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Standards

Irish Standard  
I.S. EN ISO 24598:2012

# Welding consumables - Solid wire electrodes, tubular cored electrodes and electrode-flux combinations for submerged arc welding of creep-resisting steels - Classification (ISO 24598:2012)

## I.S. EN ISO 24598:2012

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*This document replaces:*  
EN ISO 24598:2007

*This document is based on:*  
EN ISO 24598:2012

*Published:*  
14 May, 2012

This document was published  
under the authority of the NSAI  
and comes into effect on:  
14 May, 2012

**ICS number:**  
25.160.20

**NSAI**  
1 Swift Square,  
Northwood, Santry  
Dublin 9

T +353 1 807 3800  
F +353 1 807 3838  
E standards@nsai.ie  
W NSAI.ie

**Sales:**  
T +353 1 857 6730  
F +353 1 857 6729  
W standards.ie

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I.S. EN ISO 24598:2012

EUROPEAN STANDARD

**EN ISO 24598**

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2012

ICS 25.160.20

Supersedes EN ISO 24598:2007

English Version

**Welding consumables - Solid wire electrodes, tubular cored  
electrodes and electrode-flux combinations for submerged arc  
welding of creep-resisting steels - Classification (ISO  
24598:2012)**

Produits consommables pour le soudage - Fils-électrodes  
pleins, fils-électrodes fourrés et couples électrodes-flux  
pour le soudage à l'arc sous flux des aciers résistant au  
fluage - Classification (ISO 24598:2012)

Schweißzusätze - Drahtelektroden, Fülldrahtelektroden und  
Draht-Pulver-Kombinationen für das Unterpulverschweißen  
von warmfesten Stählen - Einteilung (ISO 24598:2012)

This European Standard was approved by CEN on 13 April 2012.

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## **Foreword**

This document (EN ISO 24598:2012) has been prepared by Technical Committee ISO/TC 44 "Welding and allied processes" in collaboration with Technical Committee CEN/TC 121 "Welding" 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of an identical text or by endorsement, at the latest by November 2012, and conflicting national standards shall be withdrawn at the latest by November 2012.

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 24598:2007.

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, 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 24598:2012 has been approved by CEN as a EN ISO 24598:2012 without any modification.

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I.S. EN ISO 24598:2012  
**INTERNATIONAL  
STANDARD**

**ISO  
24598**

Second edition  
2012-05-01

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**Welding consumables — Solid wire  
electrodes, tubular cored electrodes and  
electrode-flux combinations for  
submerged arc welding of creep-resisting  
steels — Classification**

*Produits consommables pour le soudage — Fils-électrodes pleins, fils-  
électrodes fourrés et couples électrodes-flux pour le soudage à l'arc  
sous flux des aciers résistant au fluage — Classification*



Reference number  
ISO 24598:2012(E)

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Tel. + 41 22 749 01 11  
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Published in Switzerland



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 24598 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 24598:2007), which has been technically revised.

The main changes compared to the previous edition are:

- a) the composition of 9C1MV is modified on the B side of Table 3 (former Table 4) and Table 4 (former Table 5);
- b) different test pieces in accordance with ISO 15792-1 are specified for side A and B in Clauses 5A and 5B, respectively.

Requests for official interpretations of any aspect of this International Standard 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 International Standard recognizes that there are two somewhat different approaches in the global market to classifying a given wire electrode, tubular cored electrode or electrode/flux combination, 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 International Standard. The classification in accordance with system A is mainly based on EN 12070:1999<sup>[2]</sup>. The classification in accordance with system B is mainly based upon standards used around the Pacific Rim.

This International Standard provides a classification system for solid wire electrodes in terms of their chemical composition, solid wire electrodes and tubular cored electrodes in terms of the deposit composition obtained with a particular submerged arc flux and, where required, electrode-flux combinations in terms of the yield strength, tensile strength and elongation of the all-weld metal deposit. The ratio of yield 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 material. 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, as appropriate.

Although combinations of wire electrodes and fluxes supplied by individual companies can have the same classification, the individual wire electrodes and fluxes from different companies are not interchangeable unless verified in accordance with this International Standard.

It should be noted that the mechanical properties of all-weld metal test pieces used to classify the wire electrodes vary from those obtained in production joints because of differences in welding procedure, such as electrode size, welding position and material composition.

**I.S. EN ISO 24598:2012**

# Welding consumables — Solid wire electrodes, tubular cored electrodes and electrode-flux combinations for submerged arc welding of creep-resisting steels — Classification

## 1 Scope

This International Standard specifies requirements for classification of solid wire electrodes, tubular cored electrodes and electrode/flux combinations (all-weld metal deposits) for submerged arc welding of creep resisting and low-alloy elevated-temperature steels. One electrode can be tested and classified with different fluxes. The solid wire electrode is also classified separately based on its chemical composition.

This International Standard is a combined specification providing for classification utilizing a system based upon the chemical composition of the solid wire electrode and all-weld metal deposit, or utilizing a system based upon the tensile strength of the all-weld metal deposit and the chemical composition of the solid wire electrode and all-weld metal deposit obtained with the electrode/flux combination.

- a) Clauses, subclauses and tables which carry the suffix letter “A” are applicable only to solid wire electrodes, tubular cored electrodes and all-weld metal deposits classified in accordance with the system based upon chemical composition.
- b) Clauses, subclauses and tables which carry the suffix letter “B” are applicable only to solid wire electrodes, tubular cored electrodes and all-weld metal deposits classified in accordance with the system based upon the tensile strength of all-weld metal deposits and the chemical composition of solid wire electrodes and all-weld metal deposits.
- c) Clauses, subclauses and tables which do not have either the suffix letter “A” or the suffix letter “B” are applicable to all solid wire electrodes, tubular cored electrodes and electrode/flux combinations classified under this International Standard.

## 2 Normative references

The following referenced documents are indispensable for the application 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 6847, *Welding consumables — Deposition of a weld metal pad for chemical analysis*

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

ISO 14174, *Welding consumables — Fluxes for submerged arc welding and electroslag welding — Classification*

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

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