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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 26059-2010

Titanium and titanium alloy halftone

钛及钛合金网板

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Foreword

This standard was proposed by the China Nonferrous Metals Industry Association.

This standard is under the jurisdiction of the National Technical Committee on Nonferrous Metals of Standardization Administration of China (SAC/TC 243).

1 Scope

The Chinese product standard for expanded titanium mesh - the sheet that is slit and stretched into a diamond mesh in one operation, so that the strands are all one piece of metal with no welds or joins. Expanded titanium is the working material of electrochemistry: it makes the anodes and cathodes of electrolysis cells, the current collectors of batteries, filter and demister elements in chemical plant, and the mesh implants of surgery, because titanium survives brine, acid and body fluid where any cheaper metal is eaten away, and because a mesh gives a large surface area with very little mass. Everything about its usefulness comes down to geometry - strand width, long and short pitch of the diamond, sheet thickness - and to the metal being the grade it was ordered as. This standard fixes the requirements, the test methods, the inspection rules, the marking, packaging, transport and storage, and the contents of the contract or order form for such mesh, and it applies to titanium and titanium alloy mesh of all uses that is cold-stamped from plate. It covers the commercially pure grades and one alloy grade, in the cold-worked, annealed and cold-flattened-annealed conditions, and it carries a worked example of how a mesh is designated in an order. Producers of titanium mill products, the electrochemical and chemical plant industries and the inspection houses that arbitrate between them are the ones who use it.

This standard specifies the requirements, the test methods, the inspection rules and the marking, packaging, transport and storage of titanium and titanium alloy mesh, as well as the contents of the contract (or order form).

This standard applies to titanium and titanium alloy mesh for all kinds of use, cold-stamped from plate.

2 Normative references

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

GB/T 3620.1 Titanium and titanium alloys - Designation and composition.

GB/T 3620.2 Titanium and titanium alloys - Permissible variations of chemical composition for finished products analysis.

GB/T 4698 (all parts) Methods for chemical analysis of sponge titanium, titanium and titanium alloys.

GB/T 6394 Metal - Determination of estimating the average grain size.

GB/T 8180 Package, mark, transportation and storage for titanium and titanium alloy processed products.

3.1.1 Grade, condition and specification

The grade, the condition and the specification of the product shall comply with the requirements of Table 1. The table lists the commercially pure grades TA1, TA2, TA3, TA8, TA8-1, TA9, TA9-1 and TA10 together with the alloy grade TC1; the supply conditions cold-worked (Y), annealed (M) and cold-flattened annealed (ZM); and, for each combination, the sheet thickness, the width and length of the mesh sheet, and the long pitch, short pitch and strand width of the mesh aperture. Two notes add that the supply condition shall be stated in the contract and that, where it is not stated, the product is supplied in the cold-worked condition, and that mesh of other specifications and grades may be supplied by agreement when the purchaser asks for it. The dimensions themselves are in the standard.

3.1.2 Shape of the product

The shape of the product is as shown in Figure 1: a rectangular mesh sheet of stated length and width, with the mesh aperture called out, and a detail view of a single diamond aperture giving the long pitch, the short pitch, the strand width and the section through a strand.

3.1.3 Designation example

The designation of the product is written in the order product name, grade, condition, specification and standard number. Clause 3.1.3 gives a worked example for a mesh made of TA1 in the cold-flattened annealed condition, of a stated sheet thickness, mesh width, mesh length and aperture, written out in the form "Mesh TA1 ZM ... - ... GB/T 26059-2010".

3.2 Chemical composition

The chemical composition of the mesh shall comply with the provisions for the relevant grade in GB/T 3620.1. Where the purchaser asks for a check analysis, the permissible variations of the chemical composition shall comply with the provisions of GB/T 3620.2.

3.3.1 Dimensional tolerances

The dimensions and permissible deviations of the mesh sheet are as specified in Table 2, and the permissible deviations of the dimensions of the mesh aperture are as specified in Table 3. Table 2 is set out by sheet thickness and gives the thickness tolerance together with the tolerances on the width and the length of the sheet; Table 3 is set out by long pitch and gives the tolerances on the long pitch, the short pitch and the strand width. The values themselves are in the standard.

3.3.2 Cutting

The mesh sheet shall be cut square, every corner being cut to a right angle, and the out-of-square shall not exceed the permissible deviations on the width and the length of the mesh sheet.

3.3.3 Flatness

Clause 3.3.3 fixes the flatness of the mesh sheet in the cold-worked condition and in the annealed condition, and separately the tighter flatness of the mesh sheet in the cold-flattened annealed condition, in each case together with the maximum distance by which a corner may stand off the flat plate. No obvious local bending of the mesh sheet is allowed. The values themselves are in the standard.

3.4.1 Strands

No broken strands and no delamination are allowed on the mesh sheet.

3.4.2 Surface appearance

The mesh sheet shall have a bright surface after alkali and acid treatment and pickling; no oxide skin is allowed, but slight darkening and local water marks are permitted.

3.4.3 Surface defects

No macroscopic defects such as cracks, scabs, folds, or metallic and non-metallic inclusions, and no traces of over-pickling or over-alkali washing, are allowed on the surface of the mesh sheet.

3.5 Microstructure

Where the purchaser asks for it and it is stated in the contract (or order form), the mesh may be supplied batch by batch with the measured values of the grain size, including the metallographic photographs.

4 Test methods

The analysis of the chemical composition of the mesh is carried out in accordance with GB/T 4698.

The dimensions and the permissible deviations of the mesh are measured with measuring tools of the corresponding accuracy.

The surface quality of the mesh is inspected visually.

The microstructure of the mesh is examined in accordance with GB/T 6394.