

## MATERIAL HARDNESS REQUIREMENTS CHART

Sl. No.	Material Grades	Hardness Requirements		Latest Edition of Standard Reference
		Rockwell Hardness Machine	Brinell Hardness Machine	
01	SS 316	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
02	SS 316L	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
03	SS 316 Ti	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
04	SS 317	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
05	SS 304	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
06	SS 304L	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
07	SS 304H	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
08	SS 321	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
09	SS 321H	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
10	SS 347	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
11	SS 347H	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
12	SS 309	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
13	SS 310	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
14	SS 410	86 HRBW Max	170 HBW Max	ASTM A240/ A240M
15	SS 904L	89 HRBW Max	180 HBW Max	ASTM A182/ A182M
16	SMO 254	89 HRBW Max	180 HBW Max	ASTM A182/ A182M
17	Duplex S31803	99 HRBW Max	230 HBW Max	ASTM A182/ A182M
18	Duplex S32205	99 HRBW Max	230 HBW Max	ASTM A182/ A182M
19	Duplex S32750	102 HRBW Max	250 HBW Max	ASTM A182/ A182M
20	Super Duplex S32760	105 HRBW Max	270 HBW Max	ASTM A182/ A182M
21	Alloy 20	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
22	MONEL 400	72 HRBW Max	130 HBW Max	ASTM B564
23	INCONEL Alloy 600	83 HRBW Max	160 HBW Max	ASTM B564
24	INCOLOY 800	94 HRBW Max	200 HBW Max	ASTM B564
25	INCOLOY 800H	94 HRBW Max	200 HBW Max	ASTM B564
26	INCOLOY 800HT	94 HRBW Max	200 HBW Max	ASTM B564
27	INCOLOY 8028	94 HRBW Max	200 HBW Max	ASTM B668
28	INCONEL Alloy 625	94 HRBW Max	200 HBW Max	ASTM B564
29	HASTELLOY C-276	99 HRBW Max	230 HBW Max	ASTM B564
30	INCOLOY 825	83 HRBW Max	160 HBW Max	ASTM B564
31	INCONEL Alloy 718	36 HRC Min	331 HBW Min	ASTM B637
32	INCONEL Alloy 718 (Ring gasket)	99 HRBW Max	230 HBW Max	Manufacturer's Specification
33	Titanium Grade 2	83 HRBW Max	160 HBW Max	ASTM B381
34	17.4 PH (H1150D)	32 HRC Max	317 HBW Max	ASTM A564/ A564M
35	17.4 PH (H1150M)	106 HRBW Max	300 HBW Max	ASTM A564/ A564M

## MATERIAL HARDNESS REQUIREMENTS CHART

Sl. No.	Material Grades	Hardness Requirements		Latest Edition of Standard Reference
		Rockwell Hardness Machine	Brinell Hardness Machine	
36	Soft Iron	56 HRBW Max	90 HBW Max	ASTM A29/ A29M
37	Low Carbon Steel (LCS)	68 HRBW Max	120 HBW Max	ASTM A29/ A29M
38	F5	72 HRBW Max	130 HBW Max	ASTM A182/ A182M
39	F5 (Seat Ring)	(78 - 97) HRBW Max	(143 - 217) HBW Max	Customer's specification
40	F9	86 HRBW Max	170 HBW Max	ASTM A182/ A182M
41	F9 (Seat Ring)	(89 - 97) HRBW	(179 - 217) HBW	Customer's specification
42	F11	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
43	F11 Cl.2 (Seat Ring)	(78 - 95) HRBW	(143 - 207) HBW	Customer's specification
44	F12	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
45	F22	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
46	F22 Cl.3 (Seat Ring)	(82 - 95) HRBW	(156 - 207) HBW	Customer's specification
47	AISI 4140	92 HRBW Max	197 HBW Max	ASTM A29/ A29M
48	ASTM A105 (Seat Ring)	90 HRBW Max	187 HBW Max	ASTM A105 / A105M
49	ASTM A350 LF2 Grade Class 1 (Seat Ring)	93 HRBW Max	197 HBW Max	ASTM A350/ A350M
50	F91	100 HRBW Max	240 HBW Max	ASTM A182/ A182M
51	F91 (Seat Ring)	(91 - 100) HRBW	(190 - 248) HBW	Customer's specification
52	SS 317	83 HRBW Max	160 HBW Max	ASTM A182/ A182M
53	F6a Cl.2 (Seat Ring)	(94 - 99) HRBW	(200 - 229) HBW	Manufacturer's specification
54	Alloy 625 PLUS	(32 - 43) HRC	(317 - 405) HBW	Manufacturer's specification
55	Alloy 925	(26 - 38) HRC	(275 - 364) HBW	Manufacturer's specification
56	F6NM	23 HRC Max	(197 - 255) HBW	Manufacturer's specification
57	Alloy 945X	(34 - 42) HRC	(332 - 399) HBW	Manufacturer's specification

**Note:** Above Material can be supplied with low hardness than the standard hardness with special Heat Treatment as per Customer Requirements