

**CROSS-REFERENCE BETWEEN DIFFERENT HARDNESS MEASUREMENTS**

Brinell Hardness BHN*	Vickers Hardness HV	Rockwell Hardness HRA	Rockwell Hardness HRB	Rockwell Hardness HRC	Shore Hardness HS
10mm ball, 3000kgf load	136° diamond pyramid, 10kgf load	brale penetrator, 60kgf load	1/16 inch ball, 100kgf load	brale penetrator, 150kgf load	
86	90		48		
95	100		56.2		
105	110		62.3		
114	120		66.7		
124	130		71.2		20
133	140		75		21
143	150		78.7		22
152	160		81.7	(0)	24
162	170		85	(3)	25
171	180		87.1	(6)	26
181	190		89.5	(8.5)	28
190	200		91.5	(11)	29
200	210		93.4	(13.4)	30
209	220		95	(15.7)	32
219	230		96.7	(18)	33
228	240	60.7	98.1	20.3	34
238	250	61.6	99.5	22.2	36
247	260	62.4	(101)	24	37
256	270	63.1	(102)	25.6	38
265	280	63.8	(103.5)	27.1	40
275	290	64.5	(104.5)	28.5	41
284	300	65.2	(105.5)	29.8	42
303	320	66.4	(107)	32.2	45
322	340	67.6	(108)	34.4	47
341	360	68.7	(109)	36.6	50
360	380	69.8	(110)	38.8	52
379	400	70.8		40.8	55
397	420	71.8		42.7	57
415	440	72.8		44.5	59
433	460	73.6		46.1	62
452	480	74.5		47.7	64
471	500	75.3		49.1	66
488	520	76.1		50.5	67
507	540	76.7		51.7	69
525	560	77.4		53	71
545	580	78		54.1	72
564	600	78.6		55.2	74
582	620	79.2		56.3	75
601	640	79.8		57.3	77
620	660	80.3		58.3	79
638	680	80.8		59.2	80
656	700	81.3		60.1	81
670	720	81.8		61	83
684	740	82.2		61.8	84
698	760	82.6		62.5	86
710	780	83		63.3	87
722	800	83.4		64	88
745	840	84.1		65.3	91
767	880	84.7		66.4	93

\*A 10mm steel ball is used for 450 BHN and below. A 10mm carbide ball is used above 450 BHN.

Also known as Firth Diamond Hardness Number.

Values in parentheses are not contained in the normal definition range for hardness checking, but are often used in a comparable measure.

All values shown in this chart are approximate and intended only as a reference guide.