

Threaded pipe fittings in malleable cast iron

The European Standard EN 10242:1994, with the incorporation of amendments A1:1999 and A2:2003, has the status of a British Standard

ICS 23.040.40

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee PSE/9, Pipe fittings other than cast iron, upon which the following bodies were represented:

- British Compressed Air Society
- British Fluid Power Association
- British Gas plc
- British Malleable Tube Fittings Association
- British Plumbing Fittings Manufacturers' Association
- British Valve and Actuator Manufacturers' Association
- Energy Industries Council
- Engineering Equipment and Materials Users' Association
- Galvanizers' Association
- Institution of Civil Engineers
- Institution of Water and Environmental Management
- Ministry of Defence
- Steel Tube Fittings Manufacturers' Technical Association

This British Standard, having been prepared under the direction of the Engineering Sector Board, was published under the authority of the Standards Board and comes into effect on 15 September 1995

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National foreword

This British Standard has been prepared under the direction of Technical Committee PSE/9, Pipe fittings other than cast iron, and is the English language version of EN 10242:1994 *Threaded pipe fittings in malleable cast iron*, including amendment A1:1999 and amendment A2:2003, as corrected by corrigendum August 1999, published by the European Committee for Standardization (CEN).

This standard partially supersedes BS 143 and BS 1256:1986, which has been amended.

Cross-references

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 38, an inside back cover and a back cover.

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Sidelining in this document indicates the most recent changes by amendment.

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English version

Threaded pipe fittings in malleable cast iron

(includes amendments A1:1999 and A2:2003)

Raccords de tuyauterie filetés en fonte
malléable
(inclut les amendements A1:1999 et A2:2003)

Gewindefittings aus Temperguß
(enthält Änderungen A1:1999 und A2:2003)

This European Standard was approved by CEN on 1994-11-10; amendment A2 was approved by CEN on 28 November 2002. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

This European Standard has been prepared by ECISS/TC 29 of which the Secretariat is held by UNSIDER.

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 May 1995, and conflicting national standards shall be withdrawn at the latest by May 1995.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Foreword to amendment A1

This amendment EN 10242:1994/A1:1999 to EN 10242:1994 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 amendment to the European Standard EN 10242:1994 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 1999, and conflicting national standards shall be withdrawn at the latest by October 1999.

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Foreword to amendment A2

This document (EN 10242:1994/A2:2003) 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 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 September 2003, and conflicting national standards shall be withdrawn at the latest by September 2003.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This standard specifies the requirements for the design and performance of threaded pipe fittings in malleable cast iron.

These fittings are for general purposes for the transmission of fluids and gases up to the limits of pressure and temperature specified in this standard. They are intended for the connection of elements threaded in accordance with ISO 7-1, sizes $\frac{1}{8}$ to 6.

For use in conditions outside the pressure and temperature limits specified, reference shall be made to the manufacturer.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 10204:1991, *Metallic products — Types of inspection documents*.

EN ISO 9001, *Quality systems — Model for quality assurance in design, development, production, installation and servicing*.
(ISO 9001:1994)

EN ISO 9002, *Quality systems — Model for quality assurance in production, installation and servicing*.
(ISO 9002:1994)

EN 45012, *General criteria for certification bodies operating quality system certification*.

EN 1562, *Founding — Malleable cast irons*.

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*.

EN ISO 228-1, *Pipe threads where pressure tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (Revision of ISO 228-1:2000)*.

EN ISO 6708, *Pipework components — Definition and selection of DN (nominal size)* (ISO 6708:1995).

3 Types of fitting

Table 1 gives an index to the fitting types, and patterns and symbols. The symbols relate to the identification of fittings and may be used for designation (see **13.1**).

Table 1 — Index of fitting types, symbols and index to tables and patterns

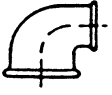
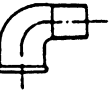
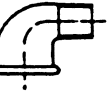
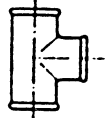
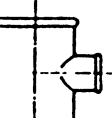
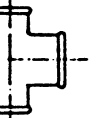
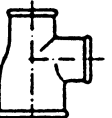
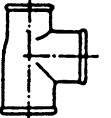
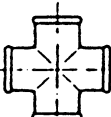
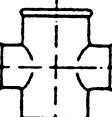
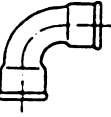
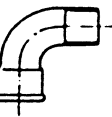
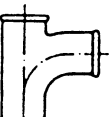
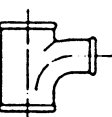
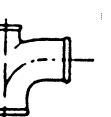
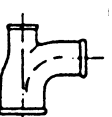
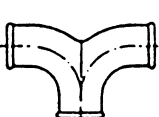
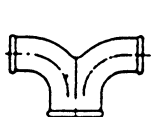
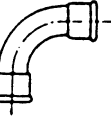
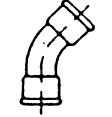
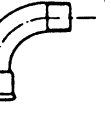
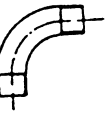
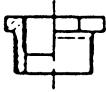
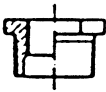
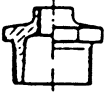
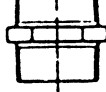
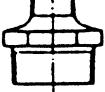
Types	Patterns					
Symbols	A1		A1/45°	A4		A4/45°
A Elbows						
	Table 8	Table 9	Table 10	Table 8	Table 9	Table 10
Symbols	B1					
B Tees						
	Table 8	Table 11	Table 11	Table 12	Table 12	
Symbols	C1					
C Crosses						
	Table 8	Table 13				
Symbols	D1	D4				
D Short bends						
	Table 14	Table 14				
Symbols	E1				E2	
E Pitcher tees Twin elbows						
	Table 14	Table 15	Table 15	Table 15	Table 14	Table 16
Symbols	G1	G1/45°	G4	G4/45°	G8	
G Long sweep bends						
	Table 17	Table 18	Table 17	Table 18	Table 17	

Table 1 — Index of fitting types, symbols and index to tables and patterns (*continued*)

Types	Patterns				
Symbols	M2		M4		
M Sockets	 Table 19	 Table 19	 Table 20	 Table 20	
Symbols	N4		N8		
N Bushings Hexagon nipples	 Table 21	 Table 21	 Table 21	 Table 22	 Table 22
Symbols	P4				
P Backnuts	 Table 23				
Symbols	T1		T8	T9	T11
T Caps Plugs	 Table 24		 Table 24	 Table 24	 Table 24
Symbols	U1	U2	U11	U12	
U Union	 Table 25	 Table 25	 Table 25	 Table 25	
Symbols	UA1	UA2	UA11	UA12	
UA Union elbows	 Table 26	 Table 26	 Table 26	 Table 26	
Symbols	Za1	Za2			
Za Side outlet elbows and tees	 Table 8	 Table 8			

4 Terminology

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

4.1

fitting

connecting piece, of one or more parts

4.2

jointing thread

thread complying with ISO 7-1

4.3

fastening thread

thread complying with ISO 228-1

4.4

fitting size

size designation of the threads of the threaded outlets as derived from ISO 7-1 (see also Clause 13)

4.5

designation of thread size

same definition as for fitting size (see 4.4)

4.6

nominal size; DN

for definition see EN ISO 6708

NOTE 1 Nominal size is designated by the letters DN followed by the appropriate number.

NOTE 2 The relationship between fitting size and nominal size (DN) is given in Annex D for guidance only.

NOTE 3 Nominal size (DN) should not be used for the designation of fitting size.

4.7

reinforcement

additional material on the outside diameter of an internally threaded fitting in the form of a band or bead

4.8

rib

local and axially aligned additional material on the outside or inside of a fitting for assistance in assembly or manufacturing

4.9

outlet

internally or externally threaded end of a fitting, which connects with a tube, fitting or other component, which is threaded in accordance with ISO 7-1

4.10

run

two principal axially aligned outlets of a tee or cross

4.11

branch

side outlet(s) of a tee, pitcher tee, or cross

4.12

chamfer

removal of a conical portion at the entrance of a thread to assist assembly and prevent damage to the start of the thread

4.13

face-to-face dimension

distance between the two parallel faces of axially aligned outlets of a fitting

4.14

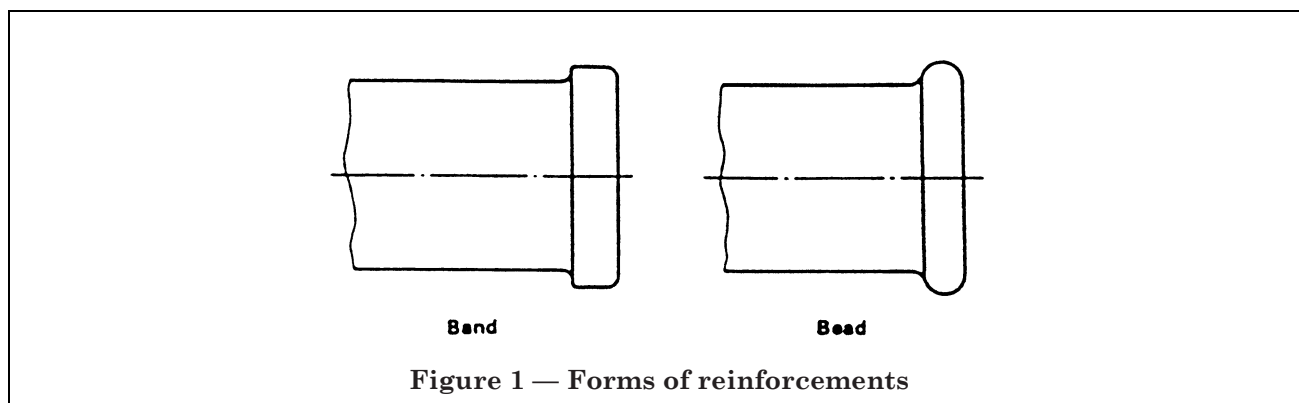
face-to-centre dimension

distance between the face of an outlet and the central axis of an angularly disposed outlet

4.15

laying length

average distance from the assembled pipe end to the axis of the fitting, or between the ends of two assembled pipes (see 7.2)



5 Materials

5.1 Material of the fitting

5.1.1 Malleable cast iron

The material used shall be malleable cast iron in accordance with the requirements of EN 1562. The grade of material used shall be selected from the following grades depending on the design symbol chosen (see 6.1).

- grades EN-GJMW-400-5 or EN-GJMW-350-4 for fittings in whiteheart malleable iron;
- grades EN-GJMB-350-10 or EN-GJMB-300-6 for fittings in blackheart malleable iron.

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 for straight fittings not larger than ¾, but excluding unions.

5.2 Hot dip zinc coating

Where a protection by zinc coating is required, the zinc coating shall be applied by the hot dip 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.

5.2.1 Chemical composition of the zinc coating

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

aluminium	(Al)	0,1 %;
antimony	(Sb)	0,01 %;
arsenic	(As)	0,02 %;
bismuth	(Bi)	0,01 %;
cadmium	(Cd)	0,01 %;
copper	(Cu)	0,1 %;
lead	(Pb)	1,6 % in individual cases 1,8 %;
tin	(Sn)	0,1 %.

5.2.2 Coating mass per surface unit

The surface related mass of the zinc coating shall be not less than 500 g/m², as an average of 5 fittings. This corresponds to a medium layer thickness of 70 µm. It shall be not less than 450 g/m² (63 µm) when it is measured on an individual sample.

The medium layer thickness $\bar{s}$ of the zinc coating in µm may 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.

5.2.3 Surface condition 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.

5.3 Despatch conditions of finished fittings

The surfaces of the fittings shall be free of polycyclic aromatic hydrocarbons.

6 Design

6.1 Fittings shall be identified by design symbols according to the selected material (see 5.1.1) and the choice of thread (see 8.1.1) as given in Table 2.

NOTE See also Annex A.

Table 2 — Design symbols

Design symbol	Thread type		Material grade
	external	internal	
A	R	Rp	EN-GJMW-400-5 or EN-GJMB-350-10
B	R	Rp	EN-GJMW-350-4 or EN-GJMB-300-6

6.2 The drawings are diagrammatic, without prejudice to the manufactured form.

6.3 The types and sizes dimensionally standardized are shown in Table 8 to Table 26.

6.4 Fittings shall be reinforced at the internally threaded ends by a band or bead, except where they are polygonal in shape to allow for spanner flats, or where fittings have side outlets (type Za1 and Za2).