

Plastic Piping Systems for soil and waste discharge (low and high temperature) within the building structure — Unplasticized poly(vinyl chloride) (PVC-U) —

Part 2: Guidance for the assessment of conformity

ICS 83.140.30;91.140.80

National foreword

This Draft for Development is the English language version of ENV 1329-2:2001

This publication is not to be regarded as a British Standard.

It is being issued in the Draft for Development series of publications and is of a provisional nature because **there is no British Standard corresponding with ENV 1329-2:2001. The publication of this draft for development does not imply that its use is mandatory.** It should be applied on this provisional basis, so that information and experience of its practical application may be obtained.

Comments arising from the use of this Draft for Development are requested so that UK experience can be reported to the European organization responsible for its conversion into a European Standard. A review of this publication will be initiated 2 years after its publication by the European organization so that a decision can be taken on its status at the end of its three-year life. The commencement of the review period will be notified by an announcement in *Update Standards*.

According to the replies received by the end of the review period, the responsible BSI Committee will decide whether to support the conversion into a European Standard, to extend the life of the prestandard or to withdraw it. Comments should be sent in writing to the Secretary of BSI Subcommittee PRI/88/1, Plastic Piping for Pressure, at 389 Chiswick High Road, London W4 4AL, giving the document reference and clause number and proposing, where possible, an appropriate revision of the text.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

This Draft for Development, having been prepared under the direction of the Sector Committee for Materials and Chemicals, was published under the authority of the Standards Committee and comes into effect on 15 August 2001

Summary of pages

This document comprises a front cover, an inside front cover, the ENV title page, pages 2 to 19, and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

English version

Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure - Unplasticized poly(vinyl chloride) (PVC-U) - Part 2: Guidance for the assessment of conformity

Systèmes de canalisations en plastique pour l'évacuation des eaux-vannes et des eaux usées (à basse et à haute température) à l'intérieur de la structure des bâtiments - Poly(chlorure de vinyle) non plastifié (PVC-U) - Partie 2: Guide pour l'évaluation de la conformité

Kunststoff-Rohrleitungssysteme zum Ableiten von Abwasser (niedriger und hoher Temperatur) innerhalb der Gebäudestruktur - Weichmacherfreies Polyvinylchlorid (PVC-U) - Teil 2: Empfehlungen für die Beurteilung der Konformität

This European Prestandard (ENV) was approved by CEN on 8 March 2001 as a prospective standard for provisional application.

The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

	Page
Foreword	3
Introduction	4
1 Scope.....	5
2 Normative references.....	5
3 Definitions, symbols and abbreviations	5
3.1 Definitions.....	5
3.2 Abbreviations.....	7
4 Requirements	8
4.1 General.....	8
4.2 Testing and inspection.....	8
Bibliography	19

Foreword

This European Prestandard has been prepared by Technical Committee CEN/TC 155 "Plastics piping systems and ducting systems", the secretariat of which is held by NEN.

This prestandard can be used to support elaboration of national third party certification procedure for products conforming to EN 1329-1:1999.

This prestandard is a Part of a System Standard for plastics piping systems of a particular material for a specified application. There are a number of such System Standards.

System Standards are based on the results of the work undertaken in ISO/TC 138 "Plastics pipes, fittings and valves for the transport of fluids", which is a Technical Committee of the International Organization for Standardisation (ISO).

They are supported by separate standards on test methods to which references are made throughout the System Standard.

The System Standards are consistent with general standards on functional requirements and on recommended practice for installation.

EN 1329 consists of the following Parts, under the general title "*Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Unplasticized poly(vinyl chloride) (PVC-U)*"

- *Part 1: Specifications for pipes, fittings and the system ;*
- *Part 2: Guidance for the assessment of conformity ;*

The Recommended practice for installation is dealt with in ENV 13801.

This part of EN 1329 includes a bibliography.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this European Prestandard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

The System Standard, of which this is Part 2, specifies the requirements for a piping system and its components when made from unplasticized poly(vinyl chloride) (PVC-U). The piping system is intended to be used for soil and waste discharge.

For material and components, requirements and test methods are specified in EN 1329-1. This standard also covers characteristics for fitness for purpose (mainly for joints). Recommended practice for installation is given in ENV 13801.

This Part of EN 1329 covers procedures and recommendations for the assessment of conformity of materials, components, joints and assemblies and is intended to be used by certification bodies, inspection bodies, testing laboratories and manufacturers.

1 Scope

This European Prestandard gives guidance for the assessment of conformity to be included in the manufacturer's quality plan as part of the quality system.

This prestandard includes :

- a) Requirements for materials, components, joints and assemblies given in EN 1329-1:1999;
- b) Requirements for the manufacturer's quality system ;

NOTE 1 It is recommended that the quality system conforms to EN ISO 9001, as applicable.

- c) Definitions and procedures to be applied if third party certification is involved.

NOTE 2 If third party certification is involved, it is recommended that the certification body is accredited to EN 45011 or EN 45012, as applicable.

This Part of EN 1329 is applicable to piping systems made from unplasticized poly(vinyl chloride) (PVC-U) in the field of soil and waste discharge systems (low and high temperature) inside buildings (application area code "B") and for soil and waste discharge systems for both inside buildings and buried in ground within the building structure (application area code "BD"). This is reflected in the marking of products by "B" or "BD".

2 Normative references

This European Prestandard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Prestandard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 1329-1:1999, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Unplasticized poly(vinyl chloride) (PVC-U) — Part 1: Specifications for pipes, fittings and the system.*

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1 : Sampling schemes indexed by acceptable quality level (AQL) for lot-by-lot inspection.*

3 Definitions, symbols and abbreviations

For the purposes of this European Prestandard, the definitions, symbols and abbreviations given in EN 1329-1:1999, apply together with the following :

3.1 Definitions

3.1.1

certification body

impartial body, governmental or non-governmental, possessing the necessary competence and responsibility to carry out certification of conformity according to given rules of procedure and management

3.1.2

inspection body

impartial organization or company, approved by a certification body as possessing the necessary competence to verify and/or to carry out initial type testing, audit testing and inspection of the manufacturer's factory production control in accordance with the relevant European Standard

3.1.3

testing laboratory

laboratory which measures, tests, calibrates or otherwise determines the characteristics of the performance of materials and products

3.1.4

quality system

organizational structure, responsibilities, procedures, processes and resources for implementing quality management (see EN ISO 8402)

3.1.5

quality plan

document setting out the specific quality practices, resources and sequence of activities relevant to a particular product or range of products

3.1.6

type testing (TT)

tests performed to prove that the material, component, joint or assembly is capable of conforming to the requirements given in the relevant standard

3.1.6.1

preliminary type testing (PTT)

type testing carried out by or on behalf of the manufacturer

3.1.6.2

initial type testing (ITT)

type testing carried out by, or on behalf of a certification body for certification purposes

3.1.7

batch release test (BRT)

test performed by the manufacturer on a batch of components which has to be satisfactorily completed before the batch can be released

3.1.8

process verification test (PVT)

test performed by the manufacturer on materials, components, joints or assemblies at specified intervals to confirm that the process continues to be capable of producing components conforming to the requirements given in the relevant standard

NOTE Such tests are not required to release batches of components and are carried out as a measure of process control.

3.1.9

audit test (AT)

test performed by, or on behalf of a certification body to confirm that the material, component, joint or assembly continues to conform with the requirements given in a System Standard and to provide information to assess the effectiveness of the quality system

3.1.10

indirect test (IT)

test performed by the manufacturer different from that specified for that particular characteristic, having verified its correlation with the specified test

3.1.11

witness testing (WT)

testing accepted by the certification body for initial type testing and/or audit testing, which is carried out by, or on behalf of the manufacturer and supervised by a representative of the certification body, qualified in testing

3.1.12

material

defined type of polymer or additive or constituent thereof

3.1.13

compound (blend)

recipe which defines types of polymer, additives or constituents at specified dosage levels

3.1.14

material batch or compound batch

clearly identifiable quantity of a particular material or compound

3.1.15

production batch

clearly identifiable collection of units, manufactured consecutively under the same conditions, using material or compound conforming to the same specification

3.1.16

lot

clearly identifiable sub-division of a batch for inspection purposes

3.1.17

sample

one or more units of product drawn from a batch or lot, selected at random without regard to quality

NOTE The number of units of product in the sample is the sample size.

3.1.18

inspection level

relationship between the lot or batch size and the sample size (see ISO 2859-1)

3.1.19

group

collection of similar components from which samples are selected for testing purposes

3.2 Abbreviations

NOTE For reasons of avoiding misunderstanding the following abbreviations are kept the same in each languages. For the same reason the terms are given in the three languages.

AT	E : audit test
	F : essai d'audit
	D : Überwachungsprüfung
BRT	E : batch release test
	F : essai de libération de campagne de fabrication
	D : Freigabeprüfung einer Charge
IT	E : indirect test
	F : essai indirect
	D : indirekte Prüfung
ITT	E : initial type testing
	F : essai de type initial
	D : Erst-Typprüfung
PTT	E : preliminary type testing
	F : essai de type préliminaire
	D : vorausgehende Typprüfung
PVT	E : process verification test
	F : essai de vérification du procédé de fabrication
	D : Prozessüberprüfung

- TT E : type test
F : essai de type
D : Typprüfung
WT E : witness testing
F : essai témoin
D : Prüfung unter Aufsicht

4 Requirements

4.1 General

4.1.1 Materials, components, joints and assemblies shall conform to the requirements given in EN 1329-1:1999.

4.1.2 Components and/or assemblies shall be produced by the manufacturer under a quality system which includes a quality plan.

4.2 Testing and inspection

4.2.1 Material specification

For the purposes of this prestandard the material specification consists of a recipe/compound which defines types of PVC and additives and their dosage levels.

The dosage level of ingredients of a material shall not exceed the tolerance bands given in Table 1. If any level exceeds the dosage band or if a type is changed, this variation in formulation constitutes a change in material.

The values of the parts *X* added to 100 parts by mass of PVC shall be specified by the manufacturer in his quality plan.

Table 1 — Material specification

Ingredients	Type	Band
PVC resin	K value : ± 3 units	$X_1 = 100$ parts
Type of stabiliser or master batch	Pb Ca-Zn Sn Ca-Sn n) Others	$X_2 : \pm 25 \%$
Lubricants	All	$X_3 : \pm 50\%$ for $X_3 \leq 0,2$ $X_3 : \pm 0,1$ part for $X_3 > 0,2$
Fillers	CaCO ₃ Others	$X_4 : \pm 3$ parts $X_5 : \pm 25\%$
Impact modifiers	All	$X_6 : \pm 1$ part
Flow agents	All	$X_7 : \pm 25\%$ for $X_7 \leq 2$ $X_7 : \pm 0,5$ part for $X_7 > 2$
Pigments	No requirements	-
Others	To be separately specified by the manufacturer	$X_{8,1} : \pm 25 \%$ $X_{8,n} : \pm 25 \%$
External reprocessable and recyclable material	With an agreed specification ¹⁾	$\leq X_9^{2)}$
External reprocessable and recyclable material	Not covered by an agreed specification	$\leq X_{10}^{3)}$
¹⁾ The specifications shall be declared by the manufacturer to the certification body. ²⁾ See limitations in A.2.2.2 of EN 1329-1:1999. ³⁾ See limitations in A.2.3.1 of EN 1329-1:1999.		

4.2.2 Grouping

For the purposes of this prestandard the following groups shall apply for TT, PTT, ITT, PVT and AT.

4.2.2.1 Size group

Three size groups, each comprising a group of nominal sizes DN, are designated as follows :

Size group 1 : 32 to 63 ;

Size group 2 : 75 to 180 ;

Size group 3 : 200 to 315.

4.2.2.2 Fitting group

Three fittings groups , each comprising a group of fitting types having a similar design, are designated as follows :

Fitting group 1 : Bends

Fitting group 2 : Branches

Fitting group 3 :Other fittings

4.2.3 Type tests (TT)

4.2.3.1 General

Type tests shall demonstrate that the products conform to all requirements for the characteristics given in Tables 2, 3 or 4 as applicable.

In addition, relevant type tests shall be carried out whenever there is a change in design, in material and/or in the production method, other than routine in-process adjustments, and to extensions of the product range as indicated in the same tables.

Table 2 — Characteristics of pipes that require type testing (TT)

Characteristics	References to paragraphs and tables of EN 1329-1:1999	Testing relevant to ¹⁾				Sampling procedure (minimum sampling)
		N	D	M	E	
PVC content ²⁾	4.1	+	-	+	-	one calculation/material
Long-term resistance to internal pressure ³⁾	10 – Table 22	+	-	+	-	once/material
Appearance	5.1	+	-	-	+	once/size group
Colour	5.2	+	-	-	+	once/size group
Geometrical characteristics	6.2 and 6.4 Tables 1 to 4, 9 and 13	+	+	-	+	once/size
Impact resistance (round-the-clock method)	7.1.1 – Table 16	+	-	+	+	once/size group/material once/material
Impact resistance ⁴⁾ (staircase method)	7.1.2 – Table 16	+	-	+	+	once/size group/material once/material
Vicat softening temperature	8.1 – Table 19	+	-	+	-	once/material
Longitudinal reversion	8.1 – Table 19	+	-	-	+	once/size group
Degree of gelation	8.1 – Table 19	+	-	+	+	once/size group/material once/material
Marking	13.2 – Table 24	+	-	-	+	once/size
¹⁾ N : new system D : change of design (only for sockets) M : change of material E : extension of the product range (except the products already covered by the scheme of a minimum sampling procedure). ²⁾ Done by calculation using Table 1. ³⁾ On the smallest produced diameters. ⁴⁾ Only for pipes intended also to be installed at temperature below – 10 °C. If this test is required, the round-the clock method is not necessary.						

Table 3 — Characteristics of fittings that require type testing (TT)

Characteristics	References to paragraphs and tables of EN 1329-1:1999	Testing relevant to ¹⁾					Sampling procedure (minimum sampling)
		N	D	M	P	E	
PVC content ²⁾	4.1	+	-	+	-	-	one calculation/material
Long-term resistance to internal pressure	10 – Table 23	+	-	+	-	-	once/material
Appearance	5.1	+	-	-	+	+	once/size/fitting
Colour	5.2	+	-	-	+	+	once/size/fitting
Geometrical characteristics	6.3 - 6.4 – 6.5 Tables 1 to 15	+	+	-	+	+	once/size/fitting
Mechanical characteristics ³⁾	7.2	+	+	-	+	+	once/size group/fitting group
Vicat softening temperature	8.2 – Table 20	+	-	+	-	-	once/material
Effect of heating ⁴⁾	8.2 – Table 20	+	+	+	+	+	once/fitting once/size group/fitting group
Marking	13.3 – Table 25	+	-	-	+	+	once/fitting
¹⁾ N : new system D : change of design M : change of material P : change of production method (injection moulding or fabricating) E : extension of the product range (except the products already covered by the scheme of the minimum sampling procedure). ²⁾ Done by calculation using Table 1. ³⁾ Only for fabricated fittings made from more than one piece. A sealing ring retaining means is not considered as a piece. ⁴⁾ Only for injection-moulded parts.							

Table 4 — Characteristics for fitness for purpose of the system that require type testing (TT)

Characteristics	References to paragraphs and tables of EN 1329-1:1999	Testing relevant to ¹⁾				Sampling procedure (minimum sampling)
		N	D	M	E	
Watertightness	9 – Table 21	+	+	-	+	once/size group/joint design ²⁾
Airtightness	9 – Table 21	+	+	-	+	once/size group/joint design ²⁾
Tightness of joints of elastomeric seals	9 – Table 21	+	+	-	+	once/size group/joint design ²⁾
Elevated temperature cycling	9 – Table 21	+	+	+	-	once/material/joint design ²⁾
Long-term performances of TPE seals	9 – Table 21	+	+	+ ³⁾	+	once/sealing material/size group/joint design ²⁾

¹⁾ See note 1 in Table 2.

²⁾ Joint design at least includes : seal design, groove geometry and seal hardness (± 5 IHRD).

³⁾ Change of TPE material.

4.2.3.2 Preliminary type testing (PTT)

The manufacturer shall demonstrate that the products conform to all requirements for all characteristics given in Tables 2, 3 or 4, as applicable.

4.2.3.3 Initial type testing (ITT)

If third party certification is involved, the certification body shall assess the conformity of a product to all requirements for the characteristics given in Tables 2, 3 or 4, as applicable.

The assessment shall be performed by validation or testing, using the sampling procedure given in Tables 2, 3 or 4, as applicable, and grouping according to 4.2.2 in an approved testing laboratory or by witness testing.

Validated preliminary test data including long-term characteristics, supplied by the manufacturer and traceable to material or compound and process, shall be taken into account for initial type testing.

4.2.4 Batch release tests (BRT)

Those characteristics specified in EN 1329-1:1999 and listed in Tables 5 or 6, as applicable, shall be batch release tested with the minimum sampling frequency as given in those tables.

The manufacturer shall specify a batch or a lot size in his quality plan.

A batch or lot shall only be released for supply when all the relevant tests and inspections have been carried out at least once at the specified frequencies and the requirements have been conformed to.

If a product fails in respect of any characteristic given in Tables 5 or 6, as applicable, the batch or lot shall be rejected or the retest procedures shall be performed for the characteristic on which the product failed.

The retest procedure shall conform to Tables 5 or 6, as applicable, and shall conform to procedure A as follows.

Procedure A

Find the last product which conforms to the requirements as specified in EN 1329-1:1999.

Release all products produced before that point and reject the products produced after that point.

If the retest requirements are conformed to then release the batch or lot. If they are not conformed to then reject the batch or lot.

Procedures for dealing with rejected products shall be detailed in the manufacturer's quality plan.

Table 5 — Characteristics of pipes and minimum sampling frequencies BRT and retesting procedure

Characteristics	Reference to paragraphs and tables of EN 1329-1:1999	Minimum sampling frequency per production line	Retest procedure
Appearance/colour	5	once/8 h	A
Mean outside diameter	6.2.1 – Tables 1 and 2	once/8 h and starting up	A
Wall thickness	6.2.5 – Tables 3 and 4	once/8 h and starting up	A
Length of pipe	6.2.3	once/8 h and starting up	A
Chamfer ¹⁾	6.2.4	once/8 h and starting up	A
Socket dimensions ²⁾	6.4 – Tables 9 to 13	once/8 h and starting up	A
Impact resistance (round the clock method)	7.1.1 – Table 16	once/24 h ³⁾	A
Impact resistance (staircase method) ⁴⁾	7.1.2 – Table 16	once/24 h ³⁾	A
Longitudinal reversion	8.1 – Table 19	once/24 h	A
Degree of gelation	8.1 – Table 19	once/24 h and starting up	A
Marking	13.2 – Table 24	once/8 h	A
¹⁾ If a chamfer is required. ²⁾ For dimensions which are influenced by the process, otherwise only at start up. ³⁾ Once/8 h when external reprocessible or recyclable material not covered by an agreed specification (see A.2.3.1 of EN 1329-1:1999) is used. ⁴⁾ If this test is carried out, the round-the-clock method is not necessary.			

Table 6 — Characteristics of fittings and minimum sampling frequencies for BRT and retesting procedure

Characteristics	Reference to paragraphs and tables of EN 1329-1:1999	Minimum sampling frequency per production line	Retest procedure
Appearance/colour	5	once/cavity/4 h	A
Wall thickness	6.3.3 – Tables 5 to 8	once/cavity/8 h	A
Socket and spigot dimensions ¹⁾	6.4 – Tables 9 to 15	once/cavity/8 h	A
Effect of heating ²⁾	8.2 – Table 20	once/cavity/24 h and starting up	A
Marking	13.3 – Table 25	Every cavity when starting up	A
¹⁾ For dimensions which are influenced by the process.			
²⁾ Only for injection-moulded parts.			

4.2.5 Process verification tests (PVT)

Those characteristics specified in EN 1329-1:1999 and listed in Table 7, shall be process verification tested with the minimum sampling frequency as given in this table, if not type tested or audit tested in the same period.

If the product does not conform to the requirements in respect of any characteristic given in Table 7, the retest procedure detailed in the manufacturer's quality plan shall be performed. If third party certification is involved, the certification body shall be informed.

If the retest procedure does not confirm conformity of the product with the requirements, then the process shall be investigated and corrected in accordance with the procedures given in the manufacturer's quality plan.

NOTE A test performed as an audit test (AT) does not need to be repeated as a process verification test (PVT)

Table 7 —Characteristics and minimum sampling frequencies for PVT

Characteristics	References to paragraphs and tables of EN 1329-1:1999	Minimum sampling frequency
Pipes		
Long-term resistance to internal pressure	10 – Table 22	once/year/material currently used
Vicat softening temperature	8.1 – Table 19	
Fittings		
Long-term resistance to internal pressure	10 – Table 23	once/2 years/material currently used
Vicat softening temperature	8.2 – Table 20	once/year/material currently used
System		
Watertightness	9 – Table 21	once/2 years/size group /socket design/series ¹⁾
Airtightness	9 – Table 21	
Tightness of joints of elastomeric seals	9 – Table 21	
Elevated temperature cycling	9 – Table 21	once/2 years/size group/socket design/series
Long-term performance of TPE seals	9 – Table 21	once/2 years/material ²⁾ /size group
¹⁾ Joint design at least includes : seal design, groove geometry and seal hardness (± 5 IHRD).		
²⁾ TPE material.		

4.2.6 Audit tests (AT)

If third party certification is involved, those characteristics specified in EN 1329-1:1999, and listed in Table 8 are intended to be audit tested with the minimum sampling frequency as given in this table.

Table 8 — Characteristics and minimum sampling frequencies for AT

Characteristics	References to paragraphs and tables of EN 1329-1:1999	Minimum sampling frequency
Pipes		
PV Content ¹⁾ Long-term resistance to internal pressure ²⁾ Vicat softening temperature	4.1 10 – Table 22 8.1 – Table 19	once/year
Appearance/colour Geometrical characteristics Impact resistance (round-the-clock method) Impact resistance (staircase method) ³⁾ Longitudinal reversion Degree of gelation Marking	5 6.2 7.1.1 – Table 16 7.1.2 – Table 16 8.1 – Table 19 8.1 – Table 19 13.2 – Table 24	once/year/size group/series
Fittings		
Long-term resistance to internal pressure	10 – Table 23	once/2 years
PVC content ¹⁾ Vicat softening temperature	4.1 8.2 – Table 20	once/year
Appearance/colour Geometrical characteristics Effect of heating Marking	5 6.3 8.2 – Table 20 13.3 – Table 25	once/year/size group/series
System		
Watertightness Airtightness Leaktightness of joints of elastomeric seals	9 – Table 21 9 – Table 21 9 – Table 21	once/year, one dimension/series
Elevated temperature cycling	9 – Table 21	once/2 years/joint type/series
Long-term performance of TPE seals	9 – Table 21	once/2 years/size group
¹⁾ Done by calculation using Table 1. ²⁾ On the smallest diameter used. ³⁾ Only for pipes intended also to be installed at temperature below – 10°C. If this test is required, the round-the-clock method is not necessary.		

NOTE 1 The sizes, types and classes selected for tests should be primarily those which have not previously been selected for audit testing. Samples should be preferably taken from the largest volume of production per group.

NOTE 2 It is expected that audit testing will be carried out over at least two visits each year.

NOTE 3 A test performed as a process verification test (PVT) does not need to be repeated as an audit test (AT).

4.2.7 Indirect tests (IT)

Generally testing shall be performed according to the test methods referred to EN 1329-1:1999.

For the purposes of this prestandard indirect testing may be used for BRT characteristics as given in Tables 5 or 6.

Indirect testing shall not be applied to TT, PVT and AT.

The indirect test method used and the correlation or safe relationship of the indirect testing to the specified testing shall be documented in the manufacturer's quality plan and the IT shall be agreed by the certification body. The continuing validity of the indirect testing shall be checked at regular intervals.

In cases of dispute the BRT as specified in Tables 5 or 6 shall be used.

If third party certification is involved, the IT shall be acceptable by certification body.

NOTE Indirect testing may be used to reduce the frequency of the specified BRT, but it is not intended to replace these tests completely.

4.2.8 Inspection records and test records

Unless otherwise specified all records of BRT shall be maintained for a minimum of 2 years and all other records for a minimum of 4 years.

Bibliography

- EN 45011, *General requirements for bodies operating product certification systems*
(ISO/IEC Guide 65:1996)
- EN 45012, *General requirements for bodies operating assessment and certification/registration of*
quality systems (ISO/IEC Guide 62:1996)
- EN ISO 8402, *Quality management and quality assurance – Vocabulary* (ISO 8402:1994)
- EN ISO 9001 *Quality management systems - Requirements* (ISO 9001:2000)

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: 020 8996 9000. Fax: 020 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: 020 8996 9001. Fax: 020 8996 7001. Standards are also available from the BSI website at <http://www.bsi-global.com>.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: 020 8996 7111. Fax: 020 8996 7048.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: 020 8996 7002. Fax: 020 8996 7001. Further information about BSI is available on the BSI website at <http://www.bsi-global.com>.

Copyright

Copyright subsists in all BSI publications. BSI also holds the copyright, in the UK, of the publications of the international standardization bodies. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI.

This does not preclude the free use, in the course of implementing the standard, of necessary details such as symbols, and size, type or grade designations. If these details are to be used for any other purpose than implementation then the prior written permission of BSI must be obtained.

If permission is granted, the terms may include royalty payments or a licensing agreement. Details and advice can be obtained from the Copyright Manager. Tel: 020 8996 7070.