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Welding consumables - Covered electrodes for manual metal arc welding of creep-resisting steels - Classification (ISO 3580:2017)

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 12/17

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN ISO 3580**

May 2017

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Supersedes EN ISO 3580:2011

English Version

**Welding consumables - Covered electrodes for manual  
metal arc welding of creep-resisting steels - Classification  
(ISO 3580:2017)**

Produits consommables pour le soudage - Électrodes  
enrobées pour le soudage manuel à l'arc des aciers  
résistant au fluage - Classification (ISO 3580:2017)

Schweißzusätze - Umhüllte Stabelektroden zum  
Lichtbogenhandschweißen von warmfesten Stählen -  
Einteilung (ISO 3580:2017)

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

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## European foreword

This document (EN ISO 3580:2017) 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of an identical text or by endorsement, at the latest by November 2017, and conflicting national standards shall be withdrawn at the latest by November 2017.

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## Endorsement notice

The text of ISO 3580:2017 has been approved by CEN as EN ISO 3580:2017 without any modification.

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## **Welding consumables — Covered electrodes for manual metal arc welding of creep-resisting steels — Classification**

*Produits consommables pour le soudage — Électrodes enrobées  
pour le soudage manuel à l'arc des aciers résistant au fluage —  
Classification*



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## 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](http://www.iso.org/directives)).

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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](http://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 fourth edition cancels and replaces the third edition (ISO 3580:2010), which has been technically revised with the following changes:

- the normative references have been updated;
- new classifications from the USA and Japan have been added in system B;
- revisions/corrections of chemical compositions and other values have been made in the tables;
- Footnote d) to [Table 1](#) has been revised to clarify that elements intentionally added that do not have values listed (including Co and B) are to be reported;
- the descriptions in [Table 3](#) have been revised;
- the range for nominal electrode efficiency for symbol 4 in [Table 4](#) has been corrected.

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](http://www.iso.org).



## Introduction

This document proposes a method for classification of covered electrodes, in terms of chemical composition of the all-weld metal (system A) and in terms of tensile strength and chemical composition (system B).

The mechanical properties of all-weld metal test specimens used to classify the electrodes vary from those obtained in production joints because of differences in welding procedure such as electrode diameter, width of weave, welding position and material composition.

The classification according to system A is mainly based on EN 1599<sup>[1]</sup>. The classification according to system B is mainly based upon standards used around the Pacific Rim.



# Welding consumables — Covered electrodes for manual metal arc welding of creep-resisting steels — Classification

## 1 Scope

This document specifies requirements for classification of covered electrodes, based on the all-weld metal in the heat-treated condition, for manual metal arc welding of ferritic and martensitic creep-resisting and low alloy elevated temperature steels.

This document is a combined specification for classification utilizing a system based upon the chemical composition of the all-weld metal, with requirements for the yield strength and impact energy of the all-weld metal, or utilizing a system based upon the tensile strength and the chemical composition of the all-weld metal.

- a) Paragraphs and tables which carry the suffix letter “A” are applicable only to electrodes classified to the system based upon chemical composition, with requirements for the yield strength and impact energy of the all-weld metal under this document.
- b) Paragraphs and tables which carry the suffix letter “B” are applicable only to electrodes classified to the system based upon the tensile strength and the chemical composition of all-weld metal under this document.
- c) Paragraphs 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.

For comparison purposes, some tables include requirements for electrodes classified according to both systems, placing individual electrodes from the two systems, which are similar in composition and properties, on adjacent lines in the particular table. In a particular line of the table that is mandatory in one system, the symbol for the similar electrode from the other system is indicated in parentheses. By appropriate restriction of the formulation of a particular electrode, it is often, but not always, possible to produce an electrode that can be classified in both systems, in which case the electrode, and/or its packaging, can be marked with the classification in either or both systems.

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

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

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*. Corrected by ISO 80000-1:2009/Cor 1:2011

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