

Rockwell Hardness Chart

				A scale,	C scale,	F scale,		Rockwell superficial hardness, 1/16-in. dia ball		Knoop			
		Brinell hardness,		60-kg	150-kg	60-kg	15T	30T	45T	hardness,		Tensile	
Rockwell B-scale	Vickers	10-mm-diam ball	500-kg 3000-kg	load, Brale	load, Brale	load, 1/16-in.-	scale, 15-kg	scale, 30-kg	scale, 45-kg	500-g load and	Sclero- scope	strength (approx),	Rockwell B-scale
hardness	hardness	load	load	indenter	indenter	diam ball	load	load	load	greater	hardness	ksi	hardness
	228	189	228	60.2	(19.9)	...	92.5	81.8	70.9	241	34	107	98
97	222	184	222	59.5	(18.6)	...	92.1	81.1	69.9	236	33	104	97
96	216	179	216	58.9	(17.2)	...	91.8	80.4	68.9	231	32	102	96
95	210	175	210	58.3	(15.7)	...	91.5	79.8	67.9	226	...	99	95
94	205	171	205	57.6	(14.3)	...	91.2	79.1	66.9	221	31	97	94
93	200	167	200	57.0	(13.0)	...	90.8	78.4	65.9	216	30	94	93
92	195	163	195	56.4	(11.7)	...	90.5	77.8	64.8	211	...	92	92
91	190	160	190	55.8	(10.4)	...	90.2	77.1	63.8	206	29	90	91
90	185	157	185	55.2	(9.2)	...	89.9	76.4	62.8	201	28	88	90
89	180	154	180	54.6	(8.0)	...	89.5	75.8	61.8	196	27	86	89
88	176	151	176	54.0	(6.9)	...	89.2	75.1	60.8	192	...	84	88
87	172	148	172	53.4	(5.8)	...	88.9	74.4	59.8	188	26	82	87
86	169	145	169	52.8	(4.7)	...	88.6	73.8	58.8	184	26	81	86
85	165	142	165	52.3	(3.6)	...	88.2	73.1	57.8	180	25	79	85
84	162	140	162	51.7	(2.5)	...	87.9	72.4	56.8	176	...	78	84
83	159	137	159	51.1	(1.4)	...	87.6	71.8	55.8	173	24	76	83
82	156	135	156	50.6	(0.3)	...	87.3	71.1	54.8	170	24	75	82
81	153	133	153	50.0	...	...	86.9	70.4	53.8	167	...	73	81
80	150	130	150	49.5	...	...	86.6	69.7	52.8	164	23	72	80
79	147	128	147	48.9	...	...	86.3	69.1	51.8	161	...	70	79
78	144	126	144	48.4	...	...	86.0	68.4	50.8	158	22	69	78
77	141	124	141	47.9	...	...	85.6	67.7	49.8	155	22	68	77
76	139	122	139	47.3	...	...	85.3	67.1	48.8	152	...	67	76
75	137	120	137	46.8	...	99.6	85.0	66.4	47.8	150	21	66	75
74	135	118	135	46.3	...	99.1	84.7	65.7	46.8	148	21	65	74
73	132	116	132	45.8	...	98.5	84.3	65.1	45.8	145	...	64	73
72	130	114	130	45.3	...	98.0	84.0	64.4	44.8	143	20	63	72
71	127	112	127	44.8	...	97.4	83.7	63.7	43.8	141	20	62	71
70	125	110	125	44.3	...	96.8	83.4	63.1	42.8	139	...	61	70
69	123	109	123	43.8	...	96.2	83.0	62.4	41.8	137	19	60	69
68	121	107	121	43.3	...	95.6	82.7	61.7	40.8	135	19	59	68
67	119	106	119	42.8	...	95.1	82.4	61.0	39.8	133	19	58	67
66	117	104	117	42.3	...	94.5	82.1	60.4	38.7	131	...	57	66
65	116	102	116	41.8	...	93.9	81.8	59.7	37.7	129	18	56	65
64	114	101	114	41.4	...	93.4	81.4	59.0	36.7	127	18	...	64
63	112	99	112	40.9	...	92.8	81.1	58.4	35.7	125	18	...	63
62	110	98	110	40.4	...	92.2	80.8	57.7	34.7	124	...	...	62
61	108	96	108	40.0	...	91.7	80.5	57.0	33.7	122	17	...	61
60	107	95	107	39.5	...	91.1	80.1	56.4	32.7	120	...	...	60
59	106	94	106	39.0	...	90.5	79.8	55.7	31.7	118	...	...	59
58	104	92	104	38.6	...	90.0	79.5	55.0	30.7	117	...	...	58
57	103	91	103	38.1	...	89.4	79.2	54.4	29.7	115	...	...	57
56	101	90	101	37.7	...	88.8	78.8	53.7	28.7	114	...	...	56
55	100	89	100	37.2	...	88.2	78.5	53.0	27.7	112	...	...	55

(a) For carbon and alloy steels in the annealed, normalized, and quenched-and-tempered conditions; less accurate for cold worked condition and for austenitic steels. The values in parentheses are beyond normal range and are given for information only.