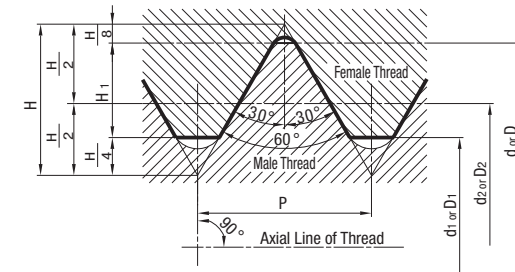


Approximate Conversion of Rockwell C Hardness Values for Steel<sup>(1)</sup>

(HRC) Rockwell C-Scale Hardness	(HV) Vickers Hardness	Brinell Hardness (HB) 10mm Ball, Load 3000kgf			Rockwell Hardness <sup>(3)</sup>			Rockwell Superficial Hardness Diamond Cone Indenter			(Hs) Shore Hardness	Tensile Strength (Approximated Value) Mpa (kgf/mm <sup>2</sup> ) (2)	Rockwell C-Scale Hardness (3)
		Standard Sphere	Tungsten Carbide Sphere	(HRA) A Scale, Load 60kgf, Diamond Cone Indenter	(HRB) B Scale, Load 100kgf, Diameter 1.6mm (1/16in) Sphere	(HRD) D Scale, Load 100kgf, Diamond Cone Indenter	15-N Scale Load 15kgf	30-N Scale Load 30kgf	45-N Scale Load 45kgf				
68	940	—	—	85.6	—	76.9	93.2	84.4	75.4	97	—	68	
67	900	—	—	85.0	—	76.1	92.9	83.6	74.2	95	—	67	
66	865	—	—	84.5	—	75.4	92.5	82.8	73.3	92	—	66	
65	832	—	(739)	83.9	—	74.5	92.2	81.9	72.0	91	—	65	
64	800	—	(722)	83.4	—	73.8	91.8	81.1	71.0	88	—	64	
63	772	—	(705)	82.8	—	73.0	91.4	80.1	69.9	87	—	63	
62	746	—	(688)	82.3	—	72.2	91.1	79.3	68.8	85	—	62	
61	720	—	(670)	81.8	—	71.5	90.7	78.4	67.7	83	—	61	
60	697	—	(654)	81.2	—	70.7	90.2	77.5	66.6	81	—	60	
59	674	—	(634)	80.7	—	69.9	89.8	76.6	65.5	80	—	59	
58	653	—	615	80.1	—	69.2	89.3	75.7	64.3	78	—	58	
57	633	—	595	79.6	—	68.5	88.9	74.8	63.2	76	—	57	
56	613	—	577	79.0	—	67.7	88.3	73.9	62.0	75	—	56	
55	595	—	560	78.5	—	66.9	87.9	73.0	60.9	74	2075(212)	55	
54	577	—	543	78.0	—	66.1	87.4	72.0	59.8	72	2015(205)	54	
53	560	—	525	77.4	—	65.4	86.9	71.2	58.5	71	1950(199)	53	
52	544	(500)	512	76.8	—	64.6	86.4	70.2	57.4	69	1880(192)	52	
51	528	(487)	496	76.3	—	63.8	85.9	69.4	56.1	68	1820(186)	51	
50	513	(475)	481	75.9	—	63.1	85.5	68.5	55.0	67	1760(179)	50	
49	498	(464)	469	75.2	—	62.1	85.0	67.6	53.8	66	1695(173)	49	
48	484	451	455	74.7	—	61.4	84.5	66.7	52.5	64	1635(167)	48	
47	471	442	443	74.1	—	60.8	83.9	65.8	51.4	63	1580(161)	47	
46	458	432	432	73.6	—	60.0	83.5	64.8	50.3	62	1530(156)	46	
45	446	421	421	73.1	—	59.2	83.0	64.0	49.0	60	1480(151)	45	
44	434	409	409	72.5	—	58.5	82.5	63.1	47.8	58	1435(146)	44	
43	423	400	400	72.0	—	57.7	82.0	62.2	46.7	57	1385(141)	43	
42	412	390	390	71.5	—	56.9	81.5	61.3	45.5	56	1340(136)	42	
41	402	381	381	70.9	—	56.2	80.9	60.4	44.3	55	1295(132)	41	
40	392	371	371	70.4	—	55.4	80.4	59.5	43.1	54	1250(127)	40	
39	382	362	362	69.9	—	54.6	79.9	58.6	41.9	52	1215(124)	39	
38	372	353	353	69.4	—	53.8	79.4	57.7	40.8	51	1180(120)	38	
37	363	344	344	68.9	—	53.1	78.8	56.8	39.6	50	1160(118)	37	
36	354	336	336	68.4	(109.0)	52.3	78.3	55.9	38.4	49	1115(114)	36	
35	345	327	327	67.9	(108.5)	51.5	77.7	55.0	37.2	48	1080(110)	35	
34	336	319	319	67.4	(108.0)	50.8	77.2	54.2	36.1	47	1055(108)	34	
33	327	311	311	66.8	(107.5)	50.0	76.6	53.3	34.9	46	1025(105)	33	
32	318	301	301	66.3	(107.0)	49.2	76.1	52.1	33.7	44	1000(102)	32	
31	310	294	294	65.8	(106.0)	48.4	75.6	51.3	32.7	43	980(100)	31	
30	302	286	286	65.3	(105.5)	47.7	75.0	50.4	31.3	42	950 (97)	30	
29	294	279	279	64.7	(104.5)	47.0	74.5	49.5	30.1	41	930 (95)	29	
28	286	271	271	64.3	(104.0)	46.1	73.9	48.6	28.9	41	910 (93)	28	
27	279	264	264	63.8	(103.0)	45.2	73.3	47.7	27.8	40	880 (90)	27	
26	272	258	258	63.3	(102.5)	44.6	72.8	46.8	26.7	38	860 (88)	26	
25	266	253	253	62.8	(101.5)	43.8	72.2	45.9	25.5	38	840 (86)	25	
24	260	247	247	62.4	(101.0)	43.1	71.6	45.0	24.3	37	825 (84)	24	
23	254	243	243	62.0	100.0	42.1	71.0	44.0	23.1	36	805 (82)	23	
22	248	237	237	61.5	99.0	41.6	70.5	43.2	22.0	35	785 (80)	22	
21	243	231	231	61.0	98.5	40.9	69.9	42.3	20.7	35	770 (79)	21	
20	238	226	226	60.5	97.8	40.1	69.4	41.5	19.6	34	760 (77)	20	
(18)	230	219	219	—	96.7	—	—	—	—	33	730 (75)	(18)	
(16)	222	212	212	—	95.5	—	—	—	—	32	705 (72)	(16)	
(14)	213	203	203	—	93.9	—	—	—	—	31	675 (69)	(14)	
(12)	204	194	194	—	92.3	—	—	—	—	29	650 (66)	(12)	
(10)	196	187	187	—	90.7	—	—	—	—	28	620 (63)	(10)	
(8)	188	179	179	—	89.5	—	—	—	—	27	600 (61)	(8)	
(6)	180	171	171	—	87.1	—	—	—	—	26	580 (59)	(6)	
(4)	173	165	165	—	85.5	—	—	—	—	25	550 (56)	(4)	
(2)	166	158	158	—	83.5	—	—	—	—	24	530 (54)	(2)	
(0)	160	152	152	—	81.7	—	—	—	—	24	515 (53)	(0)	

Note <sup>(1)</sup> Blue figures: Based on ASTM E 140, Table 1 (Jointly coordinated by SAE, ASM and ASTM.)  
<sup>(2)</sup> The units and figures shown in brackets are the results of conversion from psi figures by reference to JIS Z 8413 and Z 8438 conversion tables. Moreover, 1MPa=1N/mm<sup>2</sup>  
<sup>(3)</sup> The figures in brackets are in ranges not frequently used. They are given as referential data.



$$H = 0.866025P \quad D = d$$

$$H_1 = 0.541266P \quad D_2 = d_2$$

$$D_1 = d_1$$

$$d_2 = d - 0.649519P$$

$$d_1 = d - 1.082532P$$

Unit:mm

Nominal of Thread(1)†			Pitch P	Height of Engagement H <sub>1</sub>	Female Thread		
Column 1	Column 2	Column 3			Minor Dia. D	Effective Dia. D <sub>2</sub>	Inner Dia. D <sub>1</sub>
			Male Thread				
			Outer Dia. d	Effective Dia. d <sub>2</sub>	Inner Dia. d <sub>1</sub>		
M 1			0.25	0.135	1.000	0.838	0.729
M 1.2	M 1.1		0.25	0.135	1.100	0.938	0.829
			0.25	0.135	1.200	1.038	0.929
M 1.6	M 1.4		0.3	0.162	1.400	1.205	1.075
			0.35	0.189	1.600	1.373	1.221
M 2	M 1.8		0.35	0.189	1.800	1.573	1.421
			0.4	0.217	2.000	1.740	1.567
M 2.5	M 2.2		0.45	0.244	2.200	1.908	1.713
			0.45	0.244	2.500	2.208	2.013
M 3			0.5	0.271	3.000	2.675	2.459
M 4	M 3.5		0.6	0.325	3.500	3.110	2.850
			0.7	0.379	4.000	3.545	3.242
M 5	M 4.5		0.75	0.406	4.500	4.013	3.688
M 6			0.8	0.433	5.000	4.480	4.134
			1	0.541	6.000	5.350	4.917
M 8	M 7		1	0.541	7.000	6.350	5.917
			1.25	0.677	8.000	7.188	6.647
M 10	M 9		1.25	0.677	9.000	8.188	7.647
			1.5	0.812	10.000	9.026	8.376
M 12	M 11		1.5	0.812	11.000	10.026	9.376
			1.75	0.947	12.000	10.863	10.106
M 16	M 14		2	1.083	14.000	12.701	11.835
			2	1.083	16.000	14.701	13.835
M 20	M 18		2.5	1.353	18.000	16.376	15.294
			2.5	1.353	20.000	18.376	17.294
M 24	M 22		2.5	1.353	22.000	20.376	19.294
			3	1.624	24.000	22.051	20.752
M 30	M 27		3	1.624	27.000	25.051	23.752
			3.5	1.894	30.000	27.727	26.211
M 36	M 33		3.5	1.894	33.000	30.727	29.211
			4	2.165	36.000	33.402	31.670
M 42	M 39		4	2.165	39.000	36.402	34.670
			4.5	2.436	42.000	39.077	37.129
M 48	M 45		4.5	2.436	45.000	42.077	40.129
			5	2.706	48.000	44.752	42.587
M 56	M 52		5	2.706	52.000	48.752	46.587
			5.5	2.977	56.000	52.428	50.046
M 64	M 60		5.5	2.977	60.000	56.428	54.046
			6	3.248	64.000	60.103	57.505
	M 68		6	3.248	68.000	64.103	61.505

†Priority should be given to Column 1. If required, select items in Column 2 and 3, in that order.