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Tillsatsmaterial för svetsning – Belagda elektroder för manuell metallbågsvetsning av höghållfasta stål – Indelning (ISO 18275:2018)

Welding consumables – Covered electrodes for manual metal arc welding of high-strength steels – Classification (ISO 18275:2018)

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Europastandarden EN ISO 18275:2018 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 18275:2018.

Denna standard ersätter SS-EN ISO 18275:2012, utgåva 1

The European Standard EN ISO 18275:2018 has the status of a Swedish Standard. This document contains the official version of EN ISO 18275:2018.

This standard supersedes the SS-EN ISO 18275:2012, edition 1

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

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för AGS 443 Tillsatsmaterial för svetsning, SIS/TK 134/AG 03.

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 18275

September 2018

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Supersedes EN ISO 18275:2012

English Version

Welding consumables - Covered electrodes for manual metal arc welding of high-strength steels - Classification (ISO 18275:2018)

Produits consommables pour le soudage - Électrodes enrobées pour le soudage manuel à l'arc des aciers à haute résistance - Classification (ISO 18275:2018)

Schweißzusätze - Umhüllte Stabelektroden zum Lichtbogenhandschweißen von hochfesten Stählen - Einteilung (ISO 18275:2018)

This European Standard was approved by CEN on 20 September 2018.

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

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European foreword

This document (EN ISO 18275:2018) 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 March 2019, and conflicting national standards shall be withdrawn at the latest by March 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 18275:2012.

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, 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 18275:2018 has been approved by CEN as EN ISO 18275:2018 without any modification.

Introduction

This document recognizes that there are two somewhat different approaches in the global market to classifying a given electrode, and allows for either or both to be used, to suit a particular market need. Application of either type of classification designation (or of both, where suitable) identifies a product as classified in accordance with this document. The classification in accordance with system A was originally based on EN 757:1997. The classification in accordance with system B is mainly based on standards used around the Pacific Rim.

This document provides a classification system for covered electrodes for high-strength steels in terms of the tensile properties, impact properties and chemical composition of the all-weld metal, as well as the type of electrode covering. The ratio of yield strength to tensile strength of weld metal is generally higher than that of parent metal. Users should note that matching weld metal yield strength to parent metal yield strength does not necessarily ensure that the weld metal tensile strength matches that of the parent metal. Therefore, where the application requires matching tensile strength, selection of the consumable should be made by reference to column 3 of Table 1A or column 2 of Table 8B.

It should be noted that the mechanical properties of all-weld metal test specimens used to classify covered electrodes can 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.

Welding consumables — Covered electrodes for manual metal arc welding of high-strength steels — Classification

1 Scope

This document specifies requirements for classification of covered electrodes and deposited metal in the as-welded condition and in the post-weld heat-treated condition for manual metal arc welding of high-strength steels with a minimum yield strength greater than 500 MPa or a minimum tensile strength greater than 570 MPa.

This document is a combined specification providing a classification utilizing a system based on the yield strength and an average impact energy of 47 J of the all-weld metal, or utilizing a system based on the tensile strength and an average impact energy of 27 J of the all-weld metal.

a) Subclauses and tables which carry the suffix letter "A" are applicable only to covered electrodes classified under the system based on the yield strength and an average impact energy of 47 J of the all-weld metal given in this document.

b) Subclauses and tables which carry the suffix letter "B" are applicable only to covered electrodes classified under the system based on the tensile strength and an average impact energy of 27 J of the all-weld metal given in this document.

c) Subclauses and tables which do not have either the suffix letter "A" or the suffix letter "B" are applicable to all covered electrodes classified under this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

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

ISO 2401, *Covered electrodes — Determination of the efficiency, metal recovery and deposition coefficient*

ISO 2560:2009, *Welding consumables — Covered electrodes for manual metal arc welding of non-alloy and fine grain steels — Classification*

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

ISO 6847, *Welding consumables — Deposition of a weld metal pad for chemical analysis*

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

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

ISO 15792-1, *Welding consumables — Test methods — Part 1: Test methods for all-weld metal test specimens in steel, nickel and nickel alloys*

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

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Classification

4.1 General

Classification designations are based on two approaches to indicate 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 subclauses. 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 is based on an electrode diameter of 4,0 mm.

Classification is as follows:

4.1A Classification by yield strength and 47 J impact energy

The classification is divided into nine parts:

1) the first part gives a symbol indicating the product/process to be identified;

2) the second part gives a symbol indicating the strength and elongation of the all-weld metal (see Table 1A);

3) the third part gives a symbol indicating the impact properties of the all-weld metal (see Table 2A);

4) the fourth part gives a symbol indicating the chemical composition of the all-weld metal (see Table 3A);

5) the fifth part gives a symbol indicating the type of electrode covering (see 5.5A);

6) the sixth part gives a symbol indicating post-weld heat treatment if this is applied (see 5.6A);

7) the seventh part gives a symbol indicating the nominal electrode efficiency and type of current (see Table 5A);

8) the eighth part gives a symbol indicating the welding position (see Table 6A);

9) the ninth part gives a symbol indicating the diffusible hydrogen content of the deposited metal (see Table 7).

4.1B Classification by tensile strength and 27 J impact energy

The classification is divided into seven parts:

1) the first part gives a symbol indicating the product/process to be identified;

2) the second part gives a symbol indicating the strength of the all-weld metal (see Table 1B);

3) the third part gives a symbol indicating the type of electrode covering, the type of current, and the welding position (see Table 4B);

4) the fourth part gives a symbol indicating the chemical composition of the all-weld metal (see Table 3B);

5) the fifth part gives a symbol indicating the condition of the post-weld heat treatment under which the all-weld metal test was conducted (see 5.6B);

6) the sixth part gives a symbol indicating that the electrode has satisfied a requirement for 47 J impact energy at the temperature normally used for the 27 J requirement;

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

In both systems, the electrode classification shall include all compulsory sections and may include optional sections as outlined in 4.2A and 4.2B.

4.2 Compulsory and optional sections

4.2A Classification by yield strength and 47 J impact energy

a) Compulsory section

This section includes the symbols for the type of product, the strength and elongation, the impact properties, the chemical composition and the type of covering, i.e. the symbols defined in 5.1, 5.2A, 5.3A, 5.4A and 5.5A.

b) Optional section

This section includes the symbols for post-weld heat treatment, the weld metal recovery, the type of current, the welding positions for which the electrode is suitable, and the symbol for diffusible hydrogen content, i.e. the symbols defined in 5.6A, 5.7A, 5.8A and 5.9.

4.2B Classification by tensile strength and 27 J impact energy

a) Compulsory section

This section includes the symbols for the type of product, the strength, the type of covering (which includes the type of current and the welding position), the chemical composition and the condition of heat treatment, i.e. the symbols defined in 5.1, 5.2B, 5.4B, 5.5B and 5.6B.

b) Optional section

This section includes the symbol for the optional supplemental designator for 47 J impact energy, i.e. the symbol defined in 5.3B, and the symbol for the diffusible hydrogen content, i.e. the symbol defined in 5.9.

The designation (see Clause 11) shall be used on packages and in the manufacturer's literature and data sheets. Figure A.1 gives a schematic representation of the designation of electrodes classified by yield strength and 47 J impact energy (system A). Figure A.2 gives a schematic representation of the designation of electrodes classified by tensile strength and 27 J impact energy (system B).

5 Symbols and requirements

5.1 Symbol for the product/process

The symbol for the covered electrode used in the manual metal arc process shall be the letter E.

5.2 Symbol for tensile properties of all-weld metal

5.2A Classification by yield strength and 47 J impact energy

The symbols in Table 1A indicate the yield strength, tensile strength and elongation of the all-weld metal in the as-welded condition or, if a T is added to the designation, after post-weld heat treatment as described in 5.6, determined in accordance with Clause 6.

5.2B Classification by tensile strength and 27 J impact energy

The symbols in Table 1B indicate the tensile strength of the all-weld metal in the as-welded condition, in the post-weld heat-treated condition, or in both conditions, determined in accordance with Clause 6. The yield strength and elongation requirements depend on the specific chemical composition, heat treatment condition and covering type, as well as on the tensile strength requirements, as given for the complete classification in Table 8B.

NOTE Post-weld heat treatment (sometimes referred to as stress relief heat treatment) can alter the mechanical properties of the weld from those obtained in the as-welded condition.