SECTION 1
Plate & Sheet

Notes

Notes

Notes

Metal Processing Services

Each Harbor Steel location has invested in cutting and metalworking equipment designed to furnish you with precision pieces and parts ready for your final assembly. Below are some of the processes we perform in-house. Additionally, we are able to contract with some of our metal working customers to furnish even more first and second stage processing.

PLATE CUTTING: Harbor Steel can produce virtually any shape from plate or sheet on our modern CNC equipment. Whether it's carbon, alloy, stainless steel or aluminum we can cut close tolerance parts for your application. If you have a special shape to cut, all we need is your sketch or blueprint with clearly marked dimensions and tolerances. For ordering common shapes over the phone you can refer to the examples on the next page. Pick your part and give our salesperson your dimensions and tolerances.

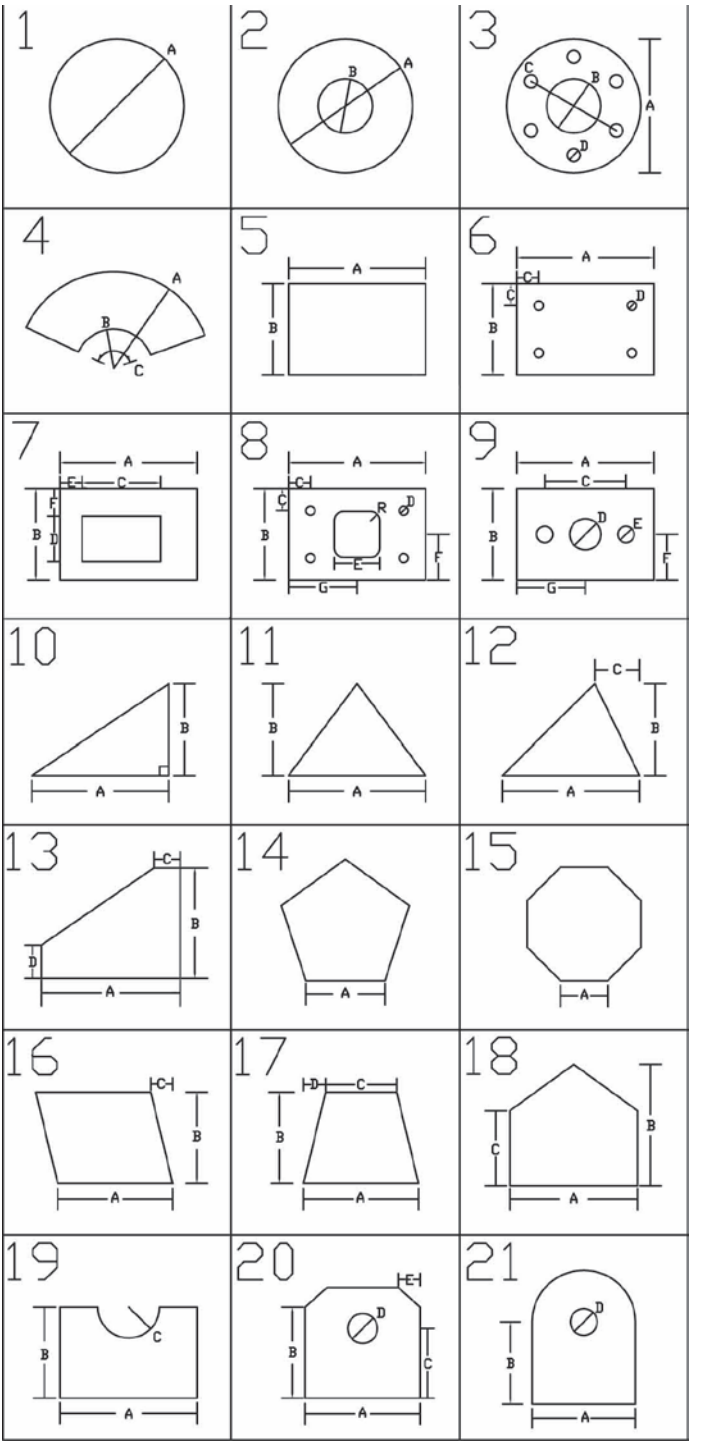
LASER CUTTING: Harbor Steel's multiple lasers can cut carbon steel up to 1" thick, stainless steel up to 1/2" thick and aluminum up to 1/4" with our large tables we can laser cut sheets and plates up to 96" wide by 480" long. Please contact your Harbor Steel representative for a complete quote.

SHEARING: Harbor Steer shears and ironworkers accurately cut everything from light gauge sheets to 1/2" plates, from narrow strips to 12' wide plates. We also shear flat bars, angles, rounds and rebar to close tolerance. If you don't need a saw or flame cut edge, consider the less expensive sheared edge.

PLASMA CUTTING: Our modern Hi-Definition and conventional plasma cutting machines deliver precise parts. Send us your drawings or we can import your CAD files directly into our CAD/CAM system. We can Hi-Def plasma cut stainless and aluminum plate up to 1 3/4" thick and carbon plate up to 2".

BURNING: State of the art computer controlled oxyfuel multi-torch machines can provide close tolerance shapes to your specs. One piece or hundreds; Harbor Steel produces simple rings and discs or intricate shapes. We stock and cut plates up to 12" thick.

BEVELING: Modern CNC controlled bevel head plasma cutting. Beveling up to 2" plate with a maximum 45° and capable of both positive and negative bevel angles on the same part.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Hot Rolled Carbon Steel Plate

ASTM A36

Used for structural applications, Carbon Steel Plates are produced from ingots made by the continuous cast, the basic-oxygen, or electric furnace processes. This material is readily formed and welded using conventional methods.

Chemical Requirements

ASTM A36

	Carbon Max %	Mn. %	P Max %	S %	Si %
to 3/4 incl	.25	Not Req'd	.04	.05	.40 Max
over 1/4 to 1-1/2 incl	.25	.80/1.20	.04	.05	.40 Max
over 1-1/2 to 2-1/2 incl	.26	.80/1.20	.04	.05	.15/.40
over 2-1/2 to 4 incl	.27	.85/1.20	.04	.05	.15/.40
over 4	.29	.85/1.20	.04	.05	.15/.40

For each reduction of 0.01% below the specified carbon maximum, an increase of 0.06% manganese above the specified maximum will be permitted up to the maximum of 1.35%.

Physical Properties

Tensile Strength (PSI)	Yield Strength (PSI)	Elong in 8" %	Elong in 2" %
58/80,000	36,000	20	23

Weight of Thicknesses of Rolled Carbon Steel Plate

Thickness	Lbs. Per Sq. In.	Lbs. Per Sq. Ft.
3/16	.0532	7.66
1/4	.0709	10.21
5/16	.0886	12.76
3/8	.1064	15.31
7/16	.1241	17.87
1/2	.1418	20.42
9/16	.1595	22.97
5/8	.1773	25.53
3/4	.2127	30.63
7/8	.2481	35.73
1	.2836	40.84
1 1/8	.3190	45.94
1 1/4	.3545	51.05
1 3/8	.3900	56.16
1 1/2	.4254	61.26
1 5/8	.4609	66.37
1 3/4	.4963	71.47
2	.5672	81.68
2 1/4	.6381	91.89
2 3/8	.6736	97.00
2 1/2	.7090	102.10
2 3/4	.7799	112.31
3	.8508	122.52
3 1/4	.9217	132.72
3 1/2	.9926	142.94
3 3/4	1.064	153.15
4	1.134	163.36
4 1/4	1.205	173.57
4 1/2	1.276	183.78
4 3/4	1.347	193.99
5	1.418	204.20
5 1/2	1.560	224.62
6	1.702	245.04

Above weights are based on Metric Density unit of .2836 (International System of units).

Hot Rolled Carbon Steel Plate

ASTM A36
Grade 50 available through 4”

Thickness	Lbs. Per Sq. Ft.	Size A B	Lbs. Per Plate
3/16	7.66	48 x 96	245.03
		48 x 120	306.29
		48 x 144	367.68
		60 x 96	306.40
		60 x 120	382.86
		60 x 144	459.60
		60 x 240	765.72
		72 x 120	459.60
		72 x 144	551.32
		72 x 240	918.86
		96 x 240	1,225.15
1/4	10.21	48 x 96	326.71
		48 x 120	408.38
		48 x 144	490.06
		48 x 240	816.79
		60 x 96	408.40
		60 x 120	510.48
		60 x 144	612.60
		60 x 240	1,020.96
		72 x 120	612.60
		72 x 144	735.09
		72 x 240	1,225.15
		60 x 96	408.38
		96 x 240	1,633.54
5/16	12.76	48 x 96	408.32
		48 x 120	510.40
		48 x 144	612.48
		60 x 96	510.40
		60 x 120	638.00
		60 x 144	918.60
		72 x 120	765.60
		72 x 240	1,531.44
		96 x 240	2,041.92
3/8	15.31	48 x 96	490.06
		48 x 120	612.58
		48 x 144	734.88
		60 x 96	612.40
		60 x 120	765.72
		60 x 144	918.60
		60 x 240	1,531.44
		72 x 120	918.60

Hot Rolled Carbon Steel Plate (con't)

Thickness	Lbs. Per Sq. Ft.	Size A B	Lbs. Per Plate
		72 x 144	1,102.64
		72 x 240	1,837.73
		96 x 240	2,450.30
1/2	20.42	48 x 96	653.41
		48 x 120	816.77
		48 x 144	980.16
		60 x 96	816.80
		60 x 120	1,020.96
		60 x 144	1,225.20
		60 x 240	2,041.92
		72 x 240	2,450.30
		96 x 240	3,267.07
5/8	25.53	48 x 96	816.77
		48 x 240	2,042.40
		60x 120	1,276.50
		72 x 288	3,675.46
		96 x 240	4,083.84
		96 x 288	4,900.61
3/4	30.63	48 x 96	980.12
		48 x 120	1,225.20
		60 x 240	3,062.88
		72 x 240	3,675.46
		96 x 240	4,900.61
7/8	35.74	96 x 240	5,718.40
1	40.84	48 x 96	1,306.83
		60 x 240	4,084.00
		72 x 240	4,900.61
		96 x 240	6,534.14
1 1/8	45.95	72 x 240	5,514.00
		96 x 240	7,350.91
1 1/4	51.05	48 x 96	1,633.54
		60 x 240	5,105.00
		96 x 240	8,167.68
1 3/8	56.16	96 x 240	18,985.60
1 1/2	61.26	48 x 96	1,960.24
		60 x 240	6,126.00
		72 x 240	7,351.20
		96 x 240	9,801.22
1 5/8	66.37	96 x 240	10,617.98
1 3/4	71.47	96 x 240	11,435.20
2	81.68	48 x 96	2,613.66
		72 x 240	9,801.60
		96 x 120	6,534.40
		96 x 240	13,068.29
		96 x 288	15,681.95
2 1/4	91.89	96 x 240	14,702.40
2 1/2	102.10	72 x 240	12,252.00
		96 x 120	8,168.00

Hot Rolled Carbon Steel Plate (con't)

Thickness	Lbs. Per Sq. Ft.	Size A B	Lbs. Per Plate
2 3/4	112.31	96 x 240	17,969.60
3	122.52	96 x 120	9,801.22
		96 x 240	19,603.20
3 1/2	142.94	96 x 240	22,870.40
4	163.36	96 x 240	26,137.60
4 1/2	183.78	96 x 240	29,404.80
5	204.20	96 x 240	32,672.00
6	245.04	96 x 240	39,206.40

Cold Rolled Sheet

ASTM A 1011
Commercial Quality, Oiled

Thickness		Size	Lbs. Per	Est. Lbs.
Gauge	Decimal	A B	Sq. Ft.	Per Sheet
10 GA	.1345	48 x 96	5.625	180.0
		48 x 120		225.0
		48 x 144		270.0
		60 x 120		281.3
		60 x 144		337.5
11 GA	.1196	48 x 96	5.00	160.0
		48 x 120		200.0
		48 x 144		240.0
		60 x 120		250.0
		60 x 144		300.0
12 GA	.1046	48 x 96	4.375	140.0
		48 x 120		175.0
		48 x 144		210.0
		60 x 120		218.8
		60 x 144		262.5
13 GA	.0897	48 x 96	3.750	120.0
		48 x 120		150.0
		48 x 144		180.0
		60 x 120		187.5
		60 x 144		225.0
14 GA	.0747	48 x 96	3.125	100.0
		48 x 120		125.0
		48 x 144		150.0
		60 x 120		156.3
		60 x 144		187.5
16 GA	.0598	48 x 96	2.500	80.0
		48 x 120		100.0
		48 x 144		120.0
		60 x 120		125.0
		60 x 144		150.0
18 GA	.0478	48 x 96	2.000	64.0
		48 x 120		80.0
		48 x 144		96.0
		60 x 120		100.0
		60 x 144		120.0
20 GA	.0359	48 x 96	1.500	48.0
		48 x 120		60.0
		48 x 144		72.0
		60 x 120		75.0
		60 x 144		90.0
22 GA	.0299	48 x 96	1.250	40.0
		48 x 120		50.0
		48 x 144		60.0
		60 x 120		62.5
		60 x 144		75.0

Pressure Vessel Plate

ASTM A516 Grade 70

Mechanical Properties

Tensile Strength, ksi	70-85
Yield point, ksi	38
Elongation in 8"	17
Elongation in 2”	21

Chemical requirements

Carbon .27-.31 (max varies with thickness)
Manganese .85-1.20
Phosphorus .035
Sulphur .04
Silicon .15-.30

Thickness	Lbs. Per Sq. Ft.	Size A B	Lbs. Per Plate
1	40.84	96 x 240	6,534.4
1 1/2	61.26	96 x 240	9,801.6
2	81.68	96 x 240	13,068.8
2 1/4	91.89	96 x 240	14,702.4
2 1/2	102.10	96 x 240	16,336.0

Steel Plate, High Strength, Low Alloy

ASTM A572 Grade 50

General purpose high strength low alloy steel designed to offer optimum combinations of strength, weldability, and notch toughness, at economical cost. Used in construction of bridges, buildings, automobiles, truck parts, railroad cars, cargo containers, construction equipment, line pipe and structural tubing, lighting standards and transmission poles.

Mechanical Properties

Tensile Strength, ksi	65
Yield Point, ksi	50

Chemical requirements

Carbon .23 max., Manganese 1.35 max, Phosphorus .04
Sulphur .05, Silicon .04 to 1 1/2, over 1 1/2 0.15/0.40

Thickness	Lbs. Per Sq. Ft.	Size A B	Lbs. Per Plate
3/8	15.32	96 x 240	2,452.20
1/2	20.42	96 x 240	3,267.07
5/8	25.53	96 x 240	4,084.80
3/4	30.63	96 x 240	4,900.80
1	40.84	96 x 240	6,534.40
1 1/4	51.05	96 x 240	8,168.00
1 1/2	61.26	96 x 240	9,801.60
1 3/4	71.47	96 x 240	11,435.20
2	81.68	96 x 240	13,068.80
2 1/4	91.89	96 x 240	14,702.40
2 1/2	102.10	96 x 240	16,336.00
2 3/4	112.30	96 x 240	17,968.00
3	122.50	96 x 240	19,600.00

Abrasion Resisting Plate

AR-MED

A hot rolled plate with higher carbon content, this plate is hard and tough with excellent abrasion resistance. It can be machined, drilled, punched and formed within limits. Applications include conveyors, mixers, dirt and stone moving equipment, dump truck bodies, bucket lips, liner plates, and coal and rock screens.

Mechanical Properties
Brinell Hardness 235/160Typical

Thickness	Lbs. Per Sq. Ft.	Size A B	Lbs. Per Plate
3/16	7.66	72 x 240	919.20
1/4	10.21	96 x 240	1,633.60
3/8	15.32	96 x 240	2,451.20
1/2	20.42	96 x 240	3,267.20
3/4	30.63	96 x 240	4,900.80
1	40.84	96 x 240	6,534.40

Abrasion Resisting Plate

AR 400F

This plate exhibits an excellent combination of hardness, abrasion resistance, formability, weldability, toughness and flatness. They are available in thicknesses from 3/16 to 2 inches. AR-400 F steels are used in the original fabrication, repair and modification of heavy equipment in such applications as truck body liners, chutes, bucket lips, hopper and crusher liners. This plate is designed for through-thickness hardness while maintaining minimum carbon, alloy and carbon equivalent contents to improve weldability. The sulfur content is reduced to a maximum of 0.005% and the steels are calcium treated for inclusion shape control. These factors enhance the cold forming characteristics of the steels.

Thickness	Lbs. Per Sq. Ft.	Size A B	Lbs. Per Plate
3/16	7.66	96 x 288	1,470.72
1/4	10.21	96 x 288	1,960.32
3/8	15.32	96 x 288	2,941.44
1/2	20.42	96 x 288	3,920.64
5/8	25.53	96 x 288	4,901.76
1	40.84	96 x 288	7,841.28
1 1/2	61.26	96 x 288	11,761.92
2	81.68	96 x 288	15,682.56
3	122.52	96 x 288	23,523.84

Abrasion Resistant Plate

AR400/AR500
Heat Treated, Quenched & Tempered

Thickness	Lbs. Per Sq. Ft.	Size A B	Lbs. Per Plate
1/4	10.21	48 x 96	326.71
		96 x 288	1,960.32
3/8	15.32	48 x 96	490.06
		96 x 288	2,941.44
1/2	20.42	48 x 96	653.41
		96 x 288	3,920.64
5/8	25.53	96 x 288	4,901.76
3/4	30.63	96 x 288	5,880.73
1	40.84	96 x 288	7,840.97
1 1/4	51.05	96 x 288	9,801.22
1 1/2	61.26	96 x 288	11,761.46

Abrasion Resisting Cladded Wear Plate

CR-600

Base Plate: ASTM A 36 steel plate
Cladding: Austenitic Steel with a High Chromium Carbide concentration
Hardness: Brinell - 600+

Plate Thickness	Clad Thk	Lbs. Per Sq. Ft.	Size A B	Lbs. Per Plate
1/4	1/4	21.5	48 x 96	688.0
			60 x 120	1,075.0
3/8	3/8	15.32	48 x 96	1030.4
			60x120	1610.0

Processing:
Plasma arc or waterjet cutting required
Can be supplied cut-to-size, formed, rolled, and welded per your drawings

End Uses:

Chutes	Truck Bodies
Sizing Screens	Bulldozer Blades
Impact & Diverter Plates	Wear Blades
Troughs	Drag Plates
Augers & Screw Conveyors	Fans & Fan Housings
Hoppers & Bins	Discharge Chutes
Buckets & Liners	Digesters

Constructional

Alloy Steel Plate

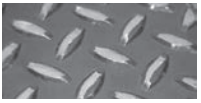
ASTM A514

ASTM A514 structural quality plates are for general structural applications where its great strength in combination with other desirable properties permits substantial weight reduction, longer service life and greater economy in applications such as heavy construction, earthmoving and mining equipment, truck and hopper body liners, chutes and wear plates.

Mechanical Properties

	Tensile Strength (PSI)	Yield Strength (PSI)	Elongation in 2"	Brinell Hardness
3/16" Through 2 1/2" Incl.	110/130,000	100,000 Min.	18%	235/293
Over	110/130,000	90,000 Min. 2 1/2" to 6" Incl.	16%	229/293

Thickness	Lbs. Per Sq. Ft.	Size A B	Lbs. Per Plate
3/16	7.66	96 x 240	1,225.60
1/4	10.21	96 x 240	1,633.60
3/8	15.32	96 x 240	2,451.20
1/2	20.42	96 x 240	3,267.20
5/8	25.53	96 x 240	4,084.80
3/4	30.63	96 x 240	4,900.80
1	40.84	96 x 240	6,534.40
1 1/4	51.05	96 x 240	8,168.00
1 1/2	61.26	96 x 240	9,801.60
2	81.68	96 x 240	13,068.80
2 1/4	91.89	96 x 240	14,702.40
2 1/2	102.10	96 x 240	16,336.00
3	122.52	96 x 240	19,603.20
3 1/4	132.73	96 x 240	21,236.80
3 1/2	142.94	96 x 240	22,870.40
4	163.36	96 x 240	26,137.60



Hot Rolled Carbon Steel Floor Plate

Raised Pattern

Thickness	Lbs. Per Sq. Ft.	Size	Lbs. Per Plate
14 Ga	3.75	48 x 96	120.00
		48 x 120	150.00
1/8	6.16	48 x 96	196.80
		48 x 120	246.00
		60 x 120	307.50
		72 x 120	369.00
3/16	8.71	48 x 96	278.72
		48 x 120	348.40
		48 x 240	696.80
		60 x 120	435.50
		60 x 240	871.00
		72 x 240	1,045.20
		96 x 240	1,393.60
1/4	11.26	48 x 96	360.32
		48 x 120	450.40
		48 x 240	900.80
		60 x 120	563.00
		60 x 240	1,126.00
		72 x 240	1,351.20
		96 x 240	1,801.60
3/8	16.37	48 x 96	523.84
		48 x 120	654.80
		60 x 120	818.50
		60 x 240	1,637.00
		72 x 240	1,964.40
		96 x 240	2,619.20
1/2	21.47	48 x 96	687.04
		48 x 120	858.80
		60 x 120	1,073.50
		96 x 240	3,435.20

Note: Thickness refers to body of plate, not including raised pattern.

PLATE & SHEET

Hot Rolled Sheet

ASTM A1011 CS, Commercial Quality

Thickness		Size	Lbs. Per	Lbs.
Gauge	Decimal	A B	Sq. Ft.	Per Sheet
7 GA	.1793	48 x 96	7.50	240.0
		48 x 120		300.0
		48 x 144		360.0
		60 x 96		300.0
		60 x 120		375.0
		60 x 144		450.0
		72 x 120		450.0
10 GA	.1345	48 x 96	5.625	180.0
		48 x 120		225.0
		48 x 144		270.0
		60 x 96		225.0
		60 x 120		281.3
		60 x 144		337.5
		72 x 120		337.5
		72 x 144		405.0
11 GA	.1196	48 x 96	5.000	160.0
		48 x 120		200.0
		48 x 144		240.0
		60 x 96		200.0
		60 x 120		250.0
		60 x 144		300.0
		72 x 120		300.0
		72 x 144		360.0
12 GA	.1046	48 x 96	4.375	140.0
		48 x 120		175.0
		48 x 144		210.0
		60 x 96		175.0
		60 x 120		218.8
		60 x 144		262.5
		72 x 120		262.5
		72 x 144		315.0
13GA	.0897	48 x 96	3.75	120.0
		48 x 120		150.0
		48 x 144		180.0
		60 x 96		150.0
		60 x 120		187.5
		60 x 144		225.0
		72 x 120		225.0
		72 x 144		270.0
14 GA	.0747	48 x 96	3.125	100.0
		48 x 120		125.0
		48 x 144		150.0
		60 x 96		125.0
		60 x 120		156.3
		60 x 144		187.5
		72 x 120		187.5
		72 x 144		225.0

MOST OF THE ABOVE GAUGES AND SIZES ARE ALSO AVAILABLE IN PICKLE AND OILED IN 5,000# QUANTITIES. IDEA MATERIAL FOR LASERS.

PLATE & SHEET

Hot Rolled Sheet

ASTM A1011 CS, Commercial Quality

Thickness		Size	Lbs. Per	Lbs.
Gauge	Decimal	A B	Sq. Ft.	Per Sheet
16 GA	.0598	48 x 96	2.500	80.0
		48 x 120		100.0
		48 x 144		120.0
		60 x 96		100.0
		60 x 120		125.0
		60 x 144		150.0

MOST OF THE ABOVE GAUGES AND SIZES ARE ALSO AVAILABLE IN PICKLE AND OILED IN 5,000# QUANTITIES. IDEA MATERIAL FOR LASERS.

Galvanized Sheet

ASTM A526 (14 ga. and heavier, Commercial Quality)
ASTM A527 (16 ga. and lighter, Lock-forming Quality)
Est. Lbs include the weight of the Zinc
ASTM A653 Type B 090

Gauge	Size A		B	Lbs. Per Sq. Ft.	Lbs. Per Sheet
10 GA	48	x	96	5.781	185.0
	48	x	120		231.2
	48	x	144		277.5
	60	x	96		231.2
	60	x	120		289.0
	60	x	144		346.9
11 GA	48	x	96	5.250	168.0
	48	x	120		210.0
	48	x	144		252.0
	60	x	96		210.0
	60	x	120		262.5
	60	x	144		315.0
12 GA	48	x	96	4.531	145.0
	48	x	120		181.2
	48	x	144		217.5
	60	x	96		181.2
	60	x	120		225.0
	60	x	144		271.9
14 GA	48	x	96	3.281	105.0
	48	x	120		131.2
	48	x	144		157.5
	60	x	96		131.2
	60	x	120		164.1
	60	x	144		196.9
16 GA	48	x	96	2.656	85.0
	48	x	120		106.2
	48	x	144		127.5
	60	x	96		106.2
	60	x	120		132.8
	60	x	144		159.4
18 GA	48	x	96	2.156	69.0
	48	x	120		86.2
	48	x	144		103.5
	60	x	96		86.2
	60	x	120		107.8
	60	x	144		129.4
20 GA	48	x	96	1.656	53.0
	48	x	120		66.2
	48	x	144		79.5
	60	x	96		66.2
	60	x	120		82.8
	60	x	144		99.4

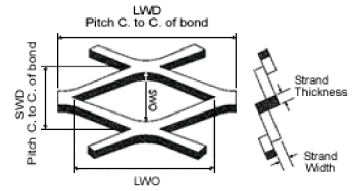
Galvanized Sheet

ASTM A526 (14 ga. and heavier, Commercial Quality)
ASTM A527 (16 ga. and lighter, Lock-forming Quality)
Est. Lbs include the weight of the Zinc
ASTM A653 Type B 090

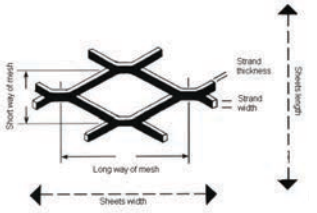
Gauge	Size A		B	Lbs. Per Sq. Ft.	Lbs. Per Sheet
22 GA	48	x	96	1.406	45.0
	48	x	120		56.2
	48	x	144		67.5
	60	x	96		56.2
	60	x	120		70.3
	60	x	144		84.4
24 GA	48	x	96	1.156	37.0
	48	x	120		46.2
	48	x	144		55.5
	60	x	96		46.2
	60	x	120		57.8
	60	x	144		69.4
26 GA	48	x	96	.906	29.0
	48	x	120		36.2
	48	x	144		43.5
	60	x	96		36.2
	60	x	120		45.3
	60	x	144		54.4

Galvanized sheets are continuously hot-dipped with a protective coating of zinc. Coating is G90 (1.25 oz per square foot). Galvanized sheets can be formed, rolled or otherwise fabricated at room temperature without disrupting their protective qualities. Applications include heating and ventilation ducts, roof flashing, electrical boxes, and many general maintenance applications.

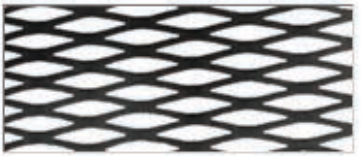
REGULAR EXPANDED METAL is a finished product as it comes from the press after having been die cut and expanded. The illustration shows that the strands and bonds angle to the original plane of the solid sheet.



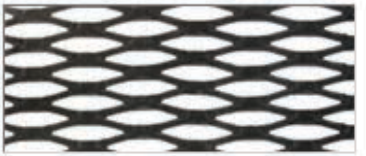
FLATTENED EXPANDED METAL is a regular expanded metal which has been cold rolled, leaving a flat, smooth surface. The length of the sheet is elongated, usually by 5% while the width stays the same.



1/4" #20 Regular



1/4" #20 Flattened



1/2" #16 Regular

1/2" #16 Flattened

3/4" #9 Regular

3/4" #9 Flattened

1 1/2" #9 Regular

1 1/2" #9 Flattened