
Prevlečene cevi, fittingi in spoji iz duktilne železove litine za odvodnjavanje in kanalizacijo - Karakteristike proizvoda ter metode za preskušanje in ocenjevanje

Coated and lined ductile iron pipes, fittings and their joints for sewerage and drainage applications - Products characteristics and test and assessment methods

Umhüllte und ausgekleidete Rohre, Formstücke, Zuberhörteile aus duktilem Gußeisen und ihre Verbindungen für Abwasser-Entsorgung - Anforderungen und Prüfverfahren

Tuyaux, raccords et accessoires en fonte ductile et leurs assemblages pour l'assainissement - Prescriptions et méthodes d'essais

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23.040.40	Kovinski fittingi	Metal fittings
93.030	Zunanji sistemi za odpadno vodo	External sewage systems

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Coated and lined ductile iron pipes, fittings and their joints for sewerage and drainage applications - Products characteristics and test and assessment methods

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Verbindungen für Abwasser-Entsorgung -
Anforderungen und Prüfverfahren

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 203.

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European foreword

This document (prEN 598:2017) has been prepared by Technical Committee CEN/TC 203 “Cast iron pipes, fittings and their joints”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 598:2007+A1:2009.

This standard has been revised to modify Annex ZA and Clause 9.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports basic work requirements of Regulation (EU) 305/2011.

For relationship with EU Regulation, see informative Annex ZA, which is an integral part of this document.

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1 Scope

This European Standard specifies the products characteristics and associated test and assessment methods applicable to coated and lined ductile iron pipes, coated and lined fittings and joints which include (non-exhaustive list) coated and lined accessories such as collar, tees, saddles, bends, tapers, flanged socket.

Intended use: Gravity and pressure drains and sewers:

- operating without pressure, or with positive or negative pressure;
- installed below or above ground;
- for conveyance of surface water, wastewater in separate systems or in combined systems.

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 196-1, *Methods of testing cement — Part 1: Determination of strength*

EN 545, *Ductile iron pipes, fittings, accessories and their joints for water pipelines — Requirements and test methods*

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

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13823:2010+A1:2014, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN ISO 1182, *Reaction to fire tests for products — Non-combustibility test (ISO 1182)*

EN ISO 1716, *Reaction to fire tests for products — Determination of the gross heat of combustion (calorific value) (ISO 1716)*

EN ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method (ISO 6506-1)*

EN ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1)*

EN ISO 11925-2, *Reaction to fire tests — Ignitability of products subjected to direct impingement of flame — Part 2: Single-flame source test (ISO 11925-2)*

3 Terms, definitions and abbreviations

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

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3.1 Terms and definitions

3.1.1

nominal size (DN)

alphanumeric designation of size for components of a pipework system, which is used for reference purposes. It comprises the letters DN followed by a dimensionless whole number which is indirectly related to the physical size, in millimeters, of the bore or outside diameter of the end connections

[SOURCE: EN ISO 6708:1995]

3.1.2

ovality

out of roundness of a pipe section; it is equal to: $100 \left(\frac{A_1 - A_2}{A_1 + A_2} \right)$

where

A_1 is the maximum axis in millimetres;

A_2 is the minimum axis, in millimetres

3.1.3

standardized length L_u

for socket and spigot pipes the standardized length, L_u is equal to the overall length (OL) minus the depth of the socket (DOS) as given by the manufacturer

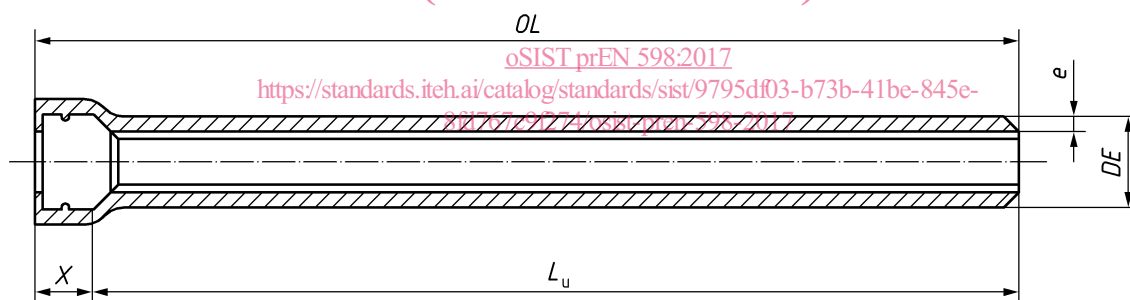


Figure 1 — Length

3.1.4

deviation

design length allowance with respect to the standardized length of a pipe

3.1.5

ductile iron

cast iron used for pipes, fittings and accessories in which graphite is present substantially in spheroidal form

3.1.6

pipe

casting of uniform bore, straight in axis, having either socket, spigot or flanged ends, except for flanged-socket pieces, flanged-spigot pieces and collars which are classified as fittings

3.1.7**fittings**

casting other than a pipe which allows pipeline deviation, change of direction or bore. In addition flanged-socket pieces, flanged-spigot pieces and collars are also classified as fittings

3.1.8**flange**

flat circular end of a pipe or fitting extending perpendicular to its axis, with bolt holes equally spaced on a circle

NOTE A flange is either fixed (e.g. integrally cast or welded-on) or adjustable; an adjustable flange comprises a ring, in one or several parts assembled together, which bears on an end joint hub and can be freely rotated around the pipe axis before jointing.

[SOURCE: EN 1092-2:1997]

3.1.9**spigot**

male end of a pipe or fitting

3.1.10**spigot end length**

spigot over a length equal to maximum insertion depth plus 50 mm

3.1.11**socket**

female end of a pipe or fitting to make the connection with the spigot of the next component

3.1.12**gasket**

sealing component of a joint

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3.1.13**joint**

connection between the ends of two pipes and/or fittings in which a gasket is used to effect a seal

3.1.14**flexible joint**

joint which permits significant angular deflection both during and after installation and which can accept a slight offset of the centerline

3.1.15**push in joint**

flexible joint assembled by pushing the spigot through the gasket in the socket of the mating component

3.1.16**mechanical joint**

flexible joint in which sealing is obtained by applying pressure to the gasket by mechanical means, e.g. a gland

3.1.17**restraint joint**

flexible joint in which a means is provided to prevent separation of the assembled joint

prEN 598:2017 (E)**3.1.18****flanged joint**

joint between two flanged ends

3.1.19**inspection chambers and manholes**

component of a discharge system, of a drain or of a sewer providing access from the ground surface for inspection and maintenance equipment

3.1.20**nominal pressure**

alphanumerical designation used for reference purposes related to a combination of mechanical and dimensional characteristics of a component of a pipework system. It comprises the letters PN followed by a dimensionless number

[SOURCE: EN 1333:2006]

NOTE All equipment of the same nominal size DN designated by the same PN number have compatible mating dimensions.

3.1.21**leak tightness test pressure**

pressure applied to a component during manufacture in order to ensure its leak tightness

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3.1.22**allowable operating pressure (PFA) (standards.iteh.ai)**

maximum hydrostatic pressure that a component can withstand continuously in service

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3.1.23**allowable maximum operating pressure (PMA)**

maximum hydrostatic pressure, including surge, that a component can withstand from time to time in service

[SOURCE: EN 476:2011]

3.1.24**allowable test pressure (PEA)**

maximum hydrostatic pressure that a newly installed component can withstand for a relatively short duration, when either fixed above ground level or laid and backfilled underground, in order to ensure the integrity and tightness of the pipeline

[SOURCE: EN 476:2011]

NOTE This test pressure is different from the system test pressure (STP), which is related to the design pressure of the pipeline and is intended to ensure its integrity and leak tightness.

3.1.25**diametral stiffness of a pipe**

characteristic of a pipe which allows it to resist ovalization under loading when installed

3.1.26**discharge system**

system of pipes, fittings, accessories and joints used to collect and drain waste water and rainwater of a building

NOTE It comprises discharge pipes, stack ventilation pipes and rainwater downpipes, installed within the limits of a building or attached to the building.

3.1.27**drain**

system of pipes, fittings, accessories and joints installed outside the limits of a building in order to connect the discharge system of this building to a sewer or a septic tank

3.1.28**sewer**

pipeline designed to collect waste water and rainwater from buildings and surface water and to convey them to the point of disposal or treatment

3.1.29**gravity sewer**

sewer operating under free flowing conditions

3.1.30**pressure sewer**

sewer (or section of a sewer) operating under positive pressure

3.1.31**vacuum system**

sewer (or section of a sewer) operating under negative pressure

3.1.32**combined system**

sewerage system collecting together rainwater, surface water and waste water

3.1.33**separate system**

sewerage system which collects waste water separately from rainwater and surface water

3.1.34**length**

effective length of a pipe is L_u as shown on Figure 1 and flanged pipes standardized length are 1, 2, 3, 4, 5, 6 meters

3.1.35**fittings for gravity sewers**

are collars, manhole connectors, angle branches, connexion branches, inspection tees, etc.

3.1.36**accessories**

casting except pipes and fittings used for pipelines, manhole, screws etc.

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prEN 598:2017 (E)**3.2 Abbreviations**

- PFA Allowable operating pressure
 PMA Allowable maximum operating pressure
 PEA Allowable test pressure

4 Product characteristics**4.1 Coated and lined ductile iron pipes****4.1.1 Reaction to fire**

The reaction to fire expresses the contribution given by the coated and lined pipes in the event of fire. When tested according to 5.1.1; the claimed class results shall be expressed according to EN 13501-1.

4.1.2 Longitudinal bending strength

Longitudinal bending strength expresses the capability of the pipe to withstand unexpected bending moments affecting the integrity and functionality of the pipe. When tested according to 5.1.2 result shall be expressed as kNm.

4.1.3 Internal pressure strength

The internal pressure strength expresses the capability of the product to withstand the internal load generated.

The internal pressure strength is calculated according to 5.1.3 and the results are expressed in bar, indicating the safety factor used in the calculation.

4.1.4 Maximum load for admissible deformation**4.1.4.1 General**

The maximum load for admissible deformation is addressed as ring stiffness performed with the test described in 5.1.4. The maximum load is the result of either traffic soil or other external conditions or a combination of soil and external conditions, it is expressed in kN/m².

4.1.4.2 Diametral stiffness

The diametral stiffness is the characteristics which allows it to resist ovalization under loading. It is expressed in kN/m² with an additional visual inspection and it is calculated as in 5.1.4.1.

4.1.4.3 Ovalisation

The ovalisation is the one that the pipe can stand when tested according to 5.1.4.2, result shall be expressed in mm.

The ovalisation is 100 times the measured vertical deflection in millimetres (caused by the applied load) divided by the measured pipe external diameter in millimetres.

4.1.5 Dimension**4.1.5.1 Nominal size DN**

Nominal sizes is defined in 3.1.1.

4.1.5.2 Diameter

4.1.5.2.1 External diameter including tolerances

Table 1 specifies the values of the external diameter DE of the coated spigot end length of pipes and their maximum allowable tolerances, when measured using a gauge in accordance with 5.1.5.2.1.

Table 1 — External diameter of a pipe

DN	External diameter, DE Mm	
	Nominal	Limit deviation
80	98	+ 1/ - 2,7
100	118	+ 1/ - 2,8
125	144	+ 1/ - 2,8
150	170	+ 1/ - 2,9
200	222	+ 1/ - 3,0
250	274	+ 1/ - 3,1
300	326	+ 1/ - 3,3
350	378	+ 1/ - 3,4
400	429	+ 1/ - 3,5
450	480	+ 1/ - 3,6
500	532	+ 1/ - 3,8
600	635	+ 1/ - 4,0
700	738	+ 1/ - 4,3
800	842	+ 1/ - 4,5
900	945	+ 1/ - 4,8
1 000	1 048	+ 1/ - 5,0
1 100	1 152	+ 1/ - 6,0
1 200	1 255	+ 1/ - 6,0
1 400	1 462	+ 1/ - 6,6
1 500	1565	+ 1/ - 7,0
1 600	1668	+ 1/ - 7,4
1 800	1 875	+ 1/ - 8,2
2 000	2 082	+ 1/ - 9,0

4.1.5.2.2 Wall thickness

The below table gives the results of wall thickness when measured according to the method in 5.2.3.1.