

ISO Tolerances for Holes (ISO 286-2)

Nominal hole sizes (mm)	
10	12
14	16
18	20
22	24
28	30
32	36
40	45
48	50
56	60
63	70
72	80
80	90
90	100
100	110
110	120
120	130
130	140
140	150
150	160
160	170
170	180
180	190
190	200
200	210
210	220
220	230
230	240
240	250
250	260
260	270
270	280
280	290
290	300
300	310
310	320
320	330
330	340
340	350
350	360
360	370
370	380
380	390
390	400
400	410
410	420
420	430
430	440
440	450
450	460
460	470
470	480
480	490
490	500
500	510
510	520
520	530
530	540
540	550
550	560
560	570
570	580
580	590
590	600
600	610
610	620
620	630
630	640
640	650
650	660
660	670
670	680
680	690
690	700
700	710
710	720
720	730
730	740
740	750
750	760
760	770
770	780
780	790
790	800
800	810
810	820
820	830
830	840
840	850
850	860
860	870
870	880
880	890
890	900
900	910
910	920
920	930
930	940
940	950
950	960
960	970
970	980
980	990
990	1000

over																				
inc.	6	10	18	30	40	50	65	80	100	120	140	160	180	200	225	250	280	315	355	400
micrometres																				
E6	+28 +20	+34 +25	+43 +32	+53 +40	+66 +50	+79 + 60	+94 +72	+110 +85		+129 +100		+142 +110		+161 +125						
E7																				
E11	+95 +20	+115 +25	+142 +32	+170 +40	+210 +50	+250 + 60	+292 +72	+335 +85		+390 +100		+430 +110		+485 +125						
E12	+140 +20	+175 +25	+212 +32	+250 +40	+300 +50	+360 + 60	+422 +72	+485 +85		+560 +100		+630 +110		+695 +125						
E13	+200 +20	+245 +25	+302 +32	+370 +40	+440 +50	+520 + 60	+612 +72	+715 +85		+820 +100		+920 +110		+1 015 +125						
F6	+18 +10	+22 +13	+27 +16	+33 +20	+41 + 2	+49 + 30	+58 +36	+68 43		+79 +50		+88 +56		+98 +62						
F7	+22 +10	+28 +13	+34 +16	+41 +20	+50 +25	+60 + 30	+71 +36	+83 43		+96 +50		+108 +56		+119 +62						
F8	+28 +10	+35 +13	+43 +16	+53 +20	+64 +25	+76 + 30	+90 +36	+106 43		+122 +50		+137 +56		+151 +62						
G6	+12 +4	+14 +5	+17 +6	+20 +7	+25 +9	+29 +10	+34 + 12	+39 +14		+44 +15		+49 +17		+54 +18						
G7	+16 +4	+20 +5	+24 +6	+28 +7	+34 +9	+40 +10	+47 + 12	+54 +14		+61 +15		+69 +17		+75 +18						
G8	+22 +4	+27 +5	+33 +6	+40 +7	+48 +9	+56 +10	+66 + 12	+77 +14		+87 +15		+98 +17		+107 +18						
H6	+8 0	+9 0	+11 0	+13 0	+16 0	+19 0	+22 0	+25 0		+29 0		+32 0		+36 0						
H7	+12 0	+15 0	+18 0	+21 0	+25 0	+30 0	+35 0	+40 0		+46 0		+52 0		+57 0						
H8	+18 0	+22 0	+27 0	+33 0	+39 0	+46 0	+54 0	+63 0		+72 0		+81 0		+89 0						
H9	+30 0	+36 0	+43 0	+52 0	+62 0	+74 0	+87 0	+100 0		+115 0		+130 0		+140 0						
H10	+48 0	+58 0	+70 0	+84 0	+100 0	+120 0	+140 0	+160 0		+185 0		+210 0		+230 0						
H11	+75 0	+90 0	+110 0	+130 0	+160 0	+190 0	+220 0	+250 0		+290 0		+320 0		+360 0						
J6	+5 -3	+5 -4	+6 -5	+8 -5	+10 -6	+13 -6	+16 -6	+18 -7		+22 -7		+25 -7		+29 -7						
J7	+6 -6	+8 -7	+10 -8	+12 -9	+14 -11	+18 -12	+22 -13	+26 -14		+30 -16		+36 -16		+39 -18						
J8	+10 -8	+12 -10	+15 -12	+20 -13	+24 -15	+28 -18	+34 -20	+41 -22		+47 -25		+55 -26		+60 -29						
JS6	+4 -4	+4.5 -4.5	+5.5 -5.5	+6.5 -6.5	+8 -8	+9.5 -9.5	+11 -11	+12.5 -12.5		+14.5 -14.5		+16 -16		+18 -18						

JS7	+6 -6	+7.5 -7.5	+9 -9	+10.5 -10.5	+12.5 -12.5	+15 -15	+17.5 -17.5	+20 -20				+23 -23			+26 -26		+28.5 -28.5		
JS8	+9 -9	+11 -11	+13.5 -13.5	+16.5 -16.5	+19.5 -19.5	+23 -23	+27 -27	+31.5 -31.5				+36 -36			+40.5 -40.5		+44.5 -44.5		
K6	+2 -6	+2 -7	+2 -9	+2 -11	+3 -13	+4 -15	+4 -18	+4 -21				+5 -24			+5 -27		+7 -29		
K7	+3 -9	+5 -10	+6 -12	+6 -15	+7 -18	+9 -21	+10 -25	+12 -28				+13 -33			+16 -36		+17 -40		
K8	+5 -13	+6 -16	+8 -19	+10 -23	+12 -27	+14 -32	+16 -38	+20 -43				+22 -50			+25 -56		+28 -61		
M6	-1 -9	-3 -12	-4 -15	-4 -17	-4 -20	-5 -24	-6 -28	-8 -33				-8 -37			-9 -41		-10 -46		
M7	0 -12	0 -15	0 -18	0 -21	0 -25	0 -30	0 -35	0 -40				0 -46			0 -52		0 -57		
M8	+2 -16	+1 -21	+2 -25	+4 -29	+5 -34	+5 -41	+6 -48	+8 -55				+9 -63			+9 -72		+11 -78		
N6	-5 -13	-7 -16	-9 -20	-11 -24	-12 -28	-14 -33	-16 -38	-20 -45				-22 -51			-25 -57		-26 -62		
N7	-4 -16	-4 -19	-5 -23	-7 -28	-8 -33	-9 -39	-10 -45	-12 -52				-14 -60			-14 -66		-16 -73		
N8	-2 -20	-3 -25	-3 -30	-3 -36	-3 -42	-4 -50	-4 -58	-4 -67				-5 -77			-5 -86		-5 -94		
P6	-9 -17	-12 -21	-15 -26	-18 -31	-21 -37	-26 -45	-30 -52	-36 -61				-41 -70			-47 -79		-51 -87		
P7	-8 -20	-9 -24	-11 -29	-14 -35	-17 -42	-21 -51	-24 -59	-28 -68				-33 -79			-36 -88		-41 -98		
P8	-12 -30	-15 -37	-18 -45	-22 -55	-26 -65	-32 -78	-37 -91	-43 -106				-50 -122			-56 -137		-62 -151		
R6	-12 -20	-16 -25	-20 -31	-24 -37	-29 -45	35 -54	37 -56	-44 -66	-47 -69	-56 -81	-58 -83	-61 -86	-68 -97	-71 -100	-75 -104	-85 -117	-89 -121	-97 -133	103 -139
R7	-11 -23	-13 -28	-16 -34	-20 -41	-25 -50	30 -60	32 -62	-38 -73	-41 -76	-48 -88	-50 -90	-53 -93	-60 -106	-63 -109	-67 -113	-74 -126	-78 -130	-87 -144	-93 -150

ISO Tolerances for Shafts (ISO 286-2)

Nominal Shaft Sizes (mm)	
10	12
16	20
25	32
40	50
56	71
80	100
112	140
160	200
224	280
315	400
450	630
630	900
900	1250
1250	1800
1800	2500
2500	3150
3150	4000
4000	5000
5000	6300
6300	8000
8000	10000
10000	12500
12500	16000
16000	20000
20000	25000
25000	31500
31500	40000
40000	50000
50000	63000
63000	80000
80000	100000
100000	125000
125000	160000
160000	200000
200000	250000
250000	315000
315000	400000
400000	500000
500000	630000
630000	800000
800000	1000000
1000000	1250000
1250000	1600000
1600000	2000000
2000000	2500000
2500000	3150000
3150000	4000000
4000000	5000000
5000000	6300000
6300000	8000000
8000000	10000000
10000000	12500000
12500000	16000000
16000000	20000000
20000000	25000000
25000000	31500000
31500000	40000000
40000000	50000000
50000000	63000000
63000000	80000000
80000000	100000000
100000000	125000000
125000000	160000000
160000000	200000000
200000000	250000000
250000000	315000000
315000000	400000000
400000000	500000000
500000000	630000000
630000000	800000000
800000000	1000000000
1000000000	1250000000
1250000000	1600000000
1600000000	2000000000
2000000000	2500000000
2500000000	3150000000
3150000000	4000000000
4000000000	5000000000
5000000000	6300000000
6300000000	8000000000
8000000000	10000000000
10000000000	12500000000
12500000000	16000000000
16000000000	20000000000
20000000000	25000000000
25000000000	31500000000
31500000000	40000000000
40000000000	50000000000
50000000000	63000000000
63000000000	80000000000
80000000000	100000000000
100000000000	125000000000
125000000000	160000000000
160000000000	200000000000
200000000000	250000000000
250000000000	315000000000
315000000000	400000000000
400000000000	500000000000
500000000000	630000000000
630000000000	800000000000
800000000000	1000000000000
1000000000000	1250000000000
1250000000000	1600000000000
1600000000000	2000000000000
2000000000000	2500000000000
2500000000000	3150000000000
3150000000000	4000000000000
4000000000000	5000000000000
5000000000000	6300000000000
6300000000000	8000000000000
8000000000000	10000000000000
10000000000000	12500000000000
12500000000000	16000000000000
16000000000000	20000000000000
20000000000000	25000000000000

over	3	6	10	18	30	40	50	65	80	100	120	140	160	180	200	225	250	280	315	355
inc.	6	10	18	30	40	50	65	80	100	120	140	160	180	200	225	250	280	315	355	400

micrometres

a12	-270	-280	-290	-300	310	320	340	360	380	410	460	520	580	-660	-740	-820	-920	1050	1200	-1350 -1920
	-390	-430	-470	-510	560	570	640	660	730	760	860	920	980	1120	1200	1280	1440	1570	1770	
d6	-30 -38	-40 -49	-50 -61	-65 -78	-80 -96	-100 -119	-120 -142	-145 -170						-170 -199		-190 -222		-210 -246		
e6	-20 -28	-25 -34	-32 -43	-40 -53	-50 -66	-60 -79	-72 -94	-85 -110						-100 -129		-110 -142		-125 -161		
e13	-20 -200	-25 -245	-32 -302	-40 -370	-50 -440	-60 -520	-72 -612	-85 -715						-100 -820		-110 -920		-125 -1015		
f5	-10 -15	-13 -19	-16 -24	-20 -29	-25 -36	-30 -43	-36 -51	-43 -61						-50 -70		-56 -79		-62 -87		
f6	-10 -18	-13 -22	-16 -27	-20 -33	-25 -41	-30 -49	-36 -58	-43 -68						-50 -79		-56 -88		-62 -98		
f7	-10 -22	-13 -28	-16 -34	-20 -41	-25 -50	-30 -60	-36 -71	-43 -83						-50 -96		-56 -108		-62 -119		
g5	-4 -9	-5 -11	-6 -14	-7 -16	-9 -20	-10 -23	-12 -27	-14 -32						-15 -35		-17 -40		-18 -43		
g6	-4 -12	-5 -14	-6 -17	-7 -20	-9 -25	-10 -29	-12 -34	-14 -39						-15 -44		-17 -49		-18 -54		
g7	-4 -16	-5 -20	-6 -24	-7 -28	-9 -34	-10 -40	-12 -47	-14 -54						-15 -61		-17 -69		-18 -75		
h4	-0 -4	-0 -4	-0 -5	-0 -6	-0 -7	-0 -8	-0 -10	-0 -12						-0 -14		-0 -16		-0 -18		
h5	-0 -5	-0 -6	-0 -8	-0 -9	-0 -11	-0 -13	-0 -15	-0 -18						-0 -20		-0 -23		-0 -25		
h6	-0 -8	-0 -9	-0 -11	-0 -13	-0 -16	-0 -19	-0 -22	-0 -25						-0 -29		-0 -32		-0 -36		
h7	-0 -12	-0 -15	-0 -18	-0 -21	-0 -25	-0 -30	-0 -35	-0 -40						-0 -46		-0 -52		-0 -57		
h8	-0 -18	-0 -22	-0 -27	-0 -33	-0 -39	-0 -46	-0 -54	-0 -63						-0 -72		-0 -81		-0 -89		
h9	-0 -30	-0 -36	-0 -43	-0 -52	-0 -62	-0 -74	-0 -87	-0 -100						-0 -115		-0 -130		-0 -140		
h10	-0 -48	-0 -58	-0 -70	-0 -84	-0 -100	-0 -120	-0 -140	-0 -160						-0 -185		-0 -210		-0 -230		
h11	-0 -75	-0 -90	-0 -110	-0 -130	-0 -160	-0 -190	-0 -220	-0 -250						-0 -290		-0 -320		-0 -360		
h12	-0 -120	-0 -150	-0 -180	-0 -210	-0 -250	-0 -300	-0 -350	-0 -400						-0 -460		-0 -520		-0 -570		
j5	+3 -2	+4 -2	+5 -3	+5 -4	+6 -5	+6 -7	+6 -9	+7 -11						+7 -13		+7 -16		+7 -18		
j6	+6 -2	+7 -2	+8 -3	+9 -4	+11 -5	+12 -7	+13 -9	+14 -11						+16 -13		+16 -16		+18 -18		
j7	+8 -4	+10 -5	+12 -6	+13 -8	+15 -10	+18 -12	+20 -15	+22 -18						+25 -21		+26 -26		+29 -28		

js5	+2.5 -2.5	+3 -3	+4 -4	+4.5 -4.5	+5.5 -5.5	+6.5 -6.5	+7.5 -7.5	+9 -9	+10 -10	+11.5 -11.5	+12.5 -12.5								
js6	+4 -4	+4.5 -4.5	+5.5 -5.5	+6.5 -6.5	+8 -8	+9.5 -9.5	+11 -11	+12.5 -12.5	+14.5 -14.5	+16 -16	+18 -18								
js7	+6 -6	+7.5 -7.5	+9 -9	+10.5 -10.5	+12.5 -12.5	+15 -15	+17.5 -17.5	+20 -20	+23 -23	+26 -26	+28.5 -28.5								
k5	+6 +1	+7 +1	+9 +1	+11 +2	+13 +2	+15 +2	+18 +3	+21 +3	+24 +4	+27 +4	+29 +4								
k6	+9 +1	+10 +1	+12 +1	+15 +2	+18 +2	+21 +2	+25 +3	+28 +3	+33 +4	+36 +4	+40 +4								
k7	+13 +1	+16 +1	+19 +1	+23 +2	+27 +2	+32 +2	+38 +3	+43 +3	+50 +4	+56 +4	+61 +4								
m5	+9 +4	+12 +6	+15 +7	+17 +8	+20 +9	+24 +11	+28 +13	+33 +15	+37 +17	+43 +20	+46 +21								
m6	+12 +4	+15 +6	+18 +7	+21 +8	+25 +9	+30 +11	+35 +13	+40 +15	+46 +17	+52 +20	+57 +21								
m7	+16 +4	+21 +6	+25 +7	+29 +8	+34 +9	+41 +11	+48 +13	+55 +15	+63 +17	+72 +20	+78 +21								
n5	+13 +8	+16 +10	+20 +12	+24 +15	+28 +17	+33 +20	+38 +23	+45 +27	+51 +31	+57 +34	+62 +37								
n6	+16 +8	+19 +10	+23 +12	+28 +15	+33 +17	+39 +20	+45 +23	+52 +27	+60 +31	+66 +34	+73 +37								
n7	+20 +8	+25 +10	+30 +12	+36 +15	+42 +17	+50 +20	+58 +23	+67 +27	+77 +31	+86 +34	+94 +37								
p5	+17 +12	+21 +15	+26 +18	+31 +22	+37 +26	+45 +32	+52 +37	+61 +43	+70 +50	+79 +56	+87 +62								
p6	+20 +12	+24 +15	+29 +18	+35 +22	+42 +26	+51 +32	+59 +37	+68 +43	+79 +50	+88 +56	+98 +62								
r6	+23 +15	+28 +19	+34 +23	+41 +28	+50 +34	+60 +41	+62 +43	+73 +51	+76 +54	+88 +63	+90 +65	+93 +68	+106 +77	+109 +80	+113 +84	+126 +94	+130 +98	+144 +108	+150 +114