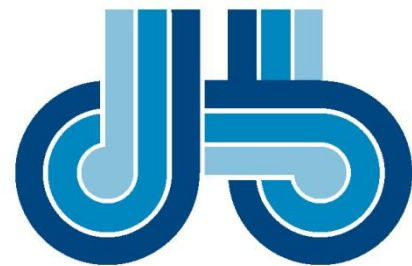


## Approximate Hardness Conversion Numbers for Non-austenitic Steels

C	A	Rockwell Scale			Tensile Strength, Approximate	
		15N	30N	45N	ksi	(MPa)
20	60.5	69.4	41.5	19.6	110	(760)
21	61.0	69.9	42.3	20.7	112	(770)
22	61.5	70.5	43.2	22.0	115	(790)
23	62.0	71.0	44.0	23.1	117	(810)
24	62.4	71.6	45.0	24.3	119	(820)
25	62.8	72.2	45.9	25.5	123	(850)
26	63.3	72.8	46.8	26.7	125	(860)
27	63.8	73.3	47.7	27.8	128	(880)
28	64.3	73.9	48.6	28.9	131	(900)
29	64.6	74.5	49.5	30.1	135	(930)
30	65.3	75.0	50.4	31.3	138	(950)
31	65.8	75.6	51.3	32.5	141	(970)
32	66.3	76.1	52.1	33.7	146	(1010)
33	66.8	76.6	53.3	34.9	149	(1030)
34	67.4	77.2	54.2	36.1	152	(1050)
35	67.9	77.7	55.0	37.2	156	(1080)
36	68.4	78.3	55.9	38.4	161	(1110)
37	68.9	78.8	56.8	39.6	166	(1140)
38	69.4	79.4	57.7	40.8	171	(1180)
39	69.9	79.9	58.6	41.9	177	(1220)
40	70.4	80.4	59.5	43.1	182	(1250)
41	70.9	80.9	60.4	44.3	188	(1300)
42	71.5	81.5	61.3	45.5	194	(1340)
43	72.0	82.0	62.2	46.7	201	(1390)
44	72.5	82.5	63.1	47.8	208	(1430)
45	73.1	83.0	64.0	49.0	215	(1480)
46	73.6	83.5	64.8	50.3	221	(1520)
47	74.1	83.9	65.8	51.4	229	(1580)
48	74.7	84.5	66.7	52.5	238	(1640)
49	75.2	85.0	67.6	53.8	246	(1700)
50	75.9	85.5	68.5	55.0	255	(1760)
51	76.3	85.9	69.4	56.1	264	(1820)
52	76.8	86.4	70.2	57.4	273	(1880)
53	77.4	86.9	71.2	58.6	283	(1950)
54	78.0	87.4	72.0	59.8	292	(2010)
55	78.5	87.9	73.0	60.9	301	(2070)
56	79.0	88.3	73.9	62.0	313	(2160)
57	79.6	88.9	74.8	63.2	325	(2240)
58	80.1	89.3	75.7	64.3	338	(2330)
59	80.7	89.8	76.6	65.5	351	(2420)
68	85.6	93.2	84.4	75.4	...	...
60	81.2	90.2	77.5	66.6	...	...
61	81.8	90.7	78.4	67.7	...	...
62	82.3	91.1	79.3	68.8	...	...
63	82.8	91.4	80.1	69.9	...	...
64	83.4	91.8	81.1	71.0	...	...
65	83.9	92.2	81.9	72.0	...	...
66	84.5	92.5	82.8	73.3	...	...
67	85.0	92.9	83.6	74.2	...	...

C-Scale, 150-kgf Load, Diamond Penetrator  
 A-Scale, 60-kgf Load, Diamond Penetrator  
 15N-Scale, 15-kgf Load, Diamond Penetrator  
 30N-Scale 30-kgf Load, Diamond Penetrator  
 45N-Scale, 45-kgf Load, Diamond Penetrator

*This table gives the approximate interrelationships of hardness values and approximate tensile strength of steels. It is possible that steels of various compositions and processing histories will deviate in hardness-tensile strength relationship from the data presented in this table. The data in this table should not be used for austenitic stainless steels, but have been shown to be applicable for ferritic and martensitic stainless steels. The data in this table should not be used to establish a relationship between hardness values and tensile strength of hard drawn wire. Where more precise conversions are required, they should be developed specially for each steel composition, heat treatment, and part. Caution should be exercised if conversions from this table are used for the acceptance or rejection of product. The approximate interrelationships may affect acceptance or rejection.*



**HARRIS STEEL**

## Approximate Hardness Conversion Numbers for Non-austenitic Steels

B	A	Rockwell Scale				Tensile Strength, ksi (MPa) Approximate
		F	15T	30T	45T	
30	26.6	74.0	70.4	36.3	2.6	...
31	27.0	74.6	70.7	37.0	3.6	...
32	27.4	75.2	71.0	37.6	4.6	...
33	27.8	75.7	71.4	38.3	5.6	...
34	28.2	76.3	71.7	39.0	6.6	...
35	28.7	76.9	72.0	39.6	7.6	...
36	29.1	77.4	72.3	40.3	8.6	...
37	29.5	78.0	72.7	41.0	9.6	...
38	29.9	78.6	73.0	41.6	10.6	...
39	30.3	79.1	73.3	42.3	11.6	...
40	30.7	79.7	73.6	43.0	12.6	...
41	31.2	80.3	74.0	43.7	13.6	...
42	31.6	80.8	74.3	44.3	14.7	...
43	32.0	81.4	74.6	45.0	15.7	...
44	32.4	82.0	74.9	45.7	16.7	...
45	32.9	82.6	75.3	46.3	17.7	...
46	33.3	83.1	75.6	47.0	18.7	...
47	33.7	83.7	75.9	47.7	19.7	...
48	34.1	84.3	76.2	48.3	20.7	...
49	34.6	84.8	76.6	49.0	21.7	...
50	35.0	85.4	76.9	49.7	22.7	...
51	35.5	86.0	77.2	50.3	23.7	...
52	35.9	86.5	77.5	51.0	24.7	...
53	36.3	87.1	77.9	51.7	25.7	...
54	36.8	87.7	78.2	52.4	26.7	...
55	37.2	88.2	78.5	53.0	27.7	...
56	37.7	88.8	78.8	53.7	28.7	...
57	38.1	89.4	79.2	54.4	29.7	...
58	38.6	90.0	79.5	55.0	30.7	...
59	39.0	90.5	79.8	55.7	31.7	...
60	39.5	91.1	80.1	56.4	32.7	...
61	40.0	91.7	80.5	57.0	33.7	...
62	40.4	92.2	80.8	57.7	34.7	..
63	40.9	92.8	81.1	58.4	35.7	..
64	41.4	93.4	81.4	59.0	36.7	..
65	41.8	93.9	81.8	59.7	37.7	56
(385)						
66	42.3	94.5	82.1	60.4	38.7	57
(395)						
67	42.8	95.1	82.4	61.0	39.8	58
(400)						
68	43.3	95.6	82.7	61.7	40.8	59
(405)						
69	43.8	96.2	83.0	62.4	41.8	60
(415)						
70	44.3	96.8	83.4	63.1	42.8	61
(420)						
71	44.8	97.4	83.7	63.7	43.8	62 (425)
72	45.3	98.0	84.0	64.4	44.8	63 (435)
73	45.8	98.5	84.3	65.1	45.8	64 (440)
74	46.3	99.1	84.7	65.7	46.8	65 (450)
75	46.8	99.6	85.0	66.4	47.8	66 (455)
76	47.3	...	85.3	67.1	48.8	67 (460)

B-Scale, 100-kgf Load 1/16-in. Ball  
 A-Scale, 60-kgf Load, Diamond Penetrator  
 F-Scale, 60-kgf Load, 1/16-in. Ball  
 15T-Scale, 15-kgf Load, 1/16-in. Ball  
 30T-Scale, 30-kgf Load, 1/16-in. Ball  
 45T Scale, 45-kgf Load, 1/16-in. Ball

*This table gives the approximate interrelationships of hardness values and approximate tensile strength of steels. It is possible that steels of various compositions and processing histories will deviate in hardness-tensile strength relationship from the data presented in this table. The data in this table should not be used for austenitic stainless steels, but have been shown to be applicable for ferritic and martensitic stainless steels. The data in this table should not be used to establish a relationship between hardness values and tensile strength of hard drawn wire. Where more precise conversions are required, they should be developed specially for each steel composition, heat treatment, and part. Caution should be exercised if conversions from this*



77	47.9	...	85.6	67.7	49.8	68 (470)
78	48.4	...	86.0	68.4	50.8	69 (475)
79	48.9	...	86.3	69.1	51.8	70 (485)
80	49.5	...	86.6	69.7	52.8	72 (495)
81	50.0	...	86.9	70.4	53.8	73 (505)
82	50.6	...	87.3	71.1	54.8	77 (530)
83	51.1	...	87.6	71.8	55.8	80 (550)
84	51.7	...	87.9	72.4	56.8	81 (560)
85	52.3	...	88.2	73.1	57.8	82 (565)
86	52.8	...	88.6	73.8	58.8	83 (570)
87	53.4	...	88.9	74.4	59.8	84 (580)
88	54.0	...	89.2	75.1	60.8	86 (590)
89	54.6	...	89.5	75.8	61.8	88 (605)
90	55.2	...	89.9	76.4	62.8	89 (615)
91	55.8	...	90.2	77.1	63.8	90 (620)
92	56.4	...	90.5	77.8	64.8	92 (635)
93	57.0	...	90.8	78.4	65.9	94 (650)
94	57.6	...	91.2	79.1	66.9	98 (675)
95	58.3	...	91.5	79.8	67.9	100 (690)
96	58.9	...	91.8	80.4	68.9	102 (705)
97	59.5	...	92.1	81.1	69.9	104 (715)
98	60.2	...	92.5	81.8	70.9	109 (750)
99	60.9	...	92.8	82.5	71.9	114 (785)
100	61.5	...	93.1	83.1	72.9	116 (800)

