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(ISO 898-1 : 1999)

Mechanical properties of fasteners made of carbon steel and alloy steel— Part 1 : Bolts, screws and studs

ICS 21.060.10

Descriptors : bolts, external threads, mechanical testing, unalloyed steels, alloy steels, fasteners, mechanical properties of materials

Reference number : **JIS B 1051 : 2000 (E)**

Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently **JIS B 1051** : 1991 is replaced with **JIS B 1051** : 2000.
In this revision, the item of "Mechanical properties of divisions 4T to 7T of bolts and small screws made of carbon steel and alloy steel" traditionally specified in the annex to the Japanese Industrial Standard was omitted, and then the conformity with the corresponding **ISO 898-1** *Mechanical properties of fasteners made of carbon steel and alloy steel— Part 1 : Bolts, screws and studs* was intended in the text.

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JIS B 1051 : 2000
(ISO 898-1 : 1999)

Mechanical properties of fasteners made of carbon steel and alloy steel— Part 1 : Bolts, screws and studs

Introduction This Japanese Industrial Standard has been prepared based on **ISO 898-1**, *Mechanical properties of fasteners made of carbon steel and alloy steel— Part 1 : Bolts, screws and studs* issued in 1999 as the third edition without changing the technical contents.

The portions underlined with dots in this Standard are the matters not included in the original International Standard.

1 Scope This Standard specifies the mechanical properties of bolts, screws and studs made of carbon steel and alloy steel when tested at an ambient temperature range of 10 °C to 35 °C.

Products conforming to the requirements of this Standard are evaluated only in the ambient temperature range and may not retain the specified mechanical and physical properties at higher and lower temperatures. Attention is drawn to Annex A which provides examples of lower yield stress and stress at 0.2 % non-proportional elongation at elevated temperatures.

At temperatures lower than the ambient temperature range, a significant change in the properties, particularly impact strength, may occur. When fasteners are to be used above or below the ambient temperature range it is the responsibility of the user to ensure that the mechanical and physical properties are suitable for his particular service conditions.

Certain fasteners may not fulfill the tensile or torsional requirements of this Standard because of the geometry of the head which reduces the shear area in the head as compared to the stress area in the thread such as countersunk, raised countersunk and cheese heads (see clause **6**).

This Standard applies to bolts, screws and studs

— with coarse pitch thread M1.6 to M39, and fine pitch thread M8 × 1 to M39 × 3;

— with diameter/pitch combinations in accordance with **JIS B 0205** and **JIS B 0207**;

— with thread tolerance in accordance with **JIS B 0209** and **JIS B 0211**;

— made of carbon steel or alloy steel.

It does not apply to set screws and similar threaded fasteners not under tensile stresses (see **JIS B 1053**).

It does not specify requirements for such properties as

— weldability;

— corrosion-resistance;

— ability to withstand temperatures above +300 °C (+250 °C for 10.9) or below −50 °C;

— resistance to shear stress;

— fatigue resistance.

Remarks : The designation system of this Standard may be used for sizes outside the limits laid down in this clause (e.g. $d > 39$ mm), provided that all mechanical requirements of the property classes are met.

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions (including the amendment) of the standards indicated below shall be applied.

JIS B 0205 *Metric coarse screw threads*

JIS B 0207 *Metric fine screw threads*

Remarks : The provisions cited from **ISO 68-1** : 1998, *ISO general purpose screw threads—Basic profile—Part 1 : Metric screw threads*, **ISO 261** : 1998, *ISO general purpose metric screw threads—General plan*, **ISO 262** : 1998, *ISO general purpose metric screw threads—Selected sizes for screws, bolts and nuts* and **ISO 724** : 1978, *ISO general purpose metric screw threads—Basic dimensions* are equivalent to the corresponding provisions in the said standard.

JIS B 0209 *Limits of sizes and tolerances for metric coarse screw threads*

JIS B 0211 *Limits of sizes and tolerances for metric fine screw threads*

Remarks : The provisions cited from **ISO 965-1** : 1998, *ISO general purpose metric screw threads—Tolerances—Part 1 : Principles and basic data* and **ISO 965-2** : 1998, *ISO general purpose metric screw threads—Tolerances—Part 2 : Limits of sizes for general purpose external and internal screw threads—Medium quality* are equivalent to the corresponding provisions in the said standard.

JIS B 1001 *Diameter of clearance holes and counterbores for bolts and screws*

Remarks : The provisions cited from **ISO 273** : 1979, *Fasteners—Clearance holes for bolts and screws* are equivalent to the corresponding provisions in the said standard.

JIS B 1041 *Fasteners—Surface discontinuities—Part 1 : Bolts, screws and studs for general requirements*

Remarks : **ISO 6157-1** : 1988, *Fasteners—Surface discontinuities—Part 1 : Bolts, screws and studs for general requirements* is identical with the said standard.

JIS B 1043 *Fasteners—Surface discontinuities—Part 3 : Bolts, screws and studs for special requirements*

Remarks : **ISO 6157-3** : 1988, *Fasteners—Surface discontinuities—Part 3 : Bolts, screws and studs for special requirements* is identical with the said standard.

JIS B 1052 *Mechanical properties of steel nuts*

Remarks : **ISO 898-2** : 1992, *Mechanical properties of fasteners made of carbon steel and alloy steel—Part 2 : Nuts with specified proof load values—Coarse thread* is identical with the said standard.