EESTI STANDARD

EVS-EN 1011-7:2004

Welding - Recommendations for welding of metallic materials - Part 7: Electron beam welding

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EESTI STANDARDIKESKUS

EESTI STANDARDI EESSÕNA	NATIONAL FOREWORD
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Käsitlusala: This standard may be used for the electron beam welding (process no. 51 according to EN ISO 4063) of weldable metallic materials according to CR ISO 15608. It does not contain data on permissible stresses on weld seams or on the testing and evaluation of weld seams. Such data can either be seen from the relevant user standards or should be separately agreed between the contracting parties	**Scope:** This standard may be used for the electron beam welding (process no. 51 according to EN ISO 4063) of weldable metallic materials according to CR ISO 15608. It does not contain data on permissible stresses on weld seams or on the testing and evaluation of weld seams. Such data can either be seen from the relevant user standards or should be separately agreed between the contracting parties

ICS 25.160.10

Võtmesõnad: qual, recommendation, specification (approval), specifications, steel welding, steels, storage, suitability, testing conditions, weldability, welded joints, welding, welding engineering, welding filler metals, welding procedure specification, welding processes, welds

Hinnagrupp S

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1011-7

July 2004

ICS 25.160.10

English version

Welding - Recommendations for welding of metallic materials - Part 7: Electron beam welding

Soudage - Recommandations pour le soudage des matériaux métalliques - Partie 7 : Soudage par faisceau d'électrons

Schweißen - Empfehlungen zum Schweißen metallischer Werkstoffe - Teil 7: Elektronenstrahlschweißen

This European Standard was approved by CEN on 30 April 2004.

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Contents

page

Foreword 5
Introduction 6
1 Scope 7
2 Normative references 7
3 Terms and definitions 7
4 Quality requirements 12
5 Storage and handling of parent metals and consumables 12
6 Welding facilities 12
7 Qualification of the welding personnel 13
8 Welding procedure specification 13
9 Welding procedure test 14
10 Joint preparation 14
10.1 Machining 14
10.2 Demagnetisation 14
10.3 Cleaning 14
10.4 Assembly 15
11 Joint design 15
11.1 Longitudinal seams 15
11.2 Circular seams 16
12 Evacuation holes 17
13 Tack welds, cosmetic passes 17
14 Thermal pre- and post heat treatment 18
15 Documentation 18
Annex A (informative) **Information about weldability of metallic materials** 19
A.1 General 19
A.2 Steels and iron alloys 19
A.3 Nickel and nickel alloys 20
A.4 Aluminium and magnesium alloys 20
A.5 Copper and copper alloys 20
A.6 Refractory and reactive metals 21
A.7 Dissimilar metals 21
A.8 Non-metals 21
Annex B (informative) **Information about causes of weld imperfections and prevention** 23
Annex C (informative) **Summary of electron beam weldability of metals with reference to CR ISO 15608:2000 groups** 26
C.1 Grouping system for steels 26
C.2 Grouping system for aluminium and aluminium alloys 30
C.3 Grouping system for copper and copper alloys 31
C.4 Grouping system for nickel and nickel alloys 31
C.5 Grouping system for titanium and titanium alloys 32
C.6 Grouping system for zirconium and zirconium alloys 32
C.7 Grouping system for cast iron 33

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Annex D (informative) **Examples of preparation of circular joints** 34
Bibliography 41

Figures

Figure 1 — Terms of electron beam oscillation 8
Figure 2 — Definition of working distance and focusing distance 9
Figure 3 — Definition for termination of circular seams 10
Figure 4 — Welding with interlayer material 11
Figure 5 — Welding of dissimilar metals with transition material 12
Figure 6 — Example of preparation of surface treated work pieces 14
Figure 7 — Normal square butt weld 15
Figure 8 — Square butt weld with spigot or integral backing 16
Figure 9 — Square butt weld with detached backing 16
Figure 10 — Work piece with run-on and run-off plate for separating the weld start and weld end 16
Figure 11 — Machining-related cavities 17
Figure 12 — Weldment with additional hole for evacuating the cavity 17
Figure A.1 — Sensitivity of hot cracks depending of alloy contents in aluminium 22
Figure D.1 — Various types of radial joints with centring 34
Figure D.2 — Work piece with radial joint, centred using a welding jig 35
Figure D.3 — Work pieces with unsuitable and better positions for radial weld 35
Figure D.4 — Various types of axial joints 36
Figure D.5 — Example of an axial weld with a depth of fusion zone adapted to suit the strength requirement (not welded through the full thickness of the joint) 36
Figure D.6 — Improved joint detail for axial welds with reduced stress concentration 37
Figure D.7 — Deterioration of joint fit-up that occurs when welding axial joints assembled with a clearance fit 37
Figure D.8 — Effect of the method of manufacture on the dimensions of gear wheels 38
Figure D.9 — Example of a gear wheel with an unsuitable located axial joint. The joint is too close to the central bore. 38
Figure D.10 — Better positioned axial joint compared with figure D.9. The joint is further from the central bore and the wall thickness has been adapted to suit the required weld strength 39
Figure D.11 — Better positioned axial joint compared with figure D.9. The slot has been included to accommodate radial shrinkage. 39
Figure D.12 — Example of a difficult to access electron beam weld 39

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Figure D.13 — Relative tendency of axial and radial welds to cause deformation 40

Tables

Table B.1 — Causes of weld imperfections and prevention 23

Table C.1 — Grouping system for steels 27

Table C.2 — Grouping system for aluminium and aluminium alloys 30

Table C.3 — Grouping system for copper and copper alloys 31

Table C.4 — Grouping system for nickel and nickel alloys 31

Table C.5 — Grouping system for titanium and titanium alloys 32

Table C.6 — Grouping system for zirconium and zirconium alloys 32

Table C.7 — Grouping system for cast irons 33

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Foreword

This document (EN 1011-7:2004) has been prepared by Technical Committee CEN/TC 121 “Welding”, the secretariat of which is held by DIN.

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 January 2005, and conflicting national standards shall be withdrawn at the latest by January 2005.

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).

This European Standard is composed of the following parts:

Part 1: General guidance for arc welding

Part 2: Arc welding of ferritic steels

Part 3: Arc welding of stainless steels

Part 4: Arc welding of aluminium and aluminium alloys

Part 5: Welding of clad steel

Part 7: Electron beam welding

Part 8: Welding of cast irons

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.

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Introduction

This document contains special recommendations for the electron beam welding of metallic materials and should be observed in connection with the general recommendations for welding according to EN 1011-1. It includes details on quality requirements, production welding facilities as well as the weldability of some materials and informs about welding procedures.

The special properties of electron beam welding derive from the high power and power density possible in the beam spot, the resulting "deep welding effect" and the unique controllability of the process.

Electron beam welding is recommended for welding metallic materials which require low heat input, low shrinkage, low distortion, and for welding dissimilar or reactive metals. It allows high welding speeds and flexibility of design by joining simple components. The electron beam is able to join very thin and very thick sections and the combination of both. It is also suited to automation and quality control.

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1 Scope

This document may be used for the electron beam welding (process no. 51 according to EN ISO 4063) of weldable metallic materials according to CR ISO 15608. It does not contain data on permissible stresses on weld seams or on the testing and evaluation of weld seams. Such data can either be seen from the relevant application standards or should be separately agreed between the contracting parties.

A requirement for the application of this document is that the recommendations should be used by appropriately trained and experienced personnel.

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 1011-1, *Welding — Recommendations for welding of metallic materials — Part 1: General guidance for arc welding*

EN ISO 13919-1:1996, *Welding — Electron and laser beam welded joints — Guidance on quality levels for imperfections — Part 1: Steel (ISO 13919-1:1996)*

EN ISO 13919-2:2001, *Welding — Electron and laser beam welded joints — Guidance on quality levels for imperfections — Part 2: Aluminium and its weldable alloys (ISO 13919-2:2001)*

EN ISO 14744-1:2000, *Welding — Acceptance inspection of electron beam welding machines — Part 1: Principles and acceptance conditions (ISO 14744-1:2000)*

EN ISO 14744-2, *Welding — Acceptance inspection of electron beam welding machines — Part 2: Measurement of accelerating voltage characteristics (ISO 14744-2:2000)*

EN ISO 14744-3, *Welding — Acceptance inspection of electron beam welding machines — Part 3: Measurement of beam current characteristics (ISO 14744-3:2000)*

EN ISO 14744-4, *Welding — Acceptance inspection of electron beam welding machines — Part 4: Measurement of welding speed (ISO 14744-4:2000)*

EN ISO 14744-5, *Welding — Acceptance inspection of electron beam welding machines — Part 5: Measurement of run-out accuracy (ISO 14744-5:2000)*

EN ISO 14744-6, *Welding — Acceptance inspection of electron beam welding machines — Part 6: Measurement of stability of spot position (ISO 14744-6:2000)*

EN ISO 15614-11:2002, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 11: Electron and laser beam welding (ISO 15614-11:2002)*

EN ISO 15609-3:2004, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 3: Electron beam welding (ISO 15609-3:2004)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 15609-3:2004, EN ISO 13919-1:1996, EN ISO 13919-2:2003, EN ISO 14744-1:2000, and EN ISO 15614-11:2002 and the following apply.