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

GB/T 3624-2010

**Titanium and titanium alloy seamless tubes
(English Translation)**

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Table of Contents

Foreword...	3
1 Scope...	4
2 Normative references...	4
3 Requirements...	4
4 Test methods...	9
5 Inspection rules...	10
6 Marking, packaging, transport and storage...	12
7 Contents of contract (or order form)...	13

Foreword

This standard, during revision, makes reference to ASTM B861-06a "Titanium and titanium alloy seamless tubes".

This standard replaces GB/T 3624-1995 "Titanium and titanium alloy tubes".

As compared with GB/T 3624-1995, this standard mainly has the following changes.

- DELETE the relevant content of welded tube and welding-rolling tubes;
- CANCEL the designation TA0.ADD the designations TA3, TA8, TA8-1, TA9-

1 and the related requirements;

- ADJUST the mechanical properties of the tubes of designations TA1, TA2, TA9, TA10;
- ADJUST the pressure value of the hydraulic test of the tubes of designation TA10;
- ADD the provisions that "When the tubes of $D/t < 10$ are subjected to flattening test, the crack generated at the position corresponding to "6 o'clock" and "12 o'clock" on the inner surface of the tube shall not be used as the basis for rejection";
- ADD the provisions on the bending properties of the tubes; the purchaser

may make selection as needed;

- ADD the requirements of the contract (order form).

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

This standard shall be under the jurisdiction of the National Nonferrous Metals Standardization Technical Committee.

The responsible drafting organizations of this standard. Bao Titanium Group Co., Ltd., Baoji Titanium Industry Co., Ltd.

1 Scope

This standard specifies the requirements, test methods, inspection rules and markings, packaging, transport, storage, quality certificate and contract (or order form) contents of titanium and titanium alloy seamless tubes.

This standard is applicable to titanium and titanium alloy seamless tubes which are produced by cold rolling (cold drawing) method. It is suitable for general industrial use.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

GB/T 228 Metallic materials - Tensile testing at ambient temperature

GB/T 241 Metal materials - Tube - Hydrostatic pressure test

GB/T 244 Metallic materials - Tube - Bend test

GB/T 246 Metal materials - Tube - Flattening test

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) Sponge titanium, titanium and titanium alloys -

Determination of aluminum content

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

3.1.1 Designation, status and specification of products

t - Nominal wall thickness of the tube, in millimeters (mm);

D - Nominal outer diameter of the tube, in millimeters (mm);

e - Constant, when the tube's diameter is less than or equal to 25.4 mm, e takes 0.04; when the tube's diameter is greater than 25.4 mm, e takes 0.06.

3.4.1.2 When the tubes of $D/t < 10$ are subjected to flattening test, the crack

generated at the position corresponding to "6 o'clock" and "12 o'clock" on the inner surface of the tube shall not be used as the basis for rejection.

3.4.2.1 When the purchaser requests and indicates in the contract (or the order

form), the tube shall be subjected to the hydraulic pressure or pneumatic pressure test. The test method selected by the purchaser shall be indicated in the contract (or order form). Where it is not indicated in the contract (or the order form), the supplier may not conduct the test, but must ensure that it meets the requirements for the minimum hydraulic pressure in 3.4.2.2 or the pneumatic pressure test in 3.4.2.3.

3.4.2.2 When the hydraulic test is carried out, the test pressure selected by the

purchaser shall be indicated in the contract (or order form). When not specified in the contract (or order form), the test pressure is calculated according to the following formula (2).

Where.

p - Test pressure, in Megapascal (MPa);

S - Allowable stress, which takes 50% of the minimum specified non-proportional extension strength, in Megapascal (MPa);

D - Nominal outer diameter of the tube, in millimeters (mm);

t - Nominal wall thickness of the tube, in millimeters (mm).

When the nominal outer diameter of the tube is not more than 76 mm, the maximum pressure of the hydraulic test is not more than 17.2 MPa; when the nominal outer diameter of the tube is greater than 76 mm, the maximum pressure of the hydraulic test is not more than 19.3 MPa. The pressure shall be maintained for 5 s during the test, the tube shall be free from distortion or leakage.

3.4.2.3 During the pneumatic pressure test, the pressure of the internal

use the S8 specimens in GB/T 228. For the tubes which have outer diameter greater than 35 mm, it shall use the S4 specimen.

4.3.3 Tube's pneumatic pressure test shall be carried out according to the method approved by both parties.

4.4 Measurement method of dimension

The dimensional inspection of the tube is carried out by the use of a gauge of corresponding accuracy.

4.5 Inspection method of appearance quality

The appearance quality of the tube is checked by visual inspection.

5.1.1 The product shall be inspected by the supplier's quality inspection

department, to ensure that the product's quality meets the requirements of this standard or contract (or purchase order). Meanwhile it shall fill in the quality certificate.

5.1.2 The products received by the purchaser shall be inspected and accepted

according to the provisions of this standard. If the inspection results are inconsistent with the provisions of this standard, they shall be submitted to the supplier within three months from the date of receipt of the product, to be settled by the supplier and the purchaser through negotiation. If arbitration is required,