

Approximate Hardness Conversion Numbers for Steel Based on Rockwell C Hardness Numbers

Rockwell C-Scale Hardness No.	Brinell Hardness No. 10-mm Tungsten Carbide Ball, 3,000-Kg Load	Rockwell hardness No.		Diamond Pyramid Hardness No., Vickers	Shore Scleroscope Hardness No.	Tensile Strength (Approximate) in 1,000 psi
		B-Scale, 100 Kg Load 1/16-In. Diam. Ball	A-Scale, 60-Kg Load, Brale Penetrator			
68	—	—	85.6	940	97	—
67	—	—	85.0	900	95	—
66	—	—	84.5	865	92	—
65	739	—	83.9	832	91	—
64	722	—	83.4	800	88	—
63	705	—	82.8	772	87	—
62	688	—	82.3	746	85	—
61	670	—	81.8	720	83	—
60	654	—	81.2	697	81	—
59	634	—	80.7	674	80	326
58	615	—	80.1	653	78	315
57	595	—	79.6	633	76	305
56	577	—	79.0	613	75	295
55	560	—	78.5	595	74	287
54	543	—	78.0	577	72	278
53	525	—	77.4	560	71	269
52	512	—	76.8	544	69	262

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		B-Scale, 100 Kg Load 1/16-In. Diam. Ball	A-Scale, 60-Kg Load, Brale Penetrator			
51	496	—	76.3	528	68	253
50	481	—	75.9	513	67	245
49	469	—	75.2	498	66	239
48	455	—	74.7	484	64	232
47	443	—	74.1	471	63	225
46	432	—	73.6	458	62	219
45	421	—	73.1	446	60	212
44	409	—	72.5	434	58	206
43	400	—	72.0	423	57	201
42	390	—	71.5	412	56	196
41	381	—	70.9	402	55	191
40	371	—	70.4	392	54	186
39	362	—	69.9	382	52	181
38	353	—	69.4	372	51	176
37	344	—	68.9	363	50	172
36	336	(109.0)	68.4	354	49	168
35	327	(108.5)	67.9	345	48	163

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		B-Scale, 100 Kg Load 1/16-In. Diam. Ball	A-Scale, 60-Kg Load, Brale Penetrator			
34	319	(108.0)	67.4	336	47	158
33	311	(107.5)	66.8	327	46	154
32	301	(107.0)	66.3	318	44	150
31	294	(106.0)	65.8	310	43	146
30	286	(105.5)	65.3	302	42	142
29	279	(104.5)	64.7	294	41	138
28	271	(104.0)	64.3	286	41	134
27	264	(103.0)	63.8	279	40	131
26	258	(102.5)	63.3	272	38	127
25	253	(101.5)	62.8	266	38	124
24	247	(101.0)	62.4	260	37	121
23	243	100.0	62.0	254	36	118
22	237	99.0	61.5	248	35	115
21	231	98.5	61.0	243	35	113
20	226	97.8	60.5	238	34	110

NOTE. The values shown are based on ASTM Spec (I 48) and 1954 SAE Handbook. Values in () are beyond normal range and are given for information only.

Approximate Hardness Conversion Numbers for Steel Based on Brinell Hardness Numbers

Brinell Indentation Diam. mm	Brinell Hardness No. 10-mm Tungsten Carbide Ball, 3,000-Kg Load	Rockwell hardness No.			Diamond Pyramid Hardness No., Vickers	Shore Scleroscope Hardness No.	Tensile Strength (Approximate) in 1,000 psi
		C-Scale, 150 Kg Load Brale Penetrator	B-Scale, 100 Kg Load 1/16-In. Diam. Ball	A-Scale, 60-Kg Load, Brale Penetrator			
2.25	745	65.3	—	84.1	840	91	—
—	733	64.7	—	83.8	820	90	—
—	722	64.0	—	83.4	800	88	—
2.30	712	—	—	—	—	—	—
—	710	63.3	—	83.0	780	87	—
—	698	62.5	—	82.6	760	86	—
—	684	61.8	—	82.2	740	—	—
2.35	682	61.7	—	82.2	737	84	—
—	670	61.0	—	81.8	720	83	—
—	656	60.1	—	81.3	700	—	—
2.40	653	60.0	—	81.2	697	81	—
—	647	59.7	—	81.1	690	—	—
—	638	59.2	—	80.8	680	80	329

Crucible Tool Steel and Specialty Alloy Selector

Approximate Hardness Conversion Numbers for Steel Based on Brinell Hardness Numbers

Brinell Indentation Diam. mm	Brinell Hardness No. 10-mm Tungsten Carbide Ball, 3,000-Kg Load	Rockwell hardness No.			Diamond Pyramid Hardness No., Vickers	Shore Scleroscope Hardness No.	Tensile Strength (Approximate) in 1,000 psi
		C-Scale, 150 Kg Load Brale Penetrator	B-Scale, 100 Kg Load 1/16-In. Diam. Ball	A-Scale, 60-Kg Load, Brale Penetrator			
—	630	58.8	—	80.6	670	—	324
2.45	627	58.7	—	80.5	667	79	323
2.50 {	—	59.1	—	80.7	640	—	328
	601	57.3	—	79.8	640	77	309
2.55 {	—	57.3	—	79.8	640	—	309
	578	56.0	—	79.1	615	75	297
2.60 {	—	55.6	—	78.8	607	—	293
	555	54.7	—	78.4	591	73	285
2.65 {	—	54.0	—	78.0	579	—	279
	534	53.5	—	77.8	569	71	274
2.70 {	—	52.5	—	77.1	553	—	266
	514	52.1	—	76.9	547	70	263

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		C-Scale, 150 Kg Load Brale Penetrator	B-Scale, 100 Kg Load 1/16-In. Diam. Ball	A-Scale, 60-Kg Load, Brale Penetrator			
2.75 {	—	51.6	—	76.7	539	—	259
	—	51.1	—	76.4	530	—	254
	495	51.0	—	76.3	528	68	253
2.80 {	—	50.3	—	75.9	516	—	247
	—	49.6	—	75.6	508	—	243
	477	49.6	—	75.6	508	66	243
2.85 {	—	48.8	—	75.1	495	—	237
	—	48.5	—	74.9	491	—	235
	461	48.5	—	74.9	491	65	235
2.90 {	—	47.2	—	74.3	474	—	226
	—	47.1	—	74.2	472	—	225
	444	47.1	—	74.2	472	63	225
2.95	429	45.7	—	73.4	455	61	217
3.00	415	44.5	—	72.8	440	59	210

Approximate Hardness Conversion Numbers for Steel Based on Brinell Hardness Numbers

Brinell Indentation Diam. mm	Brinell Hardness No. 10-mm Tungsten Carbide Ball, 3,000-Kg Load	Rockwell hardness No.			Diamond Pyramid Hardness No., Vickers	Shore Scleroscope Hardness No.	Tensile Strength (Approximate) in 1,000 psi
		C-Scale, 150 Kg Load Brale Penetrator	B-Scale, 100 Kg Load 1/16-In. Diam. Ball	A-Scale, 60-Kg Load, Brale Penetrator			
3.05	401	43.1	—	72.0	425	58	202
3.10	388	41.8	—	71.4	410	56	195
3.23	375	41.8	—	70.6	396	54	188
3.25	352	37.9	(110.0)	69.3	372	51	176
3.30	341	36.6	(109.0)	68.7	360	50	170
3.35	331	35.5	(108.5)	68.1	350	48	166
3.40	321	34.3	(108.0)	67.5	339	47	160
3.45	311	33.1	(107.5)	66.9	328	46	155
3.50	302	32.1	(107.0)	66.3	319	45	150
3.55	293	30.9	(106.0)	65.7	309	43	145
3.60	285	29.9	(105.5)	65.3	301	—	141
3.65	277	28.8	(104.5)	64.6	292	41	137

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		C-Scale, 150 Kg Load Brale Penetrator	B-Scale, 100 Kg Load 1/16-in. Diam. Ball	A-Scale, 60-Kg Load, Brale Penetrator			
3.70	269	27.6	(104.0)	64.1	284	40	133
3.75	262	26.6	(103.0)	63.6	276	39	129
3.80	255	25.4	(102.0)	63.0	269	38	126
3.85	248	24.2	(101.0)	62.5	261	37	122
3.90	241	22.8	100.0	61.8	253	36	118
3.95	235	21.7	99.0	61.4	247	35	115
4.00	229	20.5	98.2	60.8	241	34	111
4.05	223	(18.8)	97.3	-	234	-	—
4.10	217	(17.5)	96.4	-	228	33	105
4.15	212	(16.0)	95.5	—	222	—	102
4.20	207	(15.2)	94.6	-	218	32	100
4.25	201	(13.8)	93.8	—	212	31	98
4.30	197	(12.7)	92.8	-	207	30	95

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		C-Scale, 150 Kg Load Brale Penetrator	B-Scale, 100 Kg Load 1/16-In. Diam. Ball	A-Scale, 60-Kg Load, Brale Penetrator			
4.35	192	(11.5)	91.9	—	202	29	93
4.40	187	(10.0)	90.7	—	196	—	90
4.45	183	(9.0)	90.0	—	192	28	89
4.50	179	(8.0)	89.0	—	188	27	87
4.55	174	(6.4)	87.8	—	182	—	85
4.60	170	(5.4)	86.8	—	178	26	83
4.65	167	(4.4)	86.0	—	175	—	81
4.70	163	(3.3)	85.0	—	171	25	79
4.80	156	(0.9)	82.9	—	163	—	76
4.90	149	—	80.8	—	156	23	73
5.00	143	—	78.7	—	150	22	71
5.10	137	—	76.4	—	143	21	67
5.20	131	—	74.0	—	137	—	65

NOTE. The values shown are based on ASTM Spec. (E48) and 1954 SAE Handbook. Values in () are beyond normal range and are given for information only.