

KOREAN INDUSTRIAL STANDARD

KS B 1028-1990

Hexagon Socket Set Screws

1. Scope

This Korean Industrial Standard specifies the steel hexagon socket set screws (hereinafter referred to as "steel set screws") and stainless steel hexagon socket set screws (hereinafter referred to as "stainless set screw") which are used generally.

Remarks

1. The steel set screws and stainless set screws, when generally called in this standard are named simply as the set screws.
2. The set screws of flat point, cone point, dog point and cup point which are specified in this standard, are in accordance with the following ISO standard. Provided that the part enclosed with dot line and the oval point set screw in this standard shall be excluded.

Flat point: ISO 4026-1977 Hexagon socket set screws with flat point

Cone point: ISO 4027-1977 Hexagon socket set screws with cone point

Dog point: ISO 4028-1977 Hexagon socket set screws with dog point

Cup point: ISO 4029-1977 Hexagon socket set screws with cup point

2. Classes

The set screws shall be classified into the following five classes of flat point, cone point, dog point, cup point and oval point according to the shape of screw point.

3. Part Grade

The part grade of the set screws shall be in accordance with the part grade A of the threaded fasteners for general use of KS B 0238 (Tolerance System for Threaded Fasteners).

4. Mechanical Properties

4.1 Mechanical Properties of Steel Set Screws

The mechanical properties of steel set screws shall be in accordance with strength division 45 H of KS B 0240 (Mechanical Properties of Steel Set Screws).

4.2 Mechanical Properties of Stainless Steel Set Screws

The mechanical properties of stainless steel set screws shall be in accordance with property division of KS B 0241 (Mechanical Properties Corrosion-Resistant Stainless Steel Fasteners). However, the property division to the nominal designation of screw thread and the hardness of core part shall be in accordance with Table 1.

Related Standards: see page 6

Table 1

Nominal designation of screw thread	Property division	Hardness of core part
M 20 max.	A 2-70	HV 220 min.
Over M 20	A 2-50	HV 140 min.

Remark The set screw, which is of M 20 and under in nominal designation of screw thread and is subject to cutting work, can take A 2-50 as property division as agreed between the parties concerned on delivery.

5. Shape and Size

The shape and size of set screws shall be in accordance with Table 2.

Table 2

Class	Shape and size
Flat point	To be in accordance with Appendix Table 1
Cone point	To be in accordance with Appendix Table 2
Dog point	To be in accordance with Appendix Table 3
Cup point	To be in accordance with Appendix Table 4
Oval point	To be in accordance with Appendix Table 5

6. Screw Thread

The screw thread of set screw shall be in accordance with the body of KS B 0201 (Metric Coarse Screw Threads) and the tolerance grade shall be in accordance with the grade (see Table 3) of the screw thread specified in the part grade A of KS B 0238.

Table 3

Division	Tolerance grade of screw thread
Steel set screw	5 g 6 g based on KS B 0235 (Tolerance System for Metric Screw Threads) ⁽¹⁾ . Furthermore, the limits of size and tolerance of 5 g 6 g are given in Reference Table.
Stainless steel set screw	6 g of the text of KS B 0211 (Limits of Sizes and Tolerances for Metric Coarse Screw Threads) ⁽²⁾ .

Notes (1) This tolerance grade applies to the steel set screw of 45 H in strength division. However, 6 g of the text of KS B 0211 or Grade 2 of Appendix 1 of this standard may be taken as agreed between the parties concerned on delivery.

(2) The grade 2 of Appendix 1 of KS B 0211 may be taken for the time being.

Remark The maximum permissible size for the screw threads of 5 g 6 g, 6 g and Grade 2, which have been subjected to electroplating, shall be the maximum permissible size of 4h or Grade 1 external thread.

7. Geometrical Tolerance

The geometrical tolerance of set screw shall be the geometrical tolerance specified in the part tolerance grade A of KS B 0238. However, the items of the geometrical tolerance applied to the set screw shall be as specified in Table 4.

Table 4

Class	Item of geometrical tolerance	Number of figures in Appendix Table 1 of KS B 0238
Everything	Coaxiality of the hexagon socket to the threaded portion	Fig. 1.6
Cone point	Run out of the dog point conical surface to the threaded portion	Fig. 1.15
Dog point	Coaxiality of the dog point to the threaded portion	Fig. 1.14
	Perpendicularity of the end face of dog point to the threaded portion	Fig. 1.29
Cup point	Run out of the cup point conical surface to the threaded portion	Fig. 1.16

8. Appearance

The surface of set screw shall be smooth and free from quenching cracks and surface defects such as flaws, burrs and chippings of screw thread harmful to use.

Furthermore, the reference of permissible limit for surface defects should be in accordance with Reference of KS B 0101 (Glossary of Terms Relating to Fasteners), unless particularly specified.

9. Materials and Heat Treatment

The materials and heat treatment of the set screws shall be in accordance with Table 5.

Table 5

Division	Strength division	Heat treatment	Materials
Steel set screw	45 H	Quenching and tempering	To be in accordance with 3. of KS B 0240
Stainless steel set screw	A 2-50 A 2-70	--	To be in accordance with 5. of KS B 0241

10. Surface Treatment

The steel set screws shall be subjected to the treatment of black oxide coating as a rule. Where no surface treatment is required or where plating or other surface treatment is required, it shall be so designated by the purchaser. Furthermore, the stainless steel set screws shall not be subjected to surface treatment as a rule and the steel set screws subjected to electroplating shall be subjected to the treatment of embrittlement, as required.

11. Inspection

11.1 Mechanical Property Inspection

11.1.1 Mechanical Property Inspection of Steel Set Screw

The mechanical properties of steel set screw shall be inspected in accordance with Table 6 and shall meet the mechanical properties of 4.1.

Table 6

Mechanical property to be inspected	Test method
Core part hardness	To be in accordance with 4.2.1 (1) of KS B 0240
Surface hardness	To be in accordance with 4.2.1 (2) of KS B 0240
Decarburization of threaded portion	To be in accordance with 4.2.2 of KS B 0240
Proof torque	To be in accordance with 4.2.3 of KS B 0240

11.1.2 Mechanical Properties Inspection of Stainless Steel Set Screw

The mechanical properties of stainless steel set screw shall be inspected in accordance with Table 7 and shall meet the mechanical properties of 4.2.

Table 7

Mechanical property to be inspected	Test method
Tensile strength ⁽³⁾	6.2.1 (1) of KS B 0241 shall be applied as appropriate
Torsional strength ⁽⁴⁾	6.2.2 of KS B 0241 shall be applied as appropriate
Core part hardness	4.2.1 (1) of KS B 0240 shall be applied as appropriate

Notes ⁽³⁾ Where the tensile test for the products is unfeasible, the tensile strength for the materials to be used shall be confirmed. However, this confirmation is excepted in the case where the torsional strength has been inspected.

⁽⁴⁾ The torsional strength applies to those of M 1.6 to M 5. Furthermore, the tensile strength inspection may be omitted where this inspection has been done.

11.2 Shape and Size Inspection

The shape and size shall be inspected by the measuring method of each part size of KS B 0239 (Methods of Verification for Size and Geometry of Threaded Fasteners) or an alternative method and shall comply with the requirements of 5.

11.3 Screw Thread Inspection

The screw thread shall be inspected by the precision measuring method of external thread of KS B 0239 or an alternative method and shall comply with the requirements of 6. Furthermore, the go ring-gauge to be used for set screws of electroplated threads shall be those used for screw threads of 4h (those for Grade 1 for the screw thread of Grade 2).

11.4 Inspection for Geometrical Tolerance

The inspection for the geometrical tolerance shall be carried out by the measuring method of the geometrical deviation of KS B 0239 and results shall comply with the requirements of 7.

11.5 Appearance Inspection

The appearance inspection shall be carried out visually and the results shall comply with the requirements of 8.

11.6 Delivery Inspection

The sampling plan for the lot at the time of delivery shall be subjected to the agreement between the parties concerned on delivery.

12. Designation of Products

The designation of set screws shall be in accordance with number or title of standard, class, nominal designation of screw thread (d) x nominal length (l); strength division of mechanical properties (the property division in the case of stainless steel set screw) and the designated items ⁽⁵⁾.