



**REFERENCE**

**A 992 & A 36 SPECIFICATION DATA**

	Chemical Requirements										
	Shapes		A 36 Plates*				A 36 Bars*				
	A 992	A 36	over 3/4" to 1-1/2"	over 3/4" to 1-1/2"	over 2-1/2" to 4"	over 2-1/2" to 4"	over 3/4" to 1-1/2"	over 1-1/2" to 4"	over 1-1/2" to 4"		
Carbon, max.	0.23	0.26	0.25	0.25	0.26	0.27	0.29	0.26	0.27	0.28	0.29
Manganese	.050 to 1.50	—	—	.80 to 1.20	.80 to 1.20	.85 to 1.2	.85 to 1.2	—	.60 to .90	.60 to .90	.60 to .90
Silicon	0.40 max	0.40 max	0.40 max	0.40 max	0.15 - 0.40	0.15 - 0.40	0.15 - 0.40	0.40 max.	0.40 max.	0.40 max.	0.40 max.
Phosphorus, max.	0.035	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Sulphur, max.	0.045	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Copper when spec'd.	0.60 max.	0.20 min.	0.20 min.	0.20 min.	0.20 min.	0.20 min.	0.20 min.	0.20 min.	0.20 min.	0.20 min.	0.20 min.
Vanadium, max.	0.11	—	—	—	—	—	—	—	—	—	—
Columbium, max.	0.05	—	—	—	—	—	—	—	—	—	—
Nickel, max.	0.45	—	—	—	—	—	—	—	—	—	—
Chromium, max.	0.35	—	—	—	—	—	—	—	—	—	—
Molybdenum, max.	0.15	—	—	—	—	—	—	—	—	—	—

\* A 992 covers only shapes.

Mechanical Requirements	
A 992	A 36
Tensile Strength, psi	65,000 min. 58,000 to 80,000
Yield Point, psi	50,000 to 65,000 36,000
Yield to tensile ratio, max.	0.85 N/A
Elong. in 8", min.	0.18 0.20
Elong. in 2", min.	0.21 0.21

The above charts are for reference only.  
For full details consult the ASTM specifications.

## CLASSIFICATIONS

The following table shows the proper classification of various Hot Rolled Products. The difference between "Sheets" and "Plates," "Bars" and "Strip" is explained as follows:

### HOT ROLLED STEEL

Thickness in Inches	Width In Inches				
	Up to 3½"	Over 3½" to 8"	Over 8" to 12"	Over 12" to 48"	Over 48"
.2300" and over	Bar	Bar	Plate	Plate	Plate
.2299" to .2031"	Bar	Bar	Strip	Sheet	Plate
.2030" to .1800"	Strip	Strip	Strip	Sheet	Plate
.1799" to .0568"	Strip	Strip	Strip	Sheet	Sheet
.0567" to .0449"	Strip	Strip	Sheet	Sheet	Sheet
.0448" to .0344"	Strip	Strip	Sheet	Sheet	Sheet
.0343" to .0255"	Strip	Sheet	Sheet	Sheet	Sheet
.0254" & under	Sheet	Sheet	Sheet	Sheet	Sheet

### STEEL SHEET PRODUCTS

USS Gauge	MINIMUM ORDERING THICKNESS			THICKNESS TOLERANCE*		
	Hot Rolled In.	Cold Rolled In.	Galvanized In.	Hot Rolled In.	Cold Rolled In.	Galvanized In.
7	.172	...	...	.024	...	...
8	.158	...	...	.024	...	...
9	.143	...	...	.024	...	...
10	.128	.128	.1310	.024	.014	.022
11	.113	.113	.1160	.022	.012	.022
12	.098	.098	.1010	.022	.012	.020
13	.083	.083	.0860	.018	.012	.016
14	.072	.072	.0750	.018	.012	.016
16	.057	.057	.0610	.014	.010	.014
18	.045	.045	.0490	.012	.008	.012
20	...	.035	.0390	...	.006	.010
22	...	.029	.0322	...	.006	.008
24	...	.023	.0262	...	.006	.008
26	...	.018	.0210	...	.004	.006
28	...	...	.0180	...	...	.006

## WIRE AND SHEET METAL GAUGES In Decimals of an Inch

Number of Gauge	Birmingham or Stubs Iron Wire Gauge	American or Brown & Sharpe Wire Gauge	United States Standard Gauge	Jones & Laughlin, Washburn & Moen Mfg. Co., John A. Roebling's Sons Co., and American Steel and Wire Co. Wire Gauge	Trenton Iron Co. Wire Gauge	British Imperial or English Legal Standard Wire Gauge
000000	...	....	....	....	...	.500
000000	...	....	....	.4600	...	.464
00000	...	....	....	.4300	.450	.432
0000	.454	.460000	....	.3938	.400	.400
000	.425	.409642	....	.3625	.360	.372
00	.380	.364796	....	.3310	.330	.348
0	.340	.324861	....	.3065	.305	.324
1	.300	.289297	....	.2830	.285	.300
2	.284	.257627	....	.2625	.265	.276
3	.259	.229423	.2391	.2437	.245	.252
4	.238	.204307	.2242	.2253	.225	.232
5	.220	.181940	.2092	.2070	.205	.212
6	.203	.162023	.1943	.1920	.190	.192
7	.180	.144285	.1793	.1770	.175	.176
8	.165	.128490	.1644	.1620	.160	.160
9	.148	.114423	.1495	.1483	.145	.144
10	.134	.101897	.1345	.1350	.130	.128
11	.120	.090742	.1196	.1205	.1175	.110
12	.109	.080808	.1046	.1055	.105	.104
13	.095	.071962	.0897	.0915	.0925	.092
14	.083	.064084	.0747	.0800	.0806	.080
15	.072	.057068	.0673	.0720	.070	.072
16	.065	.050821	.0598	.0625	.061	.064
17	.058	.045257	.0538	.0540	.0525	.056
18	.049	.040303	.0478	.0475	.045	.048
19	.042	.035890	.0418	.0410	.040	.040
20	.035	.031961	.0359	.0348	.035	.036
21	.032	.028462	.0329	.0317	.031	.032
22	.028	.025346	.0299	.0286	.028	.028
23	.025	.022572	.0269	.0258	.025	.024
24	.022	.020101	.0239	.0230	.0225	.022
25	.020	.017900	.0209	.0204	.020	.020
26	.018	.015941	.0179	.0181	.018	.018
27	.016	.014195	.0164	.0173	.017	.016
28	.014	.012641	.0149	.0162	.016	.0145
29	.013	.011257	.0135	.0150	....	.0136
30	.012	.010025	.0120	.0140	....	.0124
31	.010	.008928	....	.0132	....	.0116
32	.009	.00795	....	.0128	....	.0108
33	.008	.00708	....	.0118	....	.0100
34	.007	.006304	....	.1004	....	.0092
35	.005	.005614	....	.0095	....	.0084
36	.004	.005	....	.0090	....	.0076
37	...	.004453	....	....	....	.0068
38	...	.003965	....	....	....	.0060
39	...	.003531	....	....	....	.0052
40	...	.003144	....	....	....	.0048

### USE OF GAUGES

As applied to commercial Steel and Iron products only three of the gauges shown have general use, as follows:

United States Standard Gauge:

Galvanized and Galvanized Sheets (before coating)

Birmingham Wire Gauge:

Hot Rolled Strip (Bands and Hoops)

Boiler Tubes, Spring Steel, Half Oval Bars, Round Edge Flat Bars, Plates.

Washburn & Moen:

Bright and Annealed Steel Wire.

# Conversion Table

## Hardness

Brinell Indentation Diameter mm	Brinell Hardness Number 3000-Kg Load 10mm Tungsten Carbide Ball	ROCKWELL HARDNESS NUMBER			Vickers Diamond Pyramid Hardness Number	Tensile Strength (approximate) in 1000 psi
		A-Scale 60-Kg Load Brale Penetrator	B-Scale 100-Kg Load 1/16 in. Dia. Ball	C-Scale 150-Kg Load Brale Penetrator		
2.25	745	84.1	—	65.3	840	—
2.35	682	82.2	—	61.7	737	—
2.40	653	81.2	—	60.0	697	—
2.45	627	80.5	—	58.7	667	323
2.50	601	79.8	—	57.3	640	309
2.55	578	79.1	—	56.0	615	297
2.60	555	78.4	—	54.7	591	285
2.65	534	77.8	—	53.5	569	274
2.70	514	76.9	—	52.1	547	263
2.75	495	76.3	—	51.0	528	253
2.80	477	75.6	—	49.6	508	243
2.85	461	74.9	—	48.5	491	235
2.90	444	74.2	—	47.1	472	225
2.95	429	73.4	—	45.7	455	217
3.00	415	72.8	—	44.5	440	210
3.05	401	72.0	—	43.1	425	202
3.10	388	71.4	—	41.8	410	195
3.15	375	70.6	—	40.4	396	188
3.20	363	70.0	—	39.1	383	182
3.25	352	69.3	(110.0)	37.9	372	176
3.30	341	68.7	(109.0)	36.6	360	170
3.35	331	68.1	(108.5)	35.5	350	166
3.40	321	67.5	(108.0)	34.3	339	160
3.45	311	66.9	(107.5)	33.1	328	155
3.50	302	66.3	(107.0)	32.1	319	150
3.55	293	65.7	(106.0)	30.9	309	145
3.60	285	65.3	(105.5)	29.9	301	141
3.65	277	64.6	(104.5)	28.8	292	137
3.70	269	64.1	(104.0)	27.6	284	133
3.75	262	63.6	(103.0)	26.6	276	129
3.80	255	63.0	(102.0)	25.4	269	126
3.85	248	62.5	(101.0)	24.2	261	122
3.90	241	61.8	100.0	22.8	253	118
3.95	235	61.4	99.0	21.7	247	115
4.00	229	60.8	98.2	20.5	241	111

# Conversion Table — CONTINUED

## Hardness

Brinell Indentation Diameter mm	Brinell Hardness Number 3000-Kg Load 10mm Tungsten Carbide Ball	ROCKWELL HARDNESS NUMBER			Vickers Diamond Pyramid Hardness Number	Tensile Strength (approximate) in 1000 psi
		A-Scale 60-Kg Load Brale Penetrator	B-Scale 100-Kg Load 1/16 in. Dia. Ball	C-Scale 150-Kg Load Brale Penetrator		
4.05	223	—	97.3	(18.8)	234	—
4.10	217	—	96.4	(17.5)	228	105
4.15	212	—	95.5	(16.0)	222	102
4.20	207	—	94.6	(15.2)	218	100
4.25	201	—	93.8	(13.8)	212	98
4.30	197	—	92.8	(12.7)	207	95
4.35	192	—	91.9	(11.5)	202	93
4.40	187	—	90.7	(10.0)	196	90
4.45	183	—	90.0	(9.0)	192	89
4.50	179	—	89.0	(8.0)	188	87
4.55	174	—	87.8	(6.4)	182	85
4.60	170	—	86.8	(5.4)	178	83
4.65	167	—	86.0	(4.4)	175	81
4.70	163	—	85.0	(3.3)	171	79
4.80	156	—	82.9	(0.9)	163	76
4.90	149	—	80.8	—	156	73
5.00	143	—	78.7	—	150	71
5.10	137	—	76.4	—	143	67
5.20	131	—	74.0	—	137	65
5.30	126	—	72.0	—	132	63
5.40	121	—	69.8	—	127	60
5.50	116	—	67.6	—	122	58
5.60	111	—	65.7	—	117	56

The values in the foregoing table are taken from Table 2, Approximate Equivalent Hardness Numbers for Brinell Hardness Numbers, for Steel, page 108, 1963 SAE Handbook, Society of Automotive Engineers, Inc.

The values shown in parentheses are beyond the normal range of the test scale and are given for information only.

## STANDARD CHEMICAL COMPOSITIONS FOR CARBON STEELS

### Basic Open-Hearth and Acid Bessemer Carbon Steels

AISI No.	C	Mn.	P Max.	S Max.	SAE No.
C 1008	0.10 max.	0.25/0.50	0.040	0.050	1008
C 1010	0.08/0.13	0.30/0.60	0.040	0.050	1010
C 1012	0.10/0.15	0.30/0.60	0.040	0.050	—
C 1015	0.13/0.18	0.30/0.60	0.040	0.050	1015
C 1018	0.15/0.20	0.60/0.90	0.040	0.050	1018
C 1020	0.18/0.23	0.30/0.60	0.040	0.050	1020
C 1023	0.20/0.25	0.30/0.60	0.040	0.050	—
C 1025	0.22/0.28	0.30/0.60	0.040	0.050	1025
C 1030	0.28/0.34	0.60/0.90	0.040	0.050	1030
C 1035	0.32/0.38	0.60/0.90	0.040	0.050	1035
C 1040	0.37/0.44	0.60/0.90	0.040	0.050	1040
C 1045	0.43/0.50	0.60/0.90	0.040	0.050	1045
C 1050	0.48/0.55	0.60/0.90	0.040	0.050	1050
C 1055	0.50/0.60	0.60/0.90	0.040	0.050	1055
C 1060	0.55/0.65	0.60/0.90	0.040	0.050	1060
C 1065	0.60/0.70	0.60/0.90	0.040	0.050	1065
C 1070	0.65/0.75	0.60/0.90	0.040	0.050	1070
C 1080	0.75/0.88	0.60/0.90	0.040	0.050	1080
C 1085	0.80/0.93	0.70/1.00	0.040	0.050	1085
C 1095	0.90/1.03	0.30/0.50	0.040	0.050	1095
B 1010	0.13 max.	0.30/0.60	0.07/0.12	0.060	—

Acid Bessemer steels not furnished to specified silicone content.

AISI GRADE DESIGNATION

SILICON LIMITATIONS

Up to C 1015 Excl.

.10 Max.

C 1015 to C 1025 Incl.

.10 Max. 10-20 OR 15-30

Over C 1025

10-20 or 15-30

Copper: When required, copper is specified as an added element to a standard steel.

### Basic Open Hearth and Acid Bessemer Resulphurized Steels

AISI No.	C	Mn.	P Max.	S Max.	SAE No.
C 1108	0.08/0.13	0.50/0.80	0.040	0.08/0.13	—
C 1110	0.08/0.13	0.30/0.60	0.040	0.08/0.13	—
C 1115	0.13/0.18	0.60/0.90	0.040	0.08/0.13	1115
C 1117	0.14/0.20	1.00/1.30	0.040	0.08/0.13	1117
C 1118	0.14/0.20	1.30/1.60	0.040	0.08/0.13	1118
C 1120	0.18/0.23	0.70/1.00	0.040	0.08/0.13	1120
C 1137	0.32/0.39	1.35/1.65	0.040	0.08/0.13	1137
C 1141	0.37/0.45	1.35/1.65	0.040	0.08/0.13	1141
B 1112	0.13 max.	0.70/1.00	0.07/0.12	0.16/0.23	1112
B 1113	0.13 max.	0.70/1.00	0.07/0.12	0.24/0.33	1113

Resulphurized steels not subject to check analysis for sulphur

Acid Bessemer steels not furnished to specified silicon content.

AISI GRADE DESIGNATION

SILICONE LIMITATIONS

Up to C 1113 Excl.

.10 Max.

C 1113 and Over

.10 Max. .10-.20 or .15-.30

### Basic Open Hearth Rephosphorized and Resulphurized Steels

AISI No.	C	Mn.	P	S	SAE No.
C 1211	0.13 max.	0.60/0.90	0.07/0.12	0.08/0.15	—
C 1212	0.13 max.	0.70/1.00	0.07/0.12	0.16/0.23	—
C 1213	0.13 max.	0.70/1.00	0.07/0.12	0.24/0.33	—

**Note:** Rephosphorized and Resulphurized steels not subject to check analysis for phosphorus and sulphur. Rephosphorized and Resulphurized steels not furnished to specified silicon content.

## PHYSICAL PROPERTIES OF STEEL

These properties are approximate and are listed here only as a guide to what may be expected from the grades given.

A.I.S.I. No.	Condition	Tensile Strength Lb. per Sq. In.	Yield Point or Yiled Strgth <sup>1</sup> Lb. per Sq. In.	Elong 2" Per Cent	Reduc- tion of Area Per Cent	Brinell
C-1008	Hot Rolled	45000/55000	26000	45	65	90/124
	Cold Drawn	52000/62000	49000	30	55	114/143
C-1010	Hot Rolled	48000/58000	30000	38	65	95/134
	Cold Drawn	55000/65000	50000	25	52	124/162
C-1015	Hot Rolled	50000/70000	32000	35	60	105/143
	Cold Drawn	62000/77000	65000	19	50	124/171
C-1016	Hot Rolled	52000/70000	32000	35	60	105/143
	Cold Drawn	65000/80000	65000	19	50	133/171
C-1017	Hot Rolled	50000/70000	32000	35	60	105/143
	Cold Drawn <sup>2</sup>	.....	.....	..	..	.....
C-1018	Cold Drawn	72000/85000	62000	20	54	168
C-1019	Hot Rolled	52000/70000	32000	35	60	105/143
	Cold Drawn	65000/80000	65000	19	50	133/171
C-1020	Hot Rolled	54000/70000	32000	35	60	109/152
	Cold Drawn	66000/81000	67000	18	50	133/181
C-1022	Hot Rolled	55000/70000	32000	35	55	114/153
	Cold Drawn	67000/82000	69000	17	50	143/190
C-1025	Hot Rolled	60000/75000	35000	30	55	124/171
	Cold Drawn	70000/85000	70000	17	50	143/190
C-1030	Hot Rolled	65000/80000	38000	30	55	133/181
	Cold Drawn	75000/90000	75000	15	45	152/200
	<sup>3</sup> WQ 1600°F					
	Draw 1000°F	90000	65000	20	60	162/219
C-1035	Hot Rolled	70000/85000	43000	25	50	143/190
	Cold Drawn	80000/100000	80000	12	45	171/209
	<sup>3</sup> WQ 1525°F					
	Draw 1000°F	95000	68000	18	55	181/228
C-1040	Hot Rolled	75000/90000	48000	25	45	152/190
	Cold Drawn	85000/105000	80000	11	40	181/219
	<sup>4</sup> QQ 1550°F					
	Draw 1000°F	100000	62000	22	50	200/247
C-1045	Hot Rolled	80000/95000	50000	25	40	162/200
	Cold Drawn	90000/110000	85000	10	40	190/228
	<sup>4</sup> OQ 1500°F					
	Draw 1000°F	105000	65000	20	45	209/247
C-1050	Hot Rolled	90000/110000	55000	20	35	171/228
	Cold Drawn	100000/120000	90000	10	35	200/247
	<sup>4</sup> OQ 1500°F					
	Draw 1000°F	115000	75000	17	40	219/266
C-1095	Hot Rolled	140000	75000	8	10	296
	<sup>4</sup> OQ 1475°F					
	Draw 1000°F	175000	120000	10	20	375
B-1010	Hot Rolled	50000/70000	35000	35	55	101/140
	Cold Drawn	65000/80000	60000	17	50	131/170
C-1115	Hot Rolled	55000/70000	40000	35	55	107/146
	Cold Drawn	65000/80000	60000	20	50	140/179
C-1117	Hot Rolled	52000/67000	35000	35	55	109/153
	Cold Drawn	70000/85000	65000	21	45	143/179
C-1118	Hot Rolled	55000/72000	40000	35	55	109/153
	Cold Drawn	70000/90000	65000	19	45	143/179
C-1120	Hot Rolled	55000/70000	32000	35	55	109/153
	Cold Drawn <sup>2</sup>	.....	.....	..	..	.....
B-1111						
B-1112	Hot Rolled	55000/70000	35000	20	50	118/133
B-1113	Cold Drawn	80000/95000	75000	15	45	156/212



## CIRCUMFERENCE AND AREAS OF CIRCLES

OF ONE INCH			OF INCHES OR FEET					
Fract.	Circ.	Area	Dia.	Circ.	Area	Dia.	Circ.	Area
1-64	.04909	.00019	1	3.1416	.7854	64	201.06	3216.99
1-32	.09818	.00077	2	6.2832	3.1416	65	204.20	3318.31
3-64	.14726	.00173	3	9.4248	7.0686	66	207.34	3421.19
1-16	.19635	.00307	4	12.5664	12.5664	67	210.49	3525.65
5-64	.24545	.00479	5	15.7080	19.635	68	213.63	3631.68
3-32	.29452	.00690	6	18.850	28.274	69	216.77	3739.28
7-64	.34363	.00939	7	21.991	38.485	70	219.91	3848.45
1-8	.39270	.01227	8	25.133	50.266	71	223.05	3959.19
9-64	.44181	.01553	9	28.274	63.617	72	226.19	4071.50
5-32	.49087	.01917	10	31.416	78.540	73	229.34	4185.39
11-64	.53999	.02320	11	34.558	95.033	74	232.48	4300.84
3-16	.58905	.02761	12	37.699	113.1	75	235.62	4417.86
13-64	.63817	.03241	13	40.841	132.73	76	238.76	4536.46
7-32	.68722	.03758	14	43.982	153.94	77	241.90	4656.63
15-64	.73635	.04314	15	47.124	176.71	78	245.04	4778.36
1-4	.78540	.04909	16	50.265	201.06	79	248.19	4901.67
17-64	.83453	.05542	17	53.407	226.98	80	251.33	5026.55
9-32	.88357	.06213	18	56.549	254.47	81	254.47	5153.00
19-64	.93271	.06922	19	59.690	283.53	82	257.61	5281.02
5-16	.98175	.07670	20	62.832	314.16	83	260.75	5410.61
21-64	1.0309	.08456	21	65.973	346.36	84	263.89	5541.77
11-32	1.0799	.09281	22	69.115	380.13	85	267.04	5674.50
23-64	1.1291	.10144	23	72.257	415.48	86	270.18	5808.80
3-8	1.1781	.11045	24	75.398	452.39	87	273.32	5944.68
25-64	1.2273	.11984	25	78.540	490.87	88	276.46	6082.12
13-32	1.2763	.12962	26	81.681	530.93	89	279.60	6221.14
27-64	1.3254	.13979	27	84.823	572.56	90	282.74	6361.73
7-16	1.3744	.15033	28	87.965	615.75	91	285.88	6503.88
29-64	1.4236	.16126	29	91.106	660.52	92	289.03	6647.61
15-32	1.4726	.17257	30	94.248	706.86	93	292.17	6792.91
31-64	1.5218	.18427	31	97.389	754.77	94	295.31	6939.78
1-2	1.5708	.19635	32	100.53	804.25	95	298.45	7088.22
33-64	1.6199	.20880	33	103.67	855.30	96	301.59	7238.23
17-32	1.6690	.22166	34	106.81	907.92	97	304.73	7339.81
35-64	1.7181	.23489	35	109.96	962.11	98	307.88	7542.96
9-16	1.7671	.24850	36	113.10	1017.88	99	311.02	7697.69
37-64	1.8163	.26248	37	116.24	1075.21	100	314.16	7853.98
19-32	1.8653	.27688	38	119.38	1134.11	101	317.30	8011.85
39-64	1.9145	.29164	39	122.52	1194.59	102	320.44	8171.28
5-8	1.9635	.30680	40	125.66	1256.64	103	323.58	8332.29
41-64	2.0127	.32232	41	128.81	1320.25	104	326.73	8494.87
21-32	2.0617	.33824	42	131.95	1385.44	105	329.87	8659.01
43-64	2.1108	.35453	43	135.09	1452.20	106	333.01	8824.73
11-16	2.1598	.37122	44	138.23	1520.53	107	336.15	8992.02
45-64	2.2090	.38828	45	141.37	1590.43	108	339.29	9160.88
23-32	2.2580	.40574	46	144.51	1661.90	109	342.43	9331.32
47-64	2.3072	.42356	47	147.65	1734.94	110	345.58	9503.32
3-4	2.3562	.44179	48	150.80	1809.56	111	348.72	9676.89
49-64	2.4054	.45253	49	153.94	1885.74	112	351.86	9852.03
24-32	2.4544	.47937	50	157.08	1963.50	113	355.00	10028.75
51-64	2.5036	.49872	51	160.22	2042.82	114	358.14	10207.03
13-16	2.5525	.51849	52	163.36	2123.72	115	361.28	10386.89
53-64	2.6017	.53862	53	166.50	2206.18	116	364.42	10568.32
27-32	2.6507	.55914	54	169.65	2290.22	117	367.57	10751.32
55-64	2.6999	.58003	55	172.79	2375.83	118	370.71	10935.88
7-8	2.7489	.60132	56	175.93	2463.01	119	373.85	11122.02
57-64	2.7981	.62298	57	179.07	2551.76	120	376.99	11309.73
29-32	2.8471	.64504	58	182.21	2642.08	121	380.13	11499.01
59-64	2.8963	.66746	59	185.35	2733.97	122	383.27	11689.87
15-16	2.9452	.69029	60	188.50	2827.43	123	386.42	11882.29
61-64	2.9945	.71349	61	191.64	2922.47	124	389.56	12076.28
31-32	3.0434	.73708	62	194.78	3019.07	125	392.70	12271.85
63-64	3.0928	.76097	63	197.92	3117.25	126	395.84	12468.98

## ESTIMATED WEIGHTS OF STEEL CIRCLES

Dia.	Thickness														
	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1 1/8	1 1/4	1 3/8	1 1/2	1
4	44	67	89	111	133	155	178	201	223	245	267	290	312	334	357
6	100	150	200	251	300	350	400	452	501	551	601	651	701	751	830
8	177	266	355	445	533	622	711	803	891	980	1069	1158	1247	1336	1428
10	277	416	555	696	833	972	1111	1254	1393	1536	1671	1810	1949	2090	2231
12	399	599	800	1002	1199	1399	1599	1806	2005	2205	2406	2606	2806	3009	3212
14	543	816	1088	1364	1632	1904	2177	2458	2629	3002	3274	3547	3819	4095	4372
16	7	11	15	18	22	25	29	32	36	39	43	46	50	53	57
18	9	14	18	23	27	32	36	41	45	50	54	59	63	68	72
20	11	17	23	28	34	39	45	50	56	61	67	72	78	83	89
22	14	21	27	34	41	48	54	61	67	74	81	88	94	101	108
24	16	25	32	41	49	57	65	72	80	88	96	104	112	120	128
26	19	29	38	47	57	66	76	85	94	103	113	122	132	141	150
28	22	33	55	55	66	77	88	98	109	120	131	142	153	164	175
30	25	38	51	63	76	88	101	113	125	138	150	163	175	188	200
32	29	43	57	72	86	100	114	128	142	157	171	185	199	214	228
34	33	49	65	81	97	113	129	145	161	177	193	209	225	241	257
36	37	55	73	91	109	127	145	63	181	199	217	234	252	270	288
38	41	61	81	101	121	141	161	181	201	221	241	261	281	301	321
40	45	67	90	112	134	156	178	201	223	248	267	289	312	334	356
42	50	74	99	123	148	173	197	222	246	271	295	319	344	368	393
44	54	81	108	135	162	189	216	243	270	297	324	351	378	405	432
46	59	89	118	148	177	206	236	265	295	324	353	383	412	441	471
48	65	97	129	161	193	225	257	289	321	353	385	417	449	481	513
50	105	140	174	209	244	279	313	347	383	418	452	487	522	556	590
54	122	163	203	244	284	325	365	406	447	487	527	568	608	649	690
56	131	175	219	262	306	349	393	437	480	524	567	611	654	692	736
60	151	201	251	301	351	401	451	501	551	601	651	701	751	801	851
62	161	214	268	321	375	428	482	535	589	642	695	749	802	855	908
64	171	228	285	342	399	456	513	570	627	684	741	798	855	912	969
66	182	243	303	364	425	485	546	606	667	727	788	848	909	969	1029
68	194	258	322	387	451	520	580	644	709	773	836	900	965	1029	1093
70	205	273	341	409	478	546	614	682	750	818	886	954	1022	1090	1158
72	217	289	361	433	505	577	649	721	794	866	937	1009	1081	1154	1226
74	229	305	381	457	534	610	686	762	838	914	990	1066	1142	1219	1295
76	241	322	402	482	563	643	723	804	884	964	1045	1125	1205	1286	1366
78	339	424	508	593	677	762	847	931	1016	1100	1185	1270	1354	1439	1523
80	357	446	535	624	713	802	891	980	1069	1158	1247	1336	1425	1514	1603
82	375	468	562	655	749	842	936	1029	1123	1216	1310	1403	1497	1590	1683
84	393	491	589	687	786	884	982	1080	1178	1276	1374	1472	1571	1669	1767
86	412	515	618	721	823	926	1029	1132	1235	1338	1441	1543	1646	1748	1850
88	431	539	647	754	862	970	1077	1184	1292	1400	1507	1615	1723	1830	1937
90	451	564	676	789	902	1014	1127	1240	1352	1465	1578	1690	1803	1915	2027
92	471	589	707	825	942	1060	1178	1295	1413	1531	1648	1766	1883	1999	2116
94	492	615	738	861	984	1107	1229	1352	1475	1598	1721	1844	1967	2089	2212
96	513	641	770	898	1026	1154	1282	1410	1539	1667	1795	1923	2052	2179	2307
98	535	668	802	935	1069	1203	1336	1470	1603	1737	1870	2004	2138	2271	2404
100	557	696	835	974	1113	1252	1391	1530	1669	1808	1948	2087	2226	2365	2504
102	724	869	1013	1158	1303	1447	1592	1737	1881	2026	2171	2316	2461	2605	2750
104	753	903	1053	1204	1354	1505	1655	1806	1956	2106	2256	2406	2556	2706	2856
106	782	938	1094	1251	1407	1563	1719	1876	2032	2188	2345	2501	2657	2813	2969
108	812	974	1136	1298	1460	1623	1785	1947	2109	2271	2434	2596	2758	2920	3082
110	842	1010	1178	1347	1515	1683	1852	2020	2188	2356	2525	2693	2861	3029	3197
112	873	1047	1222	1396	1571	1745	1920	2094	2268	2443	2617	2792	2966	3140	3314
114	904	1085	1266	1446	1627	1808	1989	2169	2350	2531	2712	2892	3072	3252	3432
116	936	1123	1310	1498	1685	1872	2059	2246	2433	2620	2808	2995	3182	3369	3556
118	969	1162	1356	1550	1743	1937	2131	2324	2518	2712	2905	3099	3292	3485	3678
120	1002	1202	1402	1603	1803	2003	2203	2404	2604	2804	3004	3205	3405	3605	3805
122	1036	1243	1450	1657	1864	2071	2278	2485	2692	2899	3106	3313	3520	3727	3934
124	1070	1284	1497	1711	1925	2139	2353	2567	2781	2994	3208	3422	3636	3850	4064

## FRACTIONS OF AN INCH IN EQUIVALENT DECIMALS

Fractions of an Inch	=	Decimals of an Inch	Fractions of an Inch	=	Decimals of an Inch
$\frac{1}{64}$	=	.015625	$\frac{39}{64}$	=	.515625
$\frac{1}{32}$	=	.03125	$\frac{17}{32}$	=	.53125
$\frac{3}{64}$	=	.046875	$\frac{35}{64}$	=	.546875
$\frac{1}{16}$	=	.0625	$\frac{9}{16}$	=	.5625
$\frac{5}{64}$	=	.078125	$\frac{37}{64}$	=	.578125
$\frac{3}{32}$	=	.09375	$\frac{19}{32}$	=	.59375
$\frac{7}{64}$	=	.109375	$\frac{39}{64}$	=	.609375
$\frac{1}{8}$	=	.125	$\frac{5}{8}$	=	.625
$\frac{9}{64}$	=	.140625	$\frac{41}{64}$	=	.640625
$\frac{5}{32}$	=	.15625	$\frac{21}{32}$	=	.65625
$\frac{11}{64}$	=	.171875	$\frac{43}{64}$	=	.671875
$\frac{3}{16}$	=	.1875	$\frac{11}{16}$	=	.6875
$\frac{13}{64}$	=	.203125	$\frac{45}{64}$	=	.703125
$\frac{7}{32}$	=	.21875	$\frac{23}{32}$	=	.71875
$\frac{15}{64}$	=	.234375	$\frac{47}{64}$	=	.734375
$\frac{1}{4}$	=	.25	$\frac{3}{4}$	=	.75
$\frac{17}{64}$	=	.265625	$\frac{49}{64}$	=	.765625
$\frac{9}{32}$	=	.28125	$\frac{25}{32}$	=	.78125
$\frac{19}{64}$	=	.296875	$\frac{51}{64}$	=	.796875
$\frac{5}{16}$	=	.3125	$\frac{13}{16}$	=	.8125
$\frac{21}{64}$	=	.328125	$\frac{53}{64}$	=	.828125
$\frac{11}{32}$	=	.34375	$\frac{27}{32}$	=	.84375
$\frac{23}{64}$	=	.359375	$\frac{55}{64}$	=	.859375
$\frac{3}{8}$	=	.375	$\frac{7}{8}$	=	.875
$\frac{25}{64}$	=	.390625	$\frac{57}{64}$	=	.890625
$\frac{13}{32}$	=	.40625	$\frac{29}{32}$	=	.90625
$\frac{27}{64}$	=	.421875	$\frac{59}{64}$	=	.921875
$\frac{7}{16}$	=	.4375	$\frac{15}{16}$	=	.9375
$\frac{29}{64}$	=	.453125	$\frac{61}{64}$	=	.953125
$\frac{15}{32}$	=	.46875	$\frac{31}{32}$	=	.96875
$\frac{31}{64}$	=	.484375	$\frac{63}{64}$	=	.984375
$\frac{1}{2}$	=	.5	1 in.	=	1.000000

## DECIMALS OF A FOOT

Inch	$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	$\frac{7}{8}$ "
0	.010	.020	.031	.041	.052	.062	.072
1"	.083	.104	.114	.125	.135	.145	.156
2"	.166	.187	.197	.208	.218	.229	.239
3"	.250	.270	.281	.291	.302	.312	.322
4"	.333	.354	.364	.375	.385	.395	.406
5"	.416	.427	.447	.458	.468	.479	.489
6"	.500	.510	.531	.541	.552	.562	.572
7"	.583	.593	.614	.625	.635	.645	.656
8"	.666	.677	.697	.708	.718	.729	.739
9"	.750	.760	.781	.791	.802	.812	.822
10"	.833	.843	.864	.875	.885	.895	.906
11"	.916	.927	.947	.958	.968	.979	.989

## WEIGHTS AND MEASURES

### United States System

#### LINEAR MEASURE

Inches	Feet	Yards	Rods	Furlongs	Miles
1.0=	.08333 =	.02778=	.0050505=	.00012626=	.00001578
12.0=	1.0 =	.333 =	.0606061=	.00151515=	.00018939
36.0=	3.0 =	1.0 =	.1818182=	.00454545=	.00056818
198.0=	16.5 =	5.5 =	1.0 =	.024 =	.003125
7920.0=	660.0 =	220.0 =	40.0 =	1.0 =	.125
63360.0=	5280.0 =	1760.0 =	320.0 =	8.0 =	1.0

#### SQUARE AND LAND MEASURE

Sq. Inches	Square Feet	Square Yards	Sq. Rods	Acres	Sq. Miles
1.0=	.006944=	.000772			
144.0=	1.0 =	.111111			
1296.0=	9.0 =	1.0 =	.03306 =	.000207 =	
39204.0=	272.25 =	30.25 =	1.0 =	.00625 =	.0000098
=43560.0	=	4840.0 =	160.0 =	1.0 =	.0015625
=	=	3097600.0 =	102400.0 =	640.0 =	1.0

#### AVOIRDUPOIS WEIGHTS

Grains	Drams	Ounces	Pounds	Tons
1.0 =	.03657 =	.002286=	.000143=	.0000000714
27.34375=	1.0 =	.0625 =	.003906=	.00000195
437.5 =	16.0 =	1.0 =	.0625 =	.00003125
7000.0 =	256.0 =	16.0 =	1.0 =	.0005
14000000.0 =	512000.0 =	32000.0 =	2000.0 =	1.0

#### DRY MEASURE

Pints	Quarts	Pecks	Cubic Feet	Bushels
1.0 =	.5 =	.0625 =	.01945=	.01563
2.0 =	1.0 =	.125 =	.03891=	.03125
16.0 =	8.0 =	1.0 =	.31112=	.25
51.42627 =	25.71314 =	3.21414 =	1.0 =	.80354
64.0 =	32.00 =	4.0 =	1.2445 =	1.0

#### LIQUID MEASURE

Gills	Pints	Quarts	U.S. Gallons	Cubic Feet
1.0 =	.25 =	.125 =	.03125=	.00418
4.0 =	1.0 =	.5 =	.125 =	.01671
8.0 =	2.0 =	1.0 =	.250 =	.03342
32.0 =	8.0 =	4.0 =	1.0 =	.1337
			7.48052=	1.0

## METRIC CONVERSION TABLE

1 meter.....	=	39.37 inches
1 centimeter.....	=	.3937 inch
1 millimeter.....	=	.03937 inch
1 square meter.....	=	10.76 sq. feet
1 square centimeter.....	=	.155 sq. inch
1 square millimeter.....	=	.00155 sq. inch
1 kilogram.....	=	2.2046 lbs.
1 metric ton.....	=	2204.6 lbs.
1 kilogram per sq. centimeter.....	=	14.2234 lbs. per sq. in.
1 kilogram per sq. millimeter.....	=	1422.34 lbs. per sq. in.
Mpa to psi.....	=	multiply by 145.0377
Mpa to ksi.....	=	multiply by .1450377
1 square inch.....	=	6.452 sq. centimeters
1 square foot.....	=	.0929 sq. meter
1 square yard.....	=	.8361 sq. meter
1 acre.....	=	.4047 hectare
1 acre.....	=	.004047 sq. kilometer
1 square mile.....	=	2.590 sq. kilometers
1 pound.....	=	.4536 kilogram
1 ton.....	=	.9078 metric tons



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