SLOVENSKI STANDARD
SIST EN 12200-1:2016

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Cevni sistemi iz polimernih materialov za odvod padavinskih voda za zunanjo uporabo - Nemehčan polivinilklorid (PVC-U) - 1. del: Specifikacije za cevi, fitinge in sistem

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

Kunststoff-Rohrleitungssysteme für außenliegende Regenfallleitungen - Weichmacherfreies Polyvinylchlorid (PVC-U) - Teil 1: Anforderungen an Rohre, Formstücke und das Rohrleitungssystem

Systèmes de canalisations de descentes d'eaux pluviales en plastique à usage externe en aérien - Poly(chlorure de vinyle) non plastifié (PVC-U) - Partie 1: Spécifications pour tubes, raccords et le système

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23.040.03	Cevovodi za zunanje sisteme transporta vode in njihovi deli	Pipeline and its parts for external water conveyance systems
93.025	Zunanji sistemi za prevajanje vode	External water conveyance systems

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EUROPEAN STANDARD

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English Version

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

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This European Standard was approved by CEN on 9 January 2016.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Page

European foreword

This document (EN 12200-1:2016) has been prepared by Technical Committee CEN/TC 155 “Plastics piping systems and ducting systems”, the secretariat of which is held by NEN.

This document supersedes EN 12200-1:2000.

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 October 2016, and conflicting national standards shall be withdrawn at the latest by October 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This European Standard has been prepared in liaison with CEN/TC 128 “Roof covering products for discontinuous laying and products for wall cladding” taking into account EN 607 [1] and EN 1462 and CEN/TC 165 “Waste water engineering” taking into account the design guidance in EN 12056-3 [4].

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 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: Requirements for pipes fittings and the system (the present standard);

— Part 2: Guide for the assessment of conformity [3].

For Rainwater discharge systems used internally within buildings the following standards apply:

EN 1329, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Unplasticized poly(vinyl chloride) (PVC-U)*

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

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

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

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

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

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

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies the requirements for pipes, fittings, brackets and the system of unplasticized poly(vinyl chloride) (PVC-U) intended for use as above-ground external rainwater piping systems.

It also specifies:

a) The requirements for metallic brackets.

b) Both solid wall pipes and fittings, (i.e. product manufactured from a single layer), as well as solid wall multi-layer pipes.

c) The test parameters for the test methods referred to in this standard.

Pipes can be used in conjunction with fittings and brackets of acrylic materials provided these polymers meet the performance requirements of this standard.

The products are usually used in conjunction with gutters conforming to EN 607 [1]. They are not intended for use with products conforming to EN 612 [2].

This standard is applicable to PVC-U rainwater systems of circular, square, rectangular or any other shape with sealed (rubber ring or solvent cement) or unsealed joints.

This standard covers a range of pipes and fittings sizes.

NOTE 1 It is the responsibility of the purchaser or specifier to make the appropriate selections from the size range to take into account their particular requirements and any relevant national regulations and installation practices or codes.

NOTE 2 The term “rainwater” in this standard is used also to encompass “surface water” (as defined in EN 752 [6]) run-off from buildings.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 513:1999, *Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors - Determination of the resistance to artificial weathering*

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

EN 681-2, *Elastomeric Seals - Materials requirements for pipe joint seals used in water and drainage applications - Part 2: Thermoplastic elastomers*

EN 1462, *Brackets for eaves gutters - Requirements and testing*

EN 12095, *Plastics piping systems - Brackets for rainwater piping systems - Test method for bracket strength*

CEN/TS 14541:2013, *Plastics pipes and fittings - Characteristics for utilisation of non-virgin PVC-U, PP and PE materials*

EN 14680, *Adhesives for non-pressure thermoplastics piping systems - Specifications*

EN 14814, *Adhesives for thermoplastic piping systems for fluids under pressure - Specifications*

EN 20105-A02, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour (ISO 105-A02)*

EN ISO 306, *Plastics - Thermoplastic materials - Determination of Vicat softening temperature (VST) (ISO 306)*

EN ISO 472, *Plastics - Vocabulary (ISO 472)*

EN ISO 580, *Plastics piping and ducting systems - Injection-moulded thermoplastics fittings - Methods for visually assessing the effects of heating (ISO 580)*

EN ISO 1043-1, *Plastics - Symbols and abbreviated terms - Part 1: Basic polymers and their special characteristics (ISO 1043-1)*

EN ISO 2505, *Thermoplastics pipes - Longitudinal reversion - Test method and parameters (ISO 2505)*

EN ISO 3126, *Plastics piping systems - Plastics components - Determination of dimensions (ISO 3126)*

EN ISO 4892-2, *Plastics - Methods of exposure to laboratory light sources - Part 2: Xenon-arc lamps (ISO 4892-2)*

EN ISO 4892-3, *Plastics - Methods of exposure to laboratory light sources - Part 3: Fluorescent UV lamps (ISO 4892-3)*

EN ISO 8256, *Plastics - Determination of tensile-impact strength (ISO 8256)*

ISO 3127, *Thermoplastics pipes — Determination of resistance to external blows — Round-the-clock method*

ISO 6259-2, *Thermoplastics pipes — Determination of tensile properties — Part 2: Pipes made of unplasticized poly(vinyl chloride) (PVC-U), chlorinated poly (vinyl chloride) (PVC-C) and high-impact poly (vinyl chloride) (PVC-HI)*

ISO 13254, *Thermoplastics piping systems for non-pressure applications — Test method for water tightness*

3 Terms, definitions, symbols and abbreviations

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

3.1 Terms and definitions

In addition to the terms and definitions given below, the terms and definitions given in EN ISO 472 and EN ISO 1043-1 apply.

3.1.1
nominal size DN
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
nominal size DN/OD
nominal size, related to the outside diameter

3.1.3
nominal outside diameter (d_n)
specified outside diameter, in millimetres, assigned to a nominal size DN/OD

3.1.4
outside diameter (d_e)
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})
value of the measurement of the outer circumference of a pipe or spigot of a fitting in any cross-section, divided by π (≈3,142), rounded to the next greater 0,1 mm

3.1.6
mean inside diameter of a pipe (d_{im})
arithmetical mean of a number of measurements of the inside diameter of a pipe in the same cross-section

3.1.7
mean inside diameter of a socket (d_{sm})
arithmetical mean of a number of measurements of the inside diameter of a socket in the same cross-section

3.1.8
wall thickness (e)
value of the measurement of the wall thickness at any point around the circumference of a component rounded to the next greater 0,1 mm

3.1.9
mean wall thickness (e_m)
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

3.2 Definitions of multilayer pipes

NOTE: These definitions were taken from CEN ISO/TR 27165 [5].

3.2.1
solid wall multilayer pipe
pipe with smooth internal and external surface, having co-extruded layers on either or both the outside and/or inside of the pipe

3.2.2
external layer of multilayer pipe
layer subject to direct UV exposure

3.2.3
internal layer of multilayer pipe
layer not subject to direct UV exposure

3.3 Material terms and definitions

3.3.1
virgin material
material in a form such as granules or powder that has not been subjected to use or processing other than that required for its manufacture and to which no reprocessed or recycled material has been added

3.3.2
own reprocessed material
material prepared from rejected unused pipes, gutters or fittings, including trimmings from the production of pipes, gutters or fittings, that will be reprocessed in a manufacturer's plant after having been previously processed by the same manufacturer by a process such as moulding or extrusion, and for which the complete formulation is known

3.3.3
external reprocessed material
material comprising either one of the following forms:

a) material from rejected unused pipes, gutters or fittings or trimmings there from, that will be reprocessed and that were originally processed by another manufacturer;

b) material from the production of unused PVC-U products other than pipes and fittings, regardless of where they are manufactured

3.3.4
recycled material
material comprising either of the following forms:

a) material from used pipes or fittings which have been cleaned and crushed or ground;

b) material from used PVC-U products other than pipes or fittings which have been cleaned and crushed or ground

3.4 Definitions for brackets

3.4.1
anchor bracket
bracket designed to be fixed to a wall or other support and attached to a socket of a pipe or fitting to prevent the socket from moving under the effect of thermal expansion

Note 1 to entry: Some anchor brackets can be adapted to act as a guide bracket (see 3.4.2).

3.4.2
guide bracket
bracket designed to be fixed to a wall or other support and to fit a pipe sufficiently loosely to allow longitudinal thermal movement whilst preventing the pipe from bowing between anchor brackets

Note 1 to entry: By fixing a guide bracket tightly below a fitting on vertical pipework, it can be made to act as an anchor bracket (see 3.4.1).

3.5 Symbols

For the purposes of this document, the following symbols apply.

A	length of engagement
C	depth of sealing zone
d_e	outside diameter
d_{em}	mean outside diameter
d_{im}	mean inside diameter of pipe or spigot
d_n	nominal outside diameter
d_s	inside diameter of a socket
d_{sm}	mean inside diameter of a socket
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
Z_d	design length (Z_d length) of a fitting
α	nominal angle of a fitting

3.6 Abbreviations

For the purposes of this document, the following abbreviations apply.

DN	nominal size
DN/OD	nominal size, outside diameter related
PVC-U	unplasticized poly(vinyl chloride)
TIR	true impact rate

4 Material

4.1 PVC-U material

The compound/ formulation shall be PVC to which are added those additives that are needed to facilitate the manufacture of components conforming to the requirements of this standard.

The PVC content shall be at least 80 % by mass for pipes and 85 % by mass for injection-moulded fittings and brackets and shall be determined by calculation. In case of dispute, the PVC content can also be determined in accordance with EN 1905.