BS EN ISO 18276:2017

BSI Standards Publication

Welding consumables — Tubular cored electrodes for gas-shielded and non-gas-shielded metal arc welding of high strength steels — Classification

bsi.

National foreword

This British Standard is the UK implementation of EN ISO 18276:2017. It is identical to ISO 18276:2017. It supersedes BS EN ISO 18276:2006, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee WEE/39, Welding consumables.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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EUROPEAN STANDARD

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English Version

Welding consumables - Tubular cored electrodes for gas-shielded and non-gas-shielded metal arc welding of high strength steels - Classification (ISO 18276:2017)

Produits consommables pour le soudage - Fils-électrodes fourrés pour le soudage à l'arc avec ou sans gaz de protection des aciers à haute résistance - Classification (ISO 18276:2017)

Schweißzusätze - Fülldrahtelektroden zum Metall-Lichtbogenschweißen mit und ohne Schutzgas von hochfesten Stählen - Einteilung (ISO 18276:2017)

This European Standard was approved by CEN on 29 March 2017.

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

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

European foreword

This document (EN ISO 18276:2017) 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of an identical text or by endorsement, at the latest by October 2017, and conflicting national standards shall be withdrawn at the latest by October 2017.

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 18276:2006.

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

Endorsement notice

The text of ISO 18276:2017 has been approved by CEN as EN ISO 18276:2017 without any modification.

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 3, *Welding consumables*.

This second edition cancels and replaces the first edition (ISO 18276:2005), which has been technically revised with the following changes:

— content has been aligned with ISO 17632:2015 and ISO 17634:2015;

— shielding gas designations have been updated;

— Table 3B has been extensively revised to align with existing Pacific Rim designations;

— new designations have been added to Table 3B;

— the T4 designator has been deleted from Table 4B;

— heat input ranges given in Table 8B have been modified to match current Pacific Rim values;

— fillet weld tests have been removed;

— an example using the Z designation has been added to Clause 11A.

Requests for official interpretations of any aspect of this document should be directed to the Secretariat of ISO/TC 44/SC 3 via your national standards body. A complete listing of these bodies can be found at www.iso.org.

Introduction

This document proposes a classification system for tubular cored electrodes in terms of the tensile properties, impact properties, chemical composition of the all-weld metal, type of electrode core, shielding gas and welding position. The ratio of yield strength to tensile strength of the weld metal is generally higher than that of the parent metal. Note that matching weld metal yield strength to parent metal yield 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 the consumable should be made by reference to column 3 of Table 1A or Table 1B.

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

The classification in accordance with system A is mainly based on EN 12535[1]. The classification in accordance with system B is mainly based upon standards used around the Pacific Rim.

INTERNATIONAL STANDARD **ISO 18276:2017(E)**

Welding consumables — Tubular cored electrodes for gas-shielded and non-gas-shielded metal arc welding of high strength steels — Classification

1 Scope

This document specifies the requirements for classification of tubular cored electrodes with or without a gas shield for metal arc welding of high-strength steels in the as-welded condition or in the post-weld heat-treated condition with a minimum yield strength higher than 550 MPa or a minimum tensile strength higher than 590 MPa. One tubular cored electrode can be tested and classified with different shielding gases, if used with more than one.

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

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

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

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

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 document, pulsed current is not used for determining the electrode classification.

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 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 6947:2011, *Welding and allied processes — Welding positions*

ISO 13916, *Welding — Guidance on the measurement of preheating temperature, interpass temperature and preheat maintenance temperature*

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