KASPERCALC

HARDNESS CONVERSION CHART

Rockwell · superficial Rockwell · Vickers · Knoop · Brinell · Shore · approximate tensile strength

ASTM E140-02, Tables 1 to 9
2026-11-06

Read across a row to compare scales. Shaded column: the chart's key scale. – = not printed for that hardness ( ) = outside the recommended range of that test

Conversions are approximate and only for the material named: test with the scale the drawing specifies.

Non-Austenitic Steels, Rockwell B Range · ASTM E140

Table 2

HRB 1/16 in ball, 100 kg	HV 136° diamond pyramid	HBS 10 mm standard ball, 3000 kg	HK Knoop diamond, 500 g and over	HRA Diamond (Brale), 60 kg	HRF 1/16 in ball, 60 kg	HR15T 1/16 in ball, 15 kg	HR30T 1/16 in ball, 30 kg	HR45T 1/16 in ball, 45 kg
100	240	240	251	61.5	–	93.1	83.1	72.9
99	234	234	246	60.9	–	92.8	82.5	71.9
98	228	228	241	60.2	–	92.5	81.8	70.9
97	222	222	236	59.5	–	92.1	81.1	69.9
96	216	216	231	58.9	–	91.8	80.4	68.9
95	210	210	226	58.3	–	91.5	79.8	67.9
94	205	205	221	57.6	–	91.2	79.1	66.9
93	200	200	216	57.0	–	90.8	78.4	65.9
92	195	195	211	56.4	–	90.5	77.8	64.8
91	190	190	206	55.8	–	90.2	77.1	63.8
90	185	185	201	55.2	–	89.9	76.4	62.8
89	180	180	196	54.6	–	89.5	75.8	61.8
88	176	176	192	54.0	–	89.2	75.1	60.8
87	172	172	188	53.4	–	88.9	74.4	59.8
86	169	169	184	52.8	–	88.6	73.8	58.8
85	165	165	180	52.3	–	88.2	73.1	57.8
84	162	162	176	51.7	–	87.9	72.4	56.8
83	159	159	173	51.1	–	87.6	71.8	55.8
82	156	156	170	50.6	–	87.3	71.1	54.8
81	153	153	167	50.0	–	86.9	70.4	53.8
80	150	150	164	49.5	–	86.6	69.7	52.8
79	147	147	161	48.9	–	86.3	69.1	51.8
78	144	144	158	48.4	–	86.0	68.4	50.8
77	141	141	155	47.9	–	85.6	67.7	49.8
76	139	139	152	47.3	–	85.3	67.1	48.8
75	137	137	150	46.8	99.6	85.0	66.4	47.8
74	135	135	147	46.3	99.1	84.7	65.7	46.8
73	132	132	145	45.8	98.5	84.3	65.1	45.8
72	130	130	143	45.3	98.0	84.0	64.4	44.8
71	127	127	141	44.8	97.4	83.7	63.7	43.8
70	125	125	139	44.3	96.8	83.4	63.1	42.8
69	123	123	137	43.8	96.2	83.0	62.4	41.8
68	121	121	135	43.3	95.6	82.7	61.7	40.8
67	119	119	133	42.8	95.1	82.4	61.0	39.8
66	117	117	131	42.3	94.5	82.1	60.4	38.7
65	116	116	129	41.8	93.9	81.8	59.7	37.7

Carbon, alloy and tool steels, as-forged, annealed, normalized or quenched and tempered, provided they are homogeneous.

Non-Austenitic Steels, Rockwell B Range · ASTM E140

Table 2

HRB 1/16 in ball, 100 kg	HV 136° diamond pyramid	HBS 10 mm standard ball, 3000 kg	HK Knoop diamond, 500 g and over	HRA Diamond (Brale), 60 kg	HRF 1/16 in ball, 60 kg	HR15T 1/16 in ball, 15 kg	HR30T 1/16 in ball, 30 kg	HR45T 1/16 in ball, 45 kg
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	87.1	77.9	51.7	25.7
52	–	–	109	35.9	86.5	77.5	51.0	24.7
51	–	–	108	35.5	86.0	77.2	50.3	23.7
50	–	–	107	35.0	85.4	76.9	49.7	22.7
49	–	–	106	34.6	84.8	76.6	49.0	21.7
48	–	–	105	34.1	84.3	76.2	48.3	20.7
47	–	–	104	33.7	83.7	75.9	47.7	19.7
46	–	–	103	33.3	83.1	75.6	47.0	18.7
45	–	–	102	32.9	82.6	75.3	46.3	17.7
44	–	–	101	32.4	82.0	74.9	45.7	16.7
43	–	–	100	32.0	81.4	74.6	45.0	15.7
42	–	–	99	31.6	80.8	74.3	44.3	14.7
41	–	–	98	31.2	80.3	74.0	43.7	13.6
40	–	–	97	30.7	79.7	73.6	43.0	12.6
39	–	–	96	30.3	79.1	73.3	42.3	11.6
38	–	–	95	29.9	78.6	73.0	41.6	10.6
37	–	–	94	29.5	78.0	72.7	41.0	9.6
36	–	–	93	29.1	77.4	72.3	40.3	8.6
35	–	–	92	28.7	76.9	72.0	39.6	7.6
34	–	–	91	28.2	76.3	71.7	39.0	6.6
33	–	–	90	27.8	75.7	71.4	38.3	5.6
32	–	–	89	27.4	75.2	71.0	37.6	4.6
31	–	–	88	27.0	74.6	70.7	37.0	3.6
30	–	–	87	26.6	74.0	70.4	36.3	2.6

Carbon, alloy and tool steels, as-forged, annealed, normalized or quenched and tempered, provided they are homogeneous.

Values exactly as printed in the sources named on each chart. Tensile strength: plain carbon and low alloy steels only, a guide (TO 1-1A-9 para 2.8.3). Rockwell: 10 kg minor load, then the major load shown. Brinell: 10 mm ball. Vickers: 136° diamond pyramid.