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## ALL GRADES SHEARED & BURNED PLATES

Size	Weight Per Sheet	Size	Weight Per Sheet
<b>3/16"</b> 7.6579#/Sq. Ft. (.05318#/Sq. In.)		<b>1/4"</b> 96 x 240"	1633.54
48 x 96"	245.05	96 x 288"	1960.24
48 x 120"	306.32	96 x 360"	2450.30
48 x 144"	367.58	96 x 480"	3267.07
48 x 240"	612.63	120 x 360"	3062.88
48 x 288"	735.16	120 x 480"	4083.84
60 x 96"	306.32	<b>5/16"</b> 12.7827#/Sq. Ft. (.08863#/Sq. In.)	
60 x 120"	382.90	48 x 96"	408.41
60 x 144"	459.47	48 x 120"	510.51
60 x 192"	612.63	48 x 144"	612.61
60 x 240"	765.79	48 x 240"	1021.02
60 x 288"	918.94	60 x 96"	510.51
72 x 96"	367.58	60 x 120"	638.14
72 x 120"	459.47	60 x 144"	765.76
72 x 144"	551.37	60 x 240"	1276.27
72 x 192"	735.16	60 x 288"	1531.53
72 x 240"	918.95	60 x 360"	1914.41
72 x 288"	1102.74	72 x 96"	612.61
72 x 360"	1378.42	72 x 120"	765.76
84 x 96"	428.84	72 x 144"	918.92
84 x 120"	536.05	72 x 240"	1531.53
84 x 144"	643.26	72 x 288"	1837.83
84 x 240"	1072.11	72 x 360"	2297.29
84 x 288"	1286.53	84 x 120"	893.39
84 x 360"	1608.16	84 x 144"	1072.07
96 x 240"	1225.26	84 x 240"	1786.78
96 x 288"	1470.32	84 x 288"	2144.14
96 x 360"	1837.90	84 x 360"	2680.17
<b>1/4"</b> 10.2096/Sq. Ft. (.0709#/Sq. In.)		84 x 480"	3573.56
48 x 96"	326.70	96 x 240"	2042.04
48 x 120"	408.38	96 x 288"	2450.44
48 x 144"	490.06	96 x 360"	3063.05
48 x 240"	816.77	96 x 480"	4084.07
48 x 288"	980.13	120 x 360"	3828.82
60 x 96"	408.38	<b>3/8"</b> 15.3144#/Sq. Ft. (.10635#/Sq. In.)	
60 x 120"	510.48	48 x 96"	490.06
60 x 144"	612.58	48 x 120"	612.58
60 x 192"	816.77	48 x 144"	735.09
60 x 240"	1020.96	48 x 240"	1225.15
60 x 288"	1225.15	48 x 288"	1470.18
60 x 360"	1531.44	60 x 96"	612.58
72 x 96"	490.06	60 x 120"	765.72
72 x 120"	612.58	60 x 144"	918.86
72 x 144"	735.09	60 x 240"	1531.44
72 x 192"	980.12	60 x 288"	1837.73
72 x 240"	1225.15	72 x 96"	735.09
72 x 288"	1470.18	72 x 120"	918.86
72 x 360"	1837.73	72 x 144"	1102.64
84 x 96"	571.74	72 x 192"	1470.18
84 x 120"	714.67	72 x 240"	1837.73
84 x 144"	857.61	72 x 288"	2205.27
84 x 192"	1143.48	72 x 360"	2756.59
84 x 240"	1429.34	84 x 96"	857.61
84 x 288"	1715.21	84 x 120"	1072.01
84 x 360"	2144.02		
84 x 480"	2858.69		

## ALL GRADES SHEARED & BURNED PLATES

Size	Weight Per Sheet	Size	Weight Per Sheet
<b>3/8"</b> 84 x 144"	1286.41	<b>5/8"</b> 72 x 240"	3062.88
84 x 240"	2144.02	72 x 288"	3675.46
84 x 288"	2572.82	84 x 240"	3573.36
84 x 360"	3216.02	84 x 288"	4288.03
84 x 480"	4288.03	84 x 360"	5360.04
96 x 120"	1225.15	84 x 480"	7146.72
96 x 240"	2450.30	96 x 240"	4083.84
96 x 288"	2940.36	96 x 360"	6125.76
96 x 360"	3675.46	96 x 480"	8167.68
96 x 480"	4900.61	120 x 360"	7657.20
120 x 360"	4594.32	120 x 480"	10209.60
120 x 480"	6125.76	<b>11/16"</b> 28.0771#/Sq. Ft. (.194980#/Sq. In.)	
<b>7/16"</b> 17.8675#/Sq. Ft. (.12408#/Sq. In.)		<b>3/4"</b> 30.6288#/Sq. Ft. (.21270#/Sq. In.)	
84 x 360"	3752.18	48 x 96"	980.12
96 x 240"	2858.80	48 x 120"	1225.15
96 x 360"	4288.20	48 x 240"	2450.30
96 x 480"	5717.61	60 x 120"	1531.44
<b>1/2"</b> 20.4192#/Sq. Ft. (.1418#/Sq. In.)		60 x 240"	3062.88
48 x 96"	653.41	72 x 240"	3675.46
48 x 120"	816.77	72 x 288"	4410.55
48 x 144"	980.12	72 x 360"	5513.18
48 x 240"	1633.54	84 x 240"	4288.03
60 x 144"	1225.15	84 x 360"	6432.05
60 x 240"	2041.92	84 x 480"	8576.06
60 x 288"	2450.30	96 x 240"	4900.61
72 x 120"	1225.15	96 x 288"	5880.73
72 x 144"	1470.18	96 x 360"	7350.91
72 x 240"	2450.30	96 x 480"	9801.22
72 x 288"	2940.36	120 x 360"	9188.64
72 x 360"	3675.46	120 x 480"	12251.52
84 x 120"	1429.34	<b>13/16"</b> 33.1819#/Sq. Ft. (.230430#/Sq. In.)	
84 x 240"	2858.69	<b>7/8"</b> 35.7336#/Sq. Ft. (.24815#/Sq. In.)	
84 x 288"	3430.43	72 x 240"	4288.03
84 x 360"	4288.03	84 x 240"	5002.70
84 x 480"	5717.38	96 x 240"	5717.38
96 x 120"	1633.54	96 x 360"	8576.06
96 x 240"	3267.07	<b>15/16"</b> 38.2867#/Sq. Ft. (.26588#/Sq. In.)	
96 x 288"	3920.49	<b>1"</b> 40.8384#/Sq. Ft. (.28360#/Sq. In.)	
96 x 360"	4900.61	48 x 96"	1306.83
96 x 480"	6534.14	48 x 120"	1633.54
120 x 360"	6125.76	60 x 120"	2041.92
120 x 480"	8167.68	60 x 240"	4083.84
<b>9/16"</b> 22.9723#/Sq. Ft. (.159534#/Sq. In.)		72 x 240"	4900.61
60 x 360"	3445.85	72 x 360"	7350.91
96 x 360"	5513.36	84 x 240"	5717.38
<b>5/8"</b> 25.524#/Sq. Ft. (.17725#/Sq. In.)		84 x 288"	6860.85
48 x 96"	816.77	84 x 360"	8576.06
48 x 120"	1020.96		
60 x 120"	1276.20		
60 x 240"	2552.40		

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## ALL GRADES SHEARED & BURNED PLATES

Size	Weight Per Sheet	Size	Weight Per Sheet
1" 96 x 240"	6534.14	2" 84 x 240"	11434.75
96 x 288"	7840.97	84 x 360"	17152.13
96 x 360"	9801.22	96 x 240"	13068.29
120 x 360"	12251.52	96 x 360"	19602.43
120 x 480"	16335.36	2-1/4" 91.8864#/Sq. Ft. (.63810#/Sq. In.)	
1-1/8" 45.9432#/Sq. Ft. (.31905#/Sq. In.)		84 x 240"	12864.10
96 x 288"	8821.09	96 x 240"	14701.82
96 x 240"	7350.91	2-3/8" 96.9912#/Sq. Ft. (.67360#/Sq. In.)	
96 x 360"	11026.37	2-1/2" 102.0960#/Sq. Ft. (.7090#/Sq. In.)	
1-1/4" 51.048#/Sq. Ft. (.3545#/Sq. In.)		72 x 240"	12251.52
60 x 240"	5104.80	84 x 240"	14293.44
72 x 240"	6125.76	96 x 240"	16335.36
84 x 240"	7146.72	2-3/4" 112.3056#/Sq. Ft. (.7799#/Sq. In.)	
84 x 288"	8576.06	96 x 240"	17968.90
84 x 360"	10720.08	3" 122.5152#/Sq. Ft. (.8508#/Sq. In.)	
96 x 120"	4083.44	60 x 240"	12251.52
96 x 240"	8167.68	72 x 240"	14701.82
96 x 360"	12251.52	84 x 192"	13721.70
1-3/16" 48.4956#/Sq. Ft. (.336775#/Sq. In.)		84 x 240"	17152.13
1-3/8" 56.1528#/Sq. Ft. (.38995#/Sq. In.)		96 x 240"	19602.43
96 x 240"	8984.45	3-1/4" 132.7248#/Sq. Ft. (.9217#/Sq. In.)	
96 x 360"	13476.67	84 x 120"	9290.74
96 x 480"	17968.90	96 x 192"	16988.77
1-1/2" 61.2576#/Sq. Ft. (.42540#/Sq. In.)		96 x 240"	21235.97
60 x 240"	6125.76	3-1/2" 142.9344#/Sq. Ft. (.9926#/Sq. In.)	
72 x 240"	7350.91	84 x 240"	20010.82
84 x 240"	8576.06	96 x 120"	11434.75
84 x 288"	10291.28	96 x 144"	13721.70
96 x 240"	9801.22	96 x 192"	18295.60
96 x 360"	14701.82	96 x 240"	22869.50
120 x 360"	18377.28	3-3/4" 153.1440#/Sq. Ft. (1.0635#/Sq. In.)	
1-5/8" 66.3624#/Sq. Ft. (.46085#/Sq. In.)		84 x 120"	10720.08
96 x 240"	10617.98	96 x 192"	19602.43
120 x 360"	19908.72	4" 163.3536#/Sq. Ft. (1.1344#/Sq. In.)	
1-3/4" 71.4672#/Sq. Ft. (.49630#/Sq. In.)		84 x 192"	18295.60
84 x 240"	10005.41	84 x 240"	22869.50
84 x 360"	15008.11	96 x 120"	13068.29
96 x 240"	11434.75	96 x 144"	15681.95
96 x 360"	17152.13	96 x 192"	20909.26
1-7/8" 76.5720#/Sq. Ft. (.531750#/Sq. In.)		96 x 240"	26136.58
2" 81.6768#/Sq. Ft. (.5672#/Sq. In.)		4-1/2" 183.7728#/Sq. Ft. (1.2762#/Sq. In.)	
48 x 288"	7840.97	72 x 240"	22052.74
60 x 240"	8167.68	84 x 192"	20582.55
72 x 240"	9801.22	96 x 120"	15294.18
72 x 288"	11761.46		

## ALL GRADES SHEARED & BURNED PLATES

Size	Weight Per Sheet	Size	Weight Per Sheet
5" 204.1920#/Sq. Ft. (1.4180#/Sq. In.)		8" 326.7072#/Sq. Ft. (2.2688#/Sq. In.)	
60 x 240"	20419.20	72 x 120"	19602.43
96 x 120"	18335.36	8-1/2" 347.1264#/Sq. Ft. (2.410600#/Sq. In.)	
96 x 144"	19602.43	5-1/2" 224.6112#/Sq. Ft. (1.5598#/Sq. In.)	
5-1/2" 224.6112#/Sq. Ft. (1.5598#/Sq. In.)		96 x 120"	17968.90
6" 245.0304#/Sq. Ft. (1.7016#/Sq. In.)		6" 245.0304#/Sq. Ft. (1.7016#/Sq. In.)	
72 x 144"	17642.19	72 x 144"	17642.19
96 x 120"	19602.43	96 x 120"	19602.43
6-1/2" 265.4496#/Sq. Ft. (1.8434#/Sq. In.)		6-1/2" 265.4496#/Sq. Ft. (1.8434#/Sq. In.)	
7" 285.8688#/Sq. Ft. (1.9852#/Sq. In.)		7" 285.8688#/Sq. Ft. (1.9852#/Sq. In.)	
72 x 120"	17152.13	72 x 120"	17152.13
84 x 120"	20010.82	84 x 120"	20010.82
7-1/2" 306.2880#/Sq. Ft. (2.1270#/Sq. In.)		7-1/2" 306.2880#/Sq. Ft. (2.1270#/Sq. In.)	
72 x 120"	18377.28	72 x 120"	18377.28

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## HIGH STRENGTH LOW ALLOY STRUCTURAL MANGANESE VANADIUM STEEL PLATES ASTM A-441

This specification covers high strength low alloy steel plates intended for structural application where savings in weight or added durability are important. These steels have enhanced atmospheric corrosion resistance at least twice that of carbon structural grades with copper addition. The specification is limited to material up to 8" in thickness. These steels are to conform to the requirements of ASTM A-6, General Requirements for delivery of Structural Steel.

### CHEMISTRY

	C max.	Mn.	P max.	S max.	Si max.	Cu min.	V min.
A-441	0.22	0.85/1.25	0.04	0.05	0.30	0.20	0.02

### MECHANICAL PROPERTIES

	Thickness Range			
	¾ inch and under	Over ¾ to 1½ inch, Incl.	Over 1½ to 4 inches, Incl.	Over 4 to 8 inches, Incl.
Tensile Strength, min. Ksi	70.0	67.0	63.0	60.0
Yield Strength, min. Ksi	50.0	46.0	42.0	40.0
Elongation, min. % in 8"	18.0	18.0	18.0	—
Elongation, min. % in 2"	—	21.0	21.0	21.0

## HIGH CARBON PLATE AISI 1040-1042

An open hearth steel generally used in place of low carbon plate where its greater strength or hardness characteristics are desired. With its higher carbon content it can be satisfactorily flame or induction hardened.

### CHEMISTRY

C max.	Mn	P max.	S max.	Si
.37/.47	.60/.90	.040	.050	to .25

### MECHANICAL PROPERTIES\*

Tensile (Ksi)	Yield (Ksi)	Elongation % in 2", min.	Hardness
85.0/95.0	50.0/60.0	25.0	Bhn 165/185

\*Average, not generally reported; to AISI Chemistry only.

## HEAT TREATED CONSTRUCTIONAL ALLOY STEEL PLATES ASTM A-514

Heat Treated Constructional Alloy Steel Plates are super-strength, heat treated plates of structural quality intended primarily for use in bridges, earth moving equipment, machinery, and other high strength applications. These plates possess greater hardness and strength than regular high tensile steel plates. They have an exceptionally high strength to weight ratio, and thus permit considerable savings in weight without loss of strength. They are readily welded by most electric arc processes using low hydrogen electrodes and moderate care. Cold forming is relatively easy, providing sufficient power is available and suitable bending radii are used. Shearing and punching are also feasible in moderate thicknesses depending upon the hardness of the plate. Machinability is comparable to other alloy steels of similar hardness.

### GENERAL ANALYSIS RANGES

A.S.T.M.	C	Mn	P	S	Si	Ni	Cr
Grade A	.15/.21	.80/1.10	.035 Max.	.04 Max.	.40/.80	—	.50/.80
Grade B	.12/.21	.70/1.00	.035 Max.	.04 Max.	.20/.35	—	.40/.65
Grade C	.10/.20	1.10/1.50	.035 Max.	.04 Max.	.15/.30	—	—
Grade D	.13/.20	.40/.70	.035 Max.	.04 Max.	.20/.35	—	.85/1.20
Grade E	.12/.20	.40/.70	.035 Max.	.04 Max.	.20/.35	—	1.40/2.00
Grade F	.10/.20	.60/1.00	.035 Max.	.04 Max.	.15/.35	.70/1.00	.40/.65
Grade G	.15/.21	.80/1.10	.035 Max.	.04 Max.	.50/.90	—	.50/.90
Mo	V	Ti	Zr	Cu	B		
.18/.28	—	—	.05/.15	—	.0025 Max.		
.15/.25	.03/.08	.01/.03	—	—	.0005/.005		
.20/.30	—	—	—	—	.001/.005		
.15/.25	*	.04/.10	—	.20/.40	.0015/.005		
.40/.60	*	.04/.10	—	.20/.40	.0015/.005		
.40/.60	.03/.08	—	—	.15/.50	.002/.006		
.40/.60	—	—	.05/.15	—	.0025 Max.		

\*May be substituted for an equivalent amount of titanium.

Continued on following page.

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Continued from preceding page.

## HEAT TREATED CONSTRUCTIONAL ALLOY STEEL PLATES ASTM A-514

### MECHANICAL PROPERTIES

	Thickness Range		
	To 3/4 Inch, Incl.	Over 3/4 to 2 1/2 Inch, Incl.	Over 2 1/2 to 4 Inches, Incl.
.2% Yield Strength, Min. P.S.I.....	100,000	100,000	90,000
Tensile Strength, Min., P.S.I.....	115/135,000	115/135,000	105/135,000
% Elong. in 2 inches, Min., per cent	18	18	17
% Red. of Area, Min., per cent....	40	40/50*	50
Brinell Hardness.....	235/293	235/293	229/293
Diameter of Cold Bend.....	2T**	3T***	4T

\*For plate thicknesses over 1 1/2".

\*\*Material thicknesses 1" and under—T represents plate thickness.

\*\*\*Material thickness 1" to 2 1/2", Incl.—T represents plate thickness.

Plates are also furnished in hardnesses up to about 360 Brinell, but in such instances all specifications for other properties are waived.

### OTHER ENGINEERING DATA

Resistance to atmospheric corrosion.....	4 to 6 times carbon steel
Elevated temperature properties.....	Approx. 3 times carbon steel
Linear coefficient of expansion.....	Approx. $7.74 \times 10^{-6}$ in. per in. per °F.
Fatigue Resistance.....	65,000/75,000 P.S.I.
Charpy impact at 10°F., V notch.....	.20 foot-pounds
Charpy impact at -50°F., keyhole notch.....	.15 foot-pounds
Modulus of elasticity.....	Approx. 30,000,000 P.S.I.

### FABRICATION PRACTICES

Cold bending.....	See Mechanical Properties Table
Cold shearing.....	Up to about 1 inch thick
Machining.....	The same as other alloy steels of similar hardness
Welding.....	Can be electric arc welded using low hydrogen electrodes

### Why are you using so much warehouse space with steel inventory?

Good question. But it is surprising how infrequently this question is asked... and answered... in the metalworking industry. Space is a factor of cost that is so often taken for granted that it is not added into the cost of production. Our large storage facilities are always available to you without cost and are part of the service we render as your "Steel Service Center." Stop using valuable production space for unnecessary metals inventory. Buy from us in shorter cycles and add to your operating profit.

## PRESSURE VESSEL PLATES, CARBON STEEL, LOW AND INTERMEDIATE TENSILE STRENGTH ASTM A-285 ASME SA-285

This specification covers three grades of carbon steel plates of low and intermediate tensile strengths which may be made by killed or semi-killed practices. These plates are intended for fusion-welded pressure vessels. The maximum thickness of plates under this specification for all grades is 2". Plates to a maximum thickness of 1/2" may be processed as coils. This specification shall conform to the requirements of ASTM A-20 general requirements for delivery of Pressure Vessel Steels.

### CHEMISTRY

	C max.	Mn max.	P max.	S
ASTM A-/ASME SA-285 Grade A	0.17	0.90	0.035	0.045
ASTM A-/ASME SA-285 Grade B	0.22	0.90	0.035	0.045
ASTM A-/ASME SA-285 Grade C	0.28	0.90	0.035	0.045

### MECHANICAL PROPERTIES

	Tensile (Ksi) min.	Yield (Ksi) min.	Elongation % in 8", min.	Elongation % in 2", min.
ASTM A-/ASME SA-285 Grade A	45.0/55.0	24.0	27.0	30.0
ASTM A-/ASME SA-285 Grade B	50.0/60.0	27.0	25.0	28.0
ASTM A-/ASME SA-285 Grade C	55.0/65.0	30.0	23.0	27.0

## PRESSURE VESSEL PLATES, CARBON STEEL, FOR INTERMEDIATE AND HIGHER-TEMPERATURE SERVICE ASTM A-515 ASME SA-515

This specification covers carbon-silicon steel plates primarily for intermediate and higher-temperature service in welded boilers and other pressure vessels. Material under this specification is available in four grades. Material shall conform to the requirements of ASTM A-20, general requirement for delivery of Pressure Vessel Steels. These plates are ordered as PVQ with additional S-3 tension testing simulating post-weld heat treatment conditions. This specification is produced to a coarse grain practice.

### CHEMISTRY

	*C max.	Mn max.	P max.	S max.	Si, Ladle
ASME SA-515 Gr. 55	0.20/0.28	0.90	0.035	0.04	0.15/0.30
ASME SA-515 Gr. 60	0.24/0.31	0.90	0.035	0.04	0.15/0.30
ASME SA-515 Gr. 65	0.28/0.33	0.90	0.035	0.04	0.15/0.30
ASME SA-515 Gr. 70	0.31/0.35	0.90	0.035	0.04	0.15/0.30

\*Carbon range due to increasing carbon content with increasing thickness.

### MECHANICAL PROPERTIES

	Tensile (Ksi) min.	Yield (Ksi) min.	Elongation % in 8", min.	Elongation % in 2", min.
ASME SA-515 Gr. 55	55.0/65.0	30.0	23.0	27.0
ASME SA-516 Gr. 60	60.0/72.0	32.0	21.0	25.0
ASME SA-516 Gr. 65	65.0/77.0	35.0	19.0	23.0
ASME SA-516 Gr. 70	70.0/85.0	38.0	17.0	21.0

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## PRESSURE VESSEL PLATES, CARBON STEEL, FOR MODERATE AND LOWER-TEMPERATURE SERVICE ASTM A-516 ASME SA-516

This specification covers carbon-silicon steel plates primarily for moderate and lower temperature service in welded pressure vessels where improved notch toughness is important. Material under this specification is available in four grades. Material shall conform to the requirements of ASME SA-20, general requirement for delivery of Pressure Vessel Steels. These plates are ordered as PVQ with additional S-3 tension testing simulating post-weld heat treatment conditions. This steel is produced to fine grain practice. When ordered for moderate and low temperature service, Charpy V-notch longitudinal information may be reported according to ASME SA-20 Classes III and IV. Plates over 1½" in thickness are carried in stock as normalized.

CVNL to SA-20 Class III: ASME SA-516 Grades 55-65  
Class IV: ASME SA-516 Grade 70

### CHEMISTRY

	C max.	Mn	P max.	S max.	Si
ASME SA-516 Grade 55	0.18/0.26	0.60/0.90	0.035	0.04	0.15/0.30
ASME SA-516 Grade 60	0.21/0.27	0.60/0.90	0.035	0.04	0.15/0.30
ASME SA-516 Grade 65	0.24/0.29	0.85/1.20	0.035	0.04	0.15/0.30
ASME SA-516 Grade 70	0.27/0.31	0.85/1.20	0.035	0.04	0.15/0.30

### MECHANICAL PROPERTIES

	Tensile (Ksi) min.	Yield (Ksi) min.	Elongation % in 8" min.	Elongation % in 2" min.
ASME SA-516 Grade 55	55.0/65.0	30.0	23.0	27.0
ASME SA-516 Grade 60	60.0/72.0	32.0	21.0	25.0
ASME SA-516 Grade 65	65.0/77.0	35.0	19.0	23.0
ASME SA-516 Grade 70	70.0/85.0	38.0	17.0	21.0

Size in Inches	Estimated Wt Lbs Per Foot	Size in Inches	Estimated Wt Lbs Per Foot
¼x48	40.84	¾x60	153.15
60	51.05	84	214.41
72	61.26	96	245.04
84	71.47	120	306.30
96	81.68	⅞x84	250.18
120	102.10	96	285.92
⅕x60	63.80	120	357.40
72	76.56	1 x84	285.88
84	89.32	96	326.72
96	102.08	120	408.40
120	127.60	1⅛x84	321.65
⅞x48	61.28	96	367.60
60	76.60	1¼x84	357.35
72	91.92	96	408.40
84	107.24	1⅝x84	393.12
96	122.56	96	449.28
120	153.20	1½x84	428.82
⅙x72	107.22	96	490.08
84	125.09	1⅞x96	530.96
96	143.96	1¾x84	500.29
120	178.70	96	571.76
½x48	81.68	2 x84	571.76
60	102.10	96	653.44
72	122.52	2¼x96	735.12
84	142.94	2¾x96	898.48
96	163.36	3 x96	980.16
120	204.20	3¼x96	1061.76
⅝x60	127.65	3½x96	1143.44
72	153.18	3¾x96	1225.12
84	178.71	4 x96	1306.80
96	204.21	4½x96	1407.16
120	255.30	4¾x96	1551.84

## STAINLESS AND HEAT-RESISTING CHROMIUM AND CHROMIUM-NICKEL STEEL PLATES FOR FUSION-WELDED UNFIRED PRESSURE VESSELS ASME SA-240 ASTM A-240

This specification covers numerous grades of chromium-nickel stainless and heat resisting alloy steels in various forms. Noted below are three of the most common grades of plates. Materials furnished under this specification shall meet the general requirements of ASME SA-480. The most notable characteristics of these alloy steel plates are their various levels of corrosion resistance and suitability for elevated temperature service.

### CHEMISTRY

	C max.	Mn max.	P max.	S max.	Si max.	Cr	Ni	M.
410	.15	1.00	.040	.030	1.00	11.5/13.5	.75 max.	—
304*	.08*	2.00	.045	.030	1.00	18.0/20.0	8.0/10.5	—
316*	.08*	2.00	.045	.030	1.00	16.0/18.0	10.0/14.0	2.0/3.0

\*\*L" Grade .03 max.

### MECHANICAL PROPERTIES

	Tensile (Ksi) min.	Yield (Ksi) min.	Elongation % in 2" min.	Hardness max. Bhn/Rc	Cold Blend Deg.
410	65.0	30.0	22.0	202.0/94.0	180.0
304	75.0	30.0	40.0	202.0/94.0	Not Req'd
316	75.0	30.0	40.0	217.0/96.0	Not Req'd

## CHROMIUM-MOLYBDENUM ALLOY STEEL PLATES AISI 4130 4140-4142

These medium to high carbon alloy plates with chromium and molybdenum content possess relatively high hardenability and strength characteristics, with chromium providing good hardness penetration and molybdenum imparting uniformity of hardness and high strength. These grades respond readily to heat treatment and are comparatively easy to machine in the heat treated condition. Additional highly desirable properties are their resistance to wear, excellent toughness and their ability to resist stress at elevated temperatures.

### CHEMISTRY

	C	Mn	P	S	Si	Cr	Mo
4130	.28/.33	.40/.60	.04	.04	.20/.35	.80/1.10	.15/.25
4140/42	.38/.45	.75/1.00	.025	.025	.20/.35	.80/1.10	.15/.25

### MECHANICAL PROPERTIES\*

	Tensile (Ksi)	Yield (Ksi)	Elongation % in 2"	Hardness
4130	80.0/ 90.0	50.0/60.0	25.0	—
4140/42	90.0/100.0	60.0/70.0	30.0	Bhn 185/210

\*Average, not generally reported; to AISI only.

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## CARBON ABRASION RESISTING STEEL PLATES

**Abrasion Resisting Steel** was developed to provide a material which is highly resistant to abrasive wear. For the most part, Abrasion Resisting Steel will greatly outlast ordinary steel, and compares favorably with the relatively higher priced alloys. Abrasion Resisting Steel plates and sheets can be machined, drilled, punched and hot formed. They will withstand some bending and forming, however certain precautions are required in welding and cold forming.

### CHEMICAL COMPOSITION

Carbon..... .35/.50 Sulphur..... .055 Max.  
Manganese..... 1.50/2.00 Silicon..... .15/.35  
Phosphorus..... .050 Max.

### HARDNESS

Brinell.....200/250

### SHEARING

½" thick and under—Room temperature  
Over ½" to 1" thick—Preheat to 600°/800°F  
Over 1" thick—Gas cut

Abrasion Resisting Steel is used for a variety of applications, such as chute and hopper liners, concrete mixers, scraper blades, hammer mill parts, ore, sand, gravel and clay handling equipment and the like.

Stock Lengths ½" thick and lighter—8' to 40'  
Over ½" thick—20' to 30'

For ⅜ inch and thinner, refer to STEEL SHEET AND STRIP Page 12.

Size in Inches	Estimated Wt Lbs Per Foot	Size in Inches	Estimated Wt Lbs Per Foot
⅜ x 48	30.64	⅜ x 48	61.28
60	38.30	60	76.60
72	45.96	72	91.92
84	53.62	84	107.94
96	61.28	96	122.56
¼ x 48	40.84	½ x 48	81.68
60	51.05	60	102.10
72	61.26	72	122.52
84	71.47	84	142.94
96	81.68	96	163.36
⅜ x 48	51.67	⅝ x 84	178.71
60	63.80	¾ x 84	214.41
72	76.56	96	245.04
84	89.32	1 x 84	285.88
96	102.08	96	326.72

## CARBON ABRASION RESISTING STEEL PLATES

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Manganese..... 1.50/2.00 Silicon..... .15/.35  
Phosphorus..... .050 Max.

### HARDNESS

Brinell.....200/250

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½" thick and under—Room temperature  
Over ½" to 1" thick—Preheat to 600°/800°F  
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Abrasion Resisting Steel is used for a variety of applications, such as chute and hopper liners, concrete mixers, scraper blades, hammer mill parts, ore, sand, gravel and clay handling equipment and the like.

Stock Lengths ½" thick and lighter—8' to 40'  
Over ½" thick—20' to 30'

For ⅜ inch and thinner, refer to STEEL SHEET AND STRIP Page 12.

Size in Inches	Estimated Wt Lbs Per Foot	Size in Inches	Estimated Wt Lbs Per Foot
¼ x 48.....	41.20	½ x 72.....	123.6
60.....	51.50	84.....	144.2
72.....	61.80	⅝ x 72.....	155.3
84.....	72.10	84.....	181.2
⅜ x 72.....	77.28	¾ x 60.....	155.3
84.....	90.16	72.....	186.4
⅝ x 72.....	92.70	84.....	217.4
84.....	108.1		

## HEAT TREATED ALLOY ABRASION RESISTING STEEL PLATES

Heat Treated Abrasion Resisting Steel Plates are alloy steel plates heat treated to a very high hardness for maximum wear and abrasion resistance. They are much harder than ordinary low alloy abrasion resisting plates and are used for application such as chutes, hoppers, and conveyors for coal, gravel, sand, slag, ore, etc.

They are available in various hardness ranges from about 260 to 400 Brinell and, while cold forming is relatively easy at the lower hardness levels, it is very difficult or impossible at maximum hardness. Welding is possible at all hardness levels utilizing the electric arc processes and low hydrogen electrodes. Stress relieving is recommended after welding, particularly with the higher hardness plates.

At the higher hardness levels, the plates are furnished to a guaranteed Brinell hardness only. Plates in the 260 to 300 Brinell range can also be furnished with guaranteed minimum physical properties if required.

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## HEAT TREATED ALLOY ABRASION RESISTING STEEL PLATES

Continued from preceding page.

Specific chemical analyses vary considerably, however nearly all are alloy steels.

### GENERAL PROPERTIES AND ENGINEERING DATA

Abrasion resistance.....	6 to 10 times mild steel
Resistance to atmospheric corrosion.....	4 to 6 times carbon steel
Elevated temperature properties.....	Approx. 5 times carbon steel
Modulus of elasticity.....	Approx. 30,000,000 P.S.I.
Coefficient of expansion.....	Approx. 7.70 x 10 <sup>-6</sup> in. per in. per °F.
Brinell hardness.....	Approx. 260 to 400, plus Brinell in increments.
Machinability.....	20 to 40% of mild steel
*Charpy Impact, 70°F., V-notch.....	16 to 40 foot-pounds
*Diameter of cold bend.....	4T to 6T for hardnesses up to about 360 Brinell Max.
	Not practical at maximum hardness levels.
**Cold shearing.....	¼ to ½ thickness of mild steel

\* Not guaranteed properties at all hardness levels.  
T represents plate thickness.

\*\* Not recommended over about 360 Brinell.

Size in Inches	Estimated Wt Lbs Per Foot	Size in Inches	Estimated Wt Lbs Per Foot
3/16 x 48	30.64	1/2 x 48	81.68
60	38.30	60	102.10
72	45.96	72	122.52
84	53.62	84	142.94
96	61.28	96	163.36
1/4 x 48	40.84	3/8 x 84	178.71
60	51.05	96	204.24
72	61.26	3/4 x 84	214.41
84	71.47	96	245.04
96	81.68	7/8 x 84	250.18
5/16 x 48	51.04	96	285.92
60	63.80	1 x 84	285.88
72	76.56	96	326.72
84	89.32	1 1/4 x 84	357.35
96	102.08	96	408.40
3/8 x 48	61.28	1 1/2 x 84	428.82
60	76.60	96	490.08
72	91.92	1 3/4 x 96	571.76
84	107.24	2 x 96	653.44
96	122.56		

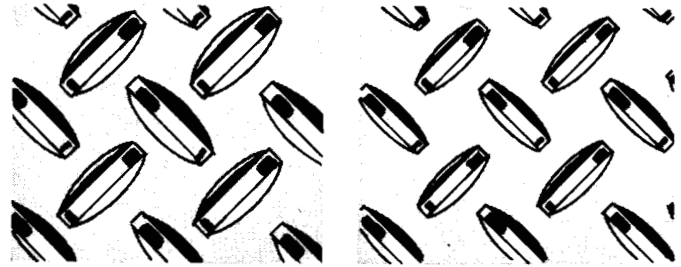
Plates are not always available in all hardnesses for all widths.

### Free your capital from investment in STEEL!

When you buy steel before you actually need it, you are not only tying up the cost of the metal...you are spending hard-earned dollars for storage, insurance, taxes, equipment costs, labor and processing expenses. These are the "hidden dollars" that belong in your profit column. Our warehouse space and processing facilities are part of the package you buy when you make us your "steel headquarters." Put your working capital to better use. Call on us for all your steel requirements.

## STEEL FLOOR PLATE

This is a tough, rolled steel floor plate which has a raised lug pattern. The pattern is manufactured in two sizes—Large Pattern recommended for floors which must withstand heavy abuse and loads; Medium Pattern for floors under ordinary conditions of usage. Provides excellent traction for feet and wheels. The design of the lugs permits free drainage and easy maintenance as there are no pockets to collect dirt or grease, and no pores to absorb liquids. Ease of installation and relative freedom from maintenance are additional factors in considering this type of flooring.



LARGE PATTERN

MEDIUM PATTERN

### Stock Lengths

16 Ga. to 14 Ga. Incl.—8', 10', 12', to 20'  
12 Ga. to 1/8" Thick Incl.—8', 10', 12', 20' to 24'  
1/4" to 1" Thick Incl.—8', 10', 12', 20', 30'

Width and Thickness	Estimated Wt. Lbs. Per Foot	Width and Thickness	Estimated Wt. Lbs. Per Foot	Width and Thickness	Estimated Wt. Lbs. Per Foot
<b>LARGE PATTERN</b>					
3/16" — (.1875")	8.71 Lb. Sq. Ft.	1/4" — (.250")	11.26 lb. Sq. Ft.	5/16" — (.3125")	13.81 Lb. Sq. Ft.
36	26.13	36	33.78	36	41.43
48	34.84	48	45.04	48	55.24
60	43.55	60	56.30	60	69.05
72	52.26	72	67.56	72	82.86
3/8" — (.375")	16.37 Lb. Sq. Ft.	1/2" — (.500")	21.47 Lb. Sq. Ft.	5/8" — (.625")	26.58 Lb. Sq. Ft.
36	49.11	36	64.41	48	106.32
48	65.48	48	85.88	72	159.48
60	81.85	60	107.35		
72	98.22	72	128.82	3/4" — (.750")	31.68 Lb. Sq. Ft.
84	114.59	84	150.29	48	126.72
96	130.96	96	171.76	60	158.40
1" — (1.000")	41.89 Lb. Sq. Ft.			72	190.08
72	251.34				
96	335.12				
<b>MEDIUM PATTERN</b>					
16 Ga. — (.063")	3.00 Lb. Sq. Ft.	12 Ga. — (.109")	5.25 Lb. Sq. Ft.	1/8" — (.125")	6.16 Lb. Sq. Ft.
36	9.00	36	15.75	36	18.48
48	12.00	48	21.00	48	24.64
		60	26.25	60	30.80
				72	36.96
14 Ga. — (.080")	3.75 Lb. Sq. Ft.	3/16" — (.1875")	8.71 Lb. Sq. Ft.	1/4" — (.250")	11.26 Lb. Sq. Ft.
36	11.25	36	26.13	36	33.78
48	15.00	48	34.84	48	45.04
		60	43.55	60	56.30
		72	52.26	72	67.56

Thickness shown is exclusive of projecting lugs.



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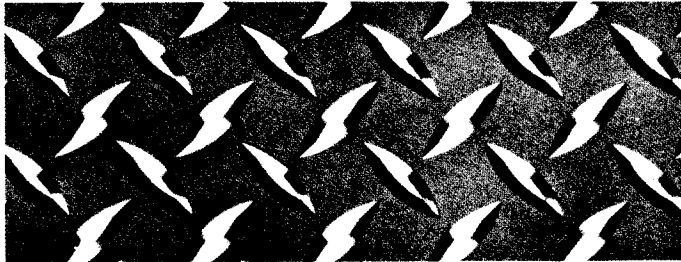
## STEEL FLOOR PLATE SUPER DIAMOND PATTERN

This superior, durable rolled steel floor plate, with its distinctive Super Diamond pattern, has been designed to meet every possible application in which safe, heavy duty flooring is required.

Super Diamond is rolled up to 96 inches wide in selected sizes, and is available in thicknesses of 16 gage through 2 inches—the broadest range of rolled steel floor plate available. This reduces fabrication costs, gives less waste and greater flexibility.

The Super Diamond pattern is designed to be free of dirt-catching pockets, and can be easily swept, hosed, or mopped clean. Liquids drain rapidly in any direction.

In addition to regular quality, Super Diamond floor plate is available in a number of special grades to meet individual requirements. These include structural, high strength—low alloy and corrosion resistant types,



Super Diamond Pattern  
½ actual size

Stock Lengths: 8' to 30'

Thickness	Width	Theoretical Wt Lbs. Per Foot	Thickness	Width	Theoretical Wt Lbs. Per Foot	Thickness	Width	Theoretical Wt Lbs. Per Foot
<b>16 ga. — [.064"]</b>			<b>14 ga. — [.080"]</b>			<b>12 ga. — [.109"]</b>		
		3.00 lb. sq. ft.			3.75 lb. sq. ft.			5.25 lb. sq. ft.
	36	9.00		36	11.25		36	15.75
	48	12.00		48	15.00		48	21.00
<b>1/8" — [.125"]</b>			<b>3/6" — [.1875"]</b>			<b>1/4" — [.250"]</b>		
		6.15 lb. sq. ft.			8.70 lb. sq. ft.			11.25 lb. sq. ft.
	36	18.45		36	26.10		36	33.75
	48	24.60		48	34.80		48	45.00
	60	30.75		60	43.50		60	56.25
	72	36.90		72	52.20		72	67.50
				84	60.90		84	78.75
				96	69.60		96	90.00

Thickness shown is exclusive of raised pattern.

Continued on following page.

## STEEL FLOOR PLATE SUPER DIAMOND PATTERN

Continued from preceding page.

Thickness	Width	Theoretical Wt Lbs. Per Foot	Thickness	Width	Theoretical Wt Lbs. Per Foot	Thickness	Width	Theoretical Wt Lbs. Per Foot
<b>5/16" — [.3125"]</b>			<b>3/8" — [.375"]</b>			<b>1/2" — [.500"]</b>		
		13.80 lb. sq. ft.			16.35 lb. sq. ft.			21.45 lb. sq. ft.
	36	41.40		36	49.05		36	64.35
	48	55.20		48	65.40		48	85.80
	60	69.00		60	81.75		60	107.25
	72	82.80		72	98.10		72	128.70
	84	96.60		84	114.45		84	150.15
	96	110.40		96	130.80		96	171.60
<b>5/8" — [.625"]</b>			<b>3/4" — [.750"]</b>			<b>1" — [1.00"]</b>		
		26.55 lb. sq. ft.			31.65 lb. sq. ft.			41.85 lb. sq. ft.
	36	79.65		36	94.95		36	125.55
	48	106.20		48	126.60		48	167.40
	60	132.75		60	158.25		60	209.25
	72	159.30		72	189.90		72	251.10
	84	185.85		84	221.55		84	292.95
	96	212.40		96	253.20		96	334.80
<b>1-1/4" — [1.25"]</b>			<b>1-1/2" — [1.50"]</b>			<b>1-3/4" — [1.75"]</b>		
		52.05 lb. sq. ft.			62.25 lb. sq. ft.			72.45 lb. sq. ft.
	24	104.10		24	124.50		24	144.90
	30	130.13		30	155.63		30	181.13
	36	156.15		36	186.75		36	217.35
	48	208.20		48	249.00		48	289.80
	60	260.25		60	311.25		60	362.25
	72	312.30		72	373.50		72	434.7
<b>2" — [2.00"]</b>								
		82.65 lb. sq. ft.						
	36	247.95						
	48	330.60						
	60	413.25						

Thickness shown is exclusive of raised pattern.