

Wilson® | Hardness Conversion Chart

Hardened Steel and Hardened Alloys												
Rockwell				Superficial			Vickers	Knoop	Brinell	Tensile Strength	Micro-ficial	
C	A	D	G	15-N	30-N	45-N	HV	HK	HB	KSI	WMN	
150 kg Brale	60 kg Brale	100 kg Brale	150 kg 1/16" ball	15 kg N Brale	30 kg N Brale	45 kg N Brale	10 kg	500 gm and over	3000 kg 10 mm ball	1000 lbs/sq in	1000 gm	
80	92.0	86.5	↑	96.5	92.0	87.0	1865	-	↑	↑	-	-
79	91.5	85.5		96.3	91.5	86.5	1787	-			-	-
78	91.0	84.5		96.0	91.0	85.5	1710	-			-	-
77	90.5	84.0		95.8	90.5	84.5	1633	-			-	-
76	90.0	83.0		95.5	90.0	83.5	1556	-			-	-
75	89.5	82.5		95.3	89.0	82.5	1478	-			-	-
74	89.0	81.5		95.0	88.5	81.5	1400	-			-	-
73	88.5	81.0		94.8	88.0	80.5	1323	-			-	-
72	88.0	80.0		94.5	87.0	79.5	1245	-			-	-
71	87.0	79.5		94.3	86.5	78.5	1160	-			-	-
70	86.5	78.5		94.0	86.0	77.5	1076	972			953	
69	86.0	78.0		93.5	85.0	76.5	1004	946			949	
68	85.6	76.9		93.2	84.4	75.4	940	920			945	
67	85.0	76.1		92.9	83.6	74.2	900	895			942	
66	84.5	75.4		92.5	82.8	73.3	865	870	NA		938	
65	83.9	74.5		92.2	81.9	72.0	832	846	739		934	
64	83.4	73.8		91.8	81.1	71.0	800	822	722		930	
63	82.8	73.0		91.4	80.1	69.9	772	799	706		926	
62	82.3	72.2		91.1	79.3	68.8	746	776	688		922	
61	81.8	71.5		90.7	78.4	67.7	720	754	670		917	
60	81.2	70.7		90.2	77.5	66.6	697	732	654	NA	913	
59	80.7	69.9		89.8	76.6	65.5	674	710	634		351	909
58	80.1	69.2		89.3	75.7	64.3	653	690	615		338	904
57	79.6	68.5		88.9	74.8	63.2	633	670	595		325	900
56	79.0	67.7		88.3	73.9	62.0	613	650	577		313	896
55	78.5	66.9		87.9	73.0	60.9	595	630	560		301	891
54	78.0	66.1		87.4	72.0	59.8	577	612	543		292	887
53	77.4	65.4		86.9	71.2	58.6	560	594	525		283	883
52	76.8	64.6		86.4	70.2	57.4	544	576	512		273	879
51	76.3	63.8		85.9	69.4	56.1	528	558	496		264	874
50	75.9	63.1		85.5	68.5	55.0	513	542	481		255	870
49	75.2	62.1		85.0	67.6	53.8	498	526	469		246	865
48	74.7	61.4		84.5	66.7	52.5	484	510	455		238	861
47	74.1	60.8		83.9	65.8	51.4	471	495	443		229	856
46	73.6	60.0		83.5	64.8	50.3	458	480	432		221	851
45	73.1	59.2		83.0	64.0	49.0	446	466	421		215	847
44	72.5	58.5		82.5	63.1	47.8	434	452	409		208	842
43	72.0	57.7		82.0	62.2	46.7	423	438	400		201	837
42	71.5	56.9		81.5	61.3	45.5	412	426	390		194	832
41	70.9	56.2		80.9	60.4	44.3	402	414	381		188	827
40	70.4	55.4		80.4	59.5	43.1	392	402	371		182	822
39	69.9	54.6		79.9	58.6	41.9	382	391	362		177	817
38	69.4	53.8		79.4	57.7	40.8	372	380	353		171	812
37	68.9	53.1		78.8	56.8	39.6	363	370	344		166	807
36	68.4	52.3		78.3	55.9	38.4	354	360	336		161	802
35	67.9	51.5		77.7	55.0	37.2	345	351	327		156	798
34	67.4	50.8		77.2	54.2	36.1	336	342	319		152	793
33	66.8	50.0		76.6	53.3	34.9	327	334	311		149	788
32	66.3	49.2		76.1	52.1	33.7	318	326	301		146	783
31	65.8	48.4		75.6	51.3	32.5	310	318	294		141	778
30	65.3	47.7	NA	75.0	50.4	31.3	302	311	286		138	773
29	64.6	47.0	91.0	74.5	49.5	30.1	294	304	279		135	768
28	64.3	46.1	90.0	73.9	48.6	28.9	286	297	271		131	762
27	63.8	45.2	89.0	73.3	47.7	27.8	279	290	264		128	757
26	63.3	44.6	88.0	72.8	46.8	26.7	272	284	258		125	751
25	62.8	43.8	87.0	72.2	45.9	25.5	266	278	253		123	746
24	62.4	43.1	86.0	71.6	45.0	24.3	260	272	247		119	741
23	62.0	42.1	84.5	71.0	44.0	23.1	254	266	243		117	736
22	61.5	41.6	83.5	70.5	43.2	22.0	248	261	237		115	730
21	61.0	40.9	82.5	69.9	42.3	20.7	243	256	231		112	725
20	60.5	40.1	81.0	69.4	41.5	19.6	238	251	226		110	720

Note
1: A 10 mm steel ball was used for 450 BHN and below. A 10 mm carbide ball was used above 450 BHN.
2: The tensile strength relation to hardness is not exact, even for steel, unless it is determined for a specific material.

Hardness vs Minimum Thickness Chart 55						
Any greater thickness and hardness can be safely tested on indicated scale	Rockwell Superficial Hardness Scales			Rockwell Regular Hardness Scales		
	15N	30N	45N	A	D	C
	15 kgf	30 kgf	45 kgf	60 kgf	100 kgf	150 kgf
Thickness inches (mm)	N Brale Indenter			Brale Indenter		
.006 (0.15)	92	-	-	-	-	-
.008 (0.20)	90	-	-	-	-	-
.010 (0.25)	88	-	-	-	-	-
.012 (0.30)	83	82	77	-	-	-
.014 (0.36)	76	78.5	74	-	-	-
.016 (0.41)	68	74	72	86	-	-
.018 (0.46)	x	66	68	84	-	-
.020 (0.51)	x	57	63	82	77	-
.022 (0.56)	x	47	58	79	75	69
.024 (0.61)	x	x	51	76	72	67
.026 (0.66)	x	x	37	71	68	65
.028 (0.71)	x	x	20	67	63	62
.030 (0.76)	x	x	x	60	58	57
.032 (0.81)	x	x	x	x	51	52
.034 (0.86)	x	x	x	x	43	45
.036 (0.91)	x	x	x	x	x	37
.038 (0.96)	x	x	x	x	x	28
.040 (1.02)	x	x	x	x	x	20
Any greater thickness and hardness can be safely tested on indicated scale	Rockwell Superficial Hardness Scales			Rockwell Regular Hardness Scales		
	15-T	30-T	45-T	F	B	G
	15 kgf	30 kgf	45 kgf	60 kgf	100 kgf	150 kgf
Thickness inches (mm)	1/16-in Ball Indenter			1/16-in Ball Indenter		
.010 (0.25)	91	-	-	-	-	-
.012 (0.30)	86	-	-	-	-	-
.014 (0.36)	81	80	-	-	-	-
.016 (0.41)	75	72	71	-	-	-
.018 (0.46)	68	64	62	-	-	-
.020 (0.51)	x	55	53	-	-	-
.022 (0.56)	x	45	43	-	-	-
.024 (0.61)	x	34	31	98	94	94
.026 (0.66)	x	x	18	91	87	87
.028 (0.71)	x	x	4	85	80	76
.030 (0.76)	x	x	x	77	71	68
.032 (0.81)	x	x	x	69	62	59
.034 (0.86)	x	x	x	x	52	50
.036 (0.91)	x	x	x	x	40	42
.038 (0.96)	x	x	x	x	28	31
.040 (1.02)	x	x	x	x	x	22

X = No minimum hardness. These are approximate numbers only.

Cylindrical Correction Chart 53											
Cylindrical work corrections to be added to observed Rockwell number for scales indicated											
Scales C, D, A											
Brale Diamond Indenter											
Diameter of Specimen - inches (mm)											
Observed Reading	1/8 (3.2)	1/4 (6.4)	3/8 (10)	1/2 (13)	5/8 (16)	3/4 (19)	7/8 (22)	1 (25)	1-1/4 (32)	1-1/2 (38)	
90	NA	0.5	0	0	0	0	0	0	0	0	
85		0.5	0.5	0.5	0.5	0	0	0	0	0	
80		0.5	0.5	0.5	0.5	0.5	0	0	0	0	
75		1.0	0.5	0.5	0.5	0.5	0.5	0	0	0	
70		1.0	1.0	0.5	0.5	0.5	0.5	0.5	0	0	
65		1.5	1.0	1.0	0.5	0.5	0.5	0.5	0	0	
60		1.5	1.0	1.0	0.5	0.5	0.5	0.5	0	0	
55		2.0	1.5	1.0	1.0	0.5	0.5	0.5	0.5	0	
50		2.5	2.0	1.5	1.0	1.0	0.5	0.5	0.5	0.5	
45		3.0	2.0	1.5	1.0	1.0	1.0	0.5	0.5	0.5	
40		3.5	2.5	2.0	1.5	1.0	1.0	1.0	0.5	0.5	
35		4.0	3.0	2.0	1.5	1.5	1.0	1.0	0.5	0.5	
30		5.0	3.5	2.5	2.0	1.5	1.5	1.0	1.0	0.5	
25		5.5	4.0	3.0	2.5	2.0	1.5	1.0	1.0	1.0	
20		6.0	4.5	3.5	2.5	2.0	1.5	1.5	1.0	1.0	
Scales B, F, G											
1/16-in Ball Indenter											
Diameter of Specimen - inches (mm)											
Observed Reading	1/8 (3.2)	1/4 (6.4)	3/8 (10)	1/2 (13)	5/8 (16)	3/4 (19)	7/8 (22)	1 (25)	1-1/4 (32)	1-1/2 (38)	
100	NA	3.5	2.5	1.5	1.5	1.0	1.0	0.5	NA	NA	
90		4.0	3.0	2.0	1.5	1.5	1.5	1.0			
80		5.0	3.5	2.5	2.0	1.5	1.5	1.5			
70		6.0	4.0	3.0	2.5	2.0	2.0	1.5			
60		7.0	5.0	3.5	3.0	2.5	2.0	2.0			
50		8.0	5.5	4.0	3.5	3.0	2.5	2.0			
40		9.0	6.0	4.5	4.0	3.0	2.5	2.5			
30		10.0	6.5	5.0	4.5	3.5	3.0	2.5			
20		11.0	7.5	5.5	4.5	4.0	3.5	3.0			
10		12.0	8.0	6.0	5.0	4.0	3.5	3.0			
0		12.5	8.5	6.5	5.5	4.5	3.5	3.0			
Scales 15-N, 30-N, 45-N											
N Brale Diamond Indenter											
Diameter of Specimen - inches (mm)											
Observed Reading	1/8 (3.2)	1/4 (6.4)	3/8 (10)	1/2 (13)	5/8 (16)	3/4 (19)	7/8 (22)	1 (25)	1-1/4 (32)	1-1/2 (38)	
90	0	0	0	0	0	0	0	0	NA	NA	
85	0.5	0.5	0.5	0.5	0	0	0	0			
80	1.0	0.5	0.5	0.5	0.5	0	0	0			
75	1.5	1.0	0.5	0.5	0.5	0.5	0	0			
70	2.0	1.0	1.0	0.5	0.5	0.5	0.5	0.5			
65	2.5	1.5	1.0	0.5	0.5	0.5	0.5	0.5			
60	3.0	1.5	1.0	1.0	1.0	0.5	0.5	0.5			
55	3.5	2.0	1.5	1.0	1.0	0.5	0.5	0.5			
50	3.5	2.0	1.5	1.0	1.0	1.0	1.0	0.5			
45	4.0	2.0	1.5	1.0	1.0	1.0	1.0	1.0			
40	4.5	2.5	1.5	1.5	1.0	1.0	1.0	1.0			
35	5.0	2.5	2.0	1.5	1.0	1.0	1.0	1.0			
30	5.5	3.0	2.0	1.5	1.5	1.0	1.0	1.0			
25	5.5	3.0	2.0	1.5	1.5	1.5	1.5	1.0			
20	6.0	3.0	2.0	1.5	1.5	1.5	1.5	1.5			
Scales 15-T, 30-T, 45-T											
1/16-in Ball Indenter											
Diameter of Specimen - inches (mm)											
Observed Reading	1/8 (3.2)	1/4 (6.4)	3/8 (10)	1/2 (13)	5/8 (16)	3/4 (19)	7/8 (22)	1 (25)	1-1/4 (32)	1-1/2 (38)	
90	1.5	1.0	1.0	0.5	0.5	0.5	0.5	0.5	NA	NA	
80	3.0	2.0	1.5	1.5	1.0	1.0	1.0	1.0			
70	5.0	3.5	2.5	2.0	1.5	1.0	1.0	1.0			
60	6.5	4.5	3.0	2.5	2.0	1.5	1.5	1.5			
50	8.5	5.5	4.0	3.0	2.5	2.0	2.0	1.5			
40	10.0	6.5	4.5	3.5	3.0	2.5	2.0	2.0			
30	11.5	7.5	5.0	3.5	3.5	2.5	2.0	2.0			
20	13.0	9.0	6.0	4.5	4.5	3.0	2.0	2.0			