

MARK V LABORATORY

18 KRIPES RD EAST GRANBY, CT 06026
www.markvlab.com 800-243-9776
markvmet@markvlab.com

ROCKWELL • BRINELL • PORTABLE • DUCTILITY • MICRO

ROCKWELL SCALES							KNOOP 500 gm ± OVER	VICKERS 10 KG	BRINELL 3000 KG		TENSILE STRENGTH KPSI
C 150 KG DIAMOND	D 100 KG DIAMOND	A 60 KG DIAMOND	45N 45 KG DIAMOND	30N 30 KG DIAMOND	15N 15 KG DIAMOND	G 150 KG 1/16" BALL			HK	HV	
68	77.0	85.5	75.5	84.5	93.0	-	920	940	-	-	-
67	76.0	85.0	74.0	83.5	-	-	895	900	-	-	-
66	75.5	84.5	73.5	83.0	92.5	-	870	865	-	-	-
65	74.5	84.0	72.0	82.0	92.0	-	846	832	-	-	-
64	74.0	83.5	71.0	81.0	-	-	822	800	-	-	-
63	73.0	83.0	70.0	80.0	91.5	-	799	772	-	-	-
62	72.0	82.5	69.0	79.5	91.0	-	776	746	-	-	-
61	71.5	82.0	67.5	78.5	90.5	-	754	720	-	-	-
60	70.5	81.0	66.5	77.5	90.0	-	732	697	-	-	-
59	70.0	80.5	65.5	76.5	-	-	710	674	-	-	351
58	69.0	80.0	64.5	75.5	89.5	-	690	653	2.47	615	338
57	68.5	79.5	63.0	75.0	89.0	-	670	633	2.51	595	325
56	67.5	79.0	62.0	74.0	88.5	-	650	613	2.55	577	313
55	67.0	78.5	61.0	73.0	88.0	-	630	595	2.59	560	301
54	66.0	78.0	60.0	72.0	87.5	-	612	577	2.63	543	292
53	65.5	77.5	58.5	71.0	87.0	-	594	560	2.67	525	283
52	64.5	77.0	57.5	70.0	86.5	-	576	544	2.70	512	273
51	64.0	76.5	56.0	69.5	86.0	-	558	528	2.75	496	264
50	63.0	76.0	55.0	68.5	85.5	-	542	513	2.79	481	255
49	62.0	75.0	54.0	67.5	85.0	-	526	498	2.83	469	246
48	61.5	74.5	52.5	66.5	84.5	-	510	484	2.87	455	238
47	61.0	74.0	51.5	66.0	84.0	-	495	471	2.91	443	229
46	60.0	73.5	50.5	65.0	83.5	-	480	458	2.94	432	221
45	59.0	73.0	49.0	64.0	83.0	-	466	446	2.98	421	215
44	58.5	72.5	48.0	63.0	82.5	-	452	434	3.02	409	208
43	57.5	72.0	46.5	62.0	82.0	-	438	423	3.05	400	201
42	57.0	71.5	45.5	61.5	81.5	-	426	412	3.09	390	194
41	56.0	71.0	44.5	60.5	81.0	-	414	402	3.13	381	188
40	55.5	70.0	43.0	59.5	80.5	-	402	392	3.17	371	182
39	54.5	70.0	42.0	58.5	80.0	-	391	382	3.21	362	177
38	54.0	69.5	41.0	57.5	79.5	-	380	372	3.24	353	171
37	53.0	69.0	39.5	57.0	79.0	-	370	363	3.28	344	166
36	52.5	68.5	38.5	56.0	78.5	-	360	354	3.32	336	161
35	51.5	68.0	37.0	55.0	77.5	-	351	345	3.36	327	156
34	51.0	67.5	36.0	54.0	77.0	-	342	336	3.41	319	152
33	50.0	67.0	35.0	53.5	76.5	-	334	327	3.45	311	149
32	49.0	66.5	33.5	52.0	76.0	-	326	318	3.50	301	146
31	48.5	66.0	32.5	51.5	75.5	-	318	310	3.54	294	141
30	47.5	65.5	31.5	50.5	75.0	92.0	311	302	3.59	286	138
29	47.0	65.0	30.0	49.5	74.5	91.0	304	294	3.64	279	135
28	46.0	64.5	29.0	48.5	74.0	90.0	297	286	3.69	271	131
27	45.0	64.0	28.0	47.5	73.5	89.0	290	279	3.73	264	128
26	44.5	63.6	26.5	47.0	73.0	88.0	284	272	3.77	258	125
25	44.0	63.0	25.5	46.0	72.0	87.0	278	266	3.81	253	123
24	43.0	62.5	24.5	45.0	71.5	86.0	272	260	3.86	247	119
23	42.0	62.0	23.0	44.0	71.0	84.5	266	254	3.89	243	117
22	41.5	61.5	22.0	43.0	70.5	83.5	261	248	3.93	237	115
21	41.0	61.0	20.5	42.5	70.0	82.5	256	243	3.98	231	112
20	40.0	60.5	19.5	41.5	69.5	81.0	251	238	4.02	226	110

- Conversion values are only approximate and may be inaccurate for specific applications. Conversion data from ASTM Standard E140 and A370 courtesy of ASTM. Rockwell numbers have been rounded to nearest 0.5 hardness numbers. Conversion values are based on tests on non-austenitic steels. ASTM E140 should be consulted for hardness conversion data for a number of other metals.
- Conversion of hardness values should be used only when it is impossible to test the material on the hardness scale specified. All hardness values should be considered approximate and Rockwell hardness numbers should be rounded to the nearest whole number.
- The hardness-tensile strength relationship is approximate and applies only for steel. The tensile strength information should not be used for austenitic stainless steels but has been shown to be applicable for ferritic and martensitic stainless steels.
- Brinell hardness values above 450HB are based on the use of a tungsten carbide ball.

ROCKWELL SCALES								KNOOP 500 gm ± OVER	3000 KG		TENSILE STRENGTH KPSI			
B 100 KG 1/16" BALL	F 60 KG 1/16" BALL	G 150 KG 1/16" BALL	45T 45 KG 1/16" BALL	30T 30 KG 1/16" BALL	15T 15 KG 1/16" BALL	E 100 KG 1/1" BALL	K 150 KG 1/1" BALL		A 60 KG DIAMOND	HK		DIA. (mm)	HB	
100	-	82.5	73.0	83.0	93.0	-	-	61.5	251	3.91	240	-	116	
99	-	81.0	72.0	82.5	-	-	-	61.0	246	3.96	234	-	114	
98	-	79.0	71.0	82.0	92.5	-	-	60.0	241	4.01	228	-	109	
97	-	77.5	70.0	81.0	92.0	-	-	59.5	236	4.06	222	-	104	
96	-	76.0	69.0	80.5	-	-	-	59.0	231	4.11	216	-	102	
95	-	74.0	68.0	80.0	91.5	-	-	58.5	226	4.17	210	-	100	
94	-	72.5	67.0	79.0	-	-	-	57.5	221	4.21	205	-	98	
93	-	71.0	66.0	78.5	91.0	-	-	57.0	216	4.26	200	166	94	
92	-	69.0	65.0	78.0	90.5	-	-	56.5	211	4.32	195	162	92	
91	-	67.5	64.0	77.0	-	-	-	56.0	206	4.37	190	159	90	
90	-	66.0	63.0	76.5	90.0	-	-	98.5	55.0	201	4.43	185	156	89
89	-	64.0	62.0	76.0	89.5	-	-	98.0	54.5	196	4.48	180	154	88
88	-	62.5	61.0	75.0	-	-	-	97.0	54.0	192	4.53	176	150	86
87	-	61.0	60.0	74.5	89.0	-	-	96.5	53.5	188	4.58	172	147	84
86	-	59.0	59.0	74.0	88.5	-	-	96.5	53.0	184	4.62	169	146	83
85	-	57.5	58.0	73.0	-	-	-	94.5	52.5	180	4.67	165	142	82
84	-	56.0	57.0	72.5	88.0	-	-	94.0	51.5	176	4.71	162	141	81
83	-	54.0	56.0	72.0	87.5	-	-	93.0	51.0	173	4.75	159	138	80
82	-	52.5	55.0	71.0	-	-	-	92.0	50.5	170	4.80	156	136	77
81	-	51.0	54.0	70.5	87.0	-	-	91.0	50.0	167	4.84	153	134	73
80	-	49.0	53.0	69.5	86.5	-	-	90.5	49.5	164	4.88	150	131	72
79	-	47.5	52.0	69.0	-	-	-	89.5	49.0	161	4.93	147	129	70
78	-	46.0	51.0	68.5	86.0	-	-	88.5	48.5	158	4.98	144	128	69
77	-	44.0	50.0	67.5	85.5	-	-	88.0	48.0	155	5.02	141	124	68
76	-	42.5	49.0	67.0	-	-	-	87.0	47.5	152	5.06	139	122	67
75	99.5	41.0	48.0	66.5	85.0	-	-	86.0	47.0	150	5.10	137	121	66
74	99.0	39.0	47.0	65.5	84.5	-	-	85.0	46.5	147	5.13	135	119	65
73	98.5	37.5	46.0	65.0	-	-	-	84.5	46.0	145	5.18	132	116	64
72	98.0	36.0	45.0	64.5	84.0	-	-	83.5	45.5	143	5.22	130	114	63
71	97.5	34.5	44.0	63.5	-	-	-	100	82.5	45.0	5.27	127	113	62
70	97.0	32.5	43.0	63.0	83.5	99.5	81.5	44.5	139	5.32	125	112	61	
69	96.0	31.0	42.0	62.5	83.0	99.0	81.0	44.0	137	5.36	123	110	60	
68	95.5	29.5	41.0	61.5	-	98.0	80.0	43.5	135	5.40	121	108	59	
67	95.0	28.0	40.0	61.0	82.5	97.5	79.0	43.0	133	5.44	119	106	58	
66	94.5	26.5	38.5	60.5	82.0	97.0	78.0	42.5	131	5.48	117	105	57	
65	94.0	25.0	37.5	59.5	-	96.0	77.5	42.0	129	5.51	116	103	56	
64	93.5	23.5	36.5	59.0	81.5	95.5	76.5	41.5	127	5.54	114	101	-	
63	93.0	22.0	35.5	58.5	81.0	95.0	75.5	41.0	125	5.58	112	99	-	
62	92.0	20.5	34.5	57.5	-	94.5	74.5	40.5	124	5.63	110	97	-	
61	91.5	19.0	33.5	57.0	80.5	93.5	74.0	40.0	122	5.68	108	95	-	
60	91.0	17.5	32.5	56.5	80.0	93.0	73.0	39.5	120	5.70	107	94	-	
59	90.5	16.0	31.5	55.5	-	92.5	72.0	39.0	118	5.73	106	93	-	
58	90.0	14.5	30.5	55.0	79.5	92.0	71.0	38.5	117	5.77	104	92	-	
57	89.5	13.0	29.5	54.5	-	91.0	70.5	38.0	115	5.81	103	90	-	
56	89.0	11.5	28.5	53.5	79.0	90.5	69.5	37.5	114	5.85	101	88	-	
55	88.0	10.0	27.5	53.0	78.5	90.0	68.5	-	112	5.87	100	87	-	
54	87.5	8.5	26.5	52.5	-	89.5	68.0	37.0	111	-	-	86	-	
53	87.0	7.0	25.5	51.5	78.0	89.0	67.0	36.5	110	-	-	85	-	
52	86.5	5.5	24.5	51.0	77.5	88.0	66.0	36.0	109	-	-	84	-	
51	86.0	4.0	23.5	50.5	-	87.5	65.0	35.5	108	-	-	83	-	
50	85.5	2.5	22.5	49.5	77.0	87.0	64.5	35.0	107	-	-	82	-	
49	85.0	-	21.5	49.0	76.5	86.5	63.5	34.5	106	-	-	81	-	
48	84.5	-	20.5	48.5	-	85.5	62.5	34.0	105	-	-	80	-	
47	83.5	-	19.5	47.5	76.0	85.0	61.5	33.5	104	-	-			