

Metallide keevitusprotseduuride spetsifitseerimine ja atesteerimine. Keevitusprotseduuri katse. Osa 8: Torude keevitamine torulaudade ühenduste külge

Specification and approval of welding procedures for metallic materials - Welding procedure test - Part 8: Welding of tubes to tube-plate joints

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 15614-8:2002 sisaldab Euroopa standardi EN ISO 15614-8:2002 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 18.09.2002 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 01.04.2002.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN ISO 15614-8:2002 consists of the English text of the European standard EN ISO 15614-8:2002.

This standard is ratified with the order of Estonian Centre for Standardisation dated 18.09.2002 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

Date of Availability of the European standard text 01.04.2002.

The standard is available from Estonian standardisation organisation.

ICS 25.160.10

Standardite reprodutseerimis- ja levitamiseõigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonilisse süsteemi või edastamine ükskõik millises vormis või millisel teel on keelatud ilma Eesti Standardikeskuse poolt antud kirjaliku loata.

Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:
Aru 10 Tallinn 10317 Eesti; www.evs.ee; Telefon: 605 5050; E-post: info@evs.ee

Right to reproduce and distribute Estonian Standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without permission in writing from Estonian Centre for Standardisation.

If you have any questions about standards copyright, please contact Estonian Centre for Standardisation:
Aru str 10 Tallinn 10317 Estonia; www.evs.ee; Phone: +372 605 5050; E-mail: info@evs.ee

ICS 25.160.10

English version

Specification and qualification of welding procedures for metallic materials - Welding procedure test - Part 8: Welding of tubes to tube-plate joints (ISO 15614-8:2002)

Descriptif et qualification d'un mode opératoire de soudage sur les matériaux métalliques - Epreuve de qualification d'un mode opératoire de soudage - Partie 8: Soudage de tubes sur plaques tubulaires (ISO 15614-8:2002)

Anforderung und Qualifizierung von Schweißverfahren für metallische Werkstoffe - Schweißverfahrensprüfung - Teil 8: Einschweißen von Rohren in Rohrböden (ISO 15614-8:2002)

This European Standard was approved by CEN on 20 April 2001.

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 Management Centre 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, 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

Contents

	page
Foreword.....	3
1 Scope	4
2 Normative references	4
3 Terms, definitions and symbols	5
3.1 Terms and definitions.....	5
3.2 Symbols	5
4 Preliminary Welding Procedure Specification (pWPS)	6
4.1 General.....	6
4.2 Items for all welding process.....	6
4.3 Items for particular welding processes	7
5 Qualification of welding procedure.....	8
6 Welding of test pieces	8
6.1 General.....	8
6.2 Type of test piece.....	8
7 Examination and testing	10
7.1 Performance	10
7.2 Acceptance levels.....	12
8 Range of qualification	14
8.1 General.....	14
8.2 Related to the manufacturer	14
8.3 Related to the material	15
8.4 Common to all welding procedures.....	15
9 Welding, Procedure Qualification Record form (WPQR)	16
Annex A (informative) Welding Procedure Qualification Record form for tube to tube-plate joints (WPQR).....	17
Annex ZA (informative) Clauses of this European Standard addressing essential requirements or other provisions of EU directives.....	22
Bibliography	23

Foreword

This document (EN ISO 15614-8:2002) has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DS, in collaboration with Technical Committee ISO/TC 44 "Welding and allied processes".

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 October 2002, and conflicting national standards shall be withdrawn at the latest by October 2002.

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, which is an integral part of this document.

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, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies requirements for the qualification testing of welding procedures for the arc welding of tube to tube-plate joints in metallic materials by manual, partly mechanized, mechanized or automatic processes.

This standard is a part of a series of standards. Details of this series are given in prEN ISO 15607, Annex A.

Qualification by tube to tube-plate joint tests can be used for all joints even if they are fully loaded or only seal welded as required in application standards.

In such cases, one or more special test pieces should be made to simulate the production joint in all essential features, e.g. dimensions, restraint, heat sink effects. The test should be carried out prior to and under the conditions to be used in production.

This standard applies to fusion welding of metallic materials for tube to tube-plate joints with gap. This standard does not apply to tube-sheets with forged end connections with welded tubes (external/internal bore welds). For welding of tube to tube-plate joints without gap welding procedure test should be defined in the specification.

For other applications and/or requirements the standard can be used if required by the specification.

Repair welding should be considered in the welding procedure test.

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 287-2, *Approval testing of welders - Fusion welding - Part 2: Aluminium and aluminium alloys*

EN 439, *Welding consumables – Shielding gases for arc welding and cutting.*

EN 571-1, *Non destructive testing – Penetrant testing – Part 1 : General principles.*

EN 1043-1, *Destructive tests on welds in metallic materials – Hardness testing – Part 1 : Hardness test on arc welded joints.*

EN 1321, *Destructive tests on welds in metallic materials – Macroscopic and microscopic examination of welds.*

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 1435, *Non destructive examination of welds – Radiographic examination of welded joints.*

EN 1708-1, *Welding – Basic weld joint details in steels – Part 1 : Pressurized components.*

EN ISO 4063, *Welding and allied processes – Nomenclature of processes and reference numbers (ISO 4063:1998).*

prEN ISO 9606-1, *Approval testing of welders - Fusion welding - Part 1: Steels (ISO/DIS 9606-1:2000)*

EN ISO 9606-3, *Approval testing of welders – Fusion welding – Part 3: Copper and copper alloys (ISO 9606-3:1999).*

EN ISO 9606-4, *Approval testing of welders – Fusion welding – Part 4: Nickel and nickel alloys (ISO 9606-4:1999).*

EN ISO 9606-5, *Approval testing of welders – Fusion welding – Part 5: Titanium and titanium alloys, zirconium and zirconium alloys (ISO 9606-5:2000).*

prEN ISO 15607:2000, *Specification and qualification of welding procedures for metallic materials – General rules (ISO/DIS 15607:2000).*

CR ISO 15608, *Welding – Guidelines for a metallic material grouping system (ISO/TR 15608:2000).*

prEN ISO 15609-1:2000, *Specification and qualification of welding procedures for metallic materials – Welding procedure specification – Part 1 : Arc welding (ISO/DIS 15609-1:2000).*

prEN ISO 15614-1:2000, *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/DIS 15614-1:2000).*

EN ISO 6520-1, *Welding and allied processes - Classification of geometric imperfections in metallic materials – Part 1: Fusion welding (ISO 6520-1:1998).*

EN 29692, *Metal-arc welding with covered electrode, gas-shielded metal-arc welding and gas welding - Joint preparations for steels (ISO 9692:1992).*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this European standard, the terms and definitions given in prEN ISO 15607:2000 apply.

3.2 Symbols

For the purposes of this standard, the following symbols apply and are shown in Figure 1, 2 and 3:

- a throat thickness (mm) (in this case, the minimal distance between root point and weld surface)
- d_p pore size (mm)
- d_a tube-outside diameter (mm)
- d_l minimum distance between two pipes (mm), see Figure 2
- g gap between tube and tube plate
- s_p starting point of the root run
- t tube-wall thickness (mm)
- t_1 cladding thickness (mm)
- t_2 tube-plate thickness (mm)
- x overlap (mm)