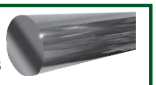
Formulae & Theoretical for Mass Calculation Section Tolerances

Sections	Formula x Spec	ALI	Brass	Bronze	Copper	Steel	Stainless
Round	D x D x	0.002132	0.006675	0.006924	0.007010	0.00616	0.00631
Hollow	(D-T)x Tx	0.0085	0.026	0.02778	0.028	0.02466	0.0253
Flat	W x T x	0.002712	0.00848	0.00882	0.00889	0.00786	0.00804
Square	S x S x	0.002712	0.00848	0.00882	0.00889	0.00786	0.00804
Hexagon	H x H x	0.00235	0.007344	0.007638	0.00776	0.0069	0.006963

TOLERANCE TABLES ROUND BARS



ISO h-table Diameter mm	ISO h-tolerances are minus tolerances					
	h6	h7	h8	h9	h10	h11
below 3.0	0.006	0.010	0.014	0.025	0.040	0.060
3.0 - 6.0	0.008	0.012	0.018	0.030	0.048	0.750
6.0 - 10.0	0.009	0.015	0.022	0.036	0.058	0.900
10.0 - 18.0	0.011	0.018	0.027	0.043	0.070	0.110
18.0 - 30.0	0.013	0.021	0.033	0.052	0.084	0.130
30.0 - 50.0	0.016	0.025	0.039	0.062	0.100	0.160
50.0 - 80.0	0.018	0.030	0.046	0.074	0.120	0.190
80.0 - 100.0	0.022	0.035	0.054	0.087	0.140	0.220

ISO k12-TABLE	
Diameter mm	Tolerance
below 3.0	-0/+0.10
3.0 - 6.0	-0/+0.12
6.0 - 10.0	-0/+0.15
10.0 - 18.0	-0/+0.18
18.0 - 30.0	-0/+0.21
30.0 - 50.0	-0/+0.25
50.0 - 80.0	-0/+0.30
80.0 - 120.0	-0/+0.35
120.0 - 180.0	-0/+0.40

DIN 1013-TABLE	
Diameter mm	Tolerance
8.0 - 15.0	+/-0.40
16.0 - 25.0	+/-0.50
26.0 - 35.0	+/-0.60
36.0 - 50.0	+/-0.70
51.0 - 80.0	+/-1.00
81.0 - 100.0	+/-1.30
101.0 - 120.0	+/-1.50
121.0 - 160.0	+/-2.00
161.0 - 200.0	+/-2.50

ASTM A484/A484M	
Diameter mm	Tolerance
8.0 - 11.0	+/-0.15
11.0 - 15.5	+/-0.18
15.5 - 22.0	+/-0.20
22.0 - 25.0	+/-0.23
25.0 - 28.0	+/-0.25
28.0 - 31.5	+/-0.28
31.5 - 34.5	+/-0.30
34.5 - 38.0	+/-0.35
38.0 - 50.0	+0.4/-0
50.0 - 63.0	+0.80/-0
63.0 - 90.0	+1.20/-0
90.0 - 115.0	+1.60/-0
115.0 - 140.0	+2.00/-0
140.0 - 165.0	+3.00/-0
165.0 - 200.0	+4.00/-0
200.0 - 300	+4.80/-0
300 - 400	+5.50/-0
400 - 625	+6.50/-0

Reference symbols for hardness and tensile strength ranges of hardness and tempered material

Note: Please consult Individual Specifications for Full Mechanical Properties.

Symbol	Ton f/ SQ In	Mpa (Newtons / sq mm)	Hardness Brinell	Tensile Strength N/mm^2
P	35/45	540/695	152/207	550/700
Q	40/50	618/772	179/229	625/775
R	45/55	695/849	201/255	700/850
S	50/60	772/926	223/277	775/925
T	55/65	849/1004	248/302	850/1000
U	60/70	926/1080	269/331	925/1075
V	65/75	1004/1158	293/352	1000/1150
W	70/80	1080/1235	311/375	1075/1225
X	75/85	1158/1312	341/401	1150/1300
Y	80/90	1235/1930	363/429	1225/1375
Z	100min	1544min	444min	1550min

• Weights are theoretical estimates, sizes given as a guideline