

## Tolerances for screws and nuts



Characteristic			Dimension range	Product class A (previously "m" = medium)	Product class B (previously "mg" = medium-coarse)	Product class C (previously "g" = coarse)	
⑦ Nominal length	l		$l \leq 150$	js15 (Slotted screws $l > 50$ js 16)	js17	js17	
			$l > 150$		js17	2 js17	
Surface roughness	Outer surface	Connecting surface, shank		$R_a = 25 \mu\text{m}$	$R_a = 25 \mu\text{m}$	any	
		Other surfaces		$R_a = 25 \mu\text{m}$	any	any	
		End, spanner flat		$R_a = 100 \mu\text{m}$	any	any	
	Thread	Flank (screw / nut)		$R_a = 25 \mu\text{m}$ ( $\leq M 5 = 16 \mu\text{m}$ /cutted $> M 5 = 40 \mu\text{m}$ )	$R_a = 25 \mu\text{m}$ (cutted = $40 \mu\text{m}$ )	$R_a = 40 \mu\text{m}$	
		Core (screw)		$R_a = 25 \mu\text{m}$	$R_a = 25 \mu\text{m}$	$R_a = 40 \mu\text{m}$	
		Core (nut)		any	any	any	
		External $\varnothing$ (screw)		any	any	any	
⑧ Run-out, symmetry (screw)	s:d	(Reference dimension for "t")	(s)	2 IT13	2 IT14	2 IT15	
	dk:d		(dk)	2 IT13	2 IT14	2 IT15	
	n:d		(d)	2 IT12	2 IT13	2 IT14	
	Run-out, symmetry (nut)		s:d (core)	(s)	2 IT13	2 IT14	2 IT15
			n:d (core)	(d)	2 IT13	2 IT14	2 IT15
⑨ Shank diameter	d <sub>s</sub>		h13	h14	$\pm$ IT15		
			Reduced shank: shank diameter ~ pitch diameter				
⑩ Slot width <sup>1)</sup>	n		$n \leq 1$	+0.20 to +0.06	-	-	
			$n > 1 \leq 3$	+0.31 to +0.06			
			$n > 3 \leq 6$	+0.37 to +0.07			
⑪ Wrench size	External drive	s		$s \leq 32 = h13$ $s > 32 = h14$	$s \leq 19 = h14/s > 19 \leq 60 = h15$ $s > 60 \leq 180 = h16/s > 180 = h17$		
⑫ Wrench size	Internal drive	s		$s 0.7 = EF 8/ s 0.9 = JS 9/ s 1.3 = K 9$ $s 1.5-2 = D 10 (D 9-)/$ $s 2.5 = D 11 (D 10-)$ $s 3 = D 11/s 4 = E 11/$ $s 5-14 = E 12 (E 11-)$ $s > 14 = D 12$	-	-	
⑬ Angle	90°		$\leq M39$	$\pm 1^\circ$	$\pm 1^\circ$	$\pm 2^\circ$	
			$> M39$	$\pm 1/2^\circ$	$\pm 1/2^\circ$	$\pm 1^\circ$	
1) Depth for slots and hexagon socket see product (dimension) standards		Classification of the product classes among the most conventional standard parts	Screws acc. to DIN*	84, 85, 444C, 478, 479, 480, 561, 564, 609, 610, 653, 787, 835, 912, 931, 933, 938, 939, 940, 960, 961, 963, 964, 965, 966, 6912, 7380, 7513, 7516, 7971-7983, 7984, 7985, 7991	444 B 609, 610 $\geq$ M12 931, 933 $\geq$ M24 960, 961 $J_{L>10d}/>150$ mm	95, 96, 97, 186, 188, 261, 316, 318, 444 A, 525, 529, 558, 571, 601, 603, 604, 605, 607, 608, 6914, 7968, 7969, 7990, 11014	
2) Tolerance fields for set screws with hexagon socket							Nuts acc. to DIN*
Thread run-out (a, x) and thread undercut (g, f) see ISO 3508/4755 (DIN 76). Chamfered end and rounded end see ISO 4753 (DIN 78). Wire hole and split pin hole see ISO 7378/8991 (DIN 962/34803).							

⑭		⑮						
External thread		a <sub>1</sub>	x <sub>1</sub>	g <sub>1</sub>	g <sub>2</sub>	u	z <sub>1</sub>	z <sub>2</sub>
Nominal $\varnothing$ M	Pitch P	max.	max.	(f.) min.	(f.) max.	2 p max.	+ IT14	+ IT14
3	0.5	1.5	1.25	1.1	1.75	1	0.75	1.5
4	0.7	2.1	1.75	1.5	2.45	1.4	1	2
5	0.8	2.4	2	1.7	2.8	1.6	1.25	2.5
6	1	3	2.5	2.1	3.5	2	1.5	3
8	1.25	3.75	3.2	2.7	4.4	2.5	2	4
10	1.5	4.5	3.8	3.2	5.2	3	2.5	5
12	1.75	5.25	4.3	3.9	6.1	3.5	3	6
14	2	6	5	4.5	7	4	3.5	7
16	2	6	5	4.5	7	4	4	8
18	2.5	7.5	6.3	5.6	8.7	5	4.5	9

⑭ = Excerpt from ISO 3508/4755 (DIN 76)  
 a<sub>1</sub> = Distance of the last full threadturn from the contact surface (for parts with threads to the head)  
 x<sub>1</sub> = Thread run-out general use  
 g (f) = Thread undercut general use (Type A)

⑭		⑮						
External thread		a	x <sub>1</sub>	g	g <sub>2</sub>	u	z <sub>1</sub>	z <sub>2</sub>
Nominal $\varnothing$ M	Pitch P	max.	max.	(f.) min.	(f.) max.	2 p max.	+ IT14	+ IT14
20	2.5	7.5	6.3	5.6	8.7	5	5	10
22	2.5	7.5	6.3	5.6	8.7	5	5.5	11
24	3	9	7.5	6.7	10.5	6	6.7	12
27	3	9	7.5	6.7	10.5	6	6.7	13.5
30	3.5	10.5	9	7.7	12	7	7.5	15
33	3.5	10.5	9	7.7	12	7	8.2	16.5
36	4	12	10	9	14	8	9	18
39	4	12	10	9	14	8	9.7	19.5
42	4.5	13.5	11	10.5	16	9	10.5	21
45	4.5	13.5	11	10.5	16	9		22.5

⑮ = Excerpt from ISO 4753 (DIN 78)  
 u = Incomplete thread at screw ends (general use for screws with rolled threading)  
 z<sub>1</sub> = Length of dog point in ISD (Ka) finish  
 z<sub>2</sub> = Length of dog point in LD (Za) finish

Excerpts from ISO 3508, 4755 (DIN 76) – ISO 4753 (DIN 78) – ISO 7378, 8991 (DIN 962/34803) and ISO 4759-1