

WILSON[®]

INSTRUMENTS

The standard for hardness testing

CONVERSION CHART

Conversions: All values, except WMM, are consistent with ASTM E 140 (1999) and ASTM A390. Values for WMM are not applicable. WMM or WMM Microhardness values are based on the Rockwell Test by Vincent L. Lupton. Laboratory data are not derived from ASTM.

Cylindrical Corrections: Values are consistent with ASTM E 18 Tables 6, 7, 12 and 14.
Hardness vs. Minimum Thickness: Values are consistent with ASTM E 18 Tables 6, 5, 11 and 12 except for 9 and 10. See Appendix 1 for the Minimum Thickness Values by Vincent L. Lupton.

HARDENED STEEL AND HARD ALLOYS

Rockwell			Superficial			Vickers			Knoop			Brinell			Tensile Strength			Micro			
C	D	G	15-N	30-N	45-N	HK	HB	10 kg	500 gm	3000 gm	1000lbz/sq.in.	1000 gm	1000 gm	1000 gm	1000 gm	1000 gm	1000 gm	1000 gm	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	1780															
78	91.0	84.5	96.0	91.0	86.5	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													
69	86.0	78.0	93.5	85.5	76.5	1004		946													
68	85.5	76.5	93.2	84.4	75.4	940		920													
67	85.0	76.1	92.9	83.6	74.2	900		895													
66	84.5	75.4	92.5	82.8	73.3	865	870	NA													
65	83.9	74.5	92.2	81.9	72.0	832	846	739													
64	83.4	73.8	91.8	81.1	71.4	800	825	722													
63	82.8	73.0	91.4	80.1	69.9	772	799	706													
62	82.3	72.2	91.1	79.3	68.6	746	776	688													
61	81.8	71.5	90.4	78.4	67.7	720	754	670													
60	81.2	70.7	90.2	77.5	66.6	697	732	654													
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	64.4	650	690	615	338	904											
57	79.6	68.5	88.9	74.8	63.2	633	670	599	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	69.6	56.1	528	558	496	264	874											
50	75.9	63.1	85.0	68.5	55.0	513	542	481	255	870											
49	75.2	62.1	84.5	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	84.1	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	62.4	46.7	422	438	394	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	78.9	56.8	39.6	363	370	344	166	807											
36	68.4	52.4	78.4	55.9	38.4	354	360	336	161	802											
35	68.0	51.7	77.9	55.0	37.2	345	350	327	156	798											
34	67.4	50.8	77.4	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	75.0	50.4	31.3	302	311	286	138	773											
29	64.8	47.0	74.5	49.5	30.1	294	304	279	135	768											
28	64.3	46.1	73.9	48.6	28.9	286	297	271	131	763											
27	63.8	45.2	73.3	47.7	27.8	279	290	264	128	757											
26	63.3	44.6	72.8	46.8	26.7	272	284	258	125	751											
25	62.8	43.8	72.2	45.9	25.5	266	278	253	123	746											
24	62.4	43.1	71.6	45.0	24.3	260	272	247	119	741											
23	62.0	42.1	71.0	44.0	23.1	254	266	243	117	736											
22	61.5	41.0	70.5	43.2	22.0	248	261	237	115	730											
21	61.0	40.9	70.0	42.3	20.7	243	256	231	112	725											
20	60.5	40.1	69.4	41.5	19.6	238	251	226	110	720											

NOTE 1: A 10mm steel ball is used for 450 HB and below.

A 10mm carbide ball is used above 450 HB.

NOTE 2: The tensile strength relation to hardness is inexact, 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		
	15-N	30-N	45-N	A	D	C
	15 kgf	30 kgf	45 kgf	60 kgf	100 kgf	150 kgf
Thickness inches (mm)	N Br/le 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	84	-	-
.018 (0.46)	X	66	68	86	-	-
.020 (0.51)	X	57	63	82	77	-
.022 (0.56)	X	47	58	79	75	69
.024 (0.61)	X	37	45	76	72	67
.026 (0.66)	X	31	37	71	68	65
.028 (0.71)	X	27	30	67	63	62
.030 (0.76)	X	X	X	60	58	57
.032 (0.81)	X	X	X	57	51	52
.034 (0.86)	X	X	X	54	43	45
.036 (0.91)	X	X	X	51	40	37
.038 (0.96)	X	X	X	48	38	28
.040 (1.02)	X	X	X	X	X	20
.010 (0.25)	91	-	-	-	-	-
.012 (0.30)	86	-	-	-	-	-
.014 (0.36)	81	80	-	-	-	-
.016 (0.41)						