DRAFT FOR DEVELOPMENT

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12200-2:2003

Plastics rainwater piping systems for above ground external use — Unplasticized poly(vinyl chloride) (PVC-U) —

Part 2: Guidance for the assessment of conformity

ICS 23.040.01

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National foreword

This Draft for Development is the official English language version of CEN/TS 12200-2:2003.

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 it is a Technical Specification adopted from CEN/TS. 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 to 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 3-year life. Notification of the start of the review period will be made in an announcement in the appropriate issue of *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 Technical Specification or to withdraw it. Comments should be sent in writing to the Secretary of BSI Subcommittee PRI/88/1, Non-pressure applications, at British Standards House, 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 Catalogue* under the section entitled "International Standards Correspondence Index", or by using the "Search" facility of the *BSI Electronic Catalogue* or of British Standards Online.

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English version

Plastics rainwater piping systems for above ground external use - Unplasticized poly(vinyl chloride) (PVC-U) - Part 2: Guidance for the assessment of conformity

This Technical Specification (CEN/TS) was approved by CEN on 25 November 2002 for provisional application.

The period of validity of this CEN/TS 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 CEN/TS can be converted into a European Standard.

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

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Contents

Foreword

This document (CEN/TS 12200-2:2003) has been prepared by CEN /TC 155 "Plastics piping systems and ducting systems", the secretariat of which is held by NEN.

This Technical Specification can be used to support elaboration of national third party certification procedures for products conforming to EN 12200-1.

This Technical Specification is a Part of a System Standard for plastics piping systems of a particular material for a specific 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 Organisation 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 12200 consists of the following Parts, under the general title "*Plastics rainwater piping systems for above ground external use — Unplasticized poly (vinyl chloride) (PVC-U)".*

— Part 1: *Specifications for pipes, fittings and the system*;

— Part 2: *Guidance for the assessment of conformity;*

This part of EN 12200 includes a bibliography.

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

Introduction

The System Standard, of which this is Part 2, specifies the requirements for a rainwater piping system and its components made from unplasticized poly (vinyl chloride) (PVC-U). The piping system is intended for above ground external use.

For material and components, requirements and test methods are specified in Part 1 of EN 12200. Characteristics for fitness for purpose are also covered in Part 1.

This Part of EN 12200 covers procedures and requirements 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 Part of EN 12200 gives guidance for the assessment of conformity to be included in the manufacturer's quality plan as part of the quality system.

This Technical Specification includes:

a) requirements for materials, components, joints and assemblies given in EN 12200-1:2000;

b) requirements for the manufacturer's quality system;

NOTE 1 It is recommended that the quality system conforms to EN ISO 9001:2000[1].

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

NOTE 2 If a third party certification is involved, it is recommended that the certification body is accredited to EN 45011[2] or EN 45012[3], as applicable.

This Part of EN 12200 is applicable to unplasticized poly (vinyl chloride) (PVC-U) rainwater piping systems intended to be used for above ground external use.

2 Normative references

This Technical Specification 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 Technical Specification only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 12200-1:2000, *Plastics rainwater piping systems for above ground external use — Unplasticized poly(vinyl chloride) (PVC-U) — Part 1: Specifications for pipes, fittings and the system*

3 Terms and definitions, symbols and abbreviations

For the purposes of this Technical Specification, the terms and definitions, symbols and abbreviations given in EN 12200-1:2000, apply together with the following.

3.1 Terms and 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 organisation 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
organisational structure, responsibilities, procedures, processes and resources for implementing quality management

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)
testing 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 specific 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 to the requirements given in the System Standard and to provide information to assess the effectiveness of the quality system

3.1.10
indirect testing
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
testing accepted by a 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 or continuously 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[4])

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 of the languages. For the same reason the terms are given in the three languages.

AT E: audit test
F: essais 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: essais de type initiaux
D: Erstprüfung

PTT E: preliminary type testing
F: essais de type préliminaires
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: essais de témoins
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 12200-1:2000.

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 Technical Specification 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 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	1) Pb 2) Ca-Zn 3) Sn 4) Ca-Sn n) Others	X_2: ± 25 %
Lubricants	All	X_3: ± 50 % for X_3 0,2 X_3: ± 0,1 parts for X_3 > 0,2
Fillers	1) $CaCO_3$ 2) Others	X_4: 3 parts X_5: 25 %
Impact modifiers	All	X_6 ± 1 part
Flow agents	All	X_7 ± 25 % for X_7 2 X_7 ± 0,5 parts for X_7 > 2
Pigments		No requirements
Others	To be separately specified by the manufacturer	$X_{8.1}$: ± 25 % $X_{8.n}$: ± 25 %
External reprocessable and recyclable material	With agreed specification [a]	X_9 [b]
External reprocessable and recyclable material	Not covered by an agreed specification	X_{10} [c]

[a] The specifications shall be declared by the manufacturer to the certification body.

[b] See limitations in A.2.2.2 of EN 12200-1: 2000.

[c] See limitations in A.2.3.1 of EN 12200-1: 2000.

4.2.2 Grouping

For the purposes of this Technical Specification the entire size range from 50 mm to 160 mm inclusive shall be considered as a single group and this shall apply for TT, PTT, ITT, PVT and AT.

4.2.2.1 Fitting group

Two fittings groups, each comprising of fitting types having a similar design, are defined as follows:

Fitting group 1: Bends, branches and straight couplers.

Fitting group 2: Pipe brackets and pipe coupler with fixing lugs.

4.2.3 Type tests (TT)

4.2.3.1 General

Type tests shall demonstrate that products conform to all requirements for the characteristics given in Table 2. 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 Table 2.

Table 2 — Characteristics that require type testing (TT)

Characteristic	References to paragraphs and tables of EN 12200-1:2000	Testing relevant to [a]					Sampling procedure (minimum sampling)
		N	D	M	P	E	
Pipes							
Appearance	5	x	x	x	x		once/size group
Geometrical characteristics	6.2 & 6.4	x	x		x	x	once/size group
Impact resistance	7.1	x		x	x	x	once/size group/material
Tensile impact strength	7.1	x		x			once/material
Tensile strength	7.1	x		x			once/material
Elongation	7.1	x		x			once/material
Vicat softening temperature	8.1	x		x			once/material
Longitudinal reversion	8.1	x		x	x	x	once/size group
Marking	12.2	x	x		x	x	once/size
Fittings							
Appearance	5	x	x	x	x	x	one sample/each fitting
Geometrical characteristics	6.3 & 6.4	x	x		x	x	once/size group/fitting group
Bracket strength	7.2	x	x	x	x	x	once/size group
Effects of heating [b]	8.2	x		x	x	x	once/fitting group
Vicat softening temperature	8.2	x		x			once/material
Marking	12.3 & 12.4	x	x		x	x	once/fitting
Fitness for purpose							
Watertightness	9	x	x		x	x	once/size group/joint design
Residual tensile impact strength	9	x		x			once/material
Artificial ageing (colour fastness)	9	x		x			once/material

[a] The letters denote the following:
N: new systems
D: change of design
M: change of material
P: change of process method
E: extension of the product range
x: denotes relevancy of testing

[b] Only for injection moulded parts

4.2.3.2 Preliminary type testing (PTT)

The manufacturer shall demonstrate that the product conforms to all requirements of the characteristics given in Table 2.

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 Table 2.

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

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 12200-1:2000 and listed in Table 3 shall be batch release tested with the minimum sampling frequency as given in Table 3.

Table 3 — Characteristics and minimum sampling frequencies for BRT and retest procedures

Characteristics	Reference to paragraphs and tables of EN 12200-1:2000	Minimum sampling frequency per line production	Retest procedure
Pipes			
Appearance	5	Once per 8 h	A
Outside diameter	6.2.1 & 6.2.2	once per 8 h	A
Wall thickness	6.2.4	once per 8 h	A
Length	6.2.3	once per 8 h	A
Socket dimensions [a]	6.4	once per 8 h	A
Impact resistance [b]	7.1	once per 24 h	A
Longitudinal reversion	8.1	once per 24 h	A
Marking	12.2	once per 8 h	A
Fittings			
Appearance	5	Once per cavity per 4 h	A
Socket and spigot dimensions [a]	6.4	once per cavity per 8 h	A
Effects of heating [c]	8.2	once per cavity per 24 h	A
Marking	12.3	every cavity when starting up	A
[a] Only applies to dimensions likely to vary during the process.			
[b] This test can be the subject of indirect testing at ambient temperature, if correlation can be established.			
[c] Only for injection moulded parts.			

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 Table 3, 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 Table 3 and shall conform to Procedure A as follows.

Procedure A

Find the last product which conforms to the requirements as specified in EN 12200-1:2000. 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.

4.2.5 Process verification tests (PVT)

Those characteristics specified in EN 12200-1:2000 and listed in Table 4, 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.

Table 4 — Characteristics and minimum sampling frequencies for PVT

Characteristic	References to paragraphs and tables of EN 12200-1:2000	Minimum sampling frequency
Vicat	8.1 & 8.2	once/year/formulation
Tensile Strength	7.1	once/year/formulation
Elongation	7.1	once/year/formulation
Watertightness	9	once/2 years/socket design

If the product does not conform to the requirements in respect of any characteristic given in Table 4, 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 to the requirements, then the process shall be investigated and corrected in accordance with the procedures given in the manufacturer's quality plan.

4.2.6 Audit tests (AT)

If third party certification is involved, those characteristics specified in EN 12200-1:2000 and listed in Table 5 are intended to be audit tested with the minimum sampling frequency as given in this table.

Table 5 — Characteristics and minimum sampling frequencies for AT

Characteristics	References to paragraphs and tables of EN 12200-1:2000	Minimum sampling Frequency
General		
Vicat	8.1 & 8.2	Once/year/formulation used [a]
Pipes		
Appearance	5	Once/year/size group/series
Dimensions	6.2 & 6.4	Once/year/ size group/series
Tensile strength	7.1	Once/year/ size group/series
Elongation	7.1	Once/year/ size group/series
Impact strength	7.1	Once/year/ size group/series
Tensile impact strength	7.1	Once/year/ size group/series
Longitudinal reversion	8.1	Once/year/ size group/series
Marking	12.2	Once/year/ size group/series
Fittings		
Appearance	5	Once/year/ size group/series
Dimensions	6.3 & 6.4	Once/year/ size group/series
Bracket strength	7.2	Once/year/ size group/series
Effects of heating	8.2	Once/year/ size group/series
Marking	12.3 & 12.4	Once/year/ size group/series
Fitness for purpose		
Residual tensile impact	9	Once/5year/formulation/colour
u/v degradation (colour fastness)	9	Once/5year/formulation/colour
Watertightness	9	Once/5year/formulation/colour
[a] A change of colour does not represent a change of formulation.		

NOTE 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.

4.2.7 Indirect tests (IT)

Generally testing shall be performed according to the test methods referred to in EN 12200-1:2000.

Indirect testing may be used for BRT characteristics as given in Table 3. 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. The continuing validity of the indirect testing shall be checked at regular intervals.

In cases of dispute the BRT as specified in Table 3 shall be used. If third party certification is involved, the IT shall be acceptable to the certification body.

NOTE Indirect testing can 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 two years and all other records for a minimum of four years.

Bibliography

[1] EN ISO 9001:2000, *Quality management systems — Requirements (ISO 9001:2000)*

[2] EN 45011, *General requirements for bodies operating product certification systems (ISO/IEC Guide 65:1996)*

[3] EN 45012, *General requirements for bodies operating assessment and certification/registration of quality systems (ISO/IEC Guide 62:1996)*

[4] ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptable quality limit (AQL) for lot-by-lot inspection*

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