

# HARDNESS CONVERSION TABLE

For Hardening Carbon and Low Alloy Steel

Tensile Strength 2) N/mm <sup>2</sup>	Vickers Hardness (F ≥ 98 n)	Brinell Hardness 1) $\left(0.102 \cdot \frac{F}{D^2} = 30 \frac{N}{mm^2}\right)$	Rockwell Hardness		
			HRB	HRC	HRA
255	80	76.0			
270	85	80.7	41.0		
285	90	85.5	48.0		
305	95	90.2	52.0		
320	100	95.0	56.2		
335	105	99.8			
350	110	105	62.3		
370	115	109			
385	120	114	66.7		
400	125	119			
415	130	124	71.2		
430	135	128			
450	140	133	75.0		
465	145	138			
480	150	143	78.7		
495	155	147			
510	160	152	81.7		
530	165	156			
545	170	162	85.0		
560	175	166			
575	180	171	87.1		
595	185	176			
610	190	181	89.5		
625	195	185			
640	200	190	91.5		
660	205	195	92.5		
675	210	199	93.5		
690	215	204	94.0		
705	220	209	95.0		
720	225	214	96.0		
740	230	219	96.7		
755	235	223			
770	240	228	98.1	20.3	60.7
785	245	233		21.3	61.2
800	250	238	99.5	22.2	61.6
820	255	242		23.1	62.0
835	260	247	[101]	24.0	62.4
850	265	252		24.8	62.7
865	270	257	[102]	25.6	63.1
880	275	261		26.4	63.5
900	280	268	[104]	27.1	63.8
915	285	271	[105]	27.8	64.2
930	290	276		28.5	64.5
950	295	280		29.2	64.8
965	300	285		29.8	65.2
995	310	295		31.0	65.8
1030	320	304		32.2	66.4
1060	330	314		33.3	67.0
1095	340	323		34.3	67.6
1125	350	333		35.5	68.1

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			HRB	HRC	HRA
1155	360	342		36.6	68.7
1190	370	352		37.7	69.2
1220	380	361		38.8	69.8
1255	390	371		39.8	70.3
1290	400	380		40.8	70.8
1320	410	390		41.8	71.4
1350	420	399		42.7	71.8
1385	430	409		43.6	72.3
1420	440	418		44.5	72.8
1455	450	428		45.3	73.3
1485	460	437		46.1	73.6
1520	470	447		46.9	74.1
1555	480	[456]		47.7	74.5
1595	490	[466]		48.4	74.9
1630	500	[475]		49.1	75.3
1665	510	[485]		49.8	75.7
1700	520	[494]		50.5	76.1
1740	530	[504]		51.1	76.4
1775	540	[513]		51.7	76.7
1810	550	[523]		52.3	77.0
1845	560	[532]		53.0	77.4
1880	570	[542]		53.6	77.8
1920	580	[551]		54.1	78.0
1955	590	[561]		54.7	78.4
1995	600	[570]		55.2	78.6
2030	610	[580]		55.7	78.9
2070	620	[589]		56.3	79.2
2105	630	[599]		56.8	79.5
2145	640	[608]		57.3	79.8
2180	650	[618]		57.8	80.0
	660			58.3	80.3
	670			58.8	80.6
	680			59.2	80.8
	690			59.7	81.1
	700			60.1	81.3
	720			61.0	81.8
	740			61.8	82.2
	760			62.5	82.6
	780			63.3	83.0
	800			64.0	83.4
	820			64.7	83.8
	840			65.3	84.1
	860			65.9	84.4
	880			66.4	84.7
	900			67.0	85.0
	920			67.5	85.3
	940			68.0	85.6

Numbers in parentheses indicate hardness values, which are outside the definition area of the standard hardness test, but often used as approximate values. The Brinell values in parenthesis are only used when measured with a hard metal ball.

1) Calculated as: HB = 0.95 x HV

2) The tensile strength values shown in the table are only to be used as approximate values. To get the exact tensile strength values a tensile test must be performed.