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Aluminum alloy clad sheets, strips and foils for brazing

钎焊用铝合金复合板、带、箔材

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Aluminum alloy clad sheets, strips and foils for brazing

1 Scope

This standard specifies the requirements, test methods, inspection rules and markings, packaging, transportation, storage, quality certificates and purchase orders (or contracts) of aluminum alloy clad sheets, strips and foils for brazing.

This standard applies to aluminum alloy clad sheets, strips and foils for brazing (hereinafter referred to as clad materials).

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

GB/T 3190 Wrought aluminum and aluminum alloy - Chemical composition

GB/T 3199 Wrought aluminum and aluminum alloy products - Packing, marking, transporting and storing

GB/T 3246.1 Inspection method for structure of wrought aluminum and aluminum alloy products - Part 1: Inspection method for microstructure

GB/T 3880.3 Wrought aluminum and aluminum alloy plates, sheets and strips for general engineering - Part 3: Tolerances on forms and dimensions

GB/T 4156 Metallic materials - Sheet and strip - Erichsen cupping test

GB/T 7999 Optical emission spectrometric analysis method of aluminum and aluminum alloys

GB/T 8170 Rules of rounding off for numerical values & expression and judgement of limiting values

GB/T 16865 Test pieces and method for tensile test for wrought aluminum and magnesium alloys products

GB/T 17432 Methods for sampling for analyzing the chemical composition

of wrought aluminum and aluminum alloys

GB/T 20975 (all parts) Methods for chemical analysis of aluminum and aluminum alloys

GB/T 27675 Designation system for aluminum and aluminum alloys composite sheets, strips and foils

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Aluminum alloy clad sheets

Sheets made of two or more aluminum alloy materials after rolling and compounding.

3.2

Aluminum alloy clad strip, foils

Strips and foils made of two or more aluminum alloy materials after rolling and compounding (hereinafter referred to as coils).

3.3

Cladding

Cladding layer for brazing in composite materials.

3.4

Matrix alloy

A core layer that plays a structural role or has a special role in composite materials.

3.5

Clad ratio

The percentage of the thickness of a single cladding layer to the total thickness of the clad, which is calculated according to formula (1).

$$F = \frac{t}{h} \times 100\% \qquad \cdots\cdots (1)$$

and the chemical composition of each matrix component layer; calculate to determine the chemical composition of the brazing layer of the sample blank.

5.1.4 For 3A11, 3B11, 4A43, 4A45, 4104, 6951, 7A11, carry out routine chemical analysis only on elements with numerical requirements outside the "Al" and "other impurities" columns in Table 3. When the quality score of unconventional analysis elements is suspected to exceed the limit value of this standard, the producer shall analyze these elements.

5.1.5 The "Al" content is calculated according to the method specified in GB/T 3190. When calculating the "Al" content, the sum of the analysis values of conventional analysis elements and suspected excessive unconventional analysis elements is taken as the "sum of element content".

5.1.6 The analysis value is judged by the rounding comparison method; the numerical rounding rules are carried out in accordance with the relevant provisions of GB/T 8170. The rounding off digits shall be consistent with the limit digits as specified in Table 2 of this standard or GB/T 3190.

5.2 Deviation of clad ratio

The inspection method for the coverage of composite materials shall be implemented in accordance with GB/T 3246.1.

5.3 Dimensional deviation

5.3.1 Thickness

Composite materials which have a thickness less than or equal to 0.130 mm are measured by the use of a micrometer which has a scale value not greater than 0.001 mm; composite materials which have a thickness greater than 0.130 mm and less than or equal to 0.250 mm are measured by a micrometer which has a scale value not greater than 0.002 mm; composite materials which have a thickness of larger than 0.250 mm should be measured by a micrometer (or a measuring tool with the same accuracy) which has a measurement accuracy of not less than 0.01 mm.

5.3.2 Width

The width of the composite material is measured by a steel strip which has an accuracy of 1 mm or a tool which has corresponding accuracy.

5.3.3 Length

The length of the clad sheet is measured by a steel strip which has an accuracy of 1 mm or a tool which has corresponding accuracy.

The length and inner diameter of the tube core are measured by a measuring tool that can ensure accuracy. The core material is guaranteed by the supplier; other items are visually inspected.

5.7 Appearance quality

Under natural scattered light, visually inspect the appearance quality. When necessary, the size measurement tool can be used to define the size of the defect, the depth of the defect can be determined by grinding.

6 Inspection rules

6.1 Inspection and acceptance

6.1.1 The product shall be inspected by the supplier, to ensure that the product quality meets the requirements of this standard and the purchase order (or contract); meanwhile fill in the quality certificate.

6.1.2 The purchaser shall inspect the products received in accordance with the provisions of this standard. When the inspection result is inconsistent with the provisions of this standard and the purchase order (or contract), it shall be submitted in writing to the supplier, to be settled by the supplier and the buyer through negotiation. Objections related to appearance quality and size deviation shall be raised within one month from the date of receipt of the product; objections related to other properties shall be raised within 3 months from the date of receipt of the product. If arbitration is required, it can be entrusted to an organization as recognized by both the supplier and the buyer; samples will be taken together at the buyer's premise.

6.2 Group-batch

Products shall be submitted for acceptance in batches; each batch shall be composed of products of the same designation (or code), state, size specifications. The weight of each batch is unlimited.

6.3 Weighing

The product shall be weighed based on kilogram.

6.4 Inspection items

Each batch of composite materials shall be tested for chemical composition, clad ratio deviation, size deviation, room temperature tensile mechanical properties, cupping properties, tube core and appearance quality.

6.5 Sampling

unqualified specimen properties in the repeated test results, the batch (furnace) of product is judged as unqualified. Upon agreement between the supplier and the buyer, the supplier is allowed to inspect one by one and roll by roll, the qualified ones are delivered.

6.6.5 When the cupping performance of any specimen is unqualified, it shall, from the batch (furnace) of products (including the product represented by the unqualified sample) (or on the product represented by the unqualified sample), take another double number of specimens to repeat the test. When the repeated test results are all qualified, then the batch (furnace) of products are judged to be qualified. If there are still unqualified specimen properties in the repeated test results, the batch (furnace) of product is judged as unqualified. Upon agreement between the supplier and the buyer, the supplier is allowed to inspect one by one, the qualified ones are delivered.

6.6.6 When the tube core of any product is unqualified, the batch of products shall be deemed unqualified. Upon agreement between the supplier and the buyer, inspection is allowed on a roll-by-roll basis; those that pass the test will be delivered.

6.6.7 When the appearance quality of any product is unqualified, the batch of products shall be deemed unqualified. Upon agreement between the supplier and the buyer, inspections are allowed one by one and roll by roll; those that pass the test will be delivered.

7 Marking, packaging, transportation, storage and quality certificate

7.1 Marking

7.1.1 Product mark

7.1.1.1 The following marks (or labels) shall be printed on the upper and lower 3 sheet stacks that have passed the inspection, or on each roll of strip or foil:

a) Product name;

b) Designation;

c) Status;

d) Size specifications;

e) Product batch number or coil number;

f) Net weight;

g) The inspection seal of the supplier's quality inspection department (or the signature or seal of the quality inspector).

7.1.1.2 Single-sided composite materials shall be marked (such as scribed) on the brazing surface of each sheet, strip and foil.

7.1.2 Packing box mark

The packaging box mark of the product shall meet the requirements of GB/T 3199.

7.2 Packaging, transportation and storage

The sheets are not greased; there is no paper packing between the sheets. When the buyer requires grease or paper pad, it shall be indicated in the order form (or contract). The packaging method of strip and foil is indicated in the order form (or contract). Other packaging, transportation, storage requirements are in accordance with GB/T 3199.

7.3 Quality certificate

Each batch of composite materials shall be accompanied by a product quality certificate, which shall indicate:

a) The name of the supplier;

b) Product name;

c) Designation, status, size specification and clad ratio;

d) Batch number or coil number;

e) Net weight and quantity;

f) Number of this standard;

g) The analysis and inspection results and the inspection seal of the supplier's quality inspection department;

h) Packing date (or exit-factory date).

8 Purchase order (or contract) content

The order form (or contract) for ordering materials as covered in this standard shall include the following:

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