SLOVENSKI STANDARD
oSIST prEN 10344:2022

01-junij-2022

Fitingi iz temprane železove litine s prižemnimi priključki za železne cevi

Malleable cast iron fittings with compression ends for steel pipes

Tempergussfittings mit Klemmanschlüssen für Stahlrohre

Raccords à compression en fonte malléable pour tubes en acier

Ta slovenski standard je istoveten z: **prEN 10344**

ICS:

23.040.40 Kovinski fitingi Metal fittings

oSIST prEN 10344:2022 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 10344

April 2022

ICS 23.040.40

English Version

Malleable cast iron fittings with compression ends for steel pipes

Raccords à compression en fonte malléable pour tubes en acier

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 10344:2022) 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.

[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 steel pipes.

This document applies to steel piping systems for different application fields, such as gas supply, distribution and supply of water for general purposes and for human consumption, irrigation, firefighting, aqueous liquids, pressurized air and gaseous fuel systems.

NOTE Products complying with this document used for drinking water applications 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.

This document contains requirements and tests relating to compression fittings which can be connected to smooth walled steel pipes. The fittings can also incorporate other types of connection, such as threaded ends in conformance with EN 10226-1, flanged ends, compression ends for connection for pipes other than steel, etc., and can also take on various structural shapes, such as, straight piece, elbow or T-piece, etc. Their range of sizes covers nominal sizes DN 10 to DN 100 (size ⅜ 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*

EN 806-2, *Specification for installations inside buildings conveying water for human consumption - Part 2: Design*

EN 1562, *Founding - Malleable cast irons*

EN 1775:2007, *Gas supply - Gas pipework for buildings - Maximum operating pressure less than or equal to 5 bar - Functional recommendations*

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

EN 10216-1, *Seamless steel tubes for pressure purposes - Technical delivery conditions - Part 1: Non-alloy steel tubes with specified room temperature properties*

EN 10217-1, *Welded steel tubes for pressure purposes - Technical delivery conditions - Part 1: Electric welded and submerged arc welded non-alloy steel tubes with specified room temperature properties*

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 10255, *Non-alloy steel tubes suitable for welding and threading - Technical delivery conditions*

EN 10284, *Malleable cast iron fittings with compression ends for polyethylene (PE) piping systems*

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

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)*

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

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

EN ISO 19892, *Plastics piping systems - Thermoplastics pipes and fittings for hot and cold water - Test method for the resistance of joints to pressure cycling (ISO 19892)*

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 General

3.1.1
fitting
connecting piece for pipes and other piping accessories, consisting of one or more parts

3.1.2
compression fitting
connecting piece for pipes and other piping accessories, equipped with minimum one compression end, sealing by elastomeric gaskets

3.1.3
transition fitting
fitting jointing different types of pipe and/or comprising different types of outlet

3.1.4
end-load-resistant joint
joint which can resist axial loads without additional external mechanical support

3.1.5
non-end-load-resistant joint
joint which cannot resist axial loads without additional external mechanical support

3.1.6
fitting size
nominal size of the connecting (steel) pipe(s)

Note 1 to entry: For transition fittings, the size designation follows the type of the outlet.

3.1.7
fitting body
main pressure-bearing part of a fitting

3.1.8
outlet
end of a fitting for the purpose of connection with a pipe or other piping accessories

3.1.9
run
two principal axially aligned outlets of a tee

3.1.10
branch
side outlet of a tee

3.1.11
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.

3.1.12
grip
locking ring
ring that holds the pipes in place and prevents pull out from the joint

3.1.13
minimum bore
smallest internal diameter of a fitting measured at any cross-section

3.1.14
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.

3.1.15
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

3.1.16
jointing thread
thread complying with EN 10226-1

3.1.17
fastening thread
thread complying with EN ISO 228-1

3.1.18
component test
test to verify the performance of a fitting carried out on the non-assembled fitting or fitting parts

3.1.19
assembly test
test to verify the fitness for purpose of an assembled fitting connected with the pipe(s)

3.2 Movability

3.2.1
angular deflection
maximum angle α subtended between the axes of the fitting and the connected pipe when the assembly still remains leak-tight following 2 full deflections by ±α in relation to the starting position

Note 1 to entry: α is according to manufacturer's specifications.

3.2.2
axial movability
axial path within which the fitting remains leak-tight following 2 full path changes by ±a in relation to the starting position

Note 1 to entry: a is according to manufacturer's specifications.

3.2.3
torsional angle
maximum angle β within the piece can twist around its axis, when the assembly still remains leak-tight following 2 full twists by ±β in relation to the starting position

Note 1 to entry: β is according to manufacturer's specifications.

3.2.4
resistance to pull-out
ability of the joint to withstand axial forces, applied mechanically or through internal pressure, while remaining leak-tight

3.3 Pressure and temperature

3.3.1
allowable operating pressure
PFA
maximum operating pressure of the connected pipe joint(s) in continuous function

3.3.2
allowable operating temperature
TFA
maximum operating temperature of the connected pipe joint(s) in continuous function

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.

NOTE In case of potable water, the 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 whiteheart malleable iron.

Grade EN-GJMB-350-10 for fittings in blackheart malleable iron.

Fittings shall be identified by material symbols 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 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 and type. For applications in cold geographic areas or for cooling circuits the minimum design temperature is –20 °C (see Table 3) and the test requirements specified in 9.3.7 are to be considered. For elevated temperatures above 70 °C, see Table 3, the test temperature in 9.3.7 shall be raised to the maximum operating temperature in the relevant application.