

English version

**Specification and qualification of welding procedures for metallic materials - Qualification based on tested welding consumables (ISO 15610:2003)**

Descriptif et qualification d'un mode opératoire de soudage pour les matériaux métalliques - Qualification basée sur des produits consommables soumis à essais (ISO 15610:2003)

Anforderung und Qualifizierung von Schweißverfahren für metallische Werkstoffe - Qualifizierung aufgrund des Einsatzes von geprüften Schweißzusätzen (ISO 15610:2003)

This European Standard was approved by CEN on 7 May 2003.

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## Foreword

This document (EN ISO 15610:2003) has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DS, in collaboration with ISO/TC 44 "Welding and allied processes".

This European Standard EN ISO 15610:2003 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2004, and conflicting national standards shall be withdrawn at the latest by May 2004.

This document supersedes EN 288-5:1994.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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

## Introduction

In EN ISO 15607, one of the methods of welding procedure qualification is based on tested welding consumables.

### 1 Scope

This European Standard is a part of a series of standards, details of this series are given in EN ISO 15607:2003, annex A.

This standard gives the necessary information to explain the requirements referenced in EN ISO 15607:2003 about the qualification of welding procedures based on tested consumables.

In addition, it gives the range of qualification.

This European Standard applies to arc and gas welding in accordance with Table 1.

**Table 1 — Applicable welding processes**

Process number according to EN ISO 4063	Welding process	Process applicable for alloys based on steel	Process applicable for alloys based on aluminium
111	Manual metal arc welding (metal arc welding with covered electrode)	X	-
114	Self-shielded tubular-cored arc welding	X	-
131	Metal inert gas welding ; MIG welding	X	X
135	Metal active gas welding ; MAG welding	X	-
136	Tubular cored metal arc welding with active gas shield	X	-
137	Tubular cored metal arc welding with inert gas shield	X	-
141	Tungsten inert gas welding ; TIG welding	X	X
15	Plasma arc welding	X	X
3	Gas welding	X	-

NOTE X indicates the process for which EN ISO 15610 is applicable and - indicates the process for which the standard is not applicable.

Other fusion welding processes may be accepted if specified.

This standard is limited to application to parent metals which produce acceptable micro structures and properties in the heat affected zone which do not deteriorate significantly in service.

This standard is not applicable where requirements for hardness or impact properties, preheating, controlled heat input, interpass temperature and post-weld heat-treatment are specified for the welded joint.

The use of this standard may also be restricted by an application standard or a specification.

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

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

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

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

EN ISO 15609-2, *Specification and qualification of welding procedures for metallic materials - Welding procedure specification - Part 2: Gas welding (ISO 15609-2:2001)*.

## 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 15607:2003 apply.

## 4 Preliminary welding procedure specifications (pWPS)

The qualification of a welding procedure based on tested welding consumables shall be based on a pWPS according to prEN ISO 15609-1 or EN ISO 15609-2. This pWPS shall specify the range for all the relevant parameters.

## 5 Qualification of the welding procedure

The essential items for the qualification are:

- specifications of parent metal(s) to be used;
- welding conditions specified by the manufacturer of the tested welding consumables as shown in the manufacturer's published literature;
- a specific pWPS to be selected according to prEN ISO 15609-1 or EN ISO 15609-2 and suitable for the application.

## 6 Range of qualification

### 6.1 General

All the conditions of qualification stated below shall be met independently of each other.

## EN ISO 15610:2003 (E)

Changes outside of the ranges of qualification shall require another welding procedure qualification.

### 6.2 Related to the welded joint

#### 6.2.1 Parent material

This standard is applicable for limited groups of materials defined in Table 2.

**Table 2 — Applicable groups of materials**

CR ISO 15608 Steel	CR ISO 15608 aluminium and its alloys
1.1	21
8.1	22.1
	22.2

Joints between dissimilar material groups are not permitted, except for joints between group 22.1 and group 22.2.

#### 6.2.2 Parent material thickness

This standard is applicable to thicknesses  $3 \text{ mm} \leq t \leq 40 \text{ mm}$ .

#### 6.2.3 Fillet weld throat thickness

This standard is applicable to  $a \geq 3 \text{ mm}$ .

#### 6.2.4 Diameter of pipes

This standard is applicable to pipe diameter  $D > 25 \text{ mm}$ .

### 6.3 Common to all welding processes

#### 6.3.1 Multi-process

Multi-process procedures are permitted providing tested consumables are used throughout the weld.

#### 6.3.2 Welding positions

The welding position is restricted to the positions identified in the manufacturer's literature.

#### 6.3.3 Welding consumables

The qualification is restricted to the manufacturer and trade name of the welding consumables selected.

#### 6.3.4 Type of current

The type of current and polarity are limited to those identified in the manufacturer's literature.

### 6.4 Specific to each welding process

#### 6.4.1 Processes 131, 135, 136 and 137

The shielding gas (face and/or back) is limited to those identified in the manufacturer's literature.

The qualification is restricted to the single-wire welding.

#### **6.4.2 Process 141 and 15**

The shielding gas (face and/or back) is limited to those identified in the manufacturer's literature.

### **7 Validity**

The welding procedure may be used as long as the welding conditions recommended by the consumables manufacturer are met.

### **8 Welding Procedure Qualification Record (WPQR)**

The WPQR shall consist of copies of relevant manufacturer's literature supporting the welding conditions given in the pWPS and an indication of the filler metal standard to which the filler metal was tested, if any. The relevant items listed for the WPS in the relevant part of prEN ISO 15609 shall be included. If the pWPS is consistent with the manufacturer's literature, the WPQR shall be signed and dated by the examiner or examining body.

## Bibliography

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

ISO 14175, *Welding consumables – Shielding gases for arc welding and cutting.*