



Stainless Steel Bar Tolerances

Hot Rolled Rounds and Squares

Specified Size (inches)	Size Tolerance		Out-of-Round or Out-of-Square (1)
	Over	Under	
.3250 - .4375 (2)	0.006	0.006	0.009
.4376 - .6250 (2)	0.007	0.007	0.01
.6260 - .8750	0.008	0.008	0.012
.8760 - 1.000	0.009	0.009	0.013
1.001 - 1.125	0.01	0.01	0.015
1.126 - 1.250	0.011	0.011	0.016
1.251 - 1.375	0.012	0.012	0.018
1.376 - 1.500	0.014	0.014	0.021
1.501 - 2.000	1/64	1/64	0.023
2.001 - 2.500	1/32	0	0.023
2.501 - 3.500	3/64	0	0.035
3.501 - 4.500	1/15	0	0.046
4.501 - 5.500	5/64	0	0.058
5.501 - 6.500	1/8	0	0.07
6.501 - 8.000	5/32	0	0.085

(1) Out-of-Round is the difference between the maximum and the minimum diameters of the bar, measured at the same cross-section. Out-of-Square is the difference in the two dimensions at the same cross-section of a square bar, each dimension being the distance between opposite faces.

(2) Round sections in the size range of 1/4" to approximately 5/8" diameter are commonly produced on rod mills in coils. Tolerances on the product made this way has not be established.

Cold Finished Rounds

(Drawn, Ground, or Ground and Polished)

Specified Size (inches)	Over	Under
.044 - .3125	0.001	0.001
.3126 - .5000	0.0015	0.0015
.5001 - 1.000	0.002	0.002
1.001 - 1.500	0.0025	0.0025
1.501 - 4.000	0.003	0.003
4.125 - 4.500	0.005	0.005
4.5625 - 6.000	0.008	0.008

Cold Finished Hexagons, Squares

Specified Size (inches)	Hexagons/Squares	
	Over	Under
.1250 - .3125	0	0.002
.3126 - .5000	0	0.003
.5001 - 1.000	0	0.004
1.001 - 2.000	0	0.006
2.001 - 3.000	0	0.008
3.001 - 4.000	0	0.01



Hardness Conversion Numbers

Birnell 3000 kg Load 10 mm Ball		Rockwell				Shore Sclero- scope	Tensile Strength psi (approx.)
Diameter Millimeters	Hardness Number	A Scale	B Scale	C Scale	15-N Scale		
2.25	745	84.1	...	65.3	92.3	91	...
2.30	712	...	...	...	...	...	...
2.35	682	82.2	...	61.7	91.0	84	...
2.40	653	81.2	...	60.0	90.2	81	...
2.45	627	80.5	...	58.7	89.6	79	...
2.50	601	79.8	...	57.3	89.0	77	...
2.55	578	79.1	...	56.0	88.4	75	...
2.60	555	78.4	...	54.7	87.8	73	298000
2.65	534	77.8	...	53.5	87.2	71	288000
2.70	514	76.9	...	52.1	86.5	70	274000
2.75	495	76.3	...	51.0	85.9	68	264000
2.80	477	75.6	...	49.6	85.3	66	252000
2.85	461	74.9	...	48.5	84.7	65	242000
2.90	444	74.2	...	47.1	84.0	63	230000
2.95	429	73.4	...	45.7	83.4	61	219000
3.00	415	72.8	...	44.5	82.8	59	212000
3.05	401	72.0	...	43.1	82.0	58	202000
3.10	388	71.4	...	41.8	81.4	56	193000
3.15	375	70.6	...	40.4	80.6	54	184000
3.20	363	70.0	...	39.1	80.0	52	177000
3.25	352	69.3	110.0	37.9	79.3	51	170000
3.30	341	68.7	109.0	36.6	78.6	50	163000
3.35	331	68.1	108.5	35.5	78.0	48	158000
3.40	321	67.5	108.0	34.3	77.3	47	152000
3.45	311	66.9	107.5	33.1	76.7	46	147000
3.50	302	66.3	107.0	32.1	76.1	45	143000
3.55	293	65.7	106.0	30.9	75.5	43	139000
3.60	285	65.3	105.5	29.9	75.0	...	136000
3.65	277	64.6	104.5	28.8	74.4	41	131000
3.70	269	64.1	104.0	27.6	73.7	40	128000
3.75	262	63.6	103.0	26.6	73.1	39	125000
3.80	255	63.0	102.0	25.4	72.5	38	121000
3.85	248	62.5	101.0	24.2	71.7	37	118000
3.90	241	61.8	100.0	22.8	70.9	36	114000
3.95	235	61.4	99.0	21.7	70.3	35	111000
4.00	229	60.8	98.2	20.5	69.7	34	109000
4.05	223	...	97.3	18.8	...	...	104000
4.10	217	...	96.4	17.5	...	33	103000
4.15	212	...	95.5	16.0	...	...	100000
4.20	207	...	94.6	15.2	...	32	99000
4.25	201	...	93.8	13.8	...	31	97000
4.30	197	...	92.8	12.7	...	30	94000
4.35	192	...	91.9	11.5	...	29	92000
4.40	187	...	90.7	10.0	...	...	90000
4.45	183	...	90.0	9.0	...	28	89000
4.50	179	...	89.0	8.0	...	27	88000
4.55	174	...	87.8	6.4	...	...	86000
4.60	170	...	86.8	5.4	...	26	84000
4.65	167	...	86.0	4.4	...	...	83000
4.70	163	...	85.0	3.3	...	25	82000
4.80	156	...	82.9	0.9	...	...	80000
4.90	149	...	80.8	...	...	23	...
5.00	143	...	78.7	...	...	22	...
5.10	137	...	76.4	...	...	21	...
5.20	131	...	74.0	...	...	...	...
5.30	126	...	72.0	...	...	20	...
5.40	121	...	69.8	...	...	19	...
5.50	116	...	67.6	...	...	18	...
5.60	111	...	65.7	...	...	15	...



Hardness Conversion Numbers

Rockwell							Birrell 500 kg Load 10 mm Ball
B Scale	F Scale	15-T Scale	30-T Scale	E Scale	H Scale	A Scale	
74	99.0	...	66.0	...	...	46.0	118
72	98.0	84.0	65.0	...	...	45.0	114
70	97.0	83.5	63.5	99.5	...	44.0	110
68	95.5	...	62.0	98.0	...	43.0	107
66	94.5	82.0	60.5	97.0	...	42.0	104
64	93.5	81.5	59.5	95.5	...	41.5	101
62	92.0	...	58.0	94.5	...	40.5	98
60	91.0	...	56.5	93.0	...	39.5	95
58	90.0	79.5	55.0	92.0	...	38.5	92
56	89.0	79.0	54.0	90.5	...	...	90
54	87.5	...	52.5	89.5	...	37.0	87
52	86.5	77.5	51.0	88.0	...	36.0	85
50	85.5	77.0	49.5	87.0	...	35.0	83
48	84.5	...	48.5	85.5	...	34.5	81
46	83.0	75.5	47.0	84.5	...	33.5	...
44	82.0	75.0	45.5	83.5	...	32.5	78
42	81.0	...	44.0	82.0	...	31.5	76
40	79.5	73.5	43.0	81.0	...	...	...
38	78.5	73.0	41.5	79.5	...	30.0	73
36	77.5	...	40.0	78.5	100.0	29.0	...
34	76.5	71.5	38.5	77.0	99.0	28.0	70
32	75.0	71.0	37.5	76.0	98.5	27.5	...
30	74.0	70.5	36.0	75.0	...	26.5	67
28	73.0	...	34.5	73.5	97.0	25.5	66
26	72.0	69.0	33.0	72.5	...	24.5	65
24	70.5	68.5	32.0	71.0	95.5	24.0	...
22	69.5	...	30.5	70.0	95.0	23.0	...
20	68.5	...	29.0	68.5	...	22.0	...
18	67.0	66.5	27.5	67.5	93.5	...	...
16	66.0	66.0	26.0	66.5	...	20.5	...
14	65.0	...	25.0	65.0	92.0	...	...
12	64.0	64.5	23.5	64.0	91.5	...	...
10	63.0	64.0	22.0	62.5	90.5	...	57
8	61.5	63.5	20.5	61.5	90.0	...	...
6	60.5	...	19.5	60.5	...	...	...
4	59.5	62.0	18.0	59.0	88.5	...	...
2	58.0	61.5	16.5	58.0	...	...	54
0	57.0	...	15.0	57.0	87.0	...	53

Rockwell Hardness Scales

Scale	Major Load, kg	Indenter	Use of Scale
A	60	Diamond Cone	Extremely hard material such as tungsten carbide or hard sheet material too thin for heavy load
B	100	1/16" ball	Materials of B 0 to B 100 hardness.
C	150	Diamond Cone	Materials of C 20 to C 70 hardness
E	100	1/8" ball	Very soft materials such as bearing metals.
F	60	1/16" ball	Very soft materials such as bearing metals.
H	60	1/8" ball	Very soft materials such as bearing metals.

Rockwell Superficial Hardness Scales

15-N	15	Diamond Cone	Materials comparable in hardness of C 20 to C70
15-T	15	1/16" ball	Materials comparable in hardness of B 0 to B 100
30-T	30	1/16" ball	Materials comparable in hardness of B 0 to B 100