SLOVENSKI STANDARD
SIST EN 1452-2:2000

01-junij-2000

Cevni sistemi iz polimernih materialov za oskrbo z vodo - Nemehļ an polivinilklorid (PVC-U) - 2. del: Cevi

Plastics piping systems for water supply - Unplasticized poly(vinyl chloride) (PVC-U) - Part 2: Pipes

Kunststoff-Rohrleitungssysteme für die Wasserversorgung - Weichmacherfreies Polyvinylchlorid (PVC-U) - Teil 2: Rohre

Systemes de canalisations en plastique pour alimentation en eau - Poly(chlorure de vinyle) non plastifié (PVC-U) - Partie 2: Tubes

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ICS:

23.040.20	Cevi iz polimernih materialov	Plastics pipes
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SIST EN 1452-2:2000 **en**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1452-2

June 1999

ICS 23.040.20

English version

Plastics piping systems for water supply - Unplasticized poly(vinyl chloride) (PVC-U) - Part 2: Pipes

Systèmes de canalisations en plastique pour alimentation en eau - Poly(chlorure de vinyle) non plastifié (PVC-U) - Partie 2: Tubes

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This European Standard was approved by CEN on 2 July 1999.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 1452-2:1999 E

Contents

For the English version :

For pipes and fittings which have comformed to the relevant national standard before 1999-06-23, as shown by the manufacturer or by a certification body, the national standard may continue to be applied until the 2001-06-30.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by 1999-12-31. Conflicting national standards shall be withdrawn at the latest by 2001-06-30.

Pour la version française :

Pour les tubes et les raccords dont la conformité à la norme nationale correspondante avant 1999-06-23 a été démontrée par le fabricant ou par un organisme certificateur, la norme nationale peut continuer à être appliquée jusqu'à 2001-06-30.

Cette norme européenne devra recevoir le statut de norme nationale, soit par publication d'un texte identique, soit par entérinement, au plus tard le 1999-12-31. Toutes les normes nationales en contradiction devront être retirées au plus tard le 2001-06-30.

Für die deutsche Fassung :

Auf Rohre und Formstücke, die vor 1999-06-23 der entsprechenden nationalen Norm entsprochen haben, wie durch den Hersteller oder eine Zertifizierungsstelle ausgewiesen, darf die nationale Norm bis 2001-06-30 weiter angewendet werden.

Diese Europäische Norm muß den Status einer nationalen Norm erhalten, entweder durch Veröffentlichung eines identischen Textes oder durch Anerkennung bis 1999-12-31. Etwaige entgegenstehende nationale Normen müssen bis 2001-06-30 zurückgezogen werden.

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 155 "Plastics piping systems and ducting systems", the secretariat of which is held by NNI. It has been prepared with the cooperation of Eureau and in liaison with CEN/TC 164 "Water supply".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by december 1999, and conflicting national standards shall be withdrawn at the latest by June 2001.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

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

This standard 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 Standardization (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 1452 consists of the following Parts, under the general title *Plastics piping systems for water supply — Unplasticized poly(vinyl chloride) (PVC-U)*:

- *Part 1: General*
- *Part 2: Pipes (this standard)*
- *Part 3: Fittings*
- *Part 4: Valves and ancillary equipment*
- *Part 5: Fitness for purpose of the system*
- *Part 6: Guidance for installation (ENV)*
- *Part 7: Guidance for assessment of conformity (ENV)*

This Part of EN 1452 includes the following annexes:

- Annex A (normative): Allowable operating pressures
- Annex B (normative): Imperial(inch)-sized pipes
- Annex C (normative): Requirements for fracture toughness test
- Annex D (informative): Bibliography.

At the date of publication of this standard, System Standards for piping systems of other plastics materials used for the same application are the following:

NOTE All listed System Standards are under preparation.

prEN 1796, *Plastics piping systems for water supply with or without pressure — Glass-reinforced thermosetting plastics (GRP) based on polyester resin (UP)*

prEN 12201, *Plastics piping systems for water supply — Polyethylene (PE)*

Introduction

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

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the products covered by this standard:

1) This standard provides no information as to whether the product may be used without restriction in any of the Member States of the EU or EFTA;

2) It should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

For material and components, other than pipes, requirements and test methods are specified in Parts 1, 3 and 4 of EN 1452. Characteristics for fitness for purpose (mainly for joints) are covered in Part 5. Guidance for installation is given in ENV 1452-6. ENV 1452-7 a guidance for the assessment of conformity.

This Part of EN 1452 covers the characteristics of pipes.

1 Scope

This Part of EN 1452 specifies the characteristics of pipes made from unplasticized poly(vinyl chloride) (PVC-U) for piping systems in the field of water supply.

It also specifies the test parameters for the test methods referred to in this standard.

In conjunction with Parts 1 to 5 of EN 1452 and ENV 1452-7, it is applicable to extruded PVC-U pipes without a socket and pipes with a socket (integral or not), intended to be used for the following:

a) water mains and services buried in ground;

b) conveyance of water above ground for both outside and inside buildings;

for the supply of water under pressure at approximately 20 °C (cold water) intended for human consumption and for general purposes.

This standard is also applicable to pipes for the conveyance of water up to and including 45 °C. For temperatures between 25 °C and 45 °C Figure A.1 in annex A applies.

This standard covers a range of pipe sizes and pressure classes and gives requirements concerning colours.

NOTE It is the responsibility of the purchaser or specifier to make the appropriate selections from these aspects, taking into account their particular requirements and any relevant national regulations and installation practices or codes.

2 Normative references

This standard 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 standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

prEN 496, *Plastics piping and ducting systems — Plastics pipes and fittings — Measurement of dimensions and visual inspection of surfaces*

EN 578, *Plastics piping systems — Plastics pipes and fittings — Determination of the opacity*

EN 580, *Plastics piping systems — Unplasticized poly(vinyl chloride) (PVC-U) pipes — Test method for the resistance to dichloromethane at a specified temperature (DCMT)*

EN 681-1, *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 1: Vulcanized rubber*

EN 727, *Plastics piping and ducting systems — Thermoplastics pipes and fittings — Determination of Vicat softening temperature (VST)*

EN 743, *Plastics piping and ducting systems — Thermoplastics pipes — Determination of the longitudinal reversion*

EN 744:1995, *Plastics piping and ducting systems — Thermoplastics pipes — Test method for resistance to external blows by the round-the-clock method*

EN 921:1995, *Plastics piping systems — Thermoplastics pipes — Determination of resistance to internal pressure at constant temperature*

EN 1452-1, *Plastics piping systems for water supply — Unplasticized poly(vinyl chloride) (PVC-U) — Part 1: General*

EN 1452-5, *Plastics piping systems for water supply — Unplasticized poly(vinyl chloride) (PVC-U) — Part 5: Fitness for purpose of the system*

ENV 1452-7:1999, *Plastics piping systems for water supply — Unplasticized poly(vinyl chloride) (PVC-U) — Part 7: Guidance for the assessment of conformity*

EN ISO 12162, *Thermoplastics materials for pipes and fittings for pressure applications — Classification and designation — Overall service (design) coefficient*

ISO 1183:1987, *Plastics — Methods for determining the density and relative density of non-cellular plastics*

ISO 6401:1985, *Plastics — Homopolymer and copolymer resins of vinyl chloride — Determination of residual vinyl chloride monomer — Gas chromatographic method*

ISO 7387-1:1983, *Adhesives with solvents for assembly of PVC-U pipe elements — Characterization — Part 1: Basic test methods*

ISO/TR 9080:1992, *Thermoplastics pipes for the transport of fluids — Methods of extrapolation of hydrostatic stress rupture data to determine the long-term hydrostatic strength of thermoplastics pipe materials*

3 Definitions, symbols and abbreviations

For the purposes of this standard, the definitions, symbols and abbreviations given in EN 1452-1 apply together with the following:

L : length of socket

m : depth of engagement

4 Material

4.1 Pipe material

The material to be used shall conform to EN 1452-1 and to the requirements given in 4.2 and 4.3.

4.2 Density

The density, ρ, at 23 °C of the pipe, when measured in accordance with ISO 1183, shall be between the following limits:

$$1350 \text{ kg/m}^3 \leq \rho \leq 1460 \text{ kg/m}^3$$

4.3 MRS-value

The pipe material shall have a minimum required strength, MRS, as defined in EN 1452-1,of at least 25 MPa.

The pipe material shall be evaluated according to ISO/TR 9080 method II [1)], where an internal pressure test is performed in accordance with EN 921:1995, to find the LCL. This evaluation shall be made with an end cap type a) or b) in accordance with EN 921:1995 and using a pipe series S ≤ 12,5. The MRS-value shall be derived from the LCL and the pipe material shall be classified by the compound manufacturer in accordance with EN ISO 12162.

Where there is available long-term experience with the effect of a change in material/compound, it is not necessary to re-evaluate the MRS. In this case the values determined with 5 test pieces at 20 °C and 60 °C during 1000 h to 5000 h shall be located on or above the 97,5 % LCL long-term characteristic curve established prior to the material/compound change.

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1) In ISO/TC 138/SC5 a new extrapolation method is under development, which is intended to replace ISO/TR 9080.

5 General characteristics

5.1 Appearance

When viewed without magnification the internal and external surfaces of pipes shall be smooth, clean and free from scoring, cavities and other surface defects to an extent that would prevent conformity to this standard. The material shall not contain any impurities visible without magnification. The ends of the pipe shall be cut cleanly and square to the axis of the pipe.

5.2 Colour

The colour of the pipes shall be either grey, blue or cream. The colour of the pipes shall be uniform throughout. For above ground application, cream pipes shall not be used.

5.3 Opacity

The wall of the pipe shall be opaque and shall not transmit more than 0,2 % of visible light when measured in accordance with EN 578. This requirement does not apply to cream pipes (see 5.2).

6 Geometrical characteristics

6.1 Measurement of dimensions

Dimensions shall be measured in accordance with prEN 496.

6.2 Nominal outside diameters

The nominal outside diameter, d_n, of a pipe shall conform to .

6.3 Mean outside diameters and their tolerances

The mean outside diameter, d_{em}, of a pipe shall conform to the applicable nominal outside diameter, d_n, within the tolerance given in table 1.

The tolerance for out-of-roundness shall conform to table 1.