

Tolerance Reference Tables

The tolerance tables below are consistent with the American National Standard Tolerances (ANSI B4.1) and the British Standard for Metric ISO Limits and Fits (BS 4500).

ANSI B4.1				
Nominal Diameter (inches) Over To	TOLERANCE GRADE			
	h10 Cavity ID	H10 Cavity OD	h11 Seal OD	H11 Seal ID
	(Dimensions are in 0.001 inches)			
0 – 0.12	+ 0.0 / – 1.6	– 0.0 / + 1.6	+ 0.0 / – 2.5	– 0.0 / + 2.5
0.12 – 0.24	+ 0.0 / – 1.8	– 0.0 / + 1.8	+ 0.0 / – 3.0	– 0.0 / + 3.0
0.24 – 0.40	+ 0.0 / – 2.2	– 0.0 / + 2.2	+ 0.0 / – 3.5	– 0.0 / + 3.5
0.40 – 0.71	+ 0.0 / – 2.8	– 0.0 / + 2.8	+ 0.0 / – 4.0	– 0.0 / + 4.0
0.71 – 1.19	+ 0.0 / – 3.5	– 0.0 / + 3.5	+ 0.0 / – 5.0	– 0.0 / + 5.0
1.19 – 1.97	+ 0.0 / – 4.0	– 0.0 / + 4.0	+ 0.0 / – 6.0	– 0.0 / + 6.0
1.97 – 3.15	+ 0.0 / – 4.5	– 0.0 / + 4.5	+ 0.0 / – 7.0	– 0.0 / + 7.0
3.15 – 4.73	+ 0.0 / – 5.0	– 0.0 / + 5.0	+ 0.0 / – 9.0	– 0.0 / + 9.0
4.73 – 7.09	+ 0.0 / – 6.0	– 0.0 / + 6.0	+ 0.0 / – 10.0	– 0.0 / + 10.0
7.09 – 9.85	+ 0.0 / – 7.0	– 0.0 / + 7.0	+ 0.0 / – 12.0	– 0.0 / + 12.0
9.85 – 12.41	+ 0.0 / – 8.0	– 0.0 / + 8.0	+ 0.0 / – 12.0	– 0.0 / + 12.0
12.41 – 15.75	+ 0.0 / – 9.0	– 0.0 / + 9.0	+ 0.0 / – 14.0	– 0.0 / + 14.0
15.75 – 19.69	+ 0.0 / – 10.0	– 0.0 / + 10.0	+ 0.0 / – 16.0	– 0.0 / + 16.0
19.69 – 30.09	+ 0.0 / – 12.0	– 0.0 / + 12.0	+ 0.0 / – 20.0	– 0.0 / + 20.0
30.09 – 41.49	+ 0.0 / – 16.0	– 0.0 / + 16.0	+ 0.0 / – 25.0	– 0.0 / + 25.0
41.49 – 56.19	+ 0.0 / – 20.0	– 0.0 / + 20.0	+ 0.0 / – 30.0	– 0.0 / + 30.0
56.19 – 76.39	+ 0.0 / – 25.0	– 0.0 / + 25.0	+ 0.0 / – 40.0	– 0.0 / + 40.0

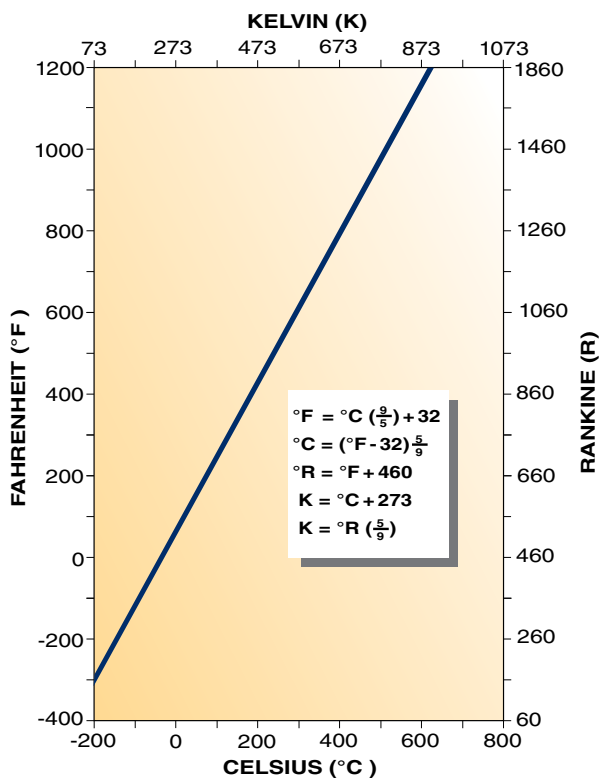
BS 4500				
Nominal Diameter (mm) Over To	TOLERANCE GRADE			
	h10 Cavity ID	H10 Cavity OD	h11 Seal OD	H11 Seal ID
	(Dimensions are in 0,001 millimeters)			
0 – 3	+ 0,0 / – 40	– 0,0 / + 40	+ 0,0 / – 60	– 0,0 / + 60
3 – 6	+ 0,0 / – 48	– 0,0 / + 48	+ 0,0 / – 75	– 0,0 / + 75
6 – 10	+ 0,0 / – 58	– 0,0 / + 58	+ 0,0 / – 90	– 0,0 / + 90
10 – 18	+ 0,0 / – 70	– 0,0 / + 70	+ 0,0 / – 110	– 0,0 / + 110
18 – 30	+ 0,0 / – 84	– 0,0 / + 84	+ 0,0 / – 130	– 0,0 / + 130
30 – 50	+ 0,0 / – 100	– 0,0 / + 100	+ 0,0 / – 160	– 0,0 / + 160
50 – 80	+ 0,0 / – 120	– 0,0 / + 120	+ 0,0 / – 190	– 0,0 / + 190
80 – 120	+ 0,0 / – 140	– 0,0 / + 140	+ 0,0 / – 220	– 0,0 / + 220
120 – 180	+ 0,0 / – 160	– 0,0 / + 160	+ 0,0 / – 250	– 0,0 / + 250
180 – 250	+ 0,0 / – 185	– 0,0 / + 185	+ 0,0 / – 290	– 0,0 / + 290
250 – 315	+ 0,0 / – 210	– 0,0 / + 210	+ 0,0 / – 320	– 0,0 / + 320
315 – 400	+ 0,0 / – 230	– 0,0 / + 230	+ 0,0 / – 360	– 0,0 / + 360
400 – 500	+ 0,0 / – 250	– 0,0 / + 250	+ 0,0 / – 400	– 0,0 / + 400
500 – 760	+ 0,0 / – 300	– 0,0 / + 300	+ 0,0 / – 500	– 0,0 / + 500
760 – 1050	+ 0,0 / – 400	– 0,0 / + 400	+ 0,0 / – 630	– 0,0 / + 630
1050 – 1425	+ 0,0 / – 500	– 0,0 / + 500	+ 0,0 / – 760	– 0,0 / + 760
1425 – 1940	+ 0,0 / – 630	– 0,0 / + 630	+ 0,0 / – 1000	– 0,0 / + 1000

All tolerances above heavy line are in accordance with American-British-Canadian (ABC) Agreements.

Conversion Tables

Pressure											
TO OBTAIN		atmosphere	bar	inches of mercury	inches of water	millimeters of mercury (Torr)	millimeters of water	kPa	MPa	Newtons/m ² (Pascal)	pounds/square inch
atmosphere	by	1	1.0133	29.9210	4.0678x10 ²	7.6000x10 ²	1.0332x10 ⁴	1.0133x10 ⁻¹	1.0133x10 ⁻¹	1.0133x10 ⁵	14.6960
bar	by	9.8692x10 ⁻¹	1	29.5300	4.0146x10 ²	7.5006x10 ²	1.0197x10 ⁴	1.000x10 ⁻²	1.0000x10 ⁻¹	1.0000x10 ⁵	14.5038
inches of mercury	by	3.3421x10 ⁻²	3.3864x10 ⁻²	1	13.5950	25.4000	3.4532x10 ²	3.3864	3.3864x10 ⁻³	3.3864x10 ³	4.9116x10 ⁻¹
inches of water	by	2.4584x10 ⁻³	2.4840x10 ⁻³	7.3556x10 ⁻²	1	1.8685	25.4000	2.4910x10 ⁻¹	2.4910x10 ⁻²	2.4910x10 ²	3.6128x10 ⁻²
millimeters of mercury (Torr)	by	1.3158x10 ⁻³	1.3332x10 ⁻³	3.9370x10 ⁻²	5.3520x10 ⁻¹	1	13.5950	1.3332x10 ⁻¹	9.8068	1.3332x10 ²	1.9337x10 ⁻²
millimeters of water	by	9.6787x10 ⁻⁵	9.8068x10 ⁻⁵	2.8959x10 ⁻³	3.9370x10 ⁻²	7.3556x10 ⁻²	1	9.8068x10 ⁻³	1.0000x10 ⁻³	9.8068	1.4223x10 ⁻³
kPa	by	9.8692x10 ⁻³	1.0000x10 ⁻²	2.9530x10 ⁻¹	4.0146	7.5006	1.0197x10 ⁻²	1	1.0000x10 ⁻⁶	1.0000x10 ³	1.4504x10 ⁻¹
MPa	by	9.8692	10.0000	2.9530x10 ²	4.0146x10 ³	7.5006x10 ³	1.0197x10 ⁵	1.0000x10 ⁻⁶	1	1.0000x10 ⁶	1.4504x10 ²
Newtons/m ² (Pascal)	by	9.8692x10 ⁻⁶	1.0000x10 ⁻⁵	2.9530x10 ⁻⁴	4.0146x10 ⁻³	7.5006x10 ⁻³	1.0197x10 ⁻¹	6.8948x10 ⁻³	6.8948x10 ⁻³	1	1.4504x10 ⁻⁴
pounds/square inch	by	6.8046x10 ⁻²	6.8947x10 ⁻²	2.0360	27.6810	51.7144	7.0310x10 ²	6.8948	6.8948x10 ⁻³	6.8948x10 ³	1

Temperature



Torque [Moment]

TO OBTAIN		N-m	kg-m	kg-cm	ft-lb	Inch-lb
N-m	by	1	0.1020	10.1970	0.7376	8.8509
kg-m	by	9.8068	1	100.0000	7.2330	86.7942
kg-cm	by	0.0981	0.0100	1	0.0723	0.8679
ft-lb	by	1.3558	0.1383	13.8255	1	12.0000
inch-lb	by	0.1130	0.0115	1.1522	0.0833	1

Force

TO OBTAIN		newton	kilogram	pound
newton	by	1	0.1020	0.2248
kilogram	by	9.8068	1	2.2046
pound	by	4.4482	0.4536	1

Distributed Force [Force per unit length]

TO OBTAIN		N/mm	kg/cm	lb/in
N/mm	by	1	1.0197	5.7102
kg/cm	by	0.9807	1	5.5997
lb/in	by	0.1751	0.1786	1

For leakage rate conversion refer to page E-80.