

INTERNATIONAL
STANDARD

ISO
4029

Second edition
1993-12-15

Hexagon socket set screws with cup point

Vis sans tête à six pans creux, à bout cuvette

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Reference number
ISO 4029:1993(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 4029 was prepared by Technical Committee ISO/TC 2, *Fasteners*.

This second edition cancels and replaces the first edition (ISO 4029:1977), which has been technically revised.

Annex A forms an integral part of this International Standard.

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Hexagon socket set screws with cup point

1 Scope

This International Standard specifies the characteristics of hexagon socket set screws with cup point and threads from M1,6 up to and including M24 and of product grade A.

If, in special cases, specifications other than those listed in this International Standard are required, they should be selected from existing International Standards, for example, ISO 261, ISO 888, ISO 898-5 and ISO 965-2.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 225:1983, *Fasteners — Bolts, screws, studs and nuts — Symbols and designations of dimensions.*

ISO 261:1973, *ISO general purpose metric screw threads — General plan.*

ISO 888:1976, *Bolts, screws and studs — Nominal lengths, and thread lengths for general purpose bolts.*

ISO 898-5:1980, *Mechanical properties of fasteners — Part 5: Set screws and similar threaded fasteners not under tensile stresses.*

ISO 965-2:1980, *ISO general purpose metric screw threads — Tolerances — Part 2: Limits of sizes for general purpose bolt and nut threads — Medium quality.*

ISO 965-3:1980, *ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional threads.*

ISO 3269:1988, *Fasteners — Acceptance inspection.*

ISO 3506:1979, *Corrosion-resistant stainless steel fasteners — Specifications.*

ISO 4042:1989, *Threaded components — Electroplated coatings.*

ISO 4759-1:1978, *Tolerances for fasteners — Part 1: Bolts, screws and nuts with thread diameters between 1,6 (inclusive) and 150 mm (inclusive) and product grades A, B and C.*

ISO 6157-1:1988, *Fasteners — Surface discontinuities — Part 1: Bolts, screws and studs for general requirements.*

ISO 6157-3:1988, *Fasteners — Surface discontinuities — Part 3: Bolts, screws and studs for special requirements.*

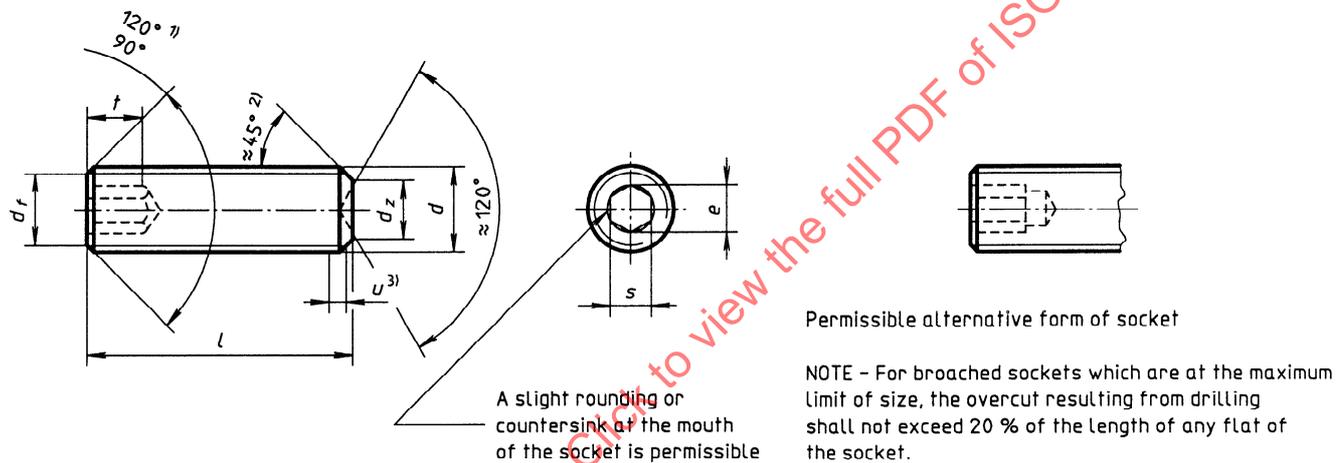
ISO 8839:1986, *Mechanical properties of fasteners — Bolts, screws, studs and nuts made of non-ferrous metals.*

ISO 8992:1986, *Fasteners — General requirements for bolts, screws, studs and nuts.*

3 Dimensions

See figure 1 and table 1.

NOTE 1 Symbols and designations of dimensions are specified in ISO 225.



1) The 120° angle is required for short-length screws of nominal length l , situated above the dotted stepped line in table 1.

2) The 45° angle applies only to the portion of the point situated below the root diameter of the thread.

3) Incomplete thread $u \leq 2P$.

Figure 1

Table 1

Dimensions in millimetres

Thread (<i>d</i>)			M1,6	M2	M2,5	M3	M4	M5	M6	M8	M10	M12	M16	M20	M24
<i>P</i> ¹⁾			0,35	0,4	0,45	0,5	0,7	0,8	1	1,25	1,5	1,75	2	2,5	3
<i>d₂</i>	max.		0,80	1,00	1,20	1,40	2,00	2,50	3,00	5,0	6,0	8,00	10,00	14,00	16,00
	min.		0,55	0,75	0,95	1,15	1,75	2,25	2,75	4,7	5,7	7,64	9,64	13,57	15,57
<i>d_f</i>			≈ Minor thread diameter												
<i>e</i>	min.	²⁾	0,803	1,003	1,427	1,73	2,3	2,87	3,44	4,58	5,72	6,86	9,15	11,43	13,72
	nom.		0,7	0,9	1,3	1,5	2	2,5	3	4	5	6	8	10	12
<i>s</i> ³⁾	max.		0,724	0,902	1,295	1,545	2,045	2,560	3,071	4,084	5,084	6,095	8,115	10,115	12,142
	min.		0,711	0,889	1,270	1,520	2,020	2,520	3,020	4,020	5,020	6,020	8,025	10,025	12,032
<i>t</i>	min.	⁴⁾	0,7	0,8	1,2	1,2	1,5	2	2	3	4	4,8	6,4	8	10
		⁵⁾	1,5	1,7	2	2	2,5	3	3,5	5	6	8	10	12	15
			Approximate mass, in kilograms per 1 000 pieces ($\rho = 7,85 \text{ kg/dm}^3$) (for information only)												
nom.	<i>l</i> min.	max.													
2	1,8	2,2	0,019	0,029	0,05										
2,5	2,3	2,7	0,025	0,037	0,063	0,079									
3	2,8	3,2	0,029	0,044	0,075	0,1	0,155								
4	3,76	4,24	0,037	0,059	0,1	0,14	0,23	0,3							
5	4,76	5,24	0,046	0,074	0,125	0,18	0,305	0,42	0,565						
6	5,76	6,24	0,054	0,089	0,15	0,22	0,38	0,54	0,74	1,25					
8	7,71	8,29	0,07	0,119	0,199	0,3	0,53	0,78	1,09	1,88	2,71				
10	9,71	10,29		0,148	0,249	0,38	0,68	1,02	1,44	2,51	3,72	5,3			
12	11,65	12,35			0,299	0,46	0,83	1,26	1,79	3,14	4,73	6,7	10,5		
16	15,65	16,35				0,62	1,13	1,74	2,49	4,4	6,73	9,5	15,7	22,9	
20	19,58	20,42					1,42	2,22	3,19	5,66	8,72	12,3	20,9	31,1	40,2
25	24,58	25,42						2,82	4,07	7,24	11,2	15,8	27,4	41,4	55,2
30	29,58	30,42							4,94	8,81	13,7	19,3	33,9	51,7	70,3
35	34,5	35,5								10,4	16,2	22,7	40,4	62	85,3
40	39,5	40,5								12	18,7	26,2	46,9	72,3	100
45	44,5	45,5									21,2	29,7	53,3	82,6	115
50	49,5	50,5									23,6	33,2	59,8	92,6	130
55	54,4	55,6										36,6	66,3	103	145
60	59,4	60,6										40,1	72,8	114	160

NOTE — Commercial lengths are shown between the stepped, continuous, bold lines.

- 1) *P* = pitch of the thread
- 2) $e_{\min} = 1,14 s_{\min}$ except for sizes M1,6, M2 and M2,5
- 3) *s* shall be gauged by attribute methods, see annex A for gauges.
- 4) For screws with nominal lengths above the dotted stepped line.
- 5) For screws with nominal lengths below the dotted stepped line.

4 Specifications and reference International Standards

See table 2.

Table 2

Material		Steel	Stainless steel	Non-ferrous metal
General requirements	International Standard	ISO 8992		
Thread	Tolerances	5g6g for class 45H; 6g for other classes		
	International Standards	ISO 261, ISO 965-2, ISO 965-3		
Mechanical properties	Property class	45H	A1, A2	...
	International Standards	ISO 898-5	ISO 3506	ISO 8839
Tolerances	Product grade	A		
	International Standard	ISO 4759-1		
Finish		Black oxide (thermal or chemical)	Plain	Plain
		Requirements for electroplating are given in ISO 4042. If different electroplating requirements are desired or if requirements are needed for other finishes, they should be negotiated between customer and supplier. Limits for surface discontinuities are given in ISO 6157-1 and ISO 6157-3.		
Acceptability		For acceptance procedure, see ISO 3269.		

5 Designation

Example of designation: A hexagon socket set screw with cup point, thread M6, nominal length $l = 12$ mm and of property class 45H is designated as follows:

Hexagon socket set screw ISO 4029 - M6 × 12 - 45H

Annex A (normative)

Gauging of hexagon socket

A.1 Gauge dimensions

See figure A.1 and table A.1.

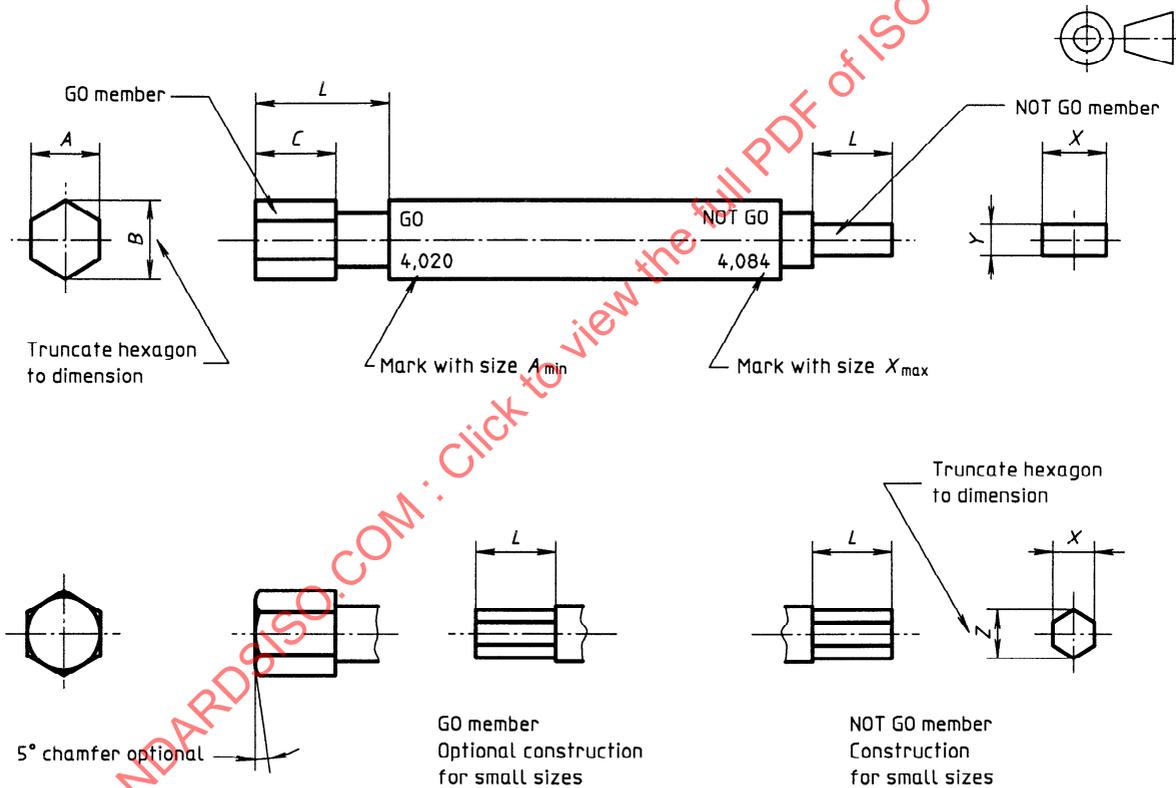


Figure A.1

Table A.1

Dimensions in millimetres

Nominal socket size, <i>s</i>		0,7	0,9	1,3	1,5	2	2,5	3	4	5	6	8	10	12	
GO gauge: Width across flats	A	max.	0,714	0,892	1,273	1,523	2,023	2,525	3,025	4,025	5,025	6,025	8,030	10,030	12,037
		min.	0,711	0,889	1,270	1,520	2,020	2,520	3,020	4,020	5,020	6,020	8,025	10,025	12,032
GO gauge: Width across corners	B	max.	0,803	1,003	1,427	1,730	2,300	2,870	3,440	4,580	5,720	6,860	9,150	11,430	13,720
		min.	0,798	0,998	1,422	1,725	2,295	2,865	3,435	4,575	5,715	6,855	9,145	11,425	13,715
GO gauge: Length	C	min.	1,5	2,4	4,7	5	5	7	7	7	7	8	8	12	12
Usable gauge length	L	min.	1,5	2,4	4,7	5	5	7	7	7	7	12	16	20	24
NOT GO gauge: Width	X	max.	0,724	0,902	1,295	1,545	2,045	2,560	3,071	4,084	5,084	6,095	8,115	10,115	12,142
		min.	0,721	0,899	1,293	1,543	2,043	2,555	3,066	4,079	5,079	6,090	8,110	10,110	12,137
NOT GO gauge: Thickness	Y	max.	—	—	—	—	—	—	—	1,80	2,30	2,80	3,80	4,80	5,75
		min.	—	—	—	—	—	—	—	1,75	2,25	2,75	3,75	4,75	5,70
NOT GO gauge: Width across corners	Z	max.	0,782	0,980	1,397	1,68	2,23	2,79	3,35	—	—	—	—	—	—
		min.	0,770	0,968	1,384	1,66	2,21	2,77	3,33	—	—	—	—	—	—

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