SLOVENSKI STANDARD

SIST EN 10311:2005

01-september-2005

Priključ ki za spajanje jeklenih cevi in fitingi za transport vode in drugih vodnih tekoļ in

Joints for the connection of steel tubes and fittings for the conveyance of water and other aqueous liquids

Verbindungen für Stahlrohre und Fittings für den Transport von Wasser und anderen wässrigen Flüssigkeiten

Assemblages pour le raccordement de tubes en acier et raccords pour le transport d'eau et d'autres liquides aqueux

Ta slovenski standard je istoveten z: **EN 10311:2005**

ICS:

23.040.60	Prirobnice, oglavki in spojni elementi	Flanges, couplings and joints

SIST EN 10311:2005 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 10311

May 2005

ICS 23.040.60

English version

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This European Standard was approved by CEN on 25 March 2005.

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.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 10311:2005: E

Contents

Foreword

This document (EN 10311:2005) 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of an identical text or by endorsement, at the latest by November 2005, and conflicting national standards shall be withdrawn at the latest by February 2007.

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 89/106/EEC.

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

Compliance of a product with this document does not confer a presumption of fitness of the product for the transport of water intended for human consumption within the meaning of the Directive 89/106/EEC. However, until the operation of the envisaged European Acceptance Scheme for construction products in contact with water intended for human consumption and the revision of the present document, products complying with this document may be used for the transport of water intended for human consumption if they comply with the relevant national, regional or local regulatory provisions applicable in the place of use.

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

Introduction

This European Standard applies to joints for use with non-alloy steel tubular products for use with all types of aqueous liquids.

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the product covered by this European Standard:

a) This European Standard provides no information as to whether the product may be used without restriction in any of the Member States of the EU or EFTA;

b) It should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

Standards EN 1123-1 'Pipes and fittings of longitudinally welded hot-dip galvanized steel pipes with spigot and socket for waste water systems — Part 1: Requirements, testing, quality control' and EN 1123-2 'Pipes and fittings of longitudinally welded hot-dip galvanized steel pipes with spigot and socket for waste water system — Part 2: Dimensions' are also available for waste water systems which require galvanized tubes.

1 Scope

This European Standard specifies a range of jointing methods for connecting low alloy steel tubes and steel tubes and fittings for use with aqueous liquids.

The following specific joint types are covered by this document: butt welded joints, welded spigot and socket (or sleeve joints), welding collars, flange joints, threaded joints, spigot and socket joints with seal and mechanical couplings.

This European Standard specifies requirements for the strength and integrity of the joints and the testing of the joints.

This European Standard does not specify the requirements for the tubes or the fittings.

This European Standard is suitable for joints intended for the conveyance of water for human consumption, after an appropriate coating has been applied.

This European Standard is not intended for use in heating networks where elevated temperature properties are required.

Flexible joints which permit significant angular deflection, both during and after installation and which can accept slight offset of the centre line, are not covered by this European Standard.

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

EN 1011-2, Welding — *Recommendations for welding of metallic materials — Part 2: Arc welding of ferritic steels*

EN 1092-1, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: Steel flanges*

EN 1591-1, *Flanges and their joints — Design rules for gasketed circular flange connections — Part 1: Calculation method*

EN 1759-1, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, Class designated — Part 1: Steel flanges, NPS* $^{1}/_{2}$ *to 24*

EN 10224, *Non-alloy steel tubes and fittings for the conveyance of aqueous liquids including water for human consumption - Technical delivery conditions*

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*

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

EN 13479, *Welding consumables – General product standard for filler metals and fluxes for fusion welding of metallic materials*

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

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

EN ISO 15607, *Specification and qualificationl of welding procedures for metallic materials - General rules (ISO 15607:2003)*

3 Terms, definitions and symbols

For the purposes of this European Standard, the symbols given in EN 10266:2003 apply together with the following terms and definitions.

3.1
allowable maximum operating pressure (p)
maximum pressure occurring from time to time, including surge, that a component is capable of withstanding in service
[EN 805:2000]

3.2
collar
short length of tube which is placed over the end of a tube or fitting and welded to it, to form a socket to receive the end of another tube or fitting

3.3
coupling
mechanical joint for connecting identical or different pipe diameters and/or identical or different materials

3.4
fitting
component, other than a pipe, which allows pipeline deviation, change of direction or bore of a tube. In addition, flanged-socket pieces, flanged-spigot pieces, collars and couplings are defined as fittings

3.5
joint
connection between the ends of two components including the means of sealing
[EN 805:2000]

3.6
adjustable joint
joint which permits significant angular deflection at the time of installation but not thereafter
[EN 805:2000]

3.7
rigid joint
joint that does not permit significant angular deflection, either during or after installation
[EN 805:2000]

3.8
nominal size (DN)
see EN ISO 6708

4 Types of joint

4.1 Butt welded joints

Butt-welded joints shall be made between tubes or tubes and fittings with their ends prepared in accordance with EN 10224. The maximum gap between the ends of the tubes or the tubes and fittings when set up for welding shall be in accordance with EN 1011-2.

4.2 Welded spigot and socket (sleeve) joints

4.2.1 General

Welded spigot and socket (sleeve) joints for welding shall comply with 4.2.2 or 4.2.3.

The general form of the joints given in Figure 1 may differ in detail from one manufacturer to another, however the principal dimensions shown shall be measured, using appropriate equipment, and values shall be as stated, subject to the manufacturers stipulated tolerances.

NOTE The dimensions of sleeve joints apply when they are shaped or made on tubes and/or fittings.

On tubes and fittings of outside diameter smaller than 711 mm, the joint may be welded on the outside only. On tubes or fittings with outside diameter 711 mm and larger, welding may be either inside, or outside, or both inside and outside. Such joints have been designed to allow the same forces to be transmitted as if the welds were fillet welds of a size appropriate to the thickness of the materials being joined.

4.2.2 Spigot and socket (sleeve) joints (type 1)

For type 1 joints (see Figure 1) the tubes or fittings shall be supplied with spigot end parallel and sleeve end either parallel or with the diameter tapered by approximately 0,8 mm on diameter per 25 mm length of sleeve.

These latter joints are designed for taper sleeves, so that the depth of penetration of the spigot into the sleeve anywhere around the circumference shall be not less than 30 mm but shall also be sufficient, if applicable, to accommodate any holes made in the sleeve to permit testing of the joint. When used to accommodate small changes in pipeline direction, the spigot shall additionally penetrate the sleeve around the whole circumference to an average depth of not less than 40 mm.

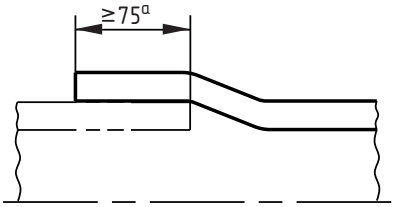
NOTE 1 At maximum penetration, the spigot can locate in the undimensioned transition area between the sleeve and the tube body. Care should be taken in expanding the tube end to prevent excessive weld gaps between the spigot and sleeve.

The manufacturer or supplier shall obtain from the purchaser at the time of enquiry and order specific details of the end preparation necessary for tubes and fittings for use with these types of joint.

NOTE 2 Assembly of sleeve joints on site in preparation for welding may require mechanical alignment aids e.g. props, jacks or wedges.

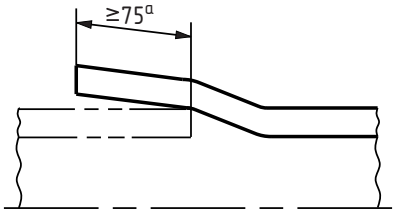
4.2.3 Spigot and socket (sleeve) joints (type 2)

For type 2 joints (see Figure 1) the tubes or fittings shall be supplied with the spigot end and the sleeve end parallel. The collar forming the sleeve shall be fabricated with not more than one longitudinal weld and shall be welded externally and internally to the sleeve tube. To ensure an adequate space between the spigot end and the internal collar weld to effect the inside joint weld, if required, the minimum sleeve length shall be (150 + 2T) mm for D > 168,3 mm and (100+ 2T) mm for $D \leq$ 168,3 mm, where T is the wall thickness of the sleeve.



a)

Type 1
(parallel sleeve)

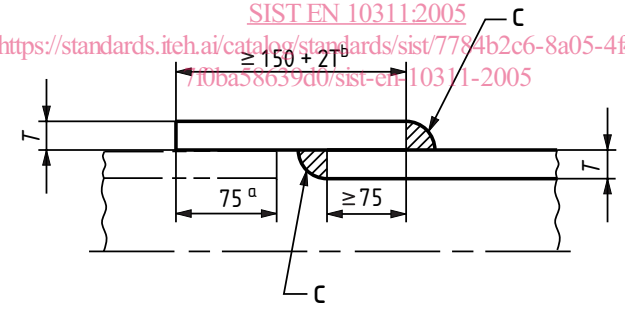


b)

Type 1 (taper sleeve: taper approx. 0,8 mm on diameter

for each 25 mm on length of socket)

NOTE All dimensions are in millimetres.



c)

Type 2 (collar sleeve)

NOTE All dimensions are in millimetres.

Key

a For outside diameters ≤ 168,3 mm, the length indicated shall be ≤ 50 mm
b For outside diameters ≤ 168,3 mm, the length indicated shall be 100 + 2*T* min
c Workshop fabrication weld

Figure 1 — Welded spigot and socket joints (these figures are idealised and do not take account of tolerances or site assembly conditions)

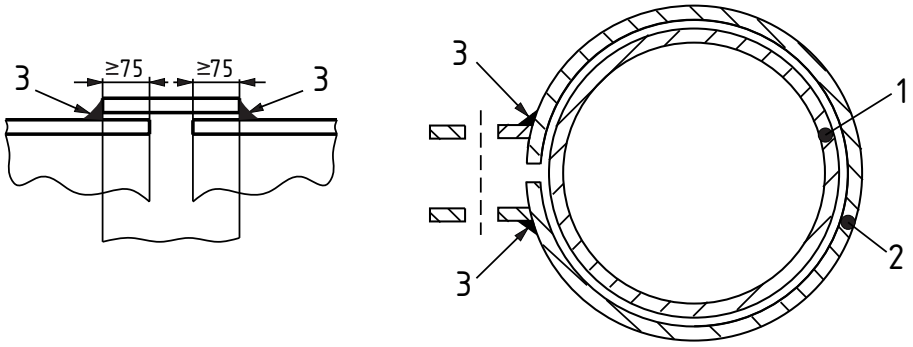
4.3 Welded collars

An example of a welding collar is shown in Figure 2. Welding collars shall be at least equal in thickness to the adjoining components; the length of sleeve shall be not less than 250 mm.

When positioned for welding the collar shall be a good fit on the outside diameter of the components to be joined. To ensure good welding conditions the gap between the collar and the tube shall be not greater than 3 mm.

Welds employed shall be fillet welds of a size appropriate to the thickness of materials being joined and the forces to be transmitted, taking into account the guidelines in EN 1011-2.

NOTE Dimensions are in millimetres.



Key
1. Pipe
2. Collar
3. Weld

Figure 2 — Welding collar

4.4 Flange joints

Flange joints shall have flanges in accordance with EN 1092-1 or EN 1759-1, as appropriate to the design conditions (see Figure 3).

The flange manufacturer or supplier shall obtain information at the time of enquiry and order specifying the type of flanges required.