

# STATE STANDARD OF USSR

# BOLTS WITH HEXAGONAL HEAD OF CLASS OF ACCURACY A

Design and dimensions
GOST 7805-70

**Official Publication** 

**State Committee of USSR on standards** 

**MOSCOW** 

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# STATE STANDARD OF USSR

# Bolts with hexagonal head of class of accuracy A

GOST 7805-70

# **Design and dimensions**

(CT C3B 4727-84)

ОКП 12 8200

Date of introduction <u>01.01.72</u>

As a part of dimension << for spanner >> S = 13 mm.

<u>01.01.73</u>

1. This standard pertains to the bolts with hexagonal heads of class of accuracy A with diameter of thread from 1.6 upto 48 mm.

Standard completely corresponds to CT C3B 4727-84.

# (Amended edition, amendment No. 4).

2. Design and dimensions of bolts should corresponds to those specified in drawing and in table 1 and 2.

### (Amended edition, amendment No. 2-6).

3. Thread – according to GOST 24705. Run out and under cut of threads - according to GOST 27148. Ends of bolts – according to GOST 12414.

# (Amended edition, amendment No. 5).

- 3a. Radius for head according to GOST 24670.
- 36. Dimensional tolerances, deviation of shapes and position of surface and inspection methods- according to GOST 1759.1 are not established by this standard.
  - 3B. Permissible surface defects of bolts and inspection method according to GOST 1759.2.
  - 3a 3B. (Introduced additionally, amendment No. 4).
- 4. According to the agreement between manufacturer and consumer, it is permitted to manufacture the bolts with nominal diameter of threads from 36 upto 48 mm with pitch of thread 2 mm.

# (Amended edition, amendment No. 4).

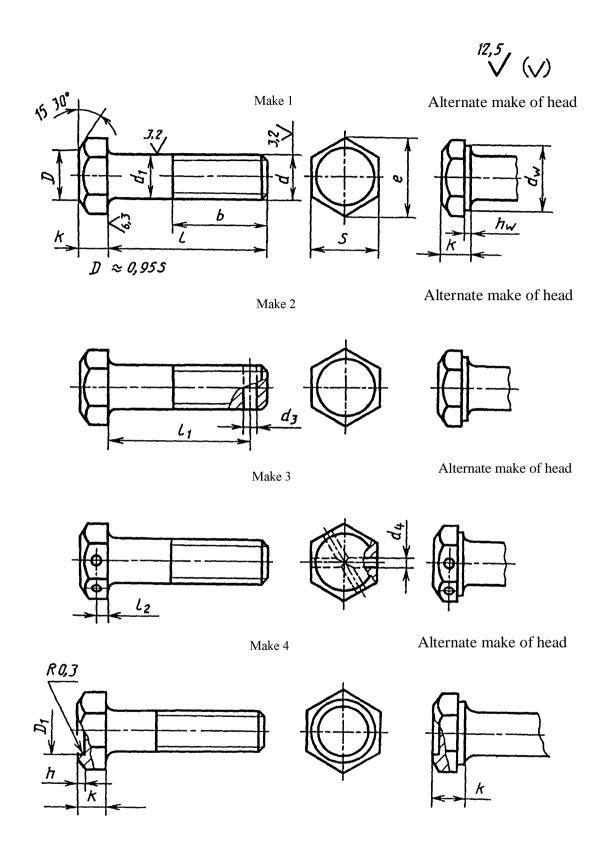
- 5. Manufacturer sets the alternate for making of head.
- 5a. It is permitted to manufacture the bolts with diameter of smooth portion of shank  $d_1$  approximately equal to the average diameter of threads.

### (Introduced additionally, amendment No. 3).

56. For application of marking signs, it is permitted to manufacture the bolts of make 1 and 2 with hole on the end face of surface of head with dimensions, which do not decrease the strength of head, in this case the depth of hole should be not more than 0.4 k.

## (Introduced additionally, amendment No. 5).

- 6. Technical requirement according to GOST 1759.0.
- 7. (Deleted, amendment No. 2).
- 8. Weight of bolts, specified in appendix 1.
- 9. (Deleted, amendment No. 4).



$$D_i \le 0.8 S$$
  
 $h = (0.2 + 0.4) k$ 

MM

																			,	,	,		
Nominal diam	eter of threads d	1,6	2	2,5	3	(3,5)	4	5	6	8	10	12	(14)	16	(18)	20	(22)	24	(27)	30	36	42	48
Pitch of	Coarse	0,35	0,4	0,45	0,5	0,6	0,7	0,8	1	1,25	1,5	1,75	2	2		2,5		3	3	3,5	4	4,5	5
thread	Fine					_	•			1	1,	25			1,5				2			3	
Diameter of	f shank. $d_i$	1,6	2	2,5	3	3,5	4	5	6	8	10	12	14	16	18	20	22	24	27	30	36	42	48
Width acro	ss flat. S	3,2	4	5	5,5	6	7	8	10	13	16	18	21	24	27	30	34	36	41	46	55	65	75
Head he	ight. k	1,1	1,4	1,7	2,0	2,4	2,8	3,5	4,0	5,3	6,4	7,5	8,8	10,0	12,0	12,5	14,0	15,0	17,0	18,7	22,5	26,0	30,0
Diameter of circle e, not les		3,4	4,3	5,5	6,0	6,6	7,7	8,8	11,1	14,4	17,8	20,0	23,4	26,8	30,1	33,5	37,7	40,0	45,6	51,3	61,3	72,6	83,9
$d_{\mathbf{w}}$ , not less th	ian	2,3	3,1	4,1	4,6	5,1	5,9	6,9	8,9	11,6	14,6	16,6	19,6	22,5	25,3	28,2	31,7	33,6	38,0	42,7	51,1	61,0	70,5
7.	Not less than			I		·		J	0,15								0,2	20				0,	25
h <sub>w</sub>	Not more than					0,4		0	,5		0	,6						0,	8				
Diameter of ho	ole in rod $d_3$						1,0	1,2	1,6	2,0	2,5	3,	,2		4,0			5,0		6,	,3	8	,0
Diameter of ho	ble in head $d_{\scriptscriptstyle 4}$						1,0	1,2	2,0	2,	5	3,	,2				4,0					5,0	
Distance from surface upto the hole in head $l_2$ js 15	ne axis of			_	***************************************		1,4	1,8	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

### Note:

- 1. It is not recommended to use the dimension of bolts, which are enclosed in brackets.
- 2. It is permitted to manufacture the bolts with dimensions, specified in appendix 2.

mm

Langth	L	engt	ı of t	hread	ds b	and d	istanc	e fror	n sur	porti	ng su	rface	at he	ad up	to ax	is of h	ole ir	n rod 1, at		
Length of	1,6	2	2,5	3	3,5	4		5	Î	6		8		10	)	13	2	(14	)	
bolts l	Ь	ь	Ь	ь	Ь	I <sub>i</sub>	Ь	1,	Ь	1,	ь	1,	b	<i>l</i> ,	b	1,	b	<i>I</i> <sub>1</sub>	b	
2	×		_		_	_	_		_		-	-	_		-	-	-	_	_	}
3	×	×	×	-	-	-	-	-	-	-	-	-		~	-	-	-	-	_	
4	×	X	×	X	_	-	-	- 1	_	_	_	_	_		-	_	_	_		
5 6	×	×	×	×	×	_	×	_	×	_	_	_	_		_	_	_	-		1
8	Î	×	l â	×	×	-	×	_	×		×	-	×			-	-	-	-	
10	×	×	×	×	×	7,5	×	-	×	-	×	- 1	×	-	×	- (	<b>-</b> i	-		1
12	9	×	×	×	×	9,5	×	9,5	×	10	×	-	×	-	×	_	×	_	_	
14	9	10	11	12	13	11,5 13,5	× 14	11,5	×	12	×	<u> </u>	×	_	×	_	×	_	×	
16 (18)	_	10	11	12	13	15,5	14	15,5	16	14	×	14	×	14	×	-	×	_	×	}
20	_	-	lii	12	13	17,5	14	17,5	16	16	×	16	×	16	×	15	×	_	×	
(22)	1-		11	12	13	19,5	14	19,5	16	18	18	18	×	18 21	×	17 20	×	17 20	×	
25	-	-	11	12	13	22,5 25,5	14	22,5 25,5	16 16	21 24	18 18	21 24	× 22	24	×	23	×	23	×	
(28) 30	_	_	_	12	13	27,5	14	27,5	16	26	18	26	22	26	×	25	×	25	×	
(32)	_	_			_	29,5	14	29,5	16	28	18	28	22	28	26	27	×	27	×	
35	-		-	-	-	32,5	14	32,5	16	31	18	31	22	31	26 26	30 33	30	30 33	×	1
(38)	-	-	-	-	-	35,5	14	35,5 37,5	16 16	34 36	18 18	34 36	22 22	36	26	35	30	35	34	
40 45	_			_	_	37,5 42,5	14	42,5	16	41	18	41	22	41	26	40	30	40	34	
50	_	_	-	_	-	47,5	14	47,5	16	46	18	46	22	46	26	45	30	45	34	
55	1 ~	-	-	-	-	52,5	14	52,5	16	51	18	51	22	51	26	50 55	30 30	50 55	34 34	
60	-	-	1 -	-	-	57,5	14	57,5 62,5	16 16	56	18	56	22 22	56	26 26	60	30	60	34	
65 70	-	-		_	_	_	_	67,5	16	66	18	66	22	66	26	55	30	65	34	
76 75	_	_	.	_	_	_	-	72,5	16	71	18	71	22	71	26	70	30	70	34	
80	-	-	.   —	-	-		-	77,5	16	76	18	76	22	76	26	75	30	75	34	
(85)	-	-	-   -	-	-		-	-	-	81	18	81 86	22 22	81	26 26	80 85	30	80 85	34	
90	-	-	_					_	_	- 80	10	91	22	91	26	90	30	90	34	
(95) 100	_				_	_			-	_		96	22	96	26	95	30	95	34	
(105)		-	-	-	_	-	-	-	-	-	-	-	-	101	26	100	30	100	34	
110	-	-	-	-	-	-	-	-	-	-	-	-	-	106	26	105	30	105	34	
(115)	-	-	-   -	-	-	-		_	_	_	_		_	116		115		115	34	
120 (125)			1 _	_	1_	_	_	_		_	_		-	121	26	120	30	120	34	
130	_	-	-	-	-	-	1 -	-	-	-	-	-	-	126	32	125	36	125	40	
140	-	-	-   -	-	-	-	-	-	-	-	-	-	-	136		135	36	135	40	
150	-	-	-   -	-	-	_	_	_		_	_	_	_	156		155		155	40	1
160 170	_			1-	1_		_	_	_	_	_	-	_	166	32	165	36	165	40	1
180	_	1	-   -	-	-	-	-	-	_	-	-	-	-	176		175		175	40	
190	-	·   -	-   -	-	-	-	-	-	-	-	-	-	-	186		185		185	40	
200	-		-   -	-	-	-	_	_	_	_	_		_	190	32	215		215	53	-
220 240	_				_		_	_	_	_	_	_	-	_	1	235	49	235	53	
260		.   -	_   _	.	.   _	_	1 -	_	-	-	1 -	-	-	-	1 -	255		255	53	
280	-		-   -	-	.	-		-	-	1-	-	-	-	-	-	-	-	275	53	
300	-	-   -	-1 -	-		1	1 -	1 -	1 -	1 -	1 -	1 -	-	-	-	1 -	1. —	295	1 22	j

Note: It is recommended to use the bolts with dimensions of length enclosed in brackets. Example of conventional code: Bolts of make 1 with diameter of thread of d 12 mm, with strength class 5.8, without coating:

Also, make 2, with width across flat S 19 mm, with fine pitch of thread with with tolerance

Table 2

		Nomina	ıl dime	ension	of th	reads	d (Si	en X	mark	of b	olts w	ith th	read	on to	tal len	gth c	of rod	)		
	1		(1			0	(2			4		27)		0		6		2	4	18
	$l_i$	b	l <sub>1</sub>	b	l <sub>1</sub>	Ь	l <sub>1</sub>	ь	1,	ь	l,	b	1,	b	1,	ь	$l_1$	b	<i>l</i> <sub>1</sub>	b
	_	_	_	_	_	-	-		_	_	_	-	_	_	_	_	_	_	_	_
		_	_	<del>-</del>	_	_	_	_	-	_	-	-	-		-	_	-	-	-	-
	_	_	_	_	_		_	_	_	_	_	=	_	_	_	_	_	_	_	_
i	-	_	-	-	-		-	_	-	_	-	-	-	-	-	_	-		-	-
1	_	_	_	-	_	_	_	_	_	_		_	_	_	_	_	_	_	_	_
	_		-		_	-	-		-		-	–	-	_		-	-	-	_	_
	_	_	_	_	_	_	_	_	_	_	_	_	-	-	-	_	-	-	-	-
		×		_	_	_	_	_	_	_	_	_	_	_	_	_	_	-	_	_
		×		×	_	-	_	_	-	-		-	-	_	-	_		-	-	_
	19	×	_	×		×	_	_		_	_	_	_	_	_	_	_	_	_	_
	22	×	22	×	_	×	_	_		_	_		-	_	-		-	_	_	_
	24 26	×	24 26	×	24 26	×	25	×	_	×	_	_	_	_	_	_	_	_		_
ł	29	×	29	×	29	×	28	×	28	×		×	-	_	-	_	_	_	_	_
	32 34	×	32 34	×	32	×	31	×	31	×	32	×	-	—   ×	-	-	-	_	-	-
	39	38	39	×	39	×	38	×	38	×	37	×	36	×	_	_	_	_	_	_
	44 49	38 38	44 49	42 42	44 49	× 46	43	X	43	×	42	×	41	×	40	×	-	_	-	-
	54	38	54	42	54	46	53	× 50	48	×	47 52	×	46	×	45 50	×	48	×	_	_
	59	38	59	42	59	46	58	50	58	54	57	×	56	×	55	×	53	×	_	×
1	64 69	38 38	64 69	42 42	64 69	46 46	63 68	50 50	63 68	54 54	62	60 60	61	66	60	×	58	×	58 56	×
	74	38	74	42	74	46	73	50	73	54	72	60	71	66	70	×	68	×	68	×
	79 84	38 38	79 84	42 42	79 84	46 46	78 83	50 50	78 83	54 54	77	60	76	66	75	X	73	×	73	×
İ	89	38	89	42	89	46	88	50	88	54	82 87	60	81	66 66	80 85	78 78	78 83	×	78 83	×
	94	38	94	42	94	46	93	50	93	54	92	60	91	66	90	78	88	×	88	×
	99 104	38 38	99 104	42 42	99 104	46 46	98 103	50 50	98 103	54 54	97 102	60	96 101	66	95 100	78 78	93	90 90	93 98	×
İ	109	38	109	42	109	46	108	50	108	54	107	60	106	66	105	78	103	90	103	102
ļ	114 119	38 38	114 119	42 42	114 119	46 46	113 118	50 50	113	54 54	112	60 60	111	66 66	110 115	78 78	108	90	108	102
ļ	124	44	124	48	124	52	123	56	123	60	122	66	121	72	120	76 84	113 118	90 96	113 118	102 108
İ	134	44	134	48	134	52	133	56	133	60	132	66	131	72	130	84	128	96	128	108
1	144 154	44 44	144 154	48 48	144 154	52 52	143 153	56 56	143 153	60 60	142 152	66 66	141 151	72 72	140 150	84 84	138 148	96 96	138 148	108 108
	164	44	164	48	164	52	163	56	163	60	162	66	161	72	160	84	158	96	158	108
	174 184	44 44	174 184	48 48	174 184	52 52	173 183	56 56	173 183	60 60	172 182	66 66	171 181	72 72	170 180	84 84	168 178	96 96	168	108
	194	44	194	48	194	52	193	56	193	60	192	66	191	72	190	84 84	188	96 96	178 188	108 108
	214 234	57 57	214	61	214	65 65	213	69	213	73	212	79	211	85	210	97	208	109	208	121
	254	57	234 254	61 61	234 254	65 65	233 253	69 69	233 253	73 73	232 252	79 79	231 251	85 85	230 250	97 97	228 248	109 109	228 248	121 121
	274	57	274	61	274	65	273	69	273	73	272	79	271	85	270	97	268	109	268	121
	294	57	294	61	294	65	293	69	293	73	292	79	291	85	290	97	288	109	288	121

width across flat S=18 mm, Length l=60 mm, with coarse pitch of thread with tolerance zone 6g,

Bolt  $M12 - 6g \times 60.58$  (S18) GOST 7805-70 zone 6g, strength class 10.9, made of steel grade 40X, with coating of thickness having 6 microns: Bolt 2M12 x 1.25 – 6g x 60.109.40X.016 GOST 7805-70

Appendix 1 Reference

# Weight of steel bolts (make 1) with coarse pitch of thread

I an adl	Theoretical weight of 1000 pieces of bolts in kg $\approx$ , at nominal diameter of thread, d in mm																					
Length		<u> </u>	ı	T	neoreti	cal we	ight of	1000 p	ieces o	tbolts	ın kg	≈, at n	omına	i diam	eter o	t thre	ad, <i>d</i> :	ın mn	1		<u> </u>	
of bolts								_							• •					<b>a</b> -	4	4.5
l, in	1.6	2	2.5	3	3.5	4	5	6	8	10	12	14	16	18	20	22	24	27	30	36	42	48
mm																						
2	0,104	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_		_			-	-
3	0,118	0,216	0,390		_	-		_	_	-	_		_			-	_	_	_	_	_	_
4	0,132	0,238	0,425	0,609		_	_	_	_		_		_	_	_	_	-	_	-	_	_	_
5	0,146	0,260	0,460	0,660	0,887				_	-	_	-		_	_	_	-			-	_	_
6	0,160	0,282	0,495	0,711	0,951	1,461	2,190	_		_			-	_	_		-	_	_	-	-	_
8		0,326			1,080	1,641	2,472	4,306			_	-	_		_	_	-	_	-	_	_	_
10	0,216		0,635		1,209	1,821	2,754	4,712			-	-	-	_	_	_	-	_		-	-	_
12	0,250		0,705		1,337	2,001	3,036		10,120			-	_	_		<i>,</i> —			<b>–</b>	-	-	-
14	0,281		0,787	1	1,466	2,181	3,318	1 '	10,850			-	_	-	_	_		_	_	-	_	_
16			0,864	1	1,595		3,600	1 1	11,570					_	-			_	<b> </b>	-	_	-
18	_	0,567	0,941		1,723	2,566	4,062		12,300					_	_	_	_	_	-	-	_	_
20			1	1,456	1,852	2,763	4,371		13,020	-				-		_	_	_	_	_	_	-
22		_	1	1,567	1,981	2,961	4,679		13,750							_	_	-			-	_
25		_	1,211		2,174	3,257	5,142		14,840					. 1		_	_	_		_		_
28			<b>-</b>	1,900	2,367	3,553	5,605		16,330							_	_	-	-	_	-	_
30	_	<u> </u>	-	2,011	2,496	3,750	5,913		17,120								_	_	-	_	-	_
32	_	_	-	-	_	3,948	6,222		17,910									_	_	-	-	_
35	_	<b>-</b>	-	_	<del></del>	4,244			19,090										-	-		-
38		-		_	_	4,540			20,280									353,3	-		-	-
40		_	_	_	_	4,738			21,070												-	_
45	_	_	_	_	- 1	5,231			23,040											_	_	_
50	_	_		_		5,725			25,020											834,5		_
55	-	-	_	_	_	6,218			26,990											872,1	1304	
60	-	-	_	_	-	6,712			28,970											909,8	1356	_
65	_		_		_	-			30,940												1407	-
70	_		-	_	-	_			32,910													
75		_		_	_	-		-	34,890													
80	_	_	_	_	_	_			36,860													
85	-	_	l — 1	-	l — I	<del>-</del>	l i	21,200	38,840	62,13	89,771	125,701	168,90	222,40	277,7	353,61	419,8	558,6	1715,2	1098,0	1612	2278

Continuation

Length																						
of							_															
bolts <i>l</i> ,	1.6	2	2.5	3	3.5	4	5	6	8	10	12	14	16	18	20	22	24	27	30	36	42	48
in mm																						
90		_	_	_	_	_	_													1141,0		
95				_	_	_														1181,0		
100	_	_				_	_	-	44,760											1221,0		
105	_	_		_	_		_		_	74,47	107,50	149,90	200,50	262,40	327,1	413,3	490,9	648,5	826,3	1261,0	1826	2546
110	_	_	_	_	_		_		_	77,55	112,00	155,90	208,40	272,30	339,4	428,2	508,7	671,0	854,1	1301,0	1880	2614
115		_			_		_	-	_	80,63	116,40	162,00	216,30	282,30	351,8	443,1	526,5	693,5	881,8	1341,0	1934	2690
120	_	_	_	_		_		_	_											1381,0		Į.
125		_	_	_	_	_	_	_		86,80	125,30	174,00	232,10	302,30	376,4	473,0	562,0	738,5	937,4	1421,0	2043	2831
130	_	_	_	_	_			_	-	89,89	129,70	180,10	240,00	312,30	388,8	487,9	579,8	761,0	965,2	1461,0	2098	2903
140	_	_	_		_					96,06	138,60	192,20	255,80	332,30	413,5	517,8	615,3	806,0	1021,0	1541,0	2207	3045
150		_					_	_	_											1621,0		
160			_	_	_	_	_	_		108,38	156,40	216,40	287,40	372,30	462,8	577,5	686,4	895,9	1132,0	1701,0	2424	3329
170	_			_	_	_		_	_											1780,0		3471
180		_				_	_	_	_											1860,0		
190			_	_	_	_	_	_	_											1940,0		3756
200	_	_		_	_		_	_	_	133,08										2020,0	2860	3898
220	_		_	]	_	_			_	_										2180,0	3077	4182
240		_	_	_	_	_	_			_										2340,0	3295	4466
260	_	_	_		_	_		_	_											2500,0		4751
280	_	_	_		_	_		_		_										2660,0		5035
300				_		_	_	_	_		_									2820,0		5319
		ı	1		i !			I		•	1	'	•	'	•	•	•	•	•	,		•

For determination of weight of bolts made of other materials, value of weight, specified in table should be multiplied by the coefficient: 0.356 – for aluminium alloys: 1.080 - for brass.

APPENDIX 1. (Amended edition, amendment No. 4).

APPENDIX 2
Reference
Additional requirement, which are reflecting the needs of national economy
Dimension in mm

	nal diame		10	12	14	22	Nor	ninal di of threa	iameter ds <i>d</i>	10	12	14	22
Widt	h across i	flat, S	17	19	22	32	Wio	dth acro	oss flat,	17	19	22	32
circun e, 1	piameter of nscribed not less th	circle, nan	18.9	21.1	24.5	35.7	ci ciro	Diamete reumse cle, e, n than	ribed ot less	18.9	21.1	24.5	35.7
$d_{w}$ ,	not less t	than	15.6	17.4	20.6	30.0	$d_{w}$	, not les	ss than	15.6	17.4	20.6	30.0
Length of bolt, l	Theoretical weight of 1000 pieces of bolts (make 1) with coarse pitch of thread, in kg $\approx$	10 12 14 16 18 20 22 25 28 30 32 35 38 40 45 50 60 65 70 75 80	18,10 19,24 20,38 21,52 22,65 23,79 24,93 26,64 28,34 29,48 30,85 32,70 34,55 35,78 38,87 41,95 45,04 48,12 51,21 54,29 57,38 60,46	29,75 31,34 32,98 34,62 36,26 38,72 41,18 42,82 44,45 47,20 49,86 51,64 56,08 60,53 64,97 69,41 73,85 78,30 82,74 87,19			Length of bolt, l	Theoretical weight of 1000 pieces of bolts (make 1) with coarse pitch of thread, in kg $\approx$	85 90 95 100 105 110 115 120 125 130 140 150 160 170 180 190 200 220 240 260 280 300	63,55 66,63 69,72 72,80 75,89 78,97 82,05 85,14 88,22 91,31 97,48 103,60 109,80 116,00 122,10 128,30 134,50 —	91,63 96,06 100,50 105,00 109,40 113,90 118,30 122,80 127,20 131,60 149,40 158,30 167,20 176,10 185,00 193,80 211,60 229,40 247,10	128,20 134,20 140,30 146,30 152,40 158,40 164,50 170,50 176,50 182,60 194,70 206,80 218,90 231,00 243,10 255,20 267,20 291,40 315,60 339,80 364,00 388,20	341,2 356,1 371,0 385,9 400,9 415,8 430,7 445,7 460,6 475,5 505,4 535,2 565,1 595,0 624,8 654,7 684,6 744,3 804,0 863,7 923,5 983,2

APPENDIX 2. (Amended edition, amendment No. 6).

## REFERENCE OF NORMATIVE- TECHNICAL DOCUMENTS

Code of HTД on which	Point Number	Code of HTД on which	Point Number
reference is given		reference is given	
GOST 1759.0-87	6	GOST 24670-81	3a
GOST 1759.1-82	36	GOST 24705-81	3
GOST 1759.2-82	3в	GOST 27148-86	3
GOST 12414-94	3		

Restriction of validity is removed under the protocol No 5-94 of intergovernmental inter state council, on standardization, metrology and certification. (HYC 11-12-94)

REPUBLICATION (April 1998) with amendment No. 2, 3, 4, 5, 6, certified in February 1974, March 1981, March 1985, March 1989, June 1995 (ИУС 3-74, 6-81, 6-85, 6-89, 9-95)