SLOVENSKI STANDARD
SIST EN 476:2011

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Nadomešča:
SIST EN 1293:2000
SIST EN 476:1997
SIST EN 773:2000

Splošne zahteve za elemente za odvod odpadne vode in kanalizacijo

General requirements for components used in drains and sewers

Allgemeine Anforderungen an Bauteile für Abwasserleitungen und -kanäle

Prescriptions générales pour les composants utilisés dans les branchements et les collecteurs d'assainissement

Ta slovenski standard je istoveten z: **EN 476:2011**

ICS:

13.060.30	Odpadna voda	Sewage water
93.030	Zunanji sistemi za odpadno vodo	External sewage systems

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EUROPEAN STANDARD

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EN 476

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English Version

General requirements for components used in drains and sewers

Exigences générales pour les composants utilisés pour les branchements et les collecteurs d'assainissement

Allgemeine Anforderungen an Bauteile für Abwasserleitungen und -kanäle

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

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Foreword

This document (EN 476:2011) has been prepared by Technical Committee CEN/TC 165 “Waste water engineering”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by July 2011, and conflicting national standards shall be withdrawn at the latest by July 2011.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 476:1997, EN 773:1999 and EN 1293:1999.

The specifications of this standard have been based on the requirements for wastewater systems specified in EN 752 and EN 12056.

This document is the result of merging EN 476, EN 773 and EN 1293.

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.

1 Scope

This European Standard specifies general requirements for components inside and outside buildings (see EN 12056-1) such as pipes, fittings and manholes with their respective joints intended for use in discharge pipes, drains and sewers which operate as gravity systems allowing for a maximum pressure of 40 kPa.

It also specifies general requirements for components used in hydraulically and pneumatically pressurised discharge pipes, drains and sewers.

It provides basic specifications to be respected in material related product standards for these applications.

It is not applicable for the direct evaluation of products. It is applicable as a reference for drawing up a product specification, if there is no product standard available.

NOTE Where the term "inside buildings" is used in the context of components fixed inside buildings, it also includes discharge pipes and fittings fixed on external surfaces of buildings.

This European Standard covers components to be used in conveying in a satisfactory manner:

- domestic wastewater;
- rainwater and surface water; and
- other waste waters acceptable for discharge into the system (e.g. industrial wastewater).

This European Standard applies to components of circular and other cross sections.

This European Standard applies equally to components which are factory-made and to those constructed on site, where applicable.

This European Standard does not apply to components used for trenchless construction according to EN 14457 and for components used for renovation of drains and sewers according to EN 13380.

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 124, *Gully tops and manhole tops for vehicular and pedestrian areas — Design requirements, type testing, marking, quality control*

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 805:2000, *Water supply — Requirements for systems and components outside buildings*

EN 1085:2007, *Wastewater treatment — Vocabulary*

EN 13101, *Steps for underground man entry chambers — Requirements, marking, testing and evaluation of conformity*

EN 14396, *Fixed ladders for manholes*

EN 14801, *Conditions for pressure classification of products for water and wastewater pipelines*

ISO 48, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1085:2007 and EN 805:2000 and the following apply.

3.1
hydraulically pressurised system
system where flow is caused by hydraulic pressure and where the pipe normally operates full

3.2
pneumatically pressurized system
system where flow is caused by pneumatic pressure which can be applied either as compressed air upstream or partial vacuum downstream and where the pipe normally operates full

3.3
nominal size
DN
numerical designation of size of component, which is a convenient integer approximately equal to a manufacturing dimension in millimetres and can apply to either the internal diameter (DN/ID) or the external diameter (DN/OD)

NOTE DN/OD pipes with solid or hollow spiral or annular profiled external surface and outside smooth spigot jointing dimensions, and with larger OD than the spigot may be designated by the spigot dimension.

3.4
external diameter
OD
mean external dimension of the pipe barrel at any cross section where for pipes with external profiles on the barrels, the external diameter is the maximum diameter when viewed in cross section

3.5
internal diameter
ID
mean internal dimension of the pipe barrel at any cross section

3.6
pipe barrel
cylindrical part of the pipe with a uniform longitudinal profile excluding socket and spigot

3.7
invert
lowest point of the internal surface of the barrel of a pipe or channel at any cross section

3.8
rigid pipe
pipe, the load carrying capacity of which is limited by breaking or overstressing, without significant deformation of its cross section

3.9
semi-rigid pipe
pipe whose load carrying capacity is limited either by deformation/overstressing (flexible behaviour) or by breaking (rigid behaviour) depending on its ring stiffness

3.10
flexible pipe
pipe, the load carrying capacity of which is limited by diametral deformation under load to the ultimate design criteria without breaking or overstressing

3.11
joint
connection between the adjacent ends of two components including the means of sealing

3.12
adjustable fitting
fitting which is designed to permit specific angular deflection at the time of installation (for pressurized and vacuum systems)

3.13
adjustable joint
joint which permits significant angular deflection at the time of installation but not thereafter

3.14
flexible joint
joint which permits angular deflection

3.15
rigid joint
joint that does not permit angular deflection

3.16
restrained joint
joint in which a means is provided to prevent separation

3.17
proof load
specified test load which a component withstands where the related requirements of the product standard are met

3.18
ultimate load
load which causes failure of a component (under test) which shall be as specified in product standards

3.19
crushing strength
load per unit length a rigid pipe is required to withstand in kN/m

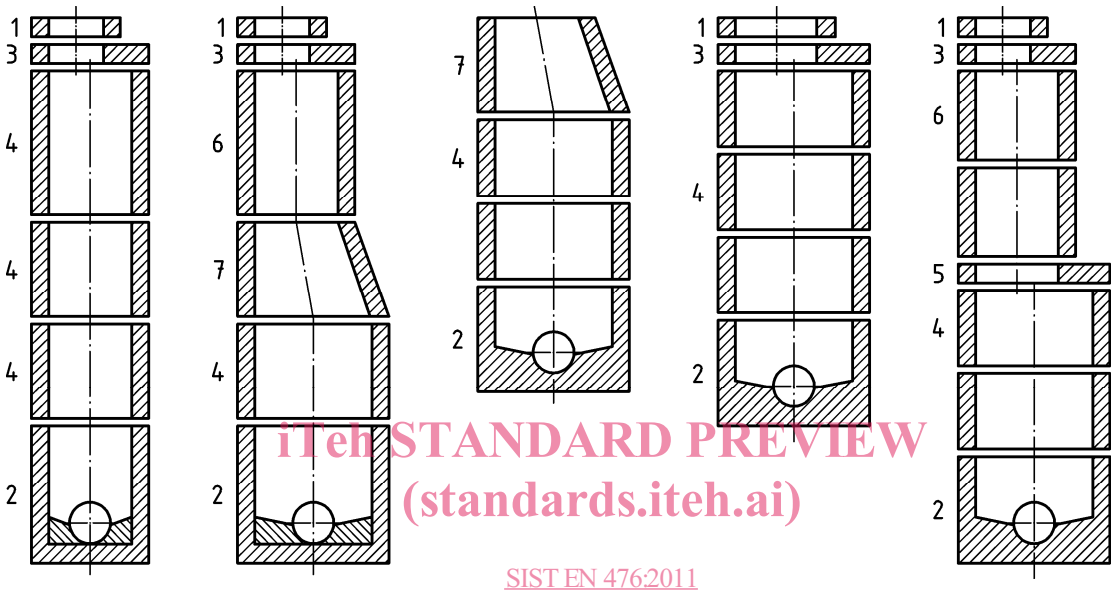
3.20
ring stiffness
resistance of a pipe to diametral deflection in response to external loading applied along one diametric plane given as follows:

$$S = \frac{E \cdot I}{D_m^3}$$

3.21
manhole
chamber with a removable cover constructed on a drain or sewer to permit entry by personnel

[EN 752:2008, 3.41]

NOTE Examples are given in Figure 1.



Key

1 adjusting unit
2 base unit
3 cover slab
4 chamber unit
5 reducing slab
6 shaft unit
7 taper

NOTE 1 Joint details have been omitted for clarity

NOTE 2 Precast base slabs of structures can be integral with the base unit or a separate slab incorporating construction joints.

Figure 1 — Description of manhole and inspection chamber components

3.22
inspection chamber
chamber with a removable cover constructed on a drain or sewer that permits the introduction of cleaning and inspection equipment from surface level, but does not provide access for personnel

[EN 752:2008, 3.34]

4 Symbols and abbreviations

DN/ID nominal size related to the internal diameter

DN/OD nominal size related to the external diameter

PFA allowable operating pressure [EN 805:2000]

PMA allowable maximum operating pressure [EN 805:2000]

PEA allowable site test pressure [EN 805:2000]

D_m diameter of the neutral axis of the pipe wall, in metres

E modulus of elasticity in flexure in the circumferential direction in kilonewtons per square metre

I second moment of area of the pipe wall in the longitudinal direction, per unit length, in metres to the fourth power per metre

S the ring stiffness of the pipe in kilonewtons per square metre

r radius for bends

α angle of bends

β angle of branches

5 Dimensional requirements

5.1 General

Product standards may include specifications which are more stringent, but not less stringent than those in this standard.

5.2 Dimensions of pipes and fittings

5.2.1 Nominal sizes

Nominal sizes DN shall be given in product standards as DN/ID or DN/OD and shall preferably be selected from Table 1 or Table 2 for reasons of interchangeability. Other nominal sizes can be specified in product standards.

Table 1 — Preferred nominal sizes DN/ID

Gravity systems DN/ID	Hydraulically pressurized systems DN/ID	Pneumatically pressurized systems DN/ID
30, 40, 50, 60, 70, 80, 90, 100, 125, 150, 200, 225, 250, 300, 350, 375, 400, 450, 500, 600, 700, 800, 900, 1 000, 1 200, 1 250, 1 400, 1 500 1 600, 1 800, 2 000, 2 200, 2 500, 2 800, 3 000, 3 500, 4 000	20, 25, 30, 40, 50, 60, 80, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1 000, 1 100, 1 200, 1 250, 1 300, 1 400, 1 500, 1 600, 1 800, 2 000, 2 100, 2 200, 2 400, 2 500, 2 600, 2 800, 3 000, 3 200, 3 500, 4 000	**30, 40, 50, 60, 80, 100, 125, 150, 200**
NOTE For each material, it is intended to limit the number of nominal sizes.		