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NATIONAL STANDARD OF THE
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ICS 77.150.10

H 61

GB/T 20250-2006

Aluminum and Aluminum Alloys Continue Extruded Tubes

铝及铝合金连续挤压管

Issued on: May 8, 2006

Implemented on: October 1, 2006

Issued by: General Administration of Quality Supervision, Inspection and Quarantine;

Standardization Administration of the People's Republic of China.

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Aluminum and Aluminum Alloys Continue Extruded Tubes

1 Scope

This Standard specifies the requirements, test methods, inspection rules and markings, transportation, storage, contract contents, etc. for aluminum and aluminum alloy continue extruded tubes.

This Standard applies to aluminum and aluminum alloy coils produced by continuous extrusion.

2 Normative References

The provisions in the following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 228 Metallic materials – Tensile testing at room temperature

GB/T 244 Metallic materials – Tube – Bend test method

GB/T 246 Metallic materials – Tube – Flattening Test

GB/T 3190 Chemical composition of wrought aluminum and aluminum alloys

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

GB/T 4340.1 Metallic materials - Vickers hardness test - Part 1: Test method

GB/T 6987 (all parts) Chemical analysis methods for aluminum and aluminum alloys

GB/T 16865 Test Pieces for Tensile Test for Wrought Aluminum and Magnesium Alloy Products

GB/T 17432 Methods for sampling for analyzing the chemical composition of wrought aluminum and aluminum alloys

3.7 Residue mass per unit inner surface area

The residue mass per unit inner surface area of the aluminum tube shall not exceed 30 mg/m².

4 Test Method

4.1 Arbitration analysis method for chemical composition

The arbitration analysis of chemical composition shall be carried out in accordance with the method specified in GB/T 6987.

4.2 Measurement method for dimension deviation

The dimensional deviation of the tube shall be measured with a measuring tool of corresponding accuracy.

4.3 Test method for mechanical properties at room temperature

The tensile test at room temperature of the tube shall be carried out in accordance with the provisions of GB/T 228; and the hardness test shall be carried out in accordance with the provisions of GB/T 4340.1.

4.4 Test method for process performance

4.4.1 Test method for air tightness

Connect one end of the tested tube to the pressure gauge and the other end to the nitrogen bottle with a pressure gauge. Fill the tube with nitrogen until the pressure in the tube reaches at least 1 MPa; then cut off the gas source and seal the two ends of the tube. After the pressure in the tube is balanced, maintain the pressure (at least 1 MPa) for 30 min and observe whether the pressure gauge value decreases.

4.4.2 Bending test

The bending test shall be carried out in accordance with the provisions of GB/T 244.

4.4.3 Flattening test

The flattening test shall be carried out in accordance with the provisions of GB/T 246.

4.5 Measurement method for the mass of residue per unit inner surface area of aluminum tube

The method for determining the mass of residue per unit inner surface area of aluminum tube can refer to Appendix A (informative); or be carried out according to the test method agreed upon by the supplier and the purchaser.

- b) Manufacturer name and trademark;
- c) Product designation;
- d) Supply state;
- e) Batch number.

6.2 Packaging, transportation and storage

6.2.1 The coil shall be spirally wound in multiple layers, with moderate winding strength and a minimum bending radius of no less than 250 mm.

6.2.2 The inner and outer circumferences and both sides of the coil shall be wrapped with corrugated paper and rolled with packing tape. To prevent moisture and pollution, it shall be covered with plastic cloth and then packed in an outer box with a certain strength.

6.2.3 The packaging, transportation and storage of tubes shall comply with the provisions of GB/T 3199; and shall be clearly marked with the words "moisture-proof and pressure-proof" and placed in a non-corrosive environment.

6.3 Quality certificate

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

- a) Name, address, telephone number and fax number of the supplier;
- b) Product name;
- c) Product designation;
- d) Specification and accuracy level;
- e) Supply state;
- f) Batch number;
- g) Net weight and number of pieces;
- h) Results of various analysis and inspections and stamp of the technical supervision department;
- i) Number of this standard;
- j) Exit-factory date (or packaging date).

Appendix A

(Informative)

Method for Measuring the Mass of Residues on the Inner Surface of the Aluminum Tube

A.1 Scope

This Method is applicable to measuring the mass of residues on the inner surface of the aluminum tube. The measuring range is $5\text{mg/m}^2 \sim 60\text{mg/m}^2$.

A.2 Principle of the method

Use a highly volatile cleaning agent to soak and wash out the dirt in the tested specimen tube; then heat it to make the cleaning agent completely evaporate; and then calculate the mass of the residue per unit inner surface area of the aluminum tube by measuring the weight of the residue.

A.3 The instruments used

A.3.1 Ultrasonic oscillator.

A.3.2 Analytical balance (0.1 mg).

A.3.3 Drying oven.

A.3.4 Constant temperature box.

A.4 Reagents

Cleaning agent: trichloroethylene (analytically pure) or carbon tetrachloride.

A.5 Test procedures

A.5.1 Use a tube cutter to cut a specimen of 4 m~6 m.

A.5.2 Bend the specimen into a U shape, place it on the platform, and make the two ends face upward.

A.5.3 Inject 80 mL of cleaning agent (A.4) from one end of the tube; then cover both ends of the tube with plastic caps; shake with an ultrasonic oscillator (A.3.1) for 1 min to 2 min; stand for 10 min; shake again for 1 min to 2 min. And then pour the cleaning agent from the other end of the tube into a beaker with a constant weight (constant weight value m_1).

A.5.4 Heat the beaker on a low-temperature electric furnace to evaporate the cleaning agent. When a small amount of solution remains in the beaker, place the beaker in a constant

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