BS EN ISO 14174:2019

BSI Standards Publication

# Welding consumables – Fluxes for submerged arc welding and electroslag welding – Classification (ISO 14174:2019)

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# National foreword

This British Standard is the UK implementation of EN ISO 14174:2019. It supersedes BS EN ISO 14174:2012, which is withdrawn.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.

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English Version

# Welding consumables - Fluxes for submerged arc welding and electroslag welding - Classification (ISO 14174:2019)

Produits consommables pour le soudage - Flux pour le soudage à l'arc sous flux et le soudage sous laitier - Classification (ISO 14174:2019)

Schweißzusätze - Pulver zum Unterpulverschweißen und Elektroschlackeschweißen - Einteilung (ISO 14174:2019)

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## European foreword

This document (EN ISO 14174:2019) 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of an identical text or by endorsement, at the latest by November 2019, and conflicting national standards shall be withdrawn at the latest by November 2019.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.

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## Endorsement notice

The text of ISO 14174:2019 has been approved by CEN as EN ISO 14174:2019 without any modification.



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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).

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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 voluntary nature of standards, 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 third edition cancels and replaces the second edition (ISO 14174:2012), which has been technically revised. The main changes compared to the previous edition are as follows:

— Subclause 5.4.3 now clarifies burn-out;

— ISO 18724 has been added to Clause 2;

— Table 3 has been expanded;

— Table 5 for flux class 2, welding current and voltage have been revised;

— an example of a Z option has been added;

— information on IIW Round robin testing of fluxes has been added to Annex B and as a bibliographical reference;

— Clause B.16 has been corrected to include $CaF_2$ (to align with EN 760).

Any feedback, question or request for official interpretation related to 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/members.html. Official interpretations, where they exist, are available from this page: https://committee.iso.org/sites/tc44/home/interpretation.html.


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# Welding consumables — Fluxes for submerged arc welding and electroslag welding — Classification

## 1 Scope

This document specifies requirements for classification of fluxes for submerged arc welding and electroslag welding for joining and overlay welding using wire electrodes, tubular cored electrodes, and strip electrodes.

NOTE This document was based on EN 760:1996.

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

ISO 14171, *Welding consumables — Solid wire electrodes, tubular cored electrodes and electrode/flux combinations for submerged arc welding of non alloy and fine grain steels — Classification*

ISO 14343, *Welding consumables — Wire electrodes, strip electrodes, wires and rods for arc welding of stainless and heat resisting steels — Classification*

ISO 18274, *Welding consumables — Solid wire electrodes, solid strip electrodes, solid wires and solid rods for fusion welding of nickel and nickel alloys — Classification*

ISO 80000-1:2009, *Quantities and units — Part 1: General* Corrected by ISO 80000-1:2009/Cor 1:2011

## 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 http://www.electropedia.org/

## 4 Classification

Fluxes for submerged arc welding and electroslag welding for joining and overlay welding are granular, fusible products of mainly mineral origin, which are manufactured by various methods. Fluxes influence the chemical composition and the mechanical properties of the weld metal.

The classification of the fluxes is divided into seven parts:

1) the first part gives a symbol indicating the product/process (see 5.1);

2) the second part gives a symbol indicating the method of manufacture (see 5.2);

3) the third part gives a symbol indicating the type of flux, characteristic chemical constituents (see Table 1);

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4) the fourth part gives a symbol indicating the applications, flux class (see 5.4);

5) the fifth part gives a symbol indicating the metallurgical behaviour (see 5.5);

6) the sixth part gives a symbol indicating the type of current (see 5.6);

7) the seventh part gives a symbol indicating the diffusible hydrogen content of deposited weld metal (see Table 6) — only applicable for class 1 fluxes.

The classification is divided into two sections.

a) the compulsory section, which includes the symbols for process, method of manufacture, characteristic chemical constituents, and applications, i.e. the symbols defined in 5.1, 5.2, 5.3 and 5.4.

b) the optional section, which includes the symbols for the metallurgical behaviour, type of current, and diffusible hydrogen, i.e. the symbols defined in 5.5, 5.6 and 5.7.

# 5 Symbols

## 5.1 Symbol for the product/process

The symbol for the flux used in submerged arc welding for joining and overlay welding shall be the letter S and for the flux used in electroslag welding for joining and overlay welding shall be the letters ES.

## 5.2 Symbol for method of manufacture

The symbol below indicates the method of manufacture:

— F: fused flux;

— A: agglomerated flux;

— M: mixed flux.

Fused fluxes are made by melting and granulating. Agglomerated fluxes are bound, granular mixtures of finer raw materials. Mixed fluxes comprise all fluxes which, after fusing or agglomerating, are mixed with one or more additional components or fluxes.

For particle size requirements in marking, see Clause 6.

## 5.3 Symbol for type of flux, characteristic chemical constituents

The symbols in Table 1 indicate the type of flux in accordance with the characteristic chemical constituents. Elemental analysis shall be performed on representative samples of the flux. Any suitable analytical technique may be used, but in cases of dispute reference shall be made to established methods. Based on the elemental analysis of the flux, the characteristic chemical constituents of the flux can be determined.

Examples of such determinations are shown in Annex A and descriptions of flux types are given in Annex B.

## 5.4 Symbol for applications, flux class

### 5.4.1 General

A given flux may carry more than one class as specified in 5.4.2 to 5.4.5.


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