SVENSK STANDARD
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Tillsatsmaterial för svetsning – Rörelektroder för gasmetallbågsvetsning av varmhållfasta stål – Indelning (ISO 17634:2015)

Welding consumables – Tubular cored electrodes for gas shielded metal arc welding of creep-resisting steels – Classification (ISO 17634:2015)

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Europastandarden EN ISO 17634:2015 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 17634:2015.

Denna standard ersätter SS-EN ISO 17634:2006, utgåva 1.

The European Standard EN ISO 17634:2015 has the status of a Swedish Standard. This document contains the official English version of EN ISO 17634:2015.

This standard supersedes the Swedish Standard SS-EN ISO 17634:2006, edition 1.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

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Denna standard är framtagen av kommittén för Tillsatsmaterial för svetsning, SIS/TK 134/AG 443.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 17634

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Supersedes EN ISO 17634:2006

English Version

Welding consumables - Tubular cored electrodes for gas shielded metal arc welding of creep-resisting steels - Classification (ISO 17634:2015)

Produits consommables pour le soudage - Fils-électrodes fourrés pour le soudage à l'arc avec gaz de protection des aciers résistant au fluage - Classification (ISO 17634:2015)

Schweißzusätze - Fülldrahtelektroden zum Metall-Schutzgasschweißen von warmfesten Stählen - Einteilung (ISO 17634:2015)

This European Standard was approved by CEN on 11 August 2015.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (EN ISO 17634:2015) has been prepared by Technical Committee ISO/TC 44 "Welding and allied processes" in collaboration with Technical Committee CEN/TC 121 “Welding and allied processes” 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 February 2016, and conflicting national standards shall be withdrawn at the latest by February 2016.

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.

This document supersedes EN ISO 17634:2006.

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, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 17634:2015 has been approved by CEN as EN ISO 17634:2015 without any modification.

Introduction

This International Standard provides a classification system for tubular cored electrodes in terms of chemical composition of the all-weld metal, type of electrode core, type of shielding gas, and welding position or in terms of the tensile properties, chemical composition of the all-weld metal, usability characteristics of the electrodes, shielding gas, and welding position. The ratio of proof to tensile strength of weld metal is generally higher than that of parent metal. Matching weld metal proof strength to parent metal proof strength will not necessarily ensure that the weld metal tensile strength matches that of the parent metal. Where the application requires matching tensile strength, therefore, selection of consumables is made by reference to column 4 of Table 2.

Of note is that the mechanical properties of all-weld metal test specimens used to classify the tubular cored electrodes will vary from those obtained in production joints because of differences in welding procedure such as electrode size, width of weave, welding position, and parent metal composition.

The classification according to system A is mainly based on EN 12071:1999. The classification according to system B is mainly based upon standards used around the Pacific Rim.

Welding consumables — Tubular cored electrodes for gas shielded metal arc welding of creep-resisting steels — Classification

1 Scope

This International Standard specifies requirements for classification of tubular cored electrodes used in the post-weld heat-treated condition for gas shielded metal arc welding of creep-resisting and low alloy elevated temperature steels. One tubular cored electrode can be tested and classified with different shielding gases.

This International Standard is a combined specification providing for classification utilizing a system based upon the chemical composition of all-weld metal or utilizing a system based upon the tensile strength and the chemical composition of all-weld metal.

1) Paragraphs and tables which carry the suffix letter "A" are applicable only to tubular cored electrodes classified to the system based upon chemical composition with requirements for the yield strength and the average impact energy of 47 J of all-weld metal in accordance with this International Standard.

2) Paragraphs and tables which carry the suffix letter "B" are applicable only to tubular cored electrodes classified to the system based upon the tensile strength and chemical composition of all-weld metal in accordance with this International Standard.

3) Paragraphs and tables which have neither the suffix letter "A" nor the suffix letter "B" are applicable to all tubular cored electrodes classified in accordance with this International Standard.

It is recognized that the operating characteristics of tubular cored electrodes can be modified by the use of pulsed current, but for the purposes of this International Standard, pulsed current is not used for determining the electrode classification.

2 Normative references

The following referenced documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 544, *Welding consumables — Technical delivery conditions for filler materials and fluxes — Type of product, dimensions, tolerances and markings*

ISO 3690, *Welding and allied processes — Determination of hydrogen content in arc weld metal*

ISO 6947, *Welding and allied processes — Welding positions*

ISO 14175, *Welding consumables — Gases and gas mixtures for fusion welding and allied processes*

ISO 14344, *Welding consumables — Procurement of filler materials and fluxes*

ISO 15792-1:2000/Amd 1:2011, *Welding Consumables — Test methods — Part 1: Test methods for all-weld metal test specimens in steel, nickel and nickel alloys*

ISO 15792-3, *Welding consumables — Test methods — Part 3: Classification testing of positional capacity and root penetration of welding consumables in a fillet weld*

ISO 80000-1:2009, *Quantities and units — Part 1: General*

3 Classification

Classification designations are based upon two approaches to indicate the chemical composition, the tensile properties, and the impact properties of the all-weld metal obtained with a given electrode. The two designation approaches include additional designators for some other classification requirements, but not all as will be clear from the following sections. In most cases, a given commercial product can be classified in both systems. Then, either or both classification designations can be used for the product.

The classification includes all-weld metal properties obtained with a tubular cored electrode and appropriate shielding gas combination as given below. With the exception of the symbol for welding position which is based on ISO 15792-3, the classification is based on the tubular cored electrode size 1,2 mm or if this is not manufactured, the next larger diameter manufactured.

3.1A Classification by chemical composition

The classification is divided into six parts:

1) The first part (T) indicates a tubular cored electrode.

2) The second part gives a symbol indicating the chemical composition of all-weld metal (see Table 1).

3) The third part gives a symbol indicating the type of electrode core (see Table 3A).

4) The fourth part gives a symbol indicating the shielding gas (see 4.5).

5) The fifth part gives a symbol indicating the welding position (see Table 4A).

6) The sixth part gives a symbol indicating the hydrogen content of deposited metal (see Table 5).

3.1B Classification by tensile strength and chemical composition

The classification is divided into seven parts:

1) The first part (T) indicates a tubular cored electrode.

2) The second part gives a symbol indicating the strength and elongation of all-weld metal in the post-weld heat-treated condition (see Table 2).

3) The third part gives a symbol indicating the usability characteristics of the electrode. (see Table 3B);

4) The fourth part gives a symbol indicating the welding position (see Table 4B).

5) The fifth part gives a symbol indicating the shielding gas (see 4.5).

6) The sixth part gives a symbol indicating the chemical composition of all-weld metal (see Table 1);

7) The seventh part gives a symbol indicating the hydrogen content of deposited metal (see Table 5).

In both systems, the electrode classification shall include all compulsory sections and may include an optional section as outlined below.

3.2A Compulsory and optional section in the classification by chemical composition

a) Compulsory section

This section includes the symbols for the type of product, the chemical composition, the type of electrode core, and the shielding gas, i.e. the symbols defined in 4.1, 4.2, 4.4A, and 4.5.

b) Optional section

This section includes the symbols for the welding positions for which the electrode is suitable and the symbol for hydrogen content, i.e. the symbols defined in 4.6 and 4.7.

3.2B Compulsory and optional section in the classification by tensile strength and chemical composition

a) Compulsory section

This section includes the symbols for the type of product, the strength, and elongation in the post-weld heat-treated condition, the welding positions for which the electrode is suitable, the usability characteristics, the shielding gas, the impact properties, and the chemical composition, i.e. the symbols defined in 4.1, 4.2, 4.3B, 4.4B, 4.5, and 4.6.

b) Optional section

This section includes the symbol for hydrogen content, i.e. the symbol defined in 4.7.

The full designation shall comprise the compulsory symbols and may include optional symbols chosen by the manufacturer. The full designation (see Clause 10) shall be used on packages and in the manufacturer's literature and data sheets.

4 Symbols and requirements

4.1 Symbol for the product/process

The symbol for the tubular cored electrode used in the gas shielded metal arc welding process is the letter T.

4.2 Symbol for the chemical composition of all-weld metal

The symbol in Table 1 indicates the chemical composition of all-weld metal determined in accordance with Clause 6.

4.3 Symbol for the mechanical properties of all-weld metal

4.3A Classification by chemical composition

No symbol shall be used for the mechanical properties of the all-weld metal. The all-weld metal obtained with the tubular cored electrodes in Table 1 under conditions given in Clause 5 shall also fulfil the mechanical property requirements specified in Table 2.

4.3B Classification by tensile strength and chemical composition

The symbol for tensile strength shall be the following:

— 49 for 490 MPa to 660 MPa tensile strength;

— 55 for 550 MPa to 690 MPa tensile strength;

— 62 for 620 MPa to 760 MPa tensile strength;

— 69 for 690 MPa to 830 MPa tensile strength.

The complete mechanical property requirements that shall be fulfilled by the various compositions are specified in Table 2.