BRITISH STANDARD

BS EN 10253-2:2007

Butt-welding pipe fittings —

Part 2: Non alloy and ferritic alloy steels with specific inspection requirements

The European Standard EN 10253-2:2007 has the status of a British Standard

ICS 23.040.40

National foreword

This British Standard is the UK implementation of EN 10253-2:2007. Together with BS EN 10253-1:1999 it supersedes BS 1965-1:1963, which is withdrawn. It partially supersedes BS 1640-1:1962, and BS 1640-3:1968, which will be withdrawn upon publication of BS EN 10253-3 and BS EN 10253-4.

The UK participation in its preparation was entrusted to Technical Committee ISE/19, Pipe fittings (other than cast iron).

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 November 2007

ISBN 978 0 580 53080 7

Amendments issued since publication

Amd. No.	Date	Comments

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 10253-2

October 2007

ICS 77.140.45; 23.040.40

English Version

Butt-welding pipe fittings - Part 2: Non alloy and ferritic alloy steels with specific inspection requirements

Raccords à souder bout à bout - Partie 2: Aciers non alliés et aciers ferritiques alliés avec contrôle spécifique

Formstücke zum Einschweißen - Teil 2: Unlegierte und legierte ferritische Stähle mit besonderen Prüfanforderungen

This European Standard was approved by CEN on 18 August 2007.

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Ref. No. EN 10253-2:2007: E

Contents

Foreword

This document (EN 10253-2:2007) has been prepared by Technical Committee ECISS/TC 29 “Steel tubes and fittings for steel tubes”, the secretariat of which is held by UNI/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of an identical text or by endorsement, at the latest by May 2008, and conflicting national standards shall be withdrawn at the latest by May 2008.

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 (97/23/EC).

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

EN 10253 comprises a series of European Standards about *Butt-welding pipe fittings*, namely:

— *Part 1 : Wrought carbon steel for general use and without specific inspection requirements*

— *Part 2 : Non alloy and ferritic alloy steels with specific inspection requirements*

— *Part 3 : Wrought austenitic and austenitic-ferritic (duplex) stainless steels without specific inspection requirements*

— *Part 4 : Wrought austenitic and austenitic-ferritic (duplex) stainless steels with specific inspection requirements*

In writing this European Standard the competent committee recognized that there are two broad types of products commonly used, and decided to reflect these in the standard by differentiating between two parts.

EN 10253-1 describes fittings without formal reference to the pressure resistance, which are not intended to be used in applications covered by the Pressure Equipment Directive (97/23/EC).

EN 10253-2 defines two types of fittings : Type A fittings have the same wall thickness at the welding ends and at the body of the fitting than a pipe having the same specified wall thickness. Their resistance to internal pressure is, in general, less than that of a straight pipe with the same dimensions. Type B fittings showing increased wall thickness at the body of the fitting are designed to resist the same internal pressure as a straight pipe with same dimensions. These two types of fittings are intended to be used in applications covered by the EU Directive 97/23/EC. According to this Directive and further interpretation guidelines (e.g. guideline 7/19), seamless fittings are considered as materials whereas welded fittings are considered as components. Therefore, in some areas of this European Standard, provisions for seamless and welded fittings are different.

The selection of steel type and requirement level depend on many factors; the properties of the fluid to be conveyed, the service conditions, the design code and any statutory requirements should all be taken into consideration. Therefore this standard gives no detailed guidelines for the application of different parts. It is the ultimate responsibility of the user to select the appropriate part for the intended application.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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

1 Scope

This Part of EN 10253 specifies the technical delivery requirements for seamless and welded butt-welding fittings (elbows, concentric and eccentric reducers, equal and reducing tees, caps) made of carbon and alloy steel which are intended for pressure purposes at room temperature, at low temperature or at elevated temperatures, and for the transmission and distribution of fluids and gases.

It specifies:

— type of fittings ;

  — type A : Butt-welding fittings with reduced pressure factor ;

  — type B : Butt-welding fittings for use at full service pressure ;

— steel grades ;

— mechanical properties ;

— dimensions and tolerances ;

— requirements for inspection and testing ;

— inspection documents ;

— marking ;

— protection and packaging.

NOTE In the case of a harmonised supporting standard for materials, presumption of conformity to the ESRs is limited to technical data of materials in the standard and does not presume adequacy of the material to a specific item of equipment. Consequently it is essential that the technical data stated in the material standard be assessed against the design requirements of this specific item of equipment to verify that the ESRs of the PED are satisfied.

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 287-1, *Qualification test of welders — Fusion welding — Part 1: Steels*

EN 910, *Destructive tests on welds in metallic materials — Bend tests*

EN 1418, *Welding personnel — Approval testing of welding operators for fusion welding and resistance weld setters for fully mechanized and automatic welding of metallic materials*

EN 10002–1, *Metallic materials — Tensile testing — Part 1: Method of test at ambient temperature*

EN 10002–5, *Metallic materials — Tensile testing — Part 5: Method of testing at elevated temperature*

EN 10020:2000, *Definition and classification of grades of steel*

EN 10021:2006, *General technical delivery conditions for steel products*

EN 10027-1, *Designation systems for steels — Part 1: Steel names*

EN 10027-2, *Designation systems for steels — Part 2: Numerical system*

EN 10028-2, *Flat products made of steels for pressure purposes — Part 2: Non-alloy and alloy steels with specified elevated temperature properties*

EN 10028-3, *Flat products made of steels for pressure purposes — Part 3: Weldable fine grain steels, normalized*

EN 10028-4, *Flat products made of steels for pressure purposes — Part 4: Nickel alloy steels with specified low temperature properties*

EN 10045–1, *Metallic materials - Charpy impact test — Part 1: Test method*

EN 10052:1993, *Vocabulary of heat treatment terms for ferrous products*

EN 10168, *Steel products — Inspection documents — List of information and description*

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

EN 10217-1, *Welded steel tubes for pressure purposes — Part 1: Non-alloy steel tubes with specified room temperature properties*

EN 10217-2, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 2: Electric welded non-alloy and alloy steel tubes with specified elevated temperature properties*

EN 10217-3, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 3: Alloy fine grain steel tubes*

EN 10217-4, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 4: Electric welded non-alloy steel tubes with specified low temperature properties*

EN 10217-5, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 5: Submerged arc welded non-alloy and alloy steel tubes with specified elevated temperature properties*

EN 10217-6, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 6: Submerged arc welded non-alloy steel tubes with specified low temperature properties*

EN 10246-10, *Non-destructive testing of steel tubes — Part 10*: *Radiographic testing of the weld seam of automatic fusion arc welded steel tubes for the detection of imperfections*

EN 10246-11, *Non-destructive testing of steel tubes — Part 11*: *Liquid penetrant testing of seamless and welded steel tubes for the detection of surface imperfections*

EN 10246-12, *Non-destructive testing of steel tubes — Part 12*: *Magnetic particle inspection of seamless and welded ferromagnetic steel tubes for the detection of surface imperfections*

EN 10266*:2003, Steel tubes, fittings and structural hollow sections — Symbols and definitions of terms for use in product standards*

EN 10273, *Hot rolled weldable steel bars for pressure purposes with specified elevated temperature properties*

EN 13480-3:2002, *Metallic industrial piping — Part 3: Design and calculation*

EN ISO 377:1997, *Steel and steel products — Location and preparation of samples and test pieces for mechanical testing (ISO 377:1997)*

EN ISO 2566-1, *Steel — Conversion of elongation values — Part 1: Carbon and low alloy steels (ISO 2566-1:1984)*.

EN ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes (ISO 3166-1:2006)*

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

EN ISO 14284, *Steel and iron — Sampling and preparation of samples for the determination of chemical composition (ISO 14284:1996)*

EN ISO 15614-1, *Specification and qualification of welding procedures for metallic materials - Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys (ISO 15614-1:2004)*

ISO 1027, *Radiographic image quality indicators for non-destructive testing — Principles and identification*

3 Terms and definitions

For the purposes of this document, the relevant definitions in EN 10020:2000, EN 10021:2006, EN 10052:1993 and EN ISO 377:1997 apply, except as defined below.

3.1
carbon steel grade
in this part of EN 10253, the following grades :

P235TR2 - P265TR2 - P235GH - P265GH - P355N - P355NH - P355NL1 - P215NL - P265NL

3.2
employer
organisation for which a person works on a regular basis

NOTE The employer may be either the fitting manufacturer or supplier or a third party organisation providing a service, e.g. NDT.

3.3
model
for elbows and return bends, the model defines the bending radius of the piece

3.4
purchaser
person or organisation that orders products in accordance with this European Standard

NOTE 1 The purchaser is not necessarily, but may be, a manufacturer of pressure equipment in accordance with the EU Directive listed in Annex ZA.

NOTE 2 Where a purchaser has responsibilities under this EU Directive, this standard will provide a presumption of conformity with the essential requirements of the Directive so identified in Annex ZA.

3.5
weld during manufacture
weld made for obtaining a fitting

NOTE This term does not include the tube welds when a tube is used as starting material.

3.6
seamless fitting
fitting manufactured without welding from starting material which is not welded

3.7
welded fitting

3.7.1
fitting made from welded tubes

3.7.2
fitting made from sheet/plate or strip where welding is a part of the manufacturing process

4 Symbols

For the purposes of this document, the symbols defined in EN 10266:2003 and the following apply:

DN, DN_1	Conventional dimension used in piping ; non measurable value (See EN ISO 6708) ;
D	Specified outside diameter for elbows, return ends, equal tees, caps and the major outside diameter for reducers and reducing tees, expressed in millimetres ;
D_1	Specified minor outside diameter for reducers and reducing tees, expressed in millimetres ;
T	Specified wall thickness at the welding ends for elbows, return bends, equal tees and bends or on the D end for reducers and reducing tees, expressed in millimetres ;
T_1	Specified wall thickness on the D_1 welding end of reducers and reducing tees, expressed in millimetres ;
ID	Internal diameter at the welding ends of elbows, return bends, equal tees and at the major welding end of reducers and reducing tees (ID = D -2T) ;
ID_1	Internal diameter at the minor welding end of reducers and reducing tees ($ID_1 = D_1 - 2T_1$) ;
C	Centre to centre distance for return bends (C ≈ 2R), expressed in millimetres ;
B	Back to face distance for return bends, expressed in millimetres ;
F	Distance from the axis of the branch outlet to the face of the centre body of tees, expressed in millimetres ;
G	Distance from the axis of the centre line to the face of the branch outlet of reducing tees, expressed in millimetres ;
k	Total height for caps, expressed in millimetres ;
L	Face to face distance for reducers, expressed in millimetres ;
X	Tolerance on the form of fittings ;
r	Inside knuckle radius of cap ;
R	Bending radius of elbows and return bends, expressed in millimetres ;
$R1$	Inside spherical radius of cap ;
P	Tolerance on the form of elbows ;
W	Distance from the extrados to the centre of a 90° elbow at the welding ends ;