

Approximate Hardness Conversion Numbers for Non-austenitic Steels^A (Rockwell B to other Hardness Numbers)

Rockwell B Scale, 100-kgf Load, 1/16-in. Dia. Ball	Vickers Hardness Number	Brinell Hardness, 3000-kgf Load, 10-mm Ball	Knoop Hardness, 500-gf Load and Over	Rockwell A Scale, 60-kgf Load, Diamond Penetrator	Rockwell F Scale, 60-kgf Load, 1/16-in. Dia. Ball	15T Scale, 15-kgf Load, 1/16-in. Dia. Ball	30T Scale, 30-kgf Load, 1/16-in. Dia. Ball	45T Scale, 45-kgf Load, 1/16-in. Dia. Ball	Approximate Tensile Strength, ksi
100	240	240	251	61.5	...	93.1	83.1	72.9	116
99	234	234	246	60.9	...	92.8	82.5	71.9	114
98	228	228	241	60.2	...	92.5	81.8	70.9	109
97	222	222	236	59.5	...	92.1	81.1	69.9	104
96	216	216	231	58.9	...	91.8	80.4	68.9	102
95	210	210	226	58.3	...	91.5	79.8	67.9	100
94	205	205	221	57.6	...	91.2	79.1	66.9	98
93	200	200	216	57.0	...	90.8	78.4	65.9	94
92	195	195	211	56.4	...	90.5	77.8	64.8	92
91	190	190	206	55.8	...	90.2	77.1	63.8	90
90	185	185	201	55.2	...	89.9	76.4	62.8	89
89	180	180	196	54.6	...	89.5	75.8	61.8	88
88	176	176	192	54.0	...	89.2	75.1	60.8	86
87	172	172	188	53.4	...	88.9	74.4	59.8	84
86	169	169	184	52.8	...	88.6	73.8	58.8	83
85	165	165	180	52.3	...	88.2	73.1	57.8	82
84	162	162	176	51.7	...	87.9	72.4	56.8	81
83	159	159	173	51.1	...	87.6	71.8	55.8	80
82	156	156	170	50.6	...	87.3	71.1	54.8	77
81	153	153	167	50.0	...	86.9	70.4	53.8	73
80	150	150	164	49.5	...	86.6	69.7	52.8	72
79	147	147	161	48.9	...	86.3	69.1	51.8	70
78	144	144	158	48.4	...	86.0	68.4	50.8	69
77	141	141	155	47.9	...	85.6	67.7	49.8	68
76	139	139	152	47.3	...	85.3	67.1	48.8	67
75	137	137	150	46.8	99.6	85.0	66.4	47.8	66
74	135	135	147	46.3	99.1	84.7	65.7	46.8	65
73	132	132	145	45.8	98.5	84.3	65.1	45.8	64
72	130	130	143	45.3	98.0	84.0	64.4	44.8	63
71	127	127	141	44.8	97.4	83.7	63.7	43.8	62
70	125	125	139	44.3	96.8	83.4	63.1	42.8	61
69	123	123	137	43.8	96.2	83.0	62.4	41.8	60
68	121	121	135	43.3	95.6	82.7	61.7	40.8	59
67	119	119	133	42.8	95.1	82.4	61.0	39.8	58
66	117	117	131	42.3	94.5	82.1	60.4	38.7	57
65	116	116	129	41.8	93.9	81.8	59.7	37.7	56
64	114	114	127	41.4	93.4	81.4	59.0	36.7	...
63	112	112	125	40.9	92.8	81.1	58.4	35.7	...
62	110	110	124	40.4	92.2	80.8	57.7	34.7	...
61	108	108	122	40.0	91.7	80.5	57.0	33.7	...
60	107	107	120	39.5	91.1	80.1	56.4	32.7	...
59	106	106	118	39.0	90.5	79.8	55.7	31.7	...
58	104	104	117	38.6	90.0	79.5	55.0	30.7	...
57	103	103	115	38.1	89.4	79.2	54.4	29.7	...
56	101	101	114	37.7	88.8	78.8	53.7	28.7	...
55	100	100	112	37.2	88.2	78.5	53.0	27.7	...
54	...	...	111	36.8	87.7	78.2	52.4	26.7	...
53	...	...	110	36.3	86.5	77.9	51.7	25.7	...
52	...	...	109	35.9	86.0	77.5	51.0	24.7	...
51	...	...	108	35.5	85.4	77.2	50.3	23.7	...
50	...	...	107	35.0	84.8	76.9	49.7	22.7	...
49	...	...	106	34.6	84.3	76.6	49.0	21.7	...
48	...	...	105	34.1	83.7	76.2	48.3	20.7	...
47	...	...	104	33.7	83.1	75.9	47.7	19.7	...
46	...	...	103	33.3	...	75.6	47.0	18.7	...

^A This table gives the approximate interrelationships of hardness values and approximate tensile strength of steels. It is possible that steels of various compositions and processing histories will deviate in hardness-tensile strength relationship from the data presented in this table. The data in this table should not be used for austenitic stainless steels, but have been shown to be applicable for ferritic and martensitic stainless steels. Where more precise conversions are required, they should be developed specifically for each steel composition, heat treatment and part.