

**AMENDMENT NO.1 JUNE 1986**  
**TO**  
**IS : 3640-1982 SPECIFICATION FOR HEXAGON FIT BOLTS**  
*( First Revision )*

*(Page 4, Table 2, last entry under size M36) -*  
Substitute '141' for '411'.

( EDC 27 )

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IS : 3640 - 1982  
(Reaffirmed 2011 )

**Indian Standard**  
**SPECIFICATION FOR**  
**HEXAGON FIT BOLTS**  
**( First Revision )**

(Reaffirmed 2016)  
(Reaffirmed 2021)

- 1. Scope** — Covers the requirements for hexagon fit bolts in the diameter range 8 to 52 mm.
- 2. Dimensions and Tolerances** — The dimensions and tolerances for hexagon fit bolts shall be as given in Table 1.
- 2.1** The preferred length-size combinations and shank lengths are given in Table 2.
- 2.2** Dimensions for application of hexagon fit bolts are given in Table 3.
- 3. Grade** — The hexagon fit bolts shall be of product Grade B as specified in IS : 1367 ( Part 2 )-1979 'Technical supply conditions for threaded steel fasteners, Part 2 Product grades and tolerances ( *second revision* )'.

**4. Mechanical Properties** — Hexagon fit bolt shall conform to property clause 5.6 of IS: 1367 (Part 3)-1979 'Technical supply conditions for threaded steel fasteners, Part 3 Mechanical properties and test methods for bolts, screws and studs with full loadability ( *second revision* )'.

**5. Designation** — Two different shank diameters have been specified in Table 1 to enable the purchaser to order hexagon fit bolts with shank diameters in finished or unfinished conditions. These hexagon fit bolts shall be designated as given in following clauses.

**5.1** Hexagon fit bolts shall be designated by name, nominal size, length, number of the standard and property class when shank diameter is required in the finished condition by the purchaser.

*Example:*

A hexagon fit bolt of size M20, Length 90 mm and of property class 5.6 shall be designated as :

Hexagon Fit Bolt M20 × 90 IS : 3640-5.6

**5.2** Hexagon fit bolts shall be designated by name, nominal size, shank diameter with allowance, length, number of the standard and property class when shank diameter is required to be finished by the purchaser.

*Example :*

A hexagon fit bolt of size M16, shank diameter  $d_3$  17.2 mm, length 70 mm and property class 5.6 shall be designated as :

Hexagon Fit Bolt M16 × 17.2 × 70 IS : 3640-5.6.

**6. Sampling** — Sampling and criteria of acceptance shall be in accordance with IS : 2614 - 1969 'Method for sampling of fasteners ( *first revision* )'.

**7. General Requirements**

**7.1** Centre holes are mandatory for hexagon fit bolts supplied with allowance on the shank diameter ( diameter,  $d_s$  ). For bolts supply finish to the size  $d_2$ , the provision of centre holes is left to the choice of the manufacturer.

**7.2** The limits of surface discontinuities shall be as specified in IS : 1367 ( Part 9 )-1979 'Technical supply conditions for threaded steel fasteners, Part 9 Surface discontinuities on bolts, screws and studs ( *second revision* )'.

**7.3** Hexagon fit bolts shall be marked and delivered as specified in IS : 1367 ( Part 18 )- 1979 'Technical supply conditions for threaded steel fasteners, Part 18 Marking and mode of delivery ( *second revision* )'.

Adopted 29 July 1982

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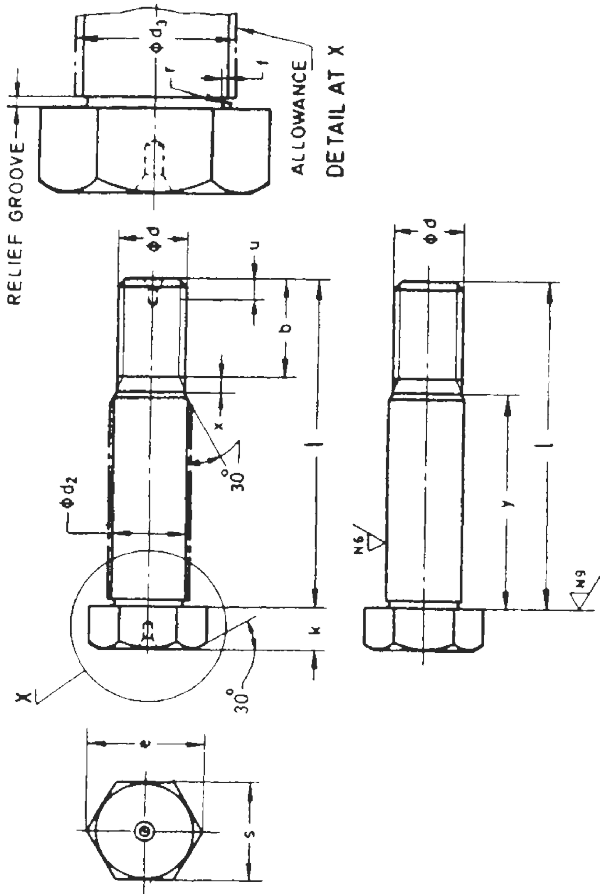
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Bolts Nuts and Fastener Accessories Sectional Committee, EDC 27 [ Ref: Doc : EDC 27 ( 3653 ) ]

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TABLE 1 DIMENSIONS AND TOLERANCES FOR HEXAGON FIT BOLTS  
( Clause 2 )

All dimensions in millimetres.



$r$  = according to IS : 3428 - 1980 'Dimensions for relief grooves ( first revision )'  
 $u$  = according to chamfered end ( CE ) of IS : 1368-1980 'Dimensions for ends of bolts and screws ( second revision )'  
 $x$  = according to thread runout, short to IS : 1369-1982 'Dimensions of screw thread run-outs and undercuts ( second revision )'

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Nominal Size <i>d</i>	M8	M10	M12	(M14)	M16	(M18)	M20	(M22)	M24	(M27)	M30	(M33)	M36	(M39)	M42	(M45)	M43	<i>am</i> *
*	14.5	17.5	20.5	22	25	27.5	28.5	32.5	—	—	—	—						
	0	†	16.5	19.5	22.5	24	27	29.5	30.5	34.5	38.5	43	45	51	56	59	63	66
	‡	‡	21.5	24.5	27.5	29	32	34.5	35.5	39.5	41.5	48	50	56	61	64	68	70
<i>d</i> <sub>2</sub> k6 ½	9	11	13	15	17	19	21	23	25	28	32	34	38	40	44	46	50	55
<i>d</i> <sub>3</sub> with allow- ance +0.2 0	9.2	11.2	13.2	15.2	17.2	19.2	21.3	23.3	25.3	28.3	32.3	34.3	38.3	40.3	44.3	46.3	50.3	55.4
<i>e</i> Min	—	17.60	19.86	22.78	26.17	29.56	32.95	37.29	39.55	45.20	50.85	55.37	60.79	66.44	71.30	76.95	82.60	88.25
<i>f</i> +0.15 0	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
<i>k</i> js 15	5.5	7	8	9	10	12	13	14	15	17	19	21	23	25	26	28	30	30
<i>s</i> <19 h14 19 <60 h15 >60 h16	13	16	18	21	24	27	30	34	36	41	46	50	65	60	65	70	75	80

Not\* — Size shown in parenthesis are of second preference.

•For lengths, up to 50 mm.

fFor lengths, above 50 up to 150 mm.

JFor lengths, above 150 mm.

§Other tolerance classes shall be specified when ordering.

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TABLE 2 PREFERRED LENGTH-SIZE COMBINATIONS AND SHANK LENGTHS FOR HEXAGON FIT BOLTS

All dimensions in millimetres.

Nominal length,	M3	M10	M12	(M14)	M16	(M18)	M20	(M22)	M24	(M27)	M30	(M33)	M36 (M30)	M42	(M45)	M48	(M52)
/ js 17																	
25	9																
28	12																
30	14																
32	16		9.5														
35	19		12.5	10.5													
38			15.5	13.5	10.5												
40	24	1121	17.5	15.5	12.5												
42	26	13	19.5	17.5	14.5	11.5											
45	29	26	22.5	20.5	17.5	14.5	13.5										
48	32	1929	25.5	23.5	20.5	17.5	16.5	12.5									
50	34	31	27.5	25.5	22.5	19.5	18.5	14.5									
55	37	34	30.5	28.5	25.5	22.5	21.5	17.5									
30	42	39	35.5	33.5	30.5	27.5	26.5	22.5	20								
65	47	44	40.5	38.5	35.5	32.5	31.5	27.5	25								
70	52	49	45.5	43.5	40.5	37.5	36.5	32.5	30	17							
75	57	54	50.5	48.5	45.5	42.5	41.5	37.5	35	22	18	16					
80	59	54	55.5	53.5	50.5	47.5	46.5	42.5	40	22	23	21	19				
85	64	64	60.5	58.5	55.5	52.5	51.5	47.5	45	27	28	26	24	18.5	10.5		
90	69	69	65.5	63.5	60.5	57.5	56.5	52.5	50	32	33	31	29	23.5	26	16	19
95	74	74	70.5	68.5	65.5	62.5	61.5	57.5	55	37	38	36	34	28.5	29.9	26	24
100	79	79	75.5	73.5	70.5	67.5	66.5	62.5	60	42	43	41	39	33.5	36	31	29
106			80.5	78.5	75.5	72.5	71.5	67.5	65	47	48	46	44	38.6	39.9	36	34
110			85.5	83.5	80.5	77.5	76.5	72.5	70	52	53	51	49	43.5	44.9	41	39
115			90.5	88.5	85.5	82.5	81.5	77.5	75	57	58	56	54	48.5	49.9	46	44
120			95.5	93.5	90.5	87.5	86.5	82.5	80	62	63	61	59	53.5	54.9	51	49
125					95.5	92.5	91.5	87.5	85	67	68	66	64	58.5	59.9	56	54
130					100.5	97.5	96.5	92.5	90	72	73	71	69	63.5	64.9	61	59
135					105.5	102.5	101.5	97.5	95	77	78	76	74	68.5	69.9	66	64
140					110.5	107.5	106.5	102.5	100	82	82	81	79	73.8	75.5	71	68
145					115.5	112.5	111.5	107.5	105	87	88	86	84	78.5	80.5	76	74
150					120.5	117.5	116.5	112.5	110	92	93	91	89	83.5	85.5	81	79
160										102	98	96	94	88.5	89.9	86	84
170										107	103	101	99	93.5	95.5	91	89
180										112	108	106	104	98.5	100.5	96	94
190										122	118	116	114	109.9	111.5	107	105
200										132	128	126	124	123.5	125.5	121	119
										142	138	136	134	133.5	135.5	130	128
										152	148	146	144	143.5	145.5	140	138

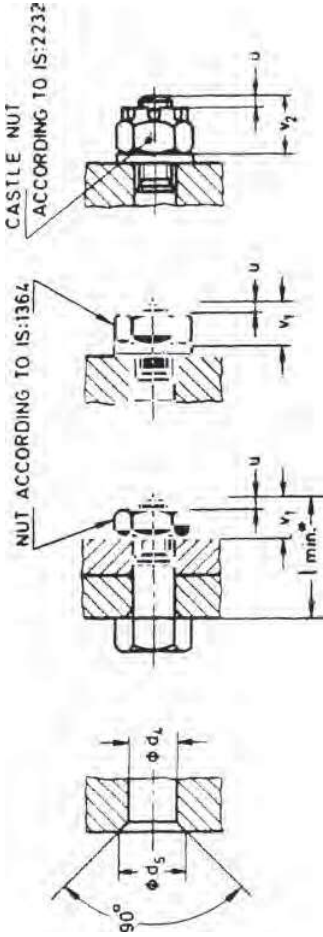
Note 1 — Preferred length-size combinations are between the steppedbold lines.

Note 2 — Sizes shown in brackets are of second preference.

Note 3 — Lengths above 200 mm shall be selected in 10 mm steps.

TABLE 3 DIMENSIONS FOR APPLICATION OF HEXAGON FIT BOLTS  
( Clause 2.2 )

All dimensions in millimetres.



Nominal Size d	M3	M8	M12	(M14)	M16	(M13)	M20	(M22)	M24	(M27)	M30	(M33)	M36	(M39)	M42
dH7	9	11	13	15	17	19	21	23	25	28	32	34	38	40	44
d5	10	12.5	15	17	19	21	23	25	28	31	34	37	40	43	46
u Min	2.5	3	3.5	4	4	5	5	5	6	6	7	7	8	8	9
v1 Min	9	11	13.5	15	17	20	21	23	25	28	31	33	37	39	43
v2 Min	12	15	18.5	20	23	26	26	31	33	36	40	42	46	48	55

Note 1 — Sizes shown in brackets are non-preferred.

\*The minimum dimension, / calculated from the clamping length shall be rounded off to the next longer bolt length.

**IS : 3640 - 1982**

### **EXPLANATORY NOTE**

Hexagon fit bolts also known as hexagon bolts with oversize shank or bearing bolts are extensively used for couplings, plummer blocks etc.

This standard was first published in 1967. It has been observed in the use of the standard, the thread length have been too long and shank lengths short resulting in difficulty of assembly. For assisting in assembly, shank lengths have been included and application details added in the present revision.

Considerable assistance has been derived, in the preparation of this standard, from DIN 609-1971 Hexagon fit bolts with long thread portion issued by Deutsches Institut für Normung.