

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	WNM	
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	NA	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	92.0	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			
80	3.0	2.0	1.5	1.5	1.0	1.0	1.0	1.0	NA	NA	
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	2.0			
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			