SLOVENSKI STANDARD
SIST EN 3875:2017

01-oktober-2017

Aeronavtika - Kovinski materiali, kovinsko polnilo za spajkanje - Tehnična specifikacija

Aerospace series - Metallic materials, Filler metal for brazing - Technical specification

Luft- und Raumfahrt - Metallische Werkstoffe, Hartlote; Technische Lieferbedingungen

Série aérospatiale - Matériaux métalliques, Métaux d'apport de brasage - Spécification technique

Ta slovenski standard je istoveten z: **EN 3875:2017**

ICS:

25.160.50	Trdo in mehko lotanje	Brazing and soldering
49.025.05	Železove zlitine na splošno	Ferrous alloys in general
49.025.15	Neželezove zlitine na splošno	Non-ferrous alloys in general

SIST EN 3875:2017 **en,fr,de**

EUROPEAN STANDARD

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EN 3875

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English Version

Aerospace series - Metallic materials, Filler metal for brazing - Technical specification

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 3875:2017) 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 Standard 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 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of an identical text or by endorsement, at the latest by February 2018, and conflicting national standards shall be withdrawn at the latest by February 2018.

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Introduction

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

1 Scope

This European Standard defines the requirements for the ordering, manufacture, testing, and delivery of all forms of filler metal for brazing for aerospace applications. It shall be applied when referred to in the EN material standard unless otherwise specified on the drawing, order or testing schedule.

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 2032-1, *Aerospace series — Metallic materials — Part 1: 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 3876, *Aerospace series — Test method for metallic materials — Braze alloys – Fusion test*[1]

EN 3877, *Aerospace series — Metallic materials — Test method — Determination of solidus and liquidus temperatures by differential thermal analysis of braze alloys*[1]

EN 3878, *Aerospace series — Test method for metallic materials — Braze alloys — Flexibility test*[1]

EN 4061, *Aerospace series — Amorphous foil in filler metal for brazing — Thickness 25 µm ≤ a ≤ 64 µm — Dimensions*[1]

EN 4062, *Aerospace series — Rolled foil in filler metal for brazing — Thickness a ≤ 1 mm — Dimensions*[1]

EN 4063, *Aerospace series — Wire in filler metal for brazing — Diameter 0,6 mm ≤ D ≤ 4 mm — Dimensions*[1]

EN 4064, *Aerospace series — Tape in filler metal for brazing — Thickness 0,075 mm ≤ a ≤ 1,5 mm — Dimensions*[1]

EN 4066, *Aerospace series — Borided foil in filler metal for brazing — Thickness 25 µm ≤ a ≤ 100 µm — Dimensions*[1]

EN 4258, *Aerospace series — Metallic materials — General organization of standardization — Links between types of EN standards and their use*

EN 4259, *Aerospace series — Metallic materials — Definition of general terms*[1]

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

EN 9100, *Quality Management Systems — Requirements for Aviation, Space and Defence Organizations*

EN 9133, *Aerospace series — Quality management systems — Qualification procedure for aerospace standard parts*

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

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

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply:

Definition of general terms, see EN 4259.

[1] Published as AECMA Prestandard at the date of publication of this European Standard

3.1 Method of melting

3.1.1
air melting
melting of charge is carried out in air i.e. without vacuum or inert atmosphere, using a protective slag, when required

3.1.2
vacuum melting
melting of the charge is carried out in vacuum

3.1.3
inert gas melting
melting of the charge is carried out in an inert atmosphere

3.2
atomization
process by which molten metal is separated into droplets which solidify as a powder:

a) gas atomization: a process of impingement at high velocity of a stream of molten metal in an inert gas to produce droplets which solidify in flight to procedure a powder;

b) rotating electrode atomization: a process in which the extremity of a rotating consumable electrode is melted by an appropriate heat source (for example: electric arc, electron beam), in such a way that the droplets are ejected from the periphery of the electrode and solidify into a powder;

c) spinning disk atomization: a process in which a molten metal is poured onto a rotating solid surface in such a way that the molten metal droplets are ejected from the surface and solidify in an inert gas to produce a powder;

d) vacuum atomization: a process in which a stream of molten metal, over saturated by a pressurised inert gas, is introduced in a vessel under vacuum so that the stream is disintegrated by the gas expansion to produce droplets which solidify to produce a powder;

e) water atomization: a process in which a high velocity water spray impinges on to molten metal to produce metal droplets which solidify to produce a powder. The powder is cooled to room temperature by water or under an inert gas

3.3
braze powder
solidified product resulting from the atomization process

3.4
powder blend
product obtained by blending one or more powder cast atomized and sieved in accordance with the material standard under the same production conditions

3.5
braze wire
wrought product of uniform solid section supplied in straight length, coils or on spools

3.6
braze foil
a) rolled foil: flat rolled product of rectangular section and uniform thickness up to 1 mm, supplied in flat lengths, or in coils with slit edges;

b) amorphous foil: product obtained from a stream of molten metal poured onto a solid surface and rapidly cooled, substantially without a crystalline structure;

c) borided foil: rolled foil with boron, or boron and other elements, diffused into the surface

3.7
braze tape
powder mixed with a binder to form a paste, which is spread on a plasticizer in the form of a tape

Note 1 to entry: The tape may have a pressure sensitive adhesive, protected by a release layer applied to the side opposite to the plasticizer.

3.8
binder
organic resin dissolved in a solvent or dispersed in an aqueous carrier

3.9
plasticizer
flexible organic sheet material capable of being coated with braze alloy on one side

3.10
release layer
protective layer covering the pressure sensitive adhesive coating

3.11
braze paste
powder mixed with a suitable binder

4 Wording of order

The order shall clearly indicate:

— quantities to be supplied;

— dates of delivery;

— material standard number;

— delivery condition;

— dimensions and tolerances or reference to an appropriate dimensional standard;

— specific weight for tape;

— 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.

Unless otherwise specified, the requirements in Tables 1 and 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 Tables 1 and 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 Tables 1 and 2. Unless otherwise agreed between the manufacturer and purchaser the qualification phase shall be run on the first 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 testings 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.

Tables 1 and 2 detail the requirements for each line of the material standard. Unless otherwise specifically requested by the purchaser, a particular testing 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 testing 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 "Capability clause" above may be negotiated with the purchaser on the basis of appropriate statistical process control and/or statistical data.

6.3.7 Testing 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;
- quantity or weight supplied, whichever is relevant;
- cast and batch number;
- results of the tests, re-tests and chemical analysis;
- description of supplies;
- Testing 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.