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

GB/T 3098.8-2010

**Mechanical properties of fasteners -- Parts for bolted
connections for use at temperatures from -200 Celsius~+700
Celsius**

紧固件机械性能 -200℃~+700℃使用的螺栓连接零件

(English Translation)

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Foreword

This Part of GB/T 3098 (hereinafter referred to as this Part) is one of the national standards "Mechanical properties of fasteners" series. The series includes:

- a) GB/T 3098.1-2010 Mechanical properties of fasteners - Bolts, screws and studs;
- b) GB/T 3098.2-2000 Mechanical properties of fasteners - Nuts - Coarse thread;
- c) GB/T 3098.3-2000 Mechanical properties of fasteners - Set screws;
- d) GB/T 3098.4-2000 Mechanical properties of fasteners - Nuts - Fine pitch thread;
- e) GB/T 3098.5-2000 Mechanical properties of fasteners - Tapping screws;
- f) GB/T 3098.6-2000 Mechanical properties of corrosion-resistant stainless-steel fasteners - Part 1: Bolts, screws and studs;
- g) GB/T 3098.7-2000 Mechanical properties of fasteners - Thread rolling screws;
- h) GB/T 3098.8-2010 Mechanical properties of fasteners - Parts for bolted connections for use at temperatures from -200 °C ~ +700 °C;
- i) GB/T 3098.9-2010 Mechanical properties of fasteners - Prevailing torque type steel nuts;
- j) GB/T 3098.10-1993 Mechanical properties of fasteners - Bolts, screws, studs and nuts made of non-ferrous metals;
- k) GB/T 3098.11-2002 Mechanical properties of fasteners - Drilling screws with

taping screw thread;

l) GB/T 3098.12-1996 Mechanical properties of fasteners - Cone proof load test on nuts;

m) GB/T 3098.13-1996 Mechanical properties of fasteners - Torsional test and minimum torques for bolts and screws with nominal diameters 1 mm to 10 mm;

n) GB/T 3098.14-2000 Mechanical properties of fasteners - Widening test on nuts;

o) GB/T 3098.15-2000 Mechanical properties of fasteners - Nuts made of stainless-steel;

p) GB/T 3098.16-2000 Mechanical properties of fasteners - Set screws made of stainless-steel;

q) GB/T 3098.17-1996 Mechanical properties of fasteners - Preloading test for the Mechanical properties of fasteners - Parts for bolted connections for use at temperatures from -200 °C ~ +700 °C

1 Scope

This part of GB/T 3098 specifies the material designations and mechanical properties of bolts and nuts, as well as the relevant technical requirements for low temperature toughness at -200 °C and high temperature strength at +700 °C.

As an important supplement to GB/T 3098.1, GB/T 3098.2, GB/T 3098.4, it is applicable to the mechanical properties of fasteners in special working environments with working temperatures below -50 °C or above +150 °C.

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) is applicable to this standard.

GB/T 228 Metallic materials - Tensile testing at ambient temperature (GB/T 228-2002, eqv ISO 6892:1998)

GB/T 3098.1 Mechanical properties of fasteners - Bolts, screws and studs (GB/T

3098.1-2010, ISO 898-1:2009, MOD)

GB/T 3098.2 Mechanical properties of fasteners - Nuts - Coarse thread (GB/T

3098.2-2000, idt ISO 898-2:1992)

GB/T 3098.4 Mechanical properties of fasteners - Nuts - Fine pitch thread (GB/T

3098.4-2000, idt ISO 898-6:1994)

GB/T 3098.6 Mechanical properties of fasteners stainless steel bolts, screws and

studs (GB/T 3098.6-2000, idt ISO3506-1:1997)

GB/T 3098.15 Mechanical properties of fasteners stainless nut (GB/T 3098.15-2000,

idt ISO 3506-2:1997)

GB/T 3103.4 Tolerances for fasteners - Components for bolted connections made

mainly from materials with a high temperature strength

GB/T 3104 Fasteners - Widths across flats of hexagon products (GB/T 3104-1982,

eqv ISO 272:1982)

GB/T 4340.1 Metallic materials - Vickers hardness test - Part 1: Test method (GB/T

4340.1-2009, ISO 6507-1:2005, MOD)

GB/T13807.2 Connections with waisted stud - Studs (GB/T 13807.2-2008, DIN

2510-3/4/8:1971, MOD)

GB/T13807.3 Connections with waisted stud - Nuts, extension sleeves (GB/T

13807.3-2008, DIN 2510-5/6/7:1971, MOD)

DIN EN 10269:2006-07 Steels and nickel alloys for fasteners with specified

elevated and/or low temperature properties

AD 2000 - Instructions W2 1), austenitic and austenitic - Ferritic steels

AD 2000 - Instructions W7 1), bolts and nuts made of ferritic steel

AD 2000 - Instructions W10 1), low temperature materials - Iron materials

TRD 106 1) Steel bolts and nuts

VdTUV WB 113/2 2) Rolled or forged high temperature resistant austenitic steel,

x8 CrNiMoBNb16-16+wk - Material number Nr1.4986+wk

VdTUV WB 435/3 2) Rolled or forged heat-resistant austenitic steel, x5Ni Cr Ti 26

15-16 - Material number Nr1.4980

VdTUV WB 490 2) Bolts and nuts made of heat-resistant steel 35B2 - Material number Nr1.5511

3 Terms and definitions

The terms and definitions specified in DIN EN 10269, GB/T 3098.1, GB/T 3098.2, GB/T 3098.4, GB/T 3098.6, GB/T 3098.15 apply to this Part.

4.1 Mechanical properties

Table 1 gives austenitic steel fasteners with a minimum operating temperature of -

200 °C. The properties of the material shall comply with the provisions of GB/T 3098.6

and GB/T 3098.15.

2 Source: TÜV Publishing Co., Ltd. Rheinland, Postal Code 101750, 50672 Cologne.

- The tensile strength of the nut material shall be higher than 70% of the tensile strength of the bolt material;
- The reasonable matching of bolt and nut materials is shown in Table 3.

Note: If the bolt material is selected according to Table 3 and a load-bearing sleeve is used, the load-bearing sleeve shall preferably be made of the same material as the bolt.

4.2.2 Bolts with full load capacity

Bolts that meet the following requirements at the time of fracture can be considered to have full load capacity:

- When the bolts are subjected to a tensile test, the minimum tensile load ($R_{m,min} \times A_s$, nominal) in Table 4a or Table 5a can be reached;
- When the bolts made of steel and nickel-chromium steel in Table 2 are tested according to GB/T 3098.1, the fracture shall occur within the length of the unthreaded thread;
- When the bolts made of austenitic steel in Table 1 are tested according to GB/T