AISI CHEMICAL COMPOSITION LIMITS:

Nonresulphurized Carbon Steels

AISI No.	SAE No.	Chemical Composition Limits, per cent			
		C	Mn	P Max.	S Max.
1008	—	0.10max.	0.30/0.50	0.040	0.050
1010	1010	0.08/0.13	0.30/0.50	0.040	0.050
1012	1012	0.10/0.15	0.30/0.60	0.040	0.050
1015	1015	0.13/0.18	0.30/0.60	0.040	0.050
1016	1016	0.13/0.18	0:60/0.90	0.040	0.050
1017	1017	0.15/0.20	0.30/0.60	0.040	0.050
1018	1018	0.15/0.20	0.60/0.90	0.040	0.050
1019	1019	0.15/0.20	0.70/1.00	0.040	0.050
1020	1020	0.18/0.23	0.30/0.60	0.040	0.050
1021	1021	0.18/0.23	0.60/0.90	0.040	0.050
1022	1022	0.18/0.23	0.70/1.00	0.040	0.050
1023	1023	0.20/0.25	0.30/0.60	0.040	0.050
1024	1024	0.19/0.25	1.35/1.65	0.040	0.050
1025	1025	0.22/0.28	0.30/0.60	0.040	0.050
1026	1026	0.22/0.28	0.60/0.90	0.040	0.050
1027	1027	0.22/0.29	1.20/1.50	0.040	0.050
1029	—	0.25/0.31	0.60/0.90	0.040	0.050
1030	1030	0.28/0.34	0.60/0.90	0.040	0.050
1035	1035	0.32/0.38	0.60/0.90	0.040	0.050
1036	1036	0.30/0.37	1.20/1.50	0.040	0.050
1037	1037	0.32/0.38	0.70/1.00	0.040	0.050
1038	1038	0.35/0.42	0.60/0.90	0.040	0.050
1039	1039	0.37/0.44	0.70/1.00	0.040	0.050
1040	1040	0.37/0.44	0.60/0.90	0.040	0.050
1041	1041	0.36/0.44	1.35/1.65	0.040	0.050
1042	1042	0.40/0.47	0.60/0.90	0.040	0.050
1043	1043	0.40/0.47	0.70/1.00	0.040	0.050
1044	1044	0.43/0.50	0.30/0.60	0.040	0.050
1045	1045	0.43/0.50	0.60/0.90	0.040	0.050
1046	1046	0.43/0.50	0.70/1.00	0.040	0.050
1048	1048	0.44/0.52	1.10/1.40	0.040	0.050
1049	1049	0.46/0.53	0.60/0.90	0.040	0.050
1050	1050	0.48/0.55	0.60/0.90	0.040	0.050
1051	—	0.45/0.56	0.85/1.15	0.040	0.050
1052	1052	0.47/0.55	1.20/1.50	0.040	0.050
1053	—	0.48/0.55	0.70/1.00	0.040	0.050
1055	1055	0.50/0.60	0.60/0.90	0.040	0.050
1060	1060	0.55/0.65	0.60/0.90	0.040	0.050
1070	1070	0.65/0.75	0.60/0.90	0.040	0.050
1078	1078	0.72/0.85	0.30/0.60	0.040	0.050
1080	1080	0.75/0.88	0.60/0.90	0.040	0.050
1084	1084	0.80/0.93	0.60/0.90	0.040	0.050
1090	1090	0.85/0.98	0.60/0.90	0.040	0.050
1095	1095	0.90/1.03	0.30/0.50	0.040	0.050

Silicon: When silicon is required, the following ranges and limits are commonly used:

STANDARD STEEL DESIGNATIONS	SILICON RANGES OR LIMITS
Up to 1015 excl.	0.10 Max.
1015 to 1025 incl.	0.10 Max., 0.10/0.20, or 0.15/0.30
Over 1025	0.10/0.20, or 0.15/0.30

Copper: Can be added to a standard steel.

Lead: When lead is required as an added element to a standard steel, a range of 0.15 to 0.35 per cent, inclusive is generally used. Such a steel is identified by inserting the letter “L” between the second and third numerals of the AISI number, e.g., 10 L 45.

AISI CHEMICAL COMPOSITION LIMITS:

Resulphurized Carbon Steels

AISI No.	SAE No.	Chemical Composition Limits, per cent			
		C	Mn	P Max.	S
1109	1109	0.08/0.13	0.60/0.90	0.040	0.08/0.13
1110	—	0.08/0.13	0.30/0.60	0.040	0.08/0.13
1116	—	0.14/0.20	1.10/1.40	0.040	0.16/0.23
1117	1117	0.14/0.20	1.00/1.30	0.040	0.08/0.13
1118	1118	0.14/0.20	1.30/1.60	0.040	0.08/0.13
1119	1119	0.14/0.20	1.00/1.30	0.040	0.24/0.33
1132	1132	0.27/0.34	1.35/1.65	0.040	0.08/0.13
1137	1137	0.32/0.39	1.35/1.65	0.040	0.08/0.13
1139	—	0.35/0.43	1.35/1.65	0.040	0.13/0.20
1140	1140	0.37/0.44	0.70/1.00	0.040	0.08/0.13
1141	1141	0.37/0.45	1.35/1.65	0.040	0.08/0.13
1144	1144	0.40/0.48	1.35/1.65	0.040	0.24/0.33
1145	1145	0.42/0.49	0.70/1.00	0.040	0.04/0.07
1146	1146	0.42/0.49	0.70/1.00	0.040	0.08/0.13
1151	1151	0.48/0.55	0.70/1.00	0.040	0.08/0.13

Silicon: When silicon is required, the following ranges and limits are commonly used:

STANDARD STEEL DESIGNATIONS	SILICON RANGES OR LIMITS
Up to 1110 excl.	0.10 Max.
1116 and over	0.10 Max., 0.10/0.20, or 0.15/0.30

Lead: When lead is required as an added element to a standard steel, a range of 0.15 to 0.35 per cent, inclusive is generally used. Such a steel is identified by inserting the letter "L" between the second and third numerals of the AISI number, e.g., 11 L 17.

Rephosphorized and Resulphurized Carbon Steels

AISI No,	SAE No.	Chemical Composition Limits, per cent				
		C	Mn	P	S	Pb
1211	—	0.13 max.	0.60/0.90	0.07/0.12	0.10/0.15	—
1212	1112'	0.13 max.	0.70/1.00	0.07/0.12	0.16/0.23	—
1213	1113'	0.13 max.	0.70/1.00	0.07/0.12	0.24/0.33	—
1215	—	0.09 max.	0.75/1.05	0.04/0.09	0.25/0.35	—
12L15	—	0.15 max.	0.85/1.15	0.04/0.09	0.26/0.35	0.15/0.35

Silicon: It is not common practice to produce these steels to specified limits for silicon because of its adverse effect on machinability.

*Not produced in Canada.

Estimated Physical Properties of Hot Rolled Carbon Steel Bars

AISI No.	Estimated Minimum Values				Brinell Hardness
	Tensile Strength, psi	Yield Strength, psi	Elongation In 2in.,%	Reduction In Area,%	
1006	43,000	24,000	30	55	86
1008	44,000	24,500	30	55	86
1009	43,000	24,000	30	55	86
1010	47,000	26,000	28	50	95
1012	48,000	26,500	28	50	95
1015	50,000	27,500	28	50	101
1016	55,000	30,000	25	50	111
1017	53,000	29,000	26	50	105
1018	58,000	32,000	25	50	116
1019	59,000	32,500	25	50	116
1020	55,000	30,000	25	50	111
1021	61,000	33,000	24	48	116
1022	62,000	34,000	23	47	121
1023	56,000	31,000	25	50	111
1024	74,000	41,000	20	42	149
1025	58,000	32,000	25	50	116
1026	64,000	35,000	24	49	126
1027	75,000	41,000	18	40	149
1030	68,000	37,500	20	42	137
1033	72,000	39,500	18	40	143
1035	72,000	39,500	18	40	143
1036	83,000	45,500	16	40	163
1037	74,000	40,500	18	40	143
1038	75,000	41,000	18	40	149
1039	79,000	43,500	16	40	156
1040	76,000	42,000	18	40	149
1041	92,000	51,000	15	40	187
1042	80,000	44,000	16	40	163
1043	82,000	45,000	16	40	163
1045	82,000	45,000	16	40	163
1046	85,000	47,000	15	40	170
1049	87,000	48,000	15	35	179
1050	90,000	49,500	15	35	179
1052	108,000	59,500	12	30	217
1055	94,000	51,500	12	30	192
1060	98,000	54,000	12	30	201
1064	97,000	53,500	12	30	201
1065	100,000	55,000	12	30	207
1070	102,000	56,000	12	30	212

Estimated Physical Properties of Hot Rolled Carbon Steel Bars

AISI No.	Estimated Minimum Values				
	Tensile Strength, psi	Yield Strength, psi	Elongation in 2in.,%	Reduction in Area,%	Brinell Hardness
1074	105,000	58,000	12	30	217
1078	100,000	55,000	12	30	207
1080	112,000	61,500	10	25	229
1084	119,000	65,500	10	25	241
1085	121,000	66,500	10	25	248
1086	112,000	61,500	10	25	229
1090	122,000	67,000	10	25	248
1095	120,000	66,000	10	25	248
1108	50,000	27,500	30	50	101
1109	50,000	27,500	30	50	101
1115	55,000	30,000	25	50	111
1117	62,000	34,000	23	47	121
1118	65,000	36,000	23	47	131
1119	62,000	34,000	23	47	121
1120	62,000	34,000	23	47	121
1126	64,000	35,000	23	47	126
1132	83,000	45,500	16	40	167
1137	88,000	48,000	15	35	179
1138	73,000	40,000	18	40	149
1140	79,000	43,500	16	40	156
1141	94,000	51,500	15	35	187
1144	97,000	53,000	15	35	197
1145	85,000	47,000	15	40	170
1146	85,000	47,000	15	40	170
1151	92,000	50,500	15	35	187
12L14	57,000	34,000	22	45	121

AISI CHEMICAL COMPOSITION LIMITS:

STANDARD

BARS, BLOOMS, BILLETS, SLABS

Chemical Composition

AISI Number	C	Mn	P Max.	S Max.
1330	0.28/0.33	1.60/1.90	0.035	0.04
1335	0.33/0.38	1.60/1.90	0.035	0.04
1340	0.38/0.43	1.60/1.90	0.035	0.04
1345	0.43/0.48	1.6011.90	0.035	0.04
4012	0.09/0.14	0.75/1.00	0.035	0.04
4023	0.20/0.25	0.70/0.90	0.035	0.04
4024	0.20/0.25	0.70/0.90	0.035	0.035/ 0.05
4027	0.25/0.30	0.70/0.90	0.035	0.04
4028	0.25/0.30	0.70/0.90	0.035	0.035/ 0.05
4037	0.35/0.40	0.70/0.90	0.035	0.04
4047	0.45/0.50	0.70/0.90	0.035	0.04
4118	0.18/0.23	0.70/0.90	0.035	0.04
4130	0.28/0.33	0.40/0.60	0.035	0.04
4137	0.35/0.40	0.70/0.90	0.035	0.04
4140	0.38/0.43	0.75/1.00	0.035	0.04
4142	0.40/0.45	0.75/1.00	0.035	0.04
4145	0.43/0.48	0.75/1.00	0.035	0.04
4147	0.45/0.50	0.75/1.00	0.035	0.04
4150	0.48/0.53	0.75/1.00	0.035	0.04
4161	0.56/0.64	0.75/1.00	0.035	0.04
4320	0.17/0.22	0.45/0.65	0.035	0.04
4340	0.38/0.43	0.60/0.80	0.035	0.04
4419	0.18/0.23	0.45/0.65	O.D35	0.04
4615	0.13/0.18	0.45/0.65	0.035	0.04
4620	0.17/0.22	0.45/0.65	0.035	0.04
4621	0.18/0.23	0.70/0.90	0.035	0.04
4626	0.24/0.29	0.45/0.65	0.035	0.04
4718	0.16/0.21	0.70/0.90	0.035	0.04
4720	0.17/0.22	0.50/0.70	0.035	0.04
4815	0.13/0.18	0.40/0.60	0.035	0.04
4817	0.15/0.20	0.40/0.60	0.035	0.04
4820	0.18/0.23	0.50/0.70	0.035	0.04
5015	0.12/0.17	0.30/0.50	0.035	0.04
5120	0.17/0.22	0.70/0.90	0.035	0.04
5130	0.28/0.33	0.70/0.90	0.035	0.04
5132	0.30/0.35	0.60/0.80	0.035	0.04
5135	0.33/0.38	0.60/0.80	0.035	0.04
5140	0.38/0.43	0.70/0.90	0.035	0.04
5145	0.43/0.48	0.70/0.90	0.035	0.04
5147	0.46/0.51	0.70/0.95	0.035	0.04
5150	0.48/0.53	0.70/0.90	0.035	0.04
5155	0.51/0.59	0.70/0.90	0.035	0.04
5160	0.56/0.64	0.75/1.00	0.035	0.04
6118	0.16/0.21	0.50/0.70	0.035	0.04
6150	0.48/0.53	0.70/0.90	0.035	0.04
8615	0.13/0.18	0.70/0.90	0.035	0.04
8617	0.15/0.20	0.70/0.90	0.035	0.04
8620	0.18/0.23	0.70/0.90	0.035	0.04
8622	0.20/0.25	0.70/0.90	0.035	0.04
8625	0.23/0.28	0.70/0.90	0.035	0.04
8627	0.25/0.30	0.70/0.90	0.035	0.04
8630	0.28/0.33	0.70/0.90	0.035	0.04
8637	0.35/0.40	0.75/1.00	0.035	0.04
8640	0.38/0.43	0.75/1.00	0.035	0.04
8642	0.40/0.45	0.75/1.00	O.Q35	0.04
8645	0.43/0.48	0.75/1.00	0.035	0.04
8655	0.51/0.59	0.75/1.00	0.035	0.04
8720	0.18/0.23	0.70/0.90	0.035	0.04
8740	0.38/0.43	0.75/1.00	0.035	0.04
8822	0.20/0.25	0.75/1.00	0.035	0.04
9255	0.51/0.59	0.70/0.95	0.035	0.04
9260	0.56/0.64	0.75/1.00	0.035	0.04

TOLERANCES

ALLOY STEELS

LADLE, CHEMICAL RANGES AND LIMITS

Ranges and Limits, Per Cent				
Si	Ni	Cr	Mo	Corresponding SAE Number
0.20/0.35	-	-	-	1330
0.20/0.35	-	-	-	1335
0.20/0.35	-	-	-	1340
0.20/0.35	-	-	-	1345
0.20/0.35	-	-	0.15/0.25	4012
0.20/0.35	-	-	0.20/0.30	4023
0.20/0.35	-	-	0.20/0.31	4024
0.20/0.35	-	-	0.20/0.30	4027
0.20/0.35	-	-	0.20/0.30	4028
0.20/0.35	-	-	0.20/0.30	4037
0.20/0.35	-	-	*0.2010.30*	4047
0.20/0.35	-	0.40/0.60	0.08/0.15	4118
0.20/0.35	-	0.80/1.10	0.15/0.25	4130
0.20/0.35	-	0.80/1.10	0.15/0.25	4137
0.20/0.35	-	0.80/1.10	0.15/0.25	4140
0.20/0.35	-	0.80/1.10	0.15/0.25	4142
0.20/0.35	-	0.70/0.90	0.15/0.25	4145
0.20/0.35	-	0.80/1. 10	0.15/0.25	4147
0.20/0.35	-	0.80/1.10	0.15/0.25	4150
0.20/0.35	-	0.70/0.90	0.25/0.35	4161
0.20/0.35	1.65/2.00	0.40/0.60	0.20/0.30	4320
0.20/0.35	1.65/2.00	0.70/0.90	0.20/0.30	4340
0.20/0.35	-	-	0.45/0.60	4419
0.20/0.35	-	-	0.20/0.30	4615
0.20/0.35	-	-	0.20/0.30	4620
0.20/0.35	-	-	0.20/0.30	4621
0.20/0.35	-	-	0.15/0.25	4626
0.20/0.35	-	0.35/0.55	0.30/0.40	4718
0.20/0.35	-	0.35/0.55	0.15/0.25	4720
0.20/0.35	-	0.40/0.60	0.20/0.30	4815
0.20/0.35	-	-	0.20/0.30	4817
0.20/0.35	-	-	0.20/0.30	4820
0.20/0.35	-	-	-	5015
0.20/0.35	-	0.30/0.50	-	5120
0.20/0.35	-	0.70/0.90	-	5130
0.20/0.35	-	0.80/1.10	-	5132
0.20/0.35	-	0.75/1.00	-	5135
0.20/0.35	-	0.80/1.05	-	5140
0.20/0.35	-	0.70/0.90	-	5145
0.20/0.35	-	0.70/0.90	-	5147
0.20/0.35	-	0.85/1.15	-	5150
0.20/0.35	-	0.70/0.90	-	5155
0.20/0.35	-	0.70/0.90	-	5160
0.20/0.35	-	0.50/0.70	0.10/0.15	6118
0.20/0.35	-	0.80/1.10	0.15Min.	6150
0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8615
0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8617
0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8620
0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8622
0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8625
0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8627
0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8630
0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8637
0.20/0.35	0.40/0.70	0.40!0.60	0.15/0.25	8640
0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8642
0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8645
0.20/0.35	0.40/0.70	0.40/0.60	0.15/0.25	8655
0.20/0.35	0.40/0.70	0.40/0.60	0.20/0.30	8720
0.20/0.35	0.40/0.70	0.40/0.60	0.20/0.30	8740
0.20/0.35	0.40/0.70	0.40/0.60	0.30/0.40	8822
0.20/0.35	-	-	-	9255
0.20/0.35	-	-	-	9260

Machinability For Cold Drawn Bars

Relative Machinability Rating, Per Cent Based on Cold Drawn B1112 as 100 Per Cent

AISI No.	Machinability Rating	AISI No.	Machinability Rating	AISI No.	Machinability Rating
Carbon and Resulphurized Steels					
12L14	158	1117	91	1020	72
B1113	136	1118	91	1137	72
1213	136	1144*	85	1045*	72
B1112	100	1141*	81	1035	70
1119	100	1016	78	1141	70
1212	100	1018	78	1050*	70
B1111	94	1022	78	1040	64
1212	94	1144	76	1045	57
				1050	54
Alloy Steels					
1330*	55	4419*	65	6150*	55
1340*	50	4615	65	8615	70
1345*	45	4621	60	8627*	60
4023	70	4626	70	8610*	65
4024	75	4718	60	8655*	55
4037*	70	4815	50	8720	65
4047*	65	5015	65	8740*	65
4118	60	5120	70	50B44*	65
4137*	70	5130*	70	50B50*	55
4140*	65	5140*	65	81B45*	65
4150*	55	5150*	60	94B17	70
4340*	50	6118	60	94B30*	70

Annealed*

TOLERANCES

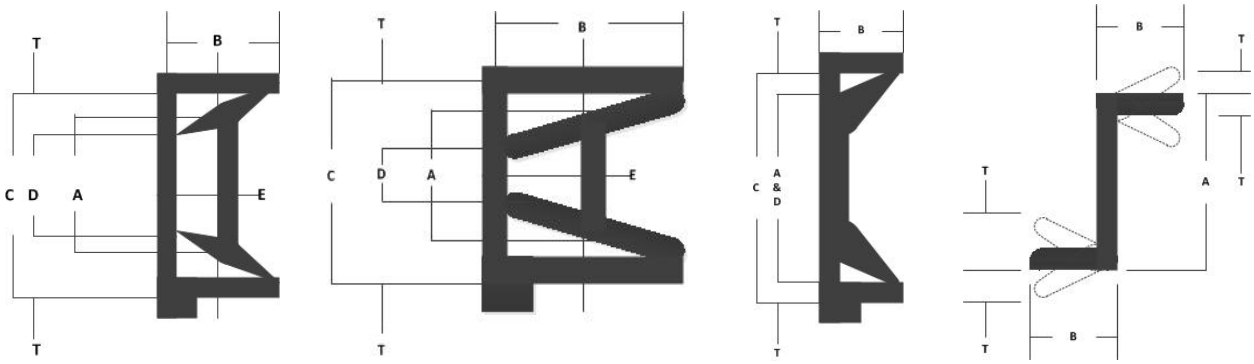
HOT ROLLED CARBON STEEL STRUCTURAL SHAPES

WEIGHT

All Sections

Overweight and Underweight Tolerances Plus or Minus	
Tolerances for Calculated or Specified Weight	**2.5 Per Cent**

PERMISSIBLE VARIATIONS IN SECTIONAL DIMENSIONS FOR STANDARD BEAMS, H-BEAMS, CHANNELS AND ZEES



Standard Beams H-Beams Channels Zees

*Back of square and centre line of Web to be Parallel when Measuring "Out-of-Square".
Note: "A" is measured at centre line of web for beams; and at back of web for channels.

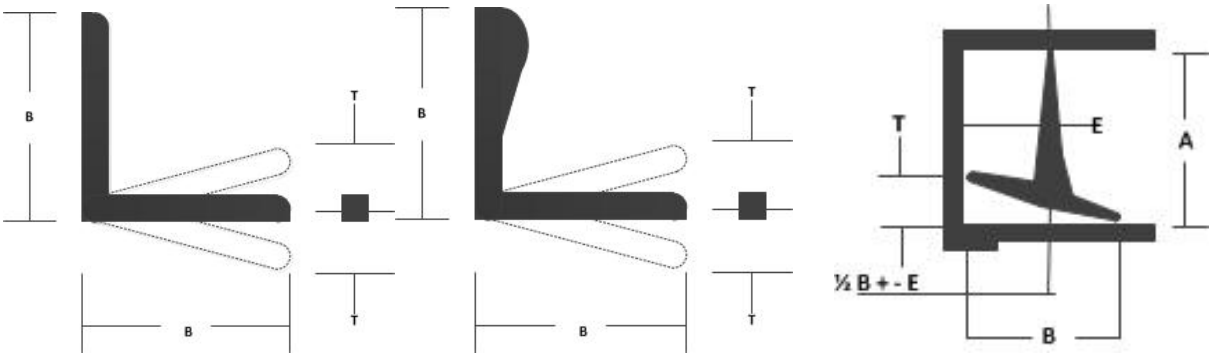
Shapes	Nominal Specified Size mm	A Depth mm		B Flange Width mm		Out-of-Square $T+T_1/B$	Out-of-Parallel C-D/B
		Over	Under	Over	Under		
Standard Beams	75 - 180 incl.	2	2	4	3	0.03	0.03
	Over 180 - 360 incl.	4	2	4	4	0.03	0.03
	Over 360 - 610 incl.	5	3	5	5	0.03	0.03
H-Beams †	100	2	2	4	3	0.03	0.03
	130	2	2	4	4	0.03	0.03
	150	4	2	5	5	0.03	0.03
	200	4	2	5	5	0.03	0.03
Channels	75 - 180 incl.	2	2	4	3	0.03	0.03
	Over 180 - 360 incl.	3	2	3	4	0.03	0.03
	Over 360	5	3	3	5	0.03	0.03
Zees	75 - 100 incl.	3	2	4	2	0.024	-
	Over 100 - 150 incl.	3	2	4	3	0.024	-

†These variations apply to H-Beams rolled in standard structural mills.

TOLERANCES

HOT ROLLED CARBON STEEL STRUCTURAL SHAPES (continued)

PERMISSIBLE VARIATIONS IN SECTIONAL DIMENSIONS FOR ANGLES, BULB ANGLES, AND ROLLED TEES



E = web off-centre.
E = 2 mm maximum for sizes (Stem of flange) 125 mm and under.
E = 3 mm maximum for sizes (Stem or flange) over 125 mm.

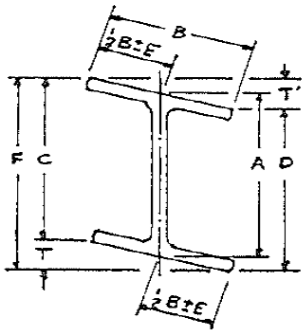
*Back of square and centre line of stem to be Parallel when measuring “out-of-square”.
† For unequal leg angles, longer leg determines classification.

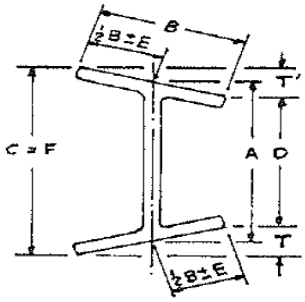
Shapes	Nominal Specified Size mm	A Depth mm		B Flange Width mm		Out-of-Square T/B
		Over	Under	Over	Under	
Angles †	75 - 100 incl.	-	-	4	2	0.024
	Over 100 - 150 incl.	-	-	4	3	0.024
	Over 150	-	-	5	3	0.024
Bulb Angles	(Depth) 75 - 100 incl.	3	2	4	2	0.024
	Over 100 - 150 incl.	3	2	4	3	0.024
	Over 150	3	2	5	3	0.024
Rolled Tees	75 - 180 incl.	2	2	4	3	0.038

TOLERANCES

HOT ROLLED CARBON STEEL STRUCTURAL SHAPES (continued)

PERMISSIBLE VARIATIONS IN SECTIONAL DIMENSIONS FOR WIDE FLANGE SHAPES, STEEL H PILES, AND WELDED WIDE FLANGE SHAPES





NOTE:
"A" is measured at centre line of web.
"B" is the actual flange width and is measured parallel to the flange.
"C" is measured parallel to the web.

Nominal Depth mm	A Depth mm		B Flange Width mm		T+T1 Out of Square mm	C-D Out of Parallel mm	E Web Off Centre mm	F Max. Overall Depth at any Cross Section mm
	Over	Under	Over	Under	Not Over	Not Over	Not Over	Over Nominal
300 and under*	4	3	6	5	5	5	5	6
Over 300	4	3	6	5	6	6	5	6

*Includes all H-Beams rolled on mills having vertical rolls.

PERMISSIBLE VARIATIONS IN LENGTH FOR STANDARD AND WIDE FLANGE SHAPES

Nominal Depth mm	Variations from Specified Length for Lengths Given, mm									
	To 9000 incl.		Over 900 to 12000 incl.		Over 12000 to 15000 incl.		Over 15000 to 20000 incl.		Over 20000	
	Over	Under	Over	Under	Over	Under	Over	Under	Over	Under
All Standard Sections	13	6	19	6	25	6	29	6	32	6
Wide-Flange Shapes: Beams 610 mm and under in nominal depth. Beams over 610 mm in nominal depth and all	10	10	13	10	16	10	21	10	24	10

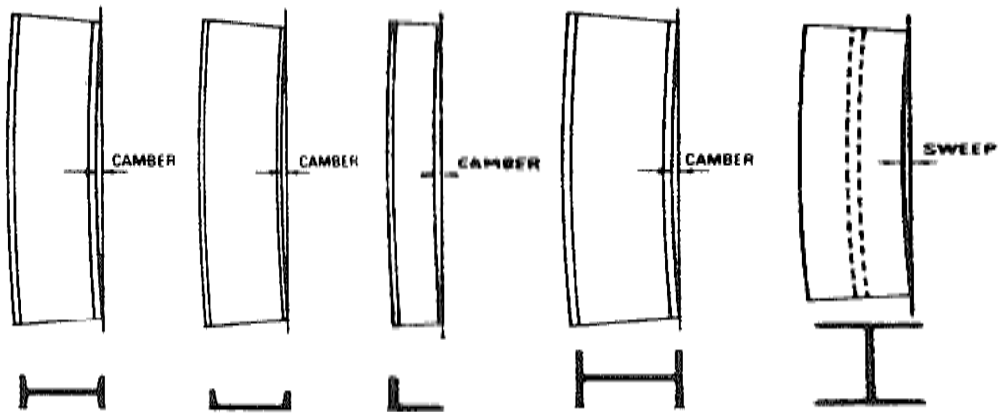
Columns	13	13	16	13	19	13	24	13	27	13

When wide flange sections are used as bearing piles, the length tolerance is plus 120 mm, minus 0 mm

TOLERANCES

HOT ROLLED CARBON STEEL STRUCTURAL SHAPES (continued)

PERMISSIBLE VARIATIONS IN STRAIGHTNESS
FOR STANDARD AND WIDE FLANGE SHAPES, BARS AND BAR SIZE SHAPES
POSITIONS FOR MEASURING CAMBER AND SWEEP



HORIZONTAL SURFACE

Standard Beams Channels Angles WF Beam WF Beam

Shapes	Maximum Permissible Variation in Straightness, mm
Standard shapes (camber)	Length in mm 500
Wide-flange beams (camber or sweep)	Length in mm 1000
Wide-flange beams when ordered as columns	

(camber or sweep): Lengths of 14000 mm and under Lengths over 14000 mm		Length in mm 1000 10 mm +	,but not more than 10 mm length - 14000 1000
Bars and bar-size shapes*		Length in mm 250	
Steel sheet piling		Length in mm 1000	

*Permissible variations in straightness do not apply to hot rolled bars if any subsequent heating operation has been performed.

TOLERANCES

HOT ROLLED CARBON STEEL STRUCTURAL SHAPES (Continued)

PERMISSIBLE VARIATIONS IN ENDS OUT-Of-SQUARE FOR STANDARD AND WIDE FLANGE SHAPES

Shapes	Permissible Variations
Standard beams, channels Standard mill H-Beams	0.016 mm/mm of depth
Angles*	0.024 mm/mm of leg length or 1-1/2^{o}
Bulb angles	0.024 mm/mm of depth or 1-1/2^{o}
Rolled tees*	0.016 mm/mm of flange or stem
Zees	0.024 mm/mm of sum of both flange lengths
Wide-flange shapes	0.016 mm/mm of depth, or of flange width, if it is greater than depth

*Permissible variations for ends out-of-square are determined on the longer members of the shape.

PERMISSIBLE VARIATIONS IN COMBINED WARPAGE AND TILT FOR WELDED STRUCTURAL SHAPES

The combined warpage and tilt of the flange shall not exceed 1/200 of the total width of the flange, or 3 mm, whichever is greater, when measured from the toe of the flange to a line normal to the plane of the web through the intersection of the centerline of the web with the outside surface of the flange plate.

PERMISSIBLE VARIATIONS IN WEB FLATNESS
FOR WELDED STRUCTURAL SHAPES

The deviation from flatness of the web as measured in a length of the web equal to the total depth of the beam shall not exceed 1/150 of the total depth of the beam.

TOLERANCES

WELDED OR SEAMLESS HOLLOW SECTIONS

PERMISSIBLE VARIATIONS IN MASS

On the basis that the density of rolled steel is 7850 Kg/m 3, the actual mass of an individual length of hollow structural section shall not deviate from the published mass by more than 3.5 or +10 per cent.

PERMISSIBLE VARIATIONS IN WALL THICKNESS

Wall thickness shall not deviate by more than ±10 per cent from the nominal wall thickness specified, except that the weld seam of welded sections may overrun the maximum thickness tolerance. In the case of rectangular sections, wall thickness shall be measured at the center of the flat.

PERMISSIBLE VARIATIONS IN CROSS-SECTIONAL DIMENSIONS

Outside dimensions measured across the flats or diameter at positions at least 50 mm from either end of a piece, including an allowance for convexity or concavity, shall not vary from the specified dimensions of the section by more than the tolerances prescribed below.

Largest Outside Dimension Across Flats or Diameter, mm	Tolerance*, mm
To 65	± 0.5
Over 65 - 90 incl.	± 0.8
Over 90 - 140 incl.	± 1.0
Over 140	± 1 per cent

*Tolerance includes allowance for convexity or concavity. Tolerance may be increased 50 percent when applied to the smaller dimension of rectangular sections whose ratio of cross-sectional dimensions is between 1.5 and 3, and 100 percent when this ratio exceeds 3.

MAXIMUM OUTSIDE CORNER RADII FOR RECTANGULAR SECTIONS

Wall Thickness mm	Maximum Outside Corner Radius, mm	
	Perimeter to 700 mm incl.	Perimeter over 700 m
To 3 incl.	6	-
Over 3 - 4 incl.	8	-
Over 4 - 5 incl.	15	-
Over 5 - 6 incl.	18	18
Over 6 - 8 incl.	21	24
Over 8 - 10 incl.	27	30
Over 10 - 13 incl.	36	39
Over 13	-	3 X wall thickness

TOLERANCES

WELDED OR SEAMLESS HOLLOW SECTIONS (Continued)

PERMISSIBLE VARIATIONS IN CORNER SQUARENESS

For rectangular sections, corners shall be square (90°) within ± F for hot formed sections and 2° for cold formed sections. Squareness shall be determined with a protractor or other suitable measuring device and the average slope of the sides shall be the basis for determination.

PERMISSIBLE VARIATION IN STRAIGHTNESS

Deviation from straightness in millimetres shall not exceed-

Total length in millimetres divided by 500.

PERMISSIBLE TWIST

Tolerances for twist for rectangular or other non-circular profiles are prescribed as follows. Twist of a rectangular section may be measured by holding down the side of one end of the section on a flat surface and noting how high above the surface is either corner at the opposite end of that side.

Largest Outside Dimension, mm	Maximum Twist per 1000 mm of Length, mm
To 65 incl.	0.8
Over 65 - 105 incl.	1
Over 105 - 155 incl.	1.1
Over 155 - 205 incl.	1.2
Over 205	1.4

PERMISSIBLE VARIATION IN ORDERED LENGTHS

Tolerances in millimetres on ordered cold cut lengths are:

+ 12 and – 6 for lengths 7500 and under;
+ 18 and – 6 for lengths over 7500

Tolerances in millimetres on ordered hot cut lengths of hot rolled sections are:

± 25 lengths 7500 and under;
± 50 lengths over 7500

TOLERANCES

COLD FINISHED CARBON STEEL BARS

Accuracy extras for rounds, squares, hexagons and flats and flats do not apply where the accuracy for which the extra is quoted is the same as or greater than the manufacturing tolerances shown below for the section below for the section ordered.

These tolerances provide for undersize variations only.

Size, in inches	Maximum of Carbon Range 0.28% or less	Maximum Carbon Range over 0.28% to 0.55 % incl.	All Carbons up to 0.55% incl. Stress Relieved	Maximum of Carbon Range Over 0.55% or All Carbons Heat Treated

All tolerances are in decimals of an inch

ROUNDS – COLDS DRAWN OR TURNED AND POLISHED

To 1-1/2 incl.	.002	.003	.004	.005
Over 1-1/2 to 2-1/2 incl.	.003	.004	.005	.006
Over 2-1/2 to 4 incl.	.004	.005	.006	.007
Over 4 to 6 incl.	.005	.006	.007	.008
Over 6 to 8 incl.	.006	.007	.008	.009

HEXAGONS – COLD DRAWN

To 3/4 incl.	.002	.003	.004	.006
Over 3/4 to 1-1/2 incl.	.003	.004	.005	.007
Over 1-1/2 to 2-1/2 incl.	.004	.005	.006	.008
Over 2-1/2	.005	.006	.007	.009

SQUARES – COLD DRAWN

To 3/4 incl.	**.002**	**.004**	**.005**	**.007**
Over 3/4 to 1-1/2 incl.	**.003**	**.005**	**.006**	**.008**
Over 1-1/2 to 2-1/2 incl.	**.004**	**.006**	**.007**	**.009**
Over 2-1/2	**.005**	**.008**	**.009**	**.011**

FLATS – COLD FINISHED*

Width, in inches				
To 3/4 incl.	.003	.004	.006	.008
Over 3/4 to 1-1/2 incl.	.004	.005	.008	.010
Over 1-1/2 to 3 incl.	.005	.006	.010	.012
Over 3 to 4 incl.	.006	.008	.011	.016
Over 4 to 6 incl.	.008	.010	.012	.020
Over 6	.013	-	-	-

*The tolerances for flats apply to thickness as well as width.

TOLERANCES

COLD FINISHED CARBON STEEL BARS (continued)

COLD DRAWN, GROUND AND POLISHED OR TURNED, GROUND AND POLISHED

These tolerances provide for undersize variations only.

	Ground and Polished from Cold Drawn Bars		**Turned, Ground and Polished**	
Size Ranges	Free Machining Grades Sulphur .08% minimum- not Furnace Treated All Carbons	Non-resulphurized Steels- Sulphur under .08% or Furnace Treated Steels All Carbons	Free Machining Grades Sulphur .08% minimum- not Furnace Treated All Carbons	Non-resulphurlzed Steels- Sulphur under ,08% or Furnace Treated Steels All Carbons
	Size to Minus	**Size to Minus**	**Size to Minus**	**Size to Minus**

To 1-1/2" inclusive	.001"	.001"	.001"	.001"
Over 1-1/2" to less than 2-1/2"	.0015''	.0015''	.0016"	.0015''
2-1/2" to 3" inclusive	.002"	.002"	.002"	.002"
Over 3" to 4" inclusive	.003"	.003"	.003"	.003"
Over 4" to 6" inclusive	-	-	.004"	.005"
Over 6"	-	-	.005"	.006"

TOLERANCES

HOT ROLLED BARS
CARBON – BARS

ROUNDS AND SQUARES AND ROUND CORNERED SQUARES – SIZE

Specified Size mm	Variation in Size mm	Out-of-Round or Out-of-Square, mm
Up to 15	± 0.2	± 0.3
Over 15 - 25	± 0.3	± 0.4
Over 25 - 35	± 0.4	± 0.6
Over 35 - 50	± 0.5	± 0.8
Over 50 - 80	± 0.8	± 1.1
Over 80 - 100	± 1.0	± 1.5
Over 100	± 1.2 per cent of size	± 1.8 per cent of size

NOTE: Out-of-round is the difference between the Max. and Min. Diameter of the Bar, measured at the same cross-section. Out-of-square is the difference in the Two Dimensions at the same cross-section of a Square Bar, each Dimension being the distance between opposite faces.

HEXAGONS – SIZE

Specified Size	Variation in Size	Out-of-Round or

mm	mm	Out-of-Square, mm
Up to 15	± 0.2	± 0.3
Over 15 - 25	± 0.4	± 0.6
Over 25 - 35	± 0.5	± 0.8
Over 35 - 50	± 0.6	± 1.1
Over 50 - 80	± 0.8	± 1.4

*Greatest difference between any two of the three possible measurements.

SQUARE-EDGEA AND ROUND-EDGE FLATS
THICKNESS AND WIDTH TOLERANCES

Specified Widths mm	Variations from Thickness for thickness given, mm						Variations from Width mm
	Up to 6	Over 6 to 13	Over 13 to 20	Over 20 to 40	Over 40 to 75	Over 75	
Up to 25	± 0.2	± 0.2	± 0.2	-	-	-	± 0.5
Over 25 - 50	± 0.3	± 0.3	± 0.3	± 0.3	-	-	± 0.8
Over 50 - 100	± 0.4	± 0.4	± 0.4	± 0.4	± 0.4	± 0.4	± 1.2
Over 100 - 150	± 0.5	± 0.5	± 0.5	± 0.5	± 0.5	± 0.5	± 2.0
Over 150 - 200	± 0.6	± 0.6	± 0.6	± 0.6	± 0.6	ŧ	± 2.8

*Flat bars not available over 150 mm wide and under 6 mm thick.
ŧ Consult producer for applicable tolerances.

TOLERANCES

HOT ROLLED BARS (Continued)

CARBON – BARS

STANDARD BAR-SIZE ANGLES – DIMENSIONS

Specified Length of Leg mm	Variations from Thickness, for thicknesses given, over and under, mm			Variation from Length of Leg, Over and Under mm
	5 and under	Over 5-10 incl.	Over 10	
50 and under	0.2	0.3	0.3	1
Over 50	0.3	0.4	0.4	2

The Longer Leg of an unequal Angle determines the size for permissible variations. Permissible out-of-square in either direction, 1-1/2 degrees.

STANDARD BAR-SIZE CHANNELS – DIMENSIONS

Specified Size of Channels mm	Variations from Size, over and under, mm				Permissible Out-of-Square* of other Flange per millimetre of Flange Width mm
	Depth of Section	Width of Flanges	Thickness of Web for thicknesses given		
			5 and under	Over 5	
40 and under	1	1	0.2	0.4	0.03
Over 40 - 75 excl.	2	2	0.4	0.5	0.03

*For channels 15 mm or less in depth, the permissible out-of-square is 5 percent of depth. The tolerance shall be rounded to the nearest millimeter after calculation.
NOTE: Measurements for depth of shape and width of flanges are overall.

LENGTH TOLERANCES

HOT SHEARING – HOT SAWING

ROUND, SQUARES, HEXAGONS, FLATS AND BAR SIZE SECTIONS

Specified Size of Rounds, Squares and Hexagons mm	Specified Size of Flats, mm		Permissible Variations Over* Specified Length Given, mm				
	Thickness	Width	1500 to 3000 excl.	3000 to 6000 excl.	6000 to 9000 excl.	9000 to 12000 excl.	12000 to 18000 excl.
HOT SHEARING							
25 and under	25 and under	75 and under	13	19	32	44	57
Over 25 - 50 incl.	Over 25	75 and under	16	25	38	51	64
Over 25 - 50 incl.	25 and under	Over 75-150 incl.	16	25	38	51	64
Over 50 - 125 incl.	Over 25	Over 75-150 incl.	25	38	44	57	70
Over 125	-	-	51	64	70	76	83
Bar-Size Sections	-	-	16	25	38	51	64
HOT SAWING							
50 - 125 incl. ŧ	25 and over	75 and over	ŧ	38	44	57	70
Over 125	-	-	ŧ	64	70	76	83

*No variation under.
ŧ smaller size and shorter lengths are not commonly sawn.

TOLERANCES

HOT ROLLED CARBON AND ALLOY STEEL PLATES

PERMISSIBLE VARIATIONS IN THICKNESS WHEN ORDERED TO THICKNESS IN METRIC (SI) UNITS

Rectangular Sheared and Universal Mill Plates 3000 mm and Under in Thickness

Specified Thickness mm	Tolerance Over Specified Thickness for Widths Given in Millimetres (mm)										
	1200 and under	Over 1200 to 1500 excl.	1500 to 1800 excl.	1800 to 2100 excl.	2100 to 2400 excl.	2400 to 2700 excl.	2700 to 3000 excl.	3000 to 3300 excl.	3300 to 3600 excl.	3600 to 4200 excl.	4200 and Over
5	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1	-	—
5.5	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1	-	-
6	0.4	0.4	0.5	0.5	0.6	0.7	0.9	1	1.1	—	—
7	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1	1.2	1.4	—
8	0.4	0.5	0.6	0.6	0.7	0.8	0.9	1	1.2	1.4	—
9	0.5	0.5	0.6	0.6	0.7	0.8	1	1	1.3	1.5	-
10	0.5	0.5	0.6	0.7	0.7	0.8	1	1	1.3	1.5	1.7
11	0.5	0.5	0.6	0.7	0.8	0.8	1	1	1.3	1.5	1.7
12	0.5	0.6	0.6	0.7	0.8	0.9	1	1	1.3	1.5	1.8
14	0.6	0.6	0.7	0.7	0.9	0.9	1	1.1	1.3	1.5	1.8
16	0.7	0.7	0.7	0.7	0.9	0.9	1	1.1	1.3	1.5	1.8
18	0.7	0.7	0.7	0.8	0.9	1	1.1	1.2	1.4	1.6	2
20	0.7	0.8	0.8	0.8	0.9	1	1.2	1.2	1.4	1.6	2
22	0.8	0.9	0.9	0.9	1	1.1	1.3	1.3	1.5	1.8	2
25	0.9	0.9	1	1	1	1.2	1.3	1.5	1.5	1.8	2.2

28	1	1	1.1	1.1	1.1	1.3	1.4	1.8	1.8	2	2.2
30	1.1	1.1	1.2	1.2	1.2	1.4	1.5	1.8	1.8	2.1	2.4
32	1.2	1.2	1.3	1.3	1.3	1.5	1.6	2	2	2.3	2.6
35	1.3	1.3	1.4	1.4	1.4	1.6	1.7	2.3	2.3	2.5	2.8
38	1.4	1.4	1.5	1.5	1.5	1.7	1.8	2.3	2.3	2.7	3
40	1.5	1.5	1.6	1.6	1.6	1.8	2	2.5	2.5	2.8	3.3
45	1.6	1.6	1.7	1.8	1.8	2	2.3	2.8	2.8	3	3.5
50	1.8	1.8	1.8	2	2	2.3	2.5	3	3	3.3	3.8
55	2	2	2	2.2	2.2	2.5	2.8	3.3	3.3	3.5	3.8
60	2.3	2.3	2.3	2.4	2.4	2.8	3	3.5	3.4	3.8	4
70	2.5	2.5	2.5	2.6	2.6	3	3.3	3.5	3.6	4	4
80	2.8	2.8	2.8	2.8	2.8	3.3	3.5	3.5	3.6	4	4
90	3	3	3	3	3	3.5	3.5	3.5	3.6	4	4.4
100	3.3	3.3	3.3	3.3	3.5	3.8	3.8	3.8	3.8	4.4	4.4
110	3.5	3.5	3.5	3.5	3.5	3.8	3.8	3.8	3.8	4.4	4.4
120	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	4.8	4.8
130	4	4	4	4	4	4	4	4	4	5.2	5.2
140	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	5.6	5.6
150	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	5.6	5.6
160	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	5.6	5.6
180	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	6.3	6.3
200	5.8	5.8	6	6	6	6	6	6	6	7	7
250	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	8.8
300	7.5	7.5	9	9	9	9	9	9	9	9	9

1) Permissible variation under specified thickness, 0.3 mm.
2) Thickness to be measured 10 to 20 mm from the longitudinal edge.
3) For specified thicknesses other than those shown, the next higher thickness will apply.
4) For thickness measured at any other location other than that specified in NOTE 2, the permissible maximum over tolerance shall be increased by 75 percent, rounded to the nearest 0.1 mm.

TOLERANCES

HOT ROLLED CARBON AND ALLOY STEEL PLATES (continued)

VARIATIONS IN WIDTH AND LENGTH ·Sheared Mill Plates 50 mm and Under in Thickness; VARIATIONS IN LENGTH ONLY- Universal Mill Plates 65 mm and Under in Thickness

Specified Dimensions mm		Variations Over Specified Width and Length for Thickness Given, mm							
		To 10 excl.		10 to 16 excl.		16 to 25 excl.		25 to 50 incl.*	
Width	Length	Width	Lgth.	Width	Lgth.	Width	Lgth	Width	Lgth.
To 1500 excl.	To 3000	10	12	10	16	14	20	16	25
1500 - 2100 excl.		12	16	14	18	16	22	20	25
2100 - 2700 excl.		14	18	16	22	18	25	25	30
2700 and over		16	22	18	25	22	30	30	32
To 1500 excl.	3000 - 6000 excl.	10	20	12	22	16	25	20	30
1500 - 2100 excl.		12	20	16	22	18	25	22	32
2100 - 2700 excl.		14	22	18	25	20	30	25	35
2700 and over		16	25	18	30	22	32	30	35
To 1500 excl.	6000 - 9000 excl.	10	25	12	28	16	32	20	38
1500 - 2100 excl.		12	25	16	30	20	32	22	38
2100 - 2700 excl.		14	25	18	32	22	35	25	38
2700 and over		18	30	22	32	25	35	32	45
To 1500 excl.	9000 - 12000 excl.	12	30	16	32	16	35	20	40
1500 - 2100 excl.		14	32	16	35	20	38	22	42
2100 - 2700 excl.		16	32	20	35	22	38	25	45

2700 and over		18	35	22	38	25	40	32	48
To 1500 excl.	12000 - 15000 excl.	12	32	14	38	16	40	20	48
1500 - 2100 excl.		14	35	16	38	20	42	22	48
2100 - 2700 excl.		16	35	20	38	22	42	25	48
2700 and over		20	38	22	40	25	45	32	48
To 1500 excl.	15000 - 18000 excl.	14	45	16	48	20	48	22	55
1500 - 2100 excl.		16	45	18	48	22	48	25	58
2100 - 2700 excl.		18	45	20	48	22	48	30	58
2700 and over		22	45	25	50	30	58	32	65
To 1500 excl.	18000 and over	14	50	18	55	22	58	25	70
1500 - 2100 excl.		18	50	22	55	25	58	30	70
2100 - 2700 excl.		20	50	22	55	25	58	32	70
2700 and over		25	50	28	60	32	65	35	75

*Permissible variations in length apply also to Universal Mill plates up to 300 mm in width for thickness over 50 to 65 mm inclusive.

NOTE: Permissible variation under specified width and length, 6 mm.

VARIATIONS IN ROLLED WIDTH – Universal Mill Plates 400 mm and Under in Thickness

Specified Width mm	Variations Over Specified Width for Thickness Given, mm					
	To 10 excl.	10-16 excl.	16-25 excl.	25-50 excl.	50-250 excl.	250 and over
Over 200 - 500 excl.	3	3	5	6	10	13
500 - 900 excl.	5	6	8	10	11	14
900 and Over	8	10	11	13	14	16

NOTE: Permissible variations under specified under width, 3mm.

TOLERANCES

HOT ROLLED CARBON AND ALLOY STEEL PLATES (continued)

PERMISSIBLE VARIATIONS IN WIDTH AND LENGTH FOR RECTANGULAR PLATES – When Gas Cutting is Specified or Required.

Specified Thickness mm	Variations Over for All Specified Widths or Lengths, mm
To 50 excl.	13
50-100 excl.	16
100-150 excl.	19
150-200 excl.	22
200-400 incl.	25

These variations may be taken all under or divided over and under, if so specified. Plates with universal rolled edges will be gas-cut to length only.

PERMISSIBLE CAMBER

For Sheared, Gas-Cut and Universal Mill Plates 50 mm and Under in Thickness.

Maximum Permissible Camber, mm =	Length in Millimetres / 500

For Gas-Cut and Universal Mill Plates Over 50 mm to 400 mm inclusive in Thickness

Width mm	Camber for Widths Given, mm
To 750 incl.	Length / 300
Over 750-1500 incl.	Length / 250

Camber as it relates to plates is the horizontal edge curvature in the length, measured over the entire length of the plate in the flat position.

TOLERANCES

HOT ROLLED CARBON AND ALLOY STEEL PLATES (continued)

PERMISSIBLE VARIATIONS FROM FLATNESS FOR CARBON STEEL –
Rectangular Sheared Plates, Universal Mill Plates, Circular and Sketch Plates.

Flatness denotes the deviation of the top or bottom surface from a horizontal plane when the plate is resting on a flat surface. This table shows flatness tolerances when flatness is measured in the length direction and also when the flatness is measured in the width direction as explained below.

Specified Thickness mm	Permissible Variations from a Plate Surface for Specified Widths, mm										
	To 900 excl.	900 to 1200 excl.	1200 to 1500 excl.	1500 to 1800 excl.	1800 to 2100 excl.	2100 to 2400 excl.	2400 to 2700 excl.	2700 to 3000 excl.	3000 to 3600 excl.	3600 to 4200 excl.	4200 and Over
To 6 excl.	17	24	30	38	42	45	49	52	56	-	-

6-10 excl.	16	21	24	30	35	38	40	43	52	-	-
10-12 excl.	14	17	19	21	24	28	31	35	40	56	69
12-20 excl.	12	16	17	19	21	24	31	31	31	49	63
20-25 excl.	12	16	17	19	19	21	23	26	28	42	56
25-50 excl.	10	14	16	17	17	19	19	19	21	35	49
50-100 excl.	9	10	12	14	14	16	16	17	21	28	35
100-150 excl.	10	12	14	16	17	17	21	24	28	28	28
150-200 excl.	12	14	16	19	21	24	26	28	28	28	28
200-250 excl.	14	16	19	21	24	28	28	28	28	28	28
250-300 excl.	16	21	24	28	28	28	28	28	28	28	28
300-400 excl.	19	23	24	28	28	28	28	28	28	28	-

1) **Flatness Variations for length.** The longer dimension specified is considered to be the length, and permissible variations in flatness along the length should not exceed the tabular amount for the specified width in plates up to 4000 mm in length or in any 4000 mm of longer plates.

2) **Flatness Tolerances for Width.** The flatness variation across the width should not exceed the tabular amount for the specified width.

3) When the longer dimension is under 900 mm the permissible variation in flatness should not exceed 6 mm.

4) The permissible variations in the above table apply to plates that have a specified minimum tensile strength of not more than 400.MPa or equivalent hardness. For plates specified to a higher minimum tensile strength or hardness, the limits given in the table are customarily increased by 50 percent.

5) The above table and notes cover the permissible variations for flatness of circular and sketch plates, based on the maximum dimensions of those plates.

PERMISSIBLE VARIATIONS IN WAVINESS

Rectangular Plates, Universal Mill Plates, Circular and Sketch Plates

Waviness tolerance as a percentage of flatness tolerance when number of waves in 4000 mm is:

1	2	3	4	5	6
100%	80%	60%	50%	40%	25%

1) Waviness denotes the maximum deviation of the surface of the plate from a plane parallel to the surface of the point of measurement and contiguous to the surface of the plate at each of the two adjacent wave peaks, when the plate is resting on a flat horizontal surface as measured in an increment of less than 4000 mm in length.

2) The waviness tolerance is a function of the flatness tolerance as obtained from the preceding table on this page, as is appropriate.