

USSR STATE STANDARD

Hexagon bolts
(Normal accuracy)
Construction and Dimensions

GOST
7798-70
This supersedes
GOST 7798-62

Valid upto 01.01.1986

1. The present standard relates to hexagon bolts of normal accuracy.

The requirements of the O9B recommendations PC 170-70, PC 186-64, PC 309-65, PC 376-65, PC 584-66 and PC 792-67 on standardisation have been taken into account in this standard.

2. Construction and dimensions of bolts must conform to those shown in the drawing and in Tables 1 and 2.

(Revised edition, Rev. No.2, Rev.No.3).

3. Threading is as per GOST 24704-81 and tolerance zones 8g and 6g as per GOST 16093-81.

4. Bolts with tolerance zones 4h, 6e, and 8d, may be manufactured by mutual consent between manufacturer and customer.

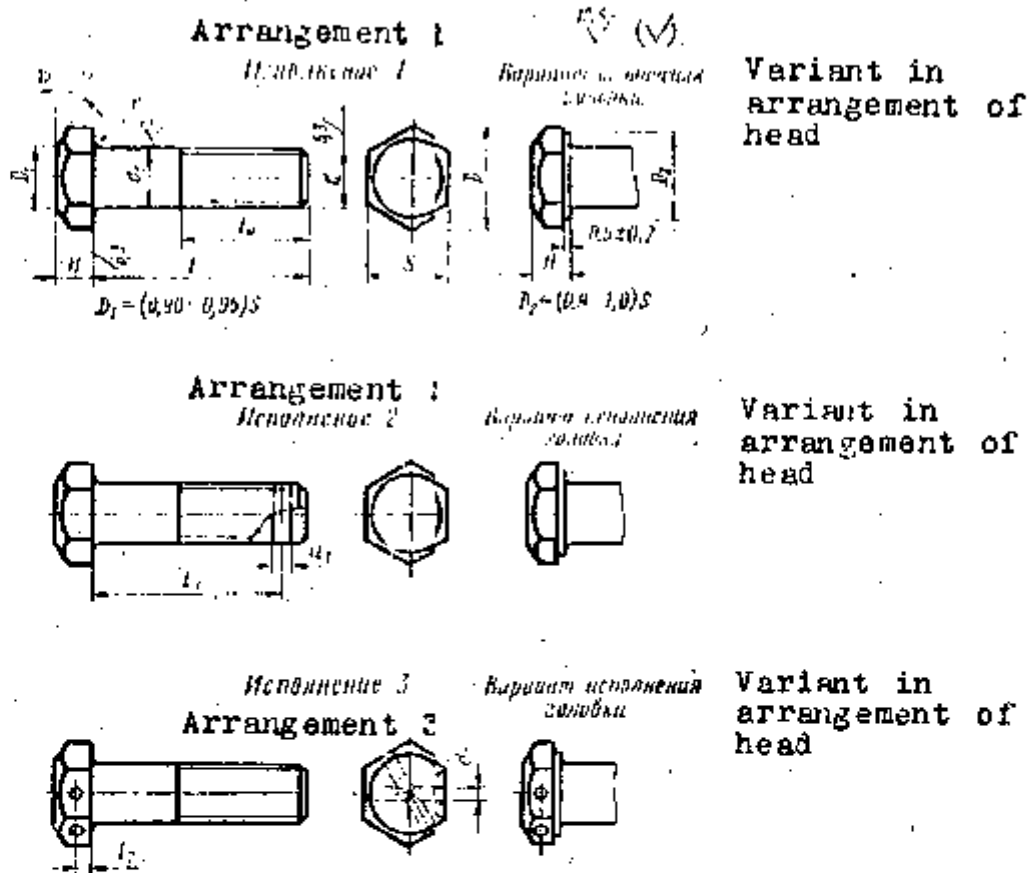
3,4 (Revised edition, Rev. No.2).

5. The manufacturer decides about variants in the head arrangement.

5a. Bolts may manufactured with diameter of unthreaded portion of body d_1 approximately equal to the average thread diameter.

(Added, Rev. No.3).

6. Technical requirements are as per GOST 1759-70.



7. Deleted (Rev.No. 2).

8. Weight of bolts is indicated in annexure 1.

9. Bolts may, with customer's concurrence, be made to tolerances given in the reference annexure No.2, if it becomes necessary to provide interchangeability for use in articles designed before 01.01.1980.

(Added, Rev. No. 3).

Nominal thread diameter d	6	8	10	12	(14)	16	(18)	20	(22)	24	(27)	30	(36)	42	48
Thread pitch	1	1.25	1.5	1.75	2	2	2.5	2.5	2.5	2	3	3.5	4	4.5	5
Body diameter d ₁															
Coarse		1	1.25	1.5	1.75	2	2.5	2.5	2.5	2	3	3.5	4	4.5	5
Fine			1	1.25	1.5	1.5	1.5	1.5	1.5	2	2	2	2	2	3
Nominal	6	8	10	12	14	16	18	20	22	24	27	30	36	42	48
Tolerance	-0.30	-0.36	-0.43	-0.43	-0.43	-0.43	-0.43	-0.43	-0.43	-0.52	-0.52	-0.52	-0.52	-0.52	-0.52
Width across flats S	10	13	17	19	22	24	27	30	32	35	41	45	52	58	65
Tolerances h14 for S<30 h15 for S>30			-0.43												
Head height H	4.0	5.5	7.0	8.0	9.0	10.0	12.0	13.0	14.0	15.0	17.0	19.0	23.0	26.0	30.0
Nominal															
Tolerance js15	+0.24	+0.24	+0.29	+0.29	+0.29	+0.29	+0.29	+0.35	+0.35	+0.35	+0.35	+0.35	+0.42	+0.42	+0.42
Width across corners D, not less than	10.9	14.2	18.7	20.9	24.3	26.5	29.9	33.3	35.0	39.6	45.2	50.9	60.8	72.1	83.4
Nominal															
Tolerance js15	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Diameter of hole in body d ₃	1.6	2.0	2.6	3.2	4.0	4.0	4.0	4.0	4.0	5.0	5.0	6.3	6.3	8.0	8.0
Nominal															
Tolerance H14	+0.25	+0.25	+0.30	+0.30	+0.30	+0.30	+0.30	+0.30	+0.30	+0.30	+0.30	+0.30	+0.30	+0.30	+0.30
Tolerance in symmetry of hole in body with respect to thread centre line in the diametral expression 2F14	0.60	0.72	0.86	0.86	0.86	0.86	0.86	0.86	0.86	1.04	1.04	1.04	1.04	1.24	1.24
Diameter of hole in head d ₁	2.0	2.5	3.2	3.2	3.2	3.2	3.2	3.2	3.2	4.0	4.0	4.0	4.0	5.0	5.0
Nominal															
Tolerance H15	+0.40	+0.40	+0.48	+0.48	+0.48	+0.48	+0.48	+0.48	+0.48	+0.48	+0.48	+0.48	+0.48	+0.48	+0.48

Table 1 Contd.

Distance from bearing surface to centre line of hole in head 1 ₂	Nominal															
	2.0	2.8	3.5	4.0	4.5	5.0	6.0	6.5	7.0	7.5	8.5	9.5	11.5	13.0	15.0	
Tolerance js15	±0.20										±0.29					+0.35
Tolerance in symmetry of head with respect to centre line of body in the diametral expression 2IT14	0.72										0.86	1.04	1.24	1.48		

Note: Bolt dimensions give in brackets are not recommended to be used.

Dimensions in mm

Размеры

1		2											
Длина болта l		Длина резьбы l_0 и расстояние от опорной поверхности диаметра резьбы d (знаком X)											
3	4	6		8		10		12		(14)		16	
		l_1	l_2	l_1	l_2	l_1	l_2	l_1	l_2	l_1	l_2	l_1	l_2
8	$\pm 0,45$	—	X	—	X	—	—	—	—	—	—	—	—
10	$\pm 0,6$	—	X	—	X	—	X	—	—	—	—	—	—
12	$\pm 0,55$	—	X	—	X	—	X	—	—	—	—	—	—
14		10	X	—	X	—	X	—	X	—	—	—	—
16		12	X	12	X	—	X	—	X	—	X	—	—
(18)		14	X	14	X	14	X	—	X	—	X	—	X
20	$\pm 0,65$	16	X	16	X	16	X	15	X	—	X	—	X
(22)		18	18	18	X	18	X	17	X	17	X	—	X
25		21	18	21	X	21	X	20	X	20	X	19	X
(28)		24	18	24	22	24	X	23	X	23	X	22	X
30	$\pm 0,8$	26	18	26	22	26	X	25	X	25	X	24	X
(32)		28	18	28	22	28	26	27	X	27	X	26	X
35		31	18	31	22	31	26	30	30	30	X	29	X
(38)		34	18	34	22	34	26	33	30	33	X	32	X
40	$\pm 0,85$	36	18	36	22	36	26	35	30	35	34	34	X
45		41	18	41	22	41	26	40	30	40	34	39	38
50		46	18	46	22	46	26	45	30	45	34	44	38
55		51	18	51	22	51	26	50	30	50	34	49	38
60	$\pm 0,95$	56	18	56	22	56	26	55	30	55	34	54	38
65		61	18	61	22	61	26	60	30	60	34	59	38
70		66	18	66	22	66	26	65	30	65	34	64	38
75		71	18	71	22	71	26	70	30	70	34	69	38
80	$\pm 1,1$	76	18	76	22	76	26	75	30	75	34	74	38
(85)		81	18	81	22	81	26	80	30	80	34	79	38
90		86	18	86	22	86	26	85	30	85	34	84	38
(95)		—	—	91	22	91	26	90	30	90	34	89	38
100	$\pm 1,1$	—	—	96	22	96	26	95	30	95	34	94	38
(105)		—	—	—	—	101	26	100	30	100	34	99	38

1. Bolt length l

2. Threaded length l_0 and distance from bearing surface of head to centre line of hole in body l_1 (tolerance + IT14) for various nominal thread diameters d (The sign X indicates full threading).

3. Nominal

4) Tolerance js16

в мм

in mm

Таблица 2
Table 2

2. Поверхности голов и до осей отверстий в стержне l_0 (пред. откл. + IT14) при отпущенных болтах с резьбой на обеих длине стержня

18		20		(22)		24		(27)		30		36		42		48	
l_1	l_0	l_1	l_0	l_1	l_0	l_1	l_0	l_1	l_0	l_1	l_0	l_1	l_0	l_1	l_0	l_1	l_0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	X	24	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	X	26	X	25	-	-	X	-	-	-	-	-	-	-	-	-	-
29	X	29	X	28	-	28	X	-	X	-	-	-	-	-	-	-	-
32	X	32	X	31	-	31	X	-	X	-	-	-	-	-	-	-	-
34	X	34	X	33	-	33	X	32	X	-	X	-	-	-	-	-	-
39	X	39	X	38	-	38	X	37	X	36	X	-	-	-	-	-	-
44	42	44	X	43	-	43	X	42	X	41	X	40	X	-	-	-	-
49	42	49	46	48	-	48	X	47	X	46	X	45	X	-	-	X	-
51	42	51	46	53	50	53	X	52	X	51	X	50	X	48	X	-	-
59	42	59	46	58	50	58	54	57	X	56	X	55	X	53	X	-	X
64	42	64	46	63	50	63	54	62	60	61	X	60	X	58	X	58	X
69	42	69	46	68	50	68	54	67	60	66	66	65	X	63	X	63	X
74	42	74	46	73	50	73	54	72	60	71	66	70	X	68	X	68	X
79	42	79	46	78	50	78	54	77	60	76	66	75	X	73	X	73	X
84	42	84	46	83	50	83	54	82	60	81	66	80	78	78	X	78	X
89	42	89	46	88	50	88	54	87	60	86	66	85	78	83	X	83	X
94	42	94	46	93	50	93	54	92	60	91	66	90	78	88	X	88	X
99	42	99	46	98	50	98	54	97	60	96	66	95	78	93	90	93	X

55

105

5

2. Thread length l_0 and distance from bearing surface of head to centre line of hole in body l_1 (tolerance + IT14) for various nominal thread diameters d (The sign X indicates full threading).

Dimensions in mm

РАЗМЕРЫ

ДАННЫЕ ОБЪЕКТА 1		ДАННЫЕ РАЗЬМЫ l_0 И РАССТОЯНИЕ ОТ ОПОРНОЙ ПОВЕРХНОСТИ ДИАМЕТРА РАЗЬМЫ d (ДИСКОВОЙ А)											
3 Номинал	4 Предел откл. ± 16	5		6		7		8		9		10	
		l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	l_{10}	l_{11}	l_{12}
110	$\pm 1,1$	—	—	—	—	10	26	105	30	105	34	104	38
(115)		—	—	—	—	11	26	110	30	110	34	109	38
120		—	—	—	—	11	26	115	30	115	34	114	38
(125)	$\pm 1,25$	—	—	—	—	12	26	120	30	120	34	119	38
130		—	—	—	—	12	26	125	30	125	34	124	38
140		—	—	—	—	13	26	135	30	135	34	133	38
150		—	—	—	—	14	26	145	30	145	34	144	38
160		—	—	—	—	15	32	155	36	155	40	154	44
170	$\pm 1,45$	—	—	—	—	16	32	165	36	165	40	164	44
180		—	—	—	—	17	32	175	36	175	40	174	44
190		—	—	—	—	18	32	185	36	185	40	184	44
200		—	—	—	—	18	32	195	36	195	40	194	44
220	$\pm 1,6$	—	—	—	—	—	—	215	36	215	40	214	44
240		—	—	—	—	—	—	235	36	235	40	234	44
260		—	—	—	—	—	—	255	36	255	40	254	44
280	$\pm 1,6$	—	—	—	—	—	—	—	—	275	40	274	44
300		—	—	—	—	—	—	—	—	295	40	294	44
6		+2,0		+2,5		-3,0		+3,5		+4,0			
7		—		+2,0		+2,5		+3,0					

1. Bolt length l
2. Threaded length l_0 and distance from bearing surface of head to centre line of hole in body l_1 (tolerance $\pm 1T14$) for various nominal thread diameters d (The sign X indicates full threading).
3. Nominal
4. Tolerance ± 16
5. Tolerance l_0
6. Coarse pitch thread
7. Fine pitch thread

в мм

in mm

2

Измерения выполняются по оси отверстия в стержне 1 (для стерж. ст. +1T14) или
отсечены болты с резьбой на всей длине стержня

2. Threaded length l_0 and distance from bearing surface of head to centre line of hole in body l_1 (tolerance +1T14) for various nominal thread diameters d (The sign X indicates full threading).

	(16)		20		(22)		24		(27)		30		36		42		48		
	l_1	l_0	l_1	l_0	l_1	l_0	l_1	l_0	l_1	l_0	l_1	l_0	l_1	l_0	l_1	l_0	l_1		
104	42	104	46	103	50	103	54	102	60	101	66	100	76	98	90	98	X	110	
109	42	109	46	108	50	108	54	107	60	106	66	105	78	103	90	103	102		
114	42	114	46	113	50	113	54	112	60	111	66	110	78	105	90	108	102		
119	42	119	46	118	50	118	54	117	60	116	66	115	78	113	90	113	102		
124	42	124	46	123	50	123	54	122	60	121	66	120	78	118	90	118	102		
134	42	134	46	133	50	133	54	132	60	131	66	130	78	128	90	128	102		
144	42	144	46	143	50	143	54	142	60	141	66	140	78	138	90	138	102		
154	48	154	52	153	56	153	60	152	66	151	72	150	84	148	96	148	108		150
164	48	164	52	163	56	163	60	162	66	161	72	160	84	158	96	158	108		
174	48	174	52	173	56	173	60	172	66	171	72	170	84	168	96	168	108		
184	48	184	52	183	56	183	60	182	66	181	72	180	84	178	96	178	108		
194	48	194	52	193	56	193	60	192	66	191	72	190	84	188	96	188	108		
214	48	214	52	213	56	213	60	212	66	211	72	210	84	208	96	208	108		
234	48	234	52	233	56	233	60	232	66	231	72	230	84	228	96	228	108		
254	48	254	52	253	56	253	60	252	66	251	72	250	84	248	96	248	108		
274	48	274	52	273	56	273	60	272	66	271	72	270	84	268	96	268	108		
294	48	294	52	293	56	293	60	292	66	291	72	290	84	288	96	288	108	300	
			+5,0				+60				+7,0		+8,0		+9,0		+10,0		
			+3,0				+4,0						+6,0						

Notes:

1. Bolts with lengths given in brackets are not recommended to be used.
2. Bolts for which dimensions l_1 and l_0 are given above the broken line may be manufactured with full threading upto the head.

Example of conventional designation.

Bolt of arrangement 1 with thread diameter $d = 12$ mm, length $l = 60$ mm coarse pitch thread with tolerance zone 8g, strength class 5.8, without plating.

Bolt M12-8g X 60.58 GOST 7798-70.

-Do- arrangement 2 with fine pitch thread, tolerance zone 6g, strength class 10.9 made out of steel grade 40 l with 01 plating to 6 microns thickness:

Bolt 2K12X1.25-6gX60-109.40Q16 GOST 7798-70.

1. Weight of steel bolts (arrangement 1) with coarse pitch thread.

ПРИЛОЖЕНИЕ 1 к ГОСТ 7798-70
Справочное Reference

1. Масса стальных болтов (исполнение 1) с крупным шагом резьбы

Bolt length 1, mm	d, mm	3. Теоретическая масса 1000 шт. болтов, кг ±, при заделывании диаметра резьбы d, мм																		
		6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	44
8	8	4,305	8,898																	
10	10	4,712	9,624	19,28																
12	12	5,118	10,350	20,42																
14	14	5,524	11,080	21,56	30,93															
16	16	5,930	11,800	22,70	32,57	47,18														
18	18	6,336	12,530	23,83	34,21	49,41	65,54													
20	20	6,742	13,250	24,97	35,85	51,65	68,49	95,81												
22	22	7,204	13,980	26,11	37,49	53,89	71,44	99,52												
25	25	7,871	15,070	27,82	39,95	57,25	75,87	105,10	135,4											
28	28	8,537	16,560	29,52	42,41	60,60	80,29	110,60	143,3											
30	30	8,981	17,350	30,66	44,05	62,84	83,24	114,30	147,9	180,5										
32	32	9,425	18,140	32,03	45,66	65,07	86,19	118,00	152,5	185,2	237,0									
35	35	10,030	19,320	33,80	47,74	67,77	89,04	122,00	157,3	203,0	255,9	333,3								
38	38	10,760	20,510	35,73	51,09	71,79	95,04	129,20	166,3	203,0	255,9	333,3								
40	40	11,200	21,300	36,96	52,87	74,45	97,99	132,90	170,9	208,5	263,5	361,8	479,1							
45	45	12,310	23,270	40,05	57,31	80,50	105,70	142,10	182,5	222,6	280,1	373,0	505,2							
50	50	13,420	25,250	43,13	61,76	86,55	113,60	152,40	194,8	236,6	296,7	404,1	531,2	844,9						
55	55	14,530	27,220	46,22	66,20	92,59	121,50	162,40	206,8	250,7	313,3	425,3	557,3	872,4	1301					
60	60	15,640	29,200	49,30	70,64	98,54	129,40	172,40	219,1	266,5	329,9	446,5	593,3	920,1	1352					
65	65	16,750	31,170	52,38	75,05	104,70	137,30	182,40	231,5	281,4	348,8	467,7	609,4	977,7	1407	2000				
70	70	17,870	33,140	55,47	79,53	110,70	145,20	192,40	243,8	295,4	365,5	491,1	635,4	995,3	1453	2155				
75	75	18,990	35,120	58,55	83,97	116,80	153,10	202,40	256,1	311,3	384,3	513,5	664,0	1033,0	1509	2147				
80	80	20,090	37,090	61,64	88,42	122,80	161,00	212,40	268,1	326,2	402,1	536,1	691,8	1071,6	1561	2211				

3. Theoretical weight of 1000 nos bolts, kg approx for various nominal diameters d, mm.

1. Weight of steel bolts (arrangement 1) with coarse pitch thread. Table contd.

1

3 Теоретический вес 1000 шт. болтов, кг ±, при номинальном диаметре d, мм

Диаметр d, мм 2	Болт length 1, мм											4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
	6	7	8	9	10	11	12	13	14	15	16																																																																																																	
85	21,200	39,070	64,735	92,855	128,900	169,900	227,400	290,600	341,200	419,500	558,600	719,500	1169,000	1512	2279																																																																																													
90	22,310	41,040	67,810	97,290	134,900	176,800	232,400	293,200	356,100	437,600	581,000	747,300	1151,000	1553	2345																																																																																													
95	—	43,020	70,900	101,700	141,000	184,700	242,400	303,500	371,000	455,400	603,500	775,100	1191,000	1715	2442																																																																																													
100	—	44,950	73,980	106,200	147,000	192,600	252,400	317,800	385,900	473,200	626,000	802,800	1231,000	1765	2479																																																																																													
105	—	—	77,070	110,600	153,100	200,500	262,400	330,200	400,900	490,900	648,500	830,600	1271,000	1825	2545																																																																																													
110	—	—	80,150	115,100	159,100	208,400	272,300	342,500	415,800	509,700	671,000	859,400	1311,000	1890	2614																																																																																													
115	—	—	83,230	119,500	165,200	216,300	282,300	354,900	430,700	526,500	693,500	895,100	1351,000	1934	2690																																																																																													
120	—	—	86,320	124,000	171,200	224,200	292,300	367,200	445,700	544,200	716,000	913,900	1391,000	1982	2759																																																																																													
125	—	—	89,400	128,400	177,200	232,100	302,300	379,500	460,600	562,000	738,500	941,100	1431,000	2040	2830																																																																																													
130	—	—	92,490	132,800	182,300	240,000	312,300	391,900	475,500	579,600	761,000	969,500	1471,000	2099	2903																																																																																													
140	—	—	98,660	141,700	195,400	255,800	332,300	416,600	505,400	615,300	806,000	1025,000	1551,000	2207	3045																																																																																													
150	—	—	104,800	150,600	207,500	271,600	352,300	441,200	535,200	650,600	850,100	1090,000	1631,000	2315	3187																																																																																													
160	—	—	111,000	159,500	219,600	287,400	372,300	465,900	565,100	685,400	895,900	1155,000	1711,000	2424	3322																																																																																													
170	—	—	117,200	168,400	231,700	303,200	392,300	490,500	595,000	721,900	940,900	1192,000	1755,000	2533	3471																																																																																													
180	—	—	123,300	177,300	243,800	319,000	412,300	515,300	624,800	757,500	985,900	1247,000	1870,000	2542	3514																																																																																													

3. Theoretical weight of 1000 nos bolts, kg approx. for various nominal diameters d, mm.

1. Weight of steel bolts (arrangement 1) with coarse pitch thread.

Table Conti.

Продолжение

3. Теоретическая масса 1000 шт. болтов, кг, при номинальном диаметре резьбы d, мм

Длина болта l, мм	d															
	6	8	10	12	14	16	18	20	22	24	27	30	36	45	48	
190	—	—	129,50	186,20	255,90	333,80	432,30	540,0	654,7	793,0	1031,0	1303,0	1650,0	2151,0	2751	3455
200	—	—	135,70	195,00	267,90	350,50	452,20	564,6	684,6	828,6	1076,0	1358,0	2030,0	2650	3298	4092
220	—	—	—	212,80	292,10	382,20	492,20	614,0	744,3	899,6	1166,0	1469,0	2190,0	2877	3675	4575
240	—	—	—	—	230,60	316,30	413,80	532,20	653,4	804,0	970,8	1256,0	1580,0	2350,0	3035	3835
260	—	—	—	—	248,30	340,50	445,40	572,20	712,7	853,7	1042,0	1346,0	1691,0	2510,0	3213	4013
280	—	—	—	—	—	364,70	476,90	612,20	762,1	923,5	1113,0	1436,0	1802,0	2570,0	3290	4190
300	—	—	—	—	—	—	388,90	508,50	652,20	811,4	983,2	1264,0	1574,0	2330,0	2949	3749

Bolt length
l, mm

3. Theoretical weight of 1000 nos bolts, kg approx, for various nominal diameters d, mm

Для определения массы болтов из других материалов величину массы, указанную в таблице, следует умножить на коэффициенты: 0,335 — для алюминиевого сплава; 1,080 — для латуни.

Weights indicated in the Table are to be multiplied by 0.335 for aluminium alloys and by 1.080 for brass.

Annexure 2
Reference

Tolerance Zones for hexagon bolts in the
OCT and ECΔΠ C:B System

Tolerance Zones

In OCT System

In ECΔΠ C:B System

B ₇	h14
B ₈	h15
CM ₈	js15
A ₇	H14
A ₈	H15
CM ₉	js16

Added (Rev. No. 3).