
Cevni sistemi iz polimernih materialov za nizko in visoko temperaturne odvodne sisteme v zgradbah - Nemehčan polivinilklorid (PVC-U) - 1. del: Zahteve za cevi fitinge in sistem

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

Kunststoff-Rohrleitungssysteme zum Ableiten von Abwasser (niedriger und hoher Temperatur) innerhalb der Gebäudestruktur - Weichmacherfreies Polyvinylchlorid (PVC-U) - Teil 1: Anforderungen an Rohre, Formstücke und das Rohrleitungssystem

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Systemes de canalisations en plastique pour l'évacuation des eaux-vannes et des eaux usées (a basse et a haute température) a l'intérieur de la structure des bâtiments - Poly(chlorure de vinyle) non plastifié (PVC-U) - Partie 1: spécifications pour tubes, raccords et le systeme

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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

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 1: Spécifications pour tubes, raccords et le système

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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 in liaison with CEN/TC 165 "Waste water engineering".

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 method 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 (the present standard)
- Part 2: Guidance for the assessment of conformity
- Part 3: Guidance for installation

This Part of EN 1329 includes the following annexes:

- Annex A (normative) : Utilisation of non-virgin material
- Annex B (informative): Bibliography.

At the date of publication of this standard, System Standards for piping systems of PVC-U with structured-wall pipes and other plastics materials used for the same application are the following:

NOTE All listed System Standards have reached the Enquiry stage.

prEN 1451, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure – Polypropylene (PP)*

prEN 1453, *Plastics piping systems with structured-wall pipes for soil and waste discharge (low and high temperature) inside building – Unplasticized poly(vinyl chloride) (PVC-U)*

prEN 1455, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Acrylonitrile-butadiene-styrene (ABS)*

prEN 1519, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Polyethylene (PE)*

prEN 1565, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Styrene copolymer blends (SAN+PVC)*

prEN 1566, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Chlorinated poly(vinyl chloride) (PVC-C)*

For pipes and fittings which have conformed to the relevant national standard before the date of availability January 1999, as shown by the manufacturer or by a certification body, the national standard may continue to be applied until the January 2001.

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 July 1999, and conflicting national standards shall be withdrawn at the latest by January 2001.

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.

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1 Scope

This European standard specifies the requirements for pipes, fittings and the system of unplasticized poly(vinyl chloride) (PVC-U) piping systems in the field of soil and waste discharge (low and high temperature) inside buildings (marked with "B") and for soil and waste discharge systems for both inside buildings and buried in ground within the building structure (marked with "BD").

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

This standard covers a range of pipes and fittings sizes and gives recommendations concerning colours.

NOTE 1 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.

This standard does not cover requirements for K-value of the raw material.

This standard is applicable to PVC-U pipes and fittings, their joints and to joints with components of other plastics (marked with "B" or "BD") intended to be used for the following purposes:

- a) soil and waste discharge pipework for the conveyance of domestic waste waters (low and high temperature);
- b) ventilation pipework associated with a);
- c) rainwater pipework within the building structure.

This standard is applicable to pipes and fittings, marked with "B", which are intended to be used inside building only and to pipes and fittings, marked with "BD", which are intended to be used inside building and buried in ground within the building structure.

NOTE 2 For use buried in ground within the building structure are intended only those components (marked with "BD") with nominal outside diameters equal to or greater than 75 mm.

NOTE 3 For external above ground application, additional requirements depending on the climate should be agreed between the manufacturer and the user.

NOTE 4 Components conforming to other standards on plastics piping systems can be used with pipes and fittings conforming to this standard, provided they conform to the requirements for joint dimensions and functional requirements given in this standard.

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 systems — Plastics pipes and fittings — Measurement of dimensions and visual inspection of surfaces*

EN 580:1994, *Plastics piping systems — Unplasticized poly(vinyl chloride) (PVC-U) pipes — Test method for the resistance to dichloromethane at a specified temperature (DCMT)*

EN 681-1:1996, *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 1: Vulcanized rubber*

prEN 681-2, *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 2: Thermoplastics elastomers*

EN 727:1994, *Plastics piping and ducting systems — Thermoplastics pipes and fittings — Determination of Vicat softening temperature (VST)*

EN 743:1994, *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 763:1994, *Plastics piping and ducting systems — Injection-moulded thermoplastics fittings — Test method for visually assessing effects of heating*
- EN 921:1995, *Plastics piping systems — Thermoplastics pipes — Determination of resistance to internal pressure at constant temperature*
- EN 922:1994, *Plastics piping and ducting systems — Pipes and fittings of unplasticized poly(vinyl chloride) (PVC-U) — Specimen preparation for determination of the viscosity number and calculation of the K-value*
- EN 1053:1995, *Plastics piping systems — Thermoplastics piping systems for non-pressure applications — Test method for watertightness*
- EN 1054:1995, *Plastics piping systems — Thermoplastics piping systems for soil and waste discharge — Test method for airtightness of joints*
- EN 1055:1996, *Plastics piping systems — Thermoplastics piping systems for soil and waste discharge inside buildings — Test method for resistance to elevated temperature cycling*
- EN 1277:1996, *Plastics piping systems — Thermoplastics piping systems for buried non-pressure applications — Test method for leaktightness of elastomeric sealing ring type joints*
- EN 1401-1:1998, *Plastics piping systems for non-pressure underground drainage and sewerage — Unplasticized poly(vinyl chloride) (PVC-U) — Part 1: Specifications for pipes, fittings and the system*
- EN 1411:1996, *Plastics piping and ducting systems — Thermoplastics pipes — Determination of resistance to external blows by the staircase method*
- EN 1905, *Plastics piping systems — Unplasticized poly(vinyl chloride) (PVC-U) pipes, fittings and material — Method for assessment of the PVC content based on total chlorine content*
- prEN 1989, *Thermoplastics piping and ducting systems — Joints for buried non-pressure applications — Test method for long-term sealing performance of joints with thermoplastics elastomer (TPE) seals by estimating the sealing pressure"*
- EN 10204:1995, *Metallic products — Types of inspection documents*
- ISO 472:1988, *Plastics — Vocabulary*
- ISO 1043-1:1990, *Plastics — Symbols — Part 1: Basic polymers and their special characteristics*
- ISO 1183:1987, *Plastics — Methods for determining the density and relative density of non-cellular plastics*

3 Definitions, symbols and abbreviations

For the purposes of this standard, the following definitions, symbols and abbreviations apply.

3.1 Definitions

In addition to the definitions given below, the definitions given in ISO 472:1988 and ISO 1043-1:1990 apply.

3.1.1 application area code

A code used in the marking of pipes and fittings to indicate the application area(s) for which they are intended, as follows:

- B: application area code for components intended for use above ground inside the building, or for components outside buildings fixed onto the wall;

D: application code for the area under and within 1 m from the building where the pipes and fittings are buried in ground and are connected to the underground drainage and sewerage system;

BD: application area code for components intended for use for both code B and code D application areas.

NOTE 1 In D application areas the existence of external forces from the surroundings in addition to the hot water discharge is usual.

NOTE 2 Other application area codes U and UD not covered by this standard are defined elsewhere, e.g. in EN 1401-1:1998.

3.1.2 Nominal size

3.1.2.1

nominal size DN

A numerical designation of the size of a component, other than a component designated by thread size, which is approximately equal to the manufacturing dimension, in millimetres (mm).

3.1.2.2

nominal size DN/OD

Nominal size, related to the outside diameter.

3.1.3

nominal outside diameter (d_n)

The specified outside diameter, in millimetres, assigned to a nominal size DN/OD.

3.1.4

outside diameter (d_e)

The value of the measurement of the outside diameter through its cross section at any point of a pipe or spigot of a fitting, rounded to the next greater 0,1 mm.

3.1.5

mean outside diameter (d_{em})

The value of the measurement of the outer circumference of a pipe or spigot of a fitting in any cross section, divided by π ($\approx 3,142$), rounded to the next greater 0,1 mm.

3.1.6

mean inside diameter of a socket (d_{sm})

The arithmetical mean of a number of measurements of the inside diameter of a socket in the same cross section.

3.1.7

out-of-roundness (ovality)

The difference between the measured maximum and the measured minimum outside diameter in the same cross section of a component.

3.1.8

wall thickness (e)

The value of measurement of the wall thickness at any point around the circumference of a component.

3.1.9

mean wall thickness (e_m)

The arithmetical mean of a number of measurements of the wall thickness, regularly spaced around the circumference and in the same cross section of a component, including the measured minimum and the measured maximum values of the wall thickness in that cross section.

3.1.10

standard dimension ratio (SDR)

A nominal ratio of the outside diameter, d_n , to the minimum wall thickness, e_{min} .

3.1.11

nominal ring stiffness (SN)

A numerical designation of the ring stiffness of a pipe or fitting which is a convenient round number relative to the determined stiffness in kilonewtons per square metre (kN/m^2), indicating the minimum ring stiffness of a pipe or fitting.

3.2 Symbols

A	: length of engagement
C	: depth of sealing zone
d_e	: outside diameter (at any point)
d_{em}	: mean outside diameter
d_n	: nominal outside diameter
d_s	: inside diameter of the socket
d_{sm}	: mean inside diameter of the socket
DN	: nominal size
DN/OD	: nominal size, outside diameter related
e	: wall thickness (at any point)
e_m	: mean wall thickness
e_2	: wall thickness of a socket
e_3	: wall thickness at the groove
L_1	: length of spigot
L_2	: length of socket
l	: effective length of a pipe
R	: radius of swept fittings
Z_d	: design length of a fitting
α	: nominal angle of a fitting

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3.3 Abbreviations

PVC-U	: Unplasticized poly(vinyl chloride)
SDR	: Standard dimension ratio
SN	: Nominal ring stiffness
TIR	: True impact rate
TPE	: Thermoplastics elastomers

4 Material

4.1 Raw material

The raw material shall be PVC-U to which are added those additives that are needed to facilitate the manufacture of components conforming to the requirements of this standard.

When calculated on the basis of a known formulation or in case of dispute or not known formulation, determined in accordance with prEN 1905 the PVC content shall be at least 80 % by mass for pipes and 85 % by mass for injection-moulded fittings.

4.2 Utilisation of non-virgin material

Requirements for the utilisation of non-virgin material are given in Annex A.

4.3 Sealing ring retaining means

Sealing rings may be retained using means made from polymers other than PVC-U, provided the joints conform to the requirements given in clause 9.

5 General characteristics

5.1 Appearance

When viewed without magnification the following requirements apply: the internal and external surfaces of pipes and fittings shall be smooth, clean and free from grooving, blistering, impurities, pores or other surface irregularity likely to prevent performance of pipes and fittings with this standard. Each end of a pipe or a fitting shall be cleanly cut, if applicable, and shall be square to its axis.

5.2 Colour

The pipes and the fittings shall be coloured through the wall.

The recommended colour of pipes and fittings is grey.

6 Geometrical characteristics

6.1 General

Dimensions shall be measured in accordance with prEN 496.

In case of dispute the reference temperature is $(23 \pm 2)^\circ\text{C}$.

NOTE The figures are schematic sketches only, to indicate the relevant dimensions. They do not necessarily represent manufactured components.

6.2 Dimensions of pipes

6.2.1 Outside diameter

The mean outside diameter, d_{em} , shall conform to tables 1 or 2 as applicable.