which contain copper and copper alloy components. This product is a liquid organic inhibitor which has been especially formulated to control corrosion of these metals. CL-5 is also effective in controlling localized corrosion which could be caused by plating-out of free copper onto ferrous metal surfaces.

- * Protects Copper/Copper Alloy System Components
- * Prevents Localized Corrosion Caused by Soluble Copper
- * Rapidly Forms Protective Film
- * Can be used with intermittent or continuous chlorination
- * Protects system metallurgy even when operating at lower pH's
- * Easy-to-feed liquid supplied in bulk or in drums

CL-47 Corrosion Inhibitor:

CALGON CL-47 Corrosion Inhibitor is a concentrated liquid solution of inorganic inhibitors used to control corrosion in open recirculating cooling water systems. It provides excellent corrosion control for all exposed metal surfaces at low treatment residuals. CL-47 functions as a true dicathodic inhibitor which effectively overcomes corrosion by cathodic polarization without increasing localized corrosion on areas not completely protected.

- * Protects All Exposed Metals
- * Effectively Overcomes Pitting of Steel
- * Easy-to-Feed Liquid Formulation

CL-56 Corrosion Inhibitor:

CL-56 helps to assure the continued reliability of open recirculating and once-through cooling water systems which contain copper and copper alloy components. This product is a liquid organic inhibitor which has been especially formulated to control corrosion of these metals. CL-56 is also effective in controlling localized corrosion which could be caused by plating out of free copper onto ferrous metal surfaces of the cooling system.

- * Protection of Copper and Copper Alloys
- * Prevents Localized Corrosion Caused by Soluble Copper
- * Complements Good Biological Control
- * Contains No Heavy Metals
- * Convenient to Use

CALGON CORP.: Cooling Water Chemicals (Continued):**CL-68 Corrosion Inhibitor:**

CALGON CL-68 Corrosion Inhibitor provides superior corrosion protection for all metals at very low chromate residuals. It functions as a true dicathodic inhibitor and effectively overcomes corrosion by cathodic polarization without increasing localized corrosion on untreated areas.

- * Reduced Sludge and Scale Deposition
- * Disposal of Chromate is Minimized
- * Effectively Overcomes Pitting of Steel
- * Easy-to-Feed Liquid Formulation

CONDUCTOR 5712:

CALGON CONDUCTOR 5712 is a non-heavy metal liquid formulation of corrosion inhibitors based on phosphorous chemistries. The product is designed to protect ferrous metal surfaces of recirculating cooling water systems. CONDUCTOR 5712 is unique in that excessive calcium phosphate formation does not result from its use. The product is designed to work in systems with lower hardness and longer retention time than are normally considered compatible with phosphate-based treatments. CONDUCTOR 5712 is compatible with chlorine. CONDUCTOR 5712 functions in an acidic to slightly basic pH range. CONDUCTOR 5712 is authorized by the USDA for use in federally inspected meat and poultry plants.

- * CONDUCTOR 5712 provides superior steel corrosion inhibition combining both anodic and cathodic inhibitor principles.
- * CONDUCTOR 5712 is stable in the presence of chlorine. There is no need to increase dosage during periods of chlorination.
- * The antifoulant characteristics of CONDUCTOR 5712 minimize deposition of calcium salts on heat transfer surfaces.
- * CONDUCTOR 5712 contains no zinc or chromate. It can be used in systems where current discharge restrictions prohibit the use of heavy metals.

CONDUCTOR 5721:

CALGON CONDUCTOR 5721 is a non-heavy metal liquid formulation of corrosion inhibitors based on phosphorous chemistries.

- * CONDUCTOR 5721 provides superior steel corrosion inhibition.
- * CONDUCTOR 5721 protects against both general and localized pitting-type corrosion of copper and copper alloys.
- * CONDUCTOR 5721 is stable in the presence of chlorine.
- * The antifoulant characteristics of CONDUCTOR 5721 minimizes deposition of calcium salts on heat transfer surfaces.
- * CONDUCTOR 5721 contains no zinc or chromate.

CALGON CORP.: Cooling Water Chemicals (Continued):

CONDUCTOR 6130:

CALGON CONDUCTOR 6130 is a non-heavy metal liquid formulation of corrosion inhibitors based on phosphorus chemistries. The product is designed to protect ferrous and copper-bearing metal surfaces of recirculating cooling water systems. It contains a threshold inhibitor, TRC-233, which is particularly effective for controlling the precipitation of calcium phosphate. The product is designed to work in systems over a wider hardness range than normally considered compatible with phosphate-based treatments. CONDUCTOR 6130 is compatible with chlorine.

- * CONDUCTOR 6130 is a single product treatment so it is not necessary to feed additional products to achieve corrosion, scale, and deposit control.
- * CONDUCTOR 6130 provides superior steel corrosion inhibition combining both anodic and cathodic inhibitor principles.
- * CONDUCTOR 6130 protects against both general and localized pitting-type corrosion of copper and copper alloys. Deposition of soluble copper on ferrous metals and formation of galvanic couples is minimized.
- * CONDUCTOR 6130 is stable in the presence of chlorine. There is no need to increase dosage during periods of chlorination.
- * CONDUCTOR 6130 functions as a dispersant keeping metal oxides and silts fluidized, minimizing deposition in equipment and on heat transfer surfaces.
- * CONDUCTOR 6130 contains no zinc or chromate. It can be used in systems where current discharge restrictions prohibit the use of heavy metals.

CUPROSTAT Copper Corrosion Inhibitor:

CUPROSTAT is a liquid formulation of organic corrosion inhibitors for use in recirculating cooling water systems to protect copper and copper alloys. Corrosion inhibition provided by this treatment is superior to other traditional approaches such as tolyltriazole.

- * CUPROSTAT contains a blend of organic inhibitors that are synergistic in the inhibition of copper corrosion.
- * CUPROSTAT produces a more stable film in the presence of intermittent chlorination than tolyltriazole alone.
- * CUPROSTAT reacts with soluble copper to remove it from the bulk water which protects against the redeposition of soluble copper on steel, and provides more positive control over localized corrosion caused by galvanic attack of steel surfaces due to the plating out of soluble copper.
- * CUPROSTAT rapidly establishes a protective film.

CALGON CORP.: PHREEGUARD Cooling Water Products:

PHREEGUARD 1202:

Technology Advance Controls Scale and Suspended Solids in Cooling Water Systems

PHREEGUARD 1202 is a zinc containing liquid formulation of corrosion, scale and deposit inhibitors based on PHREEGUARD technology. The product is designed to protect ferrous metal surfaces of recirculating cooling water systems. The product contains the terpolymer TRC-271, which is effective for controlling the precipitation of zinc. TRC-271 serves as a dispersant for suspended material such as silt and metal oxides. This dispersant action maintains the insoluble material in suspension, facilitating its removal from the system through blowdown.

Advantages:

- * Single Product Application
- * Inhibits Scale Formation
- * Stabilizes Zinc for Effective Steel Corrosion Inhibition
- * Environmental Impact
- * Prevents the Formation of Calcium Phosphate
- * Iron Oxide Deposit Control
- * Stable in Chlorinated Water
- * Convenient to Use.

PHREEGUARD 2005C Inorganic Phosphate Series:

Technology Advance Controls Corrosion, Scale and Suspended Solids

PHREEGUARD 2005C is a non-heavy metal, liquid formulation of corrosion, scale and deposit inhibitors based on patented technology. The product is designed to protect the ferrous and copper-bearing metal surfaces of recirculating cooling water systems. PHREEGUARD 2005C contains the copolymer TRC-233, which is effective for controlling the precipitation of calcium phosphate. TRC-233 also functions as a dispersant for suspended material such as silt and metal oxides. This dispersant action maintains the insoluble material in suspension, facilitating its removal from the system through blowdown.

Advantages:

- * Single Product Treatment
- * Superior Steel Corrosion Inhibition
- * Prevents the Formation of Calcium Phosphate
- * Inhibits Scale Formation in High pH/Alkalinity Water
- * Protection of Copper and Copper Alloys
- * Deposit Control
- * Stable in Chlorinated Water
- * Contains No Heavy Metals
- * Convenient to Use

CALGON CORP.: PHREEGUARD Cooling Water Products (Continued):

PHREEGUARD 2102:

Technology Advance Controls Scale and Suspended Solids in Cooling Water Systems

PHREEGUARD 2102 is a zinc containing liquid formulation of corrosion, scale and deposit inhibitors based on PHREEGUARD technology. The product is designed to protect ferrous metal surfaces of recirculating cooling water systems. The product contains the terpolymer TRC-271, which is effective for controlling the precipitation of zinc. TRC-271 serves as a dispersant for suspended material such as silt and metal oxides. This dispersant action maintains the insoluble material in suspension, facilitating its removal from the system through blowdown.

Advantages

- * Single Product Application
- * Inhibits Scale Formation
- * Stabilizes Zinc for Effective Steel Corrosion Inhibition
- * Environmental Impact
- * Prevents the Formation of Calcium Phosphate
- * Iron Oxide Deposit Control
- * Stable in Chlorinated Water
- * Convenient to Use

PHREEGUARD 2105 Inorganic Phosphate Series:

Technology Advance Controls Corrosion, Scale and Suspended Solids

PHREEGUARD 2105 is a non-heavy metal, liquid formulation of corrosion, scale and deposit inhibitors based on patented technology. The product is designed to protect ferrous metal surfaces of recirculating cooling water systems. PHREEGUARD 2105 contains the copolymer TRC-233, which is effective for controlling the precipitation of calcium phosphate. TRC-233 also functions as a dispersant for suspended material such as silt and metal oxides. This dispersant action maintains the insoluble material in suspension, facilitating its removal from the system through blowdown.

Advantages:

- * Single Product Treatment
- * Superior Steel Corrosion Inhibition
- * Prevents the Formation of Calcium Phosphate
- * Inhibits Scale Formation in High pH/Alkalinity Water
- * Deposits Control
- * Stable in Chlorinated Water
- * Contains No Heavy Metals
- * Convenient to Use

CALGON CORP.: PHREEGUARD Cooling Water Products (Continued):

PHREEGUARD 2205 Inorganic Phosphate Series:

Technology Advance Controls Corrosion, Scale and Suspended Solids

PHREEGUARD 2205 is a non-heavy metal, liquid formulation of corrosion, scale and deposit inhibitors based on patented technology. The technology is designed to protect ferrous metal surfaces of recirculating cooling water systems. PHREEGUARD 2205 contains the copolymer TRC-233, which is effective for controlling the precipitation of calcium phosphate. TRC-233 also functions as a dispersant for suspended material such as silt and metal oxides. The dispersant action maintains the insoluble material in suspension, facilitating its removal from the system through blowdown.

Advantages:

- * Single Product Treatment
- * Superior Steel Corrosion Inhibition
- * Prevents the Formation of Calcium Phosphate
- * Inhibits Scale Formation in High pH/Alkalinity Water
- * Deposit Control
- * Stable in Chlorinated Water
- * Contains No Heavy Metals
- * Convenient to Use

PHREEGUARD 2350 All-Organic Series:

Technology Advance Controls Corrosion Scale and Suspended Solids

PHREEGUARD 2350 is a non-heavy metal, liquid formulation of corrosion, scale and deposit inhibitors based on patented technology. The product is designed to protect the ferrous and copper-bearing metal surfaces of recirculating cooling water systems. PHREEGUARD 2350 contains the copolymer TRC-233, which is effective for controlling the precipitation of calcium phosphate. TRC-233 also functions as a dispersant for suspended material such as silt and metal oxides. This dispersant action maintains the insoluble material in suspension, facilitating its removal from the system through blowdown.

Advantages:

- * Single Product Treatment
- * Superior Steel Corrosion Inhibition
- * Inhibits Scale Formation in High pH/Alkalinity Water
- * Protection of Copper and Copper Alloys
- * Deposit Control
- * Stable in Chlorinated Water
- * Contains No Heavy Metals
- * Convenient to Use

CALGON CORP.: PHREEGUARD Cooling Water Products (Continued):

PHREEGUARD AM-142 Alkaline Metals Series:

Multi-Purpose Product Controls Corrosion, Scale and Suspended Solids

PHREEGUARD AM-142 is a zinc-containing liquid formulation designed to protect open recirculating cooling water systems against water-related corrosion, deposits and scale problems. The product contains an inhibitor developed by CALGON research for preventing the precipitation of basic zinc salts under high pH alkaline conditions. PHREEGUARD AM-142 contains a highly effective inhibitor to control calcium carbonate scale formation. The product also has superior dispersant action to maintain insoluble metal oxides and silt in suspension, facilitating their removal from the system through blowdown.

Advantages:

- * Single Product Application
- * Inhibits Scale Formation in High pH/Alkalinity Water
- * Stabilizes Zinc for Effective Steel Corrosion Inhibition
- * Iron Oxide Deposit Control
- * Complements Use of Chromate at High pH
- * Prevents the Formation of Calcium Phosphate

CASTROL INC.: BRAY Products Division Corrosion Preventives:**BRAYCOTE 103:**

MIL-C-16173 Grade 1

Black, viscous, solvent cutback material. Evaporation leaves hard, black, flexible coating. Parts may be handled without damage to film.

Film Thickness Mils: 3.7

Coverage Square Feet per Gallon: 250-500

Setting Time Hours: 4

Minimum Protection Time (Months) (Practical): 12+

Outdoor/Shed/Indoor

Application: Method: Spray/Dip/Brush

Temp.: Cold

Removal: Pet. Solvent/Vapor degrease/Steam clean

Flash Point F: 102

Pour Point F: +35

For general use indoors and outdoors with or without cover. For domestic and overseas shipment where "dry-to-touch" film is required.

BRAYCOTE 120:

MIL-C-15074

Straw-colored mineral oil, solvent blend. Evaporation leaves invisible monolayer protective film after solvent rinse.

Film Thickness Mils: 0.002

Coverage Square Feet per Gallon: 1000-2000

Setting Time Hours: 4

Minimum Protection Time (Months) (Practical): 6 Indoor

Application: Method: Brush/Dip/Swab

Temp.: Cold

Removal: Pet. Solvent

Flash Point F: 104

Pour Point F: +20

Removes, neutralizes and suppresses fingerprint residue corrosion. Used for temporary shop protection.

BRAYCOTE 137:

MIL-C-16173 Grade 2

Brownish-black, oily, solvent cutback material. Evaporation leaves smooth, soft, brownish-black, opaque, flexible, oil soluble film.

Film Thickness: 1.2

Coverage Square Feet per Gallon: 300-500

Setting Time Hours: 2

Minimum Protection Time (Months) (Practical): 6 Indoor

Application: Method: Spray/Dip/Brush

Temp.: Cold

Removal: Pet. Solvent/Vapor degrease/Alkali Wash

Flash Point F: 122

Pour Point F: -30

For internal and external surfaces of machined metal parts, instruments and bearings.

**CASTROL INC.: BRAY Products Division Corrosion Preventives
(Continued):**

BRAYCOTE 151:

U.S.N. 52-C-18 Grade 3

Amber colored, solvent cutback material. Evaporation leaves soft, amber colored, oily, water displacing film.

Film Thickness Mils: 0.8

Coverage Square Feet per Gallon: 1000-3000

Setting Time Hours: 2

Minimum Protection Time (Months): 4 Shed/Indoor

Application: Method: Spray/Dip/Brush

Temp.: Cold

Removal: Pet. Solvent/Vapor degrease/Alkali wash/Hot water

Flash Point F: 104

Pour Point F: 0

For internal and external surfaces of machined metal parts, particularly where water based fluids have been used. Excellent for protection of marine equipment.

BRAYCOTE 153:

MIL-C-16173 Grade 3

Black, solvent cutback material. Evaporation leaves soft, dark-brown, opaque, water displacing film.

Film Thickness Mils: 0.61

Coverage Square Feet per Gallon: 800-1200

Setting Time Hours: 4

Minimum Protection Time (Months) (Practical): 6+ Shed/Indoor

Application: Method: Spray/Dip/Brush

Temp.: Cold

Removal: Pet. Solvent/Vapor degrease/Alkali wash

Flash Point F: 116

Pour Point F: +60

For unpainted metal surfaces, particularly where exposed to moisture or high humidity. Protects critical bare steel or phosphated surfaces for long periods with suitable barrier wraps. Excellent for marine use.

BRAYCOTE 154:

Clear, solvent cutback material. Evaporation leaves a thin colorless water displacing film.

Film Thickness: 0.2

Coverage Square Feet per Gallon: 1000-3000

Setting Time Hours: <1

Minimum Protection Time (Months) (Practical): 5

Outdoor/shed/indoor

Application: Method: Spray/Dip/Brush

Temp.: Cold

Removal: Pet. Solvent/Vapor degrease/Alkali wash/Steam clean

Flash Point F: 106

Pour Point F: -80

For use on all metal surfaces, machines and highly finished parts. Excellent for protection of marine equipment. Excellent general purpose light lubricant.

**CASTROL INC.: BRAY Products Division Corrosion Preventives
(Continued):**

BRAYCOTE 194:

MIL-C-16173 Grade 4

Dark brown, solvent cutback material. Evaporation leaves amber-colored, non-tacky, transparent film.

Film Thickness Mils: 1-4

Coverage Square Feet per Gallon: 400-500

Setting Time Hours: 2

Minimum Protection Time (Months) (Practical): 12 Shed/Indoor

Application: Method: Spray/Dip/Brush

Temp.: Cold

Removal: Pet. Solvent/Vapor degrease/Steam clean/Alkali wash

Flash Point F: 112

Pour Point F: <0

For general indoor use and shed exposure with or without overwrap. Permits handling of parts and observation of markings.

BRAYCOTE 202:

MIL-C-11796 Class 1 and 1A

Brown, wax-like solid. Forms hard, tan, translucent, flexible coating.

Film Thickness Mils: 1.2-60

Coverage Square Feet per Gallon: 30-1300

Setting Time Hours: <1

Minimum Protection Time (Minutes) (Practical): 12+

Outdoor/Shed/Indoor

Application: Method: Spray/Dip/Brush

Temp.: Hot Melting Point 172F

Removal: Pet. Solvent/Vapor degrease/Steam clean

Flash Point F: 535

For general long term outdoor and indoor use where a readily removable hard film is required. Does not form a slick in presence of sea water. Used in submarine ballast tanks.

BRAYCO 236:

VV-P-236

Amber, grease-like grade petroleum. Forms soft, translucent flexible coating

Minimum Protection Time (Months) (Practical): Shed/Indoor

Application: Method: Fill

Temp.: Cold

Removal: Pet. Solvent/Steam clean

Flash Point F: 452

Light grade lubricating grease constituent in petroleum base rust preventative compounds. Not for use in heavy or hot bearings.

**CASTROL INC.: BRAY Products Division Corrosion Preventives
(Continued):**

BRAYCOTE 248:

MIL-C-11796 Class 3

Amber, grease-like solid. Forms soft, transparent, flexible grease-like film.

Film Thickness Mils: 1.5

Coverage Square Feet per Gallon: 30-1300

Setting Time Hours: <1

Minimum Protection Time (Months) (Practical): 6+ Shed/Indoor

Application: Method: Spray/Dip/Brush

Temp.: Hot Melting Point 149F

Removal: Pet. Solvent/Vapor degrease/Steam clean

Flash Point F: 474

For indoor protection of machined surfaces and anti-friction bearings.

BRAYCO 300:

VV-L-800

Light amber, low viscosity oil. Leaves oily, transparent, water displacing film. Protects against galvanic corrosion.

Film Thickness Mils: 0.005

Coverage Square Feet per Gallon: 1000-3000

Minimum Protection Time (Months) (Practical): 6 Indoor

Application: Method: Spray/Dip/Brush

Temp.: Cold

Removal: Pet. Solvent/Vapor degrease/Steam clean

Flash Point F: 295

Pour Point F: -75

Excellent general purpose, water displacing lubricating oil providing corrosion protection of medium and low temperatures. Also protects aluminum and magnesium.

BRAYCO 363:

MIL-L-7870

Clear transparent oil. Leaves oily, transparent film. Protects against galvanic corrosion.

Film Thickness Mils: 0.05

Coverage Square Feet per Gallon: 2000-4000

Minimum Protection Time (Months) (Practical): 6 Indoor

Application: Spray/Dip/Brush

Temp: Cold

Removal: Pet. Solvent/Vapor degrease/Steam clean/Alkali wash

Flash Point F: 304

Pour Point F: -72

A general purpose, low temperature, lubricating oil with excellent rust preventive properties.

**CASTROL INC.: BRAY Products Division Corrosion Preventives
(Continued):**

BRAYCO 481:

MIL-C-6529 Type 1

Amber to brown, low viscosity concentrate oil with anti-oxidants and corrosion preventatives.

Minimum Protection Time (Months) (Practical): 12+

Outdoor/Indoor

Application: Method: Dilute/Fill

Temp: Cold

Removal: Pet. Solvent/Steam clean

Flash point F: 500

Pour Point F: -15

Designed for use in the preservation of reciprocating engines, turbo jet engines, and equipment.

BRAYCO 482:

MIL-C-6529 Type 2/MIL-L-6082, 1100

Amber to brown, low viscosity oil with anti-oxidants and corrosion preventatives

Minimum Protection Time (Months) (Practical): 12

Outdoor/Indoor

Application: Method: Fill

Temp.: Cold

Removal: Pet. Solvent/Steam clean

Flash Point F: 505

Pour Point F: -5

Designed for use in aircraft piston and reciprocating engines during periods of storage or intermittent use.

BRAYCO 483:

MIL-C-6529 Type 3

Amber to brown, low viscosity, ready-mixed oil with anti-oxidants and corrosion preventatives.

Minimum Protection Time (Months) (Practical): 12+

Outdoor/Indoor

Application: Method: Fill

Temp.: Cold

Pour Point F: -55

Designed for use in turbo jet engines and equipment.

BRAYCO 599:

Corrosion preventive concentrate developed for addition to MIL-L-23699.

Minimum Protection Time (Months): Outdoor/Indoor

Application: Method: Dilute/Fill

Removal: Pet. Solvent/Steam clean

Flash Point F: 442

Pour Point F: -64

When added to MIL-L-23699 oil in aircraft and helicopter transmissions, BRAYCO 599 prevents corrosion of bearings and gears when engine and transmission are being prepared for removal and shipment.

**CASTROL INC.: BRAY Products Division Corrosion Preventives
(Continued):**

BRAYCO 885:

MIL-L-6065

Amber-colored, synthetic oil. Leaves an oily, transparent film. Protects against galvanic corrosion.

Film Thickness Mils: 0.05

Coverage Square Feet per Gallon: 2000-4000

Minimum Protection Time (Months) (Practical): 6 Indoor

Application: Method: Spray/Dip/Brush/Fill

Temp: Cold

Removal: Pet. Solvent/Vapor degrease/Alkali wash

Flash Point F: 410

Pour Point F: -85

For use in aircraft instruments and electronic equipment over the temperature range of -65F to 250F, particularly where corrosion and oxidation resistance is necessary.

CASTROL INDUSTRIAL INC.: CASTROL 4130:

Water Displacing, Solvent Based Corrosion Preventive

CASTROL 4130 is a water displacing, solvent based rust preventive designed to provide excellent long term indoor protection. This product deposits a thin, slightly greasy residual film which is easily cleaned using an alkaline cleaner or vapor degreaser.

Key Performance Benefits:

- * Superior water displacing properties - displaces free standing water and cleaner solution, and replaces the water with a protective oil film.
- * Excellent humidity protection - when used straight, this product will protect ferrous and nonferrous parts for up to 18 months indoor storage.
- * Excellent resistance to acid atmosphere - when used straight, a single coat of 4130 will protect ferrous and nonferrous parts which have been stored in or near acidic environments.

Use CASTROL 4130 Where:

- * Long term indoor humidity protection is needed.
- * Previous operations exposed the metal to water containing machining and grinding coolants, cleaners or water rinses.
- * Protection against an acid atmosphere is needed.
- * Ease of cleanability is desired.

Typical Physical and Chemical Characteristics:

Appearance: Clear to slightly hazy, light brown liquid
Specific Gravity @ 60F: 0.810-0.830
Viscosity @ 100F, SUS: 33
Flash Point, COC: 155F minimum
Fire Point, COC: 160F minimum
Low Cloud Point: <50F
Bulk Density (lbs/gal): 6.8
Film Type: Dry, slightly tacky
Suppressor: Yes
Neutralizer: No
Water Displacement: Yes

Application:

For best results CASTROL 4130 should be applied by dipping, especially if water displacement is needed. Spraying or flow-coating is also acceptable if properly functioning.

CASTROL INDUSTRIAL INC.: CASTROL 4163 Fingerprint Suppression Corrosion Preventive:

CASTROL 4163 is an oil dispersed, water displacing, fingerprint suppression, corrosion preventive formulated to give long term indoor protection. This product deposits a thin, slightly oily residual film which is easily cleaned using an alkaline cleaner or vapor degreaser.

Key Performance Benefits:

- * Excellent humidity protection: When used straight, this product will protect ferrous and nonferrous parts for up to two years indoor storage.
- * High flash point: Means no need for special fire equipment.
- * Excellent resistance to acid atmosphere: When used straight, a single coat of 4163 will protect ferrous and nonferrous parts which have been stored in or near acidic environments.
- * Superior water displacing properties: Displaces free standing water, emulsion and alkaline cleaner solutions, and replaces the water with a protective oil film.
- * Fingerprint suppression properties: Handled parts are fully protected from fingerprint corrosion because of specially formulated additives.

CASTROL 4163 is Used:

- * In previous operations where the metal is exposed to water containing machining and grinding coolants, cleaners and water rinses.
- * Where parts are manually inspected or packaged.
- * For protection when needed against an acid atmosphere.
- * Where long term indoor humidity protection is needed.
- * For ease of cleanability.

Typical Physical and Chemical Characteristics:

Appearance: Clear brown oil
Specific Gravity @ 60F: 0.887-0.904
Viscosity @ 100F, SUS: 45-55
Flash Point, COC: 220-230F
Fire Point, COC: 240-250F
Cloud Point: 32-40F
Bulk Density (lbs/gal): 7.4
Film Type: Oily

Application:

For best results CASTROL 4163 should be applied by dip or spray method.

CASTROL INDUSTRIAL INC.: CASTROL 4175 In-Process Synthetic Rust Preventive:

CASTROL 4175 is an oil free, water dilutable, in-process, synthetic corrosion preventive. This product was designed specifically to give long term in-solution and dry protection. CASTROL 4175 delivers an imperceptible film that will provide extended temporary indoor storage in a wet or dry state.

Key Performance Benefits:

- * Environmental protection: Wet protection for in-process storage where parts are stored or stacked in a wet state.
- * Versatile: Can be used effectively in the rinse stage of a two or three stage washer as a rinse and rust preventive. Can also be used in a one stage washer, as a light cleaner, rinse and rust preventive.
- * Economical to use: Can be used at 1 to 10% depending on the length of protection needed. At 10% this product will provide up to 9 months protection.
- * Compatibility: Can be used at a rate of .5 to 1% by volume as an additive to alkaline cleaner for added rust protection.

Use CASTROL 4175 Where:

- * In-process protection is needed for parts stored or stacked in wet state.
- * In-process protection is needed for parts dried by air blow-off or heated rinse.
- * Added rust protection is needed for alkaline cleaners.

Application:

CASTROL 4175 easily mixes with water upon addition to a system. 4175 can be applied to ferrous parts by immersion, spray or flowcoat. It can be used on nonferrous parts if parts are dried after application. The initial amount of material which should be added to the system is 5%. Concentration may be adjusted depending on the length of protection desired. 4175 may be heated to help facilitate drying.

Typical Physical and Chemical Characteristics:

Appearance: Clear dark amber liquid
pH of Concentrate: 9.3
Specific Gravity @ 60F: 1.073
Pour Point: <32F
Cloud Point: <32F
Bulk Density (lbs/gal): 9.0
Film Type: Imperceptible
Suppressor: Yes
Neutralizer: No
Water Displacement: No

CASTROL INDUSTRIAL INC.: CASTROL RUSTILO DW 924 Rust Preventative/Dewatering Fluid:

CASTROL RUSTILO DW 924 is a clear, light brown mobile fluid. Upon evaporation of the solvent, RUSTILO DW 924 leaves a micro-thin greasy transparent film which provides excellent protective properties for medium to long term storage.

Removal:

While removal is not normally necessary, the film may be readily removed by common petroleum solvents, suitable alkaline or emulsion cleaners.

Typical Data:

Specific Gravity: 0.810 @ 60F
Flash Point: >100F
Film Thickness: .000025 inches (0.6 Microns)
Coverage: 5150 sq.ft./gal.
Film Density: 0.018 oz./sq.yd.
Conditions @ 32F: Still completely mobile.
Drying Time @ 70F: 15 Minutes.
Degree of Protection: Indoors-12 months; Outdoors: 3 months

Means of Application:

CASTROL RUSTILO DW 924 may be applied by dipping, spraying, or brushing. It is completely homogenous and free from sediment. It is sprayable down to low temperatures without the spray jets blocking.

General Applications:

CASTROL RUSTILO DW 924 is a general purpose dewatering fluid with unlimited scope within the Engineering Industry. While its unusual characteristics make it suitable for many specialized applications, the good coverage of CASTROL RUSTILO DW 924 renders it ideal for most routine dewatering operations.

Advantages:

Thin Film: The film of CASTROL RUSTILO DW 924 being approximately .000025 inches thick does not interfere with air gauge or light refractory measuring equipment and need not, therefore, be removed from components subjected to inspection.

Fast Drying: CASTROL RUSTILO DW 924 is fast drying, however, this has not been achieved with the disadvantage of higher flammability nor by the incorporation of chlorinated compounds.

Advantages:

- * Excellent Dewatering Properties
- * Resistant to Emulsification
- * Suppresses Fingerprint Corrosion
- * Alkali Resistant
- * Compatible with Mineral Oils
- * Storage Stability
- * Film Coverage

CASTROL INDUSTRIAL INC.: CASTROL TARP Thixotropic Rust Preventive:

CASTROL TARP is an oil dispersed, thixotropic, all purpose rust preventive formulated to give excellent protection characteristics, maximum thixotropic properties and light-duty lubricating characteristics. CASTROL TARP, because of its thixotropic nature, has the ability to become fluid with agitation enabling the residual film to be self-healing.

Key Performance Benefits:

- * Outstanding humidity and salt atmosphere protection: When used straight, CASTROL TARP will protect ferrous and non-ferrous parts for up to 5 years indoor storage. This product will protect parts for 3-5 years in outdoor storage, if covered.
- * Excellent resistance to acid atmospheres: Will protect ferrous and nonferrous parts which have been stored in or near acidic environments.
- * Thixotropic properties: Enable film to be self-healing, become fluid with agitation and reduce dripping of product after coating.
- * Superior cleanability: Enables product to be easily cleaned off with an alkaline cleaner even after being stored outside.
- * High flash point: No need for special fire equipment.
- * Nonreactive to paint films: For use in protecting painted equipment which is stored outside prior to shipment.

Use CASTROL TARP Where:

- * A minimum amount of drippage and oil mess is desired (coating sheet and coil stock).
- * Hot dip products had previously been used (bearings).
- * Long-term outdoor storage of finished goods is required.
- * Protection of painted/unpainted goods is needed for over-seas shipment.

Typical Physical and Chemical Characteristics:

Appearance of Concentrate @ 150F: Brown hazy liquid
Appearance of Concentrate @ 65F: Brown, thixotropic gel
Specific Gravity @ 60F: 0.880-0.950
Flash Point, COC: >200F
Fire Point, COC: >200F
Pour Point: >150F
Bulk Density: 7.5
Film Type: Thixotropic/oily
Neutralizer: No
Water Displacement: No
Suppressor: Yes

This product can be purchased in a blue dyed version by ordering CASTROL TARP-B.

Application:

CASTROL TARP should be applied without dilution for maximum thixotropic and protection properties.

CASTROL INDUSTRIAL INC.: VAN STRAATEN 4135:

Water-displacing neutralizing corrosion preventive

VAN STRAATEN 4135 is an economical, solvent dispersed, water displacing, fingerprint suppressor corrosion preventive formulated to give medium to long term indoor protection. This product deposits a very thin, dry-to-the-touch residual film which is easily cleaned using an alkaline cleaner or vapor degreaser.

Key Performance Benefits:

- * Excellent humidity protection: When used straight, this product will protect ferrous and nonferrous parts for up to one year indoor storage.
- * Excellent resistance to acid atmospheres: When used straight, a single coat of 4135 will protect ferrous and nonferrous parts which have been stored in or near acidic environments.
- * Weldable: Welding through the film of 4135 can take place without deformation of the integrity of the weld.
- * Superior water displacing properties: Displaces free standing water, emulsions, alkaline cleaner solutions, cutting and forming fluids and replaces the water with a protective oil film.
- * Fingerprint suppression properties: Handled parts are protected from fingerprint corrosion because of specially formulated additives.

Use VAN STRAATEN 4135 Where:

- * previous operations expose the metal to water containing machining and grinding coolants, cleaners or water rinses.
- * parts are manually inspected or packaged.
- * medium to long term indoor humidity protection is needed.
- * protection against acid atmosphere is needed.
- * ease of cleanability is desired.
- * wrapped transit of finished goods is required.
- * wicking or wet packaging cannot be tolerated.
- * welding will eventually be done on parts.

Typical Physical and Chemical Characteristics:

Appearance: Clear brown liquid
Specific Gravity @ 60F: 0.78-0.81
Flash Point, COC: 155-160F
Fire Point, COC: 160-170F
Bulk Density (lbs/gal): 6.5
Film Type: Imperceptible
Suppressor: Yes
Neutralizer: No
Water Displacement: Yes

Application:

For best results, VAN STRAATEN 4135 should be applied by dipping, especially if water displacement is needed. Spraying or flowcoating is also acceptable if properly functioning.

**CASTROL INDUSTRIAL INC.: VAN STRAATEN 4164 Oil-Dispersed
Thixotropic Corrosion Preventive:**

VAN STRAATEN 4164 is an oil dispersed, thixotropic, all-purpose rust preventive formulated to give excellent protection characteristics, thixotropic properties and light-duty lubricating characteristics when higher film thicknesses are not necessary. Because of its thixotropic nature, this product has the ability to become more fluid with agitation, enabling the residual film to be self-healing.

Key Performance Benefits:

- * Outstanding humidity and salt atmosphere protection: Will protect ferrous and nonferrous parts for up to 8 months in an outdoor environment.
- * Excellent indoor protection: Will protect metal for 3 plus years.
- * Excellent resistance to acid atmosphere: Will protect ferrous and nonferrous parts which have been stored in or near acidic environments.
- * Thixotropic properties: Enable film to be self-healing, become fluid with agitation, reduce drip time of product after application and heal contact marks/fingerprints.
- * Superior cleanability: Easily cleaned off with an alkaline cleaner even after being stored outside.
- * High flash point: No need for special fire equipment.
- * Nonreactive to paint films: Can be used to protect most painted equipment which is stored outside prior to shipment.

Use VAN STRAATEN 4164 where:

- * a minimum of drippage and oil mess can be tolerated.
- * hot dip products had previously been used (bearings).
- * treatment of service parts is required, eliminating special packaging papers.
- * treatment of castings in transit is required.
- * excellent salt spray/humidity resistance is required by the end user.

Typical Physical and Chemical Characteristics:

Appearance: Hazy, brown liquid
Specific Gravity @ 60F: 0.90-0.96
Flash Point, COC: 260F
Fire Point, COC: 290F
Bulk Density (lbs/gal): 7.5
Film Type: Thixotropic, oily
Suppressor: Yes
Neutralizer: No
Water Displacement: No

This product can be purchased in a blue version by ordering VAN STRAATEN 4164-B.

Application:

For best results, VAN STRAATEN 4164 should be applied without dilution for maximum thixotropic and protection properties.

CHEMICAL TECHNOLOGIES INC.: Corrosion Preventives:

PROTECH 1300:

PROTECH 1300 is a solvent based water displacing corrosion preventive formulated to provide exceptional long-term indoor protection. This product deposits a long lasting, thin-residual film which is easily removed using an alkaline cleaner or vapor degreaser. PROTECH 1300 will provide protection to ferrous and non-ferrous parts for up to 18 months indoor storage. It can be diluted with oil or solvent to produce a product which will give shorter protection periods at a lower cost.

Benefits:

- * Excellent Humidity Protection
- * Outstanding Displacement Properties
- * Low Viscosity
- * Excellent Resistance to Acid Atmosphere

PROTECH 1400:

PROTECH 1400 is a petroleum based water displacing corrosion preventive formulated to provide exceptional long-term protection. This product deposits a long lasting, oily residual film which is easily removed using an alkaline cleaner or vapor degreaser. PROTECH 1400 will provide protection to both ferrous and non-ferrous parts for up to 18 months indoor storage. It can be diluted with oil or solvent to produce a product which will give shorter protection periods at a lower cost.

Benefits:

- * Excellent Humidity Protection
- * Outstanding Displacement Properties
- * Low Viscosity
- * Excellent Resistance to Acid Atmosphere

PROTECH 1650:

PROTECH 1650 is a water extendable corrosion inhibitor formulated to provide excellent in-process corrosion protection. This product deposits an imperceptible, monomolecular film which is easily removed using a mild alkaline cleaner. PROTECH 1650 was developed for spray applications where low foam is a primary requirement. This product is also recommended for leak testers because of its long-term clarity and stability.

Benefits:

- * Superior Corrosion Protection
- * Exceptional Wetting Properties
- * Nonfoaming
- * Biodegradable

CHEMICAL TECHNOLOGIES INC.: Corrosion Preventives (Continued):**PROTECH 1675:**

PROTECH 1675 is a water based corrosion preventive formulated to provide excellent in-process corrosion protection. This product deposits a dry, imperceptible, monomolecular film which is easily removed using a mild alkaline cleaner. PROTECH 1675 will provide long-term corrosion protection and is highly recommended for hydrostatic test tanks as well as ultrasonic testing of mixed metal parts. This product was developed for spray applications where low foam is a primary requirement.

Benefits:

- | | |
|----------------------------------|----------------------------------|
| * Superior Corrosion Protection | * Non-Flammable |
| * Exceptional Wetting Properties | * Safe On All Metals |
| * Nonfoaming | * Excellent Rancidity Resistance |
| * Biodegradable | |

PROTECH 1700:

PROTECH 1700 is a solvent based water displacing corrosion preventive formulated to provide exceptional long-term protection. This product deposits a long lasting, thixotropic, opaque film which is easily removed by wiping with solvent or vapor degreasing. PROTECH 1700 will provide protection to both ferrous and non-ferrous parts for over 12 months stored outdoors or shipped overseas. To obtain maximum corrosion protection properties the product should not be diluted.

Benefits:

- * Excellent Humidity Protection
- * Self-healing Film
- * Excellent Salt Spray Performance
- * Indoor and Outdoor Storage

PROTECH 4002:

PROTECH 4002 is an emulsifiable oil-based corrosion preventive formulated to provide excellent indoor protection to processed parts. It deposits a thin, oily residual film which can be easily cleaned using an alkaline cleaner or vapor degreaser. PROTECH 4002 protects against corrosion and stain on galvanized steel coils that are hot dipped or electroplated. This product forms stable emulsions in both hard and soft water.

Benefits:

- * Superior Corrosion Protection
- * Excellent Hard Water Stability
- * Protects Both Steel and Galvanized
- * Low Foam

CHEMICAL TECHNOLOGIES INC.: Corrosion Preventives (Continued):

PROTECH 4003:

PROTECH 4003 is an emulsifiable oil-based corrosion preventive formulated to provide excellent indoor protection to processed parts. It deposits a thin, oily residual film which can be easily cleaned using an alkaline cleaner or vapor degreaser. PROTECH 4003 protects against corrosion and stain on galvanized steel coils that are hot dipped or electroplated. This product forms stable emulsions in both hard and soft water.

Benefits:

- * Superior Corrosion Protection
- * Excellent Hard Water Stability
- * Protects Both Steel and Galvanized
- * Low Foam

CHEM-PAK, INC.: CHEMPAGARD Rust Preventives:

#1050A CHEMPAGARD 7 (indoor):

This preventive is an outstanding water displacing, non-staining rust preventive which will not emulsify even in the presence of alkali, and will quickly separate water displaced from metal surfaces after machining operations. Indoor protection of ferrous metals has been greatly extended up to 2 years in the absence of salt spray conditions. Fifty days of protection was easily obtained at 100% relative humidity at 120F. Available in easy to use aerosols and bulk.

1051A CHEMPAGARD 10 (Outdoor):

This product is a heavy duty protective material suitable for protecting metal in outdoor conditions as well as in marine transit. It provides as much as one year of protection in normal outdoor service. Available in easy to use aerosols and bulk.

#1053 PRO-TEK-A (Thixotropic):

This is specially formulated as a thixotropic, oily coating for metal that provides excellent long term protection from corrosion. Meets specification MIL-C-16173 Grade 2.

CHEMPAGARD 11 (Corrosion Control Additive):

A specially formulated product to be biodegradable and to exhibit superb wet corrosion protection to cast iron, steels, aluminum, bronze, brass and copper. Excellent for use in test tanks, circulated water systems, pressure tests, flow rates systems, and as a dip tank additive.

#2001 CHEMPAGARD 6 (Finger Print Remover):

This effective product suppresses and removes finger prints from finely ground or finished metals. In addition, it is an effective water displacing agent and indoor rust preventive.

2003 CHEMPAGARD 8 (Oily):

This highly inhibited oil provides excellent salt spray and humidity cabinet results. May be used as a storage protective oil in gear boxes, engines, pumps, bearings and other enclosed equipment.

#2004 CHEMPAGARD (Water Soluble):

A potent, water soluble rust preventive capable of protecting metals under severe conditions. Use on all forms of newly machined metals where dipping is practical. Excellent for any part treatment subject to long term indoor storage. For hot or cold dipping.

CIBA-GEIGY CORP.: IRGACOR 153 Liquid Organic Corrosion Inhibitor for Coatings:

Typical Physical Properties:

Composition: 70% amine salt of (2-benzothiazolylthio) succinic acid in xylene

Appearance: Slightly yellow solution

Viscosity @ 20C: 160 mPas(+/-10 mPas)

Density @ 20C: 0.99 g/cm³

Benefits:

- * Can be post-added to finished formulations
- * Proven performance in 2-pack epoxy, polyurethane and alkyd systems
- * Allows formulation of glossy or transparent coatings
- * Useful alone or with anticorrosive pigments
- * Corrosion resistance comparable to zinc chromate
- * Improves adhesion
- * Easily incorporated
- * Miscible in broad range of binders and solvents

IRGACOR 252 Organic Corrosion Inhibitor for Coatings:

(2-Benzothiazolylthio)succinic acid

CAS No. 95154-01-1

Typical Physical Properties:

Appearance: Light yellow crystalline powder

Molecular weight: 283

Specific gravity @ 20C: 1.52 g/cm³

Melting point: Approx. 170C (decomposition)

Thermal stability: 150C and below without decomposition

Acidity: pKI = 3.4, pKII = 5.0

Oil absorption value: 40-50g oil/100g IRGACOR 252

Benefits:

- * Proven performance in wash primers and acrylic modified alkyds and short oil alkyds
- * Preneutralized form prevents flash rust, and provides long term corrosion resistance in baked waterborne systems
- * Improves adhesion
- * Improves wetting of metal surfaces

CLIMAX MOLYBDENUM CO.: Sodium Molybdate Corrosion Inhibitor:

Feature:

- * Anodic inhibitor effective at low concentration
- * Environmentally safe and non-toxic
- * Free flowing solid
- * Passivates pits and crevices from corrosion
- * Effective over a wide pH range
- * Insensitive to changes in water conditions
- * Good thermal and oxidative stability
- * Not affected by organics, reducing agents or biocides
- * Synergistic with oxidizing medium

Applications:

Cooling Water:

Sodium Molybdate is an excellent co-inhibitor for both open and closed systems, replacing chromates for environmentally safe products.

Open System 5-20 ppm ($\text{Na}_2\text{MoO}_4 \cdot 2\text{H}_2\text{O}$)

Closed Systems 75-300 ppm ($\text{Na}_2\text{MoO}_4 \cdot 2\text{H}_2\text{O}$)

Molybdates work synergistically with nitrites, Zn (II), Ca (II), tolyltriazole, phosphates and phosphonate components. It also exhibits low sensitivity to increased chloride levels in the system.

Antifreeze:

Sodium Molybdate is an essential ingredient for closed coolants systems. It inhibits aluminum heat transfer corrosion as well as water pump cavitation damage.

The recommended treat level is - 0.2% by weight coupled with other inhibitors such as phosphates triazoles, nitrites and borates.

Metalworking Fluids/Hydraulics:

Sodium Molybdate is an effective corrosion inhibitor for synthetic metalworking fluids. When used with other inhibitors like ACTRACOR M or ACTRACOR 1987, a 3:1 ratio of ACTRACOR to molybdate is recommended.

Typical Analysis:

Water solubility @ RT.: 40%

Appearance and odor: White, odorless powder

Specific Gravity: 3.28 ($\text{H}_2\text{O} = 1$)

Solubility in Water: 44 gm/100cc @ 0C

Vapor Pressure: 0 @ 20C

Melting Point: 687C

CLIMAX PERFORMANCE MATERIALS CORP.: CLIMAX Specialty Chemicals:

ACTRACOR M and ACTRACOR T:

Boric Acid Esters of Mono- and Triethanolamine

ACTRACOR M:

Appearance: Liquid
Color: Dark Amber
Odor: Amine
Viscosity (@ 25C): 1.8 Stokes
pH (1% in dist H2O): 9.2
pH (Conc.): 10.6
Specific Gravity: 1.30
Weight/Gallon: 10.8

ACTRACOR T:

Appearance: Liquid
Color: Light Amber
Odor: Amine
Viscosity (@ 25C): 1.4 Stokes
pH (1% in dist H2O): 9.0
pH (Conc.): 10.2
Specific Gravity: 1.15
Weight/Gallon: 9.6

ACTRACOR M and T are effective replacements for Sodium Nitrite in cutting and grinding fluids by contributing mild alkalinity and corrosion protection.

ACTRACOR 800:

Solvent and oil soluble corrosion inhibitor.

Physical Appearance: Light Brown Waxy Solid
Acid Value: 20+-5
Saponification Number: 55+-10
Melting Point: 110F.
Specific Gravity: 0.866 @ 44C.
Weight/Gallon: 7.22 Lbs.
Flash Point: 375F. COC
Fire Point: 395F. COC

ACTRACOR 800 is soluble in oil, mineral spirits, kerosene and aromatic solvents. Usage levels of 4-10% are recommended and the formulated rust preventative can be applied by dipping, spraying or brushing.

**CLIMAX PERFORMANCE MATERIALS CORP.: CLIMAX Specialty Chemicals
(Continued):**

ACTRACOR 856:

Amine carboxylate corrosion inhibitor.

Appearance: Amber Liquid

pH (concentrate): 8.3

pH (1% in dist. H₂O): 7.7

Specific Gravity: 1.104

Weight/Lbs./Gal.: 9.2

Solubility: Soluble in water, glycol and alcohol

Viscosity (cps @ 25C): 1100

Film Type (after evaporation): Liquid Oily Film

A use level of 3-10% in synthetic and 2-8% in semi-synthetics should provide effective rust protection for ferrous and non-ferrous applications.

Sodium Molybdate, Crystalline (SMC):

Sodium Molybdate Corrosion Inhibitor

Feature:

Anodic inhibitor effective at low concentration

Environmentally safe and non-toxic

Free flowing solid

Passivates pits and crevices from corrosion

Effective over a wide pH range

Insensitive to changes in water conditions

Good thermal and oxidative stability

Not affected by organics, reducing agents or biocides

Synergistic with oxidizing medium

Applications:

Cooling Water:

Sodium Molybdate is an excellent co-inhibitor for both open and closed systems, replacing chromates for environmentally safe products.

Antifreeze:

Sodium Molybdate is an essential ingredient for closed coolants systems.

Metalworking Fluids/Hydraulics:

Sodium Molybdate is an effective corrosion inhibitor for synthetic metalworking fluids.

Water solubility @ RT.: 40%

Appearance and odor: White, odorless powder

Specific Gravity: 3.28

Solubility in Water: 44 gm/100cc @ 0C

Vapor Pressure: 0 @ 20C

Melting Point: 687C

CLIMAX PERFORMANCE MATERIALS CORP.: Corrosion Inhibitors:

CLIMAX MOLYHIBIT 100 Corrosion Inhibitor:

CLIMAX MOLYHIBIT 100 is a highly aqueous soluble, free-flowing solid form of molybdate ($\text{MoO}_4^{=}$). When used as a component in formulations of corrosion inhibitors for cooling water, it forms a protective coating on metal surfaces, preventing corrosion and pit initiation and development.

Major advantages of MOLYHIBIT 100 include its environmental and toxicological safety, ease of testing, insensitivity to changing process or water conditions and effectiveness with both ferrous and non-ferrous metals. Molybdates have been used successfully as corrosion inhibitors for more than 30 years.

MOLYHIBIT 240:

MOLYHIBIT 240 is a high purity, colorless 40% by weight solution of potassium molybdate (K_2MoO_4) in deionized water. Solution density is approximately 11.7 lbs./gal., and each gallon contains approximately 4.7 lbs. K_2MoO_4 .

MOLYHIBIT 240 is a water-soluble corrosion inhibitor of ferrous and nonferrous metals.

Density at 20C (68F): 11.7 lbs./gal.

Potassium Molybdate as K_2MoO_4 : 40% by weight

MOLYHIBIT 300:

Lithium Molybdate (Li_2MoO_4)

Features:

- * corrosion inhibitor for lithium chloride and lithium bromide brines
- * protects ferrous and non-ferrous metals
- * low toxicity
- * environmentally safe
- * good thermal and oxidative stability

Applications:

MOLYHIBIT 300 is used as a corrosion inhibitor for lithium brines used in refrigeration, air conditioning, and humidity regulation applications.

Typical Analysis:

White powder

Molybdenum: 55.1% by wt. minimum

Water: 0.2% by wt. maximum

Sulfate: 0.05% by wt. maximum

PO_4 , Cl_2 , SiO_2 , or Fe: 0.01% by wt. maximum

Water Solubility: 44.8% wt. percent @ 25C

Melting Point: 705C (1300F)

**CLIMAX PERFORMANCE MATERIALS CORP.: Corrosion Inhibitors
(Continued):**

MOLYHIBIT 340:

Lithium Molybdate Solution

Features:

- * corrosion inhibitor for lithium chloride and lithium bromide brines
- * protects ferrous and non-ferrous metals
- * low toxicity
- * environmentally safe
- * good thermal and oxidative stability
- * liquid product for ease of formulation and production

Applications:

MOLYHIBIT 340 is used as a corrosion inhibitor for lithium brines used in refrigeration, air conditioning, and humidity regulation applications.

Appearance: clear liquid

Density @ 20C: 11.7 lbs./gal.

Li₂MoO₄: 40% by wt. (39.8/min.)

Molybdenum: 22.0% minimum

Sulfate: 0.50 maximum

Sodium: 0.10 maximum

Po₄, Cl, SiO₂, or Fe: 0.01% maximum

MOLYBRINE 100:

MOLYBRINE 100 is a liquid corrosion inhibitor concentrate of proprietary composition miscible with the aqueous systems to which it may be added.

Uses:

MOLYBRINE 100 is a ferrous and cuprous metals corrosion inhibitor recommended for incorporation into the aqueous alkali metal brines used in various processing operations such as cooling, refrigeration, humidity control, and wet blast cleaning. Its components are considered to be an environmentally acceptable contribution to the brines.

Density @ 20C (68F): 10.2 lb/gal

pH: 10.5

**CLIMAX PERFORMANCE MATERIALS CORP.: Corrosion Inhibitors
(Continued):**

MAXAHIBIT TT-50:

MAXAHIBIT TT-50 is a 50% aqueous solution of the sodium salt of tolyltriazole. It is a corrosion inhibitor for copper and copper alloys and it is synergistic with inhibitors of other metals.

Features:

- * produces a polymeric barrier to corrosion
- * effective at small concentrations
- * aqueous form is easily mixed into liquid products
- * vapor phase inhibitor
- * inhibits stress corrosion cracking of brass
- * enhances fluxing, soldering, brazing and coating operations.
- * high degree of thermal and oxidative stability
- * low oral and dermal toxicity
- * low toxicity to fish

Mechanism:

Tolyltriazole is primarily a cathodic inhibitor because it restricts the oxygen reduction reaction. MAXAHIBIT TT-50 reacts with copper oxide on the metal surface, resulting in a polymeric coating. The inhibitor provides a mechanical and electrical barrier against corrosion. In addition, tolyltriazole complexes copper in solution, thereby preventing galvanic corrosion of other metals.

Use Directions:

When used in place of solid tolyltriazole, increase the use level of TT-50 by a factor of 2.3. Increasing the concentration, temperature, and time of contact with metal increases the protection. For replacement of Sodium Mercaptobenzothiazole, use 1 part of MAXAHIBIT TT-50 to replace 2.8 parts MBT solution.

MAXAHIBIT TT-50 works best at pH values 6-10. Solubilization at a higher pH should precede addition of lower pH additives to a system.

Typical Analysis:

Formula: $C_7H_6N_3Na$ 50% aqueous solution
 Appearance: Clear red/brown solution
 Density (lb./gal.): 9.85-9.95
 pH (10% solution): 12
 Concentration %: 50

Applications:

Cooling Water Treatment:

Functions:

- * process cooling and HVAC inhibitor
- * protects copper-nickel tubes in heat exchangers
- * protects the admiralty steam turbine condenser in power generation
- * chromate replacement for organic systems

Features:

- * low toxicity for less ecological risks at blow down
- * compatible with other corrosion inhibitors, descalants...
- * formulates well in acidic, alkaline and polymeric formulas
- * good oxidative integrity in the presence of biocides
- * synergistic with molybdate inhibitors

CORTEC CORP.: Corrosion Protection:

VCI-237 ELECTRICOR Spray:

New multi-functional formulation providing three-way protection: inhibition of multimetals, antistatic and cleaning action. Corrosion-inhibiting spray provides dry, ultrathin, protective film. For use in enclosed environments on electronic equipment and components. Will not alter electrical resistance, magnetic or thermal protection.

VCI-307 Powder for Multi-metal Protection:

Vapor corrosion inhibiting powder for ferrous and many non-ferrous metals. Apply by dust, sprinkle, or fog. Nitrite and chromate free.

VCI-309 Powder for Ferrous Metals:

Water-soluble, vapor corrosion inhibitor for protection of ferrous metals. Nitrite and chromate free. Apply powder by dust, fog or sprinkle. Apply through aqueous form by immersion or flushing.

VCI-316 Liquid Concentrate Primarily for Copper and Brass:

Synthetic, water-based inhibitor formulated primarily for copper and brass. Leaves transparent and lubricating film. Film is self-healing and scratch resistant.

VCI-317 Liquid Concentrate Primarily for Aluminum:

Synthetic, water-based inhibitor formulated primarily for aluminum. Provides a lubricating, non-sticky film. Film is self-healing and scratch resistant.

VCI-326 Oil-Based Concentrate:

Corrosion inhibiting additive for lubricating oils. Completely soluble to pass filtrability requirement of less than 1 micron. Does not change stability or lubricating properties of oils.

VCI-329 Additive Concentrate for Oils:

Liquid concentrate that boosts corrosion protection of oils. Multi-metal protection. Comforms to MIL-P-460028 and MIL-C-16173D Grade 3. FDA approved (VCI-329F).

VCI-337 Liquid Concentrate:

Liquid concentrate for multi-metal protection. Provides dry, non-tacky film. Spray or fog. FDA grade available (VCI-337F).

VCI-347 Corrosion Inhibitor/Heavy Duty Lubricant:

Liquid that provides corrosion protection for multimetals. Dilutable with water up to 1:40. Excellent lubricating properties. Replaces slushing oils on cold rolled and galvanized steel, metal forming lubricant and synthetic machining coolant.

CORTEC CORP.: Corrosion Protection (Continued):

VCI-350/351 Coating Solution:

Multi-metal Vapor Corrosion Inhibitor coating for the Folding Box and Corrugated Box Industry. Available in a solvent based or water based formulation.

VCI-357 Liquid Coating:

Liquid saturation coating for flexible substrates such as paper, corrugated, chipboard, foam, TYVEK, etc. Provides multimetal protection. Substrates coated with VCI-357, in most instances, conform with MIL-P-3420E.

VCI-365 COR-MASTIC:

Combines the best properties of proven VCI with the well-known resistance of epoxies. Apply to clean or rusted metal surfaces to give superior VCI protection, including water and brine immersion.

VCI-368 Liquid for Outdoor Protection:

Solvent-based barrier coating that provides extended, outdoor multi-metal protection. Semi-dry, translucent, self-healing, and scratch resistant film. Dilutable. Spray, roll, brush, or dip. Remove with common solvents. Conforms to MIL-C-16173D, Grade 1.

VCI-369 Sprayable Liquid Concentrate for Outdoor Protection:

Oil-based barrier coating that provides extended, outdoor multi-metal protection. Tacky, translucent, self-healing, and scratch resistant film. Dilutable. MIL-C-16173D Grade 2.

VCI-369 COR-LUBE Corrosion Inhibiting Grease:

Thixotropic grease with extreme pressure (EP) properties formulated for corrosion protection of metals exposed to severe environments.

VCI-376 Liquid for Sheltered Outdoor Protection, Paintable:

Water-borne, acrylic-based barrier coating that provides extended outdoor multi-metal protection in sheltered conditions. Clear, dry film. Can be painted over. Spray, brush, or dip. Removable. Conforms to MIL-C-16173D, Grade 4.

VCI-379 Water-Based Heavy Duty Liquid Concentrate Inhibitor:

Excellent replacement for oil based rust preventives. Provides long term protection indoors and in sheltered exposures. Can be used at high dilutions. Non-flammable.

VCI-386 Liquid for Outdoor Protection:

Water-based, barrier coating that provides extended outdoor protection for multimetals. Clear, air-dry coating.

VCI-388 Concentrate for Outdoor and Sheltered Protection:

Water-borne, excellent replacement for oil-based rust preventives in outdoor and sheltered exposures. Removable. Custom colors available. Dilutable. Non-polluting. Low V.O.C.

CORTEC CORP.: Corrosion Protection (Continued):

VCI-389 Grease Concentrate:

Increased levels of rust protection for threaded fittings and other areas where a non-hardening lubricant/corrosion resistant material is necessary. Water-based. Dilutable.

VCI-412 Concentrate Cleaner:

Water-based, dissolves grease, paraffins and waxes, biodegradable, organic and made from natural ingredients. Safe to handle. Dilutable. Non-toxic.

VCI-419 Cleaner and Degreaser Concentrate:

Water-based, heavy duty cleaner, biodegradable, nonflammable, removes heavy grease and oil deposits from carbon steel, stainless steel, zinc, brass and copper. Dilutable.

VCI-420 Liquid and VCI-421 Gel Rust Remover and Converter:

Removes rust, scale and oxide deposits from ferrous metals, brass and copper. Prepares metal surface for paint application. Dip or spray.

VCI-422 Liquid and VCI-423 Gel Organic Rust Removers:

Effectively removes rust and tarnish from steel, iron, copper, brass and chrome. Non-polluting. Will not harm human skin or adversely affect most paints, plastics, wood, textiles, ceramics or rubber.

VCI-425 Neutral Rust Remover Powder:

Biodegradable, environmentally acceptable, organic, non-flammable. Removes rust, oxidation, and scale. Effective in low dosages.

VCI-427 Aluminum Rust Remover:

Water-based, dissolves oxide/scale film from aluminum and inhibits corrosion. Dilutable.

VCI-430 Paint Stripper:

Environmentally acceptable, removes paints from metal, concrete and wood surfaces. Prevents flash rust and discoloration of stainless steel, iron, copper, aluminum and brass.

VCI-560 Powder and Tablets for Ferrous Metals:

VCI for ferrous applications. Dust or sprinkle. For tablets, insert. Nitrite-based VCI powder meets MIL-I-22110C type 1 and 2, and QPL (Qualified Products List).

VCI-609 Powder for Ferrous Metals:

Readily soluble in water. Very economical for protecting large enclosures and piping and for hydrotesting. Nitrite and chromate free, non-polluting.

CORTEC CORP.: Corrosion Protection (Continued):

VCI-617 Boiler Water Treatment:

Water-soluble, provides longterm protection against corrosion and scale formation. Suitable for low to medium pressure boilers.

VCI-619/656 Coating for Insulated Surfaces:

Water-based undercoating for thermally insulated surfaces that provides protection in sheltered conditions. Non-flammable and environmentally acceptable. Spray or brush.

VCI-629 Inhibitor for Petroleum Producing and Refining:

Concentrated additive forms a tight barrier to protect ferrous and non-ferrous metals against corrosion in production, storage tanks and hydrocarbon processing.

VCI-637 Inhibitor for Gas Flow and Transmission Lines:

Provides internal corrosion protection for gas flow and gas transmission lines. Effective against water, corrosive gases, and chloride contamination.

VCI-646 Ambiodic Water Treatment System:

Water soluble treatment protects cooling and industrial process water systems against corrosion, scale and fouling. Environmentally safe.

VCI-649 Liquid for Multimetals:

Water-soluble inhibitor for multimetals. Recommended for closed loop cooling systems and as an additive to corrosive fluids, i.e., salt water, brines, or solutions containing dissolved sulfides or halogens. Effective at low dosages. Recommended as a hydrostatic water additive.

VCI-704 METACOR:

Additive for alcohol, gasohol, gasoline and diesel fuels. Protects fuel system components including fuel tanks, carburetor elastomers and fuel pumps. Protects all metals includingterneplate, solder, copper, aluminum and steel.

VCI-1236 Liquid Additive for Vapor Degreasing, Cleaning, and Stripping Baths:

Liquid concentrate additive boosts protection for ferrous and some non-ferrous parts processed in vapor degreasing, cleaning and stripping baths, as well as for conventional solvent cleaning/degreasing systems.

CORTEC MCI-2000 Migratory Inhibitor for Concrete Admixture (Patented):

Used to prevent corrosion of rebar in concrete. To be added to concrete admixture.

CORTEC MCI-2020 Migratory Inhibitor for existing concrete structures, Patent Pending:

For surface treatment or injection in concrete to prevent corrosion of embedded steel.

COSTEC INC.: Industrial Surfactants: Imidazolines:**CHEMZOLINE T-11:**

Aminoethyl Tall Oil Imidazoline

Dark Amber, Viscous Liquid

Concentration, %: 100

Intermediate for production of film-forming corrosion inhibitors. Reaction with acidic material yields salts with film-forming persistency. Chain length of acid and degree of neutralization determine desired degree of dispersibility in aqueous systems. Neutralization with glycolic or acetic acid produces film-forming salts usable as cationic bases for "spray wax" concentrates for addition to rinse cycle in automatic car washes. It is also used to disperse certain pigments in paint formulations.

CHEMZOLINE T-33:

Aminoethyl Tall Oil Imidazoline

Dark Amber, Viscous Liquid

Concentration, %: 100

Dispersible in water as well as soluble in mineral-oil and most organic solvents. May be used to produce self-emulsifiable mineral-oil compositions or as a dispersant for mineral spirits and aromatic solvents. Excellent film-forming corrosion inhibitor, either as the base or in salt form. Salts of low-molecular-weight carboxylic or dicarboxylic acids form clear water solutions; degree of water solubility can be controlled by chain length of acid. Acetic, glycolic or hydrochloric acid salts are used as promoters in froth flotation of acidic or negatively charged ores, e.g. silica. Compatibility, heat stability and water-dispersing properties promote usage as an anti-stripping agent for asphalt compounds and coal tar pitches. It is also used to disperse certain pigments in paint formulations.

CHEMZOLINE T-44:

Hydroxyethyl Tall Oil Imidazoline

Dark, Viscous Liquid

Concentration, %: 100

Soluble in mineral oil, vegetable and animal glycerides and most organic solvents. Forms hazy, stable dispersion in water which can be clarified by acidifying with mineral or organic acids. Excellent emulsifier for mineral, vegetable and animal oils. Formulations containing 1-4% T-44 exhibit excellent emulsion stability. Corrosion inhibitor in its basic form or as its salts.

CHEMZOLINE C-22:

Hydroxyethyl Coco Imidazoline

Light Tan Paste

Concentration, %: 100

Soluble in Isopropanol, kerosene, and aromatic solvents. Forms hazy dispersion in water, clarified by acidifying. Basic form and its salts are used as corrosion inhibitors as well as emulsifiers for oils.

COSTEC INC.: Industrial Surfactants: Specialties:

AMEENEX C-18:

Fatty Amido Diamine

Light Amber Solid

Concentration, %: 100

Corrosion inhibitor. Easily formulated for desired dispersibility with good film-forming persistency. The acetic acid and hydroxyacetic salts are highly water soluble. Useful in non-metallic mineral flotation. Wetting, emulsifying and antistripping agent with asphalt compounds and coal-tar pitches.

AMEENEX C-20:

Complex Aliphatic Amine Blend

Dark Amber Liquid

Concentration, %: 100

Completely soluble in water and brine. Cationic behavior makes it useful for the formulation of corrosion inhibitors. Film-forming amine. Steam volatile for boiler-condensate corrosion control. Low combining weight makes it an efficient neutralizing amine.

AMIDEX OE:

Polyoxyalkylene Amide Ester

Amber, Viscous Liquid

Concentration, %: 100

Developed for emulsification of industrial pale oils, e.g., pale oil #100. Used to formulate soluble oils, cutting oils, drawing oils and water rinsable lubricants.

AMIDEX WD:

Fatty Amine Salt

Amber Liquid to Soft Paste

Concentration, %: 80

Shows excellent carbon removal properties when formulated with ortho-dichlorobenzene, kerosene, butyl cellosolve and water. Cold-dip degreasing formulation.

AMIDEX 1248:

Complex Fatty Amido Phosphate

Light Amber Liquid

Concentration, %: 100

Detergent, emulsifier, wetting agent for formulation of aqueous degreasers and all-purpose industrial and institutional cleaners.

COSTEC INC.: Corrosion Inhibitor Intermediates:**AMEENEX Polymer:**

Complex Resinous Polyamine

Dark, Viscous Liquid

Activity, %: 100

Excellent film persistency. Low emulsification tendency. High temperature stability. Neutralization with short-chain acids gives brine dispersible salts.

AMEENEX 70 WS:

Water-Soluble Amine Salt

Amber Liquid

Activity, %: 60

Concentrate for down-hole corrosion inhibition.

AMEENEX 73 WS:

Water-Soluble Amine Salt

Amber Liquid

Activity, %: 60

Water-soluble concentrate for oilfield corrosion control.

CHEMZOLINE C-22:

Hydroxyethyl Coco Imidazoline

Amber Liquid or Paste

Activity, %: 100

Coco fatty-acid based imidazoline. Base for water-soluble salts.

CHEMZOLINE T-11:

Aminoethyl Tall Oil Imidazoline

Amber, Viscous Liquid

Activity, %: 100

Neutralization with long-chain acids gives oil soluble salts. Short-chain acids result in water-dispersible salts. Proven oilfield corrosion inhibitor.

CHEMZOLINE T-44:

Hydroxyethyl Tall Oil Imidazoline

Amber, Viscous Liquid

Activity, %: 100

Oil-soluble inhibitor base as supplied, or as partial salts. Also a very effective emulsifier for oil-based muds.

CHEMZOLINE 1411:

Aminoethyl Tall Oil Imidazoline

Amber, Viscous Liquid

Activity, %: 100

Economical Imidazoline. Used as supplied or neutralized to desired pH. Excellent corrosion inhibitor base for high-temperature applications.

CROWN: Corrosion Preventatives:

#7007-#7013 Cold Galvanizing Compound:

- * 93% Zinc-rich coating is electrochemically fused to iron and steel
- * Equal to hot dip galvanizing
- * Aerosol will not clog or sputter

If the surface is scratched, an electrochemical reaction causes the zinc to sacrifice itself for the base metal's protection. This keeps corrosion off the protected surface. You will have no rust or rust creepage.

Authorized by USDA for use in federally inspected meat and poultry plants.

Bulk products meet these Mil Specs:

Mil-P-46105/Mil-P-21035/DOD-P-21035a

Durable and Reliable:

In an independent laboratory test, Cold Galvanizing Compound withstood over 2000 hours of salt-spray testing (Federal Test Standard No. 151a. Method 811 1)

Also, passes Preece Test for hot-dip galvanizing. Cold Galvanizing Compound is resin bonded and has a light gray, matte finish.

Simple Application:

Cold Galvanizing Compound can be easily sprayed, brushed, or dipped onto any metal surface. Suggestions for application include welded joints, guard rails, bridges, damaged surfaces, fences, heat duct, storage tanks, pipe lines and offshore equipment.

GALVA BRIGHT Premium:

Glistening zinc coating that will restore galvanized steel to the bright look of Hot Dip. GALVA BRIGHT will stop rust and corrosion on any iron or steel surface. Its zinc rich formula provides long lasting protection.

Applications:

Cosmetic repair of welds, hand rails, rims, highway guard rails, metal chain fences, pipes, TV towers, refinery piping, corrugated metal buildings, heavy equipment, and anywhere the bright look of hot dipped surfaces is preferred.

CROWN: Corrosion Preventatives (Continued):

#6007 Rust Inhibitor:

Contains Fortified Lanolin for Moisture Absorption
Protects and lubricates indoor equipment such as tools, parts, and machinery. Penetrates deep, absorbs moisture, and neutralizes corrosive acids. Waxy, elastic film removes easily with any paint solvent.

Lasting Rust Protection

Applications:

Twist drills, nuts and bolts, plow blades, pumps and machinery

#3090 Tool and Die Saver:

Protection in Storage

Protects stored tools and dies from moisture during storage. Formulated with solvents and lanolin for moisture-absorption and lubrication. Heavy, non-oily film is easy to remove when equipment is returned to service. Ideal for long-term storage or long-distance shipments.

Applications:

Precision measuring tools (calipers and gage blocks) chucks, setup jigs and tools, stored metal molds and seldom used parts.

#6013 Formula 101:

Corrosion Suppressant

Recommended for long, low-cost corrosion protection requirements. Petroleum based with excellent chemical resistance. Penetrates surface and forms transparent film that will last until you want it removed.

Applications:

Construction equipment, bridgework, tanks, pipe, farm machinery, marine equipment and shipping deck cargo

#6004 KLEER KOTE:

Crystal Clear Acrylic Protects and Waterproofs

An excellent weatherproofers and waterproofers. Provides lasting protection against wear, handling and oxidation--prevents bleaching or fading from sunlight as well as tarnishing. Resists salts, alkalis, weak acids, heat or cold. Adheres to metals, wood, and paper.

Dries quickly at room temperature to approximately 3 mils thick, depending on the thickness sprayed. Becomes tacky at 350F, but regains hardness upon cooling.

Applications:

Brass fixtures, blueprints, tubing and machine parts.

Covers and seals with a lustrous, smooth finish that makes most surfaces mar-resistant and chip-proof. Will not cause discoloration.

CROWN: Corrosion Preventatives (Continued):

#8040 Vinyl Strippable Coating:

Sprays On...Peels Off

Sprays a vinyl film and dries to a rubbery, protective coating. Clean-up requires no solvents--simply peel the coating off. Quick, clean protection from corrosion, dust, dirt and paint spray. Excellent for storage or shipping. Best when applied to smooth surfaces.

Not recommended for plastics or substrates in which ketones can cause solvent action in materials to be coated.

Peels Off in Sheets:

Apply 2 or 3 coats 15 minutes apart for best results

Applications:

Precision tools, castings, anodized aluminum, highly polished surfaces and lenses

CROWN TECHNOLOGY, INC.: Inhibitors:

CROWN Foaming Compounds:

CROWN Foamers are liquids which, when added to pickling solutions, produce thick, uniform foam blankets. The foam produced captures hot acid fumes and prevents them from escaping into the atmosphere and causing corrosion to equipment and hazards to employees.

In addition, CROWN Foamers provide good wetting properties which enhance uniform pickling.

Foamer 20:

An inexpensive liquid foamer which produces a detergent type foam. Foamer 20 is effective in both sulfuric and hydrochloric acid baths. Foamer 20 is added to the pickling solution at a ratio of 1 pint per 1000 gallons.

Foamer 20X:

Foamer 20X produces a dense foam blanket and is stable up to 12% iron concentrations. It is used in sulfuric, hydrochloric, and nitric-hydrofluoric baths. Add Foamer 20X at 1 pint per 1000 gallons.

Foamer 50:

Foamer 50 is used in nitric-hydrofluoric acid solutions. Usage is 1 pint per 1000 gallons of pickling solution. More Foamer 50 may be added if more foam is desired.

Form: Liquid

Weight: 8.5#/gal

Solubility in Acid: Complete

Color and Odor: Amber, pleasant odor

pH: 7-8

CROWN L-50SS Acid Inhibitor:

L-50SS is a unique complex amine combined with thioureas designed for use in both batch and continuous pickling of all metals.

L-50SS is Crown's best all-purpose inhibitor. Although most frequently used to control sulfuric acid, it is also efficient in hydrochloric, phosphoric and hydrofluoric acids at temperatures up to 210 degrees F. L-50SS will not oil out or break down.

L-50SS is added @ 1/2% to 1% based on the volume of concentrated acid.

At recommended concentrations L-50SS will provide as much as 96% protection to all grades of steel under prescribed conditions. It will reduce hydrogen embrittlement and leave a cleaner and whiter surface.

Form: Liquid

Weight: 8.6 lbs./gal.

Color: Dark Brown

Freezing Point: 30 degrees F.

pH: 2-4

CROWN TECHNOLOGY, INC.: Inhibitors (Continued):

CROWN L-60B HCl Acid Inhibitor:

CROWN L-60B represents a new concept in hydrochloric acid inhibition. As opposed to conventional acid inhibitors that are typically film forming chemicals, CROWN L-60B protects metals through absorption to the specific corrosion sites. The advantages to this approach are as follows:

- (1) Because metal protection does not occur until the oxide layers are removed, it is difficult to over inhibit the pickling bath by accidentally adding too much L-60B.
- (2) The chemical nature of L-60B causes an attraction for metal surfaces as well as acid. This joint attraction increases the speed at which HCl is carried to the metal surface and increases the rate of scale removal.
- (3) Corrosion protection by specific site versus film forming inhibitors results in a cleaner metal surface because of a more uniform acid attack.

Since CROWN L-60B protects at specific corrosion sites and does not form a continuous film, lower concentrations may be used without fear of over-pickling.

CROWN L-1011 Acid Inhibitor:

Among the strongest inhibitors for sulfuric acid available to the metalworking industry, L-1011 is a unique complex amine combined with thioureas designed for use in both continuous and batch pickling of all metals.

L-1011 is added @ 1/4% to 1/2% based on the volume of concentrated acid. This is equivalent to 1/4 to 1/2 gallon per 100 gallons of raw acid.

L-1011 will give 95% protection to the base metal. It is effective at all acid and iron concentrations and at temperatures to 210 degrees F. It will not oil out or break down. Hydrogen embrittlement is reduced and the steel is cleaner and whiter.

L-1011 can be used with ACID AID extenders to pickle up to 12% iron. ACID AID can be formulated in the L-1011.

L-1011 produces a medium dense foam on the surface of the acid solution. If more foam is desired, CROWN Foamer #20 should be used.

Form: Liquid
Weight: 8.76 lbs/gal.
Freeze Point: 32 degrees F
Freeze-Thaw Recovery: Complete
Solubility in Acid: Complete
pH: 2-4

CROWN TECHNOLOGY, INC.: Inhibitors (Continued):**CROWN NCI-C:****Corrosion Inhibitor/Rinse Aid**

CROWN NCI-C is uniquely formulated as a dual-function chemical to first, acid rinse residual oxides and trace chlorides or sulfates from the steel after pickling, then to form a semipermeable, chemically-bonded mono-molecular barrier to retard corrosion. This protection will vary from days to weeks dependent upon the method of application and environment.

The resultant corrosion-resistant film is non-greasy, colorless, and not apparent to the touch. The NCI-C will not interfere with lime or borax coatings, copper plating, tin plating, galvanizing, etc. It prevents the staining caused from iron oxide residues left on metal surfaces.

The performance phenomenon by the NCI-C is termed chemisorption and sequestering.

CROWN NCI-C also reduces the varying degrees of copper corrosion. Copper corrosion can cause deterioration of rubber and accelerate the corrosion rate of other metals. The pitting of aluminum, zinc, galvanized steel, iron and steel is adversely affected by copper ions in solution. NCI-C provides an effective answer to these problems:

- * Completely rinses and sequesters residual oxides.
- * Removes residual chlorides and/or sulfates from strip. Reduces surface tension.
- * Reduces tarnishing and flash rusting. It eliminates brown/reddish stains produced in continuous pickling lines.
- * Helps the cleaning and polishing of stainless steel and other metals.
- * Will work to maintain the appearance of copper and brass exposed to the environment.

CROWN 55X Inhibitor:

CROWN 55X is a powdered inhibitor formulated for use in sulfuric acid pickling solutions. 55X is among the strongest powdered inhibitors available to the pickling industry and can provide from 95% to 99% base metal protection of low carbon and high carbon steel.

CROWN 55X is used at a ratio of 4 to 8 pounds per 100 gallons of concentrated sulfuric acid.

55X is stable at temperatures as high as 210 degrees Fahrenheit.

Form: granular - powder

Appearance: white to tan salt

Flash Point: none

Solubility in Acid: Complete

CROWN TECHNOLOGY, INC.: Inhibitors (Continued):

ACID AID 5LXS-IH:

(Inhibited for Hydrochloric)

This formulation has been developed so that CROWN ACID AID can be cost efficient for use in strip pickling operations. CROWN L-60B Hydrochloric Inhibitor is formulated into the ACID AID 5LXS to produce ACID AID 5LXS-IH.

ACID AID 5LXS-IH helps to lower surface tension between the steel and the acid which leads to faster pickling rates. Iron, nickel and chrome do not slow down pickling rates until they are at much higher concentrations.

ACID AID 5LXS-IH provides up to 95% protection of base metal at temperatures as high as 220 degrees F. ACID AID 5LXS-IH exhibits excellent detergency properties and aids in the removal of dirt and oil as well as reducing "smut".

In use at a midwestern steel mill, ACID AID 5LXS-IH reduced hydrochloric acid consumption from 38 pounds per ton to 28 pounds per ton.

ACID AID 5LXS-IH is used at 1/2 to 1% based on the volume of the raw hydrochloric acid used. This is equivalent to 1/2 to 1 gallon per 100 gallons of raw acid.

Form: Liquid

Weight: 8.6 lbs./gal.

Freezing Point: 30 Degrees F

Solubility: Complete

pH: 5-6

WATCON, INC.: Water Treatment Chemicals:

WATCON 115:

WATCON 115 is a blend of glassy phosphates in liquid form, exhibiting high molecular weights, low reversion rates, and high, superior sequestering values. WATCON 115 provides an excellent solution to the problems of scaling, corrosion, and iron or "red water" in water systems due to its ability in water solution to modify the behavior of many insoluble substances. Calcium, Magnesium, and Iron salts are chelated and changed into soluble and relatively stable salts.

For scale and corrosion control, WATCON 115 is effective in distribution systems, cooling towers, once-through cooling systems, evaporative condensers, and spray ponds.

For "red water" control, WATCON 115 sequesters iron which is pumped in from the ground or introduced from corrosion in system piping. As a corrosion inhibitor, it prevents further corrosion of the treated system.

Appearance: Medium blue liquid

pH of 1% solution: 7.0-7.5

Weight: 11.5 lbs. per gallon

WATCON Steam and Return Line Treatments 126-127-128:

WATCON 126, WATCON 127, and WATCON 128 are intended for use as corrosion inhibitors in steam and return lines. These products are a blend of aliphatic amines designed to raise the pH of steam and return condensate, neutralize carbonic acid, and suppress oxygen attack. WATCON 126, WATCON 127, and WATCON 128 are considered harmless when used at the recommended concentrations as corrosion inhibitors for steam which may come in contact with foods.

FDA regulations prohibit the use of any treatments containing amines where steam may come into direct contact with milk or milk products.

Dosage:

WATCON 126 is FDA approved. It is recommended for use in high pressure systems and/or systems utilizing copper piping or tubing.

WATCON 127 is intended for use in medium pressure systems.

WATCON 128 is USDA approved. It is recommended for use in low to medium pressure systems of several thousand feet.

Physical Characteristics:

Appearance: Pink Liquid

Odor: Fishy--Ammonia

Weight/ph of 1% Solution:

WATCON 126: 8.33 Lbs./Gal./9.5-10.0

WATCON 127: 8.28 Lbs./Gal./11.0-11.5

WATCON 128: 8.28 Lbs./Gal./11.0-11.5

WATCON, INC.: Water Treatment Chemicals (Continued):

WATCON 1275:

WATCON 1275 is a non-chromate, non-phosphate blend of organic and organic zinc corrosion inhibitors intended for use as a corrosion inhibitor in recirculating cooling water systems where the use of chromates and/or phosphate based inhibitors are prohibited or restricted.

WATCON 1275 is not intended for use as a complete cooling water treatment. It is intended for use in cooling systems as an adjunct for corrosion protection where a scale control treatment such as WATCON 1305 is also used.

WATCON 1275 protects system metal with a corrosion resistant film which is continually renewed during system operation. This material will not revert under temperature as polyphosphate-based corrosion inhibitors will and is effective in dispersing any dirt accumulated in the system.

Application:

WATCON 1275 should be fed continuously to the system at a rate of 12 ounces per thousand gallons of water to maintain maximum corrosion protection.

Appearance: Clear liquid

Weight: 9.0 lbs. per gallon

pH: 5.0

WATCON 1276:

WATCON 1276 is a non-chromate, non-phosphate blend of organic and molybdate corrosion inhibitors intended for use as a corrosion inhibitor in recirculating cooling water systems where the use of chromates and/or phosphate based inhibitors are prohibited or restricted.

WATCON 1276 is not intended for use as a complete cooling water treatment. It is intended for use in cooling systems as an adjunct for corrosion protection where a scale control treatment such as WATCON 1305 is also used.

WATCON 1276 protects system metal with a corrosion resistant film which is continually renewed during system operation. This material will not revert under temperature as polyphosphate-based inhibitors will and is effective in dispersing any dirt accumulated in the system.

Application:

WATCON 1276 should be metered to the system with a positive displacement chemical feeder. Dosage is dependent on feedwater quality and boiler water surface conditions.

Appearance: Clear liquid

Weight: 9.0 lbs. per gallon

pH of 1% solution: 5.0

WATCON, INC.: Water Treatment Chemicals (Continued):

WATCON 1282:

WATCON 1282 is a nitrite phosphate corrosion inhibitor for water based systems. It is effective in providing excellent corrosion protection for iron and steel components exposed to water in a open or closed recirculating system.

Dosage:

WATCON 1282 should be applied at the rate of 10 pounds per 1,000 gallons soft water in the system. This system should be tested for nitrite levels and additional treatment added whenever nitrite is below 1,000 parts per million.

White and tan granules

WATCON 1284:

WATCON 1284 is a product formulated for use as a corrosion inhibitor in potable water distribution systems. This material produces a continuous silica film on water side distribution piping, enabling effective protection against corrosion.

This material must be used only in waters containing less than 5 GPG of total Hardness.

Dosage:

WATCON 1284 must be fed on a continuous basis at a rate of approximately 2 oz. per 1000 gallons of water. Adjustments in dosage are made by chemical test to maintain Silica residual 10 ppm over a blank sample. pH of the water being treated must not exceed 8.5 ppm.

Appearance: Colorless liquid

pH of 1% Solution: 11.0

Weight: 11.6 lbs./gallon

WELCHEM, INC.: Corrosion Inhibitors:

WELLAID 501 Corrosion Inhibitor:

- * oil soluble, water dispersible corrosion inhibitor
- * designed for oil and gas producing and handling facilities
- * forms a tenacious film on metal equipment
- * effectively reduces corrosion caused by hydrogen sulfide, carbon dioxide, and organic acids in produced fluids
- * complex cyclic amine in a hydrocarbon solvent

Physical Properties:

Density, @ 75F: 7.76 lb/gal (0.935 gm/ml)
Flash Point, TCC: 112F (45C)
Pour Point: -40F (-40C) Max.
Light Brown Liquid

WELLAID 506 Corrosion Inhibitor:

- * oil-soluble, water-dispersible corrosion inhibitor
- * designed to form a persistent film in oil producing and handling equipment
- * contains an amine salt formulated with a demulsifier/surfactant in a hydrocarbon solvent
- * used extensively in batch treating pumping wells
- * effectively reduces corrosion caused by hydrogen sulfide, carbon dioxide, and organic acids in produced fluids

Physical Properties:

Density, @ 60F: 7.88 lb/gal (0.949 gm/ml)
Flash Point, TCC: 79F (26C)
Pour Point: -15F (-10C)
Clear Dark Brown Liquid

WELLAID 506-2G Corrosion Inhibitor:

- * oil-soluble, water dispersible corrosion inhibitor
- * designed to form a persistent film in oil producing and handling equipment
- * contains an amine salt formulated with a demulsifier/surfactant in a hydrocarbon solvent
- * used extensively in batch treating pumping wells
- * effectively reduces corrosion caused by hydrogen sulfide, carbon dioxide, and organic acids in produced fluids

Physical Properties:

Density, @ 60F: 7.80 lb/gal (0.939 gm/ml)
Flash Point, TCC: 74F (23C)
Pour Point: -40F (-40C)
Clear Dark Brown Liquid

WELCHEM, INC.: Corrosion Inhibitors (Continued):

WELLAID 506-3C Corrosion Inhibitor:

- * oil-soluble, water dispersible corrosion inhibitor
- * designed to form a persistent film in oil producing and handling equipment
- * contains an amine salt formulated with a demulsifier/surfactant in a hydrocarbon solvent
- * used extensively in batch treating pumping wells
- * effectively reduces corrosion caused by hydrogen sulfide, carbon dioxide, and organic acids in produced fluids

Physical Properties:

Density, @ 60F: 7.75 lb/gal (0.929 gm/ml)
Flash Point, TCC: 88F
Pour Point: -40F (-40C)
Clear Dark Brown Liquid

WELLAID 508N Water Soluble Corrosion Inhibitor:

- * water-soluble corrosion inhibitor
- * designed for use in high water producing systems or in water gathering, disposal and injection systems
- * complex blend of amines, and a combination of surfactants in an aqueous solvent
- * effectively reduces corrosion caused by hydrogen sulfide, carbon dioxide, and organic acids in produced fluids

Physical Properties:

Density, @ 75F: 8.0 lb/gal (0.96 gm/ml)
Flash Point, TCC: 78F (25C)
Pour Point: -40F (-40C)
pH: 7.9
Brown Liquid

WELLAID 510 Corrosion Inhibitor:

- * water soluble corrosion inhibitor
- * designed for use in high WOR producing systems or in water gathering, disposal and injection systems
- * salt of an amine with a surfactant/co-surfactant package formulated in an aqueous system
- * effectively reduces corrosion caused by hydrogen sulfide, carbon dioxide, and organic acids in produced fluids

Physical Properties:

Density, @ 60F: 8.32 lb/gal (0.997 gm/ml)
Flash Point, TCC: 140F (60C)
Pour Point: -5F (-21C)
Amber Dark Brown Liquid

WELCHEM, INC.: Corrosion Inhibitors (Continued):

WELLAID 510V Corrosion Inhibitor:

Features and Benefits:

- * water soluble corrosion inhibitor
- * combines a filming and a volatile amine designed for use in gas gathering or pipeline systems
- * formulated with a surfactant/co-surfactant package in an aqueous solvent
- * effectively reduces corrosion caused by hydrogen sulfide, carbon dioxide, and organic acids in fluids encountered in gas systems

Physical Properties:

Density, @ 60F: 7.16 lb/gal (0.86 g/ml)
Flash Point, TCC: 60F (15.5C)
Pour Point: -20F (-29C)
Clear Amber Liquid

WELLAID 512 Corrosion Inhibitor:

Features and Benefits:

- * water soluble corrosion inhibitor
- * designed for use in high WOR producing systems or in water gathering, disposal and injection systems
- * complex blend of amines in an aqueous solvent
- * effectively reduces corrosion caused by hydrogen sulfide, carbon dioxide, and organic acids in produced fluids

Physical Properties:

Density, @ 75F: 8.18 lb/gal (0.98 gm/ml)
Flash Point, TCC: 83F (32C)
Pour Point: 32F (0C)
pH: 7.7
Dark Brown Liquid

WELLAID 512W Corrosion Inhibitor:

Features and Benefits:

- * water-soluble corrosion inhibitor
- * designed for use in high WOR producing systems or in water gathering, disposal and injection systems
- * complex blend of amines in an aqueous solvent
- * effectively reduces corrosion caused by hydrogen sulfide, carbon dioxide, and organic acids in produced fluids

Physical Properties:

Density, @ 60F: 8.15 lb/gal (0.982 gm/ml)
Flash Point, TCC: 90F (32C)
Pour Point: -40F (-40C)
pH: 9.5
Dark Brown Liquid

WELCHEM, INC.: Corrosion Inhibitors (Continued):

WELLAID 5120 Corrosion Inhibitor:

Features and Benefits:

- * water soluble corrosion inhibitor
- * designed for use in high WOR producing systems or in water gathering, disposal and injection systems
- * complex blend of amines in an aqueous solvent
- * effectively reduces corrosion caused by hydrogen sulfide, carbon dioxide, and organic acids in produced fluids

Physical Properties:

Density, @ 60F: 8.20 lb/gal (0.986 gm/ml)

Flash Point, TCC: 83F (28C)

Pour Point: -35F (-37C)

pH: 7.7

Dark Brown Liquid

WELLAID 5128 Water Soluble Corrosion Inhibitor:

Features and Benefits:

- * water-soluble corrosion inhibitor
- * designed for use in high water producing systems or in water gathering, disposal and injection systems
- * complex blend of quaternized amines and a combination of surfactants
- * effectively reduces corrosion caused by hydrogen sulfide, carbon dioxide, and organic acids in produced fluids

Physical Properties:

Density, @ 75F: 8.0 lb/gal (0.96 gm/ml)

Flash Point, TCC: 68F (20C)

Pour Point: -40F (-40C)

pH: 4.2

Dark Brown Liquid

WELLAID 515 Corrosion Inhibitor:

Features and Benefits:

- * oil-soluble, water-dispersible, corrosion inhibitor
- * forms a tenacious, oil-wet film on metal equipment
- * effectively reduces corrosion caused by hydrogen sulfide, carbon dioxide, and organic acids in produced fluids from oil and gas production systems
- * complex cyclic amine formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.79 lb/gal (0.938 gm/ml)

Flash Point, TCC: 89F (32C)

Pour Point: -40F (-40C) Max.

Clear Dark Brown Liquid

WELCHEM, INC.: Corrosion Inhibitors (Continued):

WELLAID 516 Corrosion Inhibitor:

Features and Benefits:

- * oil soluble, water-dispersible corrosion inhibitor
- * forms a tenacious protective film on metal equipment in oil, gas, and gas condensate production systems
- * complex cyclic amine formulated with demulsifiers/surfactants in a hydrocarbon solvent system
- * effectively reduces corrosion caused by hydrogen sulfide, carbon dioxide and organic acids in produced fluids
- * particularly effective in reducing corrosion in deep, high temperature, high pressure gas and condensate production wells and associated gathering systems
- * withstands temperatures up to 450F

Physical Properties:

Density, @ 60F: 7.33 lb/gal (0.883 gm/ml)
Flash Point, TCC: 61F (16C)
Pour Point: -40F (-40C)
Clear Dark Brown Liquid

WELLAID 5125 Water Soluble Corrosion Inhibitor:

Features and Benefits:

- * water-soluble corrosion inhibitor
- * designed for use in high water producing systems or in water gathering, disposal and injection systems
- * complex blend of quaternized amines and a combination of surfactants
- * effectively reduces corrosion caused by hydrogen sulfide, carbon dioxide, and organic acids in produced fluids

Physical Properties:

Density, @ 75F: 7.95 lb/gal (0.95 gm/ml)
Flash Point, TCC: 80F (27C)
Pour Point: -40F (-40C)
pH: 4.3 (10% in Water)
Black Liquid

WELLAID 517 Corrosion Inhibitor:

Features and Benefits:

- * oil soluble, water dispersible corrosion inhibitor
- * complex cyclic amine formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.32 lb/gal (0.882 gm/ml)
Flash Point, TCC: 60F (16C)
Pour Point: -40F (-40C)
Clear Dark Brown Liquid

WELCHEM, INC.: Corrosion Inhibitors (Continued):

WELLAID 517WC Corrosion Inhibitor:

- * oil soluble, water-dispersible corrosion inhibitor
- * complex cyclic amine formulated with demulsifiers/surfactants in a hydrocarbon/solvent system

Physical Properties:

Density, @ 60F: 7.32 lb/gal (0.882 gm/ml)
Flash Point, TCC: 60F (16C)
Pour Point: -40F (-40C)
Clear Dark Brown Liquid

WELLAID 517WCP Corrosion/Paraffin Inhibitor:

- * corrosion and paraffin inhibitor
- * blend of a complex cyclic amine and a polymeric ashless paraffinic inhibitor

Physical Properties:

Density, @ 60F: 7.34 lb/gal (0.884 gm/ml)
Flash Point, TCC: 60F (16C)
Pour Point: -40F (-40C)
Clear Dark Brown Liquid

WELLAID 5171 Corrosion Inhibitor:

- * oil-soluble, water-dispersible corrosion inhibitor
- * complex cyclic amine formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.7 lb/gal (0.927 gm/ml)
Flash Point, TCC: 60F (16C)
Pour Point: -40F (-40C)
Clear Brown Liquid

WELLAID 518 Corrosion Inhibitor:

- * oil soluble, water-dispersible corrosion inhibitor
- * complex cyclic amine formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.32 lb/gal (0.882 gm/ml)
Flash Point, TCC: 60F (16C)
Pour Point: -40F (-40C)
Clear Dark Brown Liquid

WELCHEM, INC.: Corrosion Inhibitors (Continued):

WELLAID 519 Corrosion Inhibitor:

- * oil soluble, water-dispersible, non-emulsifying corrosion inhibitor
- * amine corrosion inhibitor which has a water dispersing non-emulsifying surfactant package
- * formulated in a hydrocarbon solvent

Physical Properties:

Density, @ 60F: 7.30 lb/gal (0.875 gm/ml)
Flash Point, TCC: 60F (16C)
Pour Point: -40F (-40C)
Clear Dark Amber Liquid

WELLAID 519V Liquid/Vapor Phase Corrosion Inhibitor:

- * can reduce corrosion in oil and gas production facilities, gathering systems and pipelines caused by hydrogen sulfide, carbon dioxide, and organic acids in produced fluids, giving protection in both liquid and gas phases
- * blend of a filming and a volatile amine, formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.20 lb/gal (0.864 gm/ml)
Flash Point, TCC: 50F (10C)
Pour Point: -40F (-40C)
Clear Dark Amber Liquid

WELLAID 520 Corrosion Inhibitor:

- * oil soluble, water-dispersible corrosion inhibitor
- * complex cyclic amine formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.50 lb/gal (0.882 gm/ml)
Flash Point, TCC: 60F (16C)
Pour Point: -40F (-40C)
Clear Dark Brown Liquid

WELLAID 521 Corrosion Inhibitor:

- * oil soluble, water-dispersible corrosion inhibitor
- * complex cyclic amine formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.35 lb/gal (0.885 gm/ml)
Flash Point, TCC: 58F (15C)
Pour Point: -40F (-40C)
Clear Dark Brown Liquid

WELCHEM, INC.: Corrosion Inhibitors (Continued):

WELLAID 521C Corrosion Inhibitor:

- * oil soluble, water-dispersible corrosion inhibitor
- * complex cyclic amine formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.75 lb/gal (0.94 gm/ml)
Flash Point, TCC: 58F (15C)
Pour Point: -40F (-40C)
Clear Dark Brown Liquid

WELLAID 523 Corrosion Inhibitor:

- * oil-soluble, water-dispersible corrosion inhibitor
- * complex cyclic amine formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.7 lb/gal (0.928 gm/ml)
Flash Point, TCC: 166F (74C)
Pour Point: -40F (-40C) Max.
Clear Dark Brown Liquid

WELLAID 524 Corrosion Inhibitor:

- * oil-soluble, water-dispersible, corrosion inhibitor
- * complex cyclic amine formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.7 lb/gal (0.928 gm/ml)
Flash Point, TCC: 86F (30C)
Pour Point: -40F (-40C) Max.
Clear Dark Brown Liquid

WELLAID 524D Corrosion Inhibitor:

- * oil-soluble, water-dispersible, corrosion inhibitor
- * complex cyclic amine formulated with demulsifiers/surfactants in a hydrocarbon solvent

Physical Properties:

Clear Amber Liquid
Density, @ 60F: 7.8 lb/gal (0.94 gm/ml)
Flash Point, TCC: 182F (83C)
Pour Point: -40F (-40C)

WELCHEM, INC.: Corrosion Inhibitors (Continued):

WELLAID 525 Corrosion Inhibitor:

- * oil soluble, water dispersible corrosion inhibitor
- * amine formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.78 lb/gal (0.937 gm/ml)
Flash Point, TCC: 112F (45C)
Pour Point: -40F (-40C)
Clear Dark Amber Liquid

WELLAID 526 Liquid/Vapor Phase Corrosion Inhibitor:

- * blend of a filming and a volatile amine
- * formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.70 lb/gal (0.923 gm/ml)
Flash Point, TCC: 50F (10C)
Pour Point: -40F (-40C)
Opaque Dark Amber Liquid

WELLAID 5261 Liquid/Vapor Phase Corrosion Inhibitor:

- * oil-soluble, highly water-dispersible corrosion inhibitor
- * blend of a filming and a volatile/neutralizing amine
- * formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.60 lb/gal (0.915 gm/ml)
Flash Point, TCC: 50F (10C)
Pour Point: -40F (-40C)
Clear Amber Liquid

WELLAID 5264 Pipeline Corrosion Inhibitor:

- * oil-soluble, water-dispersible corrosion inhibitor
- * film forming amine salt

Physical Properties:

Density @ 75F: 7.81 lb/gal (0.95 gm/ml)
Flash Point, TCC: 69F (20C)
Pour Point: -40F (-40C)
Clear Amber Liquid

WELCHEM, INC.: Corrosion Inhibitors (Continued):

WELLAID 5265 Pipeline Corrosion Inhibitor:

- * blend of a filming and a volatile neutralizing amine
- * formulated with surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.71 lb/gal (0.93 gm/ml)
Flash Point, TCC: 58F (14.5C)
Pour Point: -40F (-40C)
Opaque Dark Amber Liquid

WELLAID 5266 Pipeline Corrosion Inhibitor:

- * blend of a filming and a volatile neutralizing amine
- * formulated with surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.76 lb/gal (0.93 gm/ml)
Flash Point, TCC: 58F (14.5C)
Pour Point: -40F (-40C)
Opaque Dark Amber Liquid

WELLAID 5267 Pipeline Corrosion Inhibitor:

- * blend of a filming and a volatile neutralizing amine
- * formulated with surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.66 lb/gal (0.92 gm/ml)
Flash Point, TCC: 57F (14C)
Pour Point: -40F (-40C)
Opaque Dark Amber Liquid

WELLAID 5268 Pipeline Corrosion Inhibitor:

- * oil soluble, highly water dispersible corrosion inhibitor
- * film forming amine salt

Physical Properties:

Density @ 75F: 7.74 lb/gal (0.93 gm/ml)
Flash Point, TCC: 65F (18C)
Pour Point: -40F (-40C)
Clear Amber Liquid

WELCHEM, INC.: Corrosion Inhibitors (Continued):

WELLAID 531 Corrosion Inhibitor:

- * very strong neutralizing amine
- * straight chain amine in an aqueous solution

Physical Properties:

Density, @ 75F: 8.30 lb/gal (0.995 gm/ml)
Flash Point, TCC: Above 200F (93C)
Pour Point: -40F (-40C)
Water White Liquid

WELLAID 540 Corrosion Inhibitor:

- * oil soluble, water dispersible, corrosion inhibitor
- * blend of amines and amine salts
- * formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 60F: 7.90 lb/gal (0.947 gm/ml)
Flash Point, TCC: 92F (33C)
Pour Point: -20F (-29C)
Dark Brown Liquid

WELLAID 5402 Corrosion Inhibitor:

- * salt of an amine with a surfactant/cosurfactant package

Physical Properties:

Density, @ 60F: 8.33 lb/gal (1.0 gm/ml)
Flash Point, TCC: 140F (60C)
Pour Point: -10F (-23C)
Amber Dark Brown Liquid

WELLAID 541B Corrosion Inhibitor:

- * oil-soluble, water-dispersible corrosion inhibitor
- * blend of amines and amine salts
- * formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density @ 75F: 7.60 lb/gal (0.912 gm/ml)
Flash Point, TCC: 56F (13C)
Pour Point: -40F (-40C)
Clear Amber Liquid

WELCHEM, INC.: Corrosion Inhibitors (Continued):

WELLAID 5415 Corrosion Inhibitor:

- * oil soluble, water dispersible corrosion inhibitor
- * amine salt

Physical Properties:

Density @ 75F: 7.71 lb/gal (0.93 gm/ml)
Flash Point, TCC: 77F (25C)
Pour Point: -40F (-40C)
Clear Amber Liquid

WELLAID 5416 Corrosion Inhibitor:

- * oil soluble, water dispersible corrosion inhibitor
- * amine salt

Physical Properties:

Density @ 75F: 7.6 lb/gal (0.91 gm/ml)
Flash Point, TCC: 52F (11C)
Pour Point: -40F (-40C)
Clear Amber Liquid

WELLAID 5417 Corrosion Inhibitor:

- * oil-soluble, water-dispersible corrosion inhibitor
- * amine salt

Physical Properties:

Density @ 75F: 7.6 lb/gal (0.91 gm/ml)
Flash Point, TCC: 55F (13C)
Pour Point: -40F (-40C)
Appearance: Clear Amber Liquid

WELLAID 5430 Corrosion Inhibitor:

- * oil-soluble, water-dispersible corrosion inhibitor
- * blend of amines and amine salts

Physical Properties:

Density @ 75F: 7.90 lb/gal (0.956 gm/ml)
Flash Point, TCC: 54F (12C)
Pour Point: -40F (-40C)
Clear Amber Liquid

WELLAID 5450 Corrosion Inhibitor:

- * oil-soluble, water-dispersible corrosion inhibitor

Physical Properties:

Density @ 75F: 7.85 lb/gal (0.95 gm/ml)
Flash Point, TCC: 77F (25C)
Pour Point: -40F (-40C)
Opaque Brown Liquid

WELCHEM, INC.: Corrosion Inhibitors (Continued):

WELLAID 5460 Corrosion Inhibitor:

- * oil-soluble, water-dispersible corrosion inhibitor
- * amine salt

Physical Properties:

Density @ 75F: 7.81 lb/gal (0.95 gm/ml)
Flash Point, TCC: 69F (20C)
Pour Point: -40F (-40C)
Clear Amber Liquid

WELLAID 5461 Corrosion Inhibitor:

- * oil soluble, water dispersible corrosion inhibitor
- * amine salt

Physical Properties:

Density @ 75F: 7.65 lb/gal (0.95 gm/ml)
Flash Point, TCC: 69F (20C)
Pour Point: -40F (-40C)
Clear Amber Liquid

WELLAID 5480 Corrosion Inhibitor:

- * oil soluble, water dispersible corrosion inhibitor
- * amine salt

Physical Properties:

Density @ 75F: 7.6 lb/gal (0.91 gm/ml)
Flash Point, TCC: 65F (18C)
Pour Point: -40F (-40C)
Clear Amber Liquid

WELLAID 559 Liquid/Vapor Phase Corrosion Inhibitor:

- * blend of a filming and a volatile amines
- * formulated with demulsifiers/surfactants in a hydrocarbon solvent system

Physical Properties:

Density, @ 75F: 7.30 lb/gal (0.875 gm/ml)
Flash Point, TCC: 58F (14C)
Pour Point: -40F (-40C)
Clear Brown Liquid

WELLAID 562 Corrosion/Paraffin Inhibitor:

- * combination of an oil soluble, non-emulsifying corrosion inhibitor and a totally ashless flow improver
- * it is 50:50 corrosion inhibitor/paraffin inhibitor
- * blend of cyclic amines, quaternary amines, and polymers
- * formulated in hydrocarbon solvents with demulsifiers/surfactants

Physical Properties:

Density, @ 60F: 7.60 lb/gal (0.911 gm/ml)
Flash Point, TCC: 125F (52C)
Pour Point: -30F (-34C) Max.
Black Liquid

WELCHEM, INC.: Corrosion Inhibitors (Continued):**WELLAID 5810 Packer Fluid Corrosion Inhibitor:**

- * water-soluble corrosion inhibitor

Physical Properties:

Density, @ 75F: 8.3 lb/gal (1.0 g/ml)
Flash Point, TCC: 89F (31C)
Freeze Point: -35F (-37C)
pH: 6.0
Clear Brown Liquid

WELLAID 5877N Hydrogen Sulfide Scavenger:

- * water soluble amine-based formulation designed to scavenge hydrogen sulfide (H₂S) from produced gas

Physical Properties:

Density: 8.6 lb/gal
Flash Point: >200F
Pour Point: 22F
pH: 8.4
Initial Boiling Point: >95F
Viscosity: 1.7 cps
Water Solubility: Soluble
Clear, Water-White Liquid

WELLAID 590 Atmospheric Corrosion Inhibitor:

- * oil soluble atmospheric corrosion inhibitor in a light hydrocarbon base
- * inorganic-organic sulfonate complex and organic filming agent
- * contains no amines

Physical Properties:

Density, @ 75F: 6.88 lb/gal (0.824 gm/ml)
Flash Point, TCC: 105F (41C)
Pour Point: -15F (-26C)
Cloudy Brown Liquid

WELLAID 5915A/WELLAID 5915B Corrosion Inhibitor Stick:

- * easy-to-use dual purpose stick
- * oil soluble and water dispersible

Physical Properties:

Density @ 75F: 9.0 lb/gal
Flash Point: 370F
Water Solubility: Dispersible
Melting Point: 123F
Brown Solid Stick

WELLAID 5925A/WELLAID 5925B Corrosion Inhibitor Stick:

- * effective film forming corrosion inhibitor
- * water soluble and oil dispersible

Physical Properties:

Density @ 75F: 8.8 lb/gal
Water Solubility: Soluble
Flash Point: 370F
Melting Point: 125F
Blue Solid Stick

WELCHEM, INC.: Corrosion Inhibitors:

WELCHEM A-HIB-600 Amine Corrosion Inhibitor:

- * blend of quaternary amines, metal salts, and nonionic surfactants in an alcoholic aqueous solvent system
- * water soluble

Physical Properties:

Density, @ 75F: 8.58 lb/gal (1.028 gm/ml)
Flash Point, TCC: 80F (17C)
Pour Point: 0F (-18C) Max.
pH: 2.50
Dark Brown Liquid

WELLAID 603 Corrosion Inhibitor:

- * volatile/neutralizing amine corrosion inhibitor

Physical Properties:

Density, @ 70F: 6.45 lb/gal (0.78 gm/ml)
Flash Point, TCC: 49F (10C)
Pour Point: -40F (-40C)
Clear Red Liquid

WELLAID 621N2 Corrosion Inhibitor:

- * oil soluble
- * water dispersible
- * a salted amine formulated with a demulsifier/surfactant in a hydrocarbon solvent

Physical Properties:

Density, @ 60F: 7.90 lb/gal (0.947 gm/ml)
Flash Point, TCC: 102F (39C)
Pour Point: -40F (-40C)
Dark Black Liquid

WELLAID 622 Corrosion Inhibitor:

- * oil soluble
- * water dispersible
- * a salted amine formulated with a demulsifier/surfactant in a hydrocarbon solvent

Physical Properties:

Density, @ 75F: 7.90 lb/gal (0.947 gm/ml)
Flash Point, TCC: 73F (23C)
Pour Point: -40F (-40C)
Dark Black Liquid

WELCHEM, INC: Corrosion Inhibitors (Continued):**WELLAID 632 Corrosion Inhibitor:**

- * oil soluble
- * water dispersible
- * an amine salt formulated with a demulsifier/surfactant in a hydrocarbon solvent

Physical Properties:

Density, @ 60F: 7.9 lb/gal (0.952 gm/ml)
Flash Point, TCC: 82F (27C)
Pour Point: -10F (-23C)
Clear Dark Brown Liquid

WELLAID 641 Corrosion Inhibitor:

- * liquid, high density corrosion inhibitor
- * an amine salt formulated in a water-based solvent system

Physical Properties:

Density, @ 60F: 11.41 lb/gal (1.367 gm/ml)
Flash Point, TCC: 170F (77C)
Pour Point: -15F (-26C)
Dark Brown Liquid

WELLAID 642 Corrosion Inhibitor:

- * liquid, high density corrosion inhibitor

Physical Properties:

Density, @ 60F: 9.7 lb/gal (1.16 gm/ml)
Flash Point, TCC: 105F (41C)
Pour Point: -15F (-26C)
Opaque

WELLAID 660 Corrosion Inhibitor:

- * oil soluble
- * water dispersible
- * blend of cyclic amines and quaternary amines, formulated with demulsifiers/surfactants in a hydrocarbon solvent

Physical Properties:

Density, @ 60F: 7.80 lb/gal (0.935 gm/ml)
Flash Point, TCC: 164F (73C)
Pour Point: -40F (-40C)
Opaque Dark Brown Liquid

WELLAID 661 Corrosion Inhibitor:

- * oil soluble
- * water dispersible
- * blend of cyclic amines and quaternary amines, formulated with demulsifiers/surfactants in a hydrocarbon solvent

Physical Properties:

Density, @ 75F: 7.88 lb/gal (0.944 gm/ml)
Flash Point, TCC: 165F (74C)
Pour Point: -40F (-40C)
Clear Brown Liquid

WELCHEM, INC.: Corrosion Inhibitors (Continued):

WELLAID 662 Corrosion Inhibitor:

- * oil soluble
- * water dispersible
- * blend of cyclic amines and quaternary amines, formulated with demulsifiers/surfactants in a hydrocarbon solvent

Physical Properties:

Density: 7.80 lb/gal (0.935 gm/ml)

Flash Point, TCC: 164F (73C)

Pour Point: -40F (-40C)

Dark Brown Liquid

WESTERN WATER MANAGEMENT, INC.: Boiler/Cooling Water Treatment:

Formula 8010:

Alkaline-Organic

Important Product Features:

- * Inhibits scale formation
- * Conditions sludge
- * Effective alkalinity supplement
- * U.S.D.A. Authorized
- * Compatible with normal boiler treatments
- * Ease of control - only one test
- * Convenient liquid - no dissolving powders
- * F.D.A. approved ingredients

Formula 8010 has been designed as the primary treatment for boilers operating on unsoftened makeup waters. It is particularly effective in boiler operations where the makeup water has hardness in excess of 85 mg/l (5 gpg).

Formula 8010 is an easy to use, convenient liquid. It combines non-phosphate softening agents and organic dispersants in the proper balance to economically prevent scaling and to disperse boiler sludge in a non-adherent form, allowing its removal thru blowdown. At the same time it provides the needed alkalinity to protect the boiler metal from corrosion.

MULTIONIC Formula 791:

Molybdate Formulation, scale, and corrosion inhibitor

Important Product Features:

- * Excellent corrosion inhibitor
- * Inhibits scale formation
- * Can be fed direct from shipping drum
- * Effective with or without pH control
- * Environmentally acceptable
- * U.S.D.A. authorized

MULTIONIC Formula 791 represents an important advancement in the "state of the art" of cooling water treatment. Formulation of the MULTIONIC Formula 791 provides excellent results and still remains cost effective.

The MULTIONIC Formula 791 works well with or without acid in the pH range of 6.0 to 8.5. Corrosion is inhibited by a synergistic combination of molybdate, zinc, and an azole corrosion inhibitor which act together to form a passive film on the metal surfaces. Scaling tendencies are greatly reduced by addition of a stable, chlorine resistant, organic phosphonate in the "threshold" range.

MULTIONIC Formula 791 is in a convenient, ready to use liquid form. Simplicity of control is an outstanding feature.

**WESTERN WATER MANAGEMENT, INC.: Boiling/Cooling Water Treatment
(Continued):**

SCORGUARD 911:

All Organic Scale & Corrosion Inhibitor

Important Product Features:

- * Excellent Scale Inhibition
- * Simple Dosage Control
- * Environmentally Acceptable--Contains No Metals
- * Provides Good Corrosion Protection
- * Easy to Apply

An effective cooling water treatment program, employing WESTERN SCORGUARD 911 can provide both scale formation and corrosion of all system metals. This all organic scale and corrosion inhibitor contains no metal salts and under present regulations is environmentally acceptable for use in your cooling tower.

WESTERN SCORGUARD 911 is a simple easy to apply liquid product that can be pumped directly from the shipping container. Dosage control is easily provided by the unique WESTERN Blue Color Comparator.

WESTERN SCORGUARD 911 is a blend of versatile organic chemicals.

TLI:

It stops cooling system corrosion during winter lay-up

TLI forms stable protective film on metal surfaces that lasts all winter, thus eliminating the rust and corrosion that can develop during winter storage, and the rust flakes and chip scale that appear at start-up time.

The TLI program utilizes a unique combination of products that provide excellent protection to metal surfaces after exposure to the treated water for as little as 2 hours.

The TLI treatment program uses two products: WESTERN TLI and WESTERN Microbiocide YR. These materials are both easy to use liquid formulas and are applied to the system at the same time. It is not necessary to drain and refill the system prior to application of the TLI program, since the chemicals used are compatible with all normal cooling water treatment products.

Extensive laboratory and field testing have shown that the TLI program provides excellent protection against rust and corrosion under all wet and humid conditions. It even provides protection at the air/water interface that exists in partially filled systems.

WITCO CORP.: ALLIED-KELITE ISOBRITE Bright Nickel Plating Processes:

ISOBRITE bright nickel products enhance the appearance of and provide corrosion protection to a variety of products from automotive parts and accessories to hand tools and plumbing hardware.

ISOBRITE 824:

Used mainly where long plating times are called for. The system is extremely tolerant to contaminants and imbalance in solution chemistry.

ISOBRITE 824Z:

This process is designed specifically for plating onto zinc die cast alloys and is extremely tolerant to zinc contamination.

ISOBRITE 828:

A very fast leveling process providing superior hiding power. Can be operated with a single additive when desired.

ISOBRITE 829:

The most advanced bright nickel plating process available anywhere. Affords unsurpassed brightness and leveling at minimum deposit thickness with truly outstanding ductility.

ISOBRITE 830:

Single additive barrel plating brightener offers simplicity of control, excellent ductility, brightness and leveling. Very tolerant to variations in current density often found in barrel plating.

ISOBRITE 850:

Semi bright process contains no coumarin or sulfur. Provides excellent ductility and leveling. Used where duplex nickel is called for to provide maximum corrosion resistance.

Complementary products to enhance your choice.

ISOPREP:

Soak and electrocleaners and dry acid salts are formulated to work with ISOBRITE bright nickel products and to handle even the most difficult soils. Available in energy saving low temperature form and ecology favorable non-chelated and phosphate-free formulations.

ISOBRITE copper:

Including the unique PR process, is used to prepare zinc die cast alloys for decorative nickel plating.

ISOBRITE 900:

Chrome operates at low temperature and low concentration to provide maximum covering power with minimum chromium drag out.

WITCO CORP.: ALLIED-KELITE ISOBRITE Zinc Plating Processes:

ISOBRITE Zinc Systems:

Three basic types of ISOBRITE systems are available, cyanide, alkaline non-cyanide and chloride, usable for either rack or barrel plating.

Characteristics of Zinc Plating Systems:

Regular Cyanide:

Advantages:

- * Excellent covering power
- * Good throwing power
- * Highly tolerant to poor cleaning
- * Easy to control
- * Good corrosion protection
- * Tolerant to purifiers
- * Chromates well
- * Low equipment cost

Low Cyanide:

Advantages:

- * Reduced destruction costs
- * Good covering and throwing power
- * Reduced chemical costs
- * More tolerant to metallic impurities
- * Low equipment cost
- * Less drag-out

Alkaline Non-cyanide:

Advantages:

- * Low drag-out
- * Lowest chemical cost
- * Lowest waste treatment costs
- * Good coverage
- * Good plate distribution
- * Bright deposits
- * Uses the same equipment as cyanide zincs

Bright Chloride:

Advantages:

- * Brilliant deposits obtainable
- * Good leveling and hiding properties
- * High cathode efficiency
- * Ability to plate on cast iron and similar difficult-to-plate bases (carbonitrided steel, malleable iron, etc.)
- * Easy to control compared to other non-cyanide zincs
- * Low waste treatment costs

WITCO CORP.: IRIDITE Chromate Conversion Processes:

IRIDITE Process C:

Note: IRIDITE C is a no-rinse dried-in-place coating

Components (Form): IRIDITE C (liquid)

For Use On: Multimetals/Aluminum/Steel/Hot-dipped or electro-galvanized steel

Features: Corrosion resistant/Paint and adhesive base/Inorganic no-rinse coating/Non-polluting

Typical Applications: Continuous coil lines

IRIDITE Process 1 OD:

Components (Form): IRIDITE 1A (liquid) + IRIDITE 1B (liquid)

IRIDITE Process 1P:

Components (Form): IRIDITE 1P (powder)

For Use On: Zinc plate/Cadmium plate/Zinc die castings

Features: Max. corrosion protection/Paint base/Non-reflective finish

Typical Applications: Hardware items/Military items/Communication equipment/Automotive parts

IRIDITE Process 3:

Components (Form): IRIDITE 3A (liquid) + IRIDITE 3B (liquid)

For Use On: Zinc plate/Cadmium plate/Zinc die castings

Features: Max. corrosion protection

Typical Applications: Same as listed for IRIDITE 1 OD and IRIDITE 1P/Wire goods (simulating brass)

IRIDITE 4L-1:

Components (Form): IRIDITE 4L-1 (liquid)

IRIDITE 4P-4:

Components (Form): IRIDITE 4P-4 (powder)

For Use On: Cadmium plate

Features: Good tarnish and corrosion resistance/Good solderability/Chemically polishes

Typical Applications: Electronic parts/Electrical parts/Aircraft parts

IRIDITE 4-2A:

Components (Form): IRIDITE 4-2A (liquid)

IRIDITE 4-2P:

Components (Form): IRIDITE 4-2P (powder)

For Use On: Zinc plate

Features: Good fingerprint and tarnish resistance/Moderate corrosion protection/Chemically polishes/IRIDITE 4-2A formulated especially for automatics

Typical Applications: Shelves/Electronic parts/Wire goods/Hardware items/Stampings/Machined parts

WITCO CORP.: IRIDITE Chromate Conversion Processes (Continued):

IRIDITE Process 4-73:

Components (Form): IRIDITE 4-73 (liquid)

For Use On: Zamak-3 zinc die castings

IRIDITE Process 4-75:

Components (Form): IRIDITE 4-75 (liquid)

For Use On: Zamak-5 zinc die castings

Features: Excellent corrosion protection/Good preplating
polish

Typical Applications: Brackets/Carburetors/Reconditioned
stripped die castings

IRIDITE Process 4-80:

Components (Form): IRIDITE 4-80 (liquid)

For Use On: Mechanical (peen) zinc plating

Features: Economical corrosion protection

Typical Applications: Fasteners

IRIDITE Process 5-3:

Components (Form): IRIDITE 5-3 (powder)

IRIDITE Process 5P-5:

Components (Form): IRIDITE 5P-5 (powder)

For Use On: Zinc plate (IRIDITE 5P-5 preferred for chloride
zinc deposits)/Cadmium plate/Galvanized steel/
Zinc die castings

Features: Excellent corrosion protection/Minimal iridescence,
simulates brass when lacquered

Typical Applications: Automotive parts/Electrical parts/
Military items/Hardware items/Brackets/
Carburetors

IRIDITE Process 6-2:

Components (Form): IRIDITE 6-2C (liquid) + IRIDITE 6-2S
(liquid)

For Use On: Zinc die castings/Zinc plate

Features: One-step black decorative finish/Good corrosion pro-
tection

Typical Applications: Decorative hardware items including
nuts, bolts and brackets

IRIDITE Process 7:

Components (Form): IRIDITE 7 (liquid)

IRIDITE Process 7P:

Components (Form): IRIDITE 7P (powder)

For Use On: Copper/Brass/Bronze

Features: Produces variety of finish appearances depending
on mix/Good tarnish and corrosion protection on
lead-free alloys/Chemically polishes/Eliminates
spotting-out of lacquered brass plate

Typical Applications: Electrical parts/Hardware items/Chemical
polish to eliminate buffing

WITCO CORP.: IRIDITE Chromate Conversion Processes (Continued):

IRIDITE Process 8:

Components (Form): IRIDITE 8 (liquid)

IRIDITE Process 8P:

Components (Form): IRIDITE 8P (powder)

IRIDITE Process 8-4:

Components (Form): IRIDITE 8-4 (liquid)

For Use On: Zinc plate/Cadmium plate/Galvanized steel/Zinc die castings

Features: Excellent corrosion protection/Chemically polishes

Typical Applications: Carburetors/Refrigerator shelves/Telephone parts/Electrical parts/Automotive parts

IRIDITE Process 9L-6:

Components (Form): IRIDITE 9L-6 (liquid)

For Use On: Galvanized steel (zinc or zinc-aluminum alloy)

Features: Eliminates storage stain/Longer bright finish/No rinsing or solution withdrawal required

Typical Applications: Continuous galvanizing lines/Wire/Conduit/Pipe/Strip

IRIDITE Process 12L-3S:

Components (Form): IRIDITE 12L-3S (liquid)

IRIDITE Process 12L-4:

Components (Form): IRIDITE 12L-4 (liquid)

IRIDITE Process 12P:

Components (Form): IRIDITE 12P (powder)

IRIDITE Process 12P-1:

Components (Form): IRIDITE 12P-1 (powder)

IRIDITE Process 12P-8:

Components (Form): IRIDITE 12P-8 (powder)

For Use On: Zinc plate

Features: Economical/IRIDITE 12L-4 and IRIDITE 12P-8 formulated especially for alkaline non-cyanide zinc deposits, but provide excellent results on other zinc deposits/IRIDITE 12P-1 produces a consistent blue on all three zinc systems

Typical Applications: Wire goods/Stampings/Hardware items

IRIDITE Process 14:

Components (Form): IRIDITE 14 (powder)

For Use On: Aluminum alloys

Features: Good corrosion protection/Paint base/Adhesive base/Contains no complex cyanides/Low electrical contact resistance compared to anodizing

Typical Applications: Aircraft items/Electronic parts/Signs/Space hardware and components/Computer parts/Wave guides/Replaces electrolytic anodizing except for abrasion resistance

WITCO CORP.: IRIDITE Chromate Conversion Processes (Continued):

IRIDITE Process 14-2:

Components (Form): IRIDITE 14-2 (powder)

For Use On: Aluminum alloys/Nickel

Features: Excellent corrosion protection/Extremely versatile/
Paint base/Adhesive base/Passivation treatment for
nickel/Low electrical contact resistance compared
to anodizing

Typical Applications: Same as IRIDITE 14

IRIDITE Process 14-4:

Components (Form): IRIDITE 14-4A (liquid) + IRIDITE 14-4B
(liquid)

For Use On: Aluminum alloys

Features: Formulated especially to produce a coating with good
wet strength or "wet hardness"/High corrosion pro-
tection/Paint base/Adhesive base/Low electrical con-
tact resistance compared to anodizing/More uniformi-
ty of color from one alloy to another

Typical Applicatiions: Same as IRIDITE 14

IRIDITE Process 14-5L:

Components (Form): IRIDITE 14-5LD (liquid) + IRIDITE 14-5LE
(liquid)

For Use On: Aluminum alloys

Features: Excellent corrosion protection/Paint base/Semi-
automatic feed equipment available/Low electrical
contact resistance compared to anodizing

Typical Applications: Continuous coil lines

IRIDITE Process 14-9:

Components (Form): IRIDITE 14-9 (powder)

For Use On: Aluminum alloys

Features: Good corrosion protection/Lower electrical contact
resistance than yellow coatings

Typical Applications: Aircraft items/Electronic parts

IRIDITE Process 15:

Components (Form): IRIDITE 15 (powder)

For Use On: Magnesium alloys

Features: Good corrosion protection/Paint base/Low electrical
contact resistance

Typical Applications: Office equipment/Automotive parts/Mis-
sile parts

IRIDITE Process 17P:

Components (Form): IRIDITE 17P (powder)

For Use On: Copper and alloys

Features: Good corrosion and tarnish resistance/Good paint
base/Prevents spotting out of lacquered brass plate/
Good solderability

WITCO CORP.: IRIDITE Chromate Conversion Processes (Continued):

IRIDITE Process 18P:

Components (Form): IRIDITE 18P (powder)

For Use On: Silver

Features: Good tarnish resistance/Good solderability/Low electrical contact resistance

Typical Applications: Electrical parts/Electronic parts/Computer parts

IRIDITE Process 30:

Components (Form): IRIDITE 30 (liquid)

IRIDITE 30M* (liquid) * Special maintenance additive for certain use conditions

For Use On: Aluminum alloys

Features: Chromate-phosphate type coating/Good corrosion protection/Good paint base

Typical Applications: Extrusions/Container closure coil stock/Decorative screening

IRIDITE Process 65:

Components (Form): IRIDITE 65 (powder)

For Use On: Zinc plate/Cadmium plate/Galvanized steel/Zinc die castings

Features: Economical corrosion protection

Typical Applications: Nuts, bolts and other hardware for automotive and electrical applications

IRIDITE Process 68:

Components (Form): IRIDITE 68 (powder)

For Use On: Zinc plate/Cadmium plate/Galvanized steel/Zinc die castings

Features: Excellent corrosion protection/Economical

Typical Applications: Wire goods/Fasteners and other hardware for automotive and electrical applications

IRIDITE Process 68B:

Components (Form): IRIDITE 68B (powder)

For Use On: Zinc plate

Features: Excellent corrosion protection/Formulated especially to produce a coating with good wet strength or "wet hardness"

Typical Applications: Barrel or rack plated work/Any application requiring handling or tumbling of the work during the chromating process

WITCO CORP.: IRIDITE Chromate Conversion Processes (Continued):

IRIDITE Process 80:

Components (Form): IRIDITE 80 (liquid)

For Use On: Zinc plate/Cadmium plate/Galvanized steel/Zinc
die castings/Peen plate

Features: Versatile/Economical corrosion protection

Typical Applications: Automotive parts/Electrical parts/
Military items/Hardware items/Brackets/
Carburetors

IRIDITE Process 105:

Note: IRIDITE 105 is a non-chromated passivation treatment
Components (Form): IRIDITE 105 (powder)

For Use On: Zinc plate

Features: Resists effects of handling and storage/No waste
treatment/Non-yellowing on aging/Long bath life

Typical Applications: Wire goods/Electrical parts/Electronic
parts/Office equipment/Hardware items

WITCO CORP.: IRIDITE Coatings:

IRIDITE 1 OD:

Olive drab chromate conversion coating for zinc plate, cadmium plate and zinc die cast

IRIDITE 1 OD is furnished as two liquid concentrates, IRIDITE 1A and IRIDITE 1B.

IRIDITE 5-3:

Chromate conversion coating for zinc plate, cadmium plate, zinc die castings and galvanized steel

IRIDITE 5-3 is a chemical dip that produces an economical, chromate conversion coating on zinc plate, cadmium plate, zinc die castings or galvanized steel.

IRIDITE 6-4/ARP 94:

Black Chromate/Post Dip for Zinc

The IRIDITE 6-4 system is a two part black chromate for zinc plate providing exceptional corrosion resistance.

IRIDITE 9L-6:

Chromate treatment for continuous galvanized strip

IRIDITE 9L-6 is a chemical treatment that produces a clear, protective chromate conversion coating on continuous galvanized strip, and on various zinc-aluminum surfaces.

IRIDITE 12L-3S:

Single-dip, blue-bright chromate conversion coating for zinc plate.

IRIDITE 12L-7:

Trivalent passivation for zinc

IRIDITE 12L-7 is a single dip passivation process that produces a clear to light-blue finish on electroplated zinc surfaces.

IRIDITE 14 AL-COAT for Aluminum and Aluminum Alloys:

IRIDITE 14 is a chemical process which produces a clear to yellow corrosion-resistant film on aluminum and its alloys.

IRIDITE 14-2:

Chromate conversion coating for aluminum and aluminum alloys

WITCO CORP.: ISOBRITE Plating Processes:

ISOBRITE 482/485:

Potassium chloride bright zinc plating process

Advantages:

- * Outstanding rinsability
- * Low foaming formulation
- * Electrolyte uses no ammonium
- * Simplifies waste treatment (no complexors)
- * High cathode efficiency
- * Stable brighteners
- * Brilliant deposits
- * Excellent coverage and throwing power
- * Tolerant of contaminants
- * Wide current density range
- * Readily accepts IRIDITE conversion coatings

ISOBRITE 829:

Maxi-leveling, bright nickel process

(ISOBRITE 829M single maintenance additive)

Advantages:

- * Excellent brightness in high- and low-current density areas
- * Outstanding leveling characteristics
- * Superior ductility
- * Excellent chromium receptivity
- * No harmful breakdown products
- * Versatile product--conventional or LTC bath operation
- * All-liquid component system simplifies bath makeup and maintenance

ISOBRITE 424:

Non-Cyanide Alkaline Zinc Process

Advantages:

- * Contains no cyanide
- * Simplified waste treatment
- * Outstanding coverage
- * Outstanding throwing power
- * Unusual tolerance for high temperatures
- * Operates at wide zinc and caustic concentrations
- * Single-additive process
- * No formaldehyde

Components:

ISOBRITE 408. Liquid plating concentrate.

ISOBRITE 424. Liquid brightener addition agent.

ISOBRITE 424C. Normally not required.

WITCO CORP.: KEYKOTE Phosphate Coatings:

KEYKOTE Iron Phosphate Coatings:

KEYKOTE iron phosphates are used primarily to provide a base for subsequent painting operations. These phosphates produce coatings which are uniform, fine-grained and an excellent base for powdered as well as conventional paint finishes.

By meeting the requirements of Federal Specification TT-C-490, Type II, KEYKOTE iron phosphates help insure a good bond for paint film, protect against underpaint corrosion and increase the service life of painted parts.

A variety of KEYKOTE iron phosphates are available. They are designed for use in either single stage or multi-stage systems for processing iron and steel as well as mixed metals such as aluminum, zinc, and galvanized steel.

KEYKOTE iron phosphates are easy to use and are designed to operate over a wide concentration range. They are available in both liquid and powder form. Some KEYKOTE iron phosphates are formulated with built-in detergents to clean and phosphatize in the same operation. Non-detergent phosphates are also available so that a detergent can be added separately in the exact amount needed to meet a specific cleaning requirement.

KEYKOTE Zinc Phosphate Coatings:

Zinc phosphates are divided into two types: microcrystalline and heavy. Microcrystalline phosphates are primarily intended as a base coat for paint; heavy-zinc phosphates are intended to absorb lubricants or oils for the reduction of friction in cold forming, as an aid to wear resistance and for rust and corrosion proofing. Zinc phosphates are available only in liquid form.

Allied-Kelite provides both types of zinc phosphates. Pre-paint applications:

KEYKOTE pre-paint zinc phosphates produce an extremely smooth, tightly-packed, powder-free coating that provides excellent paint adhesion, maximum paint gloss and minimum paint usage.

Heavy immersion applications:

KEYKOTE heavy-zinc-phosphate coatings are highly absorbent. They hold cold-forming lubricants, corrosion-preventive oils and other materials to help reduce friction, improve corrosion resistance and prevent galling.

KEYKOTE Manganese Phosphate Coatings:

Manganese phosphate coatings are designed for impregnation with lubricants to facilitate break-in and prevent galling on metal-to-metal mating parts. These phosphates produce heavy, uniform, porous coatings on iron and steel surfaces. Typically, these coatings are applied by high-temperature immersion.

WITCO CORP.: KEYKOTE Products:

KEYKOTE 2:

Cleaner and Iron Phosphate

A granular product specifically formulated to process steel in a three-stage immersion tank system. It cleans and phosphatizes simultaneously to provide improved paint adhesion and corrosion protection. KEYKOTE 2 is completely biodegradable.

KEYKOTE 4:

One-step cleaner and phosphate

Designed for use with steam or high-pressure hot water cleaning machines, KEYKOTE 4 is outstanding as a pretreatment prior to painting of steel, aluminum, and zinc.

KEYKOTE 23LT:

Low-temperature liquid spray cleaner and iron phosphatizer

Combination spray cleaner and iron phosphatizer that emphasizes improved performance.

KEYKOTE 25L:

Liquid non-detergent iron phosphate for spray or immersion

Uniquely formulated liquid iron phosphate for treating steel and aluminum

KEYKOTE 32:

Immersion zinc phosphate for steel

Prepaint zinc phosphate process that produces a satin smooth, fine-grained, uniform, corrosion-resistant coating on steel.

KEYKOTE 36:

Heavy zinc phosphate process for ferrous metals

Liquid concentrate zinc phosphate that can be applied by immersion or flood systems to produce very heavy, extremely fine grained, high quality phosphate coatings on a wide variety of steel alloys.

KEYKOTE 40:

Manganese phosphate anti-friction coating

Produces a heavy, thick, uniform manganese phosphate coating on iron and steel surfaces.

WITCO CORP.: NIKLAD Systems:**NIKLAD 752:**

Electroless nickel-boron system

Designed to produce bright, uniform nickel alloy deposits containing a maximum of 1% boron. These deposits can be applied to a wide variety of properly prepared metallic and non-metallic substrates. The NIKLAD 752 system can be used for rack as well as barrel plating.

- * High-purity deposits
- * Easily welded, soldered and brazed
- * High-temperature resistance
- * High hardness
- * Excellent wear resistance

NIKLAD 794:

Electroless nickel-phosphorus process

The NIKLAD 794 electroless nickel process is designed to deposit a uniform, bright nickel-phosphorus alloy onto properly prepared metal surfaces such as stainless steel, alloy steels, cast iron, copper and its alloys, titanium, beryllium and nickel alloys, magnesium, and onto various non-conductive materials. It is particularly suited for electroless nickel plating of aluminum alloys due to its high tolerance to metallic impurities.

- * Exceptionally bright deposits
- * Tolerant to metallic impurities
- * Economical to operate
- * Consistent high rate of deposition with maximum stability
- * Replenishment made at operating temperature
- * All-liquid system
- * Allows for barrel plating of parts
- * Meets specifications MIL-C-26074B, AMS 2404A and AMS 2405

NIKLAD 797:

"PHOS-FOUR" Electroless nickel-phosphorus process

NIKLAD 797 is a unique electroless nickel process offering a combination of outstanding deposit properties and simplicity of bath operation and control. NIKLAD 797 deposits have an alloy content between low and mid-phos products, providing the deposit hardness and wear resistance of a low phosphorus deposit and the ease of operation and control of a mid phosphorus process.

- * Very high as-plated hardness--up to 770 HK100
- * Very high heat-treated hardness--1000+ HK100
- * Superior wear and abrasion resistance

NIKLAD 1000:

Electroless nickel-phosphorus process

NIKLAD 1000 is a unique electroless nickel-phosphorus process specifically designed to provide maximum corrosion protection to a variety of properly prepared substrates, even at low deposit thicknesses. This high degree of protection extends part life in hostile environments, such as those found in petrochemical, mining, and food handling equipment industries.

- * Outstanding corrosion resistance
- * Compressive deposit stress
- * Ammonia-free system

WITCO CORP.: Rust Preventives:

Anti-Rust 306-B Solvent-based rust preventive:

Advantages:

- * Provides long-term indoor rust protection on ferrous metals
- * Higher flash point than other solvent-based products
- * Non-staining to most metal alloys
- * Easily removed in most conventional cleaning systems

Typical specifications:

Specific gravity: 0.817
Lbs./gallon: 6.8
Viscosity (SUS @ 100F): 35-40
Flash Point, C.O.C.: 140F
Dark amber liquid

Anti-Rust 1028 Solvent-based rust preventive:

Advantages:

- * Provides long-term indoor rust protection on ferrous metals
- * Water displacing
- * Fingerprint neutralizing
- * Non-staining to most metal alloys
- * Easily removed in most conventional cleaning systems

Typical specifications:

Specific gravity @ 60F: 0.803
Lbs./gallon @ 60F: 6.7
Viscosity (SUS @ 100F): 35
Flash Point, T.O.C.: 115F
Dark amber liquid

MACCO Anti-Rust 1028-DS-1:

Advantages:

1. Quickly displaces water on the surface of the work with a tough protective coating which resists rust.
2. Will not stain or corrode any metal or its alloy.
3. Precipitates the water to the bottom of the tank where it may be easily drained off.
4. Will both neutralize and remove fingerprints on metal surfaces.
5. Will provide excellent rust inhibition for extended periods of time.
6. Product designed to be effective even in presence of corrosive or acid fumes.

Typical Specifications:

Specific Gravity @ 60F.: 0.8498
Weight/Gallon @ 60F.: 7.05
Flash Point, C.O.C., F.: 260
Fire Point, C.O.C., F.: 285
Viscosity @ 100F. S.U.S.: 50-60
Solids Content: 20%

WITCO CORP.: Rust Preventives (Continued):

Anti-Rust 1028-P Oil-based rust preventive:

Advantages:

- * Provides long-term indoor rust protection on ferrous metals
- * Water displacing
- * Fingerprint neutralizing
- * Non-staining to most metal alloys
- * Easily removed in most conventional cleaning systems

Typical specifications:

Specific gravity: 0.858
Lbs./gallon: 7.14
Viscosity (SUS @ 100F): 50
Flash point, C.O.C.: 260F
Dark amber liquid

MACCO Anti-Rust 1028-P-432:

Advantages:

1. Will give 1,000 hours at 100% relative humidity @ 100F.
2. Transparent or nearly so when applied.
3. Easily removed with any common petroleum solvent such as kerosene, chlorinated solvents, etc.
4. May be applied by any common method such as dipping, spraying, swabbing, etc.

MACCO 1961 Water-soluble rust inhibitor:

Advantages:

- * Designed for a wide variety of applications, primarily on ferrous metals
- * Extremely economical to use
- * Leaves a non-oily, non-tacky transparent film
- * Film can be welded through
- * Film can be painted over

Typical specifications:

Specific gravity: 1.07
Lbs./gallon: 8.9
pH: 9.0
Clear amber liquid
Solubility: water

WINSOR Rust Preventive #307:

52C18, Grade III Compound
Thin Film Rust Preventive

Typical Test Data:

Flash Point: 100F Min.
Non Volatile Matter %wt.: 25
Volatile Solvent: 75
A.P.I. Gravity: 40
Pounds/Gallon: 6.87
Film Thickness: .0002"
Coverage: Approximately 1500 sq.ft. per gallon
Removability: OK.....Easily with Mineral Spirits, etc.
Protection Tests: Humidity: 300 Hours
Salt Spray: 24 Hours

WITCO CORP.: SACI: Severe Atmospheric Corrosion Inhibitors:

The inorganic-organic calcium sulfonate complex on which SACI concentrates are based is both platelet and polar in character. The platelet structure increases the path length that oxygen and water must travel to reach the metal substrate. Hydrocarbon compounds which are blended with SACI bases create an environment that is hydrophobic, further lowering water transmission. In addition, the overbased calcium sulfonate/carbonate complex has slight solubility in water (1×10^{-6}) which creates a buffered pH of 10-11, helping to passivate the active metal substrate.

Solventborne Products:

SACI 700 (50% Complex in mineral spirits)

SACI 760 (60% Complex in mineral spirits)

SACI 765 (65% Complex in mineral spirits)

The most economical starting point for formulating. All SACI variations can be made from these formulating bases.

SACI 300/300A (Complex in wax and solvent/Complex in wax, solvent and oxpet):

SACI 500/500A (Complex in wax, solvent and oxpet)

SACI 8000 Series:

SACI 8100: This product yields a durable, highly corrosion resistant film.

SACI 8200: This product was designed as a high performance, low VOC automotive undercoating.

Waterborne Products:

SACI Emulsions: These products offer superb salt spray resistance.

SACI 450W: A 50% non-volatile emulsion concentrate which must be further formulated to form firm films suitable for outdoor exposure.

SACI 445W: A 45% non-volatile, semi-formulated product which alone yields a waxy film.

Solvent-Free Products:

SACI 200/200A (Complex in oil/Complex in oil and oxidated petrolatum).

SACI 100A:

Density (Lbs/Gal): 8.1

% Solids (Wt): 58/62

Viscosity (cps @ 77F): 10000/18000

Flash Point (F): 105 min

Water Wt %: 0.5 max

SACI 200:

Density (Lbs/Gal): 8.5

% Solids (Wt): 96.0 min

Viscosity (cps @ 77F): 80000/130000

Flash Point (F): 325 min

**WITCO CORP.: SACI: Severe Atmospheric Corrosion Inhibitors
(Continued):****SACI 200A:**

Density (Lbs/Gal): 8.2
% Solids (Wt): 96.0 min
Viscosity (cps @ 77F): 85000/135000
Flash Point (F): 340 min

SACI 230:

Density (Lbs/Gal): 8.3
% Solids (Wt): 96.0 min
Viscosity (cps @ 77F): 12000/25000
Flash Point (F): 320 min
Water Wt %: 0.5 max

SACI 230A:

Density (Lbs/Gal): 8.1
% Solids (Wt): 96.0 min
Viscosity (cps @ 77F): 13000/25000
Flash Point (F): 320 min
Water Wt %: 0.5 max

SACI 200HM:

Density (Lbs/Gal): 8.3
% Solids (Wt): 96.0 min

SACI 300:

Density (Lbs/Gal): 7.9
% Solids (Wt): 58/62
Viscosity (cps @ 77F): 55000/100000
Flash Point (F): 105 min
Water Wt %: 0.5 max

SACI 300A:

Density (Lbs/Gal): 7.9
% Solids (Wt): 58/62
Viscosity (cps @ 77F): 40000/65000
Flash Point (F): 105 min
Water Wt %: 0.5 max

SACI 350:

Density (Lbs/Gal): 7.6
% Solids (Wt): 48/52
Viscosity (cps @ 77F): 10000/15000
Flash Point (F): 105 min
Water Wt %: 0.5 max

SACI 350A:

Density (Lbs/Gal): 7.6
% Solids (Wt): 48/52
Viscosity (cps @ 77F): 8000/12000
Flash Point (F): 105 min

**WITCO CORP.: SACI: Severe Atmospheric Corrosion Inhibitors
(Continued):**

SACI 445A:

Density (Lbs/Gal): 8.2
% Solids (Wt): 45 min
Viscosity (cps @ 77F): 3500 min
Flash Point (F): No Flash

SACI 450W:

Density (Lbs/Gal): 8.2
% Solids (Wt): 48 min
Viscosity (cps @ 77F): 25000/60000
Flash Point (F): No Flash

SACI 500:

Density (Lbs/Gal): 7.5
% Solids (Wt): 68/72
Viscosity (cps @ 77F): 45000/85000
Flash Point (F): 105 min
Water Wt %: 0.5 max

SACI 500A:

Density (Lbs/Gal): 7.4
% Solids (Wt): 68/72
Viscosity (cps @ 77F): 45000/70000
Flash Point (F): 105 min
Water Wt %: 0.5 max

SACI 552A:

Density (Lbs/Gal): 7.25
% Solids (Wt): 52/56
Viscosity (cps @ 77F): 3000/6000
Flash Point (F): 105 min
Water Wt %: 0.5 max

SACI 560:

Density (Lbs/Gal): 7.4
% Solids (Wt): 58/62
Viscosity (cps @ 77F): 20000/24000
Flash Point (F): 105 min
Water Wt %: 0.5 max

SACI 560A:

Density (Lbs/Gal): 7.3
% Solids (Wt): 58/62
Viscosity (cps @ 77F): 12000/16000
Flash Point (F): 105 min
Water Wt %: 0.5 max

**WITCO CORP.: SACI: Severe Atmospheric Corrosion Inhibitors
(Continued):****SACI 700:**

Density (Lbs/Gal): 8.2
% Solids (Wt): 48/52
Viscosity (cps @ 77F): 50000/80000
Flash Point (F): 105 min
Water Wt %: 0.5 max

SACI 760:

Density (Lbs/Gal): 7.8
% Solids (Wt): 60/64
Viscosity (cps @ 77F): 60000/90000
Flash Point (F): 105 min
Water Wt %: 0.5 max

SACI 2400:

Density (Lbs/Gal): 7.8
% Solids (Wt): 64/67
Viscosity (cps @ 77F): 35000/60000
Flash Point (F): 105 min
Water Wt %: 0.5 max

SACI 2452:

Density (Lbs/Gal): 7.8
% Solids (Wt): 52/56
Viscosity (cps @ 77F): 5000/9000
Flash Point (F): 105 min
Water Wt %: 0.5 max

SACI 2460:

Density (Lbs/Gal): 7.8
% Solids (Wt): 58/62
Viscosity (cps @ 77F): 20000/30000
Flash Point (F): 105 min
Water Wt %: 0.5 max

SACI 8100:

Density (Lbs/Gal): 8.2
% Solids (Wt): 68/72
Viscosity (cps @ 77F): 8000/13000
Flash Point (F): 105 min
Water Wt %: 0.5 max

SACI 8200:

Density (Lbs/Gal): 8.2
% Solids (Wt): 78/82
Viscosity (cps @ 77F): 9000/14000
Flash Point (F): 105 min
Water Wt %: 0.5 max

BAROID DRILLING FLUIDS, INC.: Corrosion Inhibitors:

BARAFILM Corrosion Inhibitor:

BARAFILM corrosion inhibitor is a blended filming amine used to protect drill pipe. The BARAFILM corrosion inhibitor will physically and chemically bond to the metal of the drill pipe and will protect the metal surface from hydrogen sulfide, carbon dioxide, and oxygen corrosion. The filming property addresses the ability of BARAFILM to oil-wet the metal and provide a protective coating in fresh, brackish and saline drilling fluids. BARAFILM has been used effectively to protect the metal surface of drill pipe in air, mist and foam drilling operations.

Recommended Uses:

- * Inhibitor for controlling hydrogen sulfide, carbon dioxide, or oxygen corrosion attack
- * Slug treatment of drilling mud to protect drillpipe in hole
- * Applied directly to drillpipe for protection from atmosphere
- * Used in air/foam, low-solids and weighted drilling fluids

Major Advantages:

- * Effective corrosion inhibitor for all water-based drilling fluids
- * Small treatment levels
- * Solubilization in oil allows for efficient and even application of inhibitor
- * Flash point above 100F (38C)
- * Temperature stable to above 300F (149C)

Physical Characteristics:

Appearance: clear brown liquid
Specific gravity: 0.913
Density, lb/gal: 7.61
Viscosity, SUS at 70F: 122
Flash Point, F (PMCC): 140
Pour Point, F: below -10F (-23C)

BARACOR-100 Corrosion Inhibitor:

BARACOR-100 is a high-activity, water-soluble corrosion inhibitor for use in fresh-water or brine fluids to provide corrosion protection in oil and gas industry applications.

Recommended Uses:

BARACOR-100 is an effective corrosion inhibitor for solids-free packer waters and other oil and gas industry applications

Major Advantages:

- * Effectiveness at low concentrations.
- * Convenience and ease of handling and addition.
- * Economy.

BAROID DRILLING FLUIDS, INC.: Corrosion Inhibitors (Continued):**BARACOR 113 Corrosion Inhibitor:**

BARACOR 113 powdered corrosion inhibitor is a blend of materials designed for multiple types of corrosion. This powdered material is completely soluble in freshwater, brackish water, and saturated solutions of sodium and/or calcium chlorides. The BARACOR 113 is a blend of zinc and chromate compounds which provide maximum corrosion protection to drill pipe and casing.

Recommended Uses:

- * Inhibitor for oxygen, carbon dioxide and hydrogen sulfide corrosion in aqueous systems
- * Passivates metals surfaces in air, foam or mist drilling
- * Protects drill pipe and casing
- * Corrosion inhibitor for sodium chloride and calcium chloride brines

Major Advantages:

- * Completely soluble in all water-based fluid systems
- * Requires minimal additions for effectiveness
- * Powdered material which can be added dry or solubilized
- * Eliminates need for several products to combat corrosion
- * Addition levels easily monitored by testing chromate content in filtrate

BARACOR 129 Multi-function Corrosion Inhibitor:

BARACOR 129 multi-function corrosion inhibitor is a unique blend of products formulated to eliminate oxygen corrosion and reduce scale formation.

Recommended Uses:

- * Oxygen removal from water-based fluids contain low levels of calcium
- * Scale inhibitor to prevent formation of corrosion cells
- * Cationic corrosion inhibitor

Major Advantages:

- * Powdered material for ease of application
- * Multi-function product
- * Totally water soluble
- * Neutral pH when solubilized in water
- * Synergistic effect from blended products

Physical Characteristics:

Appearance: Tan Powder
Bulk Density, lb/ft³: 88
pH (1% by weight solution): 7.8

BAROID DRILLING FLUIDS, INC.: Corrosion Inhibitors (Continued):

BARACOR-450 Corrosion Inhibitor for Heavy Brines:

BARACOR-450 corrosion inhibitor is a cyanogen based inorganic compound used for corrosion protection in solids-free, brine packer fluids. It forms a protective coating on metal surfaces under static conditions and reduces corrosion rates in heavy brines to less than five mils per year.

Specific gravity @ 68F: 1.317

Density, lb/gal: 11.0

Flash point (FTCC) F: >257

pH: 7.0

BARACOR 1635 Corrosion Inhibitor:

BARACOR 1635 oxygen corrosion inhibitor is recommended for the effective protection of drill pipe and casing during air drilling or in aerated drilling fluids. BARACOR 1635 will protect against oxygen corrosion, even in the presence of hydrogen sulfide or carbon dioxide. BARACOR 1635 is a granular sodium nitrite based compound which is mostly soluble in water. It can be added through a mud hopper or through a chemical barrel in solution form. The concentrated product provides flexibility and economy in shipping, handling, and addition.

Recommended Uses:

- * Corrosion inhibitor for air, foam or mist drilling
- * Oxygen scavenger for use in aerated drilling muds
- * Protecting drill pipe and casing

Major Advantages:

- * Alternative to sulfite/sulfate reaction chemistry
- * Economic powdered material
- * Majority soluble in water for ease of addition
- * Efficient, reacts with oxygen in solution or air
- * Oxidizes hydrogen sulfide under acid conditions to remove it from system

Appearance: white to yellow free-flowing powder

Bulk density, lb/ft³: 73

Compacted bulk density, lb/ft³: 135

Solubility in water at 68F (20C): 84.5%

pH (1% by weight solution): 7.1-8.1

BAR'S LEAKS, INC.: BAR'S LEAKS:

Mixes with all quality anti-freeze....harmless to rubber, aluminum, plastic, and all other metals

The original product of Bar's family, designed for complete cooling system protection. BAR'S LEAKS pellet-sized sealer dissolves into millions of tiny particles to form a lasting internal and external seal in engine blocks and heads, radiator and heater cores, head gaskets, hose connections and freeze plugs.

R 6 5 1/2 oz.:

This is the regular passenger car size, one bottle being sufficient for the average automobile.

C 16 12 oz.:

BAR'S LEAKS is especially compounded for hard to seal leaks including cracked blocks, heads and internal cracks in valve ports and cylinders.

BLC BAR'S LEAKS Concentrate:

The same patented concentrate as used world-wide by car and truck manufacturers to protect against cooling system leaks and seepage, both internal and external.

- * Seals Leaks
- * Inhibits Rust & Corrosion
- * Lubricates Water Pump Seals

BAR'S LEAKS Cooling System Cleaner:

Cooling system cleaner is easy and safe to use, keeps newer systems factory clean, cleans up old dirty systems, not an acid, needs no neutralizing, harmless to all metals.

The treatment consists of a mild scrubbing of the cooling system.

BAR'S RUST Cooling System Conditioner and Cleaner:

BAR'S RUST, the year 'round inhibitor. Contains "buffering" chemical inhibitors to insure against rust, corrosion and sludge in the cooling system - regardless of local water conditions.

Since the advent of the high efficiency, low pollution engine, with much tighter internal temperatures and thinner walls, it is more than ever necessary to keep these engine walls clean.

HDC Heavy Duty Concentrate:

BAR'S LEAKS used in trucks and buses, or any commercial duty application engines with over 6 gallon coolant capacities.

BECK CHEMICALS, INC.: FERRO BET Rust Sealer:

Phosphatizes as it penetrates

FERRO-BET Sealer is an organic film-forming penetrant which permeates rusted surfaces through to the metal underneath the rust. Its film forming properties seal out all air, moisture and other corrosion inducing elements.

FERRO-BET Sealer is an excellent phosphatizer in its own right. After it is applied to metal (rusted or unrusted) its organic phosphatizing properties change rust (ferric oxide) to iron phosphate and etch the steel surface, thus chemically linking the film to the metal. The result is a primer coat of unusual adhesion.

Controlled penetration of FERRO-BET Sealer into rusted surfaces insures a wet film deposit that is thick enough to react thoroughly with rusted surfaces. The tough skin left by the dried sealer is unsurpassed in resistance to salt and moisture. It will accept and bond with all top coats except the fast drying lacquers.

FERRO-BET Sealer is recommended for corrosion protection of steel construction, ships, tanks, machinery, tools, castings, dies, etc.; also as a protective coating for aluminum, zinc, galvanize and die castings.

Instructions:

Remove loose rust and old paint with BECK ship and tank stripper (one coat applied according to instructions will remove up to 50 coats of paint.) After using this stripper the surface should be treated with FERRO-BET Rust Remover according to directions. After the surface is dry and cleaned of FERRO-BET Rust Remover Residue, apply FERRO-BET Sealer liberally with spray gun, brush or roller.

FERRO-BET Sealer enhances the weatherability of any oil base top coat and can be added to top coat paints in amounts up to 1 part FERRO-BET Sealer to 5 parts top coat paint.

If the surface to be painted is only slightly rusted, FERRO-BET Sealer may be used without the FERRO-BET Rust Remover treatment. Simply add 50% FERRO-BET Sealer to the first coat. This mixture will usually suffice to phosphatize the thin rust coat and phosphate-etch the metal surface.

For maximum long range protection against top coat failure, Beck recommends 2 coats of FERRO-BET Aluminum to be used as the top coat. FERRO-BET Aluminum Top Coat Paint may be mixed with any color pigmented paint on a 50-50 basis. Beautifully colored metallic hues may thus be obtained.

BECK CHEMICALS, INC.: LEXISTRIP:

Purpose:

- * Stripping graffiti from Plexiglas or Lexan Sheet.
- * Stripping fresh graffiti from painted substrates.

General Description:

LEXISTRIP is a light amber gel containing blended solvents, wetting agents and evaporation retarders.

Special Advantages:

LEXISTRIP has been formulated to remove all type of painted graffiti in the shortest exposure time without affecting the substrate. This product has little or no effect on Plexiglas, Lexan, wood or metal.

Directions for Use:

LEXISTRIP is a brush type gel which can be applied to the affected surface by either brush or roller. The actual time required to loosen and dissolve the paint or other applied graffiti must be determined by testing a small portion and taking a time-reading. The stripper usually successfully removes most graffiti within 5 minutes but the stripper can remain on the substrate for more than one-half hour without drying.

F-5 GRAFFITI PREVENTER:

A non-sticky, non-greasy preventative coating to protect all substrates from permanent adhesion of graffiti. No. F-5 GRAFFITI PREVENTER penetrates deeply into most substrates and forms a coating which withstands weather extremely well. Even the hottest exposure to sun will not interfere with the protective qualities of F-5 GRAFFITI PREVENTER.

This unusual product interferes with the adhesive and penetrating properties of paints, stains and inks.

F-5 GRAFFITI PREVENTER is non-toxic, non-injurious to skin or clothing, non-corrosive to metal or plastic. The dry film has a melting point above 250F.

Directions for Use:

Apply heavily (about 5 to 10 mil.) by brush or pressure spray gun. By proper adjustment of fluid pressure vs air pressure, a uniform layer can be applied.

GRAFFITI PREVENTER F-5 viscosity has been adjusted to produce a heavy film without running off. If a thinner film is desired, GRAFFITI F-5 may be thinned to any desired viscosity by adding water. Water should be added in small amounts and thoroughly stirred into the semi-paste.

BECK CHEMICALS, INC.: VAPOBAR Vapor Barrier:

Easy-to-apply, low-cost butyl coating resists weather, water, chemicals - ideal for construction, automotive, process industries.

VAPO-BAR is an inert, non-polar, two-part chemically curing butyl rubber compound that can be applied quickly and economically by brush, roller or airless spray to produce uniform, long-life film barriers of superior resistance to water, water vapor, ultra-violet radiation, weather, ozone, sunlight, caustics, acids, oxygenated solvents and salt-solutions.

VAPO-BAR is fully effective in temperatures ranging from -60F to 250F.

Its exceptional properties and ease of application make VAPO-BAR ideal for all types of construction, for chemical and low-temperature process equipment, and for the automotive industry.

General Construction:

VAPO-BAR compounds meet the most important cost and effectiveness criteria of the construction industry:

- * high resistance to transmission of water vapor
- * high resistance to weather and ozone
- * high resistance to fertilizers, farm chemicals, mold and bacteria
- * excellent adhesion to foam, concrete and wood, without primers
- * high durability
- * permanent flexibility and elasticity to accomodate temperature changes

Process Equipment:

Many of the properties listed under general construction are desirable for chemical and low-temperature process equipment as well. Most important, however, are VAPO-BAR's resistance to actual chemical reactions and to chemical absorption which leads to swelling.

Chemically, VAPO-BAR has excellent resistance to acids, bases, alcohols, detergents, amines or polar solvents.

Physically, the coating is extremely durable.

Automotive Industry:

The ease, economy, effectiveness and durability of VAPO-BAR as a thermal, hydro and chemical barrier make the coating extremely attractive in the automotive industry for such uses as: (a) undercoating; (b) weatherproofing; (c) refrigerated truck insulation; (d) special applications attendant to new safety and EPS regulations.

The compound is also being studied for possible vibration damping and noise-reduction uses.

BETZ INDUSTRIAL: BETZ Industrial Corrosion Inhibitors:

BETZ Balanced Polymer 5400 Series:

- * Outstanding protection against metal oxide deposition and caustic corrosion
- * Designed and field-proven for high-pressure boilers
- * Exclusive BETZ TECHNIPROBE system evaluation
- * Exact tailored sodium/phosphate ratio
- * Advanced Balanced Polymer formulation for your specific needs
- * Cost-effective program cuts downtime and maintenance
- * Easy-handling liquid available through the BETZ POINT OF FEED bulk delivery system
- * Formulations available for use in FDA/USDA plants

BETZ polymer/phosphate/pH, 5400 Series products are aqueous blends of phosphate, polymeric dispersants and corrosion inhibitors. BETZ BALANCED POLYMER 5400 Series products contain SCP and SCCP synthetic carboxylated polymer and copolymer to disperse iron and other metal oxides. Polymer ratios will be tailored to provide excellent deposition protection for your specific system.

BETZ CONTINUUM 27000 Series Cooling Water Treatment:

- * Maximizes corrosion protection without heavy metals
- * Controls deposition and scale with patented BETZ HPS-1 polymer
- * Eliminates or minimizes acid feed

BETZ Continuum 27000 Series products are custom designed blends which control corrosion and scale formation in open recirculating cooling water systems. These products provide a synergistic blend of inorganic and organic phosphates designed to minimize total phosphate required under a given set of conditions.

The CONTINUUM 27000 Series products incorporate the patented calcium phosphate inhibitor BETZ HPS-1. Use of these products for treatment of cooling water systems is covered by U.S. Patents 4,759,851 and 4,895,663.

BETZ COPPER-TROL Cu-1 Inhibitor:

- * Inhibits corrosion of copper and copper alloys
- * Provides long-lasting protection
- * Applicable to once-through and recirculating cooling water systems

BETZ COPPER-TROL Cu-1 is a cooling water corrosion inhibitor specifically designed to establish a long-lasting protective film on copper and copper alloys. The purchase of this product from Betz provides a license under U.S. Patent 4,744,950.

**BETZ INDUSTRIAL: BETZ Industrial Corrosion Inhibitors
(Continued):**

BETZ CORROGEN Corrosion Inhibitor:

- * Controls preboiler and boiler oxygen corrosion
- * Reacts rapidly with dissolved oxygen
- * Improves boiler system reliability
- * Approved for use in FDA regulated boiler systems

BETZ CORROGEN is a dry, white powder of sodium sulfite, specially catalyzed to provide instantaneous oxygen removal in boiler feedwater systems. CORROGEN controls oxygen corrosion in boiler systems as well as hot and cold water systems. It is suitable where FDA regulates the treatment of boiler feedwater.

BETZ CORR-SHIELD 736:

- * Non-Chromate: not environmentally restricted
- * Effective on steel, copper, and mixed metallurgy systems
- * Stable and effective at high temperatures and heat fluxes

BETZ CORR-SHIELD 736 is a specially formulated molybdate-based corrosion inhibitor designed for use in closed cooling systems. It is effective in controlling corrosion under a wide range of conditions. CORR-SHIELD 736 has been successfully applied in systems using demineralized water makeup, softened water makeup, and hard water makeup.

BETZ COR-TROL 778P:

- * Acceptable for use in paper mills producing FDA-regulated paper
- * Controls oxygen corrosion
- * Provides superior metal passivation for boiler feedwater systems
- * Improves boiler reliability
- * Contains no hydrazine or hydrazine derivatives
- * Volatile oxygen scavenger - contributes no inorganic solids to feedwater
- * Delivered via BETZ POINT OF FEED Service Program

BETZ COR-TROL 778P is an aqueous blend of an organic oxygen scavenging material and neutralizing amine. It is a volatile oxygen scavenger and does not contribute to inorganic boiler water solids. In addition, it is safer to handle and more effective than hydrazine.

BETZ INDUSTRIAL: BETZ Industrial Corrosion Inhibitors (Continued):

BETZ LAYUP-1:

Oxygen Scavenger - Metal Conditioning Agent

- * Controls oxygen-induced corrosion and protects the boiler system components during off-line periods
- * Reduces parent metal corrosion and corrosion product deposition on critical heat-transfer surfaces
- * State-of-the-art blend specifically designed for the unique needs of cycling boilers
- * Superior low-temperature oxygen scavenging and metal passivating properties
- * All volatile composition makes it ideal for storage of superheaters

Boiler systems operating under cyclic conditions have distinctive needs. They are often stored wet and later started up, on short notice, because of the changing steam demands of a plant. BETZ LAYUP-1 is specifically designed to meet these needs using a state-of-the-art combination of an oxygen scavenger, a metal conditioner, and an alkaline agent.

BETZ MAGNI-FORM 304 Condensate Corrosion Inhibitor:

- * Completes corrosion protection provided by neutralizing and filming amine treatment programs
- * Provides superior metal passivation in condensate systems resulting in lower corrosion rates
- * Controls oxygen corrosion, even at low temperatures
- * Improves equipment reliability and reduces maintenance costs
- * Reduces condensate iron and copper levels, increasing the quantity of usable condensate and increasing boiler reliability

BETZ MAGNI-FORM 304 is an aqueous blend of an organic oxygen scavenger and a neutralizing amine. BETZ MAGNI-FORM 304 is a volatile oxygen scavenger and metal passivator and does not contribute inorganic solids to the steam, condensate system and boiler feedwater.

BETZ MAGNI-FORM 304 is designed for the control of corrosion in condensate systems due to dissolved oxygen, carbon dioxide and process contaminants. It is not approved for use where the FDA or USDA regulates boiler feedwater and condensate system treatment or in potable water systems.

**BETZ INDUSTRIAL: BETZ Industrial Corrosion Inhibitors
(Continued):**

BETZ OPTI-MEEN Series:

- * Reduces condensate corrosion through tailored treatments
- * Reduces maintenance costs
- * Improves boiler system reliability
- * Reduces feedwater iron and copper levels
- * Effectively boosts pH in boiler systems with high-alkalinity feedwater
- * Formulations available for FDA-regulated systems

BETZ OPTI-MEEN Series products are customized blends of water-soluble neutralizing amines designed to meet the needs of each specific boiler systems. They are formulated to chemically neutralize acidic condensate and protect all parts of the condensate system.

BETZ OPTI-TROL 999 Oxygen Scavenger:

- * Controls oxygen corrosion
- * Suitable for use in FDA regulated plants
- * Approved for use in USDA regulated plants
- * Provides superior metal passivation
- * Improves boiler reliability
- * Contains no hydrazine or derivatives of hydrazine
- * Contributes no inorganic solids to feedwater

BETZ OPTI-TROL 999 is an aqueous blend of an organic oxygen scavenging material and neutralizing amine. It is an organic scavenger and does not contribute to inorganic boiler water solids. In addition, it is safer to handle than hydrazine.

BETZ PERMACOL Corrosion Inhibitor:

- * Reduces condensate corrosion
- * Reduces maintenance costs
- * Reduces boiler feedwater iron
- * Improves system reliability
- * Approved for use in FDA/USDA regulated boiler systems

BETZ PERMACOL is a primary filming amine designed to reduce corrosion in condensate systems. The product establishes a protective barrier on metal surfaces, thus inhibiting the corrosive effects of oxygen and carbon dioxide. The product is suitable where FDA or USDA regulates the treatment of boiler feedwater.

**BETZ INDUSTRIAL: BETZ Industrial Corrosion Inhibitors
(Continued):**

BETZ SULFITE 3 Oxygen Scavenger:

- * Controls preboiler and boiler oxygen corrosion
- * Minimizes handling and mixing
- * Reacts rapidly
- * Approved for use in FDA-regulated plants

BETZ SULFITE 3 is a chemically stable, liquid refined grade of sodium sulfite, specially catalyzed to provide almost instantaneous oxygen removal when applied to water systems. This product is designed to control oxygen corrosion in boiler feedwater, as well as in hot and cold water systems. It is suitable where the FDA regulates the boiler feedwater treatment.

BETZ 20K Series Inhibitors--DIANODIC II Cooling Water Treatment:

- * Custom blended corrosion inhibitor/deposit control formulations
- * Maximize corrosion protection without heavy metals
- * Designed for use with BETZ 2020 product

The BETZ 20K Series inhibitors are custom designed products based on organic and inorganic materials. These products are designed to control corrosion and scale formation in open recirculating cooling water systems, and are intended to be used with BETZ 2020 to complete the DIANODIC II treatment approach. These products do not contain chromate or zinc.

BETZ 30K Series--Inhibitors:

- * Custom blended non-chromate inhibitors
- * Formulated with deposit control capability
- * Protects mild steel, copper and alloys

The BETZ 30K Series inhibitors are custom designed products based on organic and inorganic materials. These products are designed to control corrosion and scale formation in many types of cooling water systems.

**BETZ INDUSTRIAL: BETZ Industrial Corrosion Inhibitors
(Continued):**

BETZ 2020 DIANODIC II Cooling Water Treatment:

- * Patented calcium phosphate scale inhibitor
- * Permits proper phosphate concentration for complete corrosion inhibition of mild steel
- * Compatible with chlorine

BETZ 2020 Inhibitor is a special organic deposit control agent designed to control calcium phosphate formation in open recirculating cooling water systems. The use of this product for the control of the formation and/or deposition of certain materials is covered by U.S. Patent 4,029,577.

BETZ 2040 DIANODIC II Cooling Water Treatment:

- * Special corrosion inhibitor and deposit control blend
- * Maximizes corrosion protection without heavy metals
- * Designed for use with BETZ 2020 product

BETZ 2040 Inhibitor is a special blend of organic and inorganic inhibitors which does not contain chromate. This product is designed to control corrosion and scale formation in open recirculating cooling water systems and is intended to be used with BETZ 2020. BETZ 2040 also contains an inhibitor especially suited for use with copper metallurgy.

This product and its use alone or with BETZ 2020 is covered by U.S. Patents 3,837,803 and 4,303,568.

BETZ 2060 DIANODIC II Cooling Water Treatment:

- * Special corrosion inhibitor and deposit control blend
- * Maximizes corrosion protection without heavy metals
- * Designed for use with BETZ 2020 product

BETZ 2060 Inhibitor is a special blend of organic and inorganic inhibitors which does not contain chromate. This product is designed to control corrosion and scale formation in open recirculating cooling water systems and is intended to be used with BETZ 2020. BETZ 2060 also contains an inhibitor especially suited for use with copper metallurgy.

**BIRCHWOOD LABORATORIES, INC.: BIRCHWOOD CASEY Rust
Preventives and Sealants:**

SHEATH:

A superior corrosion inhibitor and lubricant for all metals. Rapidly displaces moisture from metal pores and leaves a slightly oily, polar film which will not gum under high temperature or humidity. Unsurpassed on tools, machine parts and raw steel, or as a sealant over conversion coatings. Can be applied to wet or dry surfaces.

Application: Dipping, brushing or low pressure spray.

SHEATH WS:

A water-dilutable blend of oils and corrosion inhibitors for all metals. Used at 12-25% by volume, SHEATH WS provides protection superior to other water soluble oils over black oxide and phosphate coatings.

Application: Dipping (preferably warmed to 120F) followed by 5-10 minutes drying.

DRI-TOUCH:

An ultra-fast water-displacer and penetrant for all metals. Leaves a thin, non-oily, polar film which resists humidity and corrosion. Excellent on precision parts such as gauges, electronic components, or where an oily film would be objectionable.

Application: Dipping, brushing or low pressure spray.

SATIN SHIELD:

A water-dilutable blend of polymers and waxes. Dries to a clear, satin gloss, buffable finish which is not sticky. No dimensional build-up problems. Excellent on steel machine parts (even tooling) or aluminum.

Application: Dipping, followed by 5-10 minute drying.

DRI-TOUCH Plus:

A heavy-duty, water-displacing corrosion inhibitor for all metals. Leaves a non-oily film which resists corrosion for long periods without a dimensional change. Recommended as a sealer for phosphate coatings or on parts which require long term protection with a dry surface.

Application: Dipping, brushing or low pressure spray.

PRESTO-KOTE:

A water-based combination of acrylic polymers and dry-film lubricants which dries to a clear, hard film. Resists against scuffing and corrosion and will not attract or hold dust or lint. Ideal for steel or aluminum decorative parts with non-critical dimensions.

Application: Dipping, followed by 5-10 minute drying.

**BIRCHWOOD LABORATORIES, INC.: BIRCHWOOD CASEY Rust Preventives
and Sealants (Continued):**

SHEATH:

Type: Solvent-based, water-displacing
Appearance: Amber liquid
Film Thickness: 0.14 mil
Flash Point, T.O.C.: 126F
Pour Point: -65F
Approximate Coverage, sq.ft./gal.: 1600
Humidity Resistance: 500 hours minimum
Salt Spray Resistance: 96 hours
Water-Displacement Test: Meets Mil. Spec. MIL-D-16173D,
Grade 3
Other Corrosion Tests: Meets MIL-C-23411 and MIL-C-81309
Stain Test: Meets Mil. Spec. MIL-C-22235A

DRI-TOUCH:

Type: Solvent-based, water-displacing
Appearance: Amber liquid
Film Thickness: 0.03 mil
Flash Point, T.O.C.: 120F
Pour Point: -65F
Approximate Coverage, sq.ft./gal.: 1600
Humidity Resistance: 300 hours minimum
Salt Spray Resistance: 16-24 hours
Water-Displacement Test: Meets Mil. Spec MIL-D-16173D,
Grade 3
Other Corrosion Tests: Meets MIL-C-23411 and MIL-C-81309
Stain Test: Meets Mil. Spec. MIL-C-22235A

DRI-TOUCH PLUS:

Type: Solvent-based, water-displacing
Appearance: Amber liquid
Film Thickness: 0.1 mil
Flash Point, T.O.C.: 131F
Pour Point: -65F
Approximate Coverage, sq.ft./gal.: 1600
Humidity Resistance: 600 hours minimum
Salt Spray Resistance: 96 hours minimum
Water-Displacement Test: Meets Mil. Spec. MIL-D-16173D,
Grade 3
Other Corrosion Tests: Meets MIL-C-23411 and MIL-C-81309
Stain Test: Meets Mil. Spec. MIL-C-22235A

**BIRCHWOOD LABORATORIES, INC.: BIRCHWOOD CASEY Rust Preventives
and Sealants (Continued):**

SHEATH WS:

Type: Water-dilutable
Appearance: Amber liquid
Approximate Film Thickness: .03-0.1 mil
Flash Point, T.O.C.: over 200F
Pour Point: 45F
Approximate Coverage, sq.ft./gal.: 5000+
Humidity Resistance: 250 hours minimum

SATIN SHIELD:

Type: Water-dilutable
Appearance: Tan liquid
Approximate Film Thickness: 0.2 mil
Flash Point, T.O.C.: None
Pour Point: freezes at 10F
Approximate Coverage, sq.ft./gal.: 2000
Humidity Resistance: 200 hours minimum

PRESTO KOTE:

Type: Water-based dilutable
Appearance: Milky liquid
Approximate Film Thickness: 0.2 mil
Flash Point, T.O.C.: None
Pour Point: freezes at 10F
Approximate Coverage, sq.ft./gal.: 1000
Humidity Resistance: 100 hours minimum

BIRCHWOOD LABORATORIES, INC.: PRESTO BLACK Low Temperature Blackening Process:

Over the years, black oxide coatings have been used extensively by the metalworking industry, making it possible for manufacturers of iron and steel parts of all descriptions to produce finished parts with the following properties:

- * Corrosion resistance: properly applied, the black finish prevents rusting in service or in storage.
- * Aesthetic appeal: many parts require an attractive yet durable black finish for improved sales appeal.
- * Dimensional stability: machine components and tools manufactured to tight dimensional specs cannot tolerate the non-uniform or excessive thickness of electroplated or paint coatings.
- * Low cost: blackening can generally be performed at lower operating costs than other types of finishing.

The PRESTO BLACK process satisfies these performance objectives and answers the industry's demands for lower energy consumption, higher processing efficiency, improved worker safety and less pollution.

Process Design:

There are several factors which can affect the design of the process, including:

- * The mix of alloys used, hardness and reactivity.
- * The condition of the surface prior to blackening (for example, the type of fabricating oils used, the presence of oxides such as rust, heat treat scale or machining fines, etc.)
- * The volume of parts produced per shift.
- * The method of parts handling employed (racks, baskets, conveyors, etc.)
- * The requirements of the final finish in terms of appearance, gloss and level of corrosion resistance.

In most cases, the parts are free of noticeable rust and are coated with a machining or stamping fluid. The PRESTO BLACK process would utilize the following steps:

1. Clean the parts or remove soils, cutting oils, etc., in PRESTO KLEEN HP; 130-150F; 3-6 minute soak.
2. Rinse in cold, overflowing tap water tank; 15 seconds.
3. Activate to prepare the surface for blackening in PRESTO PREP P2; 120-130F; 2-3 minute immersion.
4. Rinse in cold, overflowing tap water tank, 15 seconds.
5. Blacken at room temperature in PRESTO BLACK solution; 30-90 second immersion.
6. Rinse in cold, overflowing tap water tank; 15 seconds.
7. Seal and displace water by immersion in SHEATH, DRI-TOUCH, SATIN-SHIELD or PRESTO KOTE sealants. Allow parts to drain or dry.

BIT MANUFACTURING, INC.: SUL-FON-ATE OA-5 Product Line:**SUL-FON-ATE OA-5 Regular:**

Produced from animal derived oleic acid.

SUL-FON-ATE OA-5 Special:

Produced from a mixture of animal and plant oleics.

SUL-FON-ATE OA-5 U:

Produced from plant derived fatty acid.

SUL-FON-ATE OA-5 C:

Concentrated SUL-FON-ATE OA-5.

SUL-FON-ATE OA-5 D:

An extremely water soluble version of SUL-FON-ATE OA-5.

Established Uses:

1. Surface active agent for acidic or caustic cleaning compounds including food and beverage processing equipment.
2. Emulsion polymerization surfactant for styrene butadiene carboxylated latex (carpet, paper coating).
3. Component in blended textile specialty chemicals.
4. Corrosion inhibitor in UAN fertilizer solutions.
5. Defoamer in acid media such as phosphoric acid production.
6. Wetting agent for dust control.
7. Electrochemical processing aid/Corrosion inhibitor.
8. Flotation agent in wastewater treatment.
9. Ore leaching assistant.
10. Crystal growth controller.

SULFONATE OA5-R:

Sulfonated Oleic Acid, Sodium Salt

Typical Analysis:

	% by weight
Active Ingredient:	41
Unsulphonated Oil	6
Inorganic Salt	3
(Principally Sodium Sulfate)	
Moisture (H ₂ O)	50

Cloud Point: 50-56 deg F

pH: 5.5-6.5

Viscosity in Centipoise based on A.I. at 70 deg F:

41%	A.I.: 160
42.5%	A.I.: 200
44%	A.I.: 240

BOND CHEMICALS INC.: Corrosion Inhibitors:

BOND CHWT No. 4-415:

BOND CHWT No. 4-415 is a closed system corrosion and scale inhibitor in liquid form. It is recommended for circulating hot water, chilled water, diesel and gas engine cooling systems, etc. The blend of inhibitors effectively controls corrosion in bimetallic systems of copper, brass, bronze, aluminum, and steel, as well as solder and alloys.

BOND CHWT No. 4-415 is used where chromates are not allowed. It contains no toxic heavy metals, free caustic alkalinity, or toxic organic compounds. The special polymer in this inhibitor will remove and disperse old scale deposits. It has no adverse effects on mechanical pump seal, and improved pumping efficiencies have been reported due to the "slip" improvement in the circulating water.

It is compatible in cooling systems containing alcohols and glycol anti-freeze compounds. The mild buffering of CHWT No. 4-415 will neutralize acid residuals in cooling water caused by thermal decomposition of anti-freeze materials.

Form: Light, viscous liquid

Color: Light amber, clear

Weight per Gallon: 9.167 pounds

Specific Gravity: 1.0991

pH, 1% Solution: 8.65

BOND RIR No. 1206:

BOND RIR No. 1206 is a rust inhibiting rinse designed to stop corrosion on steel parts in the cleaning process. It contains liquid organic corrosion inhibitors which function by neutralizing the acid characteristics of the metal surface. Penetrating agents enable the inhibitors to make complete contact with the surface and facilitate rapid drain-off of rinse water. It does not contain chromates, nitrites, or petroleum type inhibitors which present disposal problems.

There are no adverse effects on paint bonding to the ware because the inhibitor is compatible with water base paints and most solvent base paints.

Form: Off-white, clear, liquid

Color: Light amber

Specific gravity 60F: 1.039

Weight per gallon: 8.66 pounds

Odor: Aromatic, slight

Flash point: None

BOND CHEMICALS INC.: Corrosion Inhibitors (Continued):**BOND RI No. 1235:**

BOND RI No. 1235 is an easy to use nitrite base product for temporary in-plant control over rusting and corrosion of freshly cleaned parts or new machine parts. It does not deposit a sticky film--after drying, the surfaces are completely dry to touch and non-tacky. The protective film is one molecule thick and does not interfere with subsequent cleaning and painting operations. Parts are protected against rusting while in plant storage--under cover for periods of up to 30 days depending upon local atmospheric conditions.

Appearance: Light amber liquid

Odor: Light--ammoniacal

Specific Gravity: 1.183

Weight per Gallon: 9.87 pounds

pH 1% solution: 9.55

Viscosity: 10 seconds, Ford Cup

BOND No. 1280 Rust Preventative:

This rust preventative and corrosion inhibitor has the unique property to pick up and displace water and moisture from a metal surface. After drying, a transparent protective coating is formed on the metal surface which prevents rusting during storage either inside or outside under cover.

Appearance: Light brown liquid at room temperature

Weight per Gallon: 6.85 pounds

Toxicity: None

Flash Point: 140F.

Safety on Metals: No attack on any metal or alloy.

BOND C.O.P. No. 1295:

BOND C.O.P. No. 1295 is an aqueous phase oxidation preventative product designed to provide long lasting protection to metallic surfaces, especially non-ferrous metals. It provides a chemically-bonded monomolecular barrier which does not wipe off, resists washing with water, and removal by many organic solvents. Bonding is very tenacious to copper where it forms complexes and the same metallic complexing has been verified with other metals.

BOND C.O.P. No. 1295 contains no toxic heavy metals, nitrites, silicates or other inorganic material. It is of very low order of toxicity and contributes very little B.O.D. to the system.

Appearance: Clear-light brown liquid

Odor: Smells like amine

Viscosity: 10 seconds No. 4 Ford Cup

Miscibility w/water: Miscible in all proportions

pH: 11.10

SG: 1.035

Wt./gal.: 8.62

THE BRULIN CORP.: Rust Preventatives:

RP 800:

RP 800 is a soft, high quality oil type rust preventive developed for long indoor storage.

Physical Characteristics:

Specific Gravity: .796

Pounds/Gallon: 6.64

Non-Volatiles: 34%

Closed Cup Flash Point: 105F.

Features: Water displacing, good in high humidity atmospheres, easy to remove when and if necessary.

Suggestions: Highly machined precision parts, bearings, cam shafts, etc., coiled steel stock.

Solvent Carrier: Petroleum Spirits.

Method of Application: Spray or dip.

Humidity Cabinet: 100% Relative Humidity 100F. - 900 hours minimum.

Coverage: 2,000 square feet per gallon

Removal: * Alkaline cleaner or petroleum solvent.

* RP 800 is generally compatible with most petro base oils and grease and thus it need not be removed.

RP 801:

RP 801 is a semi-firm waxy film rust preventative developed for long outdoor storage.

Physical Characteristics:

Specific Gravity: .870

Pounds/Gallon: 7.25

Total Solids: 42%

Closed Cup Flash Point: 105F.

Features: Good in acid atmospheres, good for extended outdoor storage. Thixotropic in nature which makes it less messy when sprayed. (Little or no drip or run off). May be dyed or pigmented to be used as a permanent coating.

Suggested Uses: Structural steel exposed to acid atmospheres. For storage of large equipment during shipment, storage or mothballing. Ferrous parts or equipment exposed to extended salt air conditions.

Solvent Carrier: Petroleum Spirits.

Method of Application: Spray. Lends itself well to an airless system.

Humidity Cabinet: 100% Relative Humidity--4,200 hours minimum.

Salt Spray: 5% Salt at 95F.--1,400 hours.

Coverage: 200-300 sq. ft. per gallon

Removal: Petroleum solvent or steam cleaning.

THE BRULIN CORP.: Rust Preventatives (Continued):

RP 802:

Concentrate. RP 802 is a water dilutable rust preventative designed for long term indoor storage.

Physical Characteristics:

Specific Gravity: .910

Pounds/Gallon: 7.59

Solids: 85%

Closed Cup Flash Point: 150F. Min.

Flash Point of Dilution: None

Features: Effective diluted up to 10 parts of water.

Highly versatile and very economical.

Suggested Uses: Machined precision parts, fabricated steel parts.

Method of Application: Spray or dip.

Humidity Cabinet: 100% Relative Humidity 100F.--800 hours minimum.

Coverage: Dependent on dilution rate.

Solvent Carrier: Oil Base (can be diluted with solvent or water).

Removal: Alkaline cleaner or petroleum solvent.

RP 808:

RP 808 is a soft film rust preventative developed for short term outdoor or long term indoor storage.

Physical Characteristics:

Specific Gravity: .840

Pounds/Gallon: 7.0

Non-volatiles: 100%

Closed Cup Flash Point: 260F.

Features: Good protection for ferrous and non ferrous metals.

Excellent vapor phase inhibitor for closed containers and tanks.

Method of Application: Spray, dip or flow coating.

Humidity Cabinet: 100% Relative Humidity 100F.--700 hours minimum.

Coverage: 2,000 sq.ft./gal.

Solvent Carrier: Petroleum oil.

Removal: Petroleum solvent, steam cleaning, detergent wash.

THE BRULIN CORP.: Rust Preventatives (Continued):

RP 809:

RP 809 is a greasy film rust preventative developed for limited outdoor storage and long indoor storage.

Physical Characteristics:

Specific Gravity: .870

Pounds/Gallon: 7.25

Non-volatiles: 30%

Closed Cup Flash Point: 115F.

Features: Good in acid atmospheres. Thixotropic in nature which makes it easier to spray.

Suggested Uses: Structural steel exposed to acid atmospheres. Ferrous and non ferrous metals.

Method of Application: Spray. Lends itself well to an airless system.

Solvent Carrier: Petroleum Spirits.

Humidity Cabinet: 100% Relative Humidity @ 100F - 3000 hours minimum.

Salt Spray: 5% salt solution 95F - 1,000 hours minimum.

Coverage: 600-800 square feet per gallon.

Removal: Petroleum solvent or steam cleaning.

RP 814 FR:

RP 814 FR is a soft, oil type rust preventative developed for long indoor storage.

Physical Characteristics:

Specific Gravity: .857

Pounds/Gallon: 7.15

Solids: 43.5

Closed Cup Flash Point: 155F. Tag Closed Cup

Features: Water displacing. Good in high humidity atmospheres. Easy to remove when and if necessary. Contains additives to neutralize fingerprint acids.

Suggestions: Highly machined precision parts, bearings, cam shafts, etc., coiled steel stock.

Humidity Cabinet Test: 100% Relative Humidity 100F. - 800 hours minimum.

Method of Application: Spray or dip

Removal: *Alkaline cleaner or petroleum solvent.

* RP 814 FR is generally compatible with most petro based oils and grease and thus it need not be removed.

THE BRULIN CORP.: Rust Preventatives (Continued):**RP 828:**

Metal film rust preventative RP 828 is a heavy oil rust preventative for use on steel stampings, machined surfaces, bearings, and other ferrous metals.

Physical Characteristics:

Specific Gravity: .900

Pounds/Gallon: 7.506

Non-volatiles: 98%

Closed Cup Flash Point: 250F.

Features: RP 828 is a water displacing rust preventative that contains a highly effective extreme pressure additive and has excellent lubrication properties.

Method of Application: Spray or dip

Coverage: 1,500 square feet per gallon

Removal: Solvent or alkaline wash

RP 835:

Brulin's RP 835 is a metal pretreatment that is used prior to painting of steel surfaces. RP 835 acts by passivating the metal surface thereby preventing "pin hole rusting". RP 835 is provided as a concentrate and should be diluted before use. It does not need to be rinsed off prior to painting.

Chemical Characteristics:

Chemical Composition: Corrosion inhibitors and water

Physical Form: Liquid

* Color: Water white

* Odor: Mild

* Viscosity: Water thin

* Lbs./gallon: 8.60

* Specific gravity: 1.032

Diluent: Water

Dilution Rate: 1:10 to 1:15

Phosphate-Free: Yes

Flash Point: None

Foaming Tendency: None

pH of Concentrate: 7-8

pH of Working Solution: 7-8

Total Active: 5%

Effect of Working Solutions on Metals: Safe

Method of Application: Dip or spray

THE BRULIN CORP.: Rust Preventatives (Continued):

RP 837:

Brulin's RP 837 is a highly concentrated rust preventative that is soluble in water. Brulin's RP 837 should be diluted with water from 1:50 to 1:150 depending on degree of protection required.

Physical Properties:

Specific Gravity: 1.09
Solids: 60%
Diluent: Water
Flash Point: None

RP 841:

Brulin's RP 841 is a rust preventative designed specifically for water bath hydrostatic testing. Brulin's RP 841 is highly concentrated and can be diluted with up to 100 parts of water. Brulin's RP 841 will not emulsify oils and grease so the bath will stay clear and cleaner longer. Any oil introduced with the parts will float on the surface and can then be removed. RP 841 will not contribute to foam generation.

Physical Properties:

Color: Clear water white
Odor: None
Sp. Gr.: 1.275
Flash Point: None

METAL FILM RP 849:

RP 849 is a high solids rust preventative designed to give indoor and outdoor protection to metal surfaces. RP 849 gives a firm, waxy coating that affords excellent protection in normal and salt atmospheres.

Chemical Characteristics:

Chemical Composition: Wax like compounds and petroleum hydrocarbons

Physical Form: Thick liquid

- * Color: Tan
- * Odor: Distinctive
- * Viscosity: 4000-8000 cps
- * Lbs./gallon: 7.55
- * Specific gravity: .905 gm/cc

Flash Point: 105F TCC

Total Active: 52%

Effect of Working Solutions on Metals: Metal Preservative

Dry Time: 1-2 hours

Method of Application: Spray, dip or roll coat.

BUCKMAN LABORATORIES, INC.: Corrosion Inhibitors:

BUTROL 23:

Low Toxicity:

BUTROL 23 is based on the well-known and effective barium metaborate pigment that has been modified to provide superior performance without the toxicological concerns associated with lead and chromate pigments.

Cost Effectiveness:

The low concentrations of BUTROL 23 required to provide long-term corrosion protection generally means lower cost for a higher performance. Also, because of the light-stabilizing and chalk-retarding properties of BUTROL 23, coatings last longer.

Compatibility:

BUTROL 23 is a new, effective corrosion inhibitor that can be used in both solvent- and water-thinned coatings. Starting formulations based on a variety of resins for both Maintenance and OEM Systems are available on request.

BUTROL 33:

Corrosion Inhibitor for Flash Rust Control

Water-based coatings are corrosive to iron unless they are properly formulated with a corrosion inhibitor. Because of their corrosivity, many paint manufacturers package such coatings in either plastic or lined metal containers. Both types of containers are expensive and often unavailable, making the use of metal cans necessary. When unlined metal cans are used to package water-based coatings, BUTROL 33 is the product of choice for in-can corrosion resistance.

Another corrosion problem associated with water-based coatings is flash rusting. Flash rusting occurs under certain conditions when water-based coatings are applied directly onto ferrous metal substrates. This phenomenon typically occurs when there is high humidity and slow drying. As the film dries, water-soluble corrosion products migrate into the film and become visible as rust-colored spots. Early rusting is similar to flash rusting, but it occurs after the paint film has already dried to touch. BUTROL 33 has demonstrated effectiveness in controlling both flash and early rusting.

Density at 25C (77F): 1.38 g/mL

Weight per U.S. gallon: 11.5 lb

Volume per kilogram: 725 mL

Volume per pound: 330 mL

pH (100 ppm in distilled water): 9-10

BUCKMAN LABORATORIES, INC.: Corrosion Inhibitors (Continued):

BUTROL 35:

For In-Can Corrosion Resistance in Water-Based Coatings

Unless protected by a corrosion inhibitor, water-based coatings are corrosive to iron. Many paint manufacturers have chosen to package such coatings in either plastic containers or lined metal ones. However, such containers are costly and often unavailable in some areas, making the use of metal cans necessary. In these instance, BUTROL 35 is the product of choice for in-can corrosion resistance.

Corrosion can also be a problem in lined metal containers when lining breaks occur at the seams, at the ears, or in the ring and curl portion of that container. BUTROL 35 is effective in controlling corrosion in such cases.

Density at 25C (77F): 1.35 g/mL

Weight per gallon: 11.2 lb

Volume per kilogram: 740 mL

Volume per pound: 335 mL

pH of 100 ppm in distilled water: 10-11

BUTROL 9100:

Modified Calcium Metaborate Corrosion Inhibitive Pigment

BUTROL 9100 is a modified calcium metaborate pigment used in coatings to provide long-term protection against rusting and oxidation. With BUTROL 9100, high performance corrosion resistant coatings can be formulated without using lead, chromates, or other toxicologically undesirable metals or salts.

BUTROL 9101:

Long-Term, Liquid Corrosion Inhibitor

BUTROL 9101 is a liquid, organic corrosion inhibitor used in coatings to provide long-term protection against rusting and oxidation.

BUTROL 9101 offers the advantage of being free of lead, chromates, and other toxicologically undesirable metals and salts. Since the product does not contribute color or hiding properties, BUTROL 9101 can be used to formulate white and transparent coatings and can be used in primers as well as topcoats. Because it is a liquid, BUTROL 9101 can be added in the letdown or even post-added.

Appearance: Amber liquid

Viscosity (Gardner): D

Refractive Index: 1.476

Density at 25C (77F): 1.14 g/mL

Weight per gallon: 9.51 lb/gal

Flash point: 196F

Odor: Slight amine

BUCKMAN LABORATORIES, INC.: Corrosion Inhibitors (Continued):**BUSAN 11-M1:**

A multifunctional pigment that is used in coatings as a package preservative, can corrosion inhibitor, mold inhibitor (fungicide), corrosion inhibitor, ultraviolet light stabilizer, tannin stain blocking agent, flame retardant, and white rust inhibitor (zinc rich paints). Because it is multifunctional, it can replace five (5) or six (6) other products commonly warehoused by paint companies. The use of BUSAN 11-M1 results in less product needing to be stored, a faster turnover of raw materials, and a savings in raw material costs.

BUSAN 11-M1 is the commercial form of modified barium metaborate, monohydrate.

Appearance: White powder

Density (g/cm³): 3.25-3.35

Density (lb/gal): 27.5

Bulking value (gal/lb): 0.036

Refractive index: 1.55-1.60

Oil absorption (lb/100 lbs): 30

pH of saturated solution (70F): 9.8-10.3

Solubility (%):

Ambient temperatures: 0.3 maximum

Boiling water: 0.4 maximum

Fusion point (F): 1650-1920

Fusion point (C): 900-1050

Thermal gravimetric test: Initial weight loss at approximately 200C (392F)

Particle size: 99.5% <20 microns

95.0% <10 microns

75.0% < 5 microns

**BUTLER ENGINEERING ASSOCIATES, INC.: COR-EX Color-Coded
Liquid Boiler Water Treatment:**

Corrects and prevents rust and scale conditions in steam and hot water systems

- * COR-EX stops scale and corrosion and removes old deposits.
- * COR-EX has been specially formulated for heating boilers, especially those under part-time supervision.
- * COR-EX is needed in schools, apartment houses, hotels, motels, commercial and domestic boilers.
- * COR-EX is color-coded, requiring only visual check to determine if boiler is protected. No chemistry is involved and no water analyses necessary.
- * COR-EX reduces maintenance costs and lengthens boiler life by stopping corrosion and the formation of heat-consuming lime scale. (Expensive leaks, re-tubing, re-piping, heat loss and higher fuel bills are all caused by corrosion and scale.)
- * COR-EX is, as a rule, added once per heating season. If additional treatment is required due to leaky system, color-coding tells you when and how much to add.
- * COR-EX can be handled with normal care. It contains no corrosive caustics or poisonous chromates, and conforms to laws in most areas regarding pollution and dumping of poisonous compounds into sewage systems.

Trade Name Index

Trade Name	Supplier
ABOCOAT	Abatron, Inc.
ABOCURE	Abatron, Inc.
ACID AID	Crown Technology, Inc.
ACQUA	Allied-Signal, Inc.
ACTIVOL	Harry Miller Corp.
ACTRACOR	Climax Performance Materials
ALCODET	Rhone-Poulenc
ALKAMULS	Rhone-Poulenc
ALKATERGE	Angus Chemical Co.
ALLIED-KELITE	Witco Corp.
ALL-ORGANIC PLUS	Diversey Water Technologies
ALOX	Alox Corp.
ALPHA-STEP	Stepan Co.
ALTRAGARD	Maurer-Shumaker, Inc.
ALTRASEAL	Maurer-Shumaker, Inc.
AMEENEX	Costec Inc.
AMIDEX	Costec Inc.
AMINE	Angus Chemical Co.
AMMONYX	Stepan Co.
AMOCO	Amoco Petroleum Co.
ANCOR	Air Products and Chemicals
ANOX	SKS Industries
ANTARA	Rhone-Poulenc
AQUALOX	Alox Corp.
ARMITE	Armite Laboratories
ARMOHIB	Akzo Chemicals Inc.
A-RUST	Process Research Products
ATPET	ICI Surfactants
ATRUST	ICI Surfactants
AXXACOAT	Northern Instruments Corp.
AXXADRY	Northern Instruments Corp.
AXXANOL	Northern Instruments Corp.
AXXATEC	Northern Instruments Corp.
BARACOR	Baroid Drilling Fluids, Inc.
BARAFILM	Baroid Drilling Fluids, Inc.
BAR'S LEAKS	Bar's Leaks, Inc.
BAR'S RUST	Bar's Leaks, Inc.
BETZ	Betz Industrial
BETZ BALANCED POLYMER	Betz Industrial
BETZ CONTINUUM	Betz Industrial
BETZ COPPER-TROL	Betz Industrial
BETZ CORROGEN	Betz Industrial

Trade Name

BETZ CORR-SHIELD
 BETZ COR-TROL
 BETZ LAYUP
 BETZ MAGNI-FORM
 BETZ OPTI-MEEN
 BETZ OPTI-TROL
 BETZ PERMACOL
 BETZ SULFITE
 BETZ TECHNIPROBE
 BIO-TERGE
 BIRCHWOOD CASEY
 BITUMASTIC
 BITUMASTIC SUPER SERVICE
 BITUMASTIC SUPERTANK
 BITUPLASTIC
 BLUE ICE-M
 BOILERGUARD
 BOND
 BRAY
 BRAYCO
 BRAYCOTE
 BUROLOCK
 BUSAN
 BUTROL

CALGON
 CALGON ULTRAMARINE
 CANMIST
 CANT-RUST
 CARSAMIDE
 CASTROL
 CASTROL RUSTILO
 CASTROL TARP
 CHEMPAGARD
 CHEMZOLINE
 CLIMAX
 COBRATEC
 CONDUCTOR
 CONQUOR
 COR-EX
 COR-LUBE
 COR-MASTIC
 CORTEC

Supplier

Betz Industrial
 Betz Industrial
 Betz Industrial
 Betz Industrial
 Betz Industrial
 Betz Industrial
 Betz Industrial
 Betz Industrial
 Betz Industrial
 Stepan Co.
 Birchwood Laboratories, Inc.
 KOP-COAT, Inc.
 KOP-COAT, Inc.
 KOP-COAT, Inc.
 KOP-COAT, Inc.
 Heatbath Park Metallurgical
 Calgon, Corp.
 Bond Chemicals Inc.
 Castrol Inc.
 Castrol Inc.
 Castrol Inc.
 Calgon Corp.
 Buckman Laboratories, Inc.
 Buckman Laboratories, Inc.

 Calgon Corp.
 Calgon Corp.
 American Charcoal Div.
 American Charcoal Div.
 Lonza Inc.
 Castrol Industrial Inc.
 Castrol Industrial Inc.
 Castrol Industrial Inc.
 Chem-Pak Inc.
 Costec Inc.
 Climax Performance Materials
 PMC Specialties Group
 Calgon Corp.
 Calgon Corp.
 Butler Engineering
 Cortec Corp.
 Cortec Corp.
 Cortec Corp.

Trade Name	Supplier
CROWN	Crown Technology, Inc.
CUPROSTAT	Calgon Corp.
CUVAN	R.T. Vanderbilt Co., Inc.
CYCLOMIDE	Rhone Poulenc
CYCLOPHOS	Alcolac
DIANODIC	Betz Industrial
DCI	DuPont Co.
DCI	W.R. Grace & Co.
DOW CORNING	Dow Corning Corp.
DRI-TOUCH	Birchwood Laboratories, Inc.
DUPONT	DuPont Co.
EXTEND	Loctite Corp.
FERRO-BET	Beck Chemicals Inc.
FLOMAG	Martin Marietta Magnesia Specialties, Inc.
GALVA BRIGHT	Crown
GLAMORGLAZE	KOP-COAT, Inc.
GLAMORTEX	KOP-COAT, Inc.
GRAFFITI PREVENTER	Beck Chemicals, Inc.
HALOX	Halox Pigments
HI-GARD	KOP-COAT, Inc.
IDA-FREEZE	Ideas, Inc.
IDA-KOTE	Ideas, Inc.
IDA-MID	Ideas, Inc.
IDA-SOIL	Ideas, Inc.
IDA-SOL	Ideas, Inc.
IDOX	Ideas, Inc.
IGEPAL	Rhone-Poulenc
IMMUNOL	Harry Miller Corp.
INERTOL	KOP-COAT, Inc.
IRGACOR	Ciba-Geigy Corp.
IRIDITE	Witco Corp.
ISOBRITE	Witco Corp.
ISOPREP	Witco Corp.
JET AMINE	Jetco Chemicals, Inc.
JET BASE	Jetco Chemicals, Inc.

Trade Name

KATAPOL
KEMAMINE
KEM-CUT
KEYKOTE
KLEANRITE
KLEER KOTE
KOP-COAT

LED-PLATE
LEXISTRIP
LUBRIZOL

MACCO
MACKAM
MAKERCLEAN
MAKON
MAXAHIBIT
MAYCO
MAZON
MAZTREAT
MCS PLUS
MELCOTE
METACOR
METAL FILM
MICROCHEM
MIRAMINE
MOGUL
MOLD SHIELD
MOLYBRINE
MOLYHIBIT
MONACOR
MONALUBE
MONAMULSE
MONATERIC
MULTIFIX
MULTIONIC

NACAP
NACORR
NALZIN
NIKLAD
NINATE
NORSOL

Supplier

Rhone-Poulenc
Humko Chemical Division
Heatbath Park Metallurgical
Witco Corp.
Parker+Amchem Div.
Crown
KOP-COAT, Inc.

Armite Laboratories
Beck Chemicals, Inc.
Lubrizol Corp.

Witco Corp.
McIntyre Group Ltd.
Maurer-Shumaker, Inc.
Stepan
Climax Performance Materials
Mayco Oil & Chemical Co.
PPG/Mazer Chemicals
PPG/Mazer Chemicals
Calgon Corp.
Metal Lubricants Co.
Cortec Corp.
The Brulin Corp.
Diversey Water Technologies
Rhone-Poulenc
Diversey Water Technologies
Percy Harms Corp.
Climax Performance Materials
Climax Performance Materials
Mona Industries, Inc.
Mona Industries, Inc.
Mona Industries, Inc.
Mona Industries, Inc.
Process Research Products
Western Water Management

R.T. Vanderbilt Co., Inc.
King Industries, Inc.
RHEOX, Inc.
Witco Corp.
Stepan Co.
McGean-Rohco, Inc.

Trade Name	Supplier
NORTEX	McGean-Rohco, Inc.
NORUST	Raybo Chemical Co.
NO-RUST	Percy Harms Corp.
PARKOTE	Heatbath Park Metallurgical
PENETRANT PLUS	Percy Harms Corp.
PENNAD	Elf Atochem North America
PHREEGUARD	Calgon Corp.
POLYRAD	Hercules Inc.
PRE-TECT	Calgon Corp.
PRESTO BLACK	Birchwood Laboratories, Inc.
PRESTO KLEEN	Birchwood Laboratories, Inc.
PRESTO-KOTE	Birchwood Laboratories, Inc.
PRESTO PREP	Birchwood Laboratories, Inc.
PROTECH	Chemical Technologies Inc.
PRO-TECH	Professional Technical Chemical
PRO-TEK-A	Chem-Pak Inc.
RAYBO	Raybo Chemical Co.
REWOCORUS	Sherex Chemical Co., Inc.
RIP	Rawn Co., Inc.
RODINE	Parker+Amchem Div.
ROKON	R.T. Vanderbilt Co., Inc.
RUSTARMOR	KOP-COAT, Inc.
RUSTIB	Raybo Chemical Co.
RUSTLICK	ITW Devcon Corp.
RUST-SHIELD	McGean-Rohco Inc.
SACI	Witco Corp.
SANDOCORIN	Sandoz Chemicals Corp.
SATIN SHIELD	Birchwood Laboratories, Inc.
SCORGUARD	Western Water Management
SHEATH	Birchwood Laboratories, Inc.
SHIELDX	Davison Chemical Div.
SLIDE	Percy Harms Corp.
STEELGARD	Harry Miller Corp.
STEPAN	Stepan Co.
STEPFAC	Stepan Co.
SUL-FON-ATE	BIT Manufacturing, Inc.
SUPER HI-GARD	KOP-COAT, Inc.
SYNKAD	Keil Chemical Div.
TECTYL	Ashland Industrial Products, Inc.

Trade Name**Supplier**

THIOKOL

Morton International

TOMAH

Exxon Chemical Co.

TREFRAWN

Rawn Co., Inc.

TYFOSEAL

National Research & Chemical

ULTRAGANIC

Maurer-Shumaker, Inc.

ULTRAMATE

Maurer-Shumaker, Inc.

ULTRAPHOS

Maurer-Shumaker, Inc.

ULTRAZINC

Maurer-Shumaker, Inc.

UNAMIDE

Lonza Inc.

UNIDYME

Union Camp Corp.

UNIHIB

Lonza Inc.

VANCHEM

R.T. Vanderbilt Co., Inc.

VANCORR

R.T. Vanderbilt Co., Inc.

VANDERBILT

R.T. Vanderbilt Co., Inc.

VANLUBE

R.T. Vanderbilt Co., Inc.

VAN STRAATEN

Castrol Industrial Inc.

VAPO-BAR

Beck Chemicals, Inc.

VARAMIDE

Sherex Chemical Co., Inc.

VIRCO-PET

Albright & Wilson Americas

WATCON

Watcon, Inc.

WELCHEM

Welchem, Inc.

WELLAID

Welchem, Inc.

WESTERN

Western Water Management

WINSOR

Witco Corp.

ZERUST

Northern Instruments Corp.

Product Information

ABATRON, INC.: ABOCOAT Coatings:

ABOCOAT 8006-3 & 8606-3:

Clear versatile epoxy protective and dielectric coating.

For spraying, brushing or rolling on metal, concrete, masonry, wood, fiberglass and most surfaces.

Superior adhesion, flexibility, hardness, water and chemical resistance

ABOCOAT/ABOCURE 8006-3 (standard version)

ABOCOAT/ABOCURE 8606-3 (rule 66 exempt version)

Suggested Uses:

Heavy-duty all-purpose protection against water, alkalis, diluted acids, common solvents, corrosion, wear. Corrosion inhibition also on tightly bound rust. Superior salt spray resistance in marine and industrial applications. Concrete, wood and metal floors coating. Brushing on moist or wet surfaces tends to emulsify water, which then evaporates with solvent. Protection of wooden furniture in plants, laboratories, commercial kitchens, hospitals. Most effective for protection of all kinds of electric and electronic components.

Characteristics:

ABOCOAT: Clear resin in organic solvent.

ABOCURE: Clear converter in organic solvent.

Total Solids: 47.4%

Weight/Gallon: 8.03 Lbs. (3.64 Kg).

Viscosity: 25 secs., #4 Ford cup

Pot Life: 60-75 hours

ABOCOAT 8003-3:

Clear One-Package, Moisture-Cure Polyurethane Coating

For hardwood, concrete and seamless floors.

Designed for high flexibility, abrasion, chemical and corrosion resistance. Excellent wear and antiskid properties.

Specifications:

% Solids: 40

Viscosity, @ 25C: 0.6-1.25 Stokes

Gardner Color: <1

Lbs/Gallon: 8.0

Kg/Liter: 0.96

Flash point: 80F (closed cup)

Characteristics:

Exceptionally tough, flexible, chemical resistant and durable.

Practically colorless, it remains so indoors and never needs waxing.

Fast drying; two or three coats can easily be applied in one day.

Easy to apply with paintroller, brush or spraygun.

Very economical, as it lasts many times as long as other coatings.

Right consistency for effectively sealing porous floors and other surfaces.

AIR PRODUCTS AND CHEMICALS, INC.: ANCOR CR Series Corrosion Inhibitors for Strong Acid Systems:

Air Products offers two fully formulated corrosion inhibitors for use in low pH systems - ANCOR CR-538 and ANCOR CR-539 corrosion inhibitors. These products are proprietary acetylenic alcohol-based inhibitors specifically formulated for use in acid pickling baths and industrial cleaning solutions of sulfuric, hydrochloric, phosphoric, hydrofluoric, citric and oxalic acids. They are low viscosity liquids which can be introduced directly into acid pickling or cleaning solutions to enhance corrosion protection over a broad temperature range with a wide variety of metals, including mild steels, copper, copper alloys and aluminum.

ANCOR CR-538 Corrosion Inhibitor:

Clear Liquid
Color: Amber
Specific Gravity, 20C: .912
pH (1% in H₂O): 10.00
Flashpoint (Closed Cup), F: 123
Boiling Point, C: 139
Vapor Pressure, 25C mm/tg: 6
Water Solubility: Dispersible

ANCOR CR-539 Corrosion Inhibitor:

Clear Liquid
Color: Amber
Specific Gravity, 20C: .920
pH (1% in H₂O): 11.15
Flashpoint (Closed Cup), F: 83
Boiling Point, C: 116
Vapor Pressure, 25C mm/tg: 15
Water Solubility: 1.0%

Features and Benefits of ANCOR CR Series Corrosion Inhibitors:

- * corrosion protection of a wide variety of metals and alloys
- * effective inhibition with most acid solutions used in pickling and cleaning solutions
- * performance over a broad temperature range to 275F
- * decreased pitting, reduction of hydrogen diffusion into the metal structure and reduced hydrogen embrittlement allowing longer equipment life and production of smooth, clean surfaces
- * effective inhibition in solutions containing high concentrations of dissolved iron.

AIR PRODUCTS AND CHEMICALS, INC.: Corrosion Inhibitors:

ANCOR DMEA:

Dimethylethanolamine is a clear, colorless liquid with an ammonia-like odor. It contains a tertiary amine group and a hydroxyl group, and, therefore, undergoes reactions typical of both amines and alcohols.

Physical Properties:

Clear, colorless liquid
Odor: Ammonia-like
Color, Platinum-Cobalt: 20 max.
Dimethylethanolamine, wt. %: 99 min.
Water, wt. %: 0.2 max.
Boiling Point, C at 760mm Hg: 134.6
Freezing Point, C: -58.6
Flash Point, Open Cup, C: 40
Molecular Weight: 89.14
Specific Gravity, @ 20C: 0.89
Calculated Hydroxyl Number: 629

Applications:

ANCOR DMEA is used in protective coatings, water treatment, corrosion inhibition, and pharmaceutical applications, and in the manufacture of resins. It also finds use as a volatile surfactant.

ANCOR OW-1 Corrosion Inhibitor:

ANCOR OW-1 inhibitor is a secondary acetylenic alcohol.

Physical Properties:

Clear amber liquid
Odor: Sharp
Boiling Point, C: 89.0
Specific Gravity, 20/20C: 0.9022
Weight/gal., lbs.: 7.50
Viscosity at 23C: 14.5 cps
Pour Point, F: -60
Flash Point, T.C.C., F: 89
pH: 6.7
Vapor Pressure 0C: 4 mm
 25C: 21 mm

Applications:

OW-1 is an effective corrosion inhibitor in mineral acid systems, such as hydrochloric, sulfuric, sulfamic, and phosphoric. Excellent corrosion protection is experienced in strong acid environments from room temperature to greater than 200F, at concentrations as low as 0.05% by weight of total dilute solution.

OW-1 inhibitor is used in oil well acidizing at intermediate and high temperatures (200F).

When blended with nitrogen containing compounds, OW-1 inhibitor produces synergistic low cost effective inhibitors for acid pickling.

AIR PRODUCTS AND CHEMICALS, INC.: Ethyl Octynol (4-ethyl-1-octyn-3-ol):

Ethyl Octynol is a secondary acetylenic alcohol.

Physical Properties:

Clear pale yellow liquid
Odor: Slightly penetrating
Boiling Point, C: 197.2
Specific Gravity, 20/20C: 0.873
Weight/gal., lbs.: 7.265
Viscosity @ 23C: 10.5 cps.
Pour Point, F: <-54
Flash Point, T.C.C., F: 169
pH: 4.6
Vapor Pressure 0C: 6 mm
 25C: 30 mm

Ethyl Octynol is a very cost effective corrosion inhibitor in acid systems. It is an excellent inhibitor for oil well acidizing, mild steel pickling, and mild steel cleaning in acid systems.

Ethyl Octynol is an effective corrosion inhibitor from ambient to elevated (300F) temperature. In conjunction with other acetylenic alcohols, Ethyl Octynol is synergistic. It is an effective inhibitor in hydrochloric, sulfuric, sulfamic, phosphoric, and other strong mineral acids. And like other acetylenic alcohols, Ethyl Octynol is an effective plating additive for bright nickel compounds.

AKZO CHEMICALS INC.: ARMOHIB Corrosion Inhibitors:

ARMOHIB is the trade name for acid corrosion inhibitors developed by Akzo Chemie America, ArmaK Chemicals. These aliphatic nitrogen inhibitors retard the corrosive effect of acids on metals during pickling, process equipment cleaning and oil well acidizing operations. These products were formulated for use with specific acids. ARMOHIB 31 may be used with sulfuric, sulfamic, citric and phosphoric acids. ARMOHIB 28 is used with hydrochloric acid and hydrochloric-hydrofluoric acid mixtures.

ARMOHIB corrosion inhibitors offer low-cost, dependable protection over a wide range of temperatures. Acid attack on metals can be retarded by incorporating small amounts of these chemicals with the acid, yet the cleaning action of the acid is not affected. Since the ARMOHIB compounds are all liquid, readily soluble in acid, non-staining and do not precipitate on standing, they are easy to use.

ARMOHIB 28 and ARMOHIB 31 must pass corrosion performance tests in order to meet specifications. 0.25% ARMOHIB 28 in 15% hydrochloric acid at 200F must show less than 0.022 lb/ft²/day corrosion of mild steel. 0.06% ARMOHIB 31 in 15% sulfuric acid at 200F must show less than 0.027 lb/ft²/day corrosion of mild steel.

ARMOHIB 28:

Specific Gravity at 25C: 0.925
Pounds Per Gallon: 7.69
Appearance at 25C: Amber Liquid
Pour Point F: 52
Flash Point F: 90

ARMOHIB 31:

Specific Gravity at 25C: 1.042
Pounds Per Gallon: 8.66
Appearance at 25C: Amber Liquid
Pour Point F: 24
Flash Point F: 340
Cloud Point F: 28

Applications:

Acid Pickling: Pickling is the removal of oxide scales formed during metal working operations by mineral acids. Hydrochloric, phosphoric and sulfuric acids are commonly used. These scales must be removed without undue acid attack on the base metal surface. An inhibitor is therefore used to protect the cleaned surface, reduce acid wastage and metal loss and prevent pitting and discoloration of the metal.

Plant Cleaning: Inhibited acids are used extensively in plant cleaning, both pre-commission and periodic planned service cleaning.

Oil Well Acidizing: In the fracturing and acidizing of compact oil formations, dilute hydrochloric acid is used to dissolve the undesirable carbonate deposits of scales which interfere with the passage of oil in tubing or in the formation itself.

ALBRIGHT & WILSON AMERICAS: VIRCO-PET 20 Corrosion Inhibitor:

VIRCO-PET 20 is a tan viscous liquid, miscible with a wide variety of organic solvents. It is an ashless, neutral organic compound which can be safely used in applications where corrosion is a problem.

Intensive tests have shown VIRCO-PET 20 to be an excellent corrosion inhibitor for both steel and aluminum. It performs well in either organic or aqueous systems, particularly under acid conditions.

VIRCO-PET 20 acts by forming a film or barrier on the surface of the metal which effectively seals it against attack by corrosive agents.

Suggested Uses:

Petroleum Products: Excellent compatibility and anti-corrosive action at low concentration make VIRCO-PET 20 a highly efficient corrosion inhibitor for the protection of engine parts, tankers, pipelines, storage tanks, and other petroleum-handling facilities. Effective inhibitor action against the attack of sea water is an outstanding characteristic.

Protective Coating
Antifreeze Compounds
Miscellaneous

VIRCO-PET 30:

VIRCO-PET 30 is a water soluble organic phosphorus chemical which gives outstanding corrosion protection to aluminum and its alloys even when aluminum is galvanically coupled with other metals. This new corrosion inhibitor also affords protection for steel, iron, copper, bronze, brass and other metals and alloys.

Tan, viscous liquid
Specific Gravity 20/4C: 1.062
Refractive Index: n 20D: 1.447
Viscosity at 100F: 332 Centistokes
Flash Point, Cleveland Open Cup: 195F
Fire Point, Cleveland Open Cup: 255F

VIRCO-PET 30's water solubility and broad inhibition characteristics, even in galvanically coupled systems, make it ideally suited for use in water-cooled engines, heat exchangers, metal cooling towers, and other metallic equipment which come in contact with aqueous and aqueous-organic solutions.

Aluminum:

The most unique activity of VIRCO-PET 30 is its protection of aluminum. This metal and its alloys are resistant to normal corrosion but are susceptible to attack by mineral-containing aqueous and semi-aqueous systems. When aluminum is galvanically coupled with a more noble metal, corrosion is accelerated.

Iron and Steel
Copper, Bronze and Brass

ALBRIGHT & WILSON AMERICAS INC.: VIRCO-PET 40 Corrosion Inhibitor:

Aluminum pigmented coatings frequently evolve gas in sufficient quantities to cause bulging and rupture of the storage containers.

VIRCO-PET 40 effectively inhibits hydrogen formation in aluminum pigmented coatings and should be evaluated in any such system where gassing is a problem.

To determine the effectiveness of VIRCO-PET 40 in hydrocarbon or water based aluminum pigmented coatings, VIRCO-PET 40 should initially be evaluated at the 1% by weight level; once the effectiveness of the product has been established, concentrations should be varied to determine optimum additive levels.

Solubility of VIRCO-PET 40 in the coating solvent is not mandatory; dispersion of VIRCO-PET 40 into the formulation generally suffices as long as contact with aluminum pigment is achieved. Product is soluble in water; it is insoluble in hexane.

ALCOLAC: CYCLOPHOS Phosphate Esters - Free Acid Form:

CYCLOPHOS P 4:

Type: Aliphatic

Foaming Properties: Very Low

% Concentration: 98

CYCLOPHOS PB 01:

Type: Aliphatic

Foaming Properties: Very Low

% Concentration: 98

CYCLOPHOS PG 55:

Type: Aliphatic

Foaming Properties: Very Low

% Concentration: 98

Extremely low foaming surfactants and emulsifiers used in mechanical dishwashers, pressure sprays, rinse aids, and low foam cleaners.

CYCLOPHOS PO 3:

Type: Aliphatic

Foaming Properties: Low

% Concentration: 98

Cosmetic grade phosphate ester used as conditioning agent and coupling agent in hair care and cosmetic preparations. Especially useful in ethnic personal care formulations as a solubilizer for mineral oil.

CYCLOPHOS PE 5:

Type: Aromatic

Foaming Properties: Moderate

% Concentration: 98

CYCLOPHOS PL 3

Type: Aliphatic

Foaming Properties: Moderate

% Concentration: 98

CYCLOPHOS PL 31:

Type: Aliphatic

Foaming Properties: Moderate

% Concentration: 98

Oil soluble moderate foaming emulsifiers. Alkali stable surfactants for degreasers, heavy duty metal washes, and industrial cleaners. Outstanding dispersants, lubricants, and anticorrosion agents.

**ALCOLAC: CYCLOPHOS Phosphate Esters - Free Acid Form
(Continued):**

CYCLOPHOS PB 12:

Type: Aromatic

Foaming Properties: High

% Concentration: 98

CYCLOPHOS PE 9:

Type: Aromatic

Foaming Properties: High

% Concentration: 98

CYCLOPHOS PE 120:

Type: Aromatic

Foaming Properties: High

% Concentration: 98

CYCLOPHOS PL 6A:

Type: Aliphatic

Foaming Properties: High

% Concentration: 98

CYCLOPHOS PL 61:

Type: Aliphatic

Foaming Properties: High

% Concentration: 98

Superb coupling agents and hydrotropes for formulated cleaner products. Excellent alkali and phosphate builder tolerance. Exceptional anticorrosion properties for metal treatment and industrial applications.

ALLIED SIGNAL: ACQUA Additives:

Use:

- * As additives in coating formulations, or
- * As supplied as protective coatings

Benefits:

- | | |
|-----------------------|---------------------------------|
| * Acid Resistant | * Water or Detergent Strippable |
| * Corrosion Resistant | * Water-Borne, Solvent Free |
| * Solvent Resistant | * Transparent |

ACQUA additives are solvent free aqueous dispersions of polyolefin based resins and can be formulated into coatings as an additive or used as supplied to form protective coatings.

ACQUA additives provide acid, solvent and corrosion resistance, but can also be used easily removed with alkaline detergent or water.

ACQUA 206:

% Solids: 20
Viscosity (cps): 20
pH: 9.5-10.5
Type: Anionic
Strippability: Detergent
Comments: Fast dry, low tack

ACQUA 207:

% Solids: 20
Viscosity (cps): 20
pH: 9.5-10.5
Type: Anionic
Strippability: Detergent
Comments: Like 206 but harder film

ACQUA 208:

% Solids: 20
Viscosity (cps): 10
pH: 9.5-10.5
Type: Anionic
Strippability: Detergent
Comments: Low odor

ACQUA 209:

% Solids: 20
Viscosity (cps): 400
pH: 9.5-10.5
Type: Anionic
Strippability: Detergent
Comments: Like 208 but harder film

ACQUA 220:

% Solids: 25
Viscosity (cps): 25
pH: 9.5-10.5
Type: Anionic
Strippability: Detergent
Comments: Hard film, low odor

ALLIED SIGNAL: ACQUA Additives (Continued):

ACQUA 225:

% Solids: 25
Viscosity (cps): 25
pH: 9.5-10.5
Type: Anionic
Strippability: Detergent
Comments: Like 220 but harder film

ACQUA 240:

% Solids: 20
Viscosity (cps): 15-20
pH: 9.5-10.5
Type: Anionic
Strippability: Water
Comments: Water strippable

ACQUA 241:

% Solids: 18
Viscosity (cps): 1700-1900
pH: 9.5-10.5
Type: Anionic
Strippability: Water
Comments: Anti-sag properties

ACQUA 242:

% Solids: 25
Viscosity (cps): 1800-2200
pH: 9.5-10.5
Type: Anionic
Strippability: Water
Comments: Pigmented for white films

ACQUA 250:

% Solids: 25
Viscosity (cps): 30
pH: 9.5-10.5
Type: Anionic
Strippability: Detergent
Comments: Detergent strippable

General Physical Properties of ACQUA Films:

Hardness (dmm): 0.9-4.0
Drop Point (C): 97-104
DSC Melt Characteristics: 54-82C
TGA - Weight Loss @ 300C Argon: 2.0-4%
 300C Air: 2.5-6.0%

ALOX CORP.: Emulsifiable Corrosion Inhibitors:

ALOX 575:

Acid Number: 9-11
Saponification Number: 28-31
Pour Point, F: +80
Specific Gravity: 1.02
Film Type: oily
Barium Content, %: 0.6

ALOX 2263:

Acid Number: 7-9
Saponification Number: 9-11
Melting Point, F: 150
Specific Gravity: 0.98
Film Type: oily
Barium Content, %: 0.5

AQUALOX 2268:

pH @ 1% in Water: 9-10
Melting Point, F: 135
Specific Gravity: 0.93
Film Type: waxy
Barium Content, %: none

ALOX 2289:

Acid Number: 16-21
Saponification Number: 37-45
Melting Point, F: 115
Specific Gravity: 0.90-0.94
Film Type: greasy
Barium Content, %: none

ALOX 2290:

Acid Number: 11-17
Saponification Number: 30-60
Melting Point, F: 110
Specific Gravity: 1.00-1.04
Film Type: oily
Barium Content, %: none

ALOX 2290A:

Acid Number: 10-15
Saponification Number: 50-75
Melting Point, F: 115
Specific Gravity: 1.01-1.05
Film Type: oily
Barium Content, %: none

AQUALOX 2295:

pH @ 1% in Water: 9-10
Melting Point, F: paste
Pour Point, F: +130F
Specific Gravity: .98
Film Type: waxy
Barium Content, %: none

ALOX CORP.: Rust Preventives--Corrosion Inhibitors:

ALOX 165:

Non-Emulsifiable, Non-Staining, Water Displacing Rust Preventive

ALOX 165 is an outstanding water displacing, non-staining rust preventive which will rapidly separate water displaced from metal surfaces after machining operations or after alkali cleaning. Ultra thin, highly protective films can be applied easily by the use of volatile solvent solutions of ALOX 165. These ultra thin films are effective in the protection of ferrous and non-ferrous metals from atmospheric corrosion even under conditions of high humidity. ALOX 165 also acts as a lubricant. ALOX 165 contains no metals except calcium.

Physical Appearance: Soft, waxy, brown solid

Odor: Mild

Acid Number: 5-11

Saponification Number: 85-105

Specific Gravity: 0.91-0.95

Weight per Gallon, Kgs., (Lbs.): 3.5 (7.8)

Flash Point (Minimum): 121C (250F)

Melting Point: 35C (95F)

AQUALOX 225A-100 & AQUALOX 225-100:

Corrosion Inhibitor for Metalworking Fluids

AQUALOX 225-100 is a 100% active low foaming surface active agent which is effective in inhibiting the attack of ferrous metals by aqueous solutions. In addition to its effectiveness as a corrosion inhibitor, it provides excellent lubricity and antiwear characteristics to aqueous, "synthetic" metalworking formulations. AQUALOX 225-100 is an amine salt which does not contain nitrites. AQUALOX 225-100 is also available without phosphorus as AQUALOX 225A-100.

All of the information contained herein applies to both AQUALOX 225A-100 and AQUALOX 225-100.

Nitrites should not be added to AQUALOX 225-100 or AQUALOX 225A-100 because of the possibility of forming nitrosamines.

Color: Pale Yellow

Odor: Mild

Viscosity, @ 40C (100F, CS): <ISO VG 680 (<550)

Pour Point, C (F): -25.5 (-14)

Specific Gravity @ 15.6C (60F): 1.06

Weight per Gallon @ 15.6C (60F), Kgs (lbs.): 4.0 (8.8)

pH: 9.7+-0.3

Phosphorus Content, % (AQUALOX 225-100 only): 0.4

Corrosion Protection, 0.75% in water will pass the Herbert Test: (IP 125/77)

Film Type: Liquid

Flash Point (ASTM D-56) C (F): 150 (300)

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):**AQUALOX 232:**

Corrosion Inhibitor for Metalworking Fluids

AQUALOX 232 is composed of amine salts of organic acids. When blended with other materials to raise the pH it becomes a very effective corrosion inhibitor in aqueous solution.

AQUALOX 232 is a low foaming surface active agent which is extremely effective in inhibiting the attack of ferrous metals by aqueous solutions. It is soluble in glycols, as well as in water, and therefore finds extensive use in synthetic metalworking formulations.

Description: 75% Active, Pale Amber Liquid, Mild Odor

Viscosity @ 40C: ISO VG 68

@ 100F: 75+-15 cs

Specific Gravity @ 15.6C (60F): 1.15

Pour Point (Maximum): -29C (-20F)

Weight per Gallon kgs. (lbs) @ 15.6C (60F): 4.4 (9.6)

pH: 7.6+-0.3

AQUALOX 232H:

AQUALOX 232H is composed of amine salts of organic acids. When AQUALOX 232H is blended with other materials (such as triethanolamine), it becomes a very effective corrosion inhibitor in aqueous solution. AQUALOX 232H gives equivalent protection to that of AQUALOX 232.

AQUALOX 232H is a low foaming surface active agent which is extremely effective in inhibiting the attack of ferrous metals by aqueous solutions. It is soluble in glycols, as well as in water, and therefore finds extensive use in synthetic metalworking formulations and circulating cooling systems.

Description: 75% Active, Yellow Color, Mild Odor

Viscosity cs @ 37.6C (100F): 44+-15

Specific Gravity @ 15.6C (60F): 1.13

Weight per Gallon @ 15.6C (60F) Kgs. (lbs): 4.3 (9.4)

Pour Point-Maximum: -29C (-20F)

pH (neat): 8.7+-0.3

pH of 70/30 TEA Blend @ 1%: 8.5+-0.3

Nitrite: Negative

Corrosion Protection (Herbert Test - IP 125): Pass @ 0.5%

Film Type (70/30 TEA Blend): Liquid/Semisolid

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):

ALOX 318F:

A Corrosion Inhibitor for Use in Oil or Solvent

ALOX 318F is a soft, waxy additive for the manufacture of rust or corrosion preventives for use on ferrous and non-ferrous metals. It is especially effective in protecting bright, ground, or highly polished steel surfaces. Solvent or oil blends can be applied by dipping, spraying or brushing. Solvent solutions will deposit a very thin, waxy film.

Rust preventives having all the desirable properties of ALOX 318F and which are water displacing can be formulated from ALOX 318FX.

Appearance: Brown Solid

Melting Point C (F) (Minimum): 39 (100)

Acid Number: 13+-2

Saponification Number: 32+-3

Flash C (F) (Minimum): 177 (350)

Weight/Gallon @ 15.6C (60F) Kgs. (lbs.): 3.5 (7.7)

Residual Film From Solvent: Essentially Dry

ALOX 319F:

Additive for Production of Preservative Lubricants and Soft Solvent Cut-Back Rust Preventives

ALOX 319F is an additive for compounding corrosion preventives. It is effective in protecting bright, ground, or highly polished steel surfaces. Solvent or oil blends can be applied by brushing, dipping, or spraying. Solvent solutions deposit a thin, essentially dry film used extensively on tools, finished surfaces, etc. Rust preventives containing ALOX 319F are excellent in acid atmospheres and are used to protect steel exposed to acid fumes.

Rust preventives having all the desirable properties of ALOX 319F and which are water displacing can be formulated from ALOX 319FX.

Appearance: Dark Solid

Acid Number: 42-46

Saponification Number: 50-60

Melting Point C, (F) (minimum): 37 (100)

Flash C (F) (minimum): 177 (350)

Fire Point: 204 (400)

Weight per Gallon @ 15.6C (60F) Kgs (lbs.): 3.5 (7.7)

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):**ALOX 350:**

Esters of an Oxidized Petroleum Fraction

ALOX 350 is used in cutting oils as a lubricity agent and for adding mild corrosion inhibition. When blended with oil-soluble sulfonates, it forms an outstanding rust inhibitor as measured by humidity cabinet performance.

Appearance: Brown Solid
Acid Number: 33 (max.)
Saponification Number: 125-140
Ash: 0.2% (Max.)
Melting Point C (F): 37-43 (100-110)
Flash C (F) (minimum): 121 (250)
Weight per Gallon Kgs (lbs.): 3.5 (7.7)

ALOX 502A:

ALOX 502A is a special combination of corrosion inhibitors designed to meet the corrosion test requirements of Specification MIL-L-21260.

Acid Number: Nil
Saponification Number: Nil
API Gravity @ 15.6C (60F): 13.9
Specific Gravity @ 15.6C (60F): 0.97
Weight per Gallon, kgs. (lbs.): 3.7 (8.1)
Flash Point, C (F): 193 (380)
Fire Point, C (F): 204 (400)

ALOX 575:

An Oil Soluble Corrosion Inhibitor

ALOX 575 is a corrosion inhibitor which may be blended with oil, oil/kerosene or oil/volatile solvent. Standard humidity cabinet and salt spray tests indicate outstanding effectiveness in these vehicles. Its properties suggest the following fields of application.

1. As a general-purpose corrosion inhibitors for use in slushing oils, preservative lubricants, etc.
2. As a rust inhibitor for mineral and soluble metal working oils.
3. As an additive for the preparation of water-based rust preventives.

Acid Number: 9-11
Saponification Number: 28-31
Specific Gravity @ 15.6C (60F): 1.02
Weight per Gallon, Kgs (lbs): 3.9 (8.5)
Pour Point, C (F): +27 (80)
Flash Point (Min.) C (F): 204 (400)

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):

ALOX 600:

Corrosion Inhibitor and Chemical Intermediate

ALOX 600 is a mixture of relatively high molecular weight organic acids, lactones and esters derived from petroleum. ALOX 600 is a source of low cost organic acids useful in the preparation of both oil soluble and water dispersible soaps which find application in the formulation of rust preventives and metal-working compounds. The alkaline earth soaps are particularly useful as automobile undercoating compounds. ALOX 600 reacted with amine or blended with metal sulfonates is a highly effective corrosion inhibitor. Such combinations are used in the formulation of slushing oils where low cost and high effectiveness are required.

Acid Number: 45-60

Saponification Number: 100-145

Specific Gravity @ 24C (75F): 0.95

Weight per Gallon @ 24C (75F): 7.9

Melting Point (Min.): 46C (115F)

Flash Point (Min.): 174C (345F)

Ash (Max.): 0.2%

ALOX 606, ALOX 606-70 & ALOX 606-55:

Heavy Duty Protective Coating

ALOX 606 is a dark colored, high melting, resilient product which is used to provide long term protection of metal surfaces. ALOX 606 is applied as a solution in a volatile solvent. The residual film, after solvent evaporation, is highly resistant to salt water and salt spray, making ALOX 606 particularly useful in automotive rustproofing applications.

ALOX 606-70 is a commercially available, partial solvent cutback, containing 70% ALOX 606 and 30% mineral spirits. This is supplied to simplify handling and further dilution of the product.

ALOX 606-55 is a commercially available, total solvent cutback, containing 55% ALOX 606 and 45% mineral spirits. This product may be used as is or further diluted.

ALOX 606:

Melting Point (minimum) C (F): 138 (280)

Specific Gravity @ 25C (77F): 0.98

ALOX 606-70:

Melting Point (minimum) C (F): 60 (140)

Specific Gravity @ 25C (77F): 0.92

ALOX 606-55:

Melting Point (minimum) C (F): Liquid

Specific Gravity @ 25C (77F): 0.895

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):

ALOX 904:

Fingerprint Remover Additive

ALOX 904 is a low treating cost additive for the formulation of fingerprint removers or rifle bore cleaners.

ALOX 904 can be formulated to provide a product which in the Alox Corporation laboratory conforms to specification MIL-C-372C "Cleaning Compound, Solvent: (For Bore of Small Arms and Automatic Aircraft Weapons) or MIL-C-15074D "Corrosion Preventive, Fingerprint Remover."

Appearance: Dark Colored, Viscous Liquid
Acid Number (ASTM D-974): 6-10
Saponification Number (ASTM D-94): 16-25
Pour Point, C (F): +18 (+65)
Flash Point (COC) (ASTM D-92): 146C (295F)
Specific Gravity @ 25C (77F): 0.980
Weight Per Gallon, kgs. (lbs): 3.70 (8.16)
Viscosity @ 100F, cs: 900-5000

ALOX 940A:

An Oil and Solvent Type Rust Preventive Additive

ALOX 940A is a highly effective rust preventive additive for use from either solvent or oil. The oil solutions are lubricants with good low temperature characteristics. The film deposited from solvent is thin, essentially invisible, and slightly oily. Machinery protected with ALOX 940A blends need not be degreased before being put into use.

ALOX 940A is an oxygenated hydrocarbon partially neutralized with calcium and then blended with a special sodium petroleum sulfonate.

Acid Number (ASTM D-974): 9 (Maximum)
Saponification Number (ASTM D-94): 31 (Maximum)
Melting Point: Viscous Liquid
Flash (O.C.) (Minimum) C (F): 149 (300)
Specific Gravity @ 15.6C (60F): 0.94-0.97
Color (ASTM D-1500): D-8 DIL

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):

ALOX 1727D:

Non-Staining Slushing Oil Additive

ALOX 1727D is a highly effective additive for the formulation of non-staining rust preventives for use on sheet steel and other steel stock. ALOX 1727D, in mineral oil solutions, has the ability to protect steel during long periods of indoor storage and will prevent the formation of black stains when parts are stored in contact with each other.

Acid Number, ASTM D-974: 2-6
Saponification Number, ASTM D-94: 20-40
Flash Point, F ASTM D-92 (Minimum): 350
Specific Gravity @ 15.6C (60F): 0.94-0.97
Appearance: Brown Viscous Liquid
Sulfated Ash, %: 4.1-5.6
Calcium Content, %: 0.8-1.4

ALOX 1846:

Corrosion Inhibitor for Jet Fuels

Percent Water: Nil
Percent Ash: Nil
API Gravity @ 15.6C (60F) API: 27.9
Weight per Gallon kgs. (lbs): 3.35 (7.39)
Pour Point, C (F): -7 (+20)
Flash Point, C (F) C.O.C.: 79 (175)
Viscosity @ 40C (100F): ISO VG 150 (155+-20 cs.)

ALOX 2000:

Metal Conditioning Compound

ALOX 2000 was developed as an additive to render rust scale more readily removable preparatory to painting and to provide protection against further rusting. ALOX 2000 is also used to loosen rusted fasteners.

Appearance: Dark colored, very viscous liquid
Acid Number (ASTM D-974): 17.5
Saponification Number (ASTM D-94): 48
Specific Gravity @ 15.6C (60F): 0.954
Weight/Gallon Kgs. (Lbs.): 3.6 (7.96)
Flash Point (O.C.) C (F): 193 (380)
Pour Point C (F): +4.0 (+40)
Barium Content: 0.36%

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):**ALOX 2019A:**

Fingerprint Remover Additive

Excellent industrial fingerprint removing formulations can be prepared from ALOX 2019A. Such formulations incorporate water, in a clear dispersion, as the solvent for removal of fingerprint salts, and an effective rust preventive to protect metal parts during long time indoor storage.

ALOX 2019A is an oxygenated hydrocarbon which has been neutralized with an amine and calcium. ALOX 2019A contains approximately 0.54% calcium and 25% 2-Butoxy Ethanol.

Acid Number (ASTM): 98

Specific Gravity: 0.94

Weight per Gallon: 7.9 lbs.

Viscosity @ 100F (37.8C): 365 SSU (78.8 cs)

Flash Point (C.C): 137F. (58C)

ALOX 2028:

Non-Emulsifiable, Non-Staining, Water Displacing Rust Preventive

ALOX 2028 is a carefully selected blend of inhibitors which includes the barium soap of an oxygenated hydrocarbon. ALOX 2028 contains approximately 4% barium.

ALOX 2028 is an outstanding effective water displacing, non-staining rust preventive which will not emulsify even in the presence of alkali, and will quickly separate water displaced from metal surfaces after machining operations or after alkali cleaning. The protective film of ALOX 2028 left on the metal after evaporation of the solvent is ultra thin, non-staining and highly protective. ALOX 2028 can also be used in mineral oil solutions to provide water displacement, though the resulting oil film left on the metal is slightly less protective (as measured in a Humidity Cabinet) than the solvent deposited film.

Economical products conforming to Grade 3 of MIL-C-16173; and Types II and III of MIL-C-0081309 can be formulated with ALOX 2028.

Acid Number (ASTM D-974): 3-5

Saponification Number (ASTM D-94): 61-69

Specific Gravity @ 24C (75F): 0.95

Weight per Gallon Kgs (lbs.): 3.6 (7.9)

Flash Point (ASTM D-92) (minimum): 121C (250F)

Melting Point (ASTM D-127): 35C (95F)

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):

ALOX 2028L:

Non-Emulsifiable, Non-staining, Water Displacing Rust Preventive, Liquid

ALOX 2028L is an outstanding water displacing, non-staining rust preventive. It will rapidly separate water displaced from metal surfaces after machining operations or after alkali cleaning. Ultra thin, highly protective films can be applied easily by the use of volatile solvent solutions of ALOX 2028L. These ultra thin films are effective in the protection of ferrous and non-ferrous metals from atmospheric corrosion even under conditions of high humidity. ALOX 2028L also acts as a lubricant. ALOX 2028L is based on oxygenated hydrocarbons and their calcium soaps. ALOX 2028L does not contain barium compounds.

Physical Appearance: Viscous Brown Liquid

Odor: Mild

Acid Number (ASTM D-974): 2-10

Saponification Number (ASTM D-94): 11-19

Specific Gravity: 0.93-0.95

Weight per Gallon Kgs (lbs): 3.5 (7.8)

Flash Point (ASTM D-92) (Minimum): 168C (335F)

Pour Point (Maximum): -18C (0F)

ALOX 2116, ALOX 2116A:

Corrosion Inhibitors in Grease

ALOX 2116 is an oxygenated hydrocarbon and contains no metals of any kind. For calcium complex grease use ALOX 2116A.

ALOX 2116A is recommended as an improvement over ALOX 2116. Extensive corrosion tests indicate the ALOX 2116A is effective in both lithium hydroxy stearate and calcium complex greases. ALOX 2116A is a partial barium soap of an oxygenated hydrocarbon.

% Barium: 1.6

Melting Point (ASTM D-127): 30C (86F)

Specific Gravity @ 156.6C (60F): 0.97

Flash Point, Open Cup (ASTM D-92): 180C (355F)

Fire Point (ASTM D-92): 190C (375F)

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):

ALOX 2162:

Thin Film Rust Preventive for Limited Salt Spray Protection

ALOX 2162 was developed to meet the requirements of some industrial applications for a thin film rust preventive which will provide resistance, for limited periods of time, to salt spray and/or acid atmospheres. ALOX 2162 can be formulated to meet MIL-C-23411 and industrial specifications requiring resistance to sulfur dioxide or hydrogen chloride. Where thin film rust preventives are required for protection against high humidity only, ALOX recommends ALOX 165.

ALOX 2162 is a blend of carefully selected inhibitors which includes a barium soap of an oxygenated hydrocarbon having a barium content of approximately 3.8%.

Acid Number (ASTM D974): 12-16

Saponification Number (ASTM D-94): 70-80

Specific Gravity @ 25C (76F): 0.96

Pounds per Gallon @ 15.6C (60F) Kgs. (Lbs.): 3.6 (8.0)

Melting Point (ASTM D127) C (F): 35 (95)

Flash Point, C (F) (ASTM D-56): 121 (250)

ALOX 2200:

ALOX 2200 is a special combination of corrosion inhibitors designed to meet the corrosion test requirements of Specification MIL-L-21260A, "Lubricating Oil, Internal-Combustion Engine, Preservative."

Appearance: Viscous Brown Liquid

API Gravity @ 15.6C (60F): 9.0

Specific Gravity @ 15.6C (60F): 1.01

Weight per Gallon Kgs (lbs.): 3.8 (8.39)

Flash Point (ASTM D-92) C (F): >190 (>375)

% Sulfated Ash: 6.5-8.6

% Barium: 4.7

Recommended Use:

1. To meet MIL-L-21260A, 3-5% ALOX 2200 should be added to an oil already meeting the engine requirements of MIL-L-2104B. NOTE: MIL-L-2104B oils contain Zinc Dialkyldithio-phosphate.
2. Excellent general purpose preservative lubricants can be prepared using as little as 1.5-2.0% ALOX 2200 in a suitable viscosity oil.

ALOX CORP.: Rust Preventives-Corrosion Inhibitors (Continued):

ALOX 2201/2201E:

ALOX 2201 and ALOX 2201E are effective corrosion inhibitors which can be blended with a suitable oil to meet the requirements of Military Specification VV-L-800C, "Lubricating Oil, General Purpose, Water Displacing, Low Temperature."

ALOX 2201:

Acid Number (ASTM D-974): 1.5-4.5
Flash Point, C (F) C.O.C. (minimum): 177 (350)
API Gravity @ 15.6C (60F): 14.4-17.0
Weight per Gallon, kgs. (lbs.): 3.6-3.7 (7.9-8.1)
% Ash (ASTM D-482): 6.2-7.2
% Barium: 3
% Calcium: 0.4

ALOX 2201E:

Acid Number (ASTM D-974): 1.5-7.0
Flash Point, C (F) C.O.C. (minimum): 177 (350)
API Gravity @ 15.6C (60F): 17-21
Weight per Gallon, kgs. (lbs.): 3.5-3.6 (7.7-7.9)
% Ash (ASTM D-482): 3.0-3.7
% Barium: None
% Calcium: 1.0

ALOX 2211Y:

ALOX 2211Y, when cutback in solvent, is a thixotropic rust preventive which will deposit a light colored, waxy, film. The protective film will provide long term protection against high humidity and salt fog.

ALOX 2211Y, when blended 50/50 with an ISO VG 46 (200SUS) naphthenic oil will deposit a light colored, soft, oily film. The protective film will provide long term protection against humidity and salt fog.

Flash Point (ASTM D-92) C (F) (minimum): 177 (350)
Melting Point, C (F): 82-104 (180-220)
Specific Gravity @ 25C (77F): 0.89
Weight per Gallon, kgs., (lbs.) @ 25C (77F): 3.4 (7.4)

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):

ALOX 2213A:

Oil/Solvent Soluble Rust Preventive Having Water Displacing, Penetrating & Lubrication Properties

ALOX 2213A was developed to meet the requirements of industrial and household applications for a thin soft film water displacing rust preventive which will provide resistance for limited periods to salt spray and/or acid atmospheres. ALOX 2213A also acts as a lubricant and penetrant. ALOX 2213A contains 2.56% barium. For ease of handling and blending Alox also offers ALOX 2213A-50 (50% ALOX 2213A and 50% oil) which is a liquid product.

Acid Number (ASTM D-974): 25-34

Saponification Number (ASTM D-94): 85-97

Melting Point (ASTM D-127): 35-46C (95-115F)

API Gravity @ 15C (60F): 1.42-20.6

Specific Gravity @ 15C (60F): 0.93-0.96

Flash Point (ASTM D-92): 149C (300F)

Weight per Gallon: 3.51-3.70 Kgs. (7.75-8.08 lbs)

ALOX 2213C:

Oil/Solvent Soluble Rust Preventive Having Superior Salt Spray, Water Displacing, Penetrating & Lubrication Properties.

ALOX 2213C was developed to meet the requirements of industrial and household applications for a thin soft film water displacing rust preventive providing superior resistance to salt atmospheres. ALOX 2213C contains 0.1% calcium and 1.1% sodium. ALOX 2213C contains no Barium.

For ease of handling and blending ALOX also offers ALOX 2213C-50 (50% ALOX 2213C and 50% oil) which is a liquid product.

Acid Number (ASTM D-974): 15-30

Saponification Number (ASTM D-94): 55-75

Melting Point (ASTM D-127) C (F): 37+-5 (100+-10)

Specific Gravity @ 15.6C (60F): 0.96-0.98

Flash Point (Minimum) C (F): 177 (350)

Weight per Gallon, Kgs (lbs.): 3.7 (8.1)

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):

ALOX 2213D:

Non-emulsifiable, non-staining, water displacing rust preventive with limited salt spray

ALOX 2213D is a water-displacing, non-staining, rust preventive which will separate water displaced from metal surfaces after machining operations or after alkali cleaning. The thin, soft film will also provide resistance for limited periods to salt spray and act as a lubricant and penetrant.

Acid Number (ASTM D974): 10-18

Drop Melt Point (ASTM D-127) C (F): 41-43 (110-115)

Specific Gravity @ 15.6C (60F): 0.94-0.97

Weight/Gallon Kgs. (Lbs.): 3.5-3.6 (7.8-8.0)

ALOX 2248C:

Asphalt Additive

The use of asphalt in making good protective films for steel is desirable because of availability and low cost. However, most blown asphalts do not make good protective films for steel because they lack low temperature flexibility and because they exhibit poor adhesion to steel.

ALOX 2248C improves the low temperature flexibility and adhesion of most blown asphalts thus making the low cost, readily available asphalt an effective protective material for steel.

Since blown asphalts are made from a wide variety of stock and exhibit a range in melting points, each responds somewhat differently to the ALOX 2248C additive.

ALOX 2248C is also available as a 50% cutback for those who cannot handle the 100% active material.

ALOX 2248C:

Melting Point, C (F): 66-71 (150-160)

Specific Gravity @ 25C (77F): 0.93

Weight per Gallon, Kgs. (lbs) @ 25C (77F): 3.5 (7.8)

Penetration, Cone, No Load @ 25C (77F): 60-70

Flash Point, C (F) minimum: 232 (450)

Appearance @ 25C (77F): Solid

ALOX 2248C-50:

Melting Point, C (F): Soft Paste

Specific Gravity @ 25C (77F): 0.86

Weight per Gallon, Kgs. (lbs) @ 25C (77F): 3.3 (7.2)

Flash Point, C (F) minimum: 42 (108)

Appearance @ 25C (77F): Paste

Pour Point C (F): 40 (100)

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):**ALOX 2263:**

An Emulsifiable Corrosion Inhibitor

ALOX 2263 is an emulsifiable corrosion inhibitor which gives outstanding protection against salt spray and high humidity conditions on both steel and phosphated steel parts. The emulsion is stable at low concentrations in soft and hard waters, through freeze thaw cycles and at elevated temperatures. The protective film, after evaporation of the water, is thin and oily. Barium content 0.5%.

Acid Number (ASTM D-974): 7-9

Saponification Number (ASTM D-94): 9-11

Specific Gravity @ 15.6C (60F): 0.98

Weight per Gallon Kgs. (lbs): 3.7 (8.2)

Pour Point: 79C (175F)

Flash Point, Minimum (ASTM D-92): 204C (400F)

AQUALOX 2268:

Corrosion Inhibitor for Aqueous Solutions

AQUALOX 2268 is a low foaming inhibitor and lubricity agent which is extremely effective in inhibiting the attack of ferrous metals by aqueous solutions. As an emulsion it also provides effective protection of steel surfaces against high humidity conditions during extended indoor storage. Emulsions will deposit extremely thin waxy films.

In addition to its effectiveness as a corrosion inhibitor, it provides excellent lubricity and antiwear characteristics as shown by Falex Tests.

Nitrites and/or nitrosating agents should not be added to AQUALOX 2268 due to the possible formation of nitrosamines.

Physical Appearance: Brown Waxy Soft Solid

Odor: Mild

Melting Point (ASTM D-127): 57+-3C (135+-5F)

Specific Gravity @ 15.6C (60F): 0.92

Weight/Gallon Kgs (lbs.): 3.4 (7.6)

Flash Point, Minimum (ASTM D-92): 135C (275F)

pH @ 1% in Water: 9-10

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):

ALOX 2278:

Additive for Production of Nonstaining Rust Preventive for Coiled or Stacked Steel

ALOX 2278 in oil is recommended for use to avoid stain and rust problems of coiled or stacked steel under adverse storage conditions.

ALOX 2278 was specifically developed for use as a nonstaining rust preventive. ALOX 2278 was designed on the basic assumption that: coated steel may come into contact with water during storage and the steel may be exposed to high temperatures, acid fumes and/or high humidity conditions.

Appearance: Soft Waxy Brown Solid

Odor: Mild

Acid Number (ASTM D-974): 4-8

Saponification Number (ASTM D-94) C (F): 60-75

Melting Point (ASTM D-127) C (F): 35+-3 (95+-5)

Flash & Fire Points (ASTM D-92) C (F) (Minimum): 121 (250)

Weight Per Gallon, Kgs (lbs): 3.6 (8.0)

ALOX 2283:

Wire Rope Protective Lubricant

ALOX 2283 is an additive for formulating Wire Rope Lubricants which are applied to the wire rope during manufacture. ALOX 2283 imparts outstanding protection against rust and corrosion while providing the lubrication essential for the proper performance of the wire rope.

Specific Gravity @ 25C (77F): 0.93

Weight per Gallon @ 25C (77F) Kgs. (lbs.): 3.5 (7.8)

Flash Point (ASTM D-92) C (F) (minimum): 191 (375)

Pour Point, C (F): -1 (30)

Viscosity @ 99C (210F) SUS (minimum): 100

Appearance: dark viscous liquid

ALOX 2284 and ALOX 2284AB:

ALOX 2284A and ALOX 2284AB are mixtures of organic acids, lactones and esters.

ALOX 2284A:

Acid Number (ASTM D-974): 160

Saponification Number (ASTM D-94): 276

Specific Gravity @ 15.6C (60F): 0.95

Weight per Gallon, Kgs. (lbs.): 3.6 (7.9)

ALOX 2284AB:

Acid Number (ASTM D-974): 160

Saponification Number (ASTM D-94): 265

Specific Gravity @ 15.6C (60F): 0.95

Weight per Gallon, Kgs. (lbs.): 3.6 (7.9)

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):

ALOX 2287:

Ballast Tank Flotation Coating Inhibitor--Biodegradable

ALOX 2287 is a highly effective additive for preparing a rust retarding compound which is capable of floating on ballast water and which deposits itself as a protective coating on adjacent tank surfaces during ballasting and deballasting operations.

ALOX 2287 can be used to formulate products meeting the requirements of Federal Specifications MIL-R-21006, "Rust Retarding Compound, Flotation Type, Ballast Tank Protective."

Acid Number Maximum (ASTM D-974): 10
Saponification Number (ASTM D-94): 75-100
Drop Melting Point (ASTM D-127), C (F): 52-57 (125-135)
Viscosity @ 99C (210F), SUS: 400-600
Penetration, Maximum: 100
Specific Gravity @ 25C (77F): 0.99
Weight per Gallon, Kgs. (Lbs.): 3.8 (8.3)
Flash Point (ASTM D-92) C (F): 205 (400)

ALOX 2289:

Acid Fume Rust Preventive Additive

ALOX 2289 is a soft, waxy additive used in the formulation of rust or corrosion preventives. ALOX 2289 in oil, solvent or oil/solvent blends are especially effective in protecting ferrous metals in acid fume (HCl) environments. The blends can be applied by dipping, spraying or brushing.

Appearance: Waxy Brown Solid
Acid Number (ASTM D-974): 16-21
Saponification Number (ASTM D-94): 37-45
Drop Melting Point, C (F) (ASTM D-127): 43-49 (110-120)
Specific Gravity: 0.90-0.94
Weight/Gallon Kgs. (lbs.): 3.5 (7.7)
Flash Point, C (F): Open Cup (min.) (ASTM D-92): 177 (350)
Fire Point, C (F) Open Cup (min.) (ASTM D-92): 215 (420)

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):

ALOX 2290/ALOX 2290A:

Corrosion Inhibitors for Use In Oil or Water

ALOX 2290 and ALOX 2290A are highly effective corrosion inhibitors which can be added to oil or water to give outstanding protection as measured by the humidity and salt spray cabinets.

Their properties suggest the following fields of application:

- A. General purpose corrosion inhibitor for use in slushing oils, preservative lubricants, etc.
- B. Rust inhibitor for mineral and soluble metalworking oils.
- C. Additive for MIL-L-3150C, "Medium Preservative Lubricant."
- D. Additive for the preparation of water-based rust preventives.

The only metal these products contain is 2.5% sodium.

ALOX 2290:

Acid Number (ASTM D-974): 11-17
Saponification Number (ASTM D-94): 30-60
Specific Gravity @ 15.6/15.6C (60/60F): 1.00-1.04
Weight per Gallon, Kgs (lbs.): 3.8-3.9 (8.3-8.7)
Flash Point, C (F) (ASTM D-92) (Min): 204 (400)
Odor: Slight

ALOX 2290A:

Acid Number (ASTM D-974): 10-15
Saponification Number (ASTM D-94): 50-75
Specific Gravity @ 15.6/15.6C (60/60F): 1.01-1.05
Weight per Gallon, Kgs (lbs.): 3.8-3.9 (8.4-8.8)
Flash Point, C (F) (ASTM D-92) (Min): 204 (400)
Odor: None

AQUALOX 2295:

Heavy Duty Emulsifiable Rust Preventive Concentrate

AQUALOX 2295 is an emulsifiable rust preventive concentrate that when diluted with additional water produces a product which is used to provide long term protection of metal surfaces. The residual film, after water evaporation, is highly resistant to salt water and salt spray, making AQUALOX 2295 particularly useful in automotive rustproofing applications.

Appearance: Tan Paste
Specific Gravity: 0.98+-0.02
Weight/Gallon Kgs. (lbs.): 3.5-3.6 (7.8-8.0)
Non Volatile Content: 42+-3%
% Water: 55+-1%
Pour Point, C (F): 43 (110)

ALOX CORP.: Rust Preventives--Corrosion Inhibitors (Continued):

ALOX 2296:

Additive for Production of Non-Staining Rust Preventive for Coiled and Stacked Steel as Well as For Ford Spec M7C36A

ALOX 2296 is a specially formulated additive when cutback in oil, solvent or water will prevent the staining of coiled or stacked steel. ALOX 2296 also provides excellent humidity cabinet protection, especially in solvent. ALOX 2296 can be formulated to meet Ford Specification M7C36A, Rust Preventive-Soft Film Type-Solvent Base.

Appearance: soft, waxy, brown solid

Odor: Mild

Acid Number (ASTM D-974): 1.0-5.0

Saponification Number (ASTM D-94): 35.0-45.0

Drop Melting Point (ASTM D-127) C (F): 32 (90) (minimum)

Specific Gravity @ 15.6C (60F): 0.93-0.96

Weight/Gallon, kgs (lbs): 3.5-3.6 (7.8-8.0)

**AMERICAN CHARCOAL DIV.: 928 Series CANT-RUST Hydrocarbon
Carried Rust Preventatives:**

The 928 Series CANT-RUST corrosion preventative liquids are a family of protective coatings used to protect iron and steel against rust, staining, and corrosion during long term indoor storage or short term outdoor storage.

The 928 Base CANT-RUST is available as a concentrate to be diluted at your facility with the solvent of your choice or as one of the following pre-blended CANT-RUST packages which offer differing drying characteristics, residual films, and odor characteristics.

928-1MO:

This is a slow drying, low odor version which leaves an oily, highly rust retardant film. The residual film is more resistant to harsh storage conditions, but may be harder to water wash.

928-3MS:

This is a low odor alternative which provides a lighter, more easily washed film than the 928-1MO. The residual film is also less easily detected.

928-1KO:

This version utilizes a faster drying carrier which has a more noticeable odor than the forementioned and leaves behind only a light, tack-free film.

928-3KO:

This quick drying medium odor version provides a non-visual, tack-free film which is easily washed. This is the most cost-effective option, but also provides the most limited shelf life.

Advantages:

- * Highly Corrosion Resistant Film
- * Warm Water Washable
- * Compatible with Non-Ferrous Metals
- * Provides Lubricating Characteristics
- * Available in Several Forms
- * Residual Film Stays Soft

Method of Application And Cleaning:

All of the CANT-RUST protective coatings may be applied using an RP 2000 CANMIST System or like applicator, or may be flood, drip, or immersion applied.

All of the 928 Series CANT-RUST products are easily removed using mild alkaline wash, mineral spirits, or vapor degrease.

AMOCO PETROLEUM CO.: AMOCO 153 and AMOCO 6715 Ashless Inhibitors:

AMOCO Ashless Inhibitors are versatile alkyl thiadiazoles that are easy to ship, handle, store and apply. They deactivate corrosive sulfur in all types of fuels including heater oil, gasoline, and LPG.

In crankcase and industrial oils, AMOCO Ashless Inhibitors offer outstanding film strength while inhibiting corrosion and oxidation. They will prevent parts from seizing or scoring and reduce valve train wear. These inhibitors can be used alone or with ashless dispersants and metal-based detergents. Where the use of zinc dithiophosphate is restricted, AMOCO Ashless Inhibitors can be used to formulate low zinc, low phosphorus motor oils with excellent wear protection.

Uses of AMOCO Ashless Inhibitors:

In fuels: Sulfur deactivator

In lubricants: Bearing corrosion inhibitor, anti-oxidant and sulfur deactivator; anti-wear agent

In emulsifiable (soluble) oils: Extreme pressure agent, bactericide; oxidation inhibitor

Properties of AMOCO 153:

Density, g/cm³ (lb/gal): 1.14 (9.5)

Viscosity at 100C, cSt: 20 to 40

Flash point, PMCC, C (F): 135 (275) min.

Color, ASTM D 1500: 4.0 max.

Sulfur, % wt: 30 to 40

Nitrogen, % wt: 7.0 to 8.5

Total acid number: 140 to 155

Properties of AMOCO 6715:

Density, g/cm³ (lb/gal): 0.93 (7.7)

Viscosity at 100C, cSt: 4 to 7

Flash point, PMCC, C (F): 149 (300) min.

Color, ASTM D 1500: 4.0 max.

Sulfur, % wt: 7 to 10

Nitrogen, % wt: 1.6 to 2.1

Total acid number, mg KOH/g: 34 to 40

AMOCO 153 as a Corrosion Inhibitor in Fuels:

Extensive laboratory and field experience has shown that AMOCO 153 is an effective anti-oxidant and sulfur deactivator at even the parts per million range.

AMOCO 153 as an Anti-Wear Agent in Lubricants:

The anti-wear properties of AMOCO 153 are highlighted by the results of the Falex extreme pressure lubricant test and the Sequence IIIC.

AMOCO PETROLEUM CO.: AMOCO 158 and AMOCO 6811 Ashless Inhibitors:

AMOCO Ashless Inhibitors are versatile alkyl thiadiazoles that are easy to ship, handle, store and apply. They deactivate corrosive sulfur in all types of fuels including heater oil, gasoline, and LPG.

In crankcase and industrial oils, AMOCO Ashless Inhibitors offer outstanding film strength while inhibiting corrosion and oxidation. They will prevent parts from seizing or scoring and reduce valve train wear. These inhibitors can be used alone or with ashless dispersants and metal-based detergents. Where the use of zinc dithiophosphate is restricted, AMOCO Ashless Inhibitors can be used to formulate low zinc, low phosphorus motor oils.

Uses of AMOCO Ashless Inhibitors:

In fuels: Sulfur deactivator

In lubricants: Bearing corrosion inhibitor, anti-oxidant and sulfur deactivator; anti-wear agent

In emulsifiable (soluble) oils: Extreme pressure agent, bactericide, oxidation inhibitor

Properties of AMOCO 158:

Density, g/cm³: 1.09 to 1.13

(lb/gal): (9.0 to 9.4)

Viscosity at 100C, cSt: 10 to 14

Flash point, PMCC, C(F): 135 (275) min.

Color, ASTM D1500: 4.0 max.

Sulfur, %m: 32 to 40

Nitrogen, %m: 5.8 to 7.0

Total acid number, mg KOH/g: 25 to 35

Properties of AMOCO 6811:

Density, g/cm³: 0.98 to 1.00

(lb/gal): (8.1 to 8.3)

Viscosity at 100C, cSt: 5 to 8

Flash point, PMCC, C(F): 149 (300) min.

Color, ASTM D1500: 4.0 max.

Sulfur, %m: 18 to 22

Nitrogen, %m: 3.2 to 4.0

Total acid number, mg KOH/g: 14 to 20

AMOCO 158 as a Corrosion Inhibitor in Fuels:

Extensive laboratory and field experience has shown that AMOCO 158 is an effective anti-oxidant and sulfur deactivator at even the parts per million range.

AMOCO 158 as a Corrosion Inhibitor in Lubricants:

Results from ASTM D 130 tests demonstrate that AMOCO 158 effectively controls corrosion in sulfurized lard oil, a sperm oil substitute.

AMOCO 158 as an Anti-Wear Agent in Lubricants:

AMOCO 158 improves lubricity when used alone or with metallic sulfonates.

AMOCO PETROLEUM CO.: AMOCO 575 Multifunctional Gasoline Additive:

AMOCO 575 is an ashless treatment for leaded and unleaded gasoline. It functions as both a clean up and a keep clean additive. By maintaining carburetor cleanliness, exhaust emissions from dirty engines are reduced, keeping anti-pollution equipment at optimum performance. AMOCO 575 reduces carburetor icing and the stalling related to ice formation. AMOCO 575 inhibits rust formation and requires no additional treatment to be acceptable for transportation in common carrier pipelines.

Density, gm/cm³ (lbs/gal): 0.91 (7.6)
 Viscosity, cSt at 100C: 7.8
 Viscosity, cSt at 40C: 65
 Flash Point, PMCC, C (F): 26.7 (80) min.
 Pour Point, C (F): -48 (-55)
 Nitrogen, %m: 3.6

AMOCO 595 Gasoline Additive:

AMOCO 595 Gasoline Additive is an ashless, zero-phosphorus treatment for gasoline. The advanced chemistry of AMOCO 595 is designed to satisfy the most demanding requirements of the latest emission controlled engines while providing superior cleanliness in earlier vehicles. AMOCO 595 has better thermal stability than first generation gasoline additives providing effective detergent activity at the higher operating temperatures of newer engines. Base gasolines from a variety of sources can be effectively treated with AMOCO 595.

The specific benefits of AMOCO 595 Additive include:

Port Fuel Injection (PFI):

Keeps injectors clean at low treat rates and exhibits "clean-up" performance at moderate treat rates;

Carburetor Detergency:

Maintains new carburetor cleanliness and cleans dirty carburetors;

Intake Valve Deposit Modification:

The superior thermal stability of AMOCO 595 makes intake valve deposits softer and more easily controlled. Substantial valve deposit reduction occurs when formulated with a polymeric carrier fluid;

Exhaust Emissions:

AMOCO 595 helps control hydrocarbon and carbon monoxide emissions by improving PFI and carburetor cleanliness;

Carburetor Icing Protection:

Effective protection of the critical metal surfaces reduces the incidence of stalls caused by carburetor icing.

Nitrogen, %m: 1.5-1.7
 Specific Gravity: 0.91
 Density, lb/gal: 7.58
 Kinematic Viscosity, cSt @ 40C: 60-120
 Flash Point, PMCC, C, min.: 38

AMOCO PETROLEUM CO.: AMOCO 9218 High Base Magnesium Sulfonate:

AMOCO 9218 is a detergent and rust inhibitor for engine lubricating oils and a corrosion inhibitor in industrial oils. Typical treat rates range from 0.5 to 1.5% mass. The superior performance of this product has been demonstrated in both laboratory test engines and in field service.

Density, gm/cm³ (lb/gal): 1.10 to 1.15 (9.2 to 9.6)

Viscosity at 100C, cSt: 60 to 195

Flash point, PMCC, C(F): 104(220) min.

Composition:

Magnesium, %m: 9.2 to 9.8

Sulfur, %m: 2.2 max.

Soap, %m: 26 min.

Total Base Number, ASTM D2896: 385 min.

AMOCO 9221 Low Base Calcium Sulfonate:

AMOCO 9221 is a high molecular weight, low base calcium sulfonate which provides excellent control of high temperature deposits in gasoline and automotive diesel engines. It is particularly effective in preventing piston ring sticking, and it can be used as a building block for railroad and marine diesel oils. In industrial oil formulations, AMOCO 9221 combines excellent detergency with good corrosion inhibition and demulsibility.

Density, gm/cm³ (lb/gal): 0.93 (7.7)

Viscosity at 100C, cSt: 30 to 110

Flash point, PMCC, C(F): 149(300) min.

Composition:

Calcium, %m: 1.2 to 1.9

Sulfur, %m: 1.7

Soap, %m: 40

Total Base Number, ASTM D2896: 10 to 20

AMOCO 9231 High Base Calcium Phenate:

AMOCO 9231 provides good oxidation inhibition in both gasoline and diesel engines. Where acid neutralization is critical the high TBN of AMOCO 9231, combined with its high temperature deposit protection make it a particularly versatile additive over a wide range of applications.

The recommended treatment level for AMOCO 9231 ranges from 0.5% mass for increased oxidation inhibition in passenger car oils to 4.0% mass for diesel engines running on high sulfur fuel.

Density at 15C, g/cm³: 1.1

Viscosity at 100C, cSt: 215

Viscosity at 40C, cSt: 14300

Flash Point PMCC, C, min: 150

Calcium, %wt.: 9.2

Sulfur, %wt.: 2.8

Total Base Number, mg KOH/g: 250

Mineral Oil, %wt.: 40

AMOCO PETROLEUM CO.: AMOCO 9243 High Base Calcium Sulfonate:

AMOCO 9243 is a superior detergent and rust inhibitor for engine lubricating oils and industrial oils. It neutralizes acids formed in diesel engines burning high sulfur fuels. AMOCO 9243 is an economic source of alkalinity for railway and marine lubricants.

Typical treat rates range from 0.5 to 5.0% mass. The effective performance of this product has been demonstrated in both laboratory test engines and in field service.

Density, gm/cm³ (lb/gal): 1.10 to 1.15 (9.2 to 9.6)

Viscosity at 100C, cSt: 50 to 135

Flash Point, PMCC, C(F): 104 (220) min.

Composition:

Calcium, %m: 11.5 to 12.0

Sulfur, %m: 2.0 max.

Soap, %m: 26 min.

Total Base Number, ASTM D2896: 300 min.

AMOCO PETROLEUM CO.: Polybutylphenols:

AMOCO Polybutylphenols provide many different functions. They are completely combustible in an engine and leave no ash residue. The phenol group provides a site for further chemical reaction while maintaining inherent antioxidantancy. End products such as engine oil dispersants and fuel detergents can be manufactured over a fairly wide molecular weight range.

AMOCO 9266:

Polybutene type: H-100
 Aromatic solvent, vol %: 20
 Activity, wt %: 73
 Specific gravity: 0.91
 Viscosity, cSt @ 100C: 20
 Flash point, PMCC, C: 60

AMOCO 9267:

Polybutene type: H-1500
 Aromatic solvent, vol %: 0
 Activity, wt %: 45
 Specific gravity: 0.90
 Viscosity, cSt @ 100C: 250
 Flash point, PMCC, C: 170

AMOCO 9268:

Polybutene type: H-100
 Aromatic solvent, vol %: 0
 Activity, wt %: 65
 Specific gravity: 0.91
 Viscosity, cSt @ 100C: 250
 Flash point, PMCC, C: 170

Dispersants:

Representing the major component of most engine formulations, dispersants are extremely important. AMOCO Dispersants afford excellent varnish control and dispersancy in internal combustion engines and industrial oils. Amoco's unique patented Mannich chemistry provides outstanding properties at both high and low service temperatures.

AMOCO 9250:

Specific Gravity: 0.91
 Nitrogen, wt %: 1.10
 Boron, wt %: 0.20
 Viscosity, cSt @ 100C: 225

AMOCO 9253:

Specific gravity: 0.91
 Nitrogen, wt %: 1.39
 Boron, wt %: 0.21
 Viscosity, cSt @ 100C: 270

AMOCO 9251:

Specific gravity: 0.90
 Nitrogen, wt %: 1.12
 Boron, wt %: 0
 Viscosity, cSt @ 100C: 240

AMOCO 9255:

Specific gravity: 0.91
 Nitrogen, wt %: 1.46
 Boron, wt %: 0
 Viscosity, cSt @ 100C: 270

AMOCO PETROLEUM CO.: Zinc Dithiophosphates:

Essential to high-performance lubricant packages, AMOCO Zinc Dithiophosphates provide several different functions. They inhibit oil oxidation, prevent valve train wear and protect bearings from corrosion. AMOCO Zinc Dithiophosphates are made from various starting alcohols so that you can select the optimum combination of activity, friction characteristics and thermal stability for each of your applications. In order of increasing thermal stability, they are AMOCO 196J, AMOCO 198, and AMOCO 199.

AMOCO 196J:

Alcohol type: 2
Zinc, wt %: 9.0
Phosphorus, wt %: 8.2
Sulfur, wt %: 17.1
Specific Gravity: 1.11
Viscosity, cSt @ 100C: 9.5

AMOCO 198:

Alcohol type: 1
Zinc, wt % 9.0
Phosphorus, wt %: 8.0
Sulfur, wt %: 16.7
Specific Gravity: 1.12
Viscosity, cSt @ 100C: 11

AMOCO 199:

Alcohol type: 1
Zinc, wt %: 6.8
Phosphorus, wt %: 6.1
Sulfur, wt %: 12.2
Specific gravity: 1.05
Viscosity, cSt @ 100C: 13

ANEDCO., INC.: Corrosion Inhibitors:

AC-101:	AC-187:
Packer Fluid	Amine Ethoxylate
AC-107:	AC-191:
Naphthenic CI - Oil Sol.	Pyridine Quat
AC-107C:	AC-192:
Napthenic CI - Oil Sol.	3-Phase P/L Inhibitor
AC-107W:	AC-195:
Napthenic CI - Wtr Sol.	Coco Quat
AC-109:	AC-196:
3 Compressor CI	Coco Diamine Acetate
AC-111:	AC-198C:
LT Acid Inhibitor	Coco Quat
AC-112:	
HT Acid Inhibitor	
AC-116:	
Amine Salt	
AC-125:	
Imidazoline/Quats/PolyAmines	
AC-128:	
Comb Amine/Quat/Sulfonate	
AC-130:	
DTA	
AC-131:	
Comb Amine/Quat	
AC-134:	
Quaternized Imidazoline	
AC-135:	
Volatile Amine	
AC-147:	
Neutralizing Amine/Wtr	
AC-148:	
Neutralizing Amine/HAN	
AC-160:	
Naphthenate CI	
AC-161:	
Comb Amine/DTA	
AC-162C:	
Amido Imidazoline	
AC-163:	
Amido Imidazoline	
AC-164:	
Hydroxy Imidazoline	
AC-170:	
Atmospheric CI	
AC-175:	
Wtr Soluble Imidazoline	
AC-186:	
Eto DiAmine	

ANGUS CHEMICAL CO.: ALKATERGE Surface Active Agents:

ALKATERGE-C:

Non-Volatile, Cationic, Surface Active Agent

Oxazoline content (min.): 70% by wt.
Specific Gravity at 25/25C: 0.920-0.940
Color (max.): 15 Gardner

ALKATERGE-C possesses "acid-accepting" properties which can be utilized advantageously. This acid-accepting property should also be useful in corrosion preventive oils where ALKATERGE-C will neutralize perspiration acids deposited during the handling of metal objects.

ALKATERGE-T:

Nonvolatile Surface Active Agent

Neutral equivalent (max.): 618
Oxazoline content (min.): 60% by wt
Free fatty acid (max.): 4% by wt
Free amino alcohol (max.): 4% by wt
Color (max.): 12 Gardner

ALKATERGE-T has been utilized as a corrosion inhibitor, an emulsifier, and a dispersant in a variety of applications.

It has been found that ALKATERGE-T adheres to hydrophilic surfaces such as metals or pigments with a force of as much as 10,500 psi. This property, as well as the ability to function as an acid acceptor, undoubtedly are major factors in the corrosion inhibition displayed by ALKATERGE-T.

ALKATERGE T-IV:

Surface Active Agent

Appearance: Dark Brown Liquid
Freeze Point: <6F (-14C)
Viscosity (25C): 965 cps
Density at 25C: 1.015 g/ml
pH (0.1% by wt.): 8.4
 (1.0%): 9.5
 (5.0%): 10.6
Approximate Molecular Weight: 545

In a modified Herbert cast-iron-chip corrosion test, ALKATERGE T-IV provided excellent protection. There was absolutely no rust on iron chips after 24 hours in deionized water containing 1.0% by weight of ALKATERGE T-IV. Similar results were obtained in hard, corrosive water containing 200 ppm calcium and 355 ppm chlorine.

ANGUS CHEMICAL CO.: AMP-95 Corrosion Inhibitor:

95% 2-Amino-2-Methyl-1-Propanol Solution

Corrosion in boiler-water systems can be controlled successfully by use of AMP-95 as the amine additive to remove CO₂.

Specifications:

Neutral equivalent: 93-97

Water: 4.8-5.8% by wt

Color (max.): 20 APHA

Typical Properties:

Specific gravity at 25/25C: 0.942

Weight per gallon at 25C: 7.85 lb

Viscosity at 25C (77F): 147 cp

at 10C (50F): 561 cp

Coefficient of expansion, 20 to 90C: 0.00096/C

Flash point, Tag open cup: 172F

Tag closed cup: 182F

Vapor pressure at 180F: 239 mmHg

Freezing point: -2C

Surface tension, neat: 36-38 dynes/cm

in 10% aqueous solution: 58 dynes/cm

pH of 0.1M aqueous solution at 20C: 11.3

pKa at 25C: 9.72

Refractive index, nD, at 20C: 1.4568

The development of alkalinity in a metalworking coolant is extremely important in aiding corrosion control of freshly-exposed metal surfaces. In addition to providing this much-needed alkalinity, the choice of alkanolamine can improve corrosion inhibition.

AMP-95 offers high base strength through its primary amine functionality. Therefore, in most metalworking fluids AMP-95 can provide corrosion protection equivalent to that of TEA at considerably lower amine levels. This equivalent corrosion protection can often be obtained when TEA is replaced with 60% or less AMP-95 on a weight basis. In addition, mixtures of AMP-95 with TEA can produce superior corrosion protection versus TEA alone.

Another important function of a metalworking fluid is to inhibit corrosion on freshly-formed metal surfaces. The type of alkanolamine selected will affect alkalinity development and thus affect the corrosion-inhibiting properties of the fluid.

AMP-95 is an effective and efficient neutralizing amine for use in preventing corrosion in steam-boiler condensate-return lines and steam turbines.

AMP-95 is a neutralizing amine, used as a corrosion inhibitor for prevention of condensate corrosion.

ANGUS CHEMICAL CO.: Corrosion Inhibitors:**AMINE CS-1135:**

Alkaline Buffering Agent and Corrosion Inhibitor

Amine CS-1135 is a cyclic substituted amine supplied as a 78% solution in water.

The advantages of using Amine CS-1135 include:

- * Effective corrosion inhibition.
- * An emulsifying agent when used with fatty acids.
- * Useful in a variety of systems. The amine is soluble in water and organic solvents.
- * Buffering capability to prevent pH drift.
- * Low freezing point.

Typical Properties:

Amine component: 78% by wt
Neutral equivalent as a base: 120-126
Color, APHA: 100 (max)
Flash Point, Tag closed cup: 120F
Freezing point: below -20C
Specific gravity at 25/25C: 0.98-0.99
Viscosity at 25C: 7.5 cp
pH: 10.5-11.5
Weight per U.S. gallon: 8.2 lb

DMAMP-80:

80% 2-Dimethylamino-2-Methyl-1-Propanol Solution

Specifications:

DMAMP, % by wt (as titratable amine): 78-82
Color, APHA: 100 max.
Water, % by wt: 18-22

Typical Properties:

Neutral equivalent: 148
Specific gravity at 25/25C: 0.95
Weight per gallon at 25C: 7.9 lb
Flash point, Tag open cup: 150F
Tag closed cup: 153F
Freezing point: -20C
Boiling point at 760 mmHg: 98C
Viscosity at 25C, Gardner: A-A2
pH of 0.1N aqueous solution: 11.6

DMAMP-80 is recommended for evaluation as a vapor-phase corrosion inhibitor in steam-condensate systems.

The amine in the vapor phase should provide complete protection for the system and allow considerable excess capacity for absorption of acidic gases.

ARMITE LABORATORIES: ARMITE 12/34:

Spray 12/34 Formula on any rust affected area.

Within Seconds it:

1: Removes Moisture

All moisture is driven off (not trapped).

2: Prevents Rust

An invisible film is deposited on the surface to prevent new rust from forming.

3: Penetrates

All "frozen", rusty parts are quickly penetrated and loosened.

4: Lubricates

12/34 Formula permanently lubricate all parts with an all-purpose, high quality oil.

Conforms to Military Specification MIL-C-23411

When applied to electrical and electronic equipment it protects all circuits, contacts and switches. It will not interfere with the circuits or operation of the equipment.

12/34 Formula is a necessity for equipment used on or near salt water. Protects and prevents rust on chrome. Effectively lubricates and prevents rust on all other equipment including electronic gear.

Harmless to paint, plastics, rubber or fabrics. Prevents rust--dries wet ignitions--contains no silicone.

LED-PLATE:

LED-PLATE, an Anti-Sieze lubricant and sealer, is a compound consisting of 70% pure metallic lead (100% through 200-mesh) suspended in a non-volatile hydrocarbon vehicle free from any additions of fillers, drying agents or other foreign materials, including graphite. Compound shall remain suspended and does not deteriorate, dry out, or harden, even when exposed to atmosphere. It shall be impervious to air, gases, water, steam, oils, ammonia and hydrocarbons; satisfactory for use in joints or any threaded fittings, with temperature range from sub-zero (-100F.) through 2987F.

LED-PLATE, with ARMITE's powdered metallic lead (a soft element) guarantees no abrasive ingredient. Non-drying hydrocarbons eliminate any hardening or "balling", evaporation, or scumming over of material. The homogeneous mixture isolates the microscopic lead particles from atmosphere, preventing any lead oxidation. With no corrosive ingredients, the product prevents thread corrosion. LED-PLATE's corrosion resistance and sealing ability make it a standard for all-around use in chemical plants, refineries and marine use. Excellent in electrical industry for conduit, bulb bases, boxes, switches etc.

Facts and Features:

Sealant, Used for thread and gasket sealing, anti-sieze, wide temperature range, pressure seal from vacuum, lead inert, extensive coverage, ready for use, perfect sealing, easy, fast disassembly and undamaged fittings.

ASHLAND INDUSTRIAL PRODUCTS, INC.: TECTYL Protective Coatings:

Firm, Asphaltic Film, Solvent Cut-Back Type, 100F. Flash Point
Solvent Mineral Spirits:

121B:

Film Description: Firm, Leathery, Resilient, Black

Use: Metal or wooden surfaces requiring in-service corrosion
and abrasion protection.

159:

Film Description: Firm, Black, Resilient

Use: Protection of underbodies and enclosed areas of new
vehicles, good penetration to ensure seams, joints and metal
surfaces are well protected.

481H:

Film Description: Hard, Lustrous, Black

Use: Protection of metal surfaces during storage, shipment
and in-service.

890:

Film Description: Firm, Lustrous, Black

Use: Protection of metal surfaces during storage, shipment
and in-service.

891:*

Film: Firm, Lustrous, Black

Use: Protection of metal surfaces during storage, shipment
and in-service.

* Lead-free

Firm, Wax Film, Solvent Cut-Back Type, 100F. Flash Solvent,
Rule 66 Exempt:

107-G:

Film: Firm, Waxy, Black

Use: Automotive rustproofing.

127B:

Film: Thin, Aluminum

Use: Long-term protection of metal surfaces in both indoor
and outdoor storage.

127C6:

Film: Firm, Waxy, Aluminum

Use: Trailers, container chassis, containers, truck bodies,
bridges, tanks and other structures in corrosive environments.

**ASHLAND INDUSTRIAL PRODUCTS, INC.: TECTYL Protective Coatings
(Continued):**

Firm, Wax Film, Solvent Cut-Back Type, 100F. Flash Solvent,
Rule 66 Exempt (Continued):

127G:

Film: Firm, Waxy, Aluminum

Use: Trailer, container chassis, containers, truck bodies,
bridges, tanks and other structures in corrosive environments.

135:

Film: Firm, Waxy, Black

Use: Vehicle underbody and enclosed boxed, seam, joint and
other crevice locations susceptible to corrosion.

140:

Film: Firm, Waxy, Amber, Translucent

Use: Protection of highly polished, intricate phosphated on
non-phosphated ferrous parts.

164:

Film: Firm, Waxy, Black

Use: External protection of machinery, machine parts and
tools, automotive parts, dies, tubing, and other ferrous
metals.

181G:

Film: Firm, Waxy, Black

Use: Vehicle rustproofing & undercoating. Protection of fin-
ished and unfinished metal surfaces.

400C:

Film: Firm, Waxy, Amber, Translucent

Use: Protects metal surfaces, precision parts, vehicles for
overseas and domestic shipment.

506:

Film: Firm, Waxy, Amber, Translucent

Use: External protection of machinery, machine rolls and
tools, automotive parts, dies, tubing and spare parts.

506-EH:

Film: Firm, Waxy, Amber, Translucent

Use: General purpose rust preventive coating for vehicle
rustproofing, protection for machinery and parts in storage.

**ASHLAND INDUSTRIAL PRODUCTS, INC.: TECTYL Protective Coatings
(Continued):**

Firm, Wax Film, Solvent Cut-Back Type, 100F. Flash Solvent,
Rule 66 Exempt (Continued):

506EH-WD:

Film: Firm, Waxy, Amber, Translucent
Use: Vehicle rustproofing, machinery and parts in storage,
pipework.

506G:

Film: Firm, Waxy, Amber, Translucent
Use: Vehicle underbody, and enclosed, boxed, seam, joint
and other crevice locations susceptible to corrosion.

517/518*:

Film: Firm, Waxy, Black or Brown
Use: Vehicle underbody and enclosed, boxed, seam, joint and
other crevice locations susceptible to corrosion.
* 518 is translucent version

846:

Film: Firm, Waxy, Amber, Transparent
Use: Indoor preservation of corrodible metals, long term
storage of precision parts, railway axles, machine tools.

Oil/Soft Wax Film, Solvent Cut-Back Type, 100F. Flash Solvent
(HF Products 140F. Flash Point):

275:

Film: Oily, Light, Transparent
Use: For protection of phosphated or non-phosphated machined
parts, automotive parts, crankshafts, bar and drill stocks and
other ferrous materials.

283/S-17-HF:

Film: Oily, Ultralight, Transparent
Use: For protection of phosphated or non-phosphated machined
parts, automotive parts, crankshafts, bar and drill stocks and
other ferrous materials.

502C:

Film: Soft, Waxy, Tan, Transparent
Use: For protection of pipe, machinery, instruments, bear-
ings, and spare parts.

511HF/511M:

Film: Soft, Wax/Oil, Light Amber, Translucent
Use: Long term indoor preservative for phosphated or non-
phosphated parts in process or in packaged shipment.

**ASHLAND INDUSTRIAL PRODUCTS, INC.: TECTYL Protective Coatings
(Continued):**

Oil/Soft Wax Film, Solvent Cut-Back Type, 100F. Flash Solvent
(HF Products 140F. Flash Point):

848D-HF:

Film: Oily, Lightly Bodied, Transparent

Use: Short term protection of phosphated and non-phosphated, bar and drill stock, machined parts, automotive parts, crankshaft, etc.

861SGD:

Film: Very Thin, Lightly Oily, Transparent

Use: For use on galvanized steel to prevent "white rust."

862:

Film: Oil, Medium Body, Transparent

Use: Indoor or undercover protection of ferrous and non-ferrous metal.

894:

Film: Soft, Thin, Wax/Oil, Light Amber, Translucent

Use: Protection or metallic surfaces of machinery, instruments or parts under cover.

Hard Resin, Solvent Cut-Back Type, Cold Application, 100F.
Aromatic Solvent:

151A:

Film: Hard, Non-Tacky, Translucent

Use: Hard, clear coating for maintaining base metal appearance or luster during long term indoor storage.

Grease Film:

858C:

Film: Amber, Transparent

Use: Lubrication and surface corrosion prevention for industrial, automotive and military equipment over operating range of -65 to 225F.

Oil Film, Oil Type, 250F. Plus Flash Oils:

205-A:

Film: Oily, Light-bodied, Transparent.

Provides protection against corrosion and prevents staining of hot or cold rolled, stacked steel mill products.

**ASHLAND INDUSTRIAL PRODUCTS, INC.: TECTYL Protective Coatings
(Continued):**

Oil Film, Oil Type, 250F. Plus Flash Oils (Continued):

700:

Film: Oily, Thin

Use: Indoor and covered protection of ferrous and non-ferrous metals.

714:

Film: Oily, Light-Bodied, Transparent

Use: Indoor protection of both ferrous and non-ferrous metals.

749WD:

Film: Oily, Light-Bodied, Transparent

Use: Protection of cold or hot rolled steel sheets, coils, bars, rods and tubing.

754:

Film: Oily, Light-Bodied, Transparent

Use: See TECTYL 714

802A:

Film: Heavy, Oily, Transparent

Use: Cold application, heavy oil film, flash 330F. Meets MIL-L-3150C.

823EM:

Film: Oily, Translucent

Use: Protection of internal surfaces of internal combustion engines and other intricate assemblies.

895A:

Film: Oily, Thin, Transparent

Use: Preservation of enclosed systems where the volatile components will protect above the oil level.

900:

Film: Oily, Thin

Use: Protection and lubrication of equipment, pneumatic controls, tools and light duty machinery.

910:

Film: Oily, Thin, Translucent

Use: For use in crankcases as factory fill and break-in oil.

**ASHLAND INDUSTRIAL PRODUCTS, INC.: TECTYL Protective Coatings
(Continued):**

Oil Film, Oil Type, 250F. Plus Flash Oils (Continued):

915W40:

Film: Oily, Thin

Use: For use as factory fill and break-in oil for all new and rebuilt engines.

930:

Film: Oily, Thin, Translucent

Use: For use in crankcases as factory fill and break-in oil.

940:

Film: Oily, Thin

Use: For use as factory fill and break-in oil for all new and rebuilt engines.

959:

Film: Thin, Oily

Use: Normally diluted with mineral spirits solvent and used to flush spent oil and salt water from metallic substrates.

966:

Film: Corrosion inhibited lubrication oil

Use: Lubrication and protection of internal surfaces of special type of internal combustion engines.

Concentrates, Cut-Back Prior to Use:

282:

Film: Oily (solvent soluble)

Use: Reduce with solvent for galvanized or aluminized metal for indoor or under cover shipment.

477D:

Film: Oily (mineral oil soluble)

Use: Reduce with mineral oil for cold rolled steel, hot strap, bar stock for indoor or under cover shipment.

810:

Film: (water soluble)

Use: Water soluble rust preventive containing EP additives for grinding, mild stamping, drawing operations and tube forming.

Hot-Melts (100% Solids) 350F + Flash Point:

435:

Film: Firm, Waxy

Use: Hot application, firm, waxy, transparent film.

437:

Film: Greaselike Waxy Film

Use: Hot application, soft, greaselike, transparent film.

ASHLAND INDUSTRIAL PRODUCTS, INC.: TECTYL Waterborne Protective Coatings:

Waterborne, 100F + Flash Point:

300:

Film: Hard, Transparent, Tack-free

Use: For limited outdoor & moderate-term indoor protection of rust-free, ferrous and non-ferrous metal parts during shipment and storage.

300EH:

Film: Hard, Transparent

Use: For limited outdoor & moderate-term indoor protection of rust-free, ferrous and non-ferrous metal parts during shipment and storage.

300EH Pigmented:

Film: Hard, Transparent

Use: For limited outdoor & moderate-term indoor protection of rust-free, ferrous and non-ferrous metal parts during shipment and storage.

300G:

Film: Hard, Translucent Golden, Tack-free

Use: For moderate-term outdoor and long-term indoor protection of rust-free, ferrous and non-ferrous metal parts during shipment and storage.

300GEH:

Film: Golden Transparent

Use: For moderate-term outdoor and long-term indoor protection of rust-free, ferrous and non-ferrous metal parts during shipment and storage.

300G Pigmented:

Film: Hard, Pigmented

Use: For moderate-term outdoor and long-term indoor protection of rust-free, ferrous and non-ferrous metal parts during shipment and storage.

324:

Film: Hard, Black, Abrasive, Resistant

Use: Acrylic latex coating providing excellent impact and abrasion resistance for use on wood floors on the underside of trailers, containers and trucks.

ASHLAND INDUSTRIAL PRODUCTS, INC.: TECTYL Waterborne Protective Coatings (Continued):

Waterborne, 100F + Flash Point (Continued):

326:

Film: Pigmented

Use: For moderate-term outdoor and long term indoor protection of rust-free ferrous and non-ferrous metal parts.

326EH:

Film: Hard, Red Oxide Primer

Use: For use as primer where a high performance, lead-free coating is needed.

327:

Film: Hard, Red Oxide

Use: For use as primer--where a high performance, lead-free coating is needed.

329:

Film: Pigmented

Uses: For moderate-term outdoor and long-term indoor protection of rust-free, ferrous and non-ferrous metal parts during shipment and storage.

335:

Film: Hard, Red Oxide, Tack Free

Use: For use as a fast dry primer where minimal protection is required and top-coating is planned.

342:

Film: Firm, Black, Gray, Pigmented

Use: Acrylic latex coating providing excellent impact and abrasion resistance. For use on undersides of trailers, containers and trucks.

343:

Film: Black

Use: Specifically formulated for wood flooring.

351:

Film: Hard, Black

Use: Thixotropic compound suitable for complete undercoating of undersides of trucks, buses, truck trailers, camp trailers.

353:

Film: Firm, Black, Resilient

Use: Designed for dip or airless spray application over metal pipe, wood and castings.

356:

Film: Hard, Black

Use: For moderate-term outdoor and long-term indoor protection of rust-free, ferrous and non-ferrous metal parts.

ASHLAND INDUSTRIAL PRODUCTS, INC.: Rust and Oxidation-Inhibiting Oils:**ETC R&O 10/ISO 22:**

API Gravity @ 60F: 33.3
Viscosity @ 40C cSt: 18.8
Viscosity @ 100C cSt: 4.1

ETC R&O 15/ISO 32:

API Gravity @ 60F: 31.2
Viscosity @ 40C cSt: 30.3
Viscosity @ 100C cSt: 5.2

ETC R&O 20/ISO 46:

API Gravity @ 60F: 29.9
Viscosity @ 40C cSt: 43.8
Viscosity @ 100C cSt: 6.6

ETC R&O 30/ISO 68:

API Gravity @ 60F: 28.9
Viscosity @ 40C cSt: 64.8
Viscosity @ 100C cSt: 8.4

ETC R&O 45/ISO 100:

API Gravity @ 60F: 28.4
Viscosity @ 40C cSt: 96.3
Viscosity @ 100C cSt: 11.0

ETC R&O 70/ISO 150:

API Gravity @ 60F: 28.1
Viscosity @ 40C cSt: 143.7
Viscosity @ 100C cSt: 14.3

ETC R&O 100/ISO 220:

API Gravity @ 60F: 27.7
Viscosity @ 40C cSt: 207.8
Viscosity @ 100C cSt: 18.4

ETC R&O 150/ISO 320:

API Gravity @ 60F: 27.2
Viscosity @ 40C cSt: 283.8
Viscosity @ 100C cSt: 23.0

ETC R&O 180/ISO 320:

API Gravity @ 60F: 27.0
Viscosity @ 40C cSt: 378.8
Viscosity @ 100C cSt: 27.7

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CORROSION INHIBITORS

An Industrial Guide

Second Edition

by

Ernest W. Flick



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Preface

This volume describes more than 1100 corrosion inhibitors and rust preventives which are currently available for industrial usage. The book, which will be of value to industrial, technical and managerial personnel involved in the specification and use of these products, has been compiled from information received from 94 manufacturers or distributors of corrosion inhibitors.

Corrosion inhibitors/rust preventives are used for numerous industrial and marine applications. Substrates needing such protection range from metals, concrete, and masonry to wood and fiberglass. Corrosion inhibitors may be supplied as liquids, powders, oils, and concentrates, for application by dipping, brushing, spraying, wiping, slushing or wrapping.

Various inorganic and organic chemicals can be found as constituents of corrosion inhibiting products: sulfites, sulfonates, molybdates, phosphates/asphalts and coal tar derivatives; organic acids, lactones, esters, alcohols, amines, quarternary amines, alkyl thiadiazoles, rubbers, surfactants, and dispersants.

Field applications for corrosion inhibitors/rust preventives may include protection of engine parts, tankers, storage tanks, pipelines, and petroleum handling facilities; protection of marine equipment and operations from humidity, salt fog and salt spray; protection from UV radiation and caustics; use as a fingerprint suppressant, in heat exchangers, for boiler feedwater, in cooling towers, metalworking fluids, and water-cooled engines.

The data included represent selections from manufacturers' descriptions, made at no cost to, nor influence from, the makers or distributors of these materials. Only

the most recent information has been included. It is believed that all of the products listed here are currently available, which will be of interest to readers concerned with product discontinuances. This book should be a valuable guide to those interested in products to help alleviate corrosion.

Products are presented by company, and the companies are listed alphabetically. The table of contents is organized in such a way as to serve as a subject index to the book. Also included is a Trade Name Index for rapid location of products by the reader. In addition, another section, which will be useful, contains the Suppliers' Addresses. It can be found immediately following the Product Information section.

The book lists the following product information, as available, in the manufacturer's own words:

- (1) Company name and product category.
- (2) Trade name and product numbers.
- (3) Product Description: A brief description of the product, as presented by the supplier.

My fullest appreciation is expressed to the companies and organizations who supplied the data included in this book.

August 1993

Ernest W. Flick

Notice

To the best of our knowledge the information in this publication is accurate; however, the Publisher does not assume any responsibility for the accuracy or completeness of, or consequences arising from, such information. This industrial Guide does not purport to contain detailed user instructions, and by its range and scope could not possibly do so. Mention of trade names or commercial products does not constitute endorsement or recommendation for use by the Publisher.

Corrosion inhibitors and their raw materials can be toxic, and therefore, due caution should always be exercised in the use of these potentially hazardous materials. Final determination of the suitability of any information or product for use contemplated by any user, and the manner of that use is the sole responsibility of the user. We strongly recommend that users seek and adhere to a manufacturer's or supplier's current instructions for handling each material they use.