



BSI Standards Publication

**Welding consumables - General product standard for filler metals and fluxes for fusion welding of metallic materials**

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## National foreword

This British Standard is the UK implementation of EN 13479:2017. It supersedes BS EN 13479:2004, which is withdrawn.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

**EN 13479**

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2017

ICS 25.160.20

Supersedes EN 13479:2004

English Version

## Welding consumables - General product standard for filler metals and fluxes for fusion welding of metallic materials

Produits consommables pour le soudage - Norme produit générale pour les métaux d'apport et les flux pour le soudage par fusion de matériaux métalliques

Schweißzusätze - Allgemeine Produktnorm für Zusätze und Pulver zum Schmelzschiessen von metallischen Werkstoffen

This European Standard was approved by CEN on 11 May 2017.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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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EUROPÄISCHES KOMITEE FÜR NORMUNG

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## European foreword

This document (EN 13479:2017) has been prepared by 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 December 2017 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 [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13479:2004.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports basic work requirements of Regulation (EU) 305/2011.

For relationship with EU Regulation 305/2011, see informative Annex ZA, which is an integral part of this document.

In comparison with the previous edition, the following modifications have been made:

- the Introduction has been deleted;
- the normative references have been updated;
- the terms 3.1 (product specification), 3.2 (manufacturer) and 3.3 (deposited metal) have been deleted from Clause 3;
- the entire document, including the Annex ZA, has been editorially revised.

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.

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## 1 Scope

This European Standard specifies product characteristics and related test/assessment methods for filler materials (welding consumables as defined in ISO/TR 25901-1) and fluxes to be used for fusion welding of metallic structures or composite metals and concrete structures in construction works.

This European Standard does not cover shielding gases and ceramic backings (as defined in ISO/TR 25901-1).

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12536:2000, *Welding consumables - Rods for gas welding of non alloy and creep-resisting steels - Classification*

EN ISO 636:2015, *Welding consumables - Rods, wires and deposits for tungsten inert gas welding of non-alloy and fine-grain steels - Classification (ISO 636:2015)*

EN ISO 1071:2015, *Welding consumables - Covered electrodes, wires, rods and tubular cored electrodes for fusion welding of cast iron - Classification (ISO 1071:2015)*

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

EN ISO 3580:2011, *Welding consumables - Covered electrodes for manual metal arc welding of creep-resisting steels - Classification (ISO 3580:2010)*

EN ISO 3581:2016, *Welding consumables - Covered electrodes for manual metal arc welding of stainless and heat-resisting steels - Classification (ISO 3581:2016)*

EN ISO 14171:2016, *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 14171:2016)*

EN ISO 14174:2012, *Welding consumables - Fluxes for submerged arc welding and electroslag welding - Classification (ISO 14174:2012)*

EN ISO 14341:2011, *Welding consumables - Wire electrodes and weld deposits for gas shielded metal arc welding of non alloy and fine grain steels - Classification (ISO 14341:2010)*

EN ISO 14343:2017, *Welding consumables - Wire electrodes, strip electrodes, wires and rods for arc welding of stainless and heat resisting steels - Classification (ISO 14343:2017)*

EN ISO 16834:2012, *Welding consumables - Wire electrodes, wires, rods and deposits for gas shielded arc welding of high strength steels - Classification (ISO 16834:2012)*

EN ISO 17632:2015, *Welding consumables - Tubular cored electrodes for gas shielded and non-gas shielded metal arc welding of non-alloy and fine grain steels - Classification (ISO 17632:2015)*

EN ISO 17633:2010, *Welding consumables - Tubular cored electrodes and rods for gas shielded and non-gas shielded metal arc welding of stainless and heat-resisting steels - Classification (ISO 17633:2010)*

EN ISO 17634:2015, *Welding consumables - Tubular cored electrodes for gas shielded metal arc welding of creep-resisting steels - Classification (ISO 17634:2015)*

EN ISO 18273:2015, *Welding consumables - Wire electrodes, wires and rods for welding of aluminium and aluminium alloys - Classification (ISO 18273:2015)*

EN ISO 18275:2012, *Welding consumables - Covered electrodes for manual metal arc welding of high-strength steels - Classification (ISO 18275:2011)*

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

EN ISO 21952:2012, *Welding consumables - Wire electrodes, wires, rods and deposits for gas shielded arc welding of creep-resisting steels - Classification (ISO 21952:2012)*

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)*

EN ISO 26304:2011, *Welding consumables - Solid wire electrodes, tubular cored electrodes and electrode-flux combinations for submerged arc welding of high strength steels - Classification (ISO 26304:2011)*

CEN/TR 10261, *Iron and steel - European standards for the determination of chemical composition*

ISO/TR 25901-1:2016, *Welding and allied processes - Vocabulary - Part 1: General terms*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/TR 25901-1:2016 apply.

### 4 Product characteristics

Chemical composition in % (m/m) for the following welding consumables shall be in accordance with the requirements for the applicable type of product as listed below:

#### **Covered electrodes for manual metal arc welding:**

- *of cast iron:* EN ISO 1071:2015, Table 2 or 3;
- *of non-alloy and fine grain steels:* EN ISO 2560:2009, Table 3A or 3B;
- *of creep-resisting steels:* EN ISO 3580:2011, Table1;
- *of stainless and heat-resisting steels:* EN ISO 3581:2016, Table1;
- *of high-strength steels:* EN ISO 18275:2012, Table 3A or 3B.

#### **Solid wires/rods/strips:**

- *for tungsten inert gas welding of non-alloy and fine-grain steels:* EN ISO 636:2015, Table 3A or 3B;
- *for fusion welding of cast iron:* EN ISO 1071:2015, Table 2 or 3;
- *for gas welding of non alloy and creep-resisting steels:* EN 12536:2000, Table1;
- *for submerged arc welding of non alloy and fine grain steels:* EN ISO 14171:2016, Table 4A or, 4B, 5A or 5B;

- *for gas shielded metal arc welding of non alloy and fine grain steels:* EN ISO 14341:2011, Table 3A or 3B;
- *for arc welding of stainless and heat resisting steels:* EN ISO 14343:2017, Table 1;
- *for gas shielded arc welding of high strength steels:* EN ISO 16834:2012, Table 3A or 3B;
- *for welding of aluminium and aluminium alloys:* EN ISO 18273:2015, Table 1;
- *for gas shielded arc welding of creep-resisting steels:* EN ISO 21952:2012, Table 1;
- *for submerged arc welding of creep-resisting steels:* EN ISO 24598:2012, Table 3;
- *for submerged arc welding of high strength steels:* EN ISO 26304:2011, Table 3.

**Tubular cored wires:**

- *for fusion welding of cast iron:* EN ISO 1071:2015, Table 2 or 3;
- *for submerged arc welding of non alloy and fine grain steels:* EN ISO 14171:2016, Table 4A or 4B, 5A or 5B;
- *for gas shielded and non-gas shielded metal arc welding of non-alloy and fine grain steels:* EN ISO 17632:2015, Table 4A or 4B;
- *for gas shielded and non-gas shielded metal arc welding of stainless and heat-resisting steels:* EN ISO 17633:2010, Table 1A or 1B-1 or 1B-2 or 1B-3 or 1B-4;
- *for gas shielded metal arc welding of creep-resisting steels:* EN ISO 17634:2015, Table 1;
- *for gas-shielded and non-gas-shielded metal arc welding of high-strength steels:* EN ISO 18276:2017, Table 3A or 3B;
- *for submerged arc welding of creep-resisting steels:* EN ISO 24598:2012, Table 3;
- *for submerged arc welding of high strength steels:* EN ISO 26304:2011, Table 3.

Chemical composition in % (m/m) for fluxes shall be in accordance with:

- *for submerged arc welding and electroslag welding:* EN ISO 14174:2012, Table 1.

**5 Testing, assessment and sampling methods**

The chemical analysis of rods/wires and/or strips, shall be performed on samples of the product or the stock from which it is made. The chemical analysis of fluxes shall be performed on samples of the product. The chemical analysis of covered electrodes and tubular cored electrodes shall be performed on any suitable all-weld metal test specimen.

The chemical analysis shall be carried out using the test method as defined in the appropriate European Standard according to CEN/TR 10261 for the element being analysed.



## 6 Assessment and verification of constancy of performance - AVCP

### 6.1 General

The compliance of filler materials and fluxes with the requirements of this standard and with the performances declared by the manufacturer in the DoP shall be demonstrated by:

- determination of the product type;
- factory production control by the manufacturer, including product assessment.

The manufacturer shall always retain the overall control and shall have the necessary means to take responsibility for the conformity of the product with its declared performance(s).

### 6.2 Type testing

#### 6.2.1 General

All performances related to characteristics included in this standard shall be determined when the manufacturer intends to declare the respective performances unless the standard gives provisions for declaring them without performing tests (e.g. use of previously existing data, CWFT and conventionally accepted performance).

Assessment previously performed in accordance with the provisions of this standard, may be taken into account provided that they were made to the same or a more rigorous test method, under the same AVCP system on the same product or products of similar design, construction and functionality, such that the results are applicable to the product in question.

For the purposes of assessment, the manufacturer's products may be grouped into families, where it is considered that the results for one or more characteristics from any one product within the family are representative for that same characteristics for all products within that same family.

NOTE 1 Products may be grouped in different families for different characteristics.

NOTE 2 Reference to the assessment method standards should be made to allow the selection of a suitable representative sample.

In addition, the determination of the product type shall be performed for all characteristics included in the standard for which the manufacturer declares the performance:

- at the beginning of the production of a new or modified filler material or flux (unless a member of the same product range), or
- at the beginning of a new or modified method of production (where this may affect the stated properties), or

they shall be repeated for the appropriate characteristic(s), whenever a change occurs in the filler material or flux design, in the raw material, or in the method of production (subject to the definition of a family), which would affect significantly one or more of the characteristics.

Products bearing regulatory marking in accordance with appropriate harmonized European specifications may be presumed to have the performances declared in the DoP, although this does not replace the responsibility on the filler material or flux manufacturer to ensure that the filler material or flux as a whole is correctly manufactured and have the declared performance values.

**6.2.2 Test samples, testing and compliance criteria**

The number of samples of filler materials or fluxes to be tested/assessed shall be in accordance with Table 1.

**Table 1 — Number of samples to be tested and compliance criteria**

Characteristic	Requirement	Assessment method	No. of samples	Compliance criteria
Chemical composition	Clause 4	Clause 5	Rods/wires and/or strips: 1 fluxes: 1 covered electrodes, tubular cored wires: 1	Clause 4

**6.2.3 Test reports**

The results of the determination of the product type shall be documented in test reports. All test reports shall be retained by the manufacturer for at least 10 years after the last date of production of the filler material or flux to which they relate.

**6.2.4 Shared other party results**

A manufacturer may use the results of the product type determination obtained by someone else (e.g. by another manufacturer, as a common service to manufacturers, or by a product developer), to justify his own declaration of performance regarding a product that is manufactured according to the same design (e.g. dimensions) and with raw materials, constituents and manufacturing methods of the same kind, provided that:

- the results are known to be valid for products with the same essential characteristics relevant for the product performance;
- in addition to any information essential for confirming that the product has such same performances related to specific essential characteristics, the other party who has carried out the determination of the product type concerned or has had it carried out, has expressly accepted<sup>1)</sup> to transmit to the manufacturer the results and the test report to be used for the latter’s product type determination, as well as information regarding production facilities and the production control process that can be taken into account for FPC;
- the manufacturer using other party results accepts to remain responsible for the product having the declared performances and he also:
  - ensures that the product has the same characteristics relevant for performance as the one that has been subjected to the determination of the product type, and that there are no significant differences with regard to production facilities and the production control process compared to that used for the product that was subjected to the determination of the product type; and
  - keeps available a copy of the determination of the product type report that also contains the information needed for verifying that the product is manufactured according to the same design and with raw materials, constituents and manufacturing methods of the same kind.

1) The formulation of such an agreement can be done by license, contract, or any other type of written consent.

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## 6.3 Factory production control (FPC)

### 6.3.1 General

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market comply with the declared performance of the essential characteristics.

The FPC system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results to control raw and other incoming materials, equipment, the production process and the product.

All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures.

This factory production control system documentation shall ensure a common understanding of the evaluation of the constancy of performance and enable the achievement of the required product performances and the effective operation of the production control system to be checked. Factory production control therefore brings together operational techniques and all measures allowing maintenance and control of the compliance of the product with the declared performances of the essential characteristics.

In case the manufacturer has used shared product type results, the FPC shall also include the appropriate documentation as foreseen in subclause 6.2.4.

### 6.3.2 Requirements

#### 6.3.2.1 General

The manufacturer is responsible for organizing the effective implementation of the FPC system in line with the content of this product standard. Tasks and responsibilities in the production control organization shall be documented and this documentation shall be kept up-to-date.

The responsibility, authority and the relationship between personnel that manages, performs or verifies work affecting product constancy, shall be defined. This applies in particular to personnel that need to initiate actions preventing product non-constancies from occurring, actions in case of non-constancies and to identify and register product constancy problems.

Personnel performing work affecting the constancy of performance of the product shall be competent on the basis of appropriate education, training, skills and experience for which records shall be maintained.

In each factory, the manufacturer may delegate the action to a person having the necessary authority to:

- identify procedures to demonstrate constancy of performance of the product at appropriate stages;
- identify and record any instance of non-constancy;
- identify procedures to correct instances of non-constancy.

The manufacturer shall draw up and keep up-to-date documents defining the factory production control. The manufacturer's documentation and procedures should be appropriate to the product and manufacturing process. The FPC system should achieve an appropriate level of confidence in the constancy of performance of the product. This involves:

- a) the preparation of documented procedures and instructions relating to factory production control operations, in accordance with the requirements of the technical specification to which reference is made;
- b) the effective implementation of these procedures and instructions;

- c) the recording of these operations and their results;
- d) the use of these results to correct any deviations, repair the effects of such deviations, treat any resulting instances of non-conformity and, if necessary, revise the FPC to rectify the cause of non-constancy of performance.

Where subcontracting takes place, the manufacturer shall retain the overall control of the product and ensure that he receives all the information that is necessary to fulfil his responsibilities according to this European Standard.

If the manufacturer has part of the product designed, manufactured, assembled, packed, processed and/or labelled by subcontracting, the FPC of the subcontractor may be taken into account, where appropriate for the product in question.

The manufacturer who subcontracts all of his activities may in no circumstances pass the above responsibilities on to a subcontractor.

NOTE Manufacturers having an FPC system, which complies with EN ISO 9001 standard and which addresses the provisions of the present European Standard are considered as satisfying the FPC requirements of the Regulation (EU) No 305/2011.

### **6.3.2.2 Equipment**

#### **6.3.2.2.1 Testing**

All weighing, measuring and testing equipment shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria.

#### **6.3.2.2.2 Manufacturing**

All equipment used in the manufacturing process shall be regularly inspected and maintained to ensure use, wear or failure does not cause inconsistency in the manufacturing process. Inspections and maintenance shall be carried out and recorded in accordance with the manufacturer's written procedures and the records retained for the period defined in the manufacturer's FPC procedures.

#### **6.3.2.3 Raw materials**

The specifications of all incoming raw materials shall be documented, as shall the inspection scheme for ensuring their compliance.

#### **6.3.2.4 Traceability and marking**

Individual packages shall be identifiable and traceable with regard to their production origin. The manufacturer shall have written procedures ensuring that processes related to affixing traceability codes and/or markings are inspected regularly.

#### **6.3.2.5 Controls during manufacturing process**

The manufacturer shall plan and carry out production under controlled conditions.

#### **6.3.2.6 Product testing and evaluation**

The manufacturer shall establish procedures to ensure that the stated values of the characteristics he declares are maintained. The characteristics, and the means of control, are:

- chemical composition: shall be subject to the test indicated in Clause 5. Each heat of solid wires, rods and strips shall be tested. At least 5 lots of covered electrodes, tubular cored wires and fluxes shall be tested each year. If less than 10 lots are produced per year, the chemical composition of every second lot shall be determined.



### 6.3.2.7 Non-complying products

The manufacturer shall have written procedures which specify how non-complying products shall be dealt with. Any such events shall be recorded as they occur and these records shall be kept for the period defined in the manufacturer's written procedures.

Where the product fails to satisfy the acceptance criteria, the provisions for non-complying products shall apply, the necessary corrective action(s) shall immediately be taken and the products or batches not complying shall be isolated and properly identified.

Once the fault has been corrected, the test or verification in question shall be repeated.

The results of controls and tests shall be properly recorded. The product description, date of manufacture, test method adopted, test results and acceptance criteria shall be entered in the records under the signature of the person responsible for the control/test.

With regard to any control result not meeting the requirements of this European Standard, the corrective measures taken to rectify the situation (e.g. a further test carried out, modification of manufacturing process, throwing away or putting right of product) shall be indicated in the records.

### 6.3.2.8 Corrective action

The manufacturer shall have documented procedures that instigate action to eliminate the cause of non-conformities in order to prevent recurrence.

### 6.3.2.9 Handling, storage and packaging

The manufacturer shall have procedures providing methods of product handling and shall provide suitable storage areas preventing damage or deterioration.

## 6.3.3 Product specific requirements

The FPC system shall address this European Standard and ensure that the products placed on the market comply with the declaration of performance.

The FPC system shall include a product specific FPC, which identifies procedures to demonstrate compliance of the product at appropriate stages, i.e.:

- a) the controls and tests to be carried out prior to and/or during manufacture according to a frequency laid down in the FPC test plan,  
  
and/or
- b) the verifications and tests to be carried out on finished products according to a frequency laid down in the FPC test plan.

If the manufacturer uses only finished products, the operations under b) shall lead to an equivalent level of compliance of the product as if FPC had been carried out during the production.

If the manufacturer carries out parts of the production himself, the operations under b) may be reduced and partly replaced by operations under a). Generally, the more parts of the production that are carried out by the manufacturer, the more operations under b) may be replaced by operations under a).

In any case the operation shall lead to an equivalent level of compliance of the product as if FPC had been carried out during the production.

NOTE Depending on the specific case, it can be necessary to carry out the operations referred to under a) and b), only the operations under a) or only those under b).

The operations under a) refer to the intermediate states of the product as on manufacturing machines and their adjustment, and measuring equipment, etc. These controls and tests and their frequency shall be chosen based on product type and composition, the manufacturing process and its complexity, the sensitivity of product features to variations in manufacturing parameters, etc.

The manufacturer shall establish and maintain records that provide evidence that the production has been sampled and tested. These records shall show clearly whether the production has satisfied the defined acceptance criteria and shall be available for at least three years.

#### **6.3.4 Initial inspection of factory and of FPC**

Initial inspection of factory and of FPC shall be carried out when the production process has been finalized and in operation. The factory and FPC documentation shall be assessed to verify that the requirements of subclauses 6.3.2 and 6.3.3 are fulfilled.

During the inspection it shall be verified:

- a) that all resources necessary for the achievement of the product characteristics included in this European Standard are in place and correctly implemented,  
and
- b) that the FPC-procedures in accordance with the FPC documentation are followed in practice,  
and
- c) that the product complies with the product type samples, for which compliance of the product performance to the DoP has been verified.

All locations where final assembly or at least final testing of the relevant product is performed, shall be assessed to verify that the above conditions a) to c) are in place and implemented. If the FPC system covers more than one product, production line or production process, and it is verified that the general requirements are fulfilled when assessing one product, production line or production process, then the assessment of the general requirements does not need to be repeated when assessing the FPC for another product, production line or production process.

All assessments and their results shall be documented in the initial inspection report.

#### **6.3.5 Continuous surveillance of FPC**

Surveillance of the FPC shall be undertaken once per year. The surveillance of the FPC shall include a review of the FPC test plan(s) and production processes(s) for each product to determine if any changes have been made since the last assessment or surveillance. The significance of any changes shall be assessed.

Checks shall be made to ensure that the test plans are still correctly implemented and that the production equipment is still correctly maintained and calibrated at appropriate time intervals.

The records of tests and measurement made during the production process and to finished products shall be reviewed to ensure that the values obtained still correspond with those values for the samples submitted to the determination of the product type and that the correct actions have been taken for non-compliant products.

#### **6.3.6 Procedure for modifications**

If modifications are made to the product, production process or FPC system that could affect any of the product characteristics declared according to this standard, then all the characteristics for which the manufacturer declares performance, which may be affected by the modification, shall be subject to the determination of the product type, as described in 6.2.1.

Where relevant, a re-assessment of the factory and of the FPC system shall be performed for those aspects, which may be affected by the modification.

All assessments and their results shall be documented in a report.

### **6.3.7 One-off products, pre-production products (e.g. prototypes) and products produced in very low quantity**

The filler material or flux produced as a one-off, prototypes assessed before full production is established, and products produced in very low quantities (max. 3 lots per year) shall be assessed as follows.

For type assessment, the provisions of 6.2.1, 3<sup>rd</sup> paragraph apply, together with the following additional provisions:

- in case of prototypes, the test samples shall be representative of the intended future production and shall be selected by the manufacturer;
- on request of the manufacturer, the results of the assessment of prototype samples may be included in a certificate or in test reports issued by the involved third party.

The FPC system of one-off products and products produced in very low quantities shall ensure that raw materials are sufficient for production of the product. The provisions on raw materials shall apply only where appropriate. The manufacturer shall maintain records allowing traceability of the product.

For prototypes, where the intention is to move to series production, the initial inspection of the factory and FPC shall be carried out before the production is already running and/or before the FPC is already in practice. The following shall be assessed:

- the FPC-documentation; and
- the factory.

In the initial assessment of the factory and FPC it shall be verified:

- a) that all resources necessary for the achievement of the product characteristics included in this European Standard will be available, and
- b) that the FPC-procedures in accordance with the FPC-documentation will be implemented and followed in practice, and
- c) that procedures are in place to demonstrate that the factory production processes can produce a product complying with the requirements of this European Standard and that the product will be the same as the samples used for the determination of the product type, for which compliance with this European Standard has been verified.

Once series production is fully established, the provisions of subclause 6.3 shall apply.

## **7 Marking, labelling and packaging**

### **7.1 Marking on the product**

#### **7.1.1 Covered electrodes**

Covered electrodes shall be durably marked on the covering, near the grip end or on the grip end, with at least an identification traceable to either the supplier trade name or the electrode classification.

### 7.1.2 Solid wires, strips and tubular cored wires

Welding consumables wound on spools or in coils shall be durably marked on the coil or spool with an identification traceable to the unique manufacturer or supplier product type.

### 7.1.3 Solid rods

Each tungsten inert gas arc welding, plasma arc welding, and oxyfuel gas welding rod shall be durably marked with an identification traceable to the unique manufacturer or supplier product type. In addition to the traceable identification, it is recommended that at least the compulsory part of the standard designation be used or colour print for identification.

### 7.1.4 Fluxes

Not applicable. Packages shall be marked in accordance with 7.2.

## 7.2 Marking on the package

The outside of each smallest package unit shall be clearly marked with the following information as a minimum:

- name of manufacturer or supplier;
- trade name;
- designation in accordance with the relevant International Standard;
- dimensions;
- for fluxes, particle size range in accordance with ISO 14174;
- batch/heat or lot number;
- type of current and polarity, where applicable;
- number of pieces or nominal net mass;
- redrying instructions or reference to a relevant information source, where applicable.

## 7.3 Packaging

Welding filler materials and fluxes shall be packed so that when suitably transported and stored in a dry storeroom, sufficient safeguard against damage and deterioration is provided.

MAHCO



## Annex ZA (informative)

### Relationship of this European Standard with Regulation (EU) No.305/2011

(When applying this standard as a harmonized standard under Regulation (EU) No. 305/2011, manufacturers and Member States are obliged by this regulation to use this Annex)

#### ZA.1 Scope and relevant characteristics

This European Standard has been prepared under standardization request M/120 "Structural metallic products and ancillaries" given to CEN and CENELEC by the European Commission (EC) and the European Free Trade Association (EFTA).

When this European Standard is cited in the Official Journal of the European Union (OJEU), under Regulation (EU) No 305/2011, it shall be possible to use it as a basis for the establishment of the Declaration of Performance (DoP) and the CE marking, from the date of the beginning of the co-existence period as specified in the OJEU.

Regulation (EU) No 305/2011, as amended, contains provisions for the DoP and the CE marking.

**Table ZA.1 — Relevant clauses for filler materials and fluxes to be used for fusion welding of metallic structures or composite metal and concrete structures in construction works**

<b>Product:</b>	Filler materials and fluxes		
<b>Intended use</b>	To be used for fusion welding of metallic structures or composite metal and concrete structures in construction works.		
Essential Characteristics	Clauses of this European Standard related to essential characteristics	Classes and/or threshold levels	Notes
Chemical composition	4	–	% (m/m)

#### ZA.2 System of Assessment and Verification of Constancy of Performance (AVCP)

The AVCP system(s) of filler materials and fluxes indicated in Table ZA.1 can be found in the EC legal act(s) adopted by the EC: (EC Decision 1998/214/EC – OJEU L80 of 18.3.1998, as amended by EC Decision 2001/596 – OJEU L209 of 2.8.2001).

Micro-enterprises are allowed to treat products under AVCP system 3 covered by this standard in accordance with AVCP system 4, applying this simplified procedure with its conditions, as foreseen in Article 37 of Regulation (EU) No.305/2011.

#### ZA.3 Assignment of AVCP tasks

The AVCP system(s) of filler materials and fluxes as provided in Table ZA.1 is defined in Table ZA.3.1 resulting from application of the clauses of this or other European Standards indicated therein. The content of the tasks assigned to the notified body shall be limited to those essential characteristics, if any, as provided for in Annex III of the relevant standardization request and to those that the manufacturer intends to declare.

Taking into account the AVCP systems defined for the products and the intended uses the following tasks are to be undertaken by the manufacturer and the notified body respectively for the assessment and verification of the constancy of performance of the product.

**Table ZA.3.1 — Assignment of AVCP tasks for filler materials and fluxes under system 2+**

Tasks		Content of the task	AVCP clauses to apply
Tasks for the manufacturer	An assessment of the performance of the construction product carried out on the basis of testing (including sampling), calculation, tabulated values or descriptive documentation of the product	Essential characteristic of Table ZA.1 relevant for the intended use which are declared	6.2
	Factory production control (FPC)	Parameters related to essential characteristic of Table ZA.1 relevant for the intended use which are declared	6.3
	Testing of samples taken at factory according to the prescribed test plan	Essential characteristic of Table ZA.1 relevant for the intended use which are declared	6.3.2.6
Tasks for the notified factory production control certification body	Initial inspection of the manufacturing plant and of FPC	Parameters related to chemical composition of Table ZA.1, relevant for the intended use which are declared. Documentation of the FPC.	6.3.4
	Continuing surveillance, assessment and evaluation of FPC	Parameters related to chemical composition of Table ZA.1, relevant for the intended use which are declared. Documentation of the FPC.	6.3.5



## Bibliography

- [1] EN ISO 9001, *Quality management systems - Requirements (ISO 9001)*









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