




















































Material	Condition	Hardness		COLOR RING		
		HRC	Brinell	Recommended	Alternate(s)	
 <p>Unalloyed Carbon Steels</p>	1005, 1006, 1008, 1009, 1010, 1011, 1012, 1013, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1025, 1026, 1029	Normalized, Hot rolled, Annealed, Cold drawn	-	≤ 180		
		Hot rolled, Normalized, Annealed, Cold drawn	≤ 20	≤ 230		
		Annealed, Cold drawn	≤ 30	≤ 280		
	1030, 1033, 1035, 1037, 1038, 1039, 1040, 1042, 1043, 1044, 1045, 1046, 1049, 1050, 1053, 1055, 1059	Hot rolled, Normalized, Annealed, Cold Drawn	-	≤ 180		
			≤ 20	≤ 230		
		Annealed, Cold drawn, Quenched and Tempered	≤ 30	≤ 280		
		Normalized, Annealed, Quenched and Tempered	≤ 35	≤ 320		
	Quenched and Tempered	≤ 38	≤ 350			
	1060, 1064, 1065, 1069, 1070, 1071, 1074, 1075, 1078, 1080, 1084, 1085, 1086, 1090, 1095	Hot rolled, Normalized, Annealed, Cold drawn	≤ 38	≤ 230		
		Hot rolled, Annealed, Cold drawn, Quenched and Tempered	≤ 20	≤ 280		
		Normalized, Annealed, Quenched and Tempered	≤ 35	≤ 320		
		Quenched and Tempered	≤ 38	≤ 350		
<p>Free Machining Leaded Steels</p>	Low Carbon 10L10, 10L15, 10L17, 10L20, 10L23, 11L15, 11L16, 11L17, 12L11, 12L12, 12L13, 12L14, 12L15, 51L15, 1L17, 51L20	Hot rolled, Normalized, Annealed, Cold drawn	-	≤ 150		
			-	≤ 200		
			≤ 25	≤ 250		
	Medium Carbon 10L25, 10L30, 10L35, 10L40, 10L42, 10L45, 10L49, 10L50, 10L55, 86L20, 86L40, 11L37, 11L38, 11L39, 11L41, 11L44, 11L46, 41L25, 41L30, 41L35, 41L40, 41L42, 41L47, 41L50	Hot rolled, Normalized, Annealed, Cold drawn	-	≤ 200		
			≤ 25	≤ 250		
		Cold drawn, Quenched and Tempered	≤ 33	≤ 300		
		≤ 38	≤ 350			
<p>Resulphurized Steels</p>	Low Carbon 1108, 1109, 1110, 1114, 1115, 1116, 1118, 1119, 1120, 1126, 1211, 1212, 1213, 1215	Hot rolled, Annealed	-	≤ 150		
		Cold drawn	-	≤ 200		
	Medium Carbon 1132, 1137, 1138, 1139, 1140, 1141, 1144, 1145, 1146, 1151	Hot rolled, Normalized, Annealed, Cold drawn	-	≤ 180		
			≤ 20	≤ 230		
		Cold drawn, Quenched and Tempered	≤ 30	≤ 280		
		Quenched and Tempered	≤ 35	≤ 320		
		≤ 38	≤ 350	