



SLOVENSKI STANDARD

oSIST prEN 4877-001:2022

01-januar-2022

Aeronavtika - Dodajni materiali za varilne kable - 001. del: Tehnična specifikacija

Aerospace series - Filler metals for welding - Part 001: Technical specification

Luft- und Raumfahrt - Schweißzusätze - Teil 001: Technische Lieferbedingungen

Série aérospatiale - Métaux d'apport de soudage - Partie 001: Spécification technique

Ta slovenski standard je istoveten z: prEN 4877-001

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ICS:

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EUROPEAN STANDARD
NORME EUROPÉENNE
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ICS

English Version

**Aerospace series - Filler metals for welding - Part 001:
Technical specification**

Série aérospatiale - Métaux d'apport de soudage -
Partie 001: Spécification technique

Luft- und Raumfahrt - Schweißzusätze - Teil 001:
Technische Lieferbedingungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ASD-STAN.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 4877-001:2021) has been prepared by the Aerospace and Defence Industries Association of Europe — Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this document has received the approval of the National Associations and the Official Services of the member countries of ASD-STAN, prior to its presentation to CEN.

This document is currently submitted to the CEN Enquiry.

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Introduction

This document is part of the series of EN metallic material standards for aerospace applications. The general organization of this series is described in EN 4258.

From the date of publication of this document, specifications for different welding products can be written in only one standard instead of separated material standards.

Already existing material standards of filler metals for welding can continue to follow the organization described in EN 4258.

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1 Scope

This document defines the requirements for the ordering, manufacture, testing, inspection and delivery of all forms of filler metal. It is applied when referred to and in conjunction with the product procurement specification unless otherwise specified on the drawing, order or inspection schedule.

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.

EN 2032-001, *Aerospace series - Metallic materials - Part 001: Conventional designation*

EN 2032-2, *Aerospace series - Metallic materials - Part 2: Coding of metallurgical condition in delivery condition*

EN 2078, *Aerospace series - Metallic materials - Manufacturing schedule, inspection schedule, inspection and test report - Definition, general principles, preparation and approval*

FprEN 4259:2019,¹ *Aerospace series — Metallic materials — Definition of general terms*

EN 4268, *Aerospace series - Metallic materials - Heat treatment facilities - General requirements*

EN 4877-002, *Aerospace series — Filler metals for welding — Part 002: Authorized filler metals*

EN ISO 544, *Welding consumables - Technical delivery conditions for filler materials and fluxes - Type of product, dimensions, tolerances and markings (ISO 544:2017)*

ISO 3954, *Powders for powder metallurgical purposes — Sampling*

ISO 4063, *Welding and allied processes — Nomenclature of processes and reference numbers*

ISO 4497, *Metallic powders — Determination of particle size by dry sieving*

TR 4607,² *Aerospace series — Weldability test for weld filler metal wire*

¹ At draft stage.

² Published as ASD-STAN Technical Report at the date of publication of this document by AeroSpace and Defence industries Association of Europe — Standardization (ASD-STAN), <http://www.asd-stan.org/>.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in FprEN 4259:2019 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

filler metal for welding

is supplied in the form of:

- wire;

wrought product of uniform solid section supplied in coil or on spools;

- rod;

wire supplied in straight cut lengths

3.2

heat

metal from a same last melting operation

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3.3

producer

producer of the alloy

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3.4

supplier

producer, transformer or reseller

3.5

batch

quantity of product from one manufacturing campaign, and characterised by a homogeneous chemical composition and grain size/diameter

3.6

product

generic term used to indicate the material as it shall be manufactured and delivered by the supply source

3.7

reseller

company that performs product storage and reselling operations

3.8

transformer

producer of product in the form requested by the customer (rod or wire)

4 Wording of order

The order shall clearly indicate:

- quantities to be supplied;
- dates of delivery;
- material designation;
- material standard number, or EN 4877-002 (when the product procurement specification is described in EN 4877-002);
- marking method;
- delivery condition;
- dimensions and tolerances or reference to an appropriate dimensional standard;
- forwarding address;
- nature and type of packing, if required;
- definition and frequency of any special tests and their retest procedures, if required.

5 Health and safety

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The product in the delivery condition should fulfil the health and safety laws of the area of the country when and where it is to be delivered. [oSIST prEN 4877-001:2022](https://standards.iteh.ai/catalog/standards/sist/d3a45ef1-10c4-4d46-8046-000000000000/sist-pr-en-4877-001-2022)

A product safety data sheet shall be available.

The implementation of certain special processes implies using substances or chemical preparations that may present risks for health, safety, or the environment. In addition to the regulations in effect in the country where the process is performed, the purchaser can prohibit and/or restrict the use of certain substances by its subcontractors. These prohibitions and/or restrictions can be described in the applicable procedures of the purchaser.

Furthermore, in strict compliance with the applicable regulations, subcontractor should use the chemicals presenting a lower risk for a given set of processes, when several choices of chemicals exist.

Pursuant to the applicable regulations, the subcontractors should

- be informed of and comply with the recommendations and the uses identified provided in the material safety data sheets for the chemical substances used in processes, and
- apply the prevention and protection measures specified in the safety data sheets and/or resulting from the workstation chemical risk assessment, in accordance with the applicable health and safety regulations.

6 List of authorized filler metals

Filler metals authorized with associated material standard are listed in EN 4877-002.

7 Technical requirements

7.1 General

The product shall be manufactured in accordance with the requirements of the relevant product's procurement specification and the applicable requirements of this specification. A manufacturing schedule shall be established and applied in accordance with EN 2078.

Product shall satisfy the requirements of the product's procurement specification and/or order and shall be free from irregularities and defects prejudicial to the subsequent manufacture or use of this product.

Notwithstanding previous acceptance complying with this product's procurement specification, any product that is found, at a later stage, to contain such defects shall be rejected. Instructions for the use of the material standard are contained in EN 4258.

Unless otherwise specified, the requirements in Table 3 and Table 4 shall apply in conjunction with those of the relevant product's procurement specification. Table 3 relates to lines 1 to 29 (inclusive) of the material standard and Table 4 relates to line 30 onwards in which the sub-line format is also used. Lines 2 to 98 may also be opened in line 100 if the product's procurement specification details specific qualification requirements. If a specific line number is not shown in Table 3 and Table 4, the requirement is stated in the product's procurement specification and/or order.

7.2 Supply

7.2.1 Agreement

All products covered by the present document shall be produced by supply sources approved by the purchaser, according to the procedures in force.

7.2.2 Freezing the production operation sheets

The producer shall ensure consistent quality.

The manufacturing and inspection operation sheet can be modified by the producer provided that the proposed modifications have no influence on part quality. It shall inform the purchaser's Quality Departments and demonstrate that the level of the product has not been affected by this change. Otherwise, the request for change shall be submitted to the notice of the purchaser's Quality Department for a decision.

The purchaser reserves the right to check the relevance of the changes made by the supply source.

7.2.3 Production process

See Table 3, line 4.2 "Method of production".

7.2.4 Transformation

The transformation shall make it possible to obtain the dimensional, metallurgical, surface roughness and quality requirements stipulated in the present document and in the product procurement specification of the product.

7.2.5 Heat treatment

See Table 3, line 6.1 "Delivery conditions — Heat treatment".

7.2.6 Surface condition

Unless indicated otherwise in the product's procurement document or the order, the required surface condition is chemical pickling, with prior machine finishing in certain cases. In cases of a product delivered in annealed condition in a controlled atmosphere, the pickling may be removed if the surface condition following annealing has no negative effect on the welding.

7.2.7 Batching

Unless otherwise specified in the order or with the agreement of the purchaser, the delivered welding rods and wires shall come from the same batch.

7.2.8 Packaging

See Table 3, line 6.1 "Delivery conditions".

7.2.9 Marking

See Table 3, line 6.1 "Delivery conditions".

7.2.10 Traceability

Each product shall be traceable to the cast production batch and/or heat treatment batch at all stages of manufacture and delivery.

Traceability shall be established in order to be able to trace, for each product, the concerned heat, the manufacturing and heat treatment steps, the inspections and the batches delivered.

The supply source shall keep the documents relative to the manufacture and inspections of the product at the disposal of the purchaser.

7.3 Inspections and tests

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7.3.1 General

7.3.1.1 Qualification of test laboratories

Laboratories performing the inspections and tests described in this document and in the procurement documents specific to the products shall meet the purchaser requirements applicable to said inspections and tests.

7.3.1.2 Test frequency

The supply source shall perform all the inspections and tests required in the product's specific procurement document and in the present document.

When an inspection frequency is set in this document, it may be alleviated in light of experience, at the discretion of the Quality Department concerned.

When the present document specifies a test frequency of 10 % of the products, this means that, if the number of products per batch is N , the tests shall be conducted on a minimum amount of products as determined by the chart of Table 1.

Table 1

Product amount N	Minimum amount of products to test
< 5	N
$5 \leq N < 50$	5
$50 \leq N < 200$	$N/10$
$N > 200$	20

7.3.1.3 Sampling of test pieces

The sample is to be taken from the outer end of the spool.

7.3.1.4 Miscellaneous testing

Additional testing, not specified in the present document, may be required in the product's specific procurement documentation.

7.3.2 Chemical composition

See Table 3, line 2 "Chemical composition".

7.3.3 Dimensional inspection

See Table 4, line 96 "Dimensional inspection".

7.3.4 Product appearance

7.3.4.1 Wires and rods

See Table 4, line 44 "External defects", sub-line 3 "Wire or rod" and sub-line 7 "Acceptance criteria".

7.3.4.2 Coated electrodes

The coatings checked on the electrodes in the packet shall neither be humid or greasy. The surface shall be uniform. Cracks in the coating are not acceptable, according to EN ISO 544.

Frequency: 10 % of products (see 7.3.1.2).

7.3.4.3 Powders

Powders shall be free from oxidation and contamination, and approximately spherical.

Frequency: One per batch. Sampling according to ISO 3954.

7.3.5 Uniformity of the batch

See Table 4, line 82 "Batch uniformity".

7.3.6 Bend diameter test

This test is only performed for wires with a diameter 2 mm.

Four coils on the spool are taken as a sample and left to unwind freely on a flat surface. The coils will unwind on the flat surface and form a circle, which shall have a diameter between:

- wire diameter 1,2 mm: 200 mm and 900 mm;
- wire diameter > 1,2 mm: 380 mm and 900 mm.

Frequency: One per spool.