

Hardness comparison table

Tensile strength, Brinell, Vickers and Rockwell hardness

Tensile strength R_m N/mm ²	Brinell hardness		Vickers hardness HV	Rockwell hardness		
	Ball indentation mm d	HB		HRB	HRC	HR 30 N
255	6.63	76.0	80	-	-	-
270	6.45	80.7	85	41.0	-	-
285	6.30	85.5	90	48.0	-	-
305	6.16	90.2	95	52.0	-	-
320	6.01	95.0	100	56.2	-	-
335	5.90	99.8	105	-	-	-
350	5.75	105	110	62.3	-	-
370	5.65	109	115	-	-	-
385	5.54	114	120	66.7	-	-
400	5.43	119	125	-	-	-
415	5.33	124	130	71.2	-	-
430	5.26	128	135	-	-	-
450	5.16	133	140	75.0	-	-
465	5.08	138	145	-	-	-
480	4.99	143	150	78.7	-	-
495	4.93	147	155	-	-	-
510	4.85	152	160	81.7	-	-
530	4.79	156	165	-	-	-
545	4.71	162	170	85.0	-	-
560	4.66	166	175	-	-	-
575	4.59	171	180	87.1	-	-
595	4.53	176	185	-	-	-
610	4.47	181	190	89.5	-	-
625	4.43	185	195	-	-	-
640	4.37	190	200	91.5	-	-
660	4.32	195	205	92.5	-	-
675	4.27	199	210	93.5	-	-
690	4.22	204	215	94.0	-	-
705	4.18	209	220	95.0	-	-
720	4.13	214	225	96.0	-	-
740	4.08	219	230	96.7	-	-
755	4.05	223	235	-	-	-
770	4.01	228	240	98.1	20.3	41.7
785	3.97	233	245	-	21.3	42.5
800	3.92	238	250	99.5	22.2	43.4
820	3.89	242	255	-	23.1	44.2
835	3.86	247	260	(101)	24.0	45.0
850	3.82	252	265	-	24.8	45.7
865	3.78	257	270	(102)	25.6	46.4
880	3.75	261	275	-	26.4	47.2
900	3.72	266	280	(104)	27.1	47.8
915	3.69	271	285	-	27.8	48.4
930	3.66	276	290	(105)	28.5	49.0
950	3.63	280	295	-	29.2	49.7
965	3.60	285	300	-	29.8	50.2
995	3.54	295	310	-	31.0	51.3
1030	3.49	304	320	-	32.2	52.3
1060	3.43	314	330	-	33.3	53.6
1095	3.39	323	340	-	34.4	54.4
1125	3.34	333	350	-	35.5	55.4
1155	3.29	342	360	-	36.6	56.4
1190	3.25	352	370	-	37.7	57.4
1220	3.21	361	380	-	38.8	58.4
1255	3.17	371	390	-	39.8	59.3
1290	3.13	380	400	-	40.8	60.2
1320	3.09	390	410	-	41.8	61.1
1350	3.06	399	420	-	42.7	61.9
1385	3.02	409	430	-	43.6	62.7
1420	2.99	418	440	-	44.5	63.5
1455	2.95	428	450	-	45.3	64.3
1485	2.92	437	460	-	46.1	64.9
1520	2.89	447	470	-	46.9	65.7
1555	2.86	(456)	480	-	47.7	66.4
1595	2.83	(466)	490	-	48.4	67.1
1630	2.81	(475)	500	-	49.1	67.7
1665	2.78	(485)	510	-	49.8	68.3
1700	2.75	(494)	520	-	50.5	69.0
1740	2.73	(504)	530	-	51.1	69.5
1775	2.70	(513)	540	-	51.7	70.0
1810	2.68	(523)	550	-	52.3	70.5
1845	2.66	(532)	560	-	53.0	71.2
1880	2.63	(542)	570	-	53.6	71.7
1920	2.60	(551)	580	-	54.1	72.1
1955	2.59	(561)	590	-	54.7	72.7
1995	2.57	(570)	600	-	55.2	73.2

Tensile strength R_m N/mm ²	Brinell hardness		Vickers hardness HV	Rockwell hardness		
	Ball indentation mm d	HB		HRB	HRC	HR 30 N
2030	2.54	(580)	610	-	55.7	73.7
2070	2.52	(589)	620	-	56.3	74.2
2105	2.51	(599)	630	-	56.8	74.6
2145	2.49	(608)	640	-	57.3	75.1
2180	2.47	(618)	650	-	57.8	75.5
-	-	-	660	-	58.3	75.9
-	-	-	670	-	58.8	76.4
-	-	-	680	-	59.2	76.8
-	-	-	690	-	59.7	77.2
-	-	-	700	-	60.1	77.6
-	-	-	720	-	61.0	78.4
-	-	-	740	-	61.8	79.1
-	-	-	760	-	62.5	79.7
-	-	-	780	-	63.3	80.4
-	-	-	800	-	64.0	81.1
-	-	-	820	-	64.7	81.7
-	-	-	840	-	65.3	82.2
-	-	-	860	-	65.9	82.7
-	-	-	880	-	66.4	83.1
-	-	-	900	-	67.0	83.6
-	-	-	920	-	67.5	84.0
-	-	-	940	-	68.0	84.4

Conversions of hardness values using this conversion table are only approximate.
See DIN 50 150, December 1976

ขนาดเผือก (Machining allowances)			
การเผือกผิวเหล็กในสภาพจำหน่ายมีความจำเป็นอย่างไร ตารางต่อไปนี้แสดงถึงขนาดเผือกอย่างน้อยที่สุดที่จำเป็นต่อการประกอบ			
ขนาดความหนา / เส้นผ่าศูนย์กลาง (mm) D (mm)	ขนาดเผือกผิว (mm) (Rolled or Asforged Steel, mm)	ขนาดเผือกผิว (mm) (Peeled or Turned Steel)	
		ความคลาดเคลื่อน (mm) (Tolerance, mm)	ขนาดเผือกผิว (mm) (Machining allowance, mm)
D < 16	+ 1	- 0 + 0.4	+ 0.5
16 < D < 25	+ 2	- 0 + 0.4	+ 0.5
25 < D < 40	+ 3	- 0 + 0.6	+ 0.8
40 < D < 63	+ 4	- 0 + 0.6	+ 0.8
63 < D < 80	+ 5	- 0 + 0.6	+ 1.0
80 < D < 100	+ 5	- 0 + 0.6	+ 1.5
100 < D < 125	+ 6	- 0 + 1.0	+ 1.5
125 < D < 160	+ 8	- 0 + 1.0	+ 1.5
160 < D < 200	+ 8	- 0 + 1.0	+ 2.0
200 < D < 250	+ 10	- 0 + 1.0	+ 2.0
250 < D < 315	+ 10	- 0 + 1.0	+ 2.5
315 < D < 400	+ 15	- 0 + 1.6	+ 3.0
400 < D < 500	+ 15	- 0 + 1.6	+ 3.0
500 < D < 600	+ 15	- 0 + 1.6	+ 3.0
D > 600	+ 25	- 0 + 1.6	+ 3.0