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**Fitingi iz temprane železove litine s prižemnimi priključki za železne cevi**

Malleable cast iron fittings with compression ends for steel pipes

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ICS

English Version

## Malleable cast iron fittings with compression ends for steel pipes

Raccords à compression en fonte malléable pour tubes  
d'acier

Tempergussfittings mit Klemmanschlüssen für Stahlrohre

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ECISS/TC 29.

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

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## Foreword

This document (prEN 10344:2006) has been prepared by Technical Committee ECISS/TC 29 “Steel tubes and fittings for steel tubes”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, B, C or D, which is an integral part of this document.

This standard includes the following annexes :

Annex A (informative) : *Quality management system.*

Annex ZA (informative) : *Clauses of this European Standard addressing the provisions of the EU Construction Products Directive.*

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## 1 Scope

This standard specifies the requirements for the design, performance and testing of malleable cast iron fittings with compression ends for steel pipes. It applies to steel piping systems for different application fields, such as gas supply, distribution of water for general purposes and for human consumption, irrigation, fire fighting, aqueous liquids, compressed air and gaseous fuel systems.

It also applies to oil piping systems, provided the elastomeric sealing material is compatible with the oil and the operating conditions.

It contains requirements and tests relating to compression fittings which can be disconnected from smooth walled steel pipes or other cylindrical metal structural elements, which are applicable for dismantlable joints. The fittings can also incorporate other types of connection, such as threaded, flanged, compression ends for connection of polyethylene pipes, 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 6 to DN 100 (size 1/8 to 4).

## 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 549, *Rubber materials for seals and diaphragms for gas appliances and gas equipment.*

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

EN 682, *Elastomeric seals – Material requirements for joint seals used in pipes and fittings carrying gas and hydrocarbon fluids.*

EN 751-1, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water – Part 1 : Anaerobic jointing compounds.*

EN 751-2, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water – Part 2 : Non-hardening jointing compounds.*

EN 751-3, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water – Part 3 : Unsintered PTFE tapes.*

EN 1562, *Founding – Malleable cast irons.*

EN 10204, *Metallic products – Types of inspection documents.*

EN 10208-1, *Steel pipes for pipelines for combustible fluids – Technical delivery conditions – Part 1 : Pipes of requirement class A.*

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 : 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 10226-2, *Pipe threads where pressure-tight joints are made on the threads – Part 2 : Taper external threads and taper internal threads – Dimensions, tolerances and designation.*

EN 10226-3, *Pipe threads where pressure-tight joints 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 piping systems.*

EN 10305-1, *Precision steel tubes – Part 1 : Seamless cold drawn tubes.*

EN 10305-2, *Precision steel tubes – Part 3 : Welded cold drawn tubes.*

EN 10305-3, *Precision steel tubes – Part 2 : Welded cold sized tubes.*

EN 12294, *Plastic piping systems – Systems for hot and cold water – Test method for leaktightness under vacuum.*

EN 12295, *Plastics piping systems – Thermoplastics pipes and associated fittings for hot and cold water – Test method for resistance of joints to pressure cycling.*

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

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads – Part 1 : Designation, dimensions and tolerances.*

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 1460, *Metallic coatings – Hot dip galvanized coatings on ferrous materials – Gravimetric determination of the mass per unit area.*

### 3 Terms and definitions

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

#### 3.1 generals

##### 3.1.1 fitting

connecting piece for pipes

##### 3.1.2 transition fitting

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

##### 3.1.3 end-load bearing joint

a joint which can resist axial loads without additional external mechanical support

##### 3.1.4 non-load bearing joint

a joint which cannot resist axial loads without additional external mechanical support



**3.1.5****fitting size**

the nominal size of the connecting steel pipe

NOTE For transition fittings the designation follows the type of the outlet.

**3.1.6****fitting body**

the main pressure-bearing part a fitting

**3.1.7****outlet**

end of a fitting which connects with a pipe

**3.1.8****run**

two principal axially aligned outlets of a tee

**3.1.9****branch**

side outlet of a tee.

**3.1.10****compression end**

an end of a fitting in which the joint is made by the compression of components onto the smooth wall pipe to provide pressure integrity and leaktightness

**3.1.11****grip ring**

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

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**3.1.12****minimum bore**

smallest internal diameter measured at any cross-section of the assembled fitting

**3.1.13****smooth walls**

smooth pipe surfaces in the seal and clamping area which are unshaped, undamaged and untreated

NOTE Cleaning and deburring is not regarded as treatment.

**3.1.14****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 compression rings

**3.1.15****jointing thread**

thread complying with EN 10226-1

**3.1.16****fastening thread**

thread complying with EN ISO 228-1

**3.1.17****component test**

test to verify the performance of a fitting carried out on the fitting with or without the internal parts

### 3.1.18

#### assembly test

test to verify the fitness for purpose of an assembled fitting with the connecting pipes

### 3.2

#### movability

#### 3.2.1

##### angular deflection

maximum angle  $\alpha$  subtended between the axes of the fitting and the connected pipe when the assembly still remains leak-tight following 2 full deflections by  $\pm \alpha$  in relation to the starting position ( $\alpha$  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  $\pm a$  in relation to the starting position ( $a$  = according to manufacturer's specifications)

#### 3.2.3

##### torsional angle

the maximum angle  $\beta$  within the piece can twist around its axis, when the assembly still remains leak-tight following 2 full twists by  $\pm \beta$  in relation to the starting position ( $\beta$  is according to manufacturer's specifications)

### 3.3

#### resistance to pull-out

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

### 3.4

#### pressure and temperature

#### 3.4.1

##### allowable operating pressure (PFA)

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

#### 3.4.2

##### allowable operating temperature (TFA)

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

## 4 Types of fittings

All types of fittings subject to this standard, provide dismountable joints

## 5 Materials

### 5.1 Material of the fitting

#### 5.1.1 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 or EN-GJMB-350-10 for fittings in white heart malleable iron ;
- grade EN-GJMW-350-4 or EN-GJMB-300-6 for fittings in black heart 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
B	EN-GJMW-350-4 or EN-GJMB-300-6

### 5.1.2 Other ferrous materials

Notwithstanding this requirement, any other ferrous materials which give mechanical properties at least equivalent to those malleable cast irons specified above will be allowed.

## 5.2 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 EN 682, respectively EN 549, depending on the specific application and shall conform to the appropriate class respectively type. For applications in cold geographic areas the minimum design temperature is – 20 °C (see Table 3) and the test requirements specified in 9.3.5 and 9.3.6 are to be considered.

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## 6 Corrosion protection

### 6.1 General

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

### 6.2 Hot dip galvanizing

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.

NOTE For fittings supplied in other ferrous materials (see 5.1.2) alternative zinc coating may be provided by agreement with the purchaser.

#### 6.2.1 Chemical composition of the hot dip galvanized 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) 1,6 % in individual cases 1,8 %.

For drinking water applications the lead content shall be less than stated above, in order not to exceed the limit specified in the Drinking Water Directive 98/83/EC.

### 6.2.2 Coating mass per surface unit

The areic mass of the zinc coating shall be not less than 500 g/m<sup>2</sup>, as an average of 5 fittings. This corresponds to a medium layer thickness of 70 µm.

It shall be not less than 450 g/m<sup>2</sup> (63 µm) when it is measured on an individual sample.

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

$$s = \frac{m_A}{7.2}$$

where

$m_A$  is the surface related mass of the zinc coating in g/m<sup>2</sup>.

### 6.2.3 Surface conditions of the zinc coating

The zinc coating on the internal surface of the fitting shall be continuous with the exception of machined black surfaces. In the special case of larger material cross-sections the iron-zinc alloy phases may grow through. The internal zinc coating shall be free from zinc blisters, zinc burrs, non-metallic remainders.

### 6.3 Non-metallic coating

Depending on external and internal conditions of use, also non-metallic coatings may be used, for example plastic coatings, if they are accepted by the purchaser.

### 6.4 Dispatch conditions of finished fittings

The surface of the fitting shall be free of polycyclic aromatic hydrocarbons.