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Aluminium and Aluminium Alloy
Multiport Profiles for Heat Exchanger

热交换器用铝及铝合金多孔型材

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Aluminium and Aluminium Alloy

Multiport Profiles for Heat Exchanger

1 Scope

This Standard specifies the requirements, test methods, test rules and marking, packaging, transportation, storage, quality certificate and order form (or contract) contents of aluminium and aluminium alloy multiport profiles for heat exchanger.

This Standard applies to aluminum and aluminum alloy multiport profiles for heat exchangers (hereinafter referred to as profiles) of which a single channel hydraulic diameter is greater than 1.0 mm.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 2523, Measuring method of surface roughness and peak count for cold-rolled metal sheet (strip)

GB/T 3190, Wrought aluminum and aluminum alloy. Chemical composition

GB/T 3199, Wrought aluminium and aluminium alloy products. Packing, marking, transporting and storing

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 judgment of limiting values

GB/T 12608, Thermal spraying - Wires, rods and cords for flame and arc spraying - Classification and technical supply condition

GB/T 12689, Methods for chemical analysis of zinc and zinc alloys

GB/T 14846, Tolerances on dimensions and form of aluminium and aluminium alloy extruded profiles

The roll-delivered profile, of which the grade is 1050, the status is H112 and the section code is YST02010001, is marked as:

MPF GB/T 33226-1050H112 YST02010001

Example 2:

The profile, of which the grade is 3102, the state is H112, zinc sprayed, the section code is YST02010002, and the length is 685.0 mm, is marked as:

MPF GB/T 33226-3102H112ASZ YST02010002×685

3.2 Raw material

3.2.1 Round ingot

The low-magnification structure of the round ingot shall not have bright crystals and looseness; the dimensional deviation shall comply with the provisions of YS/T 67; the purity shall comply with the Class-II regulations of GB/T 32186-2015.

3.2.2 Wire blank

The continuously-extruded wire blank shall comply with the provisions of YS/T 848.

3.2.3 Zinc wire

The chemical composition of the surface-sprayed zinc wire shall comply with the provisions of grade-Zn99.99 in GB/T 12608.

3.3 Chemical composition

The chemical composition of the profile shall comply with the provisions of GB/T 3190.

3.4 Dimensional deviation

3.4.1 Cross-section dimensions

The dimensional deviation of the profile cross-section shall comply with the requirements of Table 4.

4.2 Chemical composition

4.2.1 The analysis method of chemical composition shall comply with requirements of GB/T 20975 or GB/T 7999; the arbitration analysis shall adopt the methods which are specified in GB/T 20975.

4.2.2 Perform routine chemical analysis only on the numerically specified elements other than those in “Aluminum” and “Other” of corresponding grades in GB/T 3190. When the mass fraction of the non-routine analysis element is suspected to exceed the limit value of this Standard, the producer shall analyze these elements.

4.2.3 The “Al” content is calculated according to the method which is specified in GB/T 3190. When the “Al” content is calculated, take the sum of the analytical values of the conventional analytical elements and the suspected excess unconventional analytical elements as the “sum of elemental content”.

4.2.4 The determination of analysis value is based on the rounding comparison method; the value rounding rules shall be carried out in accordance with the relevant provisions of GB/T 8170; the rounding digit shall be consistent with the limit digits which are specified in GB/T 3190.

4.3 Dimensional deviation

The tendon thickness, side wall thickness, plane wall thickness, angle and arc of the profile shall be measured by an image measuring instrument; other dimensions shall be measured according to GB/T 14846.

4.4 Tensile mechanical properties at room temperature

The test method of vertical stretching of the profile at room temperature shall be carried out in accordance with provisions of GB/T 16865.

4.5 Zinc spraying amount

The measurement method of surface zinc spraying amount of the profile is as specified in GB/T 16921; during the measurement, take the average value of the five points which are uniformly distributed in the width direction on each measuring surface (accurate to 0.1 g/m²).

4.6 Salt spray corrosion resistance

The salt spray corrosion resistance of the profile is in accordance with the provisions of Appendix D of GB/T 33230-2016.

4.7 Pressure resistance

The test method of burst pressure of the profile is carried out according to the

method in GB/T 15560.

4.8 surface roughness

The surface roughness is measured according to the provisions of GB/T 2523; for the untreated surface, test Rz value; for the zinc-sprayed surface, test Ra value. The measurement trace shall include the entire width range of the upper and lower surfaces of the product; take the maximum value as the measurement result.

4.9 Appearance quality

Visually inspect the appearance quality under natural scattered light. When the defect depth cannot be determined, it is available to adopt the grinding method and the slitting method and use the instrument and equipment of corresponding precision to perform the measurement.

5 Test rules

5.1 Inspection and acceptance

5.1.1 The profile shall be inspected by the supplier to ensure that the profile quality complies with the requirements of this Standard and the order form (or the contract); the supplier shall fill in the quality certificate.

5.1.2 The buyer shall inspect the received profiles in accordance with the provisions of this Standard. If the test result is inconsistent with the provisions of this Standard and the order form (or the contract), a written form shall be submitted to the supplier; the issue shall be settled by negotiation between the supplier and the buyer. Objections of appearance quality and dimensional deviation shall be filed within one month from the date of receipt of the profile; objections of other performances shall be filed within 3 months from the date of receipt of the profile. Arbitration, if required, may be carried out by an organization which is recognized by both the supplier and the buyer; the sampling shall be jointly done on the buyer's side.

5.2 Batch

Profiles shall be submitted for acceptance in batches. Each batch shall consist of profiles of the same grade, state, section code, and film code; the weight of each batch shall not be limited.

5.3 Weight

The profiles shall be weighed on the scales.

5.4 Inspection items

repeated tests. If all the repeated test results are qualified, the batch of profiles is judged to be qualified. If the result of zinc spraying amount of any sample is still unqualified in the repeated test, judge the batch to be unqualified.

5.6.5 When the salt spray corrosion resistance of any sample is unqualified, judge the batch to be unqualified.

5.6.6 When the result of pressure resistance of any sample is unqualified, take double the number of samples from the batch of profiles to perform repeated tests. If all the repeated test results are qualified, the batch is judged to be qualified. If the result of pressure resistance of any sample is still unsatisfactory in the repeated test, then, judge the batch to be unqualified.

5.6.7 When the result of surface roughness of any sample is unqualified, take double the number of samples from the batch of profiles to perform repeated tests. If all the repeated test results are qualified, the batch is judged to be qualified. If any sample is still unqualified in the repeated test result, judge the batch to be unqualified.

5.6.8 When the appearance quality of any profile is unqualified, judge the coil (roll) of profile to be unqualified.

6 Marking, packaging, transportation, storage and quality certificate

6.1 Marking

6.1.1 Product marking

The packaging of the qualified profile shall be printed with markings (or labeling) of the following contents:

- a) the inspection stamp of the supplier's quality inspection department (or the signature or stamp of the quality inspection personnel);
- b) grade, status and cross-section code, film code of the surface-treated profile;
- c) product batch number or date of manufacture;
- d) quantity and net weight.

6.1.2 Package marking

The package marking of the profile shall comply with the provisions of GB/T 3199.

6.2 Packaging

The profiles shall be packaged in paper or paper tape in bundles; an appropriate amount of desiccant shall be placed in the package for moisture protection; the rolls shall be protected by padding or foam. Others are in accordance with the provisions of GB/T 3199. The packaging mode and method which is different from GB/T 3199 shall be agreed upon by the supplier and the buyer, and shall be indicated in the order form (or contract).

6.3 Transportation and storage

The transportation and storage of the profiles shall comply with the provisions of GB/T 3199.

6.4 Quality certificate

Each batch of profiles shall be accompanied by a product quality certificate, which indicates:

- a) the name of the supplier;
- b) product name;
- c) grade, status, cross-section code, film code;
- d) product batch number or date of manufacture;
- e) net weight or number of pieces;
- f) various of analysis and test results;
- g) the inspection stamp of the supplier's quality inspection department;
- h) code of this Standard;
- i) Date of packaging (or date of manufacture).

7 Order form (or contract) contents

The order form (or contract) that orders the products which are listed in this Standard shall include the following:

- a) product name;
- b) grade;
- c) status;

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