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Titanium-nickel shape memory alloy plate

钛镍形状记忆合金板材

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Titanium-nickel shape memory alloy plate

1 Scope

This document specifies the technical requirements, test methods, inspection rules, marking, packing, transporting, storing, accompanying documents and order form content for titanium-nickel shape memory alloy plate.

This document is applicable to the titanium-nickel shape memory alloy plate used for making spectacle frames, orthopedic implants, springs, etc.

2 Normative references

The contents of the following documents, through normative references in this text, constitute indispensable provisions of this document. Among them, for dated references, only the edition corresponding to that date applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 228.1-2010 Metallic materials - Tensile testing - Part 1: Method of test at room temperature

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 titanium and titanium alloys

GB/T 6394-2017 Determination of estimating the average grain size of metal

GB/T 8180 Wrought titanium and titanium alloy products packing, marking, transporting and storing

GB/T 23614.1 Methods for chemical analysis of titanium nickel shape memory alloy - Part 1: Determination of nickel content - Dimethylglyoxime precipitate separation-EDTA complex-zinc chloride back titration

GB/T 23614.2 Chemical analysis methods for titanium nickel shape memory alloy - Part 2: Determination of cobalt, copper, chromium, iron, niobium content - Inductively coupled plasma atomic emission spectrometry

negotiation.

4.8 Appearance quality

4.8.1 Hot-rolled plates are allowed to be delivered with alkaline pickling, sandblasting and sanding surfaces.

4.8.2 The surface of the plate is allowed to have slight darkening and local water marks, as well as local defects such as scratches, indentations, and pits that do not exceed the tolerances of its thickness. Cracks, peeling, oxide scale, crushing, metal and non-metal inclusions, and traces of alkaline washing are not allowed.

4.8.3 The plate allows local defects to be removed along the rolling direction. However, the thickness of the plate after removal shall not be less than the minimum allowable thickness.

4.8.4 There shall be no delamination in the plate.

5 Test methods

5.1 Chemical composition analysis: The analysis of nickel is carried out in accordance with the provisions of GB/T 23614.1. The analysis of cobalt, copper, chromium, iron and niobium is carried out in accordance with the provisions of GB/T 23614.2. The analysis of the remaining elements is carried out in accordance with the corresponding provisions of GB/T 4698.

5.2 The dimensions and shape are inspected using measuring tools of corresponding accuracy.

5.3 The inspection of mechanical properties shall be carried out in accordance with the provisions of GB/T 228.1-2010. For plates with a thickness of ≤ 3.0 mm, select P1 samples. For plates with thickness > 3.0 mm~6.0 mm, select P7 samples. For plates with thickness > 6.0 mm~10.0 mm, select P8 samples. For plates with a thickness of > 10.0 mm, select R7 samples.

5.4 The average grain size shall be inspected in accordance with the provisions of GB/T 6394-2017.

5.5 The microstructure and macrostructure shall be inspected in accordance with the provisions of GB/T 5168.

5.6 The shape recovery temperature shall be inspected in accordance with the provisions of YS/T 970 or YY/T 0641. The arbitration method shall be conducted in accordance with the provisions of YY/T 0641.

Labels or plates shall be affixed to the products that have passed the inspection. The following marks shall be indicated on them:

- a) Product designation;
- b) Lot number and supply state;
- c) Product specifications;
- d) Quantity and weight.

7.2 Packing, marking, transporting, storing and accompanying documents

The packing, packing marking, transporting and storing of the product shall comply with the provisions of GB/T 8180.

7.3 Accompanying documents

Each lot of products shall be accompanied by accompanying documents, which shall include supplier information, product information, number of this document, date of exit-factory or packing; and should also include:

- a) Product quality assurance:
 - Main performance and technical parameters of the product;
 - Product characteristics (including the characteristics of manufacturing process and raw materials);
 - Responsibility for product quality;
 - Quality certification obtained by the product and the results of various analyses and inspections with the inspection seal of the technical supervision department of the supplier.
- b) Product conformity certificate:
 - Inspection items and their results or inspection conclusions;
 - Lot size or lot number;
 - Inspection date;
 - Inspector's signature or seal.
- c) Inspection report and finished product inspection report during product quality control.

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