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BOLTS, SCREWS, STUDS AND NUTS  
Specifications

GOST 1759.0-87  
(CT CЭB 4203 -83)

Translated by RUSSTRANS  
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Group F31

**Change № 1 GOST 1759.0—87 Bolts, screws, studs and nuts. Specifications.**  
**Approved and introduced into effect by the decree № 3376 dated 15.11.89 of the state committee of standardization and quality of products of USSR**

**Date of Introduction 01.07.90**

Point 1.2 Add paragraph: «The basic deviations of the threads should be assigned as per GOST 16093—81 depending upon the required coating thickness. Tolerance fields of threads are specified for products without coating. After the application of coating, the requirement for threads is according to GOST 16093—81.

Point 2.4.1.1. The first paragraph. Replace words; «or conventional designation of material group» with «(or material groups)»; after word «sealed» add word «(trade mark)»;

The third paragraph, add strength class: 6.6 (after 5.6);

Last paragraph. Replace strength class: 06 with 05.

Point 2.4.1.4, add paragraph: «while using the low carbon martensite steel for products of strength class 10.9, the designation of strength class should be underlined: 10.9 or 109».

Point 3.2, add the note — 2; «2. Till 01.01.92 obligatory tests was:

As per GOST 1759.4—87 for strength classes 8.8—12.9 determinations of ultimate strength and determination of impact strength; for strength classes 4.8; 5.8; 6.8 test for strength of joints of the head with rod;

As per GOST 1759.5—87 for strength classes 8—12, proof load stress test.

Other tests are carried out as per the customer's request.

Point 4.8. Replace the reference: GOST 9.302—79 with GOST 9.302—88.

Point 4.13. Replace words: «and length < 3d» with «or length <3d».

The appendix 1. The second example of conventional designation. Replace designation: JI with LH.

(ИYC № 2 1990)

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УДК 621.552: 006.354

Group Г31

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**S T A T E S T A N D A R D O F U S S R**

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**Bolts, screws, studs and nuts.  
Specifications****GOST  
1759.0-87**

(СТ СЭВ 4203 -83)

ОКП 12 8200, 12 8300, 12 8400

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**Date of Introduction 01.01.89**

This standard covers the bolts, screws, studs and nuts with metric thread as per GOST 24705-81 of diameter from 1 to 48 mm.

**1. MAIN PARAMETERS AND DIMENSIONS**

1.1. Design, dimensions and surface finish of bolts, screws, studs and nuts are established in standards on products.

1.2. Tolerances of the dimensions, shapes and surface position of bolts, screws, studs and nuts - as per GOST 1759.1—82.

1.3. As per the customer's request, it is allowed to manufacture bolts, screws and studs with increased or decreased length of threaded section (part).

1.4. As per the agreement between the manufacturer and the customer, following is allowed to manufacture:

Bolts, studs and nuts with left hand thread;

Bolts with one locking hole in the head.

1.5. Permissible deviations of the shapes, from established in standards on design of bolts, screws, studs and nuts of all accuracy classes, should correspond to the specifications given in the appendix 5 (obligatory).

## 2. TECHNICAL REQUIREMENTS

### 2.1. Appearance

2.1.1. The surface of bolts, screws, studs and nuts should not have traces of corrosion and mechanical damages.

2.1.2. Permissible surface defects of bolts, screws and studs - as per GOST 1759.2—82.

2.1.3. Permissible surface defects of nuts — as per GOST 1759.3—83.

### 2.2. Mechanical properties and materials

2.2.1. Mechanical properties of bolts, screws (except adjusting screw) and studs made from carbon non-alloyed and alloyed steels — as per GOST 1759.4—87.

2.2.2. Mechanical properties of adjusting screws and the similar fastening products, which are not under tension, made from carbon non-alloyed and alloyed steels — as per GOST 25556—82.

2.2.3. Mechanical properties of nuts from carbon non-alloyed and alloyed steels — as per GOST 1759.5—87.

2.2.4. Mechanical properties of bolts, screws, studs and nuts, made from corrosion-proof, high-temperature, heat-resistant and thermo stable steels, and also made from recommended steel grades — as per tables 1 and 2.

2.2.5. Mechanical properties of bolts, screws, studs and nuts, made from non-ferrous alloys, and also made from recommended grades of alloys — as per tables 3 and 4.

2.2.6. It is permitted to manufacture bolts, screws, studs and nuts from materials and the alloys, which are not specified in table 1- 4. During this their mechanical properties should not be below the specified values for the respective groups.

2.2.7. As per the customer's request fastening products made from brass, manufactured by cold upsetting, should be heat-treated for removal of internal stress.

### 2.3. Coatings

2.3.1. Bolts, screws, studs and nuts should be manufactured with one of the coating types given in table 5 or without coatings.

It is permitted to use other types of coatings — as per GOST 9.303—84.

2.3.2. Thickness of coatings — as per GOST 9.303—84.

2.3.3. Technical requirements for coatings — as per GOST 9.301—86.

Table 1

**Mechanical properties of bolts, screws and studs, made from corrosion-proof, high-temperature, heat-resistant and thermo stable steels at standard temperature**

Conventional designation of group	Ultimate strength $\sigma_B$ , N/mm <sup>2</sup>	Yield limit $\sigma_T$ ( $\sigma_{0,2}$ ), N/mm <sup>2</sup>	Relative elongation $\delta_5$ , in %	Impact strength KCU, J/cm <sup>2</sup>	Proof load stress, $\sigma_{II}$ , N/mm <sup>2</sup>	Steel	
						Grade	Designation of standard
	Not less than						
21	510	195	35	Not standardized	175	12X18H10T 12X18H9T 10X17H13M2T 10X17H13M3T 06XH28MДT	GOST 5632—72
22	590	345	20	60	310	12X13 08X2H6M2T	
23	690	540	12	60	485	20X13 14X17H2	
24	880	540	8	30	485	10X11H23T3MP	
25		735	10	30	660	13X11H2B2MΦ 25X1MΦ; 25X2M1Φ 20X1M1Φ1TP	
26	1080	835	10	50	750	07X16H6	GOST 5632—72

Table 1

**Mechanical properties of nuts made from corrosion-proof, high-temperature, heat-resistant  
and thermo stable steels at standard temperature**

Conventional designation of group	Proof load stress, $\sigma_F$ , N/mm <sup>2</sup> , , not less than	Steel	
		Grade	Designation of standard
21	510	12X18H10T, 12X18H9T 10X17H13M2T 10X17H13M3T 06XH28MДT	GOST 5632—72
22	590	12X13 08X21H6M2T	
23	690	20X13, 14X17H2	
24	880	10X11H23T3MP 13X11H2B2MΦ	
25		25X1MΦ, 25X2M1Φ 20X1M1Φ1TP	GOST 20072—74
26	1080	07X16H6	GOST 5632—72

Table 3

**Mechanical properties of bolts, screws and studs made from non-ferrous alloys at standard temperature**

Conventional designation of group	Ultimate strength $\sigma_B$ , N/mm <sup>2</sup>	Yield limit $\sigma_T$ ( $\sigma_{0,2}$ ), N/mm <sup>2</sup>	Relative elongation $\delta_5$ , in %	Brinell's hardness HB	Grade of material or alloy	Designation of standard
	Minimum					
31	260	120	15	Not standardized	AMr5П AMr5	GOST 4784-74
32	310	Not standardized	12	75	Brass Л63, Brass ЛС59- 1	GOST 15527-70 GOST 12920-67
33					Brass ЛС59-1, Antimagnetic Brass Л63 Antimagnetic	
34				490	Not standardized	Not standardized
35	370	195	10	Not standardized	Д1, Д1П, Д16, Д16П	GOST 4784-74

Table 4

**Mechanical properties of nuts made from non-ferrous alloys at standard temperature**

Conventional designation of group	Proof load stress, $\sigma_F$ , N/mm <sup>2</sup> Minimum	Grade of material or alloy	Designation of standard
31	260	AMr5П, AMr5	GOST 4784-74

Continuation of table 4

Conventional designation of group	Proof load stress, $\sigma_F$ , N/mm <sup>2</sup> Minimum	Grade of material or alloy	Designation of standard
32	310	Brass ЛС59-1, Л63	GOST 15527—70,
33		Brass Л63 antimagnetic Brass ЛС59-1 antimagnetic	GOST 12920—67
34	490	Bronze Бр.АМц 9-2	GOST 18175—78
35	370	Д1, Д1П, Д16, Д16П	GOST 4784—74

Table 5

Coating type	Designation of coating	
	As per GOST 9.306-85	Code
Zinc plating, Chromate treatment/zinc-yellow plating	Ц.хр	01
Cadmium plating, Chromate treatment/zinc-yellow plating	Кд. Хр	02
Multi-layer coating: copper — nickel	М. Н	03
Multi-layer coating: copper — nickel — chromium	М. Н. Х. б	04
Chemical Oxidizing, oil finish	Хим. Окс. прм	05
Chemical phosphotazing, oil finish	Хим. Фос. прм	06
Tin plating	О	07
Copper plating	М	08
Zinc plating	Ц	09
Oxidation, chromating	АН. Окс. нхр	10
Oxidation, from acid solutions	Хим. Пас	11
Silver coating	Ср	12
Nickel plating	Н	13

## 2.4. Marking

### 2.4.1. General rules of marking

2.4.1.1. Bolts with hexagonal head, screws with the cylindrical head and hexagonal hole for key basis, hexagonal studs and nuts should be marked with strength class or with conventional designation of material groups and seal of the manufacturer,



and products with the left hand thread should be marked in addition with symbols of left hand thread.

Compulsory marking should be done:

Bolts with hexagonal head of strength classes 4.6, 5.6, 8.8, 9.8, 10.9, 12.9;

Screws with cylindrical head and hexagonal hole for key and studs of strength classes of 8.8, 9.8, 10.9, 12.9;

Nuts of strength classes 06, 8, 9, 10, 12.

2.4.1.2. Products not specified in point 2.4.1.1 and of un-specified strength classes, as well as the products manufactured by machining, should be marked as per the agreement between the manufacturer and the customer.

2.4.1.3. Marking should be either by embossing or by indentation.

2.4.1.4. While marking the strength classes, the point dividing the first and second symbol of strength class, may not be marked.

2.4.1.5. The manufacturer establishes the letter sizes of the symbols.

2.4.2. Marking of bolts with hexagonal head and screws with cylindrical head and hexagonal hole for key.

2.4.2.1. Bolts and screws with diameter of thread  $d \geq 6$  mm are subject to marking.

2.4.2.2. Marking should be carried out on face or lateral surface of the head of bolt or screw (fig. 1). Marking on lateral surface of the head should be by indentation.

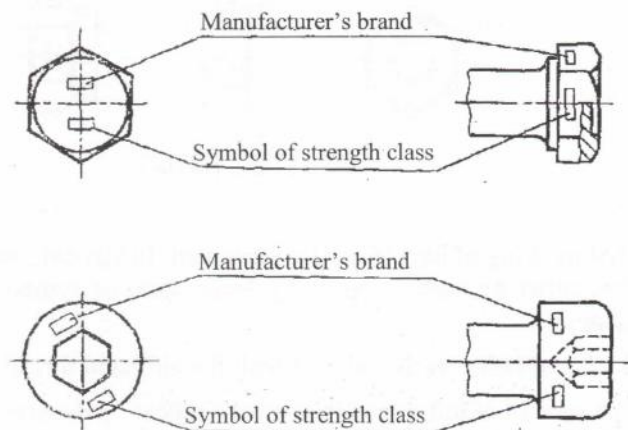


Figure 1

2.4.2.3. During marking by embossed symbols, the increase of the maximum limiting height of the head of bolt or the screw is permitted, in following limits:

- 0.1 mm — for products with diameter of thread  $d \leq 8$  mm;
- 0.2 mm — for products with diameter of thread  $8 \text{ mm} < d \leq 12$  mm;
- 0.3 mm — for products with diameter of thread  $d > 12$  mm.

#### 2.4.3. Marking of studs

2.4.3.1. Studs with diameter of thread  $d \geq 12$  mm are subject to marking. It is permitted to mark studs with diameter of thread  $d \geq 8$  mm with using of following replacement:

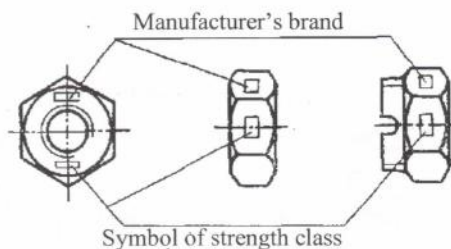
- - for strength class of 8.8;
- + - for strength class of 9.8;
- ⦿ - for strength class of 10.9;
- △ - for strength class of 12.9.

2.4.3.2. Marking should be carried out on flat surface of the stud.

#### 2.4.4. Marking of hexagonal nuts

2.4.4.1. Nuts with diameter of thread  $d \geq 6$  mm are subject to marking.

2.4.4.2. Marking should be carried out on one of the face. In technically acceptable cases it is permitted to mark on lateral surfaces of nuts (fig. 2). Marking should be by indentation.



2.4.4.3. Dial marking of nuts (fig. 3) is permitted. In this case marking should be done on chamfers either by embossing or by indentation of symbols, or on face by indentation of symbols.

#### 2.4.5. Marking of bolts, studs and nuts with the left hand thread

2.4.5.1. The symbol of left thread is an arrow indicating the screwing direction of bolt, stud and tightening of the nuts.

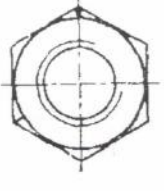
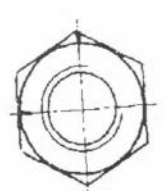
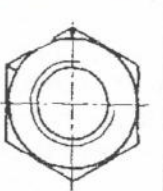
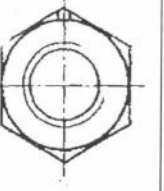
Strength class	8	9	10	12
Dial marking of nuts				

Figure 3

2.4.5.2. Marking of left thread should be done on face of the head of bolt, on one of the faces of nut (fig. 4a), on the flat surface of stud. In technically acceptable cases it is permitted to mark the symbol of left thread on lateral surfaces of nut and on the head of the bolts (fig. 4б). In this case marking should be done by indentation.

2.4.5.3. The symbol of left thread for bolts and nuts can be replaced with cuts on edges of hexagonal (fig.4в).

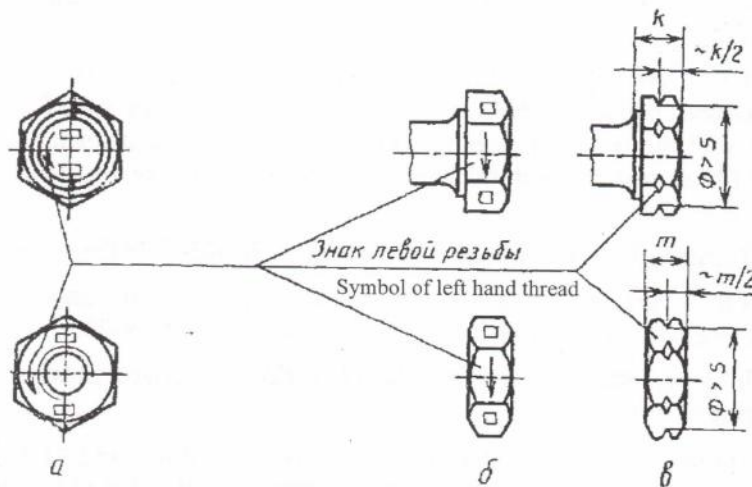


Figure 4

### 3. ACCEPTANCE

3.1. Acceptance procedures of bolts, screws, studs and nuts - as per GOST 17769-83.

3.2. Each batch of fasteners should be accompanied by the quality certificate with following information:

Name or trademark of the manufacturer;

Conventional designation of product;

List and results of the tests;

Net weights of a batch;

Means of temporary anticorrosive protection and duration of protection.

Note. It is allowed to place the quality certificate in box or in the container, in this case, it should not get damaged during transportation.

#### 4. INSPECTION METHODS

4.1. Inspection for appearance of bolts, screws, studs and nuts should be carried out without using magnifying devices.

In case of discrepancy, it is allowed to use the magnifying glass of 2.5 - 3<sup>x</sup> magnification.

4.2. Inspection of surface defects of bolts, screws and studs — as per GOST 1759.2-82.

4.3. Inspection of surface defects of nuts — as per GOST 1759.3-83.

4.4. Inspection of dimensions of bolts, screws, studs and nuts — as per GOST 1759.1-82.

4.5. Chamfers of the headcrest should be inspected by master (specimen) array (matrix) with the square hole made as per 1<sup>st</sup> series as per GOST 16030-70. A flat washer with the hole, diameter of which is more than the diameter of circumscribed circle of headcrest and with thickness of 0.5 of headcrest height should be established under the head of the bolt.

Turning of headcrest in hole of the specimen bush or in the pattern not permitted.

4.6. Surfaces finish of bolts, screws, studs and nuts should be checked by comparison with surface finish of samples as per GOST 9378-75.

It is permitted to carry out the inspection of surface finish with the help of measuring devices.

Surface finish of products, manufactured by cold die forging and surface finish of the end face of rod except for adjusting screws are not subject to inspection.

4.7. Surface finish of thread of bolts, screws and studs should be checked on lateral surfaces of its profile.

Surface finish of threads made by thread rolling, and surface finish of nut's thread is not subject to inspection and should be ensured by manufacturing process and tool.

4.8. Inspection methods of quality and thickness of coatings — as per GOST 9.302-79.

4.9. Test methods and test programs (schedules) of bolts, screws and studs made from carbon non-alloyed and alloyed steels — as per GOST 1759.4—87.

4.10. Tests of bolts, screws and studs made from corrosion-proof, high-temperature, heat-resistant and thermo stable steels, as well as made from non-ferrous alloys should be carried out as per the customer's request according to tab. 6 as per the methods given in GOST 1759.4-87.

Ultimate loads are given in the appendix 2, proof load — in the appendix 4.

Other tests of bolts, screws and studs should be carried out as per the agreement between the manufacturer and the customer.

4.11. Test methods of nuts from carbon non-alloyed and alloyed steels — as per GOST 1759.5-87.

4.12. Tests of nuts made from corrosion-proof, high-temperature, heat-resistant and thermo stable steels, as well as made from non-ferrous alloys should be carried out as per the proof load method only as per the customer's request as given in GOST 1759.5-87.

Proof loads are given in the appendix 3.

4.13. In case of manufacturing of bolts, screws and studs by machining, without subsequent heat treatment, it is permitted to carry out test of mechanical properties on base metal or on the samples made of the base metal.

Table 6

Mechanical characteristics	Type of test	Groups of materials				
		21	22, 23, 24, 25, 26	31, 35	34	32, 33
Ultimate strength	Tensile test	X 0	X 0	X 0	X 0	X 0
Yield limit	Tensile test	X	X	X	-	-
Relative elongation	Tensile test	X	X	X	X	X
Brinell's hardness	Hardness test					X 0
Impact strength	Impact strength test		X			

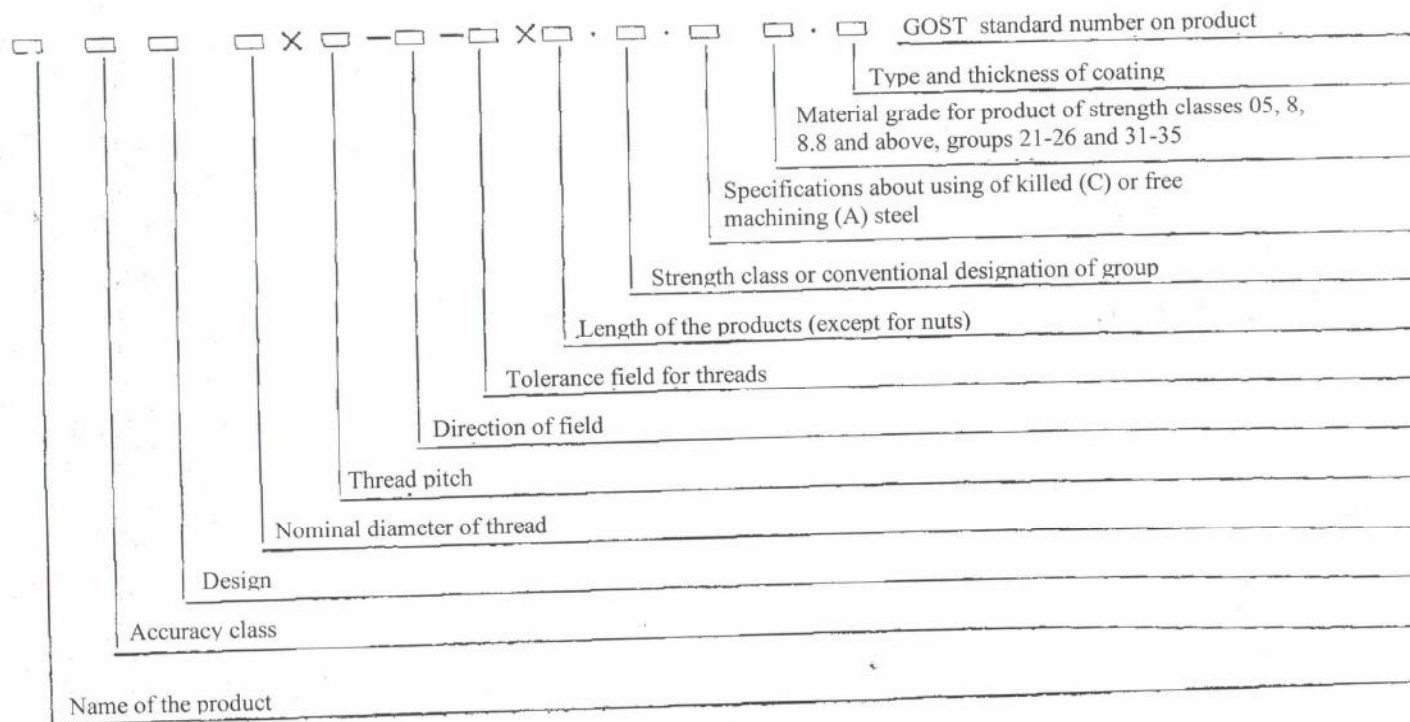
0 — for bolts, screws and studs with thread  $d \leq M 5$  and length  $< 3 d$ ;  
 X — for bolts, screws and studs with thread  $d > M 5$  and length  $\geq 3d$ .

**5. TRANSPORTATION AND STORAGE**

Temporarily anticorrosive protection of products, packing, marking of container, transportation and storage — as per GOST 18160-72.

DIAGRAM

Conventional designation of bolts, screws, studs and nuts.  
Conventional designation of bolts, screws, studs and nuts should be written as follows



Examples of conventional designations of fasteners

Screw — as per GOST 17473-80 accuracy class A, design 2, diameter of thread  $d = 12$  mm with fine pitch of thread, with tolerance field of thread 6e, length  $l = 60$ , strength class 5.8, made from killed steel with zinc plating of thickness 9 microns, Chromatizing (zinc-yellow plated)

*Screw A2M12x1.25-6ex60.58.C.019 GOST 17473-80*

Nut — as per GOST 5916-70, design 2, diameter of thread  $d = 12$  mm, with fine pitch of thread, with left hand thread, with tolerance field 6H, strength class 05, made from steel of grade 40X, with zinc plating of thickness 6 microns, Chromatizing (zinc-yellow plated)

*Nut 2M12x1,25-JI-6H.05.40X.016 GOST 5916-70*

Notes:

1. The following are not specified in conventional designations:

Design 1, coarse pitch thread, right hand thread, absence of coating, and also the parameters identically determined by product standards;

Accuracy class B if the standard on concrete fastener provides 2 accuracy classes (A and B).

2. If the coating which is not specified by this standard is used, its designation as per GOST 9.306-85.



APPENDIX 2  
Obligatory  
Table 7

The minimum ultimate loads for bolts, screws and studs with coarse thread pitch

Nominal thread diameter, d in mm	Thread pitch, P, in mm	Nominal cross-section area $A_s$ , $\text{mm}^2$	Minimum ultimate load, in N, for designated groups								
			21	22	23	24; 25	26	31	32; 33	34	36
4	0,7	8,78	4470	5170	6050	7720	9470	2280	2720	4290	3240
5	0,8	14,2	7240	8380	9800	12500	15300	3690	4400	6960	5250
6	1	20,1	10300	11900	13900	17700	21700	5230	6230	9850	7440
7	1	28,9	14700	17000	19900	25300	31100	7500	8900	14100	10660
8	1,25	36,6	18700	21600	25300	32200	39500	9520	11300	17900	13500
10	1,5	58,0	30100	34800	40700	51900	63700	15100	18000	28400	21500
12	1,75	84,3	42900	49700	58100	74100	90900	21900	26100	41300	31200
14	2	115	58700	67900	79400	101000	124000	29900	35700	56400	42600
16	2	157	80100	92600	108000	138000	170000	40800	48700	76900	58100
18	2,5	192	97900	113000	132000	169000	207000	49900	52500	94100	71000
20	2,5	245	125000	145000	169000	216000	265000	63700	76000	120000	90700
22	2,5	303	155000	179000	209000	267000	327000	78800	93900	148000	112000
24	3	353	176000	208000	243000	310000	380000	91500	109000	172000	130000
27	3	459	234000	271000	317000	404000	496000	119000	142000	225000	170000
30	3,5	561	286000	330000	386000	493000	605000	146000	174000	274000	207000
33	3,5	694	353000	410000	478000	610000	748000	180000	215000	340000	256000
36	4	817	416000	480000	563000	718000	881000	212000	253000	400000	302000
39	4	976	497000	575000	673000	860000	1053000	253500	302000	478000	361000
42	4,5	1120	571000	661000	773000	986000	1210000	291000	347000	549000	414000
45	4,5	1306	666000	770000	901000	1150000	1410000	339600	405000	640000	483000
48	5	1472	751000	868000	1020000	1300000	1590000	383000	456000	721000	545000

Table 8

## The minimum ultimate loads for bolts, screws and studs with fine thread pitch

Nominal thread diameter, d in mm	Thread pitch, P, in mm	Nominal cross-section area $A_S$ , mm <sup>2</sup>	Minimum ultimate load, in N, for designated groups								
			21	22	23	24; 25	26	31	32; 33	34	35
8	1	39,2	19900	23100	27000	34400	42200	10200	12100	19200	14500
10	1,25	61,2	31200	36100	42200	53900	66100	15900	19000	30000	22600
12	1,25	92,1	46900	54300	63500	81000	99400	23900	28500	45100	34000
14	1,5	125	63200	73200	85600	109000	134000	32200	38400	60800	45900
16	1,5	167	85200	98500	115000	147000	180000	43400	51800	81800	61800
18	1,5	216	110000	127000	149000	190000	233000	56200	67000	106000	79900
20	1,5	272	138000	160000	187000	238000	293000	70500	84000	133000	100000
22	1,5	333	170000	196000	230000	293000	360000	86600	103000	163000	123000
24	2	384	196000	227000	265000	338000	415000	998000	119000	188000	142000
27	2	496	252000	292000	342000	436000	535000	129000	153000	243000	183000
30	2	621	317000	366000	428000	546000	671000	161000	193000	304000	230000
33	2	761	388000	449000	525000	670000	822000	198000	236000	373000	282000
36	3	865	441000	510000	596000	760000	933000	225000	268000	423000	320000
39	3	1030	525000	608000	711000	906000	1112000	268000	319000	505000	381000
42	3	1205	615000	711000	830000	1060000	1300000	313000	374000	590000	446000
45	3	1400	714000	826000	966000	1232000	1512000	364000	434000	686000	518000
48	3	1603	818000	946000	1110000	1411000	1731000	417000	497000	785000	593000

APPENDIX 3  
 Obligatory  
 Table 9
Proof load for nuts with height  $m \geq 0.8 d$  with coarse thread pitch

Nominal thread diameter, d in mm	Thread pitch, P, in mm	Nominal cross-section area of mandrel $A_s, \text{mm}^2$	Proof load, in N, for designated groups								
			21	22	23	24; 25	26	31	32; 33	34	35
1,6	0,35	1,27	650	750	880	1120	1370	330	390	620	470
2	0,4	2,07	1060	1220	1430	1820	2240	540	640	1010	770
2,5	0,45	3,39	1730	2000	2340	2980	3660	880	1050	1660	1250
3	0,5	5,03	2570	2970	3470	4430	5430	1310	1560	2460	1860
3,5	0,6	6,78	3450	3990	4670	5960	7310	1760	2100	3320	2500
4	0,7	8,78	4470	5170	6050	7720	9470	2280	2720	4300	3240
5	0,8	14,2	7240	8380	9800	12500	15300	3690	4400	6960	5250
6	1	20,1	10300	11900	13900	17700	21700	5230	6230	9850	7440
7	1	28,9	14700	17000	19900	25300	31100	7490	8930	14100	10700
8	1,25	36,6	18700	21600	25300	32200	39500	9520	11300	17900	13500
10	1,5	58,0	29600	34200	40000	51000	62600	15100	18000	28400	21500
12	1,75	84,3	49200	49700	58100	74100	90900	21900	26100	41300	31200
14	2	115	587000	67900	79400	101000	124000	29900	35700	56400	42600
16	2	157	80100	92600	108000	138000	170000	40800	48700	76900	58100
18	2,5	192	97900	113000	132000	169000	207000	49900	59500	94100	71000
20	2,5	245	125000	145000	169000	216000	265000	63700	76000	120000	90700
22	2,5	303	155000	179000	209000	267000	327000	78800	93900	148000	112000
24	3	353	180000	208000	243000	310000	380000	91500	109000	172000	130000
27	3	459	234000	271000	317000	404000	496000	119000	142000	225000	170000
30	3,5	561	286000	330000	386000	493000	605000	146000	174000	274000	207000
33	3,5	694	353000	409000	478000	610000	748000	180000	215000	340000	256000
36	4	817	416000	480000	563000	718000	881000	212000	253000	400000	302000
39	4	976	497000	575000	673000	858000	1053000	254000	302000	478000	361000
42	4,5	1120	571000	661000	773000	986000	1210000	291000	347000	549000	414000
45	4,5	1305	666000	770000	900000	1148000	1409000	339000	405000	640000	483000
48	5	1472	751000	868000	1016000	1296000	1590000	383000	456000	721000	545000

Table 10

Proof load for nuts with height  $m \geq 0.8 d$  with fine thread pitch

Nominal thread diameter, d in mm	Thread pitch, P, in mm	Nominal cross-section area of mandrel $A_S$ , mm <sup>2</sup>	Proof load, in N, for designated groups								
			21	22	23	24; 25	26	31	32; 33	34	35
8	1	39,2	19900	23100	27000	34400	42200	10200	12100	19200	14500
10	1	64,5	32900	38100	44500	56800	69700	16800	20000	31600	23900
10	1,25	61,2	31200	36100	42200	53900	66100	15900	19000	30000	22600
12	1,25	92,1	46900	54300	63500	81000	99400	23900	28500	45100	34000
12	1,5	88,1	44900	52000	60800	77500	95100	22900	27300	43200	32600
14	1,5	125	63200	73200	85600	109000	134000	32200	38400	60800	45900
16	1,5	167	85200	98500	115000	147000	180000	43400	51800	81800	61800
18	1,5	216	110000	127000	149000	190000	233000	56200	67000	106000	79900
18	2	204	104000	120000	141000	180000	220000	53000	63200	100000	75500
20	1,5	272	138000	160000	187000	238000	293000	70500	84000	133000	100000
20	2	258	132000	152000	178000	227000	279000	67100	80000	126000	95500
22	1,5	333	170000	196000	230000	293000	360000	86600	103000	163000	123000
22	2	318	162000	185000	219000	280000	343000	82700	98600	156000	118000
24	1,5	401	205000	237000	277000	353000	433000	104000	124000	196000	148000
24	2	384	196000	327000	265000	338000	415000	99800	119000	188000	142000
27	2	496	252000	292000	342000	436000	535000	129000	153000	243000	183000
30	2	621	317000	366000	428000	546000	671000	161000	193000	304000	230000
33	2	761	388000	448000	524000	669000	821000	198000	236000	372000	281000
36	3	865	441000	510000	596000	760000	933000	225000	268000	423000	320000
39	3	1030	524000	607000	709000	905000	1105000	266000	317000	501000	379000
42	3	1205	615000	711000	831000	1060000	1301000	313000	374000	590000	446000
45	3	1397	712000	824000	964000	1229000	1509000	363000	433000	685000	517000
48	3	1603	818000	946000	1122000	1411000	1731000	417000	497000	785000	593000

APPENDIX 4  
Obligatory  
Table 11

Proof loads for bolts, screws and studs with coarse thread pitch

Nominal thread diameter, d in mm	Thread pitch, P, in mm	Nominal cross-section area $A_S$ , mm <sup>2</sup>	Proof load, in N, for designated groups				
			21	22	23; 24	25	26
4	0,70	8,78	1540	2720	4260	5790	6590
5	0,80	14,20	2490	4400	6890	9370	10700
6	1,00	20,10	3520	6230	9760	13300	15100
7	1,00	28,90	5068	8960	14000	19100	21700
8	1,25	36,60	6410	11300	17800	24200	27500
10	1,50	58,00	10200	18000	28100	38300	43500
12	1,75	84,30	14800	26100	40900	55600	63200
14	2,00	115,00	20100	35700	55800	75900	86300
16	2,00	157,00	27500	48700	76100	104000	118000
18	2,50	192,00	33600	59500	93100	127000	144000
20	2,50	245,00	42900	76000	119000	162000	184000
22	2,50	303,00	53000	93900	147000	200000	227000
24	3,00	353,00	61800	109000	171000	233000	265000
27	3,00	459,00	80300	142000	223000	303000	344000
30	3,50	561,00	98000	174000	272000	370000	421000
33	3,50	694,00	121000	215000	337000	458000	521000
36	4,00	817,00	143000	253000	396000	539000	613000
39	4,00	976,00	171000	303000	473000	644000	732000
42	4,50	1120,00	196000	347000	543000	739000	840000
45	4,50	1306,00	229000	405000	633000	862000	980000
48	5,00	1472,00	258000	456000	714000	972000	1104000

Table 12

Proof loads for bolts, screws and studs with fine thread pitch

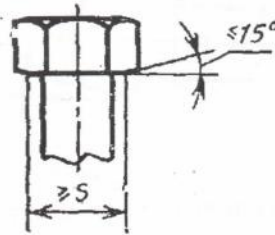
Nominal thread diameter, d in mm	Thread pitch, P, in mm	Nominal cross-section area $A_S$ , mm <sup>2</sup>	Proof load, in N, for designated groups				
			21	22	23; 24	25	26
8	1,00	39,2	6840	12200	19000	25800	29400
10	1,25	61,2	10700	19000	29700	40400	45900
12	1,25	92,1	16100	28600	44700	60800	69000

Continuation of table 12

Nominal thread diameter, d in mm	Thread pitch, P, in mm	Nominal cross- section area $A_s$ , $\text{mm}^2$	Proof load, in N, for designated groups				
			21	22	23; 24	25	26
14	1,50	125,0	21900	38800	60600	82500	93800
16	1,50	167,0	29200	51800	81000	110000	125000
18	1,50	216,0	37800	67000	105000	143000	162000
20	1,50	272,0	47600	84000	132000	179000	204000
22	1,50	333,0	58300	103000	162000	220000	250000
24	2,00	384,0	67200	119000	186000	253000	288000
27	2,00	496,0	86800	154000	241000	327000	372000
30	2,00	621,0	109000	193000	301000	410000	466000
33	2,00	761,0	133000	236000	369000	502000	571000
36	3,00	865,0	151000	268000	419000	571000	649000
39	3,00	1030,0	180000	319000	500000	680000	773000
42	3,00	1205,0	211000	374000	584000	795000	904000
45	3,00	1400,0	245000	434000	679000	924000	1050000
48	3,00	1603,0	281000	497000	777000	1058000	1202000

APPENDIX 5  
Obligatory

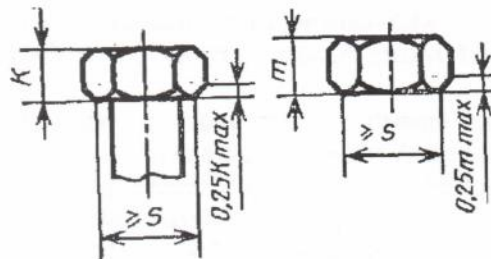
1. Chamfer on bearing surface of bolts — at a angle not more than  $15^\circ$  (fig. 5).



S- spanner size

Fig. 5

2. Chamfering of edges of hexagonal or square with bearing surface or end face of bolt head and with bearing surface of nut, not more than 0.25 of heights of the bolt head or nut (fig. 6).



S- spanner size

Fig. 6

3. Rounding-off of edges of hexagonal or square should not reduce the diameter of circumscribed circle from minimum limiting dimension.

4. Rounding-off of shoulders of heads of bolts and screws with countersunk and raised countersunk head and edges of bolts and screws with semicircular and cylindrical heads, should not reduce the diameter of head from the minimum limiting dimension.

5. Under pressing as a shear of top of semicircular, spherical and raised countersunk head is permitted, if diameter of shear area does not exceed 30 % of nominal diameter of the head for accuracy class A; 40 % of nominal diameter of the head for accuracy classes B and C.

Under pressing should not reduce the height of the head from minimum limiting dimension.

6. Inclination, forming the head not more than  $5^\circ$  and sphere on upper face of head, should not deduce the height of the cylindrical head from maximum limiting dimension (fig. 7).

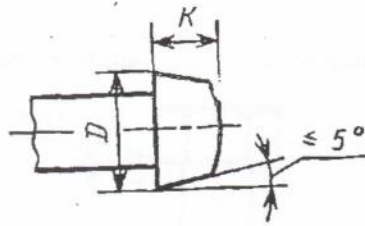


Figure 7

7. Reduction of minimum diameter of the head in a direction of groove, should not exceed:

- 0.3 mm — for screws with diameter of thread upto 2 mm;
- 0.6 mm — for screws with diameter of thread above 2 mm upto 6 mm;
- 0.8 mm - for screws with diameter of thread above 6 mm.

8. Reduction of minimum diameter of semicircular and countersink heads in a direction of rib or edges of square head rest should not exceed:

- 0.6 mm — for bolts with diameter of the head upto 30 mm;
- 0.8 mm — for bolts with diameter of the head above 30 mm.

9. Chamfering of square headrest should not result to turning of bolts in inspection array.

10. Convexity of diameter of rod under the head of bolts and screws, for products of accuracy classes A and B, not more than:

- 0.05 mm on length of 5 mm diameter of thread upto 16 mm;
- 0.1 mm on length of 8 mm diameter of thread from 16 upto 27 mm;
- 0.2 mm on length of 10 mm diameter of thread above 27 mm.

For products of accuracy class C - not more than the deviation limits as per tolerance field +JT14 on the length, which is twice the nominal thread diameter.

11. Bevel cut of rod with width not more than:

- One pitch of thread — for accuracy classes A and B;
- Two pitch of thread - for accuracy class C.

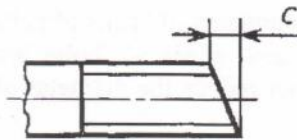


Figure 8

12. Countersink of hole for cotter pin - with diameter not more than 1.5 of the hole diameter.

13. Inclination of groove (angle  $\alpha$  — fig. 9) not more than:

- 3° — for accuracy class A;
- 5° — for accuracy classes B and C.



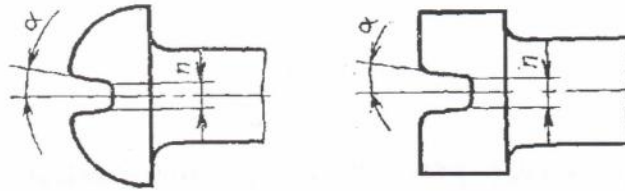


Fig. 9

14. Center holes on faces of head and rod are allowed.

15. Absence of end chamfers on products of accuracy class C with rolled thread and on rods of screws of accuracy class A and B with rolled thread is allowed.

Upon agreement between the customer and the manufacturer absence of end chamfers on rods of bolts and studs of accuracy classes A and B with rolled thread is allowed.

16. Rounding-off of the upper end face of the head instead of chamfers of bolts with indentation in the head is allowed.

17. Concavity of bottom surface of grooves toward its length with the curvature corresponding to radius of standard groove or key milling cutter, as well as convexity with radius not less than 90 mm — for screws with diameter of thread upto 12 mm and not less than 150 mm — for screws with diameter of thread more than 12 mm is allowed.

18. Presence of crater in helix of thread of nuts (while manufacturing the thread by rolling) should not deduce the sizes of thread beyond deviation limits.

**Supersedes GOST 1759—70 (regarding technical requirements and marking of fasteners)**

**REFERENCE TECHNICAL-STANDARD DOCUMENTS**

Document no	Point no.
GOST 9.301—86	2.3.3
GOST 9.302—79	4.8
GOST 9.303—84	2.3.1, 2.3.2
GOST 9.306—85	2.3.1
GOST 1759.1—82	4.4
GOST 1759.2—82	2.1.2, 4.2
GOST 1759.3—83	2.1.3, 4.3
GOST 1759.4—87	2.2.1, 4.9, 4.10
GOST 1759.5—87	2.2.3, 4.11, 4.12
GOST 4784—74	2.2.5
GOST 5632—72	2.2.4
GOST 9378—75	4.6
GOST 12920—67	2.2.5
GOST 15527—70	2.2.5
GOST 16030—70	4.5
GOST 17769—83	3.1
GOST 18160—72	5
GOST 18175—78	2.2.5
GOST 20072—74	2.2.4
GOST 24705—81	Introduction
GOST 25556—82	2.2.2