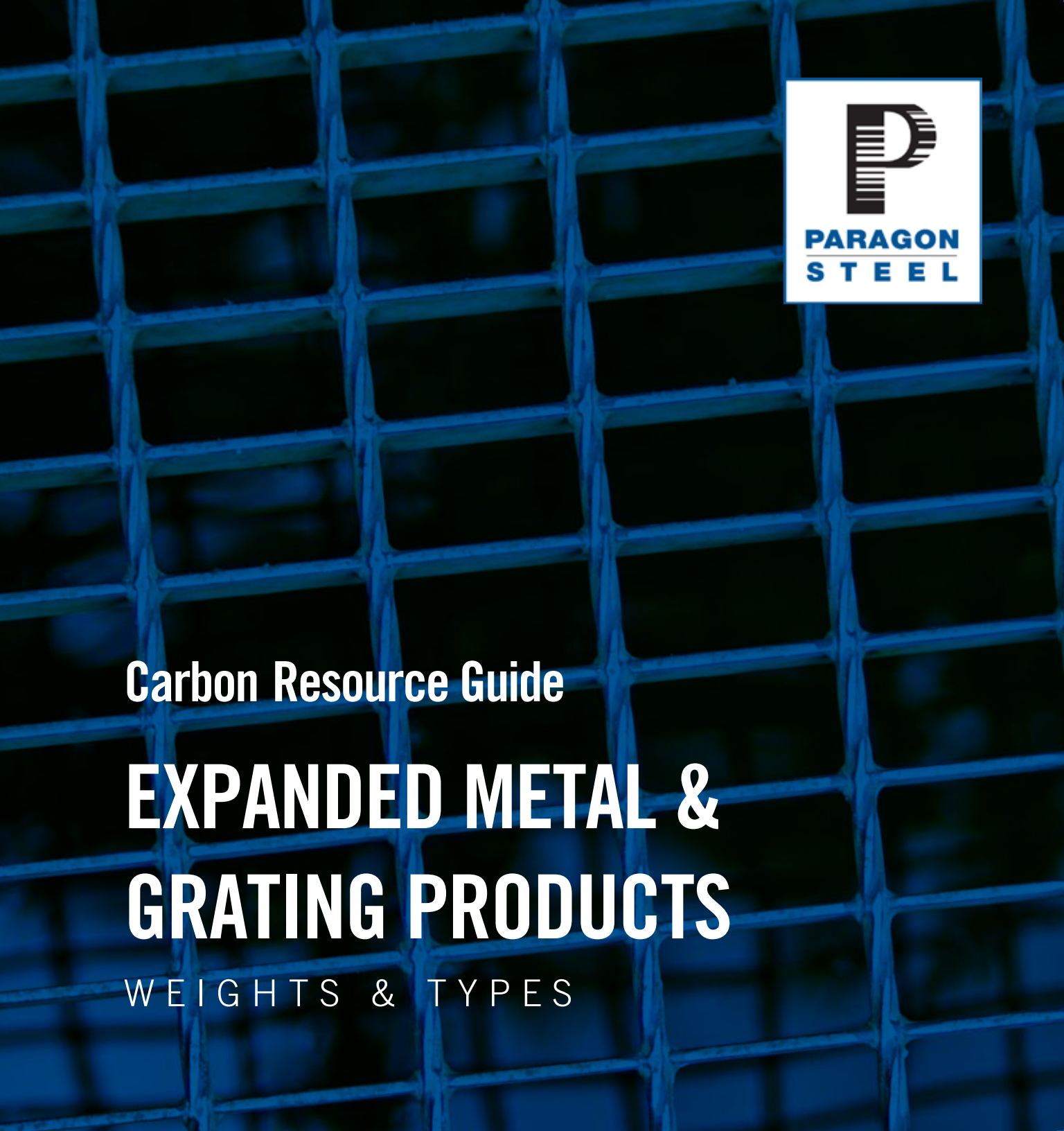


Carbon Resource Guide

EXPANDED METAL & GRATING PRODUCTS

WEIGHTS & TYPES

Expanded Metal & Grating Products

Expanded Metal, Expanded metal Grating, Bar Grating, PDM Stair Treads and Diamond Grip are all products that have openings in their horizontal surfaces, which increase friction for safer climbing and standing, and allow dirt, oil, etc. to fall through. This provides a certain amount of self cleaning.

Expanded Metal - Raised

		Center to Center of Bonds			Weight in Pounds Per Square Foot	
Style Designation	**Stock Sizes**	**Width**	**Length**	**Thickness of Strand**	**Plain**	**Galv.**
1/4 - No. 18	48 x 96	.255	1.00	.048	1.14	1.71
1/2 - No.18	48 x 96	.500	1.20	.048	.70	.85
1/2 - No. 16	48 x 96	.500	1.20	.060	.86	.97
1/2 - No. 13	48 x 96	.500	1.20	.092	1.47	1.73
3/4 - No. 16	48 x 96	.923	2.00	.060	.54	.65
3/4 - No. 13	48 x 96	.923	2.00	.092	.80	.92
3/4 - No. 10	48 x 96	.923	2.00	.092	1.20	1.36
3/4 - No. 9	48 x 96	.923	2.00	.134	1.80	1.95
1 - No. 16	48 x 96	1.090	2.40	.060	.44	.51
1 1/2 - No. 16	48 x 96	1.330	3.00	.060	.400	.48
1 1/2 - No. 13	48 x 96	1.330	3.00	.092	.60	.68
1 1/2 - No. 10	48 x 96	1.330	3.00	.092	.79	.89
1 1/2 - No. 9	48 x 96	1.330	3.00	.134	1.20	1.31
1 1/2 - No. 6	48 x 96	1.330	3.00	.198	2.50	2.73
2 - No. 9	48 x 96	1.850	4.00	.134	.90	1.02

Expanded Metal - Flattened

		Center to Center of Bonds			Weight in Pounds Per Square Foot	
Style Designation	**Stock Sizes**	**Width**	**Length**	**Thickness of Strand**	**Plain**	**Galv.**
1/4 - No. 20	48 x 96	.255	1.03	.030	.83	1.24
1/4 - No. 18	48 x 96	.255	1.03	.040	1.11	1.65
1/2 - No. 20	48 x 96	.500	1.26	.029	.40	.51
1/2 - No. 18	48 x 96	.500	1.26	.039	.66	.88
1/2 - No. 16	48 x 96	.500	1.26	.050	.82	1.00
1/2 - No. 13	48 x 96	.500	1.26	.070	1.40	1.62
3/4 - No. 16	48 x 96	.923	2.10	.048	.51	.61
3/4 - No. 14	48 x 96	.923	2.12	.061	.63	.75
3/4 - No. 13	48 x 96	.923	2.10	.070	.76	.86
3/4 - No. 9	48 x 96	.923	2.12	.120	1.71	1.86
3/4 - No. 9	48 x 120	.923	2.12	.120	1.71	1.86
3/4 - No. 9	48 x 144	.923	2.12	.120	1.71	1.86
1 - No. 16	48 x 96	1.090	2.56	.048	.41	.50
1 1/2 - No. 13	48 x 96	1.330	3.20	.070	.57	.68
1 1/2 - No. 9	48 x 96	1.330	3.20	.110	1.11	1.28

Expanded Metal - Grating

		Center to Center of Bonds		Weight in Pounds Per Square Foot	
Style Designation	**Stock Sizes**	**Width**	**Length**	**Plain**	**Galv.**
3.0 Lb Catwalk	120 x 24	1.33	5.33	3.00	3.20
3.0 Lb. Grating	48 x 96	1.33	5.33	3.00	3.20
3.0 Lb Grating	48 x 120	1.33	5.33	3.00	3.20
3.14 Lb Skywalk	48 x 96	2.00	6.00	3.14	3.34
3.14 Lb Skwalk	48 x 120	2.00	6.00	3.14	3.34
4.0 Lb Grating	48 x 96	1.33	5.33	4.00	4.30
4.0 Lb Grating	48 x 120	1.33	5.33	4.00	4.30
4.27 Lb Walkway	48 x 96	1.41	4.00	4.27	4.57
5.0 Lb Grating	48 x 96	1.33	5.33	5.00	5.50
5.0 Lb Grating	48 x 120	1.33	5.33	5.00	5.50
6.25 Lb Grating	48 x 96	1.41	5.33	6.25	6.85

Expanded Metal Terminology

Material Terminology

Expanded Metal (also called raised or regular expanded metal) is metal sheet that is simultaneously slit and stretched into a rigid, open mesh. It is available in carbon, stainless and galvanized steel, and in aluminum.

Flattened Expanded Metal is made by passing expanded metal through a rolling mill to flatten it. This process reduces the thickness slightly and provides a smooth, flat surface.

Expanded Metal Grating is made from thicker sheet or plate, by a process similar to that which produces expanded metal. Expanded metal grating is often used for catwalks and platform applications where self cleaning and good footing are required.

Decorative Expanded Metal is manufactured so that the open areas have unique, decorative shapes.

Expanded Metal Stair Treads use expanded metal grating for the horizontals surfaces, flat bar for the vertical surfaces and angles at the corners.

The **Bond** is the pint where adjacent Strands intersect. The bond is always twice the width of the strand.

C.S.F. (100 Square Feet) is the unit of measure that is used to weigh and price expanded metal.

Camber is a slight bow, which can occur during manufacturing and results in an out-or-square-condition.

Deburring is a process whereby most expanded metal is passed through rotary steel brushes to remove burrs and rough edges. Expanded metal grating and very light expanded metal are generally not deburred.

The **Diamond** is the diamond-shaped open area formed by the Strands and bonds (also referred to as the **Opening**).

F.X.M. is the commonly used abbreviation for Flattened Expanded Metal.

L.W.D. or **L.W.O.** refers to the Long Way of the Diamond or Long Way or the Opening. This is used to make it clear that you are measuring in a direction that is parallel to the largest dimension of the diamond.

Mesh is the nominal distance, expressed in inches, from the center of one bond to the center of an adjacent bond measured across the S.W.D.

The **Opening Size** is the area enclosed by the Strands and bonds.

The **Overall Thickness** is the finished thickness of the sheet, which often determines the selection of framing components.

The **Percent of Open Area** is used by designers to calculate the degree to which light and air can pass through a piece of expanded metal.

The **Pitch** is the measurement from a point on one diamond to the same point on an adjacent diamond.

R.X.M. is the commonly used abbreviation from Raised Expanded Metal.

S.W.D. or **S.W.O.** refers to the Short Way of the Diamond or the Short Way of the Opening. This is used to make it clear that you are measuring in a direction that is parallel to the smallest dimension of the diamond.

The **Strand** is the single metal strip that forms the border of the diamond, or opening. The strand has thickness (the thickness of the sheet) and width.

Welded Bar Grating Products

Welded Bar Grating is a manufactured product which has a multitude of uses. For instance, it is used to cover trenches in pavements, to make self-cleaning stair treads and to construct platforms around equipment.

There are a number of questions that you will need to answer when ordering Welded Bar Grating:

1. What material? Most Welded Bar Grating is made from carbon steel but it is also available in Stainless Steel and Aluminum. A similar product is made from fiberglass for use in highly corrosive applications.

2. Which way do the bearing bars run? For greatest strength the bearing bars will usually run the short way of the span. (If you had a trench that was 10"x 120" the bearing bars would normally span the 10" dimension of your trench. See the illustration of bearing and cross bars on the next page).

3. What is the size of the area that you need to cover? Give the size in inches and remember to allow for clearance. If you are putting grating into a 10" wide trench, a 10” wide piece of grating will not fit. You would want to order your grating somewhat narrower, say 9 3/4" or 9 7/8" in width in order to clear.

4. Are the pieces to be banded? Banding is used to close the spaces between the bearing bars. This makes for a more finished look, keeps the ends from being bent out of shape and reduces the change of injury from the exposed ends of the bearing bars when the pieces have to be handled.

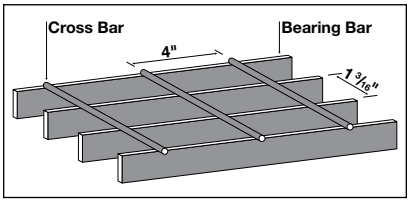
5. Are the pieces to be painted or galvanized? When special ordering you may specify that the grating be painted or galvanized by the manufacturer.

6. Are the bearing bars to be serrated or smooth? When special ordering you may specify that the top edge of the bearing bars be cut in such a manner that a series of bumps will provide greater friction.

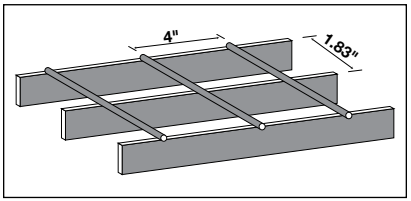
Remember that while Welded Bar Grating is available in custom sizes, you will want to work from standard 3' x 24' panels whenever possible. (4' wide panels may be special ordered). This means that in the example of a 10"x 120" trench used above it world take 3 pieces 10" by 36" and 1 piece 10" x 12" to cover the trench with bearing bars running the short way of the span.

While it might seem easier to cover the area with one piece, you would have to run the bearing bars the 10' way to cover the trench with one piece. The 10' span would be very weak. Remember also, that you may occasionally have to remove the grating to clean your trench and one man can handle three-foot long pieces more easily than he can handle a ten foot long piece.

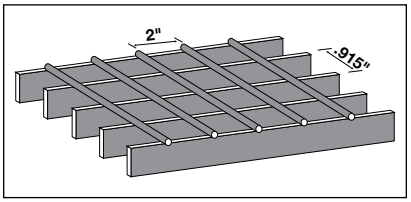
Types & Spacings of Welded Bar Grating



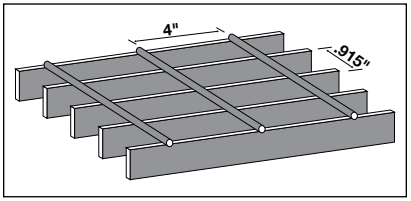
Standard welded spacing pattern according to Federal specification RRG-661c. Bearing bars on 1 3/16" centers. Cross bars on 4" centers. Most commonly used pattern.



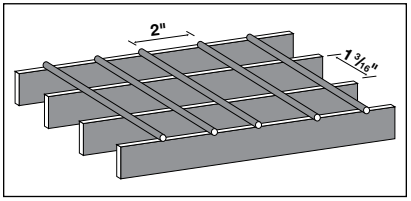
Cross bars on 4" centers. Bearing bar spacing opened up on 1.83" centers. This grating is used for maximum light and air circulation.



Cross bars on 2" centers with bearing bars on .915" centers. Ideal for sidewalks. Accomodates bicycle traffic.



Bearing bars on .915" centers. Cross bars on 4" centers. Used where heavy loads are applied and depth is restricted.



Cross bar spacing narrowed to 2" centers. Bearing bars on 1 3/16" centers. Increased surface contact for long life under heavy traffic.

Bar Grating Load Table

	U= Uniform Load	D= Deflection	C= Concentrted Load			
Bearing Bar Size In Inches			**Span**			
		2'0"	**2'6"**	**3'0"**	**3'6"**	**4'0"**
3/16 x 3/4	U	575	370	259	186	144
	D	.093	.152	.218	.294	.373
	C	579	463	388	330	289
	D	.077	.120	.173	.235	.310
1/8 x 1	U	688	440	304	225	172
	D	.073	.110	.160	.219	.286
	C	688	549	459	391	343
	D	.059	.091	.129	.175	.232
3/16 x 1	U	1030	659	460	335	256
	D	.073	.112	.160	.219	.287
	C	1029	822	687	588	513
	D	.058	.090	.129	.176	.230
1/8 x 1 1/4	U	1072	688	475	351	269
	D	.059	.090	.175	.233	.290
	C	1074	859	714	610	538
	D	.048	.073	.104	.142	.180
3/16 x 1 1/4	U	1610	1029	714	528	401
	D	.059	.090	.128	.174	.230
	C	1610	1283	1074	919	801
	D	.048	.073	.105	.141	.180
1/8 x 1 1/2	U	1541	988	687	501	387
	D	.045	.074	.106	.148	.193
	C	1542	1237	1030	884	723
	D	.038	.058	.086	.116	.155
3/16 x 1 1/2	U	2320	1484	1032	75	580
	D	.047	.076	.107	.148	.193
	C	2320	1858	1548	1325	1160
	D	.038	.060	.088	.088	.154
3/16 x 1 3/4	U	3140	2018	1401	1030	788
	D	.041	.062	.093	.126	.164
	C	3150	2522	2100	1803	1573
	D	.031	.053	.075	.100	.134
3/16 x 2	U	4118	2633	1830	1346	1029
	D	.038	.058	.080	.112	.140
	C	4118	3293	2748	2350	2059
	D	.029	.047	.062	.089	.116
3/16 x 2 1/4	U	5210	3330	2310	1670	1301
	D	.033	.050	.073	.099	.128
	C	5210	4169	3475	2913	2604
	D	.028	.040	.058	.080	.103

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