SLOVENSKI STANDARD
SIST EN 10253-3:2009

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Cevni fitingi za soležne zvare - 3. del: Kovna avstenitna in avstenitno-feritna (dupleksna) nerjavna jekla brez posebnih zahtev glede pregledov

Butt-welding pipe fittings - Part 3: Wrought austenitic and austenitic-ferritic (duplex) stainless steels without specific inspection requirements

Formstücke zum einschweissen - Teil 3: Austenitischen und austenitisch-ferritischen nichtrostenden Stähle ohne besonderen Prüfanforderungen

Raccords a souder bout a bout - Partie 3: Aciers inoxydables austénitiques et austéno-ferritiques sans contrôle spécifique

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ICS:

23.040.40	Kovinski fitingi	Metal fittings
77.140.20	Visokokakovostna jekla	Stainless steels

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EUROPEAN STANDARD

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English Version

Butt-welding pipe fittings - Part 3: Wrought austenitic and austenitic-ferritic (duplex) stainless steels without specific inspection requirements

Raccords à souder bout à bout - Partie 3: Aciers inoxydables austénitiques et austéno-ferritiques sans contrôle spécifique

Formstücke zum Einschweißen - Teil 3: Nichtrostende austenitische und austenitisch-ferritische (Duplex-) Stähle ohne besondere Prüfanforderungen

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Foreword

This document (EN 10253-3:2008) 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of an identical text or by endorsement, at the latest by May 2009, and conflicting national standards shall be withdrawn at the latest by May 2009

.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

Part 5: Wrought austenitic and austenitic-ferritic (duplex) stainless steels for use as construction products

In writing EN 10253 the competent committee recognized that there are two broad types of products commonly used for stainless steels, 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 committee recognized the need to provide a basic type in which the minimum wall thickness of the fitting is guaranteed without formal reference to the pressure resistance. This type is considered in Part 3 and includes products not intended for use in applications covered by the Pressure Equipment Directive (97/23/EC) except applications according to Article 3 Paragraph 3.

The application standards for the Pressure Equipment Directive category I - IV will require that the fitting is designed to withstand a defined resistance to internal pressure. This approach is considered in Part 4.

Information about structural dimensions of fittings is given in Annex A and commonly used dimensions and wall thicknesses are given in Annex B.

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.

Introduction

The European Organisation for Standardization (CEN) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents applied to steel grade 1.4410, the compositions of which is given in Table 3.

CEN takes no position concerning the evidence, validity and scope of these patent rights.

The holder of these patent rights has assured CEN that he/she are willing to negotiate licences, under reasonable and non-discriminatory terms and conditions, with applicants throughout the world. In this respect, the statements of the holders of these patent rights are registered with CEN. Information may be obtained from:

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Attention is drawn to the possibility that some of the elements within this document may be the subject of patent rights other than those indicated above. CEN shall not be responsible for identifying any or all such patents rights.

1 Scope

1.1 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 austenitic and austenitic–ferritic (duplex) stainless steel without specific inspection requirements.

It specifies:

— steel grades;

— mechanical properties;

— dimensions and tolerances;

— requirements for inspection and testing;

— inspection documents;

— marking;

— handling and packaging.

1.2 Limitation of use

The allowed pressures and temperatures are the responsibility of the customer according to the state of the art and in application of the safety coefficients in the application regulations, codes and standards.

In common, joint coefficient is used in the calculation of the thicknesses of components which include one or several butt welds, other than circumferential:

— for equipment subject to random non-destructive testing: 0,85;

— for equipment not subject to non-destructive testing other than visual inspection: 0,7.

1.3 Unless otherwise specified in this part of EN 10253 the general technical delivery requirements in EN 100021 apply.

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 ISO 15609-1, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 1: Arc welding (ISO 15609-1:2004)*

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

EN 1418, *Welding personal — 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 steel — Part 1: Steel names*

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

EN 10028-7, *Flat products made of steels for pressure purposes — Part 7: Stainless steels*

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

EN 10079:2007, *Definition of steel products*

EN 10088-2, *Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*

EN 10088-3, *Stainless steels — Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes*

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

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

EN 10216-5, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 5: Stainless steel tubes*

EN 10217-7, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 7: Stainless steel tubes*

EN ISO 8493, *Metallic materials — Tubes — Drift-expanding test (ISO 8493:1998)*

EN ISO 8495, *Metallic materials — Tubes — Ring expanding test (ISO 8495:1998)*

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

EN 10272, *Stainless steel bars for pressure purposes*

EN 10296-2, *Welded circular steel tubes for mechanical and general engineering purposes — Technical delivery conditions — Part 2: Stainless steel*

EN 10297-2, *Seamless steel tubes for mechanical and general engineering purposes — Technical delivery conditions — Part 2: Stainless steel*

EN 13445-3, *Unfired pressure vessels — Part 1: Design*

EN 13480-1, *Metallic industrial piping — Part 1: General*

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

EN ISO 2566-2, *Steel — Conversion of elongation values — Part 2: Austenitic steels (ISO 2566-2:1984)*

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 3651-2, *Determination of resistance to intergranular corrosion of stainless steels — Part 2: Ferritic, austenitic and ferritic-austenitic (duplex) stainless steels — Corrosion test in media containing sulfuric acid (ISO 3651-2:1998)*

EN ISO 9001, *Quality management systems — Requirements (ISO 9001:2000)*

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

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purpose of this document, the relevant terms and definitions given in EN 10020:2000, EN 10021:2006, EN 10052:1993, EN 10079:2007 and EN ISO 377:1997 apply, except as defined below.

3.1.1
model
for elbows and return bends, the model defines the bending radius of the piece

3.1.2
welded fitting
fittings made from welded tubes or fittings made from plate/sheet or strip where welding is a part of the manufacturing process

3.1.3
seamless fitting
fittings manufactured without welding from starting material which is not welded

3.1.4
purchaser
person or organisation that orders products in accordance with this European Standard

3.1.5
employer
organisation for which a person works on a regular basis. The employer can be either the fitting manufacturer or supplier or a third party organisation providing a service, e.g. NDT

3.2 Symbols

For the purpose of this document, the symbols given in EN 10266 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 and equal tees 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
H	Face to centre distance for 45° elbows, expressed in millimetres
K	Total height for caps, expressed in millimetres
L	Face to face distance for reducers, expressed in millimetres
Q	Tolerance on the form of fittings
r	Inside knuckle radius of cap
R	Bending radius of elbows and return bends, expressed in millimetres
R_m	Tensile strength at room temperature, expressed in MPa
$R_{p0,2}$	Minimum 0,2 % proof strength at room temperature, expressed in MPa
$R_{p1,0}$	Minimum 1,0 % proof strength at room temperature, expressed in MPa
A	Percentage of elongation at rupture, with reference to gauge length of $5,65 \sqrt{S_0}$
HBW	Brinell hardness
W0	Welded from hot or cold rolled plate, sheet or strip 1D, 2D, 2E, 2B (symbols of flat products according to EN 10088-2)
W1	Welded from hot rolled plate, sheet or strip 1D, descaled
W2	Welded from cold rolled plate, sheet or strip 2D, 2E, 2B, descaled

4 Classification of grades and designation

4.1 Classification of grades

Steels covered in this European Standard are classified according to their structure into:

— austenitic steels;

— austenitic–ferritic (duplex) steels.

For more details see EN 10088-1.

4.2 Designation

For the fittings covered by this European Standard the designation shall consist of:

number of this European Standard (EN 10253-3);

plus either:

steel name in accordance with EN 10027-1;

or:

steel number allocated in accordance with EN 10027-2.

5 Information to be obtained from the purchaser

5.1 Mandatory information

The following information shall be obtained from the purchaser, at the time of enquiry and/or order:

5.1.1 Designation of fittings

5.1.1.1 Elbows and return bends

Elbows and return bends are designated by the model (2D, 3D, 5D, D+100 and so on), the angle and the outside diameter D.

5.1.1.2 Reducers

Reducers are designated by the model (concentric or eccentric), the major diameter D and the minor diameter D_1.

5.1.1.3 Tees

Equal tees are designated by the outside diameter D.

Reducing tees are designated by the major diameter D and by the minor diameter D_1.

5.1.1.4 Caps

Caps are designated by the outside diameter D.

5.1.2 Information

The following information shall be obtained from the purchaser at the time of enquiry and order:

a) quantity required (number of pieces);

b) designation of fittings (see 5.1.1) and the wall thickness T (T_1);

c) designation of the steel grade according to this European Standard;

d) reference to this European Standard.