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Aluminium alloy stretched plates

铝合金预拉伸板

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Aluminium alloy stretched plates

1 Scope

This Standard specifies the requirements, test methods, inspection rules and marking, packaging, transportation, storage and quality certification and ordering (or contracting) information for aluminium alloy stretched plates.

This Standard applies to aluminium alloy plates (hereinafter referred to as plates) which are stretched in accordance with the specified amount of 1.5% ~ 3% after solution heat treatment.

2 Normative references

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

GB/T 3075, *Metallic materials – Fatigue testing – Axial-force-controlled method*

GB/T 3190, *Wrought aluminium and aluminium alloy – Chemical composition*

GB/T 3199, *Wrought aluminium and aluminium 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 3246.2, *Inspection method for structure of wrought aluminum and aluminum alloy products – Part 2: Inspection method for macrostructure*

GB/T 3880.1, *Wrought aluminium and aluminium alloy plates, sheets and strips for general engineering – Part 1: Technical conditions of delivery*

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

GB/T 4161, *Metallic materials – Determination of plane-strain fracture toughness*

GB/T 6519, *Process for ultrasonic inspection of wrought aluminum alloy products*

3.13 Macrostructure

3.13.1 The macrostructure of plates shall not be layered.

3.13.2 For plates of 7050 alloy and conditions T7451 and T7651, and of 7150 alloy and condition T7751, when the “special purposes” are stated in the order (or contract), non-fracture macrostructure samples shall be taken for the inspection on macrostructure; the macrostructure samples shall be free from cracks, layers, inclusions and visible oxidation film defects.

3.13.3 For plates of 7050 alloy and conditions T7451 and T7651, and 7150 alloy and T7751, with a thickness greater than or equal to 25.00 mm, when the “fracture macrostructure requirements” are stated in the order (or contract), macrostructure samples shall be taken for the inspection on fracture organization; the fracture shall be free from visible oxidation films and non-metallic inclusions and other injurious defects.

3.14 Microstructure

The microstructure of plates shall not be overburnt.

3.15 Appearance quality

3.15.1 The surface of plates shall be free from cracks, peels, non-metallic presses, corrosion, corrosion pits, slip lines and irremovable grease marks.

3.15.2 The surface of plates shall be free from indentations, impressions, metallic presses, slight scratches, bruises, overly-pressed scratches and other defects, with a depth exceeding the minus deviation of the thickness of plates. The difference of the thickness of plates at the defects and the depth of the defects shall not be less than the minimum thickness allowed for plates.

3.15.3 The surface of plates allows oxidation tinted smooth dark areas and dark areas along the direction of rolling.

3.15.4 Technical cladding plates allow cladding falling off and bubbles under cladding.

3.15.5 On the surface of normal cladding plates per square meter, the total area of bubbles shall not be greater than 40 mm²; a single one shall not be greater than 10 mm².

3.15.6 The defects of the surface of plates are allowed to be coped with using sandpaper while inspecting; the area of coping shall not exceed 5% of the area; the depth of coping shall not exceed the allowable minus deviation of the thickness of plates. The thickness of the locations of plates coped with shall not be less than the minimum allowable thickness of plates.

purchaser's premises.

5.2 Batch

Plates shall be submitted by batch for acceptance. Each batch consists of plates of the same designation, condition and specification; the weight of each batch is not subjected to a limitation. When it is required that one melt form a batch or that there is any requirement on the batch weight, it shall be as agreed by the supplier and the purchaser and stated in the order (or contract).

5.3 Weight

Plates shall be weighed.

5.4 Inspection items

5.4.1 Before delivery, the inspection on chemical composition, dimensional tolerances, room temperature tensile property and appearance quality shall be carried out for each batch of plates.

5.4.2 The thickness of cladding shall be ensured by the technique of the supplier without delivery inspection. If the "inspection on the thickness of cladding" is stated in the order (or contract), the inspection on the thickness of cladding shall be carried out.

5.4.3 For 7150 alloy plates in T7751 condition, when the inspection on the compression yield strength is stated in the order (or contract), the inspection on the compression yield strength shall be carried out.

5.4.4 For plates of 7075 alloy in conditions T7351 and T7651, of 7050 alloy in conditions T7451 and T7651, and of 7150 alloy in condition T7751, the inspection on the electrical conductivity shall be carried out.

5.4.5 For plates of 7050 alloy in conditions T7451 and T7651, and of 7150 alloy in condition T7751, when the inspection on the stress corrosion property is stated in the order (or contract), the inspection on the stress corrosion property shall be carried out.

5.4.6 For plates of 7050 alloy in conditions T7451 and T7651, and of 7150 alloy in condition T7751, when the inspection on the exfoliation corrosion property is stated in the order (or contract), the inspection on the exfoliation corrosion property shall be carried out.

5.4.7 For plates of 7050 alloy in conditions T7451 and T7651, and of 7150 alloy in condition T7751, when the inspection on the fracture toughness property is stated in the order (or contract), the inspection on the fracture toughness property shall be carried out.

5.4.8 When the "ultrasonic inspection and inspection level" are stated in the order (or

piece is determined to be acceptable. If there is still any sample unacceptable among the reinspection results, then the tensile piece is determined to be unacceptable.

5.6.5 When the room temperature compression property of any sample is unacceptable, it is allowed to cut out double the number of samples once again from the tensile piece for reinspection, and when all of the reinspection results are acceptable, then the tensile piece is determined to be acceptable. If there is still any sample unacceptable among the reinspection results, then the tensile piece is determined to be unacceptable.

5.6.6 When the electrical conductivity of any sample is unacceptable, then the tensile piece is determined to be unacceptable. But it is allowed to take samples for the test on the stress corrosion property and the exfoliation corrosion property; when all the test results on the stress corrosion property and the exfoliation corrosion property are acceptable, the tensile piece is determined to be acceptable. If there is still any sample unacceptable among the test results of the stress corrosion property and the exfoliation corrosion property, then the tensile piece is determined to be unacceptable. But the supplier is allowed to repeat heat treatment and take samples once again with respect to all relevant properties.

5.6.7 When the stress corrosion property of any sample is unacceptable, the batch is determined to be unacceptable. But the supplier is allowed to carry out aging treatment and take samples once again with respect to all relevant properties.

5.6.8 When the exfoliation corrosion property of any sample is unacceptable, the batch is determined to be unacceptable. But the supplier is allowed to carry out aging treatment and take samples once again with respect to all relevant properties.

5.6.9 When the fracture toughness property of any sample is unacceptable, the tensile piece is determined to be unacceptable.

5.6.10 When the ultrasonic inspection of any plate is unacceptable, the piece is determined to be unacceptable.

5.6.11 When the fatigue property of any sample is unacceptable, the tensile piece is determined to be unacceptable.

5.6.12 When the macrostructure of any sample is unacceptable, the batch is determined to be unacceptable. However, when the purchaser agrees to the supplier's requirements for the inspection on each piece, the inspection on each piece can be carried out and those acceptable can be delivered.

5.6.13 When the macrostructure of any sample is unacceptable, the batch is determined to be unacceptable.

5.6.14 When the appearance quality of any plate is unacceptable, the piece is

g) inspection results on all analytical items and stamp of the technical supervision department;

h) packaging date (or delivery date).

7 Ordering (or contracting) information

The order (or contract) for ordering the plates listed in this Standard shall include the following information:

- a) product name;
- b) designation;
- c) condition;
- d) specification
- e) weight (or number of pieces);
- f) for the inspection on the thickness of cladding for plates with normal aluminium cladding or technical aluminium cladding is required, the “inspection on the thickness of cladding” shall be stated;
- g) for plates of 7150 alloy for which the inspection on the longitudinal compression yield strength is required, the “inspection on the longitudinal compression yield strength” shall be stated;
- h) for plates of 7050 alloy in conditions T7451 and T7651, and of 7150 alloy in condition T7751, when the inspection on the stress corrosion property is required, the “inspection on the stress corrosion property” shall be stated;
- i) for plates of 7050 alloy in conditions T7451 and T7651, and of 7150 alloy in condition T7751, when the inspection on the exfoliation corrosion property is required, the “inspection on the exfoliation corrosion property” shall be stated;
- j) for plates of 7050 alloy in conditions T7451 and T7651, and of 7150 alloy in condition T7751, when the inspection on the fracture toughness property is required, the “inspection on the fracture toughness property” shall be stated;
- k) for plates for which the ultrasonic inspection is required, the “ultrasonic inspection and inspection level” shall be stated;
- l) for 7050 alloy in condition T7451, when the inspection on the fatigue property is required, the “inspection on the fatigue property” shall be stated;

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