



SLOVENSKI STANDARD
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Fitingi iz temprane litine s koničnimi priključki za polietilenske (PE) cevovode

Malleable cast iron fittings with compression ends for polyethylene (PE) piping systems

Tempergußfittings mit Klemmanschlüssen für Polyethylen(PE)-Rohrleitungssysteme

Raccords en fonte malléable avec extrémités à compression pour systèmes de canalisation en polyéthylène (PE)

Ta slovenski standard je istoveten z: prEN 10284

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Kovinski fittingi

Metal fittings

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Malleable cast iron fittings with compression ends for polyethylene (PE) piping systems

Raccords en fonte malléable avec extrémités à
compression pour systèmes de canalisation en
polyéthylène (PE)

Tempergußfittings mit Klemmanschlüssen für
Polyethylen(PE)-Rohrleitungssysteme

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 459/SC 10.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 10284:2022) has been prepared by Technical Committee CEN/TC 459 “ECISS - European Committee for Iron and Steel Standardization”¹, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

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¹ Through its sub-committee CEN/TC 459/SC 10 “Steel tubes, and iron and steel fittings” (secretariat: UNI).

1 Scope

This document specifies the requirements for the design, performance and testing of fittings made of malleable cast iron (see also Clause 5 Materials) with compression ends for polyethylene piping systems.

This document applies to piping systems in polyethylene (PE) materials for different application fields, such as water and gas supply, water distribution, irrigation, aqueous liquids, pressurized air and gaseous fuel systems.

NOTE Products complying with this document used for water applications intended for human consumption are expected to comply with the relevant national, regional or local regulatory provisions applicable in the place of use. Due to the variety and dynamic of the requirements, it is advisable to check the compliance.

The malleable cast iron fittings specified in this standard are of compression end type for the connection of PE pipes or of transition type with combined compression ends for pipes in different materials or with combined compression and threaded ends in conformance with EN 10226-1. Their range of sizes covers nominal outside diameters of PE pipes dn 16 mm to dn 110 mm (DN 10 to DN 100) and pipe thread sizes $\frac{3}{8}$ to 4.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 549, *Rubber materials for seals and diaphragms for gas appliances and gas equipment*

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

EN 682, *Elastomeric Seals - Materials requirements for seals used in pipes and fittings carrying gas and hydrocarbon fluids* <https://standards.iteh.ai/catalog/standards/sist/597693ac-3c44-4c3a-ae99-e975153b51ec/osist-pren-10284-2022>

EN 1555-2, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 2: Pipes*

EN 1562, *Founding - Malleable cast irons*

EN 10204, *Metallic products - Types of inspection documents*

EN 10226-1, *Pipe threads where pressure tight joints are made on the threads - Part 1: Taper external threads and parallel internal threads - Dimensions, tolerances and designation*

EN 10226-3, *Pipes threads where pressure tight joint are made on the threads - Part 3: Verification by means of limit gauges*

EN 10344, *Malleable cast iron fittings with compression ends for steel pipes*

EN 12201-2, *Plastics piping systems for water supply, and for drainage and sewerage under pressure - Polyethylene (PE) - Part 2: Pipes*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation (ISO 228-1)*

EN ISO 228-2, *Pipe threads where pressure-tight joints are not made on the threads - Part 2: Verification by means of limit gauges (ISO 228-2)*

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EN ISO 1167-1, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids - Determination of the resistance to internal pressure - Part 1: General method (ISO 1167-1)*

EN ISO 1167-4, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids - Determination of the resistance to internal pressure - Part 4: Preparation of assemblies (ISO 1167-4)*

EN ISO 1460, *Metallic coatings - Hot dip galvanized coatings on ferrous materials - Gravimetric determination of the mass per unit area (ISO 1460)*

EN ISO 2178, *Non-magnetic coatings on magnetic substrates - Measurement of coating thickness - Magnetic method (ISO 2178)*

EN ISO 3458, *Plastics piping systems - Mechanical joints between fittings and pressure pipes - Test method for leaktightness under internal pressure (ISO 3458)*

EN ISO 3459, *Plastic piping systems - Mechanical joints between fittings and pressure pipes - Test method for leaktightness under negative pressure (ISO 3459)*

EN ISO 3501, *Plastics piping systems - Mechanical joints between fittings and pressure pipes - Test method for resistance to pull-out under constant longitudinal force (ISO 3501)*

EN ISO 3503, *Plastics piping systems - Mechanical joints between fittings and pressure pipes - Test method for leaktightness under internal pressure of assemblies subjected to bending (ISO 3503)*

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

EN ISO 15875-2, *Plastics piping systems for hot and cold water installations - Crosslinked polyethylene (PE-X) - Part 2: Pipes (ISO 15875-2)*

EN ISO 9227, *Corrosion tests in artificial atmospheres - Salt spray tests (ISO 9227)*

ISO 13951, *Plastics piping systems — Test method for the resistance of plastic pipe/pipe or pipe/fitting assemblies to tensile loading*

ISO 19899, *Plastics piping systems — Polyolefin pipes and mechanical fitting assemblies — Test method for the resistance to end load (AREL test)*

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

fitting

connecting piece for pipes and other piping accessories, consisting of one or more parts

3.2**compression fitting**

connecting piece for pipes and other piping accessories, equipped with minimum one compression end, sealing by elastomeric gaskets

3.3**transition fitting**

fitting jointing different types of pipe and/or comprising different types of outlet

3.4**end-load resistant joint**

joint which can resist axial loads without additional external mechanical support

3.5**non-end-load resistant joint**

joint which cannot resist axial loads without additional external mechanical support

3.6**fitting size**

size designation of the nominal outside diameter, dn, of the connecting PE pipe or of the size of the jointing thread

3.7**fitting body**

main pressure-bearing part of a fitting

3.8**outlet**

end of a fitting for the purpose of connection with a pipe or other piping accessories

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3.9**run**

two principal axially aligned outlets of a tee

3.10**branch**

side outlet of a tee

3.11**compression end**

end in which a mechanical joint is formed by the tightening of a nut to compress a ring or sleeve onto the outside wall of the tube, or clamp a flared portion of the tube to the body of a fitting

Note 1 to entry: The assembled joint should be understood as being demountable.

Note 2 to entry: The purpose of a compression end is to connect pipe and fitting body using a compression system, consisting of a body and a nut or flange, by using common tools.

3.12**supporting sleeve****insert stiffener**

cylindrical device providing a permanent support for the pipe to prevent creep in the pipe wall under radial compressive forces

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prEN 10284:2022 (E)**3.13****grip
locking ring**

ring that holds the pipes in place and prevents pull out from the joint

3.14**minimum bore**

smallest internal diameter of a fitting measured at any cross-section

3.15**smooth wall**

smooth pipe surface in the seal and clamping area which is unshaped, undamaged and untreated

Note 1 to entry: Cleaning and deburring is not regarded as treatment.

3.16**dismountability**

ability of a fitting to disconnect and re-assemble the joint without destroying the fitting body and the pipe, except the components of the jointing system, such as the sealing and grip or locking rings

3.17**jointing thread**

thread complying with EN 10226-1

3.18**fastening thread**

thread complying with EN ISO 228-1

3.19**component test**

test to verify the performance of a fitting carried out on the non-assembled fitting or fitting parts

3.20**assembly test**

test to verify the fitness for purpose of an assembled fitting connected with the pipe(s)

3.21**resistance to pull-out**

ability of the joint to withstand axial forces, applied mechanically or through internal pressure, while remaining leak-tight

3.22**allowable operating pressure****PFA**

maximum operating pressure of the connected pipe joint(s) in continuous function

3.23**allowable operating temperature****TFA**

maximum operating temperature of the connected pipe joint(s) in continuous function

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4 Types of fittings

Types and shapes of fittings are to the discretion of the manufacturer and therefore not standardized or limited regarding measurements.

5 Materials

5.1 General

All materials of fitting body and components shall be resistant against the medium of the respective application. In case of potable water, national hygienic requirements apply.

5.2 Material of the fitting body

5.2.1 Malleable cast iron

The material used for the fitting body shall be malleable cast iron conforming to EN 1562. The grade of material used shall be selected from the following grades:

- Grade EN-GJMW-400-5 for fittings in white heart malleable iron.
- Grade EN-GJMB-350-10 for fittings in black heart malleable iron.

Fittings shall be designated by material symbol according to the selected material mentioned above and as given in Table 1.

Table 1 — Material symbols

Material symbol	Material grade
A	EN-GJMW-400-5 or EN-GJMB-350-10

5.3 Material of the fitting components

Materials of the internal parts of the fittings in contact with PE pipe shall not adversely affect pipe performance, e.g. by initiation of stress cracking. If a lubricant (detergent, grease, etc.) is used for assembling it shall have no detrimental effect on the properties of the pipe and shall not cause the assembly to fail the functional and hygienic requirements.

5.4 Elastomers

The material of elastomeric sealing rings used in fittings shall be chosen for drinking water application from EN 681-1 and for gas supply from EN 682, and/or EN 549, depending on the specific application and shall conform to the appropriate class or type.

NOTE For the choice of elastomeric materials, it is advisable to comply with national regulations.

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6 Corrosion protection

6.1 General

In applications where materials are susceptible to corrosion, the components shall be adequately protected as follows.

NOTE For the choice of corrosion protection, it is advisable to comply with national regulations.

6.2 Hot dip galvanizing

6.2.1 General

Where a protection by zinc coating is required, the zinc coating shall be applied by the hot dip galvanizing process and shall meet the following requirements.

Additional permanent coatings on top of the hot dip zinc coating do not fall under the category of hot dip galvanizing in terms of use in the potable water application. The suitability of additional permanent coatings for potable water applications should be demonstrated by testing.

6.2.2 Chemical composition of the hot dip zinc coating

The content by mass of the accompanying elements in the finished zinc coating shall not exceed the following maximum values:

- antimony (Sb) 0,01 %
- arsenic (As) 0,02 %
- bismuth (Bi) 0,01 %
- cadmium (Cd) 0,01 %
- lead (Pb) 0,1 %

NOTE The chemical composition is restricted with regard to the limitation of dangerous substances also in respect to drinking water applications. When fittings are used in potable water applications, relevant national hygienic regulations apply.

6.2.3 Coating mass per surface unit and layer thickness

The surface related mass of the zinc coating shall not be less than 500 g/m², which equals to a layer thickness of 70 µm. These limits refer to the average of 5 fittings with 10 measurements each, statistically distributed across the fitting. The layer mass/thickness measured on an individual sample shall not be less than 450 g/m² (63 µm).

The medium layer thickness s of the zinc coating in µm shall be calculated by using the approximation formula:

$$\bar{s} = \frac{m_A}{7,2}$$

where

m_A is the surface related mass of the zinc coating in g/m².