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(ISO 898-5 : 1998)

**Mechanical properties of
fasteners made of carbon steel
and alloy steel—
Part 5 : Set screws and similar
threaded fasteners not under
tensile stresses**

ICS 21.060.10

Descriptors : set screws, steels, mechanical properties of materials, mechanical testing,
alloy steels, unalloyed steels

Reference number : JIS B 1053 : 1999 (E)

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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 Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently **JIS B 1053 : 1995** is replaced with **JIS B 1053 : 1999**.

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Mechanical properties of fasteners made of carbon steel and alloy steel— Part 5 : Set screws and similar threaded fasteners not under tensile stresses

Introduction This Japanese Industrial Standard has been prepared based on ISO 898-5, *Mechanical properties of fasteners made of carbon steel and alloy steel—Part 5 : Set screws and similar threaded fasteners not under tensile stresses* issued in 1998 as the second edition without changing the technical contents.

The portions underlined with dots in this Standard show the matters not specified in the original International Standard.

1 Scope This Standard specifies the mechanical properties of set screws and similar threaded fasteners not under tensile stresses with nominal thread diameters from 1.6 mm up to and including 24 mm, which are made of carbon steel or alloy steel (hereafter referred to as “set screws”).

The mechanical and physical properties apply when tested at an ambient temperature of 10 °C to 35 °C and will vary at higher or lower temperatures.

This Standard does not apply to set screws requiring special properties such as

- specified tensile stresses (see JIS B 1051);
- weldability;
- corrosion resistance;
- ability to withstand temperatures above + 300 °C or below – 50 °C.

Note : Set screws made from free-cutting steel should not be used above + 250 °C.

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards indicated below shall apply.

JIS B 0215 *Tolerance system for metric screw threads*

Remarks : The provisions cited from ISO 965-3 : 1998, *ISO general purpose metric screw threads—Tolerances—Part 3 : Deviations for constructional threads* are equivalent to the corresponding provisions in the said standard.

JIS Z 2243 *Brinell hardness test—Test method*

Remarks : The provisions cited from ISO 6506 : 1981, *Metallic materials—Hardness test—Brinell test* are equivalent to the corresponding provisions in the said standard.

JIS Z 2244 *Vickers hardness test—Test method*

Remarks : The provisions cited from ISO 6507-1 : 1997, *Metallic materials—Vickers hardness test—Part 1 : Test method* are equivalent to the corresponding provisions in the said standard.

JIS Z 2245 Rockwell hardness test—Test method

Remarks : The provisions cited from **ISO 6508 : 1986, *Metallic materials—Hardness test—Rockwell test (scales A-B-C-D-E-F-G-H-K)*** are equivalent to the corresponding provisions in the said standard.

3 Designation system The property classes are designated by the symbols shown in Table 1. The numerical part of the symbol represents 1/10 of the minimum Vickers hardness, the letter H in the symbol refers to hardness.

Table 1 Designations of property classes in relation to Vickers hardness

Property class	14H	22H	33H	45H
Vickers hardness, HV min.	140	220	330	450

4 Materials Set screws shall be made of steel conforming to the requirements specified in Table 2. For property class 45H, other materials may be used provided that the proof torque requirements in 6.3 are met.

Table 2 Steel specifications

Property class	Material	Heat treatment	Chemical composition % (m/m)			
			C		P	S
			max.	min.	max.	max.
14H	Carbon steel ^{1, 2)}	—	0.50	—	0.11	0.15
22H	Carbon steel ³⁾	Quenched and tempered	0.50	—	0.05	0.05
33H	Carbon steel ³⁾	Quenched and tempered	0.50	—	0.05	0.05
45H	Alloy steel ^{3, 4)}	Quenched and tempered	0.50	0.19	0.05	0.05
1) Free-cutting steel may be used, with lead content 0.35 % maximum, phosphorus content 0.11 % maximum and sulphur content 0.34 % maximum. 2) Case hardening is allowed in the case of square-head set screws. 3) Steel with lead content 0.35 % maximum may be used. 4) Shall contain one or more of alloying element chromium, nickel, molybdenum, vanadium or boron.						

5 Mechanical properties When tested by the methods specified in clause 6 the set screws shall have, at ambient temperature, the mechanical properties specified in Table 3.