SLOVENSKI STANDARD
SIST EN 3879:2023

01-april-2023

Aeronavtika - Kovinski materiali - Kovinsko polnilo za varjenje - Tehnična specifikacija

Aerospace series - Metallic materials - Filler metal for welding - Technical specification

Luft- und Raumfahrt - Metallische Werkstoffe - Schweisszusatz - Technische Lieferbedingungen

Série aérospatiale - Matériaux métalliques - Métal d'apport de soudage - Spécification technique

Ta slovenski standard je istoveten z: **EN 3879:2023**

ICS:

25.160.20	Potrošni material pri varjenju	Welding consumables
49.025.05	Železove zlitine na splošno	Ferrous alloys in general

SIST EN 3879:2023 **en,fr,de**

EUROPEAN STANDARD

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English Version

Aerospace series - Metallic materials - Filler metal for welding - Technical specification

Série aérospatiale - Matériaux métalliques - Métal d'apport de soudage - Spécification technique

Luft- und Raumfahrt - Metallische Werkstoffe - Schweisszusatz - Technische Lieferbedingungen

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

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European foreword

This document (EN 3879:2023) 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, prior to its presentation to CEN.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2023, and conflicting national standards shall be withdrawn at the latest by August 2023.

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.

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Introduction

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

1 Scope

This document defines the requirements for the ordering, manufacture, testing, inspection and delivery of all forms of filler metal. It shall be applied when referred to and in conjunction with the EN material standard 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*

EN 4058, *Aerospace series — Filler rods and filler wires for welding in titanium and titanium alloys — Diameter 0,5 mm ≤ D ≤ 5,0 mm — Dimensions*

EN 4059, *Aerospace series — Filler rods and filler wires for welding in steel — Diameter 0,5 mm ≤ D ≤ 5,0 mm — Dimensions*

EN 4060, *Aerospace series — Filler rods and filler wires for welding in heat resisting alloys — Diameter 0,5 mm ≤ D ≤ 5,0 mm — Dimensions*

EN 4259, *Aerospace series — Metallic materials — Definition of general terms*

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

ISO 544, *Welding consumables — Technical delivery conditions for filler materials and fluxes — Type of product, dimensions, tolerances and markings* [1)]

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

1) Published by: ISO International Organization for Standardization http://www.iso.ch/.

2) This project has been cancelled in July 2017.

3 Terms and definitions

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

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

— ISO Online browsing platform: available at https://www.iso.org/obp/

— IEC Electropedia: available at https://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

4 Wording of order

The order shall clearly indicate:

— quantities to be supplied;

— dates of delivery;

— material standard number;

— 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

The product in the delivery condition shall fulfil the health and safety laws of the area of the country when and where it is to be delivered.

A product safety data sheet shall be available.

6 Technical requirements

6.1 General

The product shall be manufactured in accordance with the requirements of the relevant material standard 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 material standard and/or order and shall be free from irregularities prejudicial to the subsequent manufacture or use of this product.

Notwithstanding previous acceptance complying with this material standard, 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 1 and in Table 2 shall apply in conjunction with those of the relevant material standard. Table 1 relates to lines 1 to 29 (inclusive) of the material standard and Table 2 relates to lines 30 onwards in which the sub-line format is also used. Lines 2 to 98 may also be opened in line 100 if the material standard details specific qualification requirements. If a specific line number is not shown in Table 1 and Table 2, the requirement is stated in the material standard and/or order.

6.2 Qualification requirements

Qualification requirements when invoked by the material standard and/or order are detailed in Table 1 and Table 2. Unless otherwise agreed between the manufacturer and purchaser the qualification phase shall be run on the first 3 (three) batches.

6.3 Release requirements

6.3.1 Release tests

Release testing shall be the responsibility of the manufacturer.

The purchaser reserves the right to perform any of the inspections and/or tests required by the material standard and/or order.

The test samples shall be representative of the product.

When required the manufacturer shall inform the purchaser of the planned dates for extraction of samples and release testing in order that these operations may be witnessed.

Table 1 and Table 2 detail the requirements for each line of the material standard. Unless otherwise specifically requested by the purchaser, a particular inspection and/or test for release shall be carried out if corresponding acceptance criteria and/or values are stated in the applicable material standard but see also 6.3.5 “Capability clause”.

6.3.2 Retests

If the test procedure or test piece preparation is faulty, testing shall be re-applied at the original frequency after rectification of the original cause of failure.

When failure cannot be attributed to faulty testing, or test piece preparation, further test samples shall be selected at twice the original frequency from the product, one of which shall be that on which the original results were obtained unless already withdrawn by the manufacturer after suitable identification of the cause of failure. If all retest results are satisfactory, the batch shall be accepted. If one or more tests are unsatisfactory, the batch shall be:

— rejected; or

— 100 % retested and the conforming lengths accepted; or

— partially or fully re-heat treated if heat treatment can rectify the cause of the failure and tested as a completely new batch except for chemical composition. No product or test sample shall be re-heat treated more than twice.

6.3.3 Rejection

Any failure to meet the requirements of the material standard shall be cause for rejection.

6.3.4 Special tests

Special tests may be required by the purchaser. In such cases, the nature of the test, method, frequency and technical requirements shall be specified on the order or inspection schedule and shall be mutually agreed by the manufacturer and the purchaser.

6.3.5 Capability clause

Where the capability clause is invoked and where sufficient statistical evidence exists, the test need not be carried out (unless specifically requested by the purchaser). However, this in no way reduces the obligations of the manufacturer to fulfil the requirements. If subsequent testing indicates that the product does not comply with the requirements, the batch shall be rejected.

If sufficient statistical evidence does not exist, the test shall be carried out at a frequency agreed between the manufacturer and purchaser.

6.3.6 Statistical process control

Reduction in the extent of release testing, other than that defined in 6.3.5 above may be negotiated with the purchaser on the basis of appropriate statistical process control and/or statistical data.

6.3.7 Inspection and test report

The manufacturer shall furnish, with each delivery, a report conforming to the requirements of EN 2078 stating the following:

— manufacturer's name and address and, if appropriate, identification of the plant;

— order number;

— material standard number;

— delivery condition and metallurgical code of the product;

— description of supplies;

— quantity and dimensions;

— cast and batch number;

— results of the mandatory tests, re-tests and chemical analysis;

— inspection stamp.

6.4 Traceability

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

Table 1 — Technical requirements for lines 1 to 29, where appropriate *(1 of 7)*

Material standard line reference			Requirements	Frequency of testing	
No	Title			*Qualification*	Release
1	Material designation		See EN 2032-1.	—	—
2	Chemical composition %		The chemical composition shall comply with the requirements of the relevant material standard. The chemical composition of each cast shall be determined. Additionally for titanium and titanium alloy filler metal the hydrogen (H_2) content shall be determined. Samples for analytical purposes shall be representative of the cast. The method of analysis shall be at the option of the manufacturer. In cases of dispute the method set out in the relevant ISO standard shall be used. If no ISO standard exists, an analytical method, that can be calibrated to an agreed reference standard, shall be used. Elements that are not specified in the material standards shall not be intentionally added to the alloy.	2 (two) per cast	1 (one) per cast
3	Method of melting		As stated in the material standard.	—	—
4.1	Form		Wire and rod	—	—
4.2	Method of production		Drawing, extrusion If required by the material standard, filler metal in ferritic steel shall be provided with a copper coating, uniformly and evenly deposited. The surface shall be cleaned before coating to obtain a good bond. Wire shall be wound on spools in individual layers in such a way that kinks, waves and sharp bends are avoided. The start and end of a wire shall be secured in place. Wire should readily unwind without overlapping or wedging. Wire on each spool shall be of continuous length and from the same cast.	—	—
4.3	Limit dimension(s)	mm	Minimum and/or maximum size of the product expressed as a nominal diameter, *D*, of wire or rod.	—	—
5	Technical specification		Reference to this technical specification EN 3879. In cases of conflict, the requirements of the material standard shall take precedence over those of this technical specification.	—	—