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Titanium Alloy Extrusion Profiles for Aviation

航空用钛合金挤压型材

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Titanium Alloy Extrusion Profiles for Aviation

1 Scope

This Standard stipulates the technical requirements, test methods, inspection rules, marking, packaging, transportation, storage, quality certificate and order form (or contract) content of titanium alloy extrusion profiles for aviation.

This Standard is applicable to titanium alloy profiles which are manufactured through the method of extrusion (hereinafter referred to as profiles).

2 Normative References

The following documents are indispensable to the application of this document. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 228.1 *Metallic Materials - Tensile Testing - Part 1: Method of Test at Room Temperature*;

GB/T 3620.1 *Designation and Composition of Titanium and Titanium Alloys*;

GB/T 3620.2 *Titanium and Titanium Alloys - Permissible Variations of Chemical Composition for Wrought Product Analysis*;

GB/T 4698 (all parts) *Methods for Chemical Analysis of Titanium Sponge, Titanium and Titanium Alloys*;

GB/T 5168 *Microstructure and Macrostructure Examination for α - β Titanium Alloys*;

GB/T 8180-2007 *Wrought Titanium and Titanium Alloy Products - Packing, Marking, Transporting and Storing*;

GB/T 23603 *Test Method of Titanium and Titanium Alloy Surface Contamination Layer*.

3 Technical Requirements

3.1 Materials

3.1.1 Ingots for the manufacture of profiles shall go through at least two times of smelting. The first time of smelting may adopt vacuum consumable electric-arc furnace or cold-hearth furnace for smelting. The subsequent smelting shall adopt vacuum consumable electric-arc furnace for smelting. Furthermore, the last time of smelting

3.9.1 The surface of profiles shall be clean; there shall be no cracks, folds, peeling, pinholes, oxidized color, metallic or non-metallic inclusions.

3.9.2 The surface of profiles allows the existence of slight defects that are not more than 0.1 mm, such as scratches, extrusion marks, pitting and wrinkles. However, the allowed minimum dimension shall be guaranteed.

3.9.3 It is allowed to eliminate partial defects on profiles. However, after the elimination, the allowed minimum dimension of profiles shall be guaranteed. The ratio of the depth and breadth of such elimination shall be not more than 1:6.

4 Test Methods

4.1 Chemical composition shall be tested in accordance with GB/T 4698.

4.2 Dimensions and allowable deviations shall be tested through measuring instruments of corresponding accuracy.

4.3 Room-temperature tensile properties shall be tested in accordance with GB/T 228.1.

4.4 Macrostructure shall be tested in accordance with GB/T 5168.

4.5 Microstructure shall be tested under 200 times in accordance with GB/T 5168.

4.6 Surface contamination shall be tested under 100 times in accordance with GB/T 23603.

4.7 Surface quality shall be tested through visual inspection, or through measuring instruments of corresponding accuracy.

5 Inspection Rules

5.1 Inspection and Acceptance Inspection

5.1.1 Products shall be inspected by the supply-side, which shall guarantee that product quality complies with the stipulations of this Standard and the order form (or contract). In addition, a quality certificate shall be filled out.

5.1.2 The demand-side shall inspect the received products in accordance with the stipulations of this Standard and the order form (or contract). If the inspection result does not comply with the stipulations of this Standard and the order form (or contract), the demand-side shall propose this to the supply-side within 3 months, starting from the date of receiving the products. This shall be settled by the demand-side and the supply-side through negotiation.

5.4.3 When the inspection result of dimensions, allowable deviations and surface quality is disqualified, then, that product shall be determined as disqualified.

6 Marking, Packaging, Transportation, Storage and Quality Certificate

6.1 Product Marking

On products that are qualified in the inspection, the following marking (or label) shall be made:

- a) Designation;
- b) Specification;
- c) Status;
- d) Batch No.;
- e) Serial No. of this Standard.

6.2 Packaging, Marking, Transportation and Storage

Products' packaging, marking, transportation and storage shall comply with the stipulations of pipes in GB/T 8180-2007.

6.3 Quality Certificate

Each batch of products shall be attached with a quality certificate, which indicates:

- a) The supply-side's name;
- b) Product's name;
- c) Product's designation, specification and status;
- d) Smelting furnace No., batch No., batch weight and quantity;
- e) Various analysis and inspection results, and the quality inspection department's inspection stamp;
- f) Serial No. of this Standard;
- g) Date of packaging.

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