

Tensile Strength

GENERAL STEEL GROUP THROUGH HARDNESS VERSUS APPROXIMATE TENSILE STRENGTH									
HARDNESS		TENSILE STRENGTH							
BRINELL HARDNESS BHN*	ROCKWELL HARDNESS HRC	PLAIN CARBON STEEL AND LOW ALLOY STEEL		STAINLESS STEEL AUSTENITIC TYPE			STAINLESS STEEL CHROMIUM TYPE		
10mm BALL, 3000kgf LOAD	BRALE PENETRATOR, 60kgf LOAD	N/mm ² (APPROX.)	PSI (APPROX.)	kgf/mm ² (APPROX.)	N/mm ² (APPROX.)	PSI (APPROX.)	kgf/mm ² (APPROX.)	N/mm ² (APPROX.)	PSI (APPROX.)
86		285	41,334						
95		320	46,410						
105		350	50,761						
114		385	55,837						
124		415	60,188						
133		450	65,264						
143		480	69,615	50	490	71,115	50	490	71,115
152	(0)	510	73,966	56	549	79,649	53	520	75,382
162	(3)	545	79,042	62	608	88,183	59	579	83,916
171	(6)	575	83,393	62	608	88,183	59	579	83,916
181	(8.5)	610	88,470	68	667	96,716	65	637	92,450
190	(11)	640	92,820	68	667	96,716	65	637	92,450
200	(13.4)	675	97,897	75	736	106,673	71	696	100,983
209	(15.7)	705	102,248	75	736	106,673	71	696	100,983
219	(18)	740	107,324	80	785	113,784	78	765	110,939
228	20.3	770	111,675	80	785	113,784	78	765	110,939
238	22.2	800	116,026	85	834	120,896	81	794	115,206
247	24	835	121,102	88	863	125,162			
256	25.6	865	125,453	91	892	129,429	88	863	125,162
265	27.1	900	130,529	94	922	133,696			
275	28.5	930	134,880	97	951	137,963	96	941	136,541
284	29.8	965	139,856	100	981	142,230			
303	32.2	1,030	149,383	109	1,069	155,031	106	1,040	150,764
322	34.4	1,095	158,810	118	1,157	167,831	113	1,108	160,720
341	36.6	1,155	167,512	127	1,245	180,632	120	1,177	170,676
360	38.8	1,220	176,939	136	1,334	193,433	127	1,245	180,632
379	40.8	1,290	187,091	145	1,422	206,234	134	1,314	190,588
397	42.7	1,350	195,793	156	1,530	221,879			
415	44.5	1,420	205,945	167	1,638	237,524			
433	46.1	1,485	215,372	178	1,746	253,169			
452	47.7	1,555	225,525	189	1,853	268,815			
471	49.1	1,630	236,402	200	1,961	284,460			
488	50.5	1,700	246,554	209	2,050	297,261			
507	51.7	1,775	257,432	218	2,138	310,061			
525	53	1,845	267,584	227	2,226	322,862			
545	54.1	1,920	278,461	236	2,314	335,663			
564	55.2	1,995	289,339	245	2,403	348,464			

*A 10mm steel ball is used for 450 BHN and below. A 10mm carbide ball is used above 450 BHN.

Values in parentheses are not contained in the normal definition range for hardness checking, but are often used in a comparable measure.

The Tensile Strength relationship to hardness is inexact, even for the steel, unless it is determined for a specific material. Therefore, this chart provides only very general approximate Tensile Strength values.