

SLOVENSKI STANDARD

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Cevni sistemi iz polimernih materialov za odpadno vodo in kanalizacijo, ki delujejo po težnostnem principu in so položeni v zemljo - Nemehčan polivinilklorid (PVC-U), polipropilen (PP) in polietilen (PE) - 1. del: Specifikacije za pomožne fitinge in plitve revizijske jaške

Plastics piping systems for non-pressure underground drainage and sewerage - Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) - Part 1: Specifications for ancillary fittings including shallow inspection chambers

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Kunststoff-Rohrleitungssysteme für erdverlegte drucklose Abwasserkanäle und -leitungen - Weichmacherfreies Polyvinylchlorid (PVC-U), Polypropylen (PP) und Polyethylen (PE) - Teil 1: Anforderungen an Schächte und Zubehöerteile

Systèmes de canalisations en plastique pour les branchements et les collecteurs d'assainissement enterrés sans pression - Poly(chlorure de vinyle) non plastifié (PVC-U), polypropylène (PP) et polyéthylène (PE) - Partie 1: Spécifications pour raccords auxiliaires y compris les boîtes de branchement

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**Plastics piping systems for non-pressure underground drainage
and sewerage - Unplasticized poly(vinyl chloride) (PVC-U),
polypropylene (PP) and polyethylene (PE) - Part 1:
Specifications for ancillary fittings including shallow inspection
chambers**

Systèmes de canalisations en plastique pour les
branchements et les collecteurs d'assainissement enterrés
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U), polypropylène (PP) et polyéthylène (PE) - Partie 1:
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Polyvinylchlorid (PVC-U), Polypropylen (PP) und
Polyethylen (PE) - Teil 1: Anforderungen an Schächte und
Zubehörteile

This European Standard was approved by CEN on 23 October 2010.

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Foreword

This document (EN 13598-1:2010) has been prepared by Technical Committee CEN/TC 155 "Plastics piping systems and ducting systems", the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by June 2011, and conflicting national standards shall be withdrawn at the latest by June 2011.

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 document supersedes EN 13598-1:2003.

The main changes compared to the previous edition are:

- a) the opening of the standard to allow the controlled use of external reclaim materials (Annex A);
- b) increased testing detail for mechanical saddles (Annex B).

This European Standard is a supplementary standard for System Standards 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 being 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 and by European Standards for thermoplastic underground drainage and sewerage systems, 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.

This European Standard consists of the following parts: under the general title *Plastics piping systems for non-pressure underground drainage and sewerage — Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE)*:

- *Part 1: Specifications for ancillary fittings including shallow inspection chambers* (this standard);
- *Part 2: Specifications for manholes and inspection chambers in traffic areas and deep underground installations*;
- *Part 3: Guidance for the assessment of conformity* (a Technical Specification is under preparation).

This document includes a bibliography.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

EN 13598-1:2010 (E)**1 Scope**

This European Standard specifies the definitions and requirements for ancillary fittings of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP), and polyethylene (PE) intended to be used in non-pressure underground drainage and sewerage systems, conforming to EN 476:

- a) outside the building structure (application area code “U”), reflected in the marking of products by “U”, and
- b) both buried in ground within the building structure (application area code “D”) and outside the building structure (application area code “U”), reflected in the marking of products by “UD”.

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

The ancillary fittings covered by this standard are the following:

- sealed access fittings;
- rodding point covers;
- rodding tees;
- mechanical saddles;
- inspection chambers for shallow non-roadway applications to a maximum depth of 1,25 m.

NOTE 1 Inspection chambers as defined in 6.1.3 of EN 476:1997 have a riser with a DN/ID less than 800 mm.

NOTE 2 Deep inspection chambers and manholes for application area U are specified in Part 2 of this standard.

The fittings can be manufactured by various methods e.g. injection moulding, rotational moulding, spiral winding or fabricated from components made to other standards.

The jointing can be with:

- elastomeric ring seal joint;
- cemented joint for PVC-U;
- welded joint for PP and PE.

NOTE 3 Pipes, fittings and other components conforming to any of the plastics products standards listed in Clause 2 can be used with ancillary fittings conforming to this standard, provided they conform to the requirements for joint dimensions given in Clause 6 and to the requirements of Table 6.

2 Normative references

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

EN 295-3:1991, *Vitrified clay pipes and fittings and pipe joints for drains and sewers — Part 3: Test methods*

EN 476:1997, *General requirements for components used in discharge pipes, drains and sewers for gravity systems*

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 681-3, *Elastomeric seals — Materials requirements for pipe joint seals used in water and drainage applications — Part 3: Cellular materials of vulcanized rubber*

EN 681-4, *Elastomeric seals — Materials requirements for pipe joint seals used in water and drainage applications — Part 4: Cast polyurethane sealing elements*

EN 728, *Plastics piping and ducting systems — Polyolefin pipes and fittings — Determination of oxidation induction time*

EN 922, *Plastics piping and ducting systems — Pipes and fittings of unplasticized poly(vinylchloride)(PVC-U) — Specimen preparation for determination of the viscosity number and calculation of the K-value*

EN 1053, *Plastics piping systems — Thermoplastics piping systems for non-pressure applications — Test method for watertightness*

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 1253-1:2003, *Gullies for buildings — Part 1: Requirements*

EN 1253-2:2003, *Gullies for buildings — Part 2: Test methods*

EN 1277:2003, *Plastics piping systems — Thermoplastics piping systems for buried non-pressure applications — Test methods for leaktightness of elastomeric sealing ring type joints*

EN 1401-1:2009, *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 1852-1:2009, *Plastics piping systems for non-pressure underground drainage and sewerage — Polypropylene (PP) — Part 1: Specifications for pipes, fittings and the system*

EN 12256, *Plastics piping systems — Thermoplastics fittings — Test method for mechanical strength or flexibility of fabricated fittings*

EN 12666-1:2005, *Plastics piping systems for non-pressure underground drainage and sewerage — Polyethylene (PE) — Part 1: Specifications for pipes, fittings and the system*

EN 13476-1:2007, *Plastics piping systems for non-pressure underground drainage and sewerage — Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) — Part 1: General requirements and performance characteristics*

EN 13476-2:2007, *Plastics piping systems for non-pressure underground drainage and sewerage — Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) — Part 2: Specifications for pipes and fittings with smooth internal and external surface and the system, Type A*

EN 13476-3:2007+A1:2009, *Plastics piping systems for non-pressure underground drainage and sewerage — Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) — Part 3: Specifications for pipes and fittings with smooth internal and profiled external surface and the system, Type B*

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

EN 14758-1:2005+A1:2009, *Plastics piping systems for non-pressure underground drainage and sewerage — With mineral modifiers (PP-MD) — Part 1: Specifications for pipes, fittings and the system*

EN 14830, *Thermoplastics inspection chamber and manhole bases — Test methods for buckling resistance*

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EN 14982, *Plastics piping and ducting systems — Thermoplastics shafts or risers for inspection chambers and manholes — Determination of ring stiffness*

EN ISO 580:2005, *Plastics piping and ducting systems — Injection-moulded thermoplastics fittings — Methods for visually assessing the effects of heating (ISO 580:2005)*

EN ISO 1043-1:2001, *Plastics — Symbols and abbreviated terms — Part 1: Basic polymers and their special characteristics (ISO 1043-1:2001)*

EN ISO 1133, *Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of the thermoplastics (ISO 1133:2005)*

EN ISO 1183-1, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method (ISO 1183-1:2004)*

EN ISO 1183-2, *Plastics — Methods for determining the density of non-cellular plastics — Part 2: Density gradient column method (ISO 1183-2:2004)*

EN ISO 3126, *Plastics piping systems — Plastics components — Determination of dimensions (ISO 3126:2005)*

3 Terms, definitions, symbols and abbreviations

For the purposes of this document, the terms, definitions and abbreviations given in EN 1401-1:2009, EN 1852-1:2009, EN 12666-1:2005, EN 13476-1:2007, EN 13476-2:2007, EN 13476-3:2007+A1:2009, EN 14758-1:2005+A1:2009, EN ISO 1043-1:2001 and the following apply.

3.1 Terms and definitions

3.1.1

sealed access fitting

fitting that permits entry into the system for rodding or inspection and that has a sealed cover

3.1.2

rodding point cover

fitting which is installed at ground level with a removable cover that permits the introduction of equipment for inspection and the clearance of blockages, and the riser shafts connected to which do not exceed 200 mm outside diameter and are not less than 100 mm inside diameter

3.1.3

rodding tee

fitting which is installed in a drainage or sewerage system that connects to a rodding point at ground level by means of a vertical shaft that permits the introduction of equipment for the clearance of blockages, and also equipment for the inspection of the connecting pipe work in one or more directions, and the riser shafts connected to which do not exceed 200 mm outside diameter and are not less than 100 mm inside diameter

3.1.4

mechanical saddle

fitting that enables a branch connection to be made to buried drainage/sewerage systems of larger diameter by cutting a hole in the larger pipe and is retained in position by mechanical means

3.1.5

inspection chamber – shallow

drainage and sewerage fitting:

— which is used for connecting drainage or sewerage installations and/or for changing the direction of drainage/sewerage runs,

- which has a maximum depth from invert of drain to top of riser of 1,25 m and terminates at ground level, thus permitting the introduction of cleaning, inspection and test equipment and the removal of debris,
- which does not provide access for personnel,
- and the riser shafts connected to which have a minimum outside diameter of 200 mm and have a maximum inside diameter of less than 800 mm

3.1.6

structured-wall ancillary fittings

fittings which have an optimised design with regard to material usage to achieve the relevant performance requirements

3.1.7

reformulated material

recyclable / reprocessible material that has been reformulated, by the use of additives and processing techniques, to meet an agreed specification

NOTE Typically the additives used would be stabilizers, pigments, etc., the reformulated material taking the form of homogeneous pellets, granules, powder, etc. with the produced batch having consistent physical properties.

3.1.8

standard dimension ratio - SDR

numerical designation of a pipe series, which is a convenient round number, approximately equal to the dimension ratio of the nominal outside diameter, d_n , and the nominal wall thickness, e_n

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3.2 Abbreviations

DN/ID : nominal size, inside diameter related

DN/OD : nominal size, outside diameter related

PVC-U : unplasticized poly(vinyl chloride)

PE : polyethylene

PP : polypropylene

PP-MD : polypropylene with incorporated mineral modifiers

4 Material

4.1 General

The material shall conform to EN 1401-1, EN 1852-1, EN 12666-1, EN 13476-1, EN 13476-2, EN 13476-3, EN 14758-1 as applicable.

4.1.1 Reprocessable and recyclable materials

The use of manufacturers own rework material and external reprocessible and recyclable material and their dosing levels shall be as specified in the standards listed in 4.1.

4.1.2 Reformulated material

Shallow inspection chambers may be manufactured from reformulated material provided that these materials are maintained within the specification limits given in Annex A.

EN 13598-1:2010 (E)**4.1.3 Components from other standards**

Plastics components, fabricated or otherwise, are permitted to be utilised as sub components of the final assembly provided that they have been manufactured in accordance with EN 1401-1, EN 1852-1, EN 12666-1, EN 13476-1, EN 13476-2, EN 13476-3 and EN 14758-1. Components of other than plastics materials should conform to relevant EN for these materials.

4.2 Sealing ring retaining components

It is permitted that sealing rings are retained using components made from materials other than the actual pipe or fitting PVC-U, PP or PE.

4.3 Sealing rings

The sealing ring material shall conform to EN 681-1, EN 681-2, EN 681-3 or EN 681-4 as applicable.

The sealing ring shall have no detrimental effects on the properties of the components and shall not cause the test assembly to fail the performance requirements given in Clause 10.

4.4 Adhesives for PVC-U

The adhesive or solvent cement shall conform to EN 14680.

The adhesive shall have no detrimental effects on the properties of the components and shall not cause the test assembly to fail the performance requirements given in Clause 10.

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5 General characteristics

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5.1 General

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When viewed without magnification the following requirements apply:

- a) the internal and external surfaces of ancillary fittings shall be smooth, clean and free from grooving, blistering, visible impurities or pores and any other surface irregularity likely to prevent their conformity with this standard;
- b) ancillary fittings ends shall be cleanly cut and square with the axis of the ends and within any cutting zone recommended by the manufacturer.

5.2 Assemblies

Any combination of products manufactured from the materials listed in 4.1 may be used for the manufacture of assemblies.

5.3 Colour

Ancillary fittings if manufactured in layers shall have their surface layers coloured throughout. The outside layer of ancillary fittings should preferably be black, orange-brown (approximately RAL 8023 [1]) or dusty grey (approximately RAL 7037 [1]). Other colours may be used.

6 Geometrical characteristics**6.1 General**

For the purpose of specifying dimensions the nominal diameter of ancillary fittings shall be that of the pipe which can be connected to its outlet except that in the case of mechanical saddles the size of the main pipe and branch

connection shall be used. All dimensions shall be measured in accordance with EN ISO 3126. Geometrical characteristics supplementary to those specified in this standard shall be declared by the manufacturer but shall conform to the minima specified in EN 476.

6.2 Dimensions

6.2.1 Design lengths

The design lengths shall be declared by the manufacturer. The requirements of bends formed in the base of performed inspection chambers shall conform to the requirements of EN 476.

NOTE The design lengths (Z-lengths) are intended to assist in the design of moulds and are not intended to be used for quality control purposes. ISO 265-1 [2] can be used as a guideline.

6.2.2 Preferred angles of bends and branches

The preferred angles of bends and branches should conform to 4.3.1 of EN 476:1997. Other angles are permitted.

6.2.3 Wall thicknesses of bodies and spigots

The wall thickness of ancillary fitting components including spigots for pipe connections shall not be less than those specified in EN 1401-1, EN 1852-1, EN 12666-1, EN 13476-1, EN 13476-2, EN 13476-3, EN 14758-1 for a fitting or component of the same material and nominal diameter.

Chamber bases, including the first 300 mm of any integral riser, shall be sized as per nominal size of the riser. All separate riser components and integral risers above the first 300 mm shall have a minimum wall thickness for the size as the lowest stiffness class of the above standards.

6.2.4 Diameters and length of engagement (A_{min}) of sockets, wall thickness of sockets for pipe connections and length of spigots

The diameters and lengths and wall thicknesses of sockets intended for jointing to pipes to other standards and the length of moulded spigots shall not be less than those specified in EN 1401-1, EN 1852-1, EN 12666-1, EN 13476-1, EN 13476-2, EN 13476-3 and EN 14758-1 for a fitting of the same material and nominal diameter.

6.3 Additional requirements

6.3.1 Inspection chambers

The internal dimensions of inspection chambers shall conform to 3.1.5 and to the minima specified in EN 476:1997 (see Figure 5.)

Dimensions of inspection chamber riser shafts and dimensions of their connecting sockets on inspection chamber bodies shall be declared by the manufacturer.

6.3.2 Access fittings

Circular openings in access fittings shall have a minimum diameter greater than 50 % of the internal diameter of the fitting subject to a minimum of 90 mm.

Rectangular access fittings shall have minimum opening dimensions of 150 mm and 90 mm measured on their longitudinal and transverse centre lines.

NOTE 1 The performance of the access opening can be measured with the length of a 50 mm diameter rigid cylinder capable of passing through the opening and the outlet of the access fitting, when connected to SDR 41 pipe spigots or sockets (where the access fitting has been designed for use with a non interchangeable pipe then the pipe for which it was designed should be used). The preferred lengths of the rigid cylinder in millimetres should be: 160, 200, 250, 315, 400, 500, 630 which