

**004 Approximate Hardness Conversion Numbers for Cartridge Brass (70% Copper 30% Zinc Alloy)**

Vickers Hardness (HV)	Rockwell Hardness Number		Rockwell Superficial Hardness Number			Brinell 10mm Ball 500 kgf (HBS)
	B Scale	F Scale	15T Scale	30T Scale	45T Scale	
	1/16" Ball 100 kgf (HRB)	1/16" Ball 60 kg (HRF)	1/16" Ball 15 kgf (HR 15T)	1/16" Ball 30 kgf (HR 30T)	1/16" Ball 45 kgf (HR 45T)	
196	93.5	110.0	90.0	77.5	66.0	169
194	...	109.5	...	...	65.5	167
192	93.0	...	...	77.0	65.0	166
190	92.5	109.0	...	76.5	64.5	164
188	92.0	...	89.5	...	64.0	162
186	91.5	108.5	...	76.0	63.5	161
184	91.0	...	...	75.5	63.0	159
182	90.5	108.0	89.0	...	62.5	157
180	90.0	107.5	...	75.0	62.0	156
178	89.0	...	...	74.5	61.5	154
176	88.5	107.0	...	...	61.0	152
174	88.0	...	88.5	74.0	60.5	150
172	87.5	106.5	...	73.5	60.0	149
170	87.0	...	...	...	59.5	147
168	86.0	106.0	88.0	73.0	59.0	146
166	85.5	...	...	72.5	58.5	144
164	85.0	105.5	...	72.0	58.0	142
162	84.0	105.0	87.5	...	57.5	141
160	83.5	...	...	71.5	56.5	139
158	83.0	104.5	...	71.0	56.0	138
156	82.0	104.0	87.0	70.5	55.5	136
154	81.5	103.5	...	70.0	54.5	135
152	80.5	103.0	...	...	54.0	133
150	80.0	...	86.5	69.5	53.5	131
148	79.0	102.5	...	69.0	53.0	129
146	78.0	102.0	...	68.5	52.5	128
144	77.5	101.5	86.0	68.0	51.5	126
142	77.0	101.0	...	67.5	51.0	124
140	76.0	100.5	85.5	67.0	50.0	122
138	75.0	100.0	...	66.5	49.0	121
136	74.5	99.5	85.0	66.0	48.0	120
134	73.5	99.0	...	65.5	47.5	118
132	73.0	98.5	84.5	65.0	46.5	116
130	72.0	98.0	84.0	64.5	45.5	114
128	71.0	97.5	...	63.5	45.0	113
126	70.0	97.0	83.5	63.0	44.0	112
124	69.0	96.5	...	62.5	43.0	110
122	68.0	96.0	83.0	62.0	42.0	108
120	67.0	95.5	...	61.0	41.0	106
118	66.0	95.0	82.5	60.5	40.0	105
116	65.0	94.5	82.0	60.0	39.0	103
114	64.0	94.0	81.5	59.5	38.0	101
112	63.0	93.0	81.0	59.5	37.0	99
110	62.0	92.6	80.5	58.0	35.5	97
108	61.0	92.0	...	57.0	34.5	95
106	59.5	91.2	80.0	56.0	33.0	94
104	58.0	90.5	79.5	55.0	32.0	92
102	57.0	89.8	79.0	54.5	30.5	90
100	56.0	89.0	78.5	53.5	29.5	88

References:

Hardness Testing ASM International, Metals Park, OH 1987

ASTM Designatin E-140-12b

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	B Scale 1/16" Ball 100 kgf (HRB)	F Scale 1/16" Ball 60 kg (HRF)	15T Scale 1/16" Ball 15 kgf (HR 15T)	30T Scale 1/16" Ball 30 kgf (HR 30T)	45T Scale 1/16" Ball 45 kgf (HR 45T)	
98	54.0	88.0	78.0	52.5	29.0	86
96	53.0	87.2	77.5	51.5	26.0	85
94	51.0	86.3	77.0	50.5	24.5	83
92	49.5	85.4	76.5	49.0	23.0	82
90	47.5	84.4	75.5	48.0	21.0	80
80	37.5	78.6	72.0	41.0	7.5	72.0
78	35.0	77.4	71.5	39.5	4.5	70.0
76	32.5	76.0	70.5	38.0	1.0	68.0
74	30.0	74.8	70.0	36.0	...	66.0
72	27.5	73.2	69.0	34.0	...	64.0
70	24.5	71.8	68.0	32.0	...	63.0
68	21.5	70.0	67.0	30.0	...	62.0
66	18.5	68.5	66.0	28.0	...	61.0
64	15.5	66.8	65.0	25.5	...	59.0
62	12.5	65.0	63.5	23.0	...	57.0
60	10.0	62.5	62.5	...	...	55.0
58	...	61.0	61.0	18.0	...	53.0
56	...	58.8	60.0	15.0	...	52.0
54	...	56.5	58.5	12.0	...	50.0
52	...	53.5	57.0	...	...	48.0
50	...	50.5	55.5	...	...	47.0
49	...	49.0	54.5	...	...	46.0
48	...	47.0	53.5	...	...	45.0
47	...	45.0	...	...	...	44.0
46	...	43.0	...	...	...	43.0
45	...	40.0	...	...	...	42.0

References:

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