PMWI

# Aluminum & Steel GRATING


**Pleasant Mount Welding, Inc.**
**45 Dundaff Street**
**Carbondale, PA 18407-1801**
**(570) 282-6164 Fax: (570) 282-7917**

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# PMWI HISTORY

**PMWI has been serving the Fabricated Metals Market since 1983*...We are the Largest Manufacturer of Miscellaneous Metals for Wastewater and Water Treatment Facilities on the East Coast...and now PMWI has it's own lines of Aluminum Grating and Heavy Duty Welded Steel Grating Available.***

Pleasant Mount Welding, Inc. was established in 1983 to serve the fabricated metals market. After a short period, we realized that the metal fabrication industry seemed to have a poor reputation for service. Customers received late deliveries, workmanship was inconsistent, and there were customer service issues. PMWI made a commitment to be different. Our primary goal is to focus on **"what our customers expect"**.

In 1994 PMWI relocated to a 40,000 SQFT building in Carbondale, PA. Our commitment to excellence has fostered tremendous growth, and in 2007 we purchased a second 80,000 SQFT manufacturing facility within minutes of our main headquarters. This building located on 8th Ave is our certified AISC fabrication facility. A third building located directly across from our corporate building houses our Environmental Division and our most recently acquired 43,000 SQFT Atlas Street facility is home to our Grating Division.

Pleasant Mount Welding, Inc. manufacturing and design personnel have almost 40 years of experience supplying lintels, weir plates, embedded angles, bar racks, grating, pipe supports, ladders and numerous other fabrications. The Design and Engineering team utilizes cutting edge software in order to produce accurate and easy to follow shop drawings. Their goal is to get approved shop drawings on the first submittal. We follow **YOUR** schedule when creating submittals. PMWI also has licensed Professional Engineers on staff to help meet any of your structural design needs. Our many years of experience in metals fabrication will benefit you on all your projects.

**QUALITY:** The associates at PMWI do their very best to maintain high quality standards in every aspect of the company. We take great pride in producing error free shop drawings and quality fabricated products.

**DELIVERIES:** PMWI is dedicated to making sure that your deliveries are on time. We strive to make sure that you meet all your contract deadlines.

**CUSTOMER SERVICE:** Our Customers are our first priority. We are in business to serve you and your needs. We will do everything possible to make sure that you are satisfied with our service and the quality of our products.

**COSTS:** By focusing on quality, deliveries, and customer service, we help save you money. Quality will increase your jobsite productivity, on-time deliveries will ensure you meet your contract deadlines, and customer service will solve your problems - you will increase your bottom line profitability.

**Main Office - 45 Dundaff Street, Carbondale, PA 18407**

**AISC Facility - 24 8th Avenue, Carbondale, PA 18407**

The manufacturing operations for PMWI are performed in all four of our facilities. Each location is equipped with a complete line of modern equipment and technology.

PMWI fabricates metals according to all major codes including AISC standards, AWS welding codes and ASME welding codes. Our grating products are fabricated in accordance with NAAMM standards and follow grating industry standard practices. Specialized manufacturing software is used to organize and manage all of our manufacturing operations.

When it comes to fabricating aluminum, stainless steel and carbon steel products, PMWI has the necessary experience you can rely on to help meet your specific application needs.

PMWI manufacturing capabilities include shearing, sawing, plate bending, plate rolling, pipe bending, punching, drilling, TIG or MIG welding and shot blasting. PMWI can also handle all of your coating requirements, painting, galvanizing, anodizing or powder coat finishes.

**8th Avenue Mfg Facility**

**52 Dundaff Environmental Div.**

**Atlas Street Grating Division**

# BENEFITS OF ALUMINUM

***Aluminum* has a unique set of properties*...that make it one of the most useful engineering & construction materials available today.***

Aluminum is the most abundant metallic element and one of earth's greatest natural resources. It's light weight, high strength-to-weight ratio, and excellent corrosion resistance under most environmental conditions makes it the top choice for manufacturing metal bar grating.

Unlike other types of grating materials, aluminum can be recycled, making it an environmentally friendly choice. Aluminum is also a very durable material that provides many years of service without showing signs of wear or decay. Aluminum can be easily cleaned and maintained and does not absorb bacteria sustaining particles. This makes it a perfect solution for sanitary processing operations. Aluminum is also a very resilient material that will deflect under loads and then spring back to it's original shape.

This special set of features and benefits make aluminum grating the go-to-solution for many specialized applications such as: sewage and wastewater treatment facilities, chemical processing plants, pulp and paper industry, and many other manufacturing and industrial applications. Aluminum grating also has a very aesthetically pleasing appearance that makes it a very practical and cost effective solution for many architectural and commercial applications including fencing, building facades, vent grilles, ceiling tiles, and entranceways.

## *Aluminum is your "Lightweight Grating Solution"*

- **Aluminum** has a High Strength-to-Weight Ratio
- **Aluminum** has Excellent Corrosion Resistance
- **Aluminum** can be Easily Recycled
- **Aluminum** can be Easily Modified for Fit-Up in the Field.
- **Aluminum** has an Attractive Appearance
- **Aluminum** is Lightweight
- **Aluminum** is Non-Toxic
- **Aluminum** is Durable
- **Aluminum** is Resilient

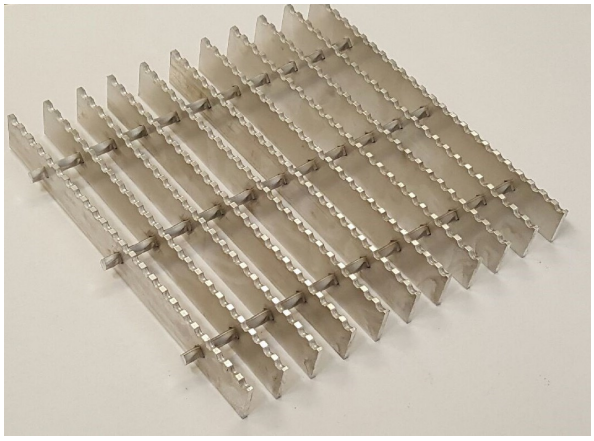
# ALUMINUM GRATING PRODUCTS

Pleasant Mount Welding offers several types of aluminum grating and stair treads: Swage Locked I-Bar and Rectangular Bar, Pressure Locked Aluminum Dove Tail, and Extruded Aluminum Plank. Aluminum Bar and Plank grating provides smoother lines and an attractive appearance compared to typical welded grating. Corrosion resistant aluminum bar and plank grating has many applications due to its light weight and high strength-to-weight ratio. It is ideally suited for use in corrosive and harsh environments making it the perfect choice for walkways and platforms in wastewater/water treatment facilities, refineries, chemical processing plants, pump stations, and a host of many other industrial and commercial applications. Aluminum grating is durable and provides many years of maintenance free service. Aluminum grating also has the advantages of being non-toxic and is easily recycled. It is available in standard mill finish or anodized finishes and offers various forms of slip resistance.

## Aluminum Swage Locked I-Bar Grating

### SI Series

Swage Locked I-Bar Grating is one of our most popular grating products and provides strength equal to rectangular bar grating of equal depth, but at a lighter weight and lower cost. This is a type of pressure locked grating made by permanently attaching the crossbars to the bearing bars using a pressure applied swaging process. The I-bar shaped bearing bars come in 7 different grating depths ranging from 1" to $2^{1}/_{2}$". Swage locked I-bar grating is offered in either a $1^{3}/_{16}$" spacing (19-spacing) or $^{15}/_{16}$" spacing (15-spacing). Crossbars are available on 4" and 2" centers. The I-Bar bearing bar flanges incorporate a striated surface for slip resistance and ***SlipNot*** slip resistant coating is also available.

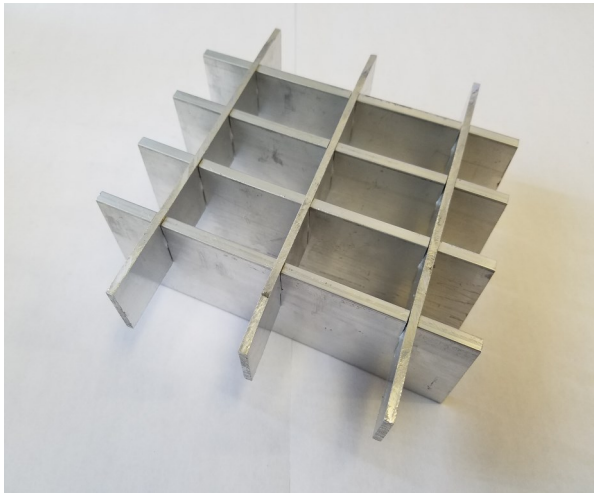


## Aluminum Swage Locked Rectangular Bar Grating

### SR Series

Swage Locked Rectangular Bar Grating is the most widely used pressure locked type of aluminum grating. It is made by locking the crossbars to the rectangular bearing bars using a pressure applied swaging process. The bearing bars have 7 different depths ranging from 1" to $2^{1}/_{2}$". Swage-locked rectangular bar grating is offered in a $1^{3}/_{16}$" spacing (19-spacing) or $^{15}/_{16}$" spacing (15-spacing). Crossbars are available on 4" and 2" centers. The rectangular bearing bars are available as a solid plain rectangular bar or with a serrated surface for slip resistance. ***SlipNot*** slip resistant coating is also available for non-serrated solid rectangular bar grating.

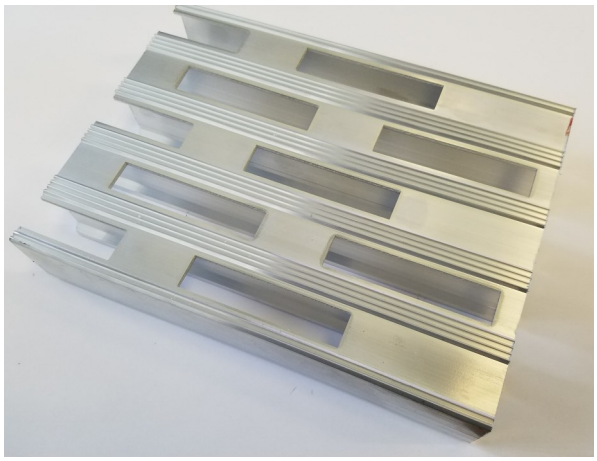
# ALUMINUM GRATING PRODUCTS



## Aluminum Dovetail Grating

### ADT Series

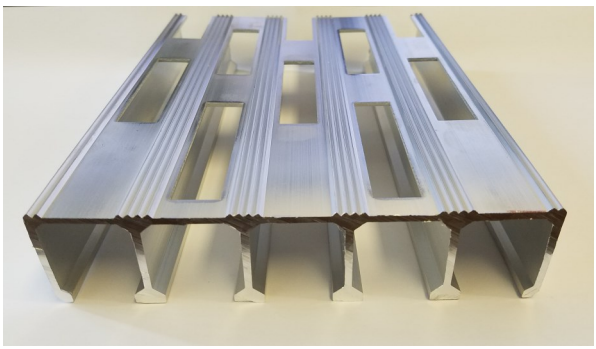
Aluminum Dovetail Grating is a type of pressure locked bar grating that offers a rectangular crossbar that is flush with the top of the rectangular bearing bars. This style of grating offers a smooth clean appearance. Both bearing bars and crossbars are precision slotted and assembled in an egg-crate overlapping configuration and hydraulically pressed together to form a tightly locked rigid grating panel. Dovetail bearing bars are offered in a $1^{3}/_{16}$" spacing (19-spacing) and ***$^{15}/_{16}$" spacing (15-spacing) - check for availability***. Crossbars are available on 4" and 2" centers. Available in 7 grating depths ranging from 1" to $2\ ^{1}/_{2}$". Dovetail grating is a popular choice of Architects because of the aesthetically appealing appearance. The bearing bars come as plain solid or serrated and may be coated with a ***Slip-Not*** skid resistant coating if required.



## Aluminum Plank Grating

### PLK Series

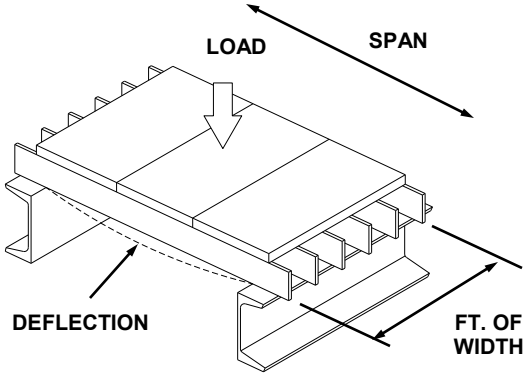
Aluminum Heavy Duty Plank is a structurally sound and attractive alternative to regular bar grating. Made from extruded aluminum, plank grating is available in 6" wide sections in 20'-0" lengths. PMWI has a built in chamfer on the bottom sides of the plank that allow planks to easily welded together to form required panel sizes. Aluminum Plank is relatively maintenance free and has no parts to work loose. The plank surface can be provided unpunched or in a variety of punch patterns to allow the passage of air, light, heat or moisture. Punch patterns include a ***diagonal punch pattern that meets ADA requirements for wheelchair accessibility (check for availability)***. The plank web top surface offers a flush walking surface for maximum foot contact and comfort. It is a great alternative to applications requiring open grating with attached plate on the top surface. Aluminum Plank grating is available in 8 grating depths ranging from $^{3}/_{4}$" to $2\ ^{1}/_{2}$".

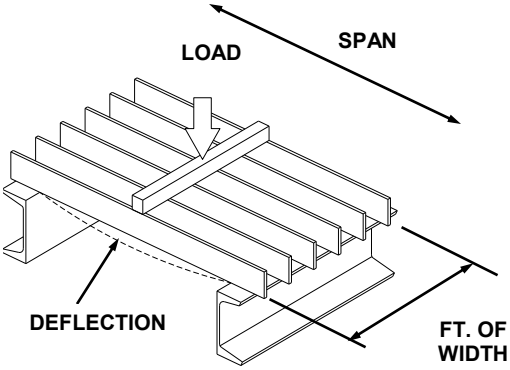


# ALUMINUM DESIGN CRITERIA

**The tables of safe loads and deflection that follow have been calculated using the following design parameters:**

**U** = Uniform Load - lbs/ft$^2$
**C** = Concentrated Load - lbs/ft of grating width
**D** = Deflection - inches
**I** = Moment of Inertia - in$^4$/ft of grating width
**S** = Section Modulus - in$^3$/ft of grating width
**L** = Simple Clear Span - feet
**E** = Modulus of Elasticity (10,000,000 psi)
**F** = Allowable Bending Stress (12,000 psi)
**M** = Bending Moment




| | Uniform Load | Concentrated Load |
|---|---|---|
| **Determine M:** | $M = \frac{FS}{12}$ | $M = \frac{FS}{12}$ |
| **Determine U or C:** | $U = \frac{8M}{L^2}$ | $C = \frac{4M}{L}$ |
| **Check D*:** | $D = \frac{5UL(L \times 12)^3}{384EI}$ | $D = \frac{C(L \times 12)^3}{48\ EI}$ |

*** Deflection shall be limited to $^1/_4$" under 100 lbs. uniform load for safe pedestrian comfort.**

**NOTE: The design of aluminum grating for pedestrian loads is deflection limited as opposed to strength limited. Although aluminum alloy 6061-T6 is stronger than 6063-T6, the Modulus of Elasticity for both alloys is the same: 10,000,000 psi. Therefore equal loads will produce the same deflection assuming that the yield strength is not exceeded.**

***Aluminum grating is recommended for use with pedestrian traffic and for light, rubber pneumatic tired rolling traffic (carts, dollies and hand trucks).***
***For other rolling loads (forklifts, cars, trucks, etc.) Heavy Duty Steel Grating is recommended.***

# ALUMINUM I-BAR

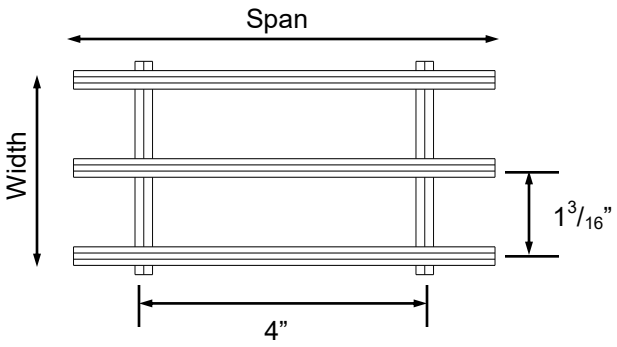
## SI SERIES

The Aluminum I-Bar SI Series style of grating offers a very popular and economically priced alternative to regular rectangular bar grating. The extruded I-Bar sections have the same load carrying capacity as rectangular bar grating but is approximately 30% less weight per square foot. The striations located on top and bottom flanges of the I-Bar sections provide a built-in means of slip resistance without the additional cost of serrations that are associated with rectangular bar grating. An optional ***Slip-Not*** coating can also be applied to the I-Bar sections to obtain an even greater slip resistance coefficient.

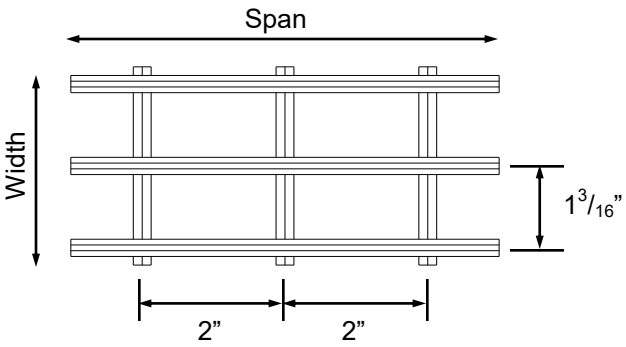
# ALUMINUM PROFILES

## I-BAR PROFILES - SI SERIES

### 19-SI-4

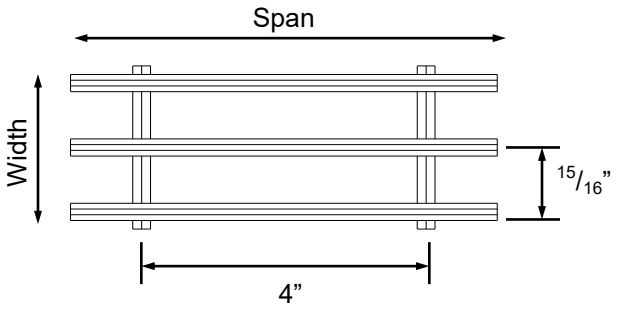



### 19-SI-2

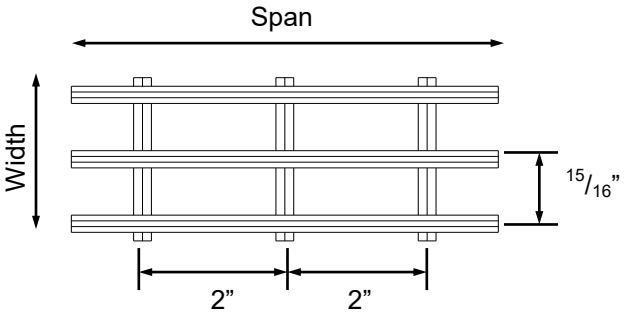



| % Open Area | |
|---|---|
| 4" cc | 80% |
| 2" cc | 77% |

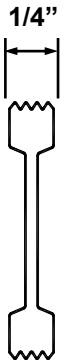
### 15-SI-4




### 15-SI-2




| % Open Area | |
|---|---|
| 4" cc | 76% |
| 2" cc | 73% |




End View

*The I-Bar SI Series offers an economically priced alternative to rectangular bar grating. Extruded I-bar sections have the same load carrying capacity with less weight per square foot compared to rectangular bars. The striated top and bottom flanges provide a built-in slip resistance without the added cost of serrating.*

***Note:** The .031" striations top and bottom flanges are in addition to the standard grating depth. For example, a 1" I-bar section has an overall depth of 1.062"*

# I-BAR SWAGE LOCKED

## LOAD & DEFLECTION TABLE

**19-SI-4 & 19-SI-2**

| Bearing Bar Size | Ped. Span inches | Approx. Weight lbs/sqft | Sec. Prop. $S_x$* ($in^3$) / $I_x$* ($in^4$) | | Clear Span (Direction of Bearing Bars) 2'-0" | 2'-6" | 3'-0" | 3'-6" | 4'-0" | 4'-6" | 5'-0" | 5'-6" | 6'-0" | 6'-6" | 7'-0" | 8'-0" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1" x 1/4" | 44 | 1.99 | 0.316 | U | 632 | 404 | 281 | 206 | 158 | | | | | | | |
| | | | | Du | 0.144 | 0.225 | 0.324 | 0.441 | 0.576 | | | | | | | |
| | | | 0.158 | C | 632 | 505 | 421 | 361 | 316 | | | | | | | |
| | | | | Dc | 0.115 | 0.180 | 0.259 | 0.353 | 0.461 | | | | | | | |
| 1-1/4" x 1/4" | 52 | 2.34 | 0.493 | U | 987 | 632 | 439 | 322 | 247 | 195 | | | | | | |
| | | | | Du | 0.115 | 0.180 | 0.259 | 0.353 | 0.461 | 0.583 | | | | | | |
| | | | 0.308 | C | 987 | 789 | 658 | 564 | 493 | 439 | | | | | | |
| | | | | Dc | 0.092 | 0.144 | 0.207 | 0.282 | 0.368 | 0.467 | | | | | | |
| 1-1/2" x 1/4" | 59 | 2.70 | 0.711 | U | 1421 | 909 | 632 | 464 | 355 | 281 | 227 | | | | | |
| | | | | Du | 0.096 | 0.150 | 0.216 | 0.294 | 0.384 | 0.487 | 0.599 | | | | | |
| | | | 0.533 | C | 1421 | 1137 | 947 | 812 | 711 | 632 | 568 | | | | | |
| | | | | Dc | 0.077 | 0.120 | 0.173 | 0.235 | 0.307 | 0.389 | 0.480 | | | | | |
| 1-3/4" x 1/4" | 66 | 3.06 | 0.967 | U | 1934 | 1238 | 860 | 632 | 484 | 382 | 309 | 256 | 215 | | | |
| | | | | Du | 0.082 | 0.129 | 0.185 | 0.252 | 0.329 | 0.417 | 0.514 | 0.623 | 0.741 | | | |
| | | | 0.846 | C | 1934 | 1547 | 1289 | 1105 | 967 | 860 | 774 | 703 | 645 | | | |
| | | | | Dc | 0.066 | 0.103 | 0.148 | 0.202 | 0.263 | 0.333 | 0.412 | 0.498 | 0.593 | | | |
| 2" x 1/4" | 73 | 3.43 | 1.263 | U | 2526 | 1617 | 1123 | 825 | 632 | 499 | 404 | 334 | 281 | 239 | | |
| | | | | Du | 0.072 | 0.113 | 0.162 | 0.221 | 0.288 | 0.364 | 0.450 | 0.544 | 0.649 | 0.760 | | |
| | | | 1.263 | C | 2526 | 2021 | 1684 | 1444 | 1263 | 1123 | 1011 | 919 | 842 | 777 | | |
| | | | | Dc | 0.058 | 0.090 | 0.130 | 0.176 | 0.230 | 0.292 | 0.360 | 0.436 | 0.518 | 0.608 | | |
| 2-1/4" x 1/4" | 80 | 3.75 | 1.599 | U | 3197 | 2046 | 1421 | 1044 | 799 | 632 | 512 | 423 | 355 | 303 | 261 | |
| | | | | Du | 0.064 | 0.100 | 0.144 | 0.196 | 0.256 | 0.324 | 0.400 | 0.484 | 0.576 | 0.677 | 0.784 | |
| | | | 1.798 | C | 3197 | 2558 | 2132 | 1827 | 1599 | 1421 | 1279 | 1163 | 1066 | 984 | 914 | |
| | | | | Dc | 0.051 | 0.080 | 0.115 | 0.157 | 0.205 | 0.259 | 0.320 | 0.387 | 0.461 | 0.541 | 0.628 | |
| 2-1/2" x 1/4" | 87 | 4.15 | 1.974 | U | 3947 | 2526 | 1754 | 1289 | 987 | 780 | 632 | 522 | 439 | 374 | 322 | 247 |
| | | | | Du | 0.058 | 0.090 | 0.130 | 0.176 | 0.230 | 0.292 | 0.360 | 0.436 | 0.519 | 0.609 | 0.705 | 0.923 |
| | | | 2.467 | C | 3947 | 3158 | 2632 | 2256 | 1974 | 1754 | 1579 | 1435 | 1316 | 1215 | 1128 | 987 |
| | | | | Dc | 0.046 | 0.072 | 0.104 | 0.141 | 0.184 | 0.233 | 0.288 | 0.348 | 0.415 | 0.487 | 0.565 | 0.737 |

U = Safe uniform load (psf)
C = Safe concentrated load (lbs/ft width)
D = Deflection (inches)
E = Modulus of Elasticity, 10,000,000 psi
F = Allowable Fiber Stress, 12,000 psi
Material: ASTM B221, 6063-T6

Loads and deflections shown are theoretical and based on static loading.

* Based on 10.105 bars/ft of grating width. Bearing bar spacing of 1-3/16" c.c. Add 0.3 lbs/sqft for 19-SI-2.

Deflection: Spans and loads to the right of the bold line exceed 1/4" deflection for uniform load of 100 psf which provides safe pedestrian comfort. This can be exceeded for other types of loads with the Engineer's approval.

Finish: Mill finish unless otherwise specified.

### Panel Width Chart (in.) - 19-SI-4 & 19-SI-2

**Dimensions are Out-to-Out of Bearing Bar Flanges****

| No. of Bars | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4" Flange | $1^{7}/_{16}$ | $2^{5}/_{8}$ | $3^{13}/_{16}$ | 5 | $6^{3}/_{16}$ | $7^{3}/_{8}$ | $8^{9}/_{16}$ | $9^{3}/_{4}$ | $10^{15}/_{16}$ | $12^{1}/_{8}$ | $13^{5}/_{16}$ | $14^{1}/_{2}$ | $15^{11}/_{16}$ | $16^{7}/_{8}$ | $18^{1}/_{16}$ |
| No. of Bars | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| 1/4" Flange | $19^{1}/_{4}$ | $20^{7}/_{16}$ | $21^{5}/_{8}$ | $22^{13}/_{16}$ | 24 | $25^{3}/_{16}$ | $26^{3}/_{8}$ | $27^{9}/_{16}$ | $28^{3}/_{4}$ | $29^{15}/_{16}$ | $31^{1}/_{8}$ | $32^{5}/_{16}$ | $33^{1}/_{2}$ | $34^{11}/_{16}$ | $35^{7}/_{8}$ |

** Add 1/4" for extended crossbars. Bearing Bar flange width is 1/4" top and bottom. Standard panel width indicated in "maroon".

# I-BAR SWAGE LOCKED

## LOAD & DEFLECTION TABLE

## 15-SI-4 & 15-SI-2

| Bearing Bar Size | Ped. Span inches | Approx. Weight lbs/sqft | Sec. Prop. $S_x$* ($in^3$) / $I_x$* ($in^4$) | | Clear Span (Direction of Bearing Bars) 2'-0" | 2'-6" | 3'-0" | 3'-6" | 4'-0" | 4'-6" | 5'-0" | 5'-6" | 6'-0" | 6'-6" | 7'-0" | 8'-0" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1" x 1/4" | 46 | 2.42 | 0.400 | U | 800 | 512 | 356 | 261 | 200 | | | | | | | |
| | | | | Du | 0.144 | 0.225 | 0.324 | 0.441 | 0.576 | | | | | | | |
| | | | 0.200 | C | 800 | 640 | 533 | 457 | 400 | | | | | | | |
| | | | | Dc | 0.115 | 0.180 | 0.259 | 0.353 | 0.461 | | | | | | | |
| 1-1/4" x 1/4" | 55 | 2.87 | 0.625 | U | 1250 | 800 | 556 | 408 | 313 | 247 | 200 | | | | | |
| | | | | Du | 0.115 | 0.180 | 0.259 | 0.353 | 0.461 | 0.583 | 0.720 | | | | | |
| | | | 0.391 | C | 1250 | 1000 | 833 | 714 | 625 | 556 | 500 | | | | | |
| | | | | Dc | 0.092 | 0.144 | 0.207 | 0.282 | 0.368 | 0.467 | 0.576 | | | | | |
| 1-1/2" x 1/4" | 63 | 3.33 | 0.900 | U | 1800 | 1152 | 800 | 588 | 450 | 356 | 288 | 238 | | | | |
| | | | | Du | 0.096 | 0.150 | 0.216 | 0.294 | 0.384 | 0.487 | 0.599 | 0.726 | | | | |
| | | | 0.675 | C | 1800 | 1440 | 1200 | 1029 | 900 | 800 | 720 | 655 | | | | |
| | | | | Dc | 0.077 | 0.120 | 0.173 | 0.235 | 0.307 | 0.389 | 0.480 | 0.581 | | | | |
| 1-3/4" x 1/4" | 70 | 3.78 | 1.225 | U | 2450 | 1568 | 1089 | 800 | 613 | 484 | 392 | 324 | 272 | | | |
| | | | | Du | 0.082 | 0.129 | 0.185 | 0.252 | 0.329 | 0.417 | 0.514 | 0.623 | 0.741 | | | |
| | | | 1.072 | C | 2450 | 1960 | 1633 | 1400 | 1225 | 1089 | 980 | 891 | 817 | | | |
| | | | | Dc | 0.066 | 0.103 | 0.148 | 0.202 | 0.263 | 0.333 | 0.412 | 0.498 | 0.593 | | | |
| 2" x 1/4" | 78 | 4.25 | 1.600 | U | 3200 | 2048 | 1422 | 1045 | 800 | 632 | 512 | 423 | 356 | 303 | 261 | |
| | | | | Du | 0.072 | 0.113 | 0.162 | 0.221 | 0.288 | 0.364 | 0.450 | 0.544 | 0.649 | 0.760 | 0.881 | |
| | | | 1.600 | C | 3200 | 2560 | 2133 | 1829 | 1600 | 1422 | 1280 | 1164 | 1067 | 985 | 914 | |
| | | | | Dc | 0.058 | 0.090 | 0.130 | 0.176 | 0.230 | 0.292 | 0.360 | 0.436 | 0.518 | 0.608 | 0.705 | |
| 2-1/4" x 1/4" | 85 | 4.66 | 2.025 | U | 4050 | 2592 | 1800 | 1322 | 1013 | 800 | 648 | 536 | 450 | 383 | 331 | 253 |
| | | | | Du | 0.064 | 0.100 | 0.144 | 0.196 | 0.256 | 0.324 | 0.400 | 0.484 | 0.576 | 0.676 | 0.784 | 1.023 |
| | | | 2.278 | C | 4050 | 3240 | 2700 | 2314 | 2025 | 1800 | 1620 | 1473 | 1350 | 1246 | 1157 | 1013 |
| | | | | Dc | 0.051 | 0.080 | 0.115 | 0.157 | 0.205 | 0.259 | 0.320 | 0.387 | 0.461 | 0.541 | 0.628 | 0.820 |
| 2-1/2" x 1/4" | 92 | 5.16 | 2.500 | U | 5000 | 3200 | 2222 | 1633 | 1250 | 988 | 800 | 661 | 556 | 473 | 408 | 313 |
| | | | | Du | 0.058 | 0.090 | 0.130 | 0.176 | 0.230 | 0.292 | 0.360 | 0.436 | 0.519 | 0.609 | 0.705 | 0.923 |
| | | | 3.125 | C | 5000 | 4000 | 3333 | 2857 | 2500 | 2222 | 2000 | 1818 | 1667 | 1538 | 1429 | 1250 |
| | | | | Dc | 0.046 | 0.072 | 0.104 | 0.141 | 0.184 | 0.233 | 0.288 | 0.348 | 0.415 | 0.487 | 0.565 | 0.737 |

U = Safe uniform load (psf)
C = Safe concentrated load (lbs/ft width)
D = Deflection (inches)
E = Modulus of Elasticity, 10,000,000 psi
F = Allowable Fiber Stress, 12,000 psi
Material: ASTM B221, 6063-T6

Loads and deflections shown are theoretical and based on static loading.

* Based on 12.8 bars/ft of grating width. Bearing bar spacing of 15/16" c.c. Add 0.3 lbs/sqft for 15-SI-2.

Deflection: Spans and loads to the right of the bold line exceed 1/4" deflection for uniform load of 100 psf which provides safe pedestrian comfort. This can be exceeded for other types of loads with the Engineer's approval.

Finish: Mill finish unless otherwise specified.

## Panel Width Chart (in.) - 15-SI-4 & 15-SI-2

Dimensions are Out-to-Out of Bearing Bar Flanges**

| No. of Bars | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4" Flange | $1^{3}/_{16}$ | $2^{1}/_{8}$ | $3^{1}/_{16}$ | 4 | $4^{15}/_{16}$ | $5^{7}/_{8}$ | $6^{13}/_{16}$ | $7^{3}/_{4}$ | $8^{11}/_{16}$ | $9^{5}/_{8}$ | $10^{9}/_{16}$ | $11^{1}/_{2}$ | $12^{7}/_{16}$ | $13^{3}/_{8}$ | $14^{5}/_{16}$ |
| No. of Bars | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| 1/4" Flange | $15^{1}/_{4}$ | $16^{3}/_{16}$ | $17^{1}/_{8}$ | $18^{1}/_{16}$ | 19 | $19^{15}/_{16}$ | $20^{7}/_{8}$ | $21^{13}/_{16}$ | $22^{3}/_{4}$ | $23^{11}/_{16}$ | $24^{5}/_{8}$ | $25^{9}/_{16}$ | $26^{1}/_{2}$ | $27^{7}/_{16}$ | $28^{3}/_{8}$ |
| No. of Bars | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | | | | | | | |
| 1/4" Flange | $29^{5}/_{16}$ | $30^{1}/_{4}$ | $31^{3}/_{16}$ | $32^{1}/_{8}$ | $33^{1}/_{16}$ | 34 | $34^{15}/_{16}$ | $35^{7}/_{8}$ | | | | | | | |

** Add 1/4" for extended crossbars. Bearing Bar flange width is 1/4" top and bottom. Standard panel width indicated in "maroon".

# Model Specification: 19-SI-4 Aluminum I-Bar Gratings

September 15, 2022

Specifier Notes: Architect or engineer should carefully review and edit this section to meet the requirements of the project and local building codes. Coordinate this section with other specification sections and the drawings and delete any unused "Specifier Notes" and options shown in **"red"** after editing.

This section covers Pleasant Mount Welding, Inc.'s "19-SI-4 Aluminum I-Bar Swage Lock Grating." This model specification may also be edited and revised for 19-SI-2, 15-SI-4 or 15-SI-2 I-Bar Swage Lock Gratings. Consult PMWI (www.pmwi.net) for assistance in editing this section for specific applications. Call 570.282.6164 or email sales@pmwi.net with any questions.

## SECTION 055300 - Metal Fabrications: Metal Gratings

## Part 1: General

### 1.1 Section Includes

A. Prefabricated, light-duty aluminum bar gratings.

B. Miscellaneous installation hardware and accessories.

### 1.2 Reference Standards

A. ANSI A326.3-2017: American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials.

B. ASTM B221: Aluminum Extruded Bars and Shapes.

C. ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

### 1.3 Action Submittals

A. Product Data: The contractor shall submit the manufacturer's catalog pages including load tables, anchor details and standard installation details.

B. Shop Drawings: The contractor shall submit for approval shop drawings for the fabrication and erection of all gratings, based on construction drawings of current issue. Include plans, elevations, and details of sections and connections as required. Show type and location of all fasteners.

C. Samples of grating and anchorage system shall be submitted for approval.

### 1.4 Quality Assurance

A. Manufacturer Qualification: A company specializing in the manufacture of metal bar gratings with not less than 10 years of documented experience.

B. Fabrication tolerances shall be in accordance with applicable provisions and recommendations of ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

## Part 2: Products

**2.1 Source Requirements:**

Design is based upon use of gratings as manufactured by Pleasant Mount Welding, Inc. and terminology used herein may include reference to the specific performance or product of this manufacturer. Such reference shall be construed only as establishing the quality of materials, operational features and workmanship used under this section and shall not, in any way, be construed as limiting competition.

**2.2 Manufacturers:**

Acceptable manufacturers include Pleasant Mount Welding, Inc. (45 Dundaff Street, Carbondale, PA 18407, 570-282-6164, www.pmwi.net) or approved equal.

**2.3 Manufactured Units:**

A. **Description:** Aluminum I-Bar Swage Lock Grating type **19-SI-4**. Square cross bars are assembled through diamond shaped holes in I-shaped bearing bars, which are then permanently locked in place by a swaging process.

1. Bearing Bar Spacing: **1-3/16"** on center.
2. Bearing Bar Depth: based on loading requirements and clear span as shown on drawings.
3. Bearing Bar Thickness: **1/4" at top to provide 15/16"** space between bars.
4. Cross Bar Spacing: **4"** on center.
5. Top Surface of Bearing Bars: **Striated or SlipNOT® Slip Resistance Coating**

B. **Fabrication:** Fabricate cutouts in grating sections for penetrations as indicated. Arrange cutouts to permit grating removal without disturbing items penetrating gratings. Trim band ends (and cuts in grating) with bars of the same thickness and nominal depth and material as bearing bars (as shown on drawings). Weld banding flush with the top surface of grating. Include fabrication required for attachment system shown on drawing plans, or as recommended by manufacturer.

C. **Design Criteria:**

1. **Loading:** Grating products shall be designed and manufactured to meet live load conditions of **100 lbs / SQFT with a maximum deflection of 1/4"** for the clear spans shown on the drawings. Bearing bar depth shall be as shown on contract drawings, or as recommended by the manufacturer to meet loading requirements, clear span conditions and maximum deflections specified.

2. **Traction / Slip-Resistance**: When a traction surface is required, it is to be tested per ANSI A326.3-2017. Top surface shall provide a minimum Wet Dynamic Coefficient of Friction (Wet DCOF) of 0.45 to meet high traction classification.

D. **Materials:** Bearing bars and banding are aluminum 6063-T6 and aluminum cross bars are type 6063-T1.

E. **Fabrication Tolerances** shall be in accordance with ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

F. **Top Surface:** When required, **SlipNOT® Slip Resistance Coating** will be included in order to meet or exceed Wet Dynamic COF requirements of paragraph 2.3 C.2 above.

G. **Finish:** Gratings shall be **Mill finish or A-41 Clear Anodized.**

**2.4 Accessories:**

Provide appropriate fasteners for type, grade, and class required for approved anchorage system.

## Part 3: Execution

**3.1 Field Verification:**

Take field measurements prior to preparation of final shop drawings (and fabrication where required) to ensure proper fitting of the work.

**3.2 Installation**

A. Prior to grating installation, contractor shall inspect supports for correct alignment and conditions for proper attachment and support of the gratings. Metal shall be used for all grating supports and provide the minimum bearing surface for the depth of grating per ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual. Ends of all bearing bars at cutouts for penetrations are to be supported in like manner. Any inconsistencies between contract drawings and supporting structure deemed detrimental to grating placement shall be reported in writing to the engineer, architect or owner's agent prior to placement.

B. Install grating in accordance with shop drawings and standard installation clearances as recommended by ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

C. Protection of Aluminum from Dissimilar Materials:

1. Where aluminum surfaces come into contact with dissimilar metals, surfaces shall be kept from direct contact by painting the dissimilar metal with one coat of bituminous paint, powder coat paint, or other approved insulating material.

2. Where aluminum surfaces come into contact with dissimilar materials such as concrete, masonry or lime mortar, exposed aluminum surfaces shall be painted with one coat of bituminous paint, powder coat paint, or other approved insulating material.

**3.3 Grating Attachment:**

Use approved attachment system and fasteners to secure grating to supporting members as shown on plans.

# ALUMINUM RECTANGULAR BAR

## SR SERIES

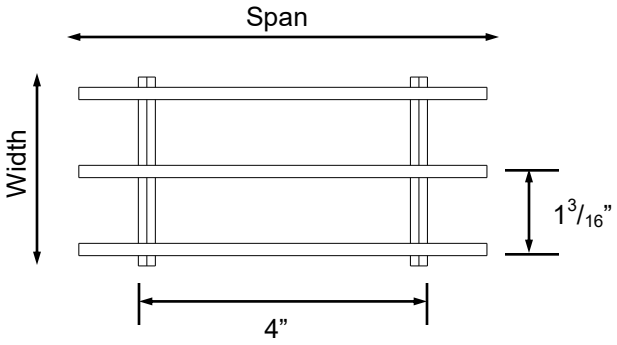
The most widely used type of aluminum pressure locked grating is the Swage Locked Rectangular Bar SR Series. The aluminum crossbars are assembled through punched diamond shaped openings in the flat rectangular bearing bars and locked in place by our hydraulic swaging process.

The SR Series provides an aesthetically clean look with sharp lines and a recessed crossbar that allows grating panels to be formed without any need for welding. This grating is often used for architectural applications. Slip resistant coatings are available as well as serrated bearing bar surface.

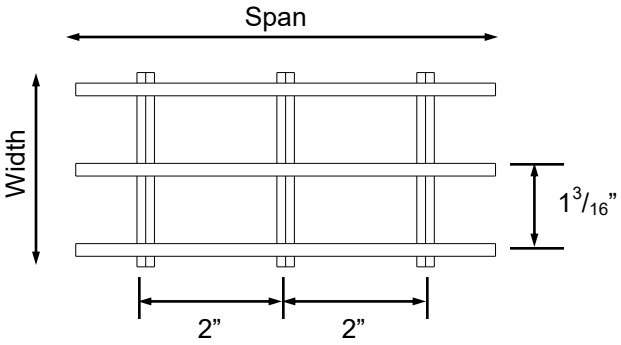
# ALUMINUM PROFILES

## RECTANGULAR BAR PROFILES - SR SERIES

### 19-SR-4

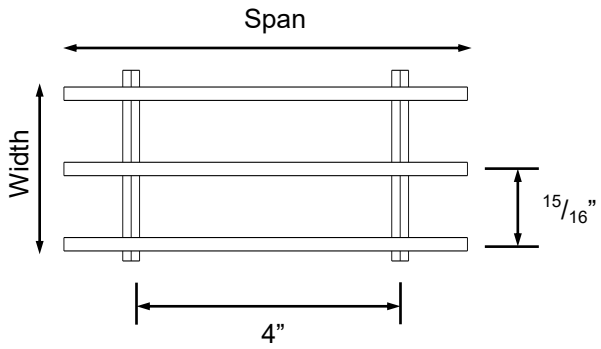



### 19-SR-2

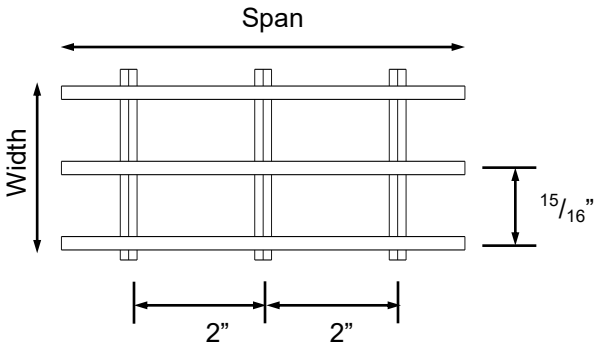



| % Open Area | |
|---|---|
| 4" cc | 85% |
| 2" cc | 81% |

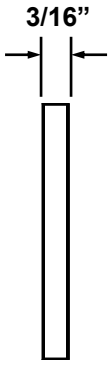
### 15-SR-4




### 15-SR-2




| % Open Area | |
|---|---|
| 4" cc | 76% |
| 2" cc | 73% |




End View

*The Aluminum Rectangular Bar SR Series offers an alternative to the I-Bar style of grating. The rectangular bearing bars have the same load carrying capacity as the I-Bar series, however the weight per square foot of grating will be greater. The rectangular bearing bars are offered either as a plain surface or can be serrated to provide slip resistance. When a serrated surface is required, the depth of the grating required for a specified load shall be 1/4" deeper than that shown in the load tables of this manual.*

# RECT BAR SWAGE LOCKED

## LOAD & DEFLECTION TABLE

## 19-SR-4 & 19-SR-2

| Bearing Bar Size | Ped. Span inches | Approx. Weight lbs/sqft | Sec. Prop. $S_x$* ($in^3$) / $I_x$* ($in^4$) | | Clear Span (Direction of Bearing Bars) 2'-0" | 2'-6" | 3'-0" | 3'-6" | 4'-0" | 4'-6" | 5'-0" | 5'-6" | 6'-0" | 6'-6" | 7'-0" | 8'-0" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1" x 3/16" | 44 | 2.46 | 0.316 | U | 632 | 404 | 281 | 206 | 158 | | | | | | | |
| | | | | Du | 0.144 | 0.225 | 0.324 | 0.441 | 0.576 | | | | | | | |
| | | | 0.158 | C | 632 | 505 | 421 | 361 | 316 | | | | | | | |
| | | | | Dc | 0.115 | 0.180 | 0.259 | 0.353 | 0.461 | | | | | | | |
| 1-1/4" x 3/16" | 52 | 3.01 | 0.493 | U | 987 | 632 | 439 | 322 | 247 | 195 | | | | | | |
| | | | | Du | 0.115 | 0.180 | 0.259 | 0.353 | 0.461 | 0.583 | | | | | | |
| | | | 0.308 | C | 987 | 789 | 658 | 564 | 493 | 439 | | | | | | |
| | | | | Dc | 0.092 | 0.144 | 0.207 | 0.282 | 0.369 | 0.467 | | | | | | |
| 1-1/2" x 3/16" | 59 | 3.56 | 0.711 | U | 1421 | 909 | 632 | 464 | 355 | 281 | 227 | | | | | |
| | | | | Du | 0.096 | 0.150 | 0.216 | 0.294 | 0.384 | 0.486 | 0.600 | | | | | |
| | | | 0.533 | C | 1421 | 1137 | 947 | 812 | 711 | 632 | 568 | | | | | |
| | | | | Dc | 0.077 | 0.120 | 0.173 | 0.235 | 0.307 | 0.389 | 0.480 | | | | | |
| 1-3/4" x 3/16" | 66 | 4.12 | 0.967 | U | 1934 | 1238 | 860 | 632 | 484 | 382 | 309 | 256 | 215 | | | |
| | | | | Du | 0.082 | 0.129 | 0.185 | 0.252 | 0.329 | 0.417 | 0.514 | 0.622 | 0.741 | | | |
| | | | 0.846 | C | 1934 | 1547 | 1289 | 1105 | 967 | 860 | 774 | 703 | 645 | | | |
| | | | | Dc | 0.066 | 0.103 | 0.148 | 0.202 | 0.263 | 0.333 | 0.411 | 0.498 | 0.592 | | | |
| 2" x 3/16" | 73 | 4.68 | 1.263 | U | 2526 | 1617 | 1123 | 825 | 632 | 499 | 404 | 334 | 281 | 239 | | |
| | | | | Du | 0.072 | 0.113 | 0.162 | 0.221 | 0.288 | 0.365 | 0.450 | 0.545 | 0.648 | 0.761 | | |
| | | | 1.263 | C | 2526 | 2021 | 1684 | 1444 | 1263 | 1123 | 1011 | 919 | 842 | 777 | | |
| | | | | Dc | 0.058 | 0.090 | 0.130 | 0.176 | 0.230 | 0.292 | 0.360 | 0.436 | 0.518 | 0.608 | | |
| 2-1/4" x 3/16" | 80 | 5.24 | 1.599 | U | 3197 | 2046 | 1421 | 1044 | 799 | 632 | 512 | 423 | 355 | 303 | 261 | |
| | | | | Du | 0.064 | 0.100 | 0.144 | 0.196 | 0.256 | 0.324 | 0.400 | 0.484 | 0.576 | 0.676 | 0.784 | |
| | | | 1.798 | C | 3197 | 2558 | 2132 | 1827 | 1599 | 1421 | 1279 | 1163 | 1066 | 984 | 914 | |
| | | | | Dc | 0.051 | 0.080 | 0.115 | 0.157 | 0.205 | 0.259 | 0.320 | 0.387 | 0.461 | 0.541 | 0.627 | |
| 2-1/2" x 3/16" | 87 | 5.79 | 1.974 | U | 3947 | 2526 | 1754 | 1289 | 987 | 780 | 632 | 522 | 439 | 374 | 322 | 247 |
| | | | | Du | 0.058 | 0.090 | 0.130 | 0.176 | 0.230 | 0.292 | 0.360 | 0.436 | 0.518 | 0.608 | 0.706 | 0.922 |
| | | | 2.467 | C | 3947 | 3158 | 2632 | 2256 | 1974 | 1754 | 1579 | 1435 | 1316 | 1215 | 1128 | 987 |
| | | | | Dc | 0.046 | 0.072 | 0.104 | 0.141 | 0.184 | 0.233 | 0.288 | 0.348 | 0.415 | 0.487 | 0.564 | 0.737 |

U = Safe uniform load (psf)
C = Safe concentrated load (lbs/ft grating width)
D = Deflection (inches)
E = Modulus of Elasticity, 10,000,000 psi
F = Allowable Fiber Stress, 12,000 psi
Material: ASTM B221, 6063-T6

Loads and deflections shown are theoretical and based on static loading.

* Based on 10.105 bars/ft of grating width. Bearing bar spacing of 1-3/16" c.c. Add 0.3 lbs/sqft for 19-SR-2.

Deflection: Spans and loads to the right of the bold line exceed 1/4" deflection for uniform load of 100 psf which provides safe pedestrian comfort. This can be exceeded for other types of loads with the Engineer's approval.

Serrated Bars: For serrated grating, the depth of grating required for a specified load is 1/4" deeper than that shown in table.

Finish: Mill finish unless otherwise specified.

## Panel Width Chart (in.) - 19-SR-4 & 19-SR-2

Dimensions are Out-to-Out of Bearing Bars**

| No. of Bars | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/16" Flange | $1^{3}/_{8}$ | $2^{9}/_{16}$ | $3^{3}/_{4}$ | $4^{15}/_{16}$ | $6^{1}/_{8}$ | $7^{5}/_{16}$ | $8^{1}/_{2}$ | $9^{11}/_{16}$ | $10^{7}/_{8}$ | $12^{1}/_{16}$ | $13^{1}/_{4}$ | $14^{7}/_{16}$ | $15^{5}/_{8}$ | $16^{13}/_{16}$ | 18 |
| No. of Bars | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| 3/16" Flange | $19^{3}/_{16}$ | $20^{3}/_{8}$ | $21^{9}/_{16}$ | $22^{3}/_{4}$ | $22^{15}/_{16}$ | $25^{1}/_{8}$ | $26^{5}/_{16}$ | $27^{1}/_{2}$ | $28^{11}/_{16}$ | $29^{7}/_{8}$ | $31^{1}/_{16}$ | $32^{1}/_{4}$ | $33^{7}/_{16}$ | $34^{5}/_{8}$ | $35^{13}/_{16}$ |

** Add 1/4" for extended crossbars. Standard panel width indicated in "maroon".

# RECT BAR SWAGE LOCKED

## LOAD & DEFLECTION TABLE

## 15-SR-4 & 15-SR-2

| Bearing Bar Size | Ped. Span inches | Approx. Weight lbs/sqft | Sec. Prop. $S_x$* ($in^3$) / $I_x$* ($in^4$) | | Clear Span (Direction of Bearing Bars) 2'-0" | 2'-6" | 3'-0" | 3'-6" | 4'-0" | 4'-6" | 5'-0" | 5'-6" | 6'-0" | 6'-6" | 7'-0" | 8'-0" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1" x 3/16" | 46 | 3.06 | 0.400 | U | 800 | 512 | 356 | 261 | 200 | | | | | | | |
| | | | | Du | 0.144 | 0.225 | 0.324 | 0.441 | 0.576 | | | | | | | |
| | | | 0.200 | C | 800 | 640 | 533 | 457 | 400 | | | | | | | |
| | | | | Dc | 0.115 | 0.180 | 0.259 | 0.353 | 0.461 | | | | | | | |
| 1-1/4" x 3/16" | 55 | 3.75 | 0.625 | U | 1250 | 800 | 556 | 408 | 313 | 247 | 200 | | | | | |
| | | | | Du | 0.115 | 0.180 | 0.259 | 0.353 | 0.461 | 0.583 | 0.720 | | | | | |
| | | | 0.391 | C | 1250 | 1000 | 833 | 714 | 625 | 556 | 500 | | | | | |
| | | | | Dc | 0.092 | 0.144 | 0.207 | 0.282 | 0.368 | 0.467 | 0.576 | | | | | |
| 1-1/2" x 3/16" | 63 | 4.45 | 0.900 | U | 1800 | 1152 | 800 | 588 | 450 | 356 | 288 | 238 | | | | |
| | | | | Du | 0.096 | 0.150 | 0.216 | 0.294 | 0.384 | 0.487 | 0.599 | 0.726 | | | | |
| | | | 0.675 | C | 1800 | 1440 | 1200 | 1029 | 900 | 800 | 720 | 655 | | | | |
| | | | | Dc | 0.077 | 0.120 | 0.173 | 0.235 | 0.307 | 0.389 | 0.480 | 0.581 | | | | |
| 1-3/4" x 3/16" | 70 | 5.16 | 1.225 | U | 2450 | 1568 | 1089 | 800 | 613 | 484 | 392 | 324 | 272 | | | |
| | | | | Du | 0.082 | 0.129 | 0.185 | 0.252 | 0.329 | 0.417 | 0.514 | 0.623 | 0.741 | | | |
| | | | 1.072 | C | 2450 | 1960 | 1633 | 1400 | 1225 | 1089 | 980 | 891 | 817 | | | |
| | | | | Dc | 0.066 | 0.103 | 0.148 | 0.202 | 0.263 | 0.333 | 0.412 | 0.498 | 0.593 | | | |
| 2" x 3/16" | 78 | 5.87 | 1.600 | U | 3200 | 2048 | 1422 | 1045 | 800 | 632 | 512 | 423 | 356 | 303 | 261 | |
| | | | | Du | 0.072 | 0.113 | 0.162 | 0.221 | 0.288 | 0.364 | 0.450 | 0.544 | 0.649 | 0.760 | 0.881 | |
| | | | 1.600 | C | 3200 | 2560 | 2133 | 1829 | 1600 | 1422 | 1280 | 1164 | 1067 | 985 | 914 | |
| | | | | Dc | 0.058 | 0.090 | 0.130 | 0.176 | 0.230 | 0.292 | 0.360 | 0.436 | 0.518 | 0.608 | 0.705 | |
| 2-1/4" x 3/16" | 85 | 6.57 | 2.025 | U | 4050 | 2592 | 1800 | 1322 | 1013 | 800 | 648 | 536 | 450 | 383 | 331 | 253 |
| | | | | Du | 0.064 | 0.100 | 0.144 | 0.196 | 0.256 | 0.324 | 0.400 | 0.484 | 0.576 | 0.676 | 0.784 | 1.023 |
| | | | 2.278 | C | 4050 | 3240 | 2700 | 2314 | 2025 | 1800 | 1620 | 1473 | 1350 | 1246 | 1157 | 1013 |
| | | | | Dc | 0.051 | 0.080 | 0.115 | 0.157 | 0.205 | 0.259 | 0.320 | 0.387 | 0.461 | 0.541 | 0.628 | 0.820 |
| 2-1/2" x 3/16" | 92 | 7.27 | 2.500 | U | 5000 | 3200 | 2222 | 1633 | 1250 | 988 | 800 | 661 | 556 | 473 | 408 | 313 |
| | | | | Du | 0.058 | 0.090 | 0.130 | 0.176 | 0.230 | 0.292 | 0.360 | 0.436 | 0.519 | 0.609 | 0.705 | 0.923 |
| | | | 3.125 | C | 5000 | 4000 | 3333 | 2857 | 2500 | 2222 | 2000 | 1818 | 1667 | 1538 | 1429 | 1250 |
| | | | | Dc | 0.046 | 0.072 | 0.104 | 0.141 | 0.184 | 0.233 | 0.288 | 0.348 | 0.415 | 0.487 | 0.565 | 0.737 |

U = Safe uniform load (psf)
C = Safe concentrated load (lbs/ft width)
D = Deflection (inches)
E = Modulus of Elasticity, 10,000,000 psi
F = Allowable Fiber Stress, 12,000 psi
Material: ASTM B221, 6063-T6

Finish: Mill finish unless otherwise specified.

Loads and deflections shown are theoretical and based on static loading.

* Based on 12.8 bars/ft of grating width. Bearing bar spacing of 15/16" c.c. Add 0.3 lbs/sqft for 15-SR-2.

Deflection: Spans and loads to the right of the bold line exceed 1/4" deflection for uniform load of 100 psf which provides safe pedestrian comfort. This can be exceeded for other types of loads with the Engineer's approval.

Serrated Bars: For serrated grating, the depth of grating required for a specified load is 1/4" deeper than that shown in table.

## Panel Width Chart (in.) - 15-SR-4 & 15-SR-2

### Dimensions are Out-to-Out of Bearing Bars**

| No. of Bars | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/16" Flange | $1^{1}/_{8}$ | $2^{1}/_{16}$ | 3 | $3^{15}/_{16}$ | $4^{7}/_{8}$ | $5^{13}/_{16}$ | $6^{3}/_{4}$ | $7^{11}/_{16}$ | $8^{5}/_{8}$ | $9^{9}/_{16}$ | $10^{1}/_{2}$ | $11^{7}/_{16}$ | $12^{3}/_{8}$ | $13^{5}/_{16}$ | $14^{1}/_{4}$ |
| No. of Bars | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| 3/16" Flange | $15^{3}/_{16}$ | $16^{1}/_{8}$ | $17^{1}/_{16}$ | 18 | $18^{15}/_{16}$ | $19^{7}/_{8}$ | $20^{13}/_{16}$ | $21^{3}/_{4}$ | $22^{11}/_{16}$ | $23^{5}/_{8}$ | $24^{9}/_{16}$ | $25^{1}/_{2}$ | $26^{7}/_{16}$ | $27^{3}/_{8}$ | $28^{5}/_{16}$ |
| No. of Bars | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | | | | | | | |
| 3/16" Flange | $29^{1}/_{4}$ | $30^{3}/_{16}$ | $31^{1}/_{8}$ | $32^{1}/_{16}$ | 33 | $33^{15}/_{16}$ | $34^{7}/_{8}$ | $35^{13}/_{16}$ | | | | | | | |

** Add 1/4" for extended crossbars. Standard panel width indicated in "maroon".

# Model Specification: 19-SR-4 Aluminum Rectangular Bar Gratings

September 15, 2022

Specifier Notes: Architect or engineer should carefully review and edit this section to meet the requirements of the project and local building codes. Coordinate this section with other specification sections and the drawings and delete any unused "Specifier Notes" and options shown in **"red"** after editing.

This section covers Pleasant Mount Welding, Inc.'s "19-SR-4 Aluminum Rectangular Bar Swage Lock Grating." This model specification may also be edited and revised for 19-SR-2, 15-SR-4 or 15-SR-2 Aluminum Rectangular Bar Swage Lock Gratings. Consult PMWI (www.pmwi.net) for assistance in editing this section for specific applications. Call 570.282.6164 or email sales@pmwi.net with any questions.

## SECTION 055300 - Metal Fabrications: Metal Gratings

## Part 1: General

### 1.1 Section Includes

A. Prefabricated, light-duty aluminum bar gratings.

B. Miscellaneous installation hardware and accessories.

### 1.2 Reference Standards

A. ANSI A326.3-2017: American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials.

B. ASTM B221: Aluminum Extruded Bars and Shapes.

C. ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

### 1.3 Action Submittals

A. Product Data: The contractor shall submit the manufacturer's catalog pages including load tables, anchor details and standard installation details.

B. Shop Drawings: The contractor shall submit for approval shop drawings for the fabrication and erection of all gratings, based on construction drawings of current issue. Include plans, elevations, and details of sections and connections as required. Show type and location of all fasteners.

C. Samples of grating and anchorage system shall be submitted for approval.

### 1.4 Quality Assurance

A. Manufacturer Qualification: A company specializing in the manufacture of metal bar gratings with not less than 10 years of documented experience.

B. Fabrication tolerances shall be in accordance with applicable provisions and recommendations of ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

## Part 2: Products

### 2.1 Source Requirements:

Design is based upon use of gratings as manufactured by Pleasant Mount Welding, Inc. and terminology used herein may include reference to the specific performance or product of this manufacturer. Such reference shall be construed only as establishing the quality of materials, operational features and workmanship used under this section and shall not, in any way, be construed as limiting competition.

### 2.2 Manufacturers:

Acceptable manufacturers include Pleasant Mount Welding, Inc. (45 Dundaff Street, Carbondale, PA 18407, 570-282-6164, www.pmwi.net) or approved equal.

### 2.3 Manufactured Units:

A. **Description:** Aluminum Rectangular Bar Swage Lock Grating type **19-SR-4**. Square cross bars are assembled through diamond shaped holes in rectangular bearing bars, which are then permanently locked in place by a swaging process.

1. Bearing Bar Spacing: **1-3/16"** on center.
2. Bearing Bar Depth: based on loading requirements and clear span as shown on drawings.
3. Bearing Bar Thickness: **3/16" to provide 1"** space between bars.
4. Cross Bar Spacing: **4"** on center.
5. Top Surface of Bearing Bars: **Plain | Serrated | SlipNOT® Slip Resistance Coating**

B. **Fabrication:** Fabricate cutouts in grating sections for penetrations as indicated. Arrange cutouts to permit grating removal without disturbing items penetrating gratings. Trim band ends (and cuts in grating) with bars of the same thickness, nominal depth and material as bearing bars (as shown on drawings). Weld banding flush with the top surface of grating. Include fabrication required for attachment system shown on drawing plans, or as recommended by manufacturer.

C. **Design Criteria:**

1. **Loading:** Grating products shall be designed and manufactured to meet live load conditions of **100 lbs / SQFT with a maximum deflection of 1/4"** for the clear spans shown on the drawings. Bearing bar depth shall be as shown on contract drawings, or as recommended by the manufacturer to meet loading requirements, clear span conditions and maximum deflections specified.

2. **Traction / Slip-Resistance**: When a traction surface is required, it is to be tested per ANSI A326.3-2017. Top surface shall provide a minimum Wet Dynamic Coefficient of Friction (Wet DCOF) of 0.45 to meet high traction classification.

D. **Materials:** Bearing bars and banding are aluminum 6063-T6 and aluminum cross bars are type 6063-T1.

E. **Fabrication Tolerances** shall be in accordance with ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

F. **Top Surface:** When required, **SlipNOT® Slip Resistance Coating** will be included in order to meet or exceed Wet Dynamic COF requirements of paragraph 2.3 C.2 above.

G. **Finish:** Gratings shall be **Mill finish or A-41 Clear Anodized.**

**2.4 Accessories:**

Provide appropriate fasteners for type, grade, and class required for approved anchorage system.

## Part 3: Execution

**3.1 Field Verification:**

Take field measurements prior to preparation of final shop drawings (and fabrication where required) to ensure proper fitting of the work.

**3.2 Installation**

A. Prior to grating installation, contractor shall inspect supports for correct alignment and conditions for proper attachment and support of the gratings. Metal shall be used for all grating supports and provide the minimum bearing surface for the depth of grating per ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual. Ends of all bearing bars at cutouts for penetrations are to be supported in like manner. Any inconsistencies between contract drawings and supporting structure deemed detrimental to grating placement shall be reported in writing to the engineer, architect or owner's agent prior to placement.

B. Install grating in accordance with shop drawings and standard installation clearances as recommended by ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

C. Protection of Aluminum from Dissimilar Materials:

1. Where aluminum surfaces come into contact with dissimilar metals, surfaces shall be kept from direct contact by painting the dissimilar metal with one coat of bituminous paint, powder coat paint, or other approved insulating material.

2. Where aluminum surfaces come into contact with dissimilar materials such as concrete, masonry or lime mortar, exposed aluminum surfaces shall be painted with one coat of bituminous paint, powder coat paint, or other approved insulating material.

**3.3 Grating Attachment:**

Use approved attachment system and fasteners to secure grating to supporting members as shown on plans.

# ALUMINUM DOVETAIL

## ADT SERIES

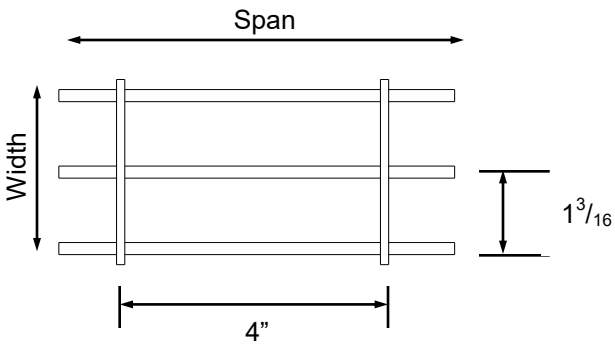
Aluminum Dovetail ADT Series grating is a traditional design pressure locked grating that has a flush top rectangular crossbar. Both bearing bars and crossbars are precision slotted, assembled in an egg-crate configuration and hydraulically pressed together to form a rigidly locked grating panel.

Aluminum Dovetail ADT Series grating is a very popular choice of Architects due to it's smooth, clean lines and aesthetic eye appeal. Serrated bearing bars are available for this type of grating and a ***Slip-Not*** coating may be applied to non-serrated plain bearing bars for increased slip resistance.

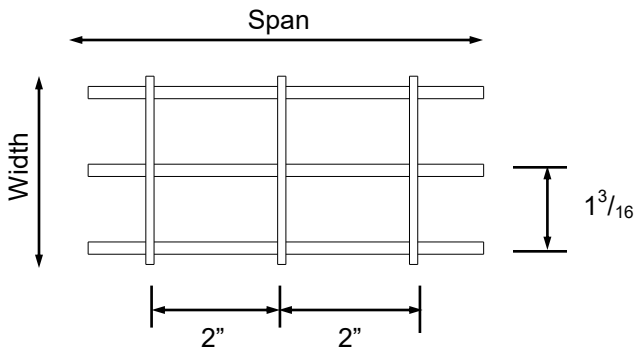
# ALUMINUM PROFILES

## ALUMINUM DOVETAIL PROFILES - ADT SERIES

### 19-ADT-4



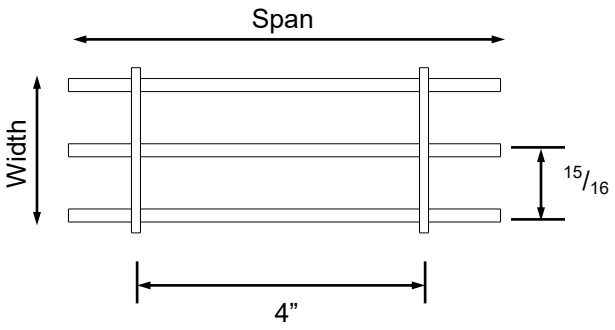

### 19-ADT-2



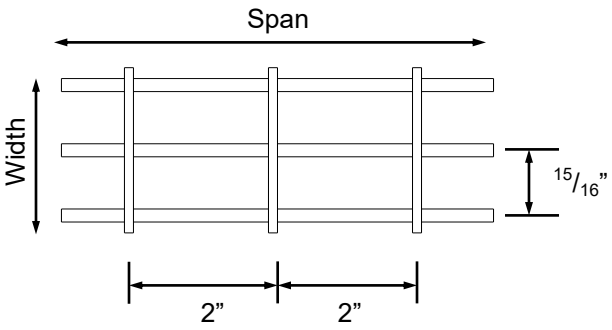

| % Open Area | |
|---|---|
| 4” cc | 81% |
| 2” cc | 79% |

**** 15-ADT Series (Check for Availability)***

### 15-ADT-4




### 15-ADT-2




| % Open Area | |
|---|---|
| 4” cc | 77% |
| 2” cc | 75% |

# ALUMINUM DOVETAIL

## LOAD & DEFLECTION TABLE

## 19-ADT-4 & 19-ADT-2

| Bearing Bar Size | Ped. Span inches | Approx. Weight lbs/sqft | Sec. Prop. $S_x$* ($in^3$) / $I_x$* ($in^4$) | | Clear Span (Direction of Bearing Bars) 2'-0" | 2'-6" | 3'-0" | 3'-6" | 4'-0" | 4'-6" | 5'-0" | 5'-6" | 6'-0" | 6'-6" | 7'-0" | 8'-0" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1" x 3/16" | 44 | 2.46 | 0.316 | U | 632 | 404 | 281 | 206 | 158 | | | | | | | |
| | | | | Du | 0.144 | 0.225 | 0.324 | 0.441 | 0.576 | | | | | | | |
| | | | 0.158 | C | 632 | 505 | 421 | 361 | 316 | | | | | | | |
| | | | | Dc | 0.115 | 0.180 | 0.259 | 0.353 | 0.461 | | | | | | | |
| 1-1/4" x 3/16" | 52 | 3.01 | 0.493 | U | 987 | 632 | 439 | 322 | 247 | 195 | | | | | | |
| | | | | Du | 0.115 | 0.180 | 0.259 | 0.353 | 0.461 | 0.583 | | | | | | |
| | | | 0.308 | C | 987 | 789 | 658 | 564 | 493 | 439 | | | | | | |
| | | | | Dc | 0.092 | 0.144 | 0.207 | 0.282 | 0.369 | 0.467 | | | | | | |
| 1-1/2" x 3/16" | 59 | 3.56 | 0.711 | U | 1421 | 909 | 632 | 464 | 355 | 281 | 227 | | | | | |
| | | | | Du | 0.096 | 0.150 | 0.216 | 0.294 | 0.384 | 0.486 | 0.600 | | | | | |
| | | | 0.533 | C | 1421 | 1137 | 947 | 812 | 711 | 632 | 568 | | | | | |
| | | | | Dc | 0.077 | 0.120 | 0.173 | 0.235 | 0.307 | 0.389 | 0.480 | | | | | |
| 1-3/4" x 3/16" | 66 | 4.12 | 0.967 | U | 1934 | 1238 | 860 | 632 | 484 | 382 | 309 | 256 | 215 | | | |
| | | | | Du | 0.082 | 0.129 | 0.185 | 0.252 | 0.329 | 0.417 | 0.514 | 0.622 | 0.741 | | | |
| | | | 0.846 | C | 1934 | 1547 | 1289 | 1105 | 967 | 860 | 774 | 703 | 645 | | | |
| | | | | Dc | 0.066 | 0.103 | 0.148 | 0.202 | 0.263 | 0.333 | 0.411 | 0.498 | 0.592 | | | |
| 2" x 3/16" | 73 | 4.68 | 1.263 | U | 2526 | 1617 | 1123 | 825 | 632 | 499 | 404 | 334 | 281 | 239 | | |
| | | | | Du | 0.072 | 0.113 | 0.162 | 0.221 | 0.288 | 0.365 | 0.450 | 0.545 | 0.648 | 0.761 | | |
| | | | 1.263 | C | 2526 | 2021 | 1684 | 1444 | 1263 | 1123 | 1011 | 919 | 842 | 777 | | |
| | | | | Dc | 0.058 | 0.090 | 0.130 | 0.176 | 0.230 | 0.292 | 0.360 | 0.436 | 0.518 | 0.608 | | |
| 2-1/4" x 3/16" | 80 | 5.24 | 1.599 | U | 3197 | 2046 | 1421 | 1044 | 799 | 632 | 512 | 423 | 355 | 303 | 261 | |
| | | | | Du | 0.064 | 0.100 | 0.144 | 0.196 | 0.256 | 0.324 | 0.400 | 0.484 | 0.576 | 0.676 | 0.784 | |
| | | | 1.798 | C | 3197 | 2558 | 2132 | 1827 | 1599 | 1421 | 1279 | 1163 | 1066 | 984 | 914 | |
| | | | | Dc | 0.051 | 0.080 | 0.115 | 0.157 | 0.205 | 0.259 | 0.320 | 0.387 | 0.461 | 0.541 | 0.627 | |
| 2-1/2" x 3/16" | 87 | 5.79 | 1.974 | U | 3947 | 2526 | 1754 | 1289 | 987 | 780 | 632 | 522 | 439 | 374 | 322 | 247 |
| | | | | Du | 0.058 | 0.090 | 0.130 | 0.176 | 0.230 | 0.292 | 0.360 | 0.436 | 0.518 | 0.608 | 0.706 | 0.922 |
| | | | 2.467 | C | 3947 | 3158 | 2632 | 2256 | 1974 | 1754 | 1579 | 1435 | 1316 | 1215 | 1128 | 987 |
| | | | | Dc | 0.046 | 0.072 | 0.104 | 0.141 | 0.184 | 0.233 | 0.288 | 0.348 | 0.415 | 0.487 | 0.564 | 0.737 |

U = Safe uniform load (psf)
C = Safe concentrated load (lbs/ft grating width)
D = Deflection (inches)
E = Modulus of Elasticity, 10,000,000 psi
F = Allowable Fiber Stress, 12,000 psi
Material: ASTM B221, 6063-T6

Loads and deflections shown are theoretical and based on static loading.

* Based on 10.105 bars/ft of grating width. Bearing bar spacing of 1-3/16" c.c. Add 0.3 lbs/sqft for 19-ADT-2.

Deflection: Spans and loads to the right of the bold line exceed 1/4" deflection for uniform load of 100 psf which provides safe pedestrian comfort. This can be exceeded for other types of loads with the Engineer's approval.

Serrated Bars: For serrated grating, the depth of grating required for a specified load is 1/4" deeper than that shown in table.

Finish: Mill finish unless otherwise specified.

## Panel Width Chart (in.) - 19-ADT-4 & 19-ADT-2

### Dimensions are Out-to-Out of Bearing Bars**

| No. of Bars | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/16" Flange | $1\frac{3}{8}$ | $2\frac{9}{16}$ | $3\frac{3}{4}$ | $4\frac{15}{16}$ | $6\frac{1}{8}$ | $7\frac{5}{16}$ | $8\frac{1}{2}$ | $9\frac{11}{16}$ | $10\frac{7}{8}$ | $12\frac{1}{16}$ | $13\frac{1}{4}$ | $14\frac{7}{16}$ | $15\frac{5}{8}$ | $16\frac{13}{16}$ | 18 |
| No. of Bars | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| 3/16" Flange | $19\frac{3}{16}$ | $20\frac{3}{8}$ | $21\frac{9}{16}$ | $22\frac{3}{4}$ | $22\frac{15}{16}$ | $25\frac{1}{8}$ | $26\frac{5}{16}$ | $27\frac{1}{2}$ | $28\frac{11}{16}$ | $29\frac{7}{8}$ | $31\frac{1}{16}$ | $32\frac{1}{4}$ | $33\frac{7}{16}$ | $34\frac{5}{8}$ | $35\frac{13}{16}$ |

** Add 1/4" for extended crossbars. Standard panel width indicated in "maroon".

# ALUMINUM DOVETAIL

## LOAD & DEFLECTION TABLE *** 15-ADT Series (Check Availability)* 15-ADT-4 & 15-ADT-2

| Bearing Bar Size | Ped. Span inches | Approx. Weight lbs/sqft | Sec. Prop. $S_x$* ($in^3$) / $I_x$* ($in^4$) | | Clear Span (Direction of Bearing Bars) 2'-0" | 2'-6" | 3'-0" | 3'-6" | 4'-0" | 4'-6" | 5'-0" | 5'-6" | 6'-0" | 6'-6" | 7'-0" | 8'-0" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1" x 3/16" | 46 | 3.06 | 0.400 | U | 800 | 512 | 356 | 261 | 200 | | | | | | | |
| | | | | Du | 0.144 | 0.225 | 0.324 | 0.441 | 0.576 | | | | | | | |
| | | | 0.200 | C | 800 | 640 | 533 | 457 | 400 | | | | | | | |
| | | | | Dc | 0.115 | 0.180 | 0.259 | 0.353 | 0.461 | | | | | | | |
| 1-1/4" x 3/16" | 55 | 3.75 | 0.625 | U | 1250 | 800 | 556 | 408 | 313 | 247 | 200 | | | | | |
| | | | | Du | 0.115 | 0.180 | 0.259 | 0.353 | 0.461 | 0.583 | 0.720 | | | | | |
| | | | 0.391 | C | 1250 | 1000 | 833 | 714 | 625 | 556 | 500 | | | | | |
| | | | | Dc | 0.092 | 0.144 | 0.207 | 0.282 | 0.368 | 0.467 | 0.576 | | | | | |
| 1-1/2" x 3/16" | 63 | 4.45 | 0.900 | U | 1800 | 1152 | 800 | 588 | 450 | 356 | 288 | 238 | | | | |
| | | | | Du | 0.096 | 0.150 | 0.216 | 0.294 | 0.384 | 0.487 | 0.599 | 0.726 | | | | |
| | | | 0.675 | C | 1800 | 1440 | 1200 | 1029 | 900 | 800 | 720 | 655 | | | | |
| | | | | Dc | 0.077 | 0.120 | 0.173 | 0.235 | 0.307 | 0.389 | 0.480 | 0.581 | | | | |
| 1-3/4" x 3/16" | 70 | 5.16 | 1.225 | U | 2450 | 1568 | 1089 | 800 | 613 | 484 | 392 | 324 | 272 | | | |
| | | | | Du | 0.082 | 0.129 | 0.185 | 0.252 | 0.329 | 0.417 | 0.514 | 0.623 | 0.741 | | | |
| | | | 1.072 | C | 2450 | 1960 | 1633 | 1400 | 1225 | 1089 | 980 | 891 | 817 | | | |
| | | | | Dc | 0.066 | 0.103 | 0.148 | 0.202 | 0.263 | 0.333 | 0.412 | 0.498 | 0.593 | | | |
| 2" x 3/16" | 78 | 5.87 | 1.600 | U | 3200 | 2048 | 1422 | 1045 | 800 | 632 | 512 | 423 | 356 | 303 | 261 | |
| | | | | Du | 0.072 | 0.113 | 0.162 | 0.221 | 0.288 | 0.364 | 0.450 | 0.544 | 0.649 | 0.760 | 0.881 | |
| | | | 1.600 | C | 3200 | 2560 | 2133 | 1829 | 1600 | 1422 | 1280 | 1164 | 1067 | 985 | 914 | |
| | | | | Dc | 0.058 | 0.090 | 0.130 | 0.176 | 0.230 | 0.292 | 0.360 | 0.436 | 0.518 | 0.608 | 0.705 | |
| 2-1/4" x 3/16" | 85 | 6.57 | 2.025 | U | 4050 | 2592 | 1800 | 1322 | 1013 | 800 | 648 | 536 | 450 | 383 | 331 | 253 |
| | | | | Du | 0.064 | 0.100 | 0.144 | 0.196 | 0.256 | 0.324 | 0.400 | 0.484 | 0.576 | 0.676 | 0.784 | 1.023 |
| | | | 2.278 | C | 4050 | 3240 | 2700 | 2314 | 2025 | 1800 | 1620 | 1473 | 1350 | 1246 | 1157 | 1013 |
| | | | | Dc | 0.051 | 0.080 | 0.115 | 0.157 | 0.205 | 0.259 | 0.320 | 0.387 | 0.461 | 0.541 | 0.628 | 0.820 |
| 2-1/2" x 3/16" | 92 | 7.27 | 2.500 | U | 5000 | 3200 | 2222 | 1633 | 1250 | 988 | 800 | 661 | 556 | 473 | 408 | 313 |
| | | | | Du | 0.058 | 0.090 | 0.130 | 0.176 | 0.230 | 0.292 | 0.360 | 0.436 | 0.519 | 0.609 | 0.705 | 0.923 |
| | | | 3.125 | C | 5000 | 4000 | 3333 | 2857 | 2500 | 2222 | 2000 | 1818 | 1667 | 1538 | 1429 | 1250 |
| | | | | Dc | 0.046 | 0.072 | 0.104 | 0.141 | 0.184 | 0.233 | 0.288 | 0.348 | 0.415 | 0.487 | 0.565 | 0.737 |

U = Safe uniform load (psf)
C = Safe concentrated load (lbs/ft width)
D = Deflection (inches)
E = Modulus of Elasticity, 10,000,000 psi
F = Allowable Fiber Stress, 12,000 psi
Material: ASTM B221, 6063-T6

Finish: Mill finish unless otherwise specified.

Loads and deflections shown are theoretical and based on static loading.

* Based on 12.8 bars/ft of grating width. Bearing bar spacing of 15/16" c.c. Add 0.3 lbs/sqft for 15-ADT-2.

Deflection: Spans and loads to the right of the bold line exceed 1/4" deflection for uniform load of 100 psf which provides safe pedestrian comfort. This can be exceeded for other types of loads with the Engineer's approval.

Serrated Bars: For serrated grating, the depth of grating required for a specified load is 1/4" deeper than that shown in table.

## Panel Width Chart (in.) - 15-ADT-4 & 15-ADT-2

Dimensions are Out-to-Out of Bearing Bars**

| No. of Bars | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/16" Flange | $1^1/_8$ | $2^1/_{16}$ | 3 | $3^{15}/_{16}$ | $4^7/_8$ | $5^{13}/_{16}$ | $6^3/_4$ | $7^{11}/_{16}$ | $8^5/_8$ | $9^9/_{16}$ | $10^1/_2$ | $11^7/_{16}$ | $12^3/_8$ | $13^5/_{16}$ | $14^1/_4$ |
| No. of Bars | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| 3/16" Flange | $15^3/_{16}$ | $16^1/_8$ | $17^1/_{16}$ | 18 | $18^{15}/_{16}$ | $19^7/_8$ | $20^{13}/_{16}$ | $21^3/_4$ | $22^{11}/_{16}$ | $23^5/_8$ | $24^9/_{16}$ | $25^1/_2$ | $26^7/_{16}$ | $27^3/_8$ | $28^5/_{16}$ |
| No. of Bars | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | | | | | | | |
| 3/16" Flange | $29^1/_4$ | $30^3/_{16}$ | $31^1/_8$ | $32^1/_{16}$ | 33 | $33^{15}/_{16}$ | $34^7/_8$ | $35^{13}/_{16}$ | | | | | | | |

** Add 1/4" for extended crossbars. Standard panel width indicated in "maroon".

# Model Specification: 19-ADT-4 Aluminum Dovetail Gratings

September 15, 2022

Specifier Notes: Architect or engineer should carefully review and edit this section to meet the requirements of the project and local building codes. Coordinate this section with other specification sections and the drawings and delete any unused "Specifier Notes" and options shown in **"red"** after editing.

This section covers Pleasant Mount Welding, Inc.'s "19-ADT-4 Aluminum Dovetail Pressure Lock Grating." This model specification may also be edited and revised for 19-ADT-2, 15-ADT-4 or 15-ADT-2 Aluminum Dovetail Pressure Lock Gratings. Consult PMWI (www.pmwi.net) for assistance in editing this section for specific applications. Call 570.282.6164 or email sales@pmwi.net with any questions.

## SECTION 055300 - Metal Fabrications: Metal Gratings

## Part 1: General

### 1.1 Section Includes

A. Prefabricated, light-duty aluminum bar gratings.

B. Miscellaneous installation hardware and accessories.

### 1.2 Reference Standards

A. ANSI A326.3-2017: American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials.

B. ASTM B221: Aluminum Extruded Bars and Shapes.

C. ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

### 1.3 Action Submittals

A. Product Data: The contractor shall submit the manufacturer's catalog pages including load tables, anchor details and standard installation details.

B. Shop Drawings: The contractor shall submit for approval shop drawings for the fabrication and erection of all gratings, based on construction drawings of current issue. Include plans, elevations, and details of sections and connections as required. Show type and location of all fasteners.

C. Samples of grating and anchorage system shall be submitted for approval.

### 1.4 Quality Assurance

A. Manufacturer Qualification: A company specializing in the manufacture of metal bar gratings with not less than 10 years of documented experience.

B. Fabrication tolerances shall be in accordance with applicable provisions and recommendations of ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

## Part 2: Products

### 2.1 Source Requirements:

Design is based upon use of gratings as manufactured by Pleasant Mount Welding, Inc. and terminology used herein may include reference to the specific performance or product of this manufacturer. Such reference shall be construed only as establishing the quality of materials, operational features and workmanship used under this section and shall not, in any way, be construed as limiting competition.

### 2.2 Manufacturers:

Acceptable manufacturers include Pleasant Mount Welding, Inc. (45 Dundaff Street, Carbondale, PA 18407, 570-282-6164, www.pmwi.net) or approved equal.

### 2.3 Manufactured Units:

A. **Description:** Aluminum Dovetail Pressure Lock Grating type **19-ADT-4**. Rectangular bearing bars are slotted to receive slotted rectangular cross bars, which are assembled in egg-crate fashion and hydraulically pressed to permanently lock the bars in place.

1. Bearing Bar Spacing: **1-3/16"** on center.
2. Bearing Bar Depth: based on loading requirements and clear span as shown on drawings.
3. Bearing Bar Thickness: **3/16" to provide 1"** space between bars.
4. Cross Bar Spacing: **4"** on center.
5. Top Surface of Bearing Bars: **Plain | Serrated | SlipNOT® Slip Resistance Coating**

B. **Fabrication:** Fabricate cutouts in grating sections for penetrations as indicated. Arrange cutouts to permit grating removal without disturbing items penetrating gratings. Trim band ends (and cuts in grating) with bars of the same thickness, nominal depth and material as bearing bars (as shown on drawings). Weld banding flush with the top surface of grating. Include fabrication required for attachment system shown on drawing plans, or as recommended by manufacturer.

C. **Design Criteria:**

1. **Loading:** Grating products shall be designed and manufactured to meet live load conditions of **100 lbs / SQFT with a maximum deflection of 1/4"** for the clear spans shown on the drawings. Bearing bar depth shall be as shown on contract drawings, or as recommended by the manufacturer to meet loading requirements, clear span conditions and maximum deflections specified.

2. **Traction / Slip-Resistance**: When a traction surface is required, it is to be tested per ANSI A326.3-2017. Top surface shall provide a minimum Wet Dynamic Coefficient of Friction (Wet DCOF) of 0.45 to meet high traction classification.

D. **Materials:** Bearing bars and banding are aluminum 6063-T6 and aluminum cross bars are type 6063-T52.

E. **Fabrication Tolerances** shall be in accordance with ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

F. **Top Surface:** When required, SlipNOT® Slip Resistance Coating will be included in order to meet or exceed Wet Dynamic COF requirements of paragraph 2.3 C.2 above.

G. **Finish:** Gratings shall be **Mill finish or A-41 Clear Anodized.**

### 2.4 Accessories:

Provide appropriate fasteners for type, grade, and class required for approved anchorage system.

## Part 3: Execution

### 3.1 Field Verification:

Take field measurements prior to preparation of final shop drawings (and fabrication where required) to ensure proper fitting of the work.

### 3.2 Installation

A. Prior to grating installation, contractor shall inspect supports for correct alignment and conditions for proper attachment and support of the gratings. Metal shall be used for all grating supports and provide the minimum bearing surface for the depth of grating per ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual. Ends of all bearing bars at cutouts for penetrations are to be supported in like manner. Any inconsistencies between contract drawings and supporting structure deemed detrimental to grating placement shall be reported in writing to the engineer, architect or owner's agent prior to placement.

B. Install grating in accordance with shop drawings and standard installation clearances as recommended by ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

C. Protection of Aluminum from Dissimilar Materials:

1. Where aluminum surfaces come into contact with dissimilar metals, surfaces shall be kept from direct contact by painting the dissimilar metal with one coat of bituminous paint, powder coat paint, or other approved insulating material.

2. Where aluminum surfaces come into contact with dissimilar materials such as concrete, masonry or lime mortar, exposed aluminum surfaces shall be painted with one coat of bituminous paint, powder coat paint, or other approved insulating material.

### 3.3 Grating Attachment:

Use approved attachment system and fasteners to secure grating to supporting members as shown on plans.

# ALUMINUM PLANK

## PLK SERIES

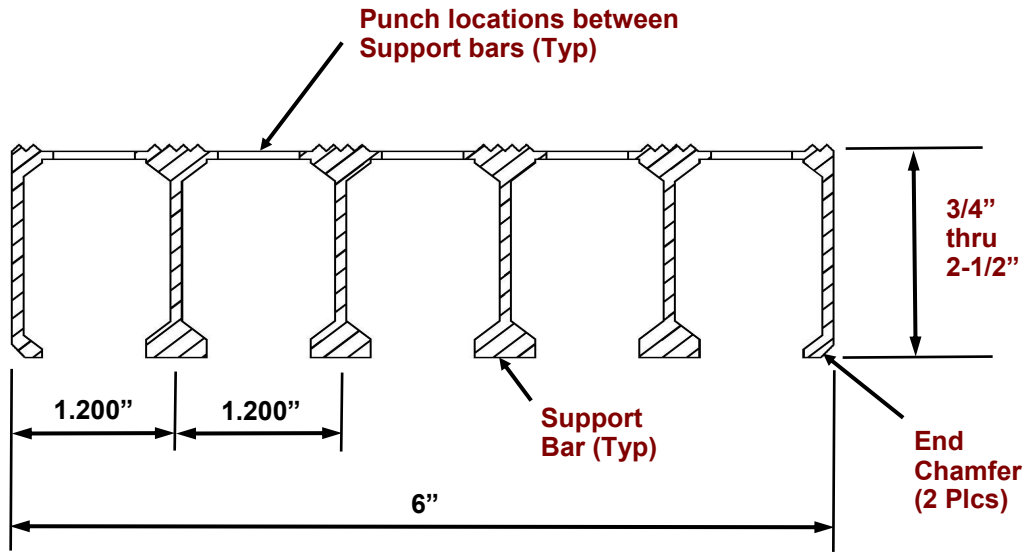
Aluminum Heavy Duty Plank (PLK Series) grating is an alternative to typical bar grating. Aluminum plank grating offers a structurally sound and attractive look. Made from extruded aluminum 6063-T6 material, plank grating will provide many years of maintenance free use and has no parts to work loose. The plank surface can be provided unpunched or with a rectangular punch pattern. PMWI has limited stock of ***Diagonal ADA punch patterns for wheelchair accessibility (check with PMWI for availability)***.

The plank structure of interconnecting webs provide for maximum foot contact and comfort. Plank is a good alternative for applications requiring open grating with plate attached to the top grating surface. Plank is the perfect choice for wastewater treatment plants to help reduce odors associated with these facilities. Plank grating is also ideal for other applications including entranceways, walkways, bridges, trails, stadiums, marinas, decks, docks and more.

# ALUMINUM PLANK

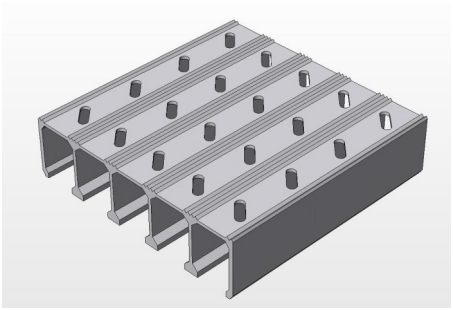
## PLANK SECTION AVAILABILITY

Aluminum Plank is only available in our Heavy Duty Plank cross sectional design shown below. The Heavy Duty line of plank grating (PLK Series) is used primarily for water and waste treatment markets and the marine industry but has many benefits that make it an ideal choice for many other applications requiring a structurally sound and relatively maintenance free grating product.



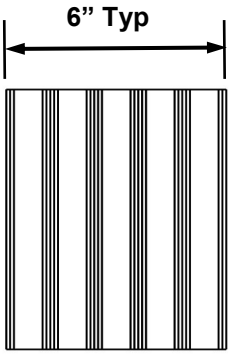

## PUNCH PATTERN GUIDE

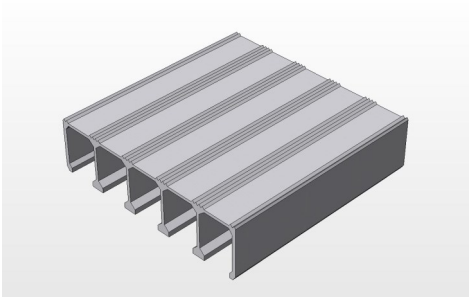
Aluminum plank is available unpunched or in various punch patterns. Rectangular punched openings are used most often in the water and waste treatment industries and in marine applications. All plank grating comes with built-in striations at each support bar location and the punched patterns are positioned between each of the support bars on the top surface of the plank. All of PMWI's ***Diagonal Punched Patterns**** as well as our unpunched plank meet ADA specifications for high heel and wheelchair traffic.



*Diagonal ADA Punched Plank **(Check for Availability)*

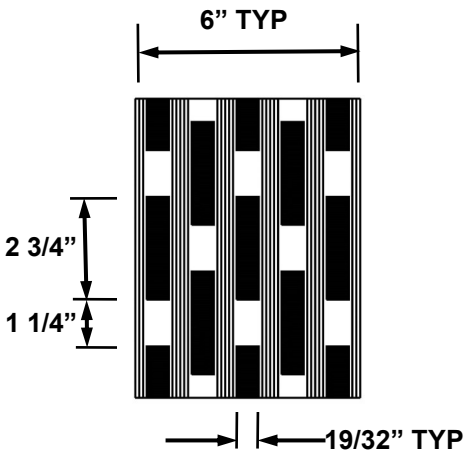
**UNPUNCHED**

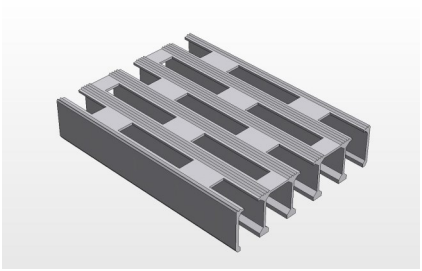


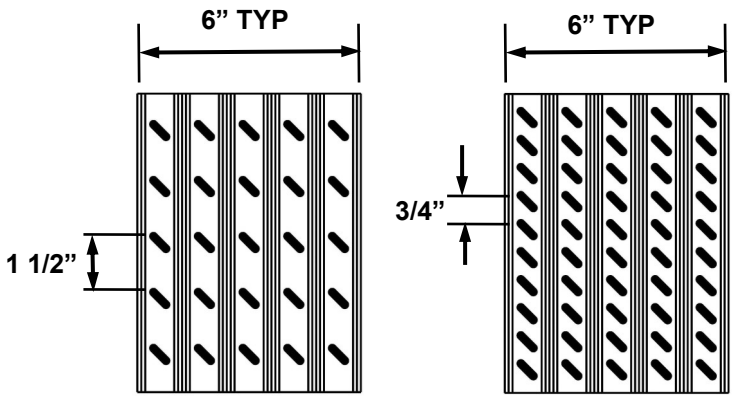
# ALUMINUM PLANK

## RECTANGULAR PUNCHED

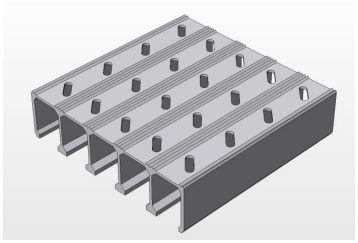


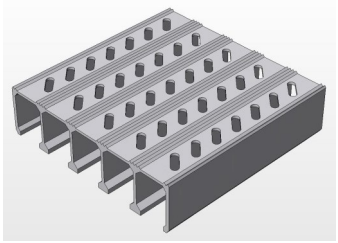



## DIAGONAL (ADA) PUNCHED **(Check Availability)



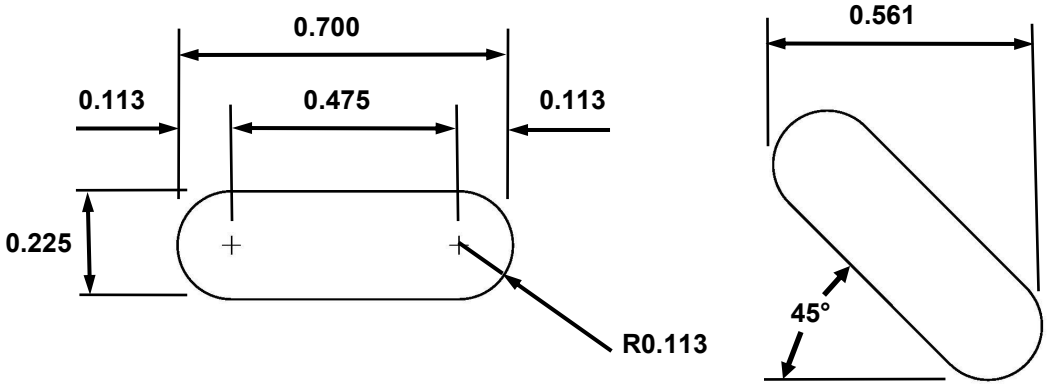

*ALPlank 8** *ALPlank 15**





* *Number indicates % open area*

## DIAGONAL PUNCH DIMENSIONS




*Grating height based on load and clear span requirements*

# ALUMINUM PLANK

## PLANK FABRICATION

Aluminum plank grating (PLK Series) is available in 24’-0” lengths for customer fabrication, or as fabricated by Pleasant Mount Welding according to customer plans and specifications.

Individual 6” wide plank sections may be banded together to form standard panel widths for ease of handling and installation. When the width of the total grating “run” (number of continuous series of panels) does not result in a total measurement evenly divisible by the 6” wide plank sections, the last panel can be fabricated from several whole sections and a partial section according to the Panel Width Chart shown below. In order to meet flatness tolerances, fabricated panels must always be end banded, and should not exceed a maximum 36” width.

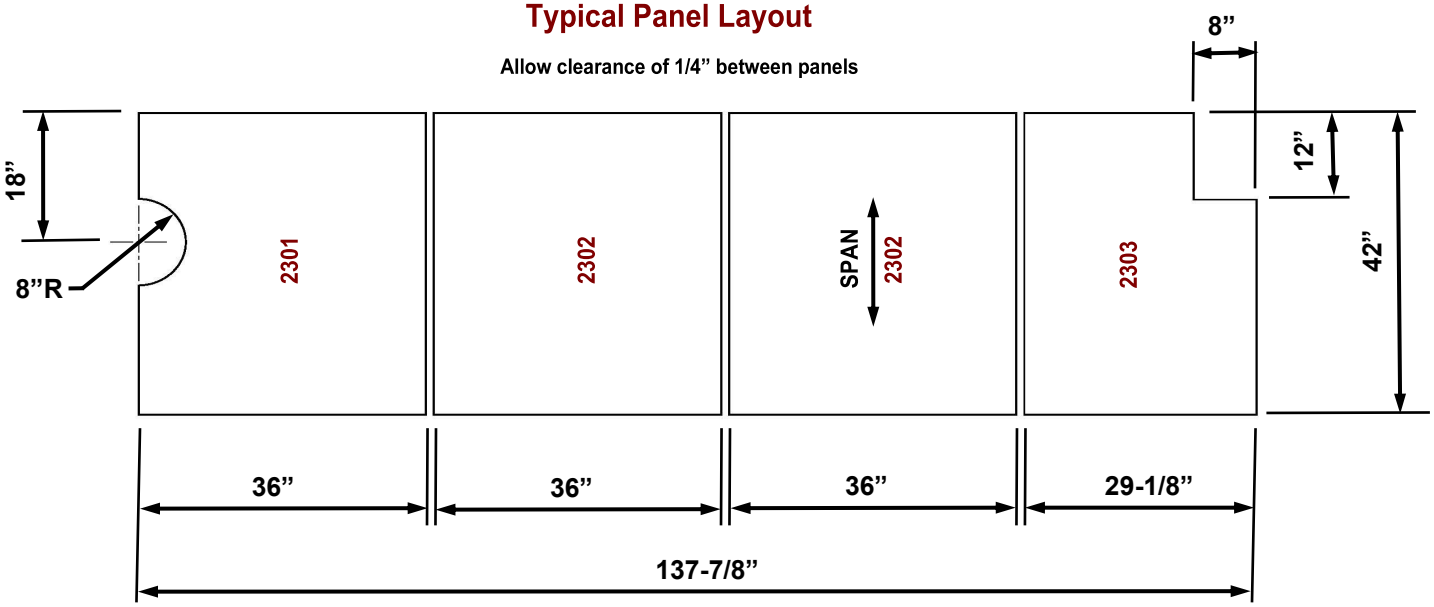
The two arrows on a typical panel layout arrangement drawing designates the span direction of the grating which runs perpendicular to the supporting members. Identical panels shall have the same mark numbers. Cutouts and banding are priced separately according to quantity and size required.

### Aluminum Plank - Panel Width Chart (in.)

| | 1-1/2 | 2-11/16 | 3-7/8 | 5-1/8 |
|---|---|---|---|---|
| 6 | 7-1/2 | 8-11/16 | 9-7/8 | 11-1/8 |
| 12 | 13-1/2 | 14-11/16 | 15-7/8 | 17-1/8 |
| 18 | 19-1/2 | 20-11/16 | 21-7/8 | 23-1/8 |
| 24 | 25-1/2 | 26-11/16 | 27-7/8 | 29-1/8 |
| 30 | 31-1/2 | 32-11/16 | 33-7/8 | 35-1/8 |
| 36 | | | | |

### Typical Panel Layout

Allow clearance of 1/4” between panels




NOTE: Panels made from 6” sections and partial sections are banded on the ends only. Side bands are typically not furnished, unless specified by the customer.

# ALUMINUM PLANK

| % Open Area | |
|---|---|
| Rectangular Punched | 34% |

| % Open Area | |
|---|---|
| *Diagonal ALPlk8* | 8% |
| *Diagonal ALPlk15* | 15% |

*** Check Availability*

## LOAD & DEFLECTION TABLE

* Based on Rect Punched plank.

## HEAVY DUTY PLANK (PLK SERIES)

| Plank Size Inches | Ped. Span Inches | Sec. Prop. $S_x$* ($in^3$) | $I_x$* ($in^4$) | Approx. Weight lbs/sqft Non Punched | Approx. Weight lbs/sqft Rect Punched | | Clear Span (Direction of Support Bars) 2'-0" | 2'-6" | 3'-0" | 3'-6" | 4'-0" | 4'-6" | 5'-0" | 5'-6" | 6'-0" | 6'-6" | 7'-0" | 8'-0" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/4 | 39 | 0.224 | 0.105 | 2.2 | 1.8 | U | 447 | 286 | 198 | 146 | 111 | 88 | 71 | | | | | |
| | | | | | | Du | 0.153 | 0.238 | 0.342 | 0.467 | 0.606 | 0.770 | 0.946 | | | | | |
| | | | | | | C | 447 | 358 | 298 | 255 | 223 | 198 | 179 | | | | | |
| | | | | | | Dc | 0.122 | 0.191 | 0.275 | 0.373 | 0.487 | 0.616 | 0.764 | | | | | |
| 1 | 48 | 0.412 | 0.243 | 2.6 | 2.2 | U | 822 | 526 | 365 | 268 | 205 | 162 | 131 | 108 | 91 | | | |
| | | | | | | Du | 0.122 | 0.190 | 0.273 | 0.372 | 0.485 | 0.614 | 0.756 | 0.913 | 1.090 | | | |
| | | | | | | C | 822 | 658 | 548 | 470 | 411 | 365 | 329 | 299 | 274 | | | |
| | | | | | | Dc | 0.097 | 0.152 | 0.219 | 0.298 | 0.389 | 0.492 | 0.608 | 0.735 | 0.875 | | | |
| 1-1/4 | 57 | 0.704 | 0.491 | 3.2 | 2.8 | U | 1408 | 901 | 626 | 459 | 352 | 278 | 225 | 186 | 156 | 133 | 114 | 88 |
| | | | | | | Du | 0.103 | 0.161 | 0.232 | 0.316 | 0.413 | 0.522 | 0.644 | 0.780 | 0.926 | 1.088 | 1.254 | 1.651 |
| | | | | | | C | 1408 | 1126 | 939 | 805 | 704 | 626 | 563 | 512 | 469 | 433 | 402 | 352 |
| | | | | | | Dc | 0.083 | 0.129 | 0.186 | 0.253 | 0.330 | 0.418 | 0.516 | 0.624 | 0.743 | 0.872 | 1.011 | 1.321 |
| 1-1/2 | 66 | 1.083 | 0.869 | 3.8 | 3.4 | U | 2165 | 1386 | 962 | 707 | 541 | 427 | 346 | 286 | 240 | 205 | 176 | 135 |
| | | | | | | Du | 0.090 | 0.140 | 0.202 | 0.275 | 0.359 | 0.453 | 0.560 | 0.678 | 0.805 | 0.948 | 1.094 | 1.432 |
| | | | | | | C | 2165 | 1732 | 1443 | 1237 | 1082 | 962 | 866 | 787 | 721 | 666 | 618 | 541 |
| | | | | | | Dc | 0.072 | 0.112 | 0.161 | 0.220 | 0.287 | 0.363 | 0.448 | 0.542 | 0.645 | 0.758 | 0.878 | 1.148 |
| 1-3/4 | 74 | 1.479 | 1.365 | 4.4 | 4.0 | U | 2956 | 1892 | 1314 | 965 | 739 | 584 | 473 | 391 | 328 | 279 | 241 | 184 |
| | | | | | | Du | 0.078 | 0.122 | 0.175 | 0.239 | 0.312 | 0.395 | 0.487 | 0.590 | 0.701 | 0.821 | 0.954 | 1.243 |
| | | | | | | C | 2956 | 2365 | 1971 | 1689 | 1478 | 1314 | 1182 | 1075 | 985 | 909 | 844 | 739 |
| | | | | | | Dc | 0.062 | 0.097 | 0.140 | 0.191 | 0.250 | 0.316 | 0.390 | 0.472 | 0.561 | 0.659 | 0.764 | 0.998 |
| 2 | 83 | 1.989 | 2.074 | 4.9 | 4.5 | U | 3979 | 2546 | 1768 | 1299 | 994 | 785 | 636 | 526 | 442 | 376 | 324 | 248 |
| | | | | | | Du | 0.069 | 0.108 | 0.155 | 0.211 | 0.276 | 0.349 | 0.431 | 0.522 | 0.621 | 0.728 | 0.844 | 1.102 |
| | | | | | | C | 3979 | 3183 | 2652 | 2273 | 1989 | 1768 | 1591 | 1446 | 1326 | 1224 | 1136 | 994 |
| | | | | | | Dc | 0.055 | 0.086 | 0.124 | 0.169 | 0.221 | 0.280 | 0.345 | 0.418 | 0.497 | 0.584 | 0.676 | 0.883 |
| 2-1/4 | 91 | 2.591 | 3.008 | 5.5 | 5.0 | U | 5223 | 3342 | 2321 | 1705 | 1305 | 1031 | 835 | 690 | 580 | 494 | 426 | 326 |
| | | | | | | Du | 0.063 | 0.098 | 0.141 | 0.191 | 0.250 | 0.316 | 0.390 | 0.472 | 0.562 | 0.660 | 0.765 | 0.999 |
| | | | | | | C | 5223 | 4178 | 3482 | 2984 | 2611 | 2321 | 2089 | 1899 | 1741 | 1607 | 1492 | 1305 |
| | | | | | | Dc | 0.050 | 0.078 | 0.113 | 0.153 | 0.200 | 0.253 | 0.313 | 0.378 | 0.450 | 0.528 | 0.613 | 0.800 |
| 2-1/2 | 97 | 3.028 | 3.888 | 5.9 | 5.5 | U | 6080 | 3891 | 2702 | 1985 | 1520 | 1201 | 972 | 804 | 675 | 575 | 496 | 380 |
| | | | | | | Du | 0.056 | 0.088 | 0.127 | 0.172 | 0.225 | 0.285 | 0.352 | 0.426 | 0.506 | 0.594 | 0.689 | 0.901 |
| | | | | | | C | 6080 | 4864 | 4053 | 3474 | 3040 | 2702 | 2432 | 2211 | 2026 | 1871 | 1737 | 1520 |
| | | | | | | Dc | 0.045 | 0.070 | 0.101 | 0.138 | 0.180 | 0.228 | 0.282 | 0.341 | 0.405 | 0.476 | 0.552 | 0.721 |

U = Safe uniform load (psf)
C = Safe concentrated load (lbs/ft width)
D = Deflection (inches)
E = Modulus of Elasticity, 10,000,000 psi
F = Allowable Fiber Stress, 12,000 psi
Material: ASTM B221, 6063-T6

Loads and deflections shown in this table are theoretical and based on static loading.

Finish: Mill finish unless otherwise specified.

Deflection: Spans and loads to the right of the bold line exceed 1/4" deflection for uniform load of 100 psf. This can be exceeded for other types of loads with the Engineer's approval.

**Model Specification:**
**Aluminum Plank (PLK Series) - Unpunched Gratings**

September 16, 2022

Specifier Notes: Architect or engineer should carefully review and edit this section to meet the requirements of the project and local building codes. Coordinate this section with other specification sections and the drawings and delete any unused "Specifier Notes" and options shown in **"red"** after editing.

This section covers Pleasant Mount Welding, Inc.'s "Aluminum Plank (PLK Series) – Unpunched Grating." Consult PMWI (www.pmwi.net) for assistance in editing this section for specific applications. Call 570.282.6164 or email sales@pmwi.net with any questions.

## SECTION 055300 - Metal Fabrications: Metal Gratings

## Part 1: General

### 1.1 Section Includes

A. Prefabricated, custom-designed aluminum plank gratings.

B. Miscellaneous installation hardware and accessories.

### 1.2 Reference Standards

A. ANSI A326.3-2017: American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials.

B. ASTM B221: Aluminum Extruded Bars and Shapes.

C. ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

### 1.3 Action Submittals

A. Product Data: The contractor shall submit the manufacturer's catalog pages including load tables, anchor details and standard installation details.

B. Shop Drawings: The contractor shall submit for approval shop drawings for the fabrication and erection of all gratings, based on construction drawings of current issue. Include plans, elevations, and details of sections and connections as required. Show type and location of all fasteners.

C. Samples of grating and anchorage system shall be submitted for approval.

### 1.4 Quality Assurance

A. Manufacturer Qualification: A company specializing in the manufacture of metal bar gratings with not less than 10 years of documented experience.

B. Fabrication tolerances shall be in accordance with applicable provisions and recommendations of ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

## Part 2: Products

### 2.1 Source Requirements:

Design is based upon use of gratings as manufactured by Pleasant Mount Welding, Inc. and terminology used herein may include reference to the specific performance or product of this manufacturer. Such reference shall be construed only as establishing the quality of materials, operational features and workmanship used under this section and shall not, in any way, be construed as limiting competition.

### 2.2 Manufacturers:

Acceptable manufacturers include Pleasant Mount Welding, Inc. (45 Dundaff Street, Carbondale, PA 18407, 570-282-6164, www.pmwi.net) or approved equal.

### 2.3 Manufactured Units:

A. **Description:** Aluminum Plank Grating (PLK Series) - **Unpunched**. Six-inch wide extruded aluminum plank, with support bars spaced **1.2**" on center. Fabricated with banding into panels of standard width to fill area shown on drawings.

1. Plank Depth: based on loading requirements and clear span.
2. Top Surface of Plank: **Striated or SlipNOT® Slip Resistance Coating.**

B. **Fabrication:** Fabricate cutouts in grating sections for penetrations as indicated. Arrange cutouts to permit grating removal without disturbing items penetrating plank. Trim band ends (and cuts in the plank) with banding bars of 1/8" minimum thickness, that are the same nominal depth and material as the plank section. Weld banding flush with the top surface of grating. Include fabrication required for attachment system shown on drawing plans, or as recommended by manufacturer.

C. **Design Criteria:**

1. **Loading:** Grating products shall be designed and manufactured to meet live load conditions of **100 lbs / SQFT with a maximum deflection of 1/4"** for the clear spans shown on the drawings. Bearing bar depth shall be as shown on contract drawings, or as recommended by the manufacturer to meet loading requirements, clear span conditions and maximum deflections specified.

2. **Traction / Slip-Resistance**: When a traction surface is required, it is to be tested per ANSI A326.3-2017. Top surface shall provide a minimum Wet Dynamic Coefficient of Friction (Wet DCOF) of 0.45 to meet high traction classification.

D. **Materials:** Aluminum plank and banding are aluminum type 6063-T6.

E. **Fabrication Tolerances** shall be in accordance with ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

F. **Top Surface:** When required, SlipNOT® Slip Resistance Coating will be included in order to meet or exceed Wet Dynamic COF requirements of paragraph 2.3 C.2 above.

G. **Finish:** Gratings shall be **Mill finish or A-41 Clear Anodized.**

**2.4 Accessories:**

Provide appropriate fasteners for type, grade, and class required for approved anchorage system.

## Part 3: Execution

**3.1 Field Verification:**

Take field measurements prior to preparation of final shop drawings (and fabrication where required) to ensure proper fitting of the work.

**3.2 Installation**

A. Prior to grating installation, contractor shall inspect supports for correct alignment and conditions for proper attachment and support of the gratings. Metal shall be used for all grating supports and provide the minimum bearing surface for the depth of grating per ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual. Ends of all bearing bars at cutouts for penetrations are to be supported in like manner. Any inconsistencies between contract drawings and supporting structure deemed detrimental to grating placement shall be reported in writing to the engineer, architect or owner's agent prior to placement.

B. Install grating in accordance with shop drawings and standard installation clearances as recommended by ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

C. Protection of Aluminum from Dissimilar Materials:

1. Where aluminum surfaces come into contact with dissimilar metals, surfaces shall be kept from direct contact by painting the dissimilar metal with one coat of bituminous paint, powder coat paint, or other approved insulating material.

2. Where aluminum surfaces come into contact with dissimilar materials such as concrete, masonry or lime mortar, exposed aluminum surfaces shall be painted with one coat of bituminous paint, powder coat paint, or other approved insulating material.

**3.3 Grating Attachment:**

Use approved attachment system and fasteners to secure grating to supporting members as shown on plans.

**Model Specification:**
**Aluminum Plank (PLK Series) – Rectangular Punched Gratings**

September 16, 2022

Specifier Notes: Architect or engineer should carefully review and edit this section to meet the requirements of the project and local building codes. Coordinate this section with other specification sections and the drawings and delete any unused "Specifier Notes" and options shown in **"red"** after editing.

This section covers Pleasant Mount Welding, Inc.'s "Aluminum Plank (PLK Series) – Rectangular Punched Grating." Consult PMWI (www.pmwi.net) for assistance in editing this section for specific applications. Call 570.282.6164 or email sales@pmwi.net with any questions.

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### 1.3 Action Submittals

A. Product Data: The contractor shall submit the manufacturer's catalog pages including load tables, anchor details and standard installation details.

B. Shop Drawings: The contractor shall submit for approval shop drawings for the fabrication and erection of all gratings, based on construction drawings of current issue. Include plans, elevations, and details of sections and connections as required. Show type and location of all fasteners.

C. Samples of grating and anchorage system shall be submitted for approval.

### 1.4 Quality Assurance

A. Manufacturer Qualification: A company specializing in the manufacture of metal bar gratings with not less than 10 years of documented experience.

B. Fabrication tolerances shall be in accordance with applicable provisions and recommendations of ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

## Part 2: Products

### 2.1 Source Requirements:

Design is based upon use of gratings as manufactured by Pleasant Mount Welding, Inc. and terminology used herein may include reference to the specific performance or product of this manufacturer. Such reference shall be construed only as establishing the quality of materials, operational features and workmanship used under this section and shall not, in any way, be construed as limiting competition.

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A. **Description:** Aluminum Plank Grating (PLK Series) – **Rectangular Punched**. Six-inch wide extruded aluminum plank, with support bars spaced **1.2"** on center. Fabricated with banding into panels of standard width to fill area shown on drawings.

1. Plank Depth: based on loading requirements and clear span.
2. Top Surface of Plank: **Striated or SlipNOT® Slip Resistance Coating.**
3. Punch Pattern: Rectangular 19/32" x 2-3/4" holes staggered and spaced 4" on center along the span; spaced 1.2" on center between support bars. Punched holes shall have Plain Pattern.

B. **Fabrication:** Fabricate cutouts in grating sections for penetrations as indicated. Arrange cutouts to permit grating removal without disturbing items penetrating plank. Trim band ends (and cuts in the plank) with banding bars of 1/8" minimum thickness, that are the same nominal depth and material as the plank section. Weld banding flush with the top surface of grating. Include fabrication required for attachment system shown on drawing plans, or as recommended by manufacturer.

C. **Design Criteria:**

1. **Loading:** Grating products shall be designed and manufactured to meet live load conditions of **100 lbs / SQFT with a maximum deflection of 1/4"** for the clear spans shown on the drawings. Bearing bar depth shall be as shown on contract drawings, or as recommended by the manufacturer to meet loading requirements, clear span conditions and maximum deflections specified.

2. **Traction / Slip-Resistance**: When a traction surface is required, it is to be tested per ANSI A326.3-2017. Top surface shall provide a minimum Wet Dynamic Coefficient of Friction (Wet DCOF) of 0.45 to meet high traction classification.

D. **Materials:** Aluminum plank and banding are aluminum type 6063-T6.

E. **Fabrication Tolerances** shall be in accordance with ANSI/NAAMM MBG 531-17: Metal Bar Grating Manual.

F. **Top Surface:** When required, SlipNOT® Slip Resistance Coating will be included in order to meet or exceed Wet Dynamic COF requirements of paragraph 2.3 C.2 above.

G. **Finish:** Gratings shall be **Mill finish or A-41 Clear Anodized.**

### 2.4 Accessories:

Provide appropriate fasteners for type, grade, and class required for approved anchorage system.

## Part 3: Execution

### 3.1 Field Verification:

Take field measurements prior to preparation of final shop drawings (and fabrication where required) to ensure proper fitting of the work.

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### 3.3 Grating Attachment:

Use approved attachment system and fasteners to secure grating to supporting members as shown on plans.

# ALUMINUM STAIR TREADS

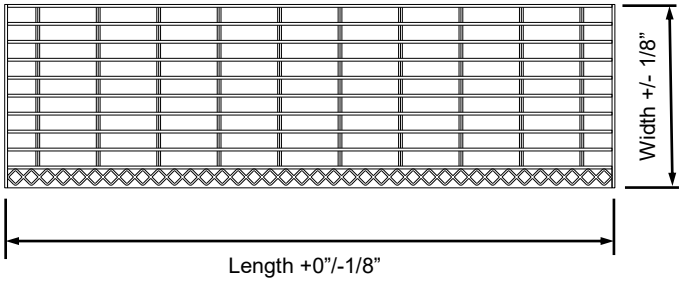
Many grating platform and walkway applications require stairways to access the various elevations that are associated with most construction projects. PMWI offers aluminum stair treads in all of our aluminum grating styles to match our grating products: Swage Locked I-Bar (SI Series), Swage Locked Rectangular Bar (SR Series), Pressure Locked Aluminum Dovetail (ADT Series), and Aluminum Heavy Duty Plank (PLK Series).

The SR Series and ADT Series stair treads may be ordered with a plain or serrated surface while the SI Series stair treads have a striated surface similar to the I-Bar grating profile. Aluminum Plank stair treads come unpunched or may be punched in one of several of our available punch patterns including “American with Disabilities Act” (ADA) options ***(Check Availability)***.

Nosings for aluminum stair treads include standard extruded Grooved Nosing with a striated surface similar to the I-bar grating or an optional cast Abrasive Nosing is available. Additionally, a slip resistant coating can be applied to improve the overall slip resistance of the stair tread.

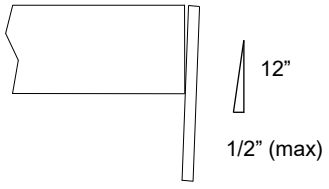
Carrier end plates are provided with a hole and slot for attachment to stair stringers (Note: mounting bolts for mounting to stringers not furnished with treads).

## STAIR TREAD TOLERANCES




**Overall Dimensional Tolerances**

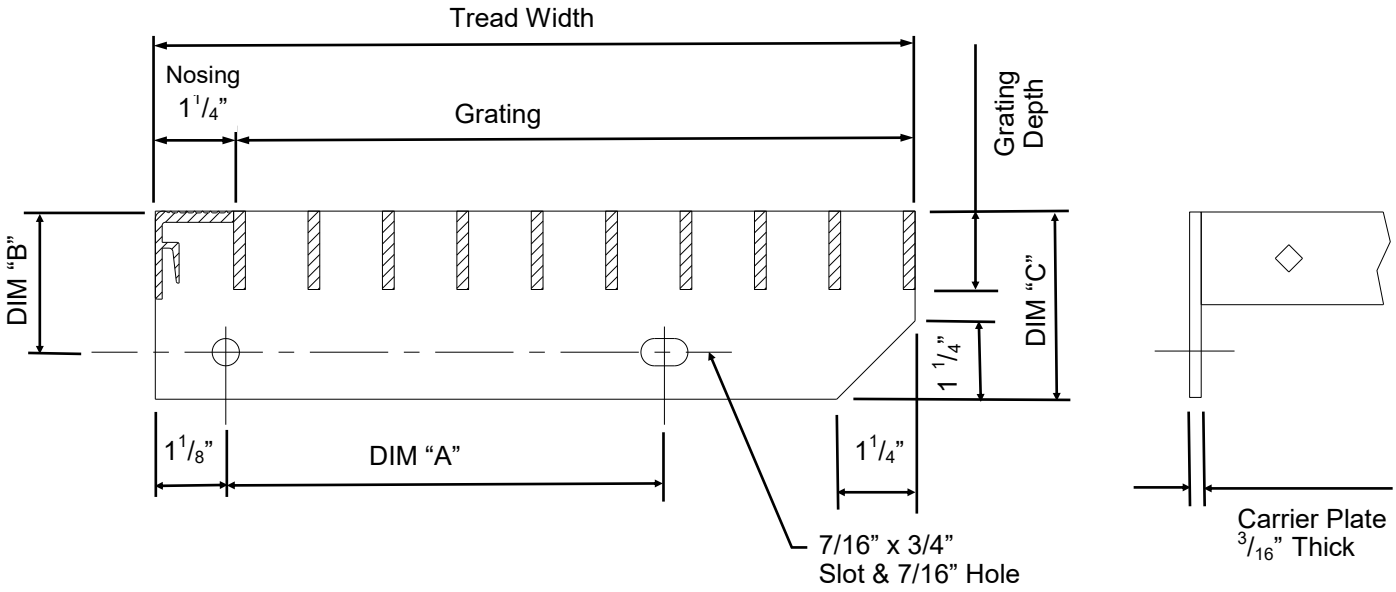
**Note:** Length of Stair Tread is distance Between outer faces of Carrier Plates



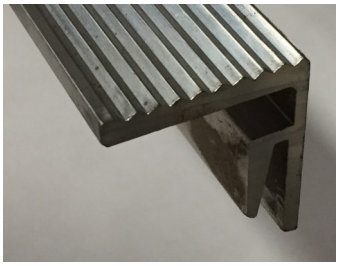

**Carrier Plate Lean**

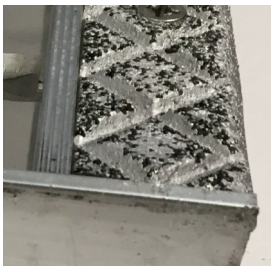
# ALUMINUM STAIR TREADS

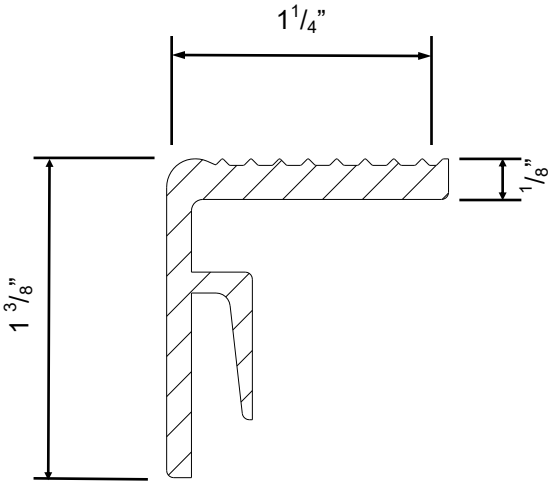
## ALUMINUM STAIR TREAD DETAILS

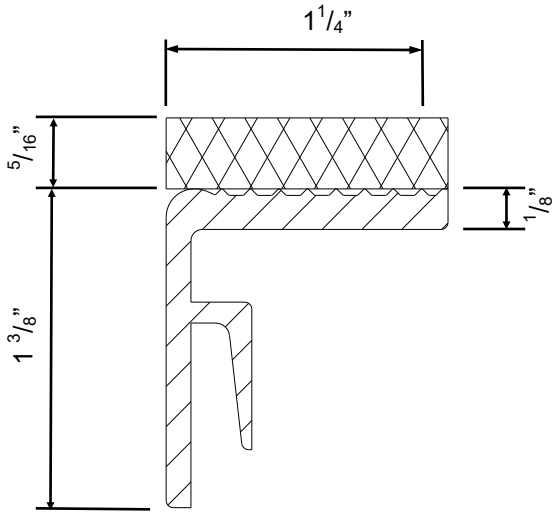



## Treads with Carrier Plates








**Grooved**

**Cast Aluminum Abrasive**

## Nosing Details

# ALUMINUM STAIR TREADS

## Standard Tread Widths[1]

| No. of Bearing Bars | Width (includes nosing) | | | DIM "A" |
|---|---|---|---|---|
| | SR & ADT Series | SI Series | Plank Series | |
| 5 | 6-3/16" | 6-1/4" | 6-3/8" | 2-1/2" |
| 6 | 7-3/8" | 7-7/16" | 7-1/4" | 4-1/2" |
| 7 | 8-9/16" | 8-5/8" | 8-3/4" | 4-1/2" |
| 8 | 9-3/4" | 9-13/16" | 9-15/16" | 7" |
| 9 | 10-15/16" | 11" | 11-1/8" | 7" |
| 10 | 12-1/8" | 12-3/16" | 12-3/8" | 7" |

## Carrier Plate Dimensions

| Grating Depth | DIM "B" | DIM "C" |
|---|---|---|
| 1" | 2-1/4" | 3" |
| 1-1/4" | 2-1/4" | 3" |
| 1-1/2" | 2-1/4" | 3" |
| 1-3/4" | 2-1/4" | 3" |
| 2" | 3-1/4" | 4" |
| 2-1/4" | 3-1/4" | 4" |
| 2-1/2" | 3-1/4" | 4" |

## Max Plank Tread Length[2]

| Grating Depth | Plank Grating |
|---|---|
| 1" | 30" |
| 1-1/4" | 36" |
| 1-1/2" | 44" |
| 1-3/4" | 53" |
| 2" | 63" |
| 2-1/4" | 66" |
| 2-1/2" | 70" |

## Maximum Tread Length[2] (inches) *** 15-ADT Series (Check for Availability)*

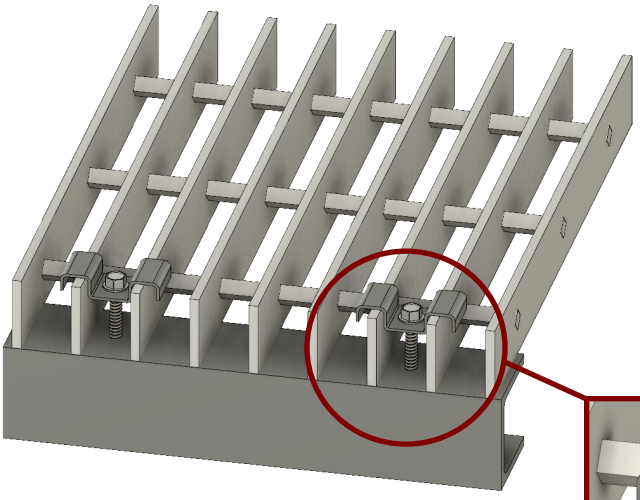
| Bar Size (inches) | SR & ADT Series Plain Surface | | SR & ADT Series Serrated Surface | | SI Series Striated Surface | |
|---|---|---|---|---|---|---|
| | 19 1-3/16" c.c. | 15 15/16" c.c. | 19 1-3/16" c.c. | 15 15/16" c.c. | 19 1-3/16" c.c. | 15 15/16" c.c. |
| 1 x 3/16 | 28 | 30 | 26 | 27 | | |
| 1 x 1/4 | | | | | 28 | 30 |
| 1-1/4 x 3/16 | 34 | 37 | 31 | 33 | | |
| 1-1/4 x 1/4 | | | | | 34 | 37 |
| 1-1/2 x 3/16 | 42 | 46 | 38 | 42 | | |
| 1-1/2 x 1/4 | | | | | 42 | 46 |
| 1-3/4 x 3/16 | 51 | 56 | 46 | 51 | | |
| 1-3/4 x 1/4 | | | | | 51 | 56 |
| 2 x 3/16 | 61 | 66 | 56 | 61 | | |
| 2 x 1/4 | | | | | 61 | 66 |
| 2-1/4 x 3/16 | 66 | 66 | 66 | 66 | | |
| 2-1/4 x 1/4 | | | | | 66 | 66 |
| 2-1/2 x 3/16 | 66 | 70 | 66 | 66 | | |
| 2-1/2 x 1/4 | | | | | 66 | 70 |

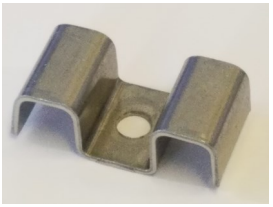
**1. Table of widths based on 3/16" thick Rectangular Bearing bars (1/4" I-bars) and standard 1-3/16" center-to-center bearing bar spacing.**
**2. Maximum tread length based on 300 lb. concentrated load on front 5" of tread at center of tread length and maximum deflection D=1/240 of length. Design treads exceeding 66" length for 300 lb. concentrated loads at 1/3 points.**

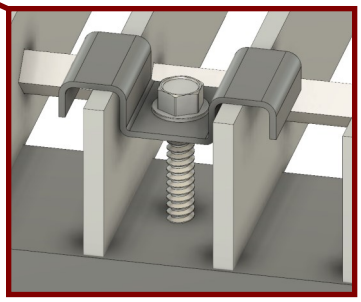
# GRATING ANCHORS

## Saddle Clip

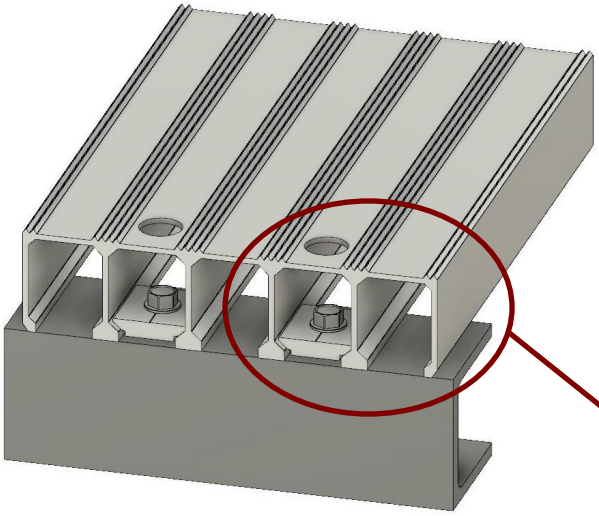
A bent-clip type fastener for removable bar grating panels. Clips fit over two adjacent bearing bars and can be secured to the substrate using standard TEK screws. Recessed design allows fastener heads to remain below grating surface. Made from stainless steel and available in both 15-spacing and 19-spacing sizes. Saddle clips are compatible with I-Bar, Dovetail, and Rectangular Bar grating types.





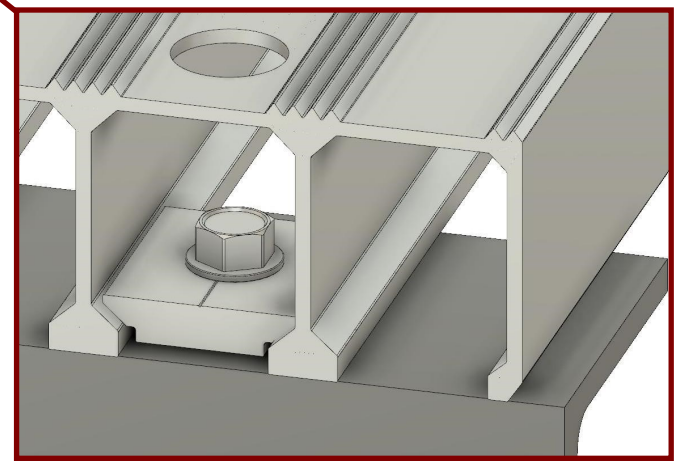


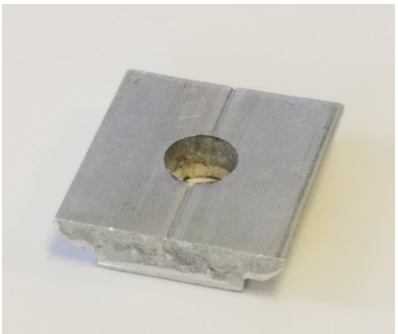
**Note:** Crossbars may need to be snipped in field to facilitate placement of saddle clips at support locations.



## Plank Lug

A plank lug is sized to fit between the bottom flanges of plank grating and is an ideal method for anchoring plank grating. Plank lugs may be tack welded in place and can be secured to the substrate using standard TEK screws. Made from aluminum and fits all depths of plank grating. Plank lugs may also be used with 19-spacing I-Bar. 5/8" diameter holes are required in plank decking to access plank lug fasteners.



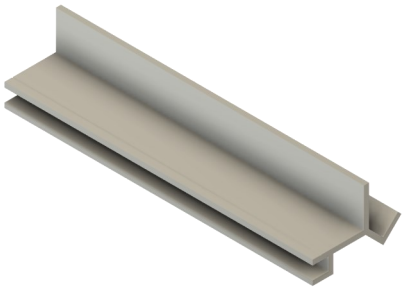


**Note:** Tack welding of grating in the field (by others) is an alternative method for anchoring all permanently installed grating.

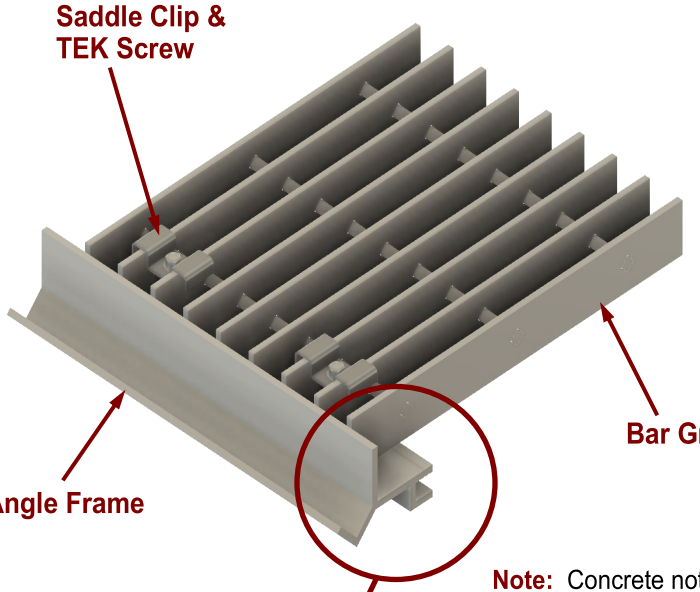
# GRATING ANGLE FRAME

## Aluminum Grating Angle Frame Embed

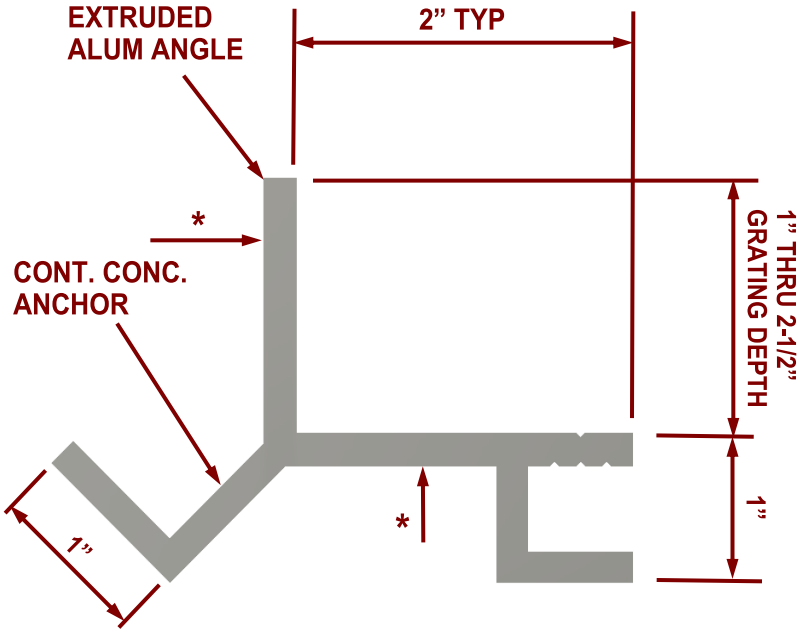
Pleasant Mount Welding offers an extruded aluminum grating frame for embedded concrete applications. The angle frame incorporates a continuous slot to accommodate grating fasteners, clips or self tapping screws. The extruded angle frame also provides a continuous anchor for embedding in concrete and may be used alone or in conjunction with a supplemental anchor strap (if necessary). Grating angle frame is offered to match grating depths from 1" to 2-1/2" and shall have mitered corners (where applicable). Angle frames can be provided in mill finish or coated with bituminous paint to protect surfaces that will come into contact with concrete.



Extruded Angle Frame




**Note:** Concrete not shown




PMWI EXTRUDED ANGLE SECTION

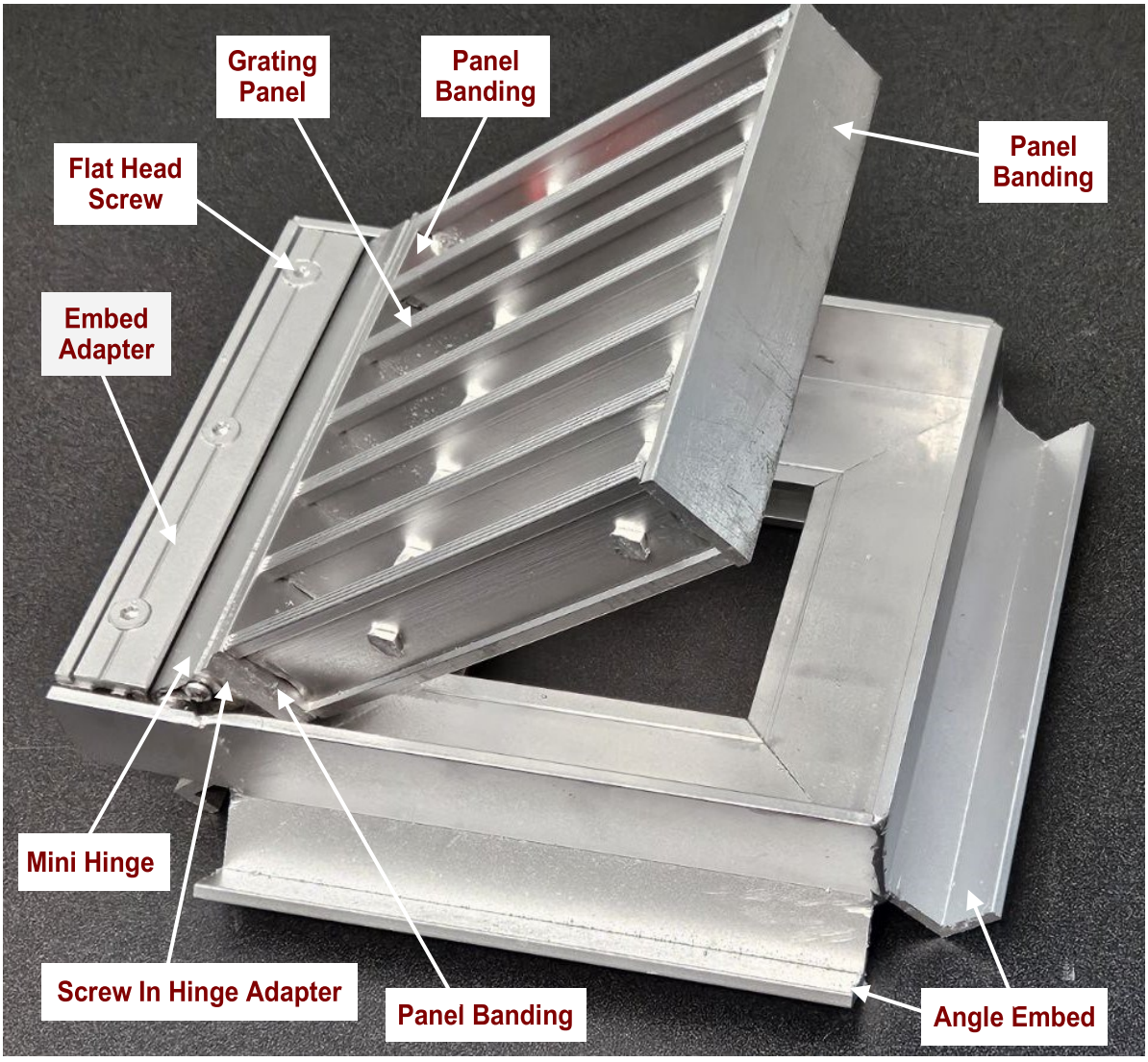
# GRATING HINGE ADAPTER KIT

## Aluminum Grating Hinge Adapter Kit

Pleasant Mount Welding has developed an aluminum Grating Hinge Adapter Kit that is comprised of a few aluminum extruded components. These components are used to attach to grating panels to allow a hinged configuration.

The kit includes a Screw In Hinge Adapter for attaching to grating panel banding. In one kit configuration this Screw In Hinge Adapter mates with the Mini Hinge on one side of the hinge and the opposite hinge side mates with an Embed Adapter that attaches directly to an angle embed (see photo below). The Grating Hinge Kit can also be used between adjacent grating panels when each is equipped with a Screw In Hinge Adapter and where each grating panel will have sufficient bearing surface on a support member.

An optional slam latch assembly is also available if grating panel must be secured in the closed position.




**Grating Hinge Adapter Kit**

# HEAVY DUTY STEEL GRATING FEATURES & BENEFITS

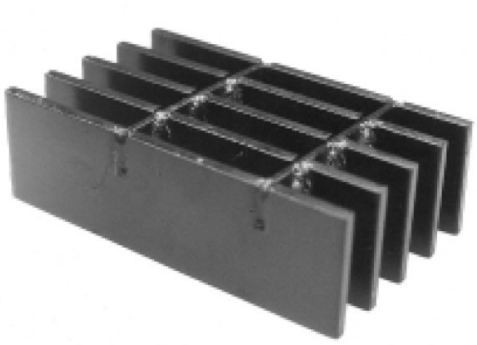
## Features & Benefits

Heavy duty steel grating is used in areas where heavy static or rolling loads are generally encountered. This includes heavy vehicular traffic up to H-25 loading. Calculations for vehicular loadings are based on the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges and can be calculated by our Engineering department for your specific project applications.

Heavy duty welded carbon steel is by far the most popular choice where high strength is required. Heavy duty steel grating is used in high load areas such as airports, industrial plants, truck and bus terminals, parking lots and railroad yards. Common uses are flooring, bridge decking, ramps, subway and tunnel ventilation grilles, docks, and curb grates.

Our sturdy heavy duty steel grating maintains the same level over many years of service and has minimal deflection under heavy rolling loads.

***PMWI, providing quality products and superior service for 40 Years***

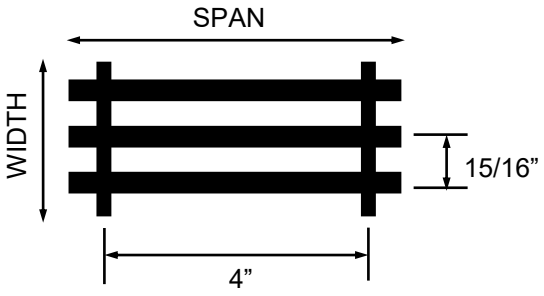


## Heavy Duty Welded Steel (W Series)

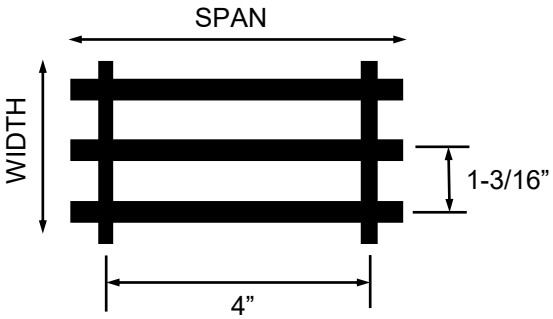
Heavy Duty Welded Carbon Steel grating is the most popular choice where high strength is the primary grating requirement. The main bearing bars are slotted and assembled with cross bars that are welded with one fillet weld at every bearing bar/cross bar joint. Galvanizing is an option and Stainless steel can also be provided for highly corrosive applications. Our Heavy Duty Welded Steel (W Series) grating meets the demanding vehicular loading requirements of the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges and can handle heavy rolling loads. ***Slipnot*™** slip resistance coating is also available. The typical markets for Heavy Duty Steel grating include highway bridge decks, ramps, airfields, industrial flooring and trenches.

## GRATING PROFILES - HEAVY DUTY WELDED STEEL (W SERIES)

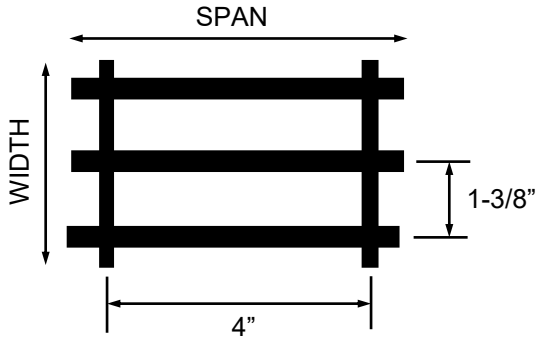
All profiles shown below are also available with 2” cross bar center-to-center spacing. Product numbers for those profiles would be 15-W-2, 19-W-2, 22-W-2, 30-W-2 and 38-W-2.



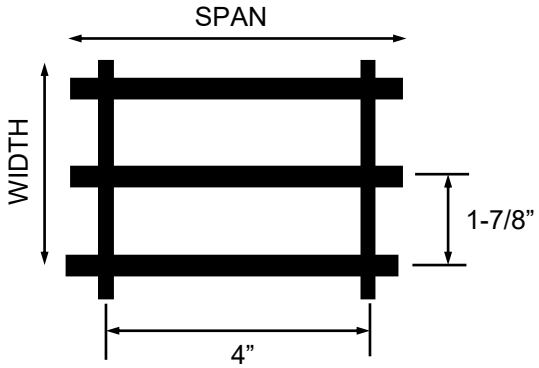

**15-W-4**



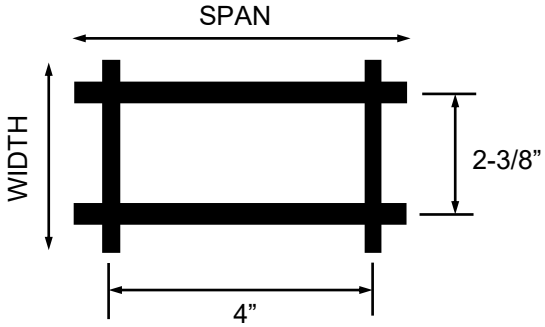

**19-W-4**




**22-W-4**




**30-W-4**




**38-W-4**

# HEAVY DUTY STEEL GRATING DESIGN CRITERIA

## Design Criteria

The following pages provide Vehicular Load Tables, Maximum Safe Concentrated Loads, and Static Load & Deflection Tables to assist the designer with a convenient reference for the load carrying capabilities of typical heavy duty grating. Calculations for uniform and concentrated loads per foot of grating width are similar in format to those shown for Aluminum Bar grating on page 7, except that F = 20,000 psi and E = 29,000,000 psi. Calculations for vehicular loadings are based on the 16th Edition of the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges and utilize the following formulas:

**M** = Bending Moment
**S** = Section Modulus - $in^3$/ft of grating width
**I** = Moment of Inertia - $in^4$/bar
**E** = Modulus of Elasticity (29,000,000 psi)
**F** = Allowable Bending Stress (20,000 psi)
**L** = Simple Clear Span - inches
**D** = Deflection - inches

**a** = Partial Load Contact Parallel to Span - inches
**s** = Center-to-Center Spacing between Bearing Bars - inches
**b** = Partial Load Contact Dimension at 90° to Span - inches
**b** = a + (2s)
**P** = Total Wheel or Partial Load Including Impact - lbs.
$\mathbf{P_1}$ = P per Bearing Bar - lbs.
$\mathbf{P_1}$ = P x (s/b)

| | |
|---|---|
| **Step 1.** Determine M: | $\mathbf{M} = \frac{FS}{12}$ |
| **Step 2.** Substituting for M, solve for L: | (i) a > L $\quad \mathbf{M} = \frac{PL^2}{8ab}$ <br> (ii) a < L $\quad \mathbf{M} = \frac{P(.25L—.125a)}{b}$ |
| **Step 3.** Check D*: | $\mathbf{D} = \frac{P_1[(2L^3) - (a^2L) + (a^3/4)]}{96EI}$ |

** Deflection limited to the lesser of .125 inches or L/400 of span to a maximum 8'-0" per AASHTO*

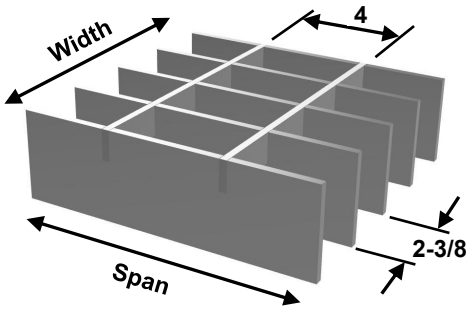
| Maximum Traffic Conditions | Wheel Load (lbs.) (1/2 of Axle Load + 30% Impact) | Loading | Load Distribution[2] | |
|---|---|---|---|---|
| | | | a | b |
| **Truck Traffic**<br>52,000 Lbs. Total Load<br>40,000 Lbs. Axle Load<br>Dual Wheels  | 26,000 | H-25 | 25" | 25" + (2s) |
| **Truck Traffic**<br>41,600 Lbs. Total Load<br>32,000 Lbs. Axle Load<br>Dual Wheels  | 20,800 | H-20/<br>HL-93[6] | 20" | 20" + (2s) |
| **Truck Traffic**<br>31,200 Lbs. Total Load<br>24,000 Lbs. Axle Load<br>Dual Wheels  | 15,600 | H-15 | 15" | 15" + (2s) |
| **10,000 Lbs. Capacity Forklift Truck**<br>14,400 Lbs. Vehicle Weight<br>31,720 Lbs. Total Load (Rubber Tires)<br>85% Drive Axle Load  | 13,481 | 5-Ton[3] | 11" | 11" + (2s) |
| **6,000 Lbs. Capacity Forklift Truck**<br>9,800 Lbs. Vehicle Weight<br>20,540 Lbs. Total Load (Rubber Tires)<br>85% Drive Axle Load  | 8,730 | 3-Ton[3] | 7" | 7" + (2s) |
| **2,000 Lbs. Capacity Forklift Truck**<br>4,200 Lbs. Vehicle Weight<br>8,060 Lbs. Total Load (Rubber Tires)<br>85% Drive Axle Load  | 3,426 | 1-Ton[3] | 4" | 4" + (2s) |
| **3,578 Lbs. Capacity Passenger Vehicle**<br>6,322 Lbs. Vehicle Weight<br>12,870 Lbs. Total Load (Rubber Tires)<br>60% Drive Axle Load  | 3,861 | Passenger Vehicle | 9" | 9" + (2s) |

**Notes:**
1) For continuous spans, use continuity factor = .80.
2) This distribution results in larger grating sizes for lighter trucks on shorter spans. Spans shown for H15/H20 reflect more critical condition.
3) The forklift wheel loads and load distribution patterns depicted above, generally, and only partially, represent the broad range of rubber-tired lift trucks available. For those applications falling outside of these examples, please contact PMWI.
4) Wheeled vehicles with urethane tires should **NEVER** be used in conjunction with open grid bar grating.
5) HS20 is the same as H20 and HS15 is the same as H15. The "S" stands for semi-trailer.
6) The "HL-93" notation shown with "H-20" represents AASHTO's truck loading standard post-1993. Since 1993, H-10, H-20, etc. have been retired in lieu of the "HL-93" loading which represents all trucks.

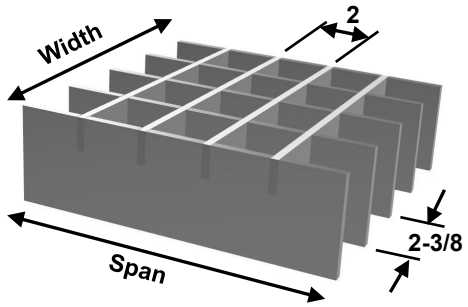
# 38-SPACE

# HEAVY DUTY WELDED STEEL GRATING

### 38-W-4




### 38-W-2




| % Open Area* | | | | | |
|---|---|---|---|---|---|
| BB Size | CB Ctrs | Bearing Bar Thickness | | | |
| | | 1/4" | 5/16" | 3/8" | 1/2" |
| Thru 2-1/2" | 4" cc | 82% | 80% | 77% | - |
| | 2" cc | 76% | 73% | 71% | - |
| 3" to 6" | 4" cc | 84% | 82% | 79% | 74% |
| | 2" cc | 80% | 78% | 75% | 71% |

## VEHICULAR LOAD TABLE

| Bearing Bar Size (Inches) | Weight ** (Lbs./Sqft.) | Section Properties | | Maximum Safe Clear Span (Inches) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Sx ** ($In^3$/Ft. Width) | Ix ** ($In^4$/Ft. Width) | Auto Traffic | 1 Ton | 3 Ton | 5 Ton | H-15 | H20/ HL-93 | H-25 |
| 1 x 1/4 | 5.42 | 0.211 | 0.105 | 9 | 5 | 5 | 6 | 7 | 8 | 8 |
| 1 x 3/8 | 7.57 | 0.316 | 0.158 | 11 | 7 | 6 | 7 | 8 | 10 | 10 |
| 1-1/4 x 1/4 | 6.49 | 0.329 | 0.206 | 12 | 7 | 6 | 7 | 9 | 10 | 11 |
| 1-1/4 x 3/8 | 9.17 | 0.493 | 0.308 | 16 | 10 | 7 | 9 | 11 | 12 | 13 |
| 1-1/2 x 1/4 | 7.59 | 0.474 | 0.355 | 15 | 10 | 7 | 9 | 10 | 12 | 13 |
| 1-1/2 x 5/16 | 9.17 | 0.592 | 0.444 | 18 | 12 | 8 | 10 | 12 | 13 | 15 |
| 1-1/2 x 3/8 | 10.78 | 0.711 | 0.533 | 21 | 14 | 9 | 11 | 13 | 15 | 16 |
| 1-3/4 x 1/4 | 8.66 | 0.645 | 0.564 | 19 | 12 | 9 | 10 | 12 | 14 | 16 |
| 1-3/4 x 3/8 | 12.40 | 0.967 | 0.846 | 27 | 18 | 12 | 13 | 15 | 17 | 19 |
| 2 x 1/4 | 9.72 | 0.842 | 0.842 | 24 | 16 | 11 | 12 | 14 | 16 | 17 |
| 2 x 5/16 | 11.89 | 1.053 | 1.053 | 29 | 19 | 12 | 13 | 16 | 18 | 20 |
| 2 x 3/8 | 14.01 | 1.263 | 1.263 | 34 | 23 | 14 | 15 | 18 | 20 | 21 |
| 2-1/4 x 1/4 | 10.78 | 1.066 | 1.199 | 29 | 20 | 13 | 13 | 16 | 18 | 20 |
| 2-1/4 x 3/8 | 15.63 | 1.599 | 1.799 | 42 | 29 | 17 | 17 | 20 | 22 | 24 |
| 2-1/2 x 1/4 | 11.89 | 1.316 | 1.645 | 35 | 24 | 15 | 15 | 18 | 20 | 22 |
| 2-1/2 x 5/16 | 14.57 | 1.645 | 2.056 | 43 | 30 | 18 | 18 | 21 | 23 | 25 |
| 2-1/2 x 3/8 | 17.25 | 1.974 | 2.467 | 50* | 35 | 21 | 20 | 24 | 25 | 27 |
| 3 x 1/4 | 16.06 | 1.895 | 2.842 | 49 | 34 | 20 | 20 | 23 | 25 | 26 |
| 3 x 5/16 | 19.30 | 2.369 | 3.553 | 57* | 42 | 24 | 23 | 27 | 28 | 30 |
| 3 x 3/8 | 22.53 | 2.842 | 4.263 | 60* | 50 | 29 | 27 | 31 | 32 | 34 |
| 3 x 1/2 | 28.95 | 3.790 | 5.685 | 66* | 59* | 37 | 35 | 39 | 40 | 41 |
| 3-1/2 x 1/4 | 18.24 | 2.579 | 4.513 | 61 | 45 | 26 | 25 | 29 | 30 | 32 |
| 3-1/2 x 3/8 | 25.72 | 3.869 | 6.770 | 70* | 63* | 38 | 35 | 40 | 40 | 42 |
| 3-1/2 x 1/2 | 33.25 | 5.158 | 9.027 | 77* | 69* | 49 | 45 | 50 | 50 | 51 |
| 4 x 1/4 | 20.36 | 3.369 | 6.737 | 70* | 59 | 33 | 31 | 35 | 36 | 38 |
| 4 x 5/16 | 24.66 | 4.211 | 8.422 | 75* | 67* | 41 | 38 | 43 | 43 | 44 |
| 4 x 3/8 | 28.95 | 5.053 | 10.106 | 80* | 72* | 48 | 44 | 50 | 50 | 51 |
| 4 x 1/2 | 37.54 | 6.737 | 13.475 | 88* | 79* | 63 | 57 | 63* | 62* | 62* |
| 4-1/2 x 1/4 | 22.53 | 4.263 | 9.593 | 81* | 73* | 41 | 38 | 43 | 43 | 45 |
| 4-1/2 x 3/8 | 32.18 | 6.395 | 14.389 | 83* | 75* | 60 | 55 | 61 | 60 | 61 |
| 4-1/2 x 1/2 | 41.84 | 8.527 | 19.186 | 96* | 89* | 72* | 69* | 71* | 70* | 69* |
| 5 x 1/4 | 24.66 | 5.264 | 13.159 | 88* | 78* | 50 | 46 | 51 | 51 | 52 |
| 5 x 5/16 | 30.01 | 6.579 | 16.449 | 94* | 84* | 62 | 56 | 63 | 62 | 62 |
| 5 x 3/8 | 35.42 | 7.895 | 19.738 | 96* | 90* | 72* | 66 | 71* | 70* | 70* |
| 5 x 1/2 | 46.13 | 10.527 | 26.318 | 96* | 96* | 80* | 76* | 78* | 77* | 77* |
| 5-1/2 x 1/4 | 26.80 | 6.369 | 17.514 | 96* | 86* | 60 | 55 | 61 | 60 | 61 |
| 5-1/2 x 3/8 | 38.60 | 9.553 | 26.272 | 96* | 96* | 80* | 76* | 78* | 77* | 77* |
| 5-1/2 x 1/2 | 50.42 | 12.738 | 35.029 | 96* | 96* | 88* | 84* | 86* | 85* | 84* |
| 6 x 1/4 | 28.95 | 7.580 | 22.739 | 96* | 94* | 71 | 64 | 71 | 70 | 70 |
| 6 x 5/16 | 35.42 | 9.474 | 28.423 | 96* | 96* | 82* | 78* | 80* | 79* | 79* |
| 6 x 3/8 | 41.83 | 11.369 | 34.108 | 96* | 96* | 87* | 83* | 85* | 84* | 83* |
| 6 x 1/2 | 54.72 | 15.159 | 45.477 | 96* | 96* | 96* | 91* | 94* | 92* | 92* |

*Maximum spans are limited by maximum allowable stress or the lesser deflection of L/400 or 1/8" to a maximum simple span of 8'-0" (2,438mm). **Based on 5.053 bars/ft. of grating width. Bearing bars 2-3/8" center-to-center spacing. When serrated grating is specified, the depth of grating required for a specified load will be 1/4" greater than that shown in these tables. Weights shown are for 4" cross bar centers. Add 1.13 lbs/sqft. (3/8" Dia. CB) or 3.18 lbs./sqft. (1-1/4" x 1/4" CB) for 2" cross bar centers. Cross bars are determined based on project applications and bearing bar height.

# HEAVY DUTY WELDED STEEL GRATING

## MAXIMUM SAFE CONCENTRATED LOADS

| Bearing Bar Size (Inches) | Maximum Safe Concentrated Load* (Lbs./Foot of Grating Width) - Clear Span | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1'-0" | 1'-6" | 2'-0" | 2'-6" | 3'-0" | 3'-6" | 4'-0" | 4'-6" | 5'-0" | 5'-6" | 6'-0" | 7'-0" | 8'-0" |
| 1 x 1/4 | 1407 | 938 | 703 | 563 | 469 | 402 | | | | | | | |
| 1 x 3/8 | 2107 | 1404 | 1053 | 843 | 702 | 602 | | | | | | | |
| 1-1/4 x 1/4 | 2193 | 1462 | 1097 | 877 | 731 | 627 | 548 | | | | | | |
| 1-1/4 x 3/8 | 3287 | 2191 | 1643 | 1315 | 1096 | 939 | 822 | | | | | | |
| 1-1/2 x 1/4 | 3160 | 2107 | 1580 | 1264 | 1053 | 903 | 790 | 702 | | | | | |
| 1-1/2 x 5/16 | 3947 | 2631 | 1973 | 1579 | 1316 | 1128 | 987 | 877 | | | | | |
| 1-1/2 x 3/8 | 4740 | 3160 | 2370 | 1896 | 1580 | 1354 | 1185 | 1053 | | | | | |
| 1-3/4 x 1/4 | 4300 | 2867 | 2150 | 1720 | 1433 | 1229 | 1075 | 956 | 860 | | | | |
| 1-3/4 x 3/8 | 6447 | 4298 | 3223 | 2579 | 2149 | 1842 | 1612 | 1433 | 1289 | | | | |
| 2 x 1/4 | 5613 | 3742 | 2807 | 2245 | 1871 | 1604 | 1403 | 1247 | 1123 | | | | |
| 2 x 5/16 | 7020 | 4680 | 3510 | 2808 | 2340 | 2006 | 1755 | 1560 | 1404 | | | | |
| 2 x 3/8 | 8420 | 5613 | 4210 | 3368 | 2807 | 2406 | 2105 | 1871 | 1684 | | | | |
| 2-1/4 x 1/4 | 7107 | 4738 | 3553 | 2843 | 2369 | 2030 | 1777 | 1579 | 1421 | 1292 | | | |
| 2-1/4 x 3/8 | 10660 | 7107 | 5330 | 4264 | 3553 | 3046 | 2665 | 2369 | 2132 | 1938 | | | |
| 2-1/2 x 1/4 | 8773 | 5849 | 4387 | 3509 | 2924 | 2507 | 2193 | 1950 | 1755 | 1595 | 1462 | | |
| 2-1/2 x 5/16 | 10967 | 7311 | 5483 | 4387 | 3656 | 3133 | 2742 | 2437 | 2193 | 1994 | 1828 | | |
| 2-1/2 x 3/8 | 13160 | 8773 | 6580 | 5264 | 4387 | 3760 | 3290 | 2924 | 2632 | 2393 | 2193 | | |
| 3 x 1/4 | 12633 | 8422 | 6317 | 5053 | 4211 | 3610 | 3158 | 2807 | 2527 | 2297 | 2106 | | |
| 3 x 5/16 | 15793 | 10529 | 7897 | 6317 | 5264 | 4512 | 3948 | 3510 | 3159 | 2872 | 2632 | | |
| 3 x 3/8 | 18947 | 12631 | 9473 | 7579 | 6316 | 5413 | 4737 | 4210 | 3789 | 3445 | 3158 | | |
| 3 x 1/2 | 25267 | 16844 | 12633 | 10107 | 8422 | 7219 | 6317 | 5615 | 5053 | 4594 | 4211 | | |
| 3-1/2 x 1/4 | 17193 | 11462 | 8597 | 6877 | 5731 | 4912 | 4298 | 3821 | 3439 | 3126 | 2866 | 2456 | |
| 3-1/2 x 3/8 | 25793 | 17196 | 12897 | 10317 | 8598 | 7370 | 6448 | 5732 | 5159 | 4690 | 4299 | 3685 | |
| 3-1/2 x 1/2 | 34387 | 22924 | 17193 | 13755 | 11462 | 9825 | 8597 | 7641 | 6877 | 6252 | 5731 | 4912 | |
| 4 x 1/4 | 22460 | 14973 | 11230 | 8984 | 7487 | 6417 | 5615 | 4991 | 4492 | 4084 | 3743 | 3209 | |
| 4 x 5/16 | 28073 | 18716 | 14037 | 11229 | 9358 | 8021 | 7018 | 6239 | 5615 | 5104 | 4679 | 4010 | |
| 4 x 3/8 | 33687 | 22458 | 16843 | 13475 | 11229 | 9625 | 8422 | 7486 | 6737 | 6125 | 5614 | 4812 | |
| 4 x 1/2 | 44913 | 29942 | 22457 | 17965 | 14971 | 12832 | 11228 | 9981 | 8983 | 8166 | 7486 | 6416 | |
| 4-1/2 x 1/4 | 28420 | 18947 | 14210 | 11368 | 9473 | 8120 | 7105 | 6316 | 5684 | 5167 | 4737 | 4060 | 3553 |
| 4-1/2 x 3/8 | 42633 | 28422 | 21317 | 17053 | 14211 | 12181 | 10658 | 9474 | 8527 | 7752 | 7106 | 6090 | 5329 |
| 4-1/2 x 1/2 | 56847 | 37898 | 28423 | 22739 | 18949 | 16242 | 14212 | 12633 | 11369 | 10336 | 9474 | 8121 | 7106 |
| 5 x 1/4 | 35093 | 23396 | 17547 | 14037 | 11698 | 10027 | 8773 | 7799 | 7019 | 6381 | 5849 | 5013 | 4387 |
| 5 x 5/16 | 43860 | 29240 | 21930 | 17544 | 14620 | 12531 | 10965 | 9747 | 8772 | 7975 | 7310 | 6266 | 5483 |
| 5 x 3/8 | 52633 | 35089 | 26317 | 21053 | 17544 | 15038 | 13158 | 11696 | 10527 | 9570 | 8772 | 7519 | 6579 |
| 5 x 1/2 | | 46787 | 35090 | 28072 | 23393 | 20051 | 17545 | 15596 | 14036 | 12760 | 11697 | 10026 | 8773 |
| 5-1/2 x 1/4 | | 28307 | 21230 | 16984 | 14153 | 12131 | 10615 | 9436 | 8492 | 7720 | 7077 | 6066 | 5308 |
| 5-1/2 x 3/8 | | 42458 | 31843 | 25475 | 21229 | 18196 | 15922 | 14153 | 12737 | 11579 | 10614 | 9098 | 7961 |
| 5-1/2 x 1/2 | | 56613 | 42460 | 33968 | 28307 | 24263 | 21230 | 18871 | 16984 | 15440 | 14153 | 12131 | 10615 |
| 6 x 1/4 | | 33689 | 25267 | 20213 | 16844 | 14438 | 12633 | 11230 | 10107 | 9188 | 8422 | 7219 | 6317 |
| 6 x 5/16 | | 42107 | 31580 | 25264 | 21053 | 18046 | 15790 | 14036 | 12632 | 11484 | 10527 | 9023 | 7895 |
| 6 x 3/8 | | 50529 | 37897 | 30317 | 25264 | 21655 | 18948 | 16843 | 15159 | 13781 | 12632 | 10828 | 9474 |
| 6 x 1/2 | | | 50530 | 40424 | 33587 | 28874 | 25265 | 22458 | 20212 | 18375 | 16843 | 14437 | 12633 |

| % Open Area* | | | | | |
|---|---|---|---|---|---|
| BB Size | CB Ctrs | Bearing Bar Thickness | | | |
| | | 1/4" | 5/16" | 3/8" | 1/2" |
| Thru 2-1/2" | 4" cc | 82% | 80% | 77% | - |
| | 2" cc | 76% | 73% | 71% | - |
| 3" to 6" | 4" cc | 84% | 82% | 79% | 74% |
| | 2" cc | 80% | 78% | 75% | 71% |

*Loads are theoretical, and are based on a unit stress of 20,000 psi.*

*Based on 5.053 bars/ft. of grating width. Bearing bars 2-3/8" center-to-center spacing. **Note:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

### Panel Width Chart (in.) - 38-W-4 & 38-W-2

**Dimensions are Out-to-Out of Bearing Bars****

| No. of Bars | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4" Bars | $2^{5}/_{8}$ | 5 | $7^{3}/_{8}$ | $9^{3}/_{4}$ | $12^{1}/_{8}$ | $14^{1}/_{2}$ | $16^{7}/_{8}$ | $19^{1}/_{4}$ | $21^{5}/_{8}$ | 24 | $26^{3}/_{8}$ | $28^{3}/_{4}$ | $31^{1}/_{8}$ | $33^{1}/_{2}$ | $35^{7}/_{8}$ |
| 5/16" Bars | $2^{11}/_{16}$ | $5^{1}/_{16}$ | $7^{7}/_{16}$ | $9^{13}/_{16}$ | $12^{3}/_{16}$ | $14^{9}/_{16}$ | $16^{15}/_{16}$ | $19^{5}/_{16}$ | $21^{11}/_{16}$ | $24^{1}/_{16}$ | $26^{7}/_{16}$ | $28^{13}/_{16}$ | $31^{3}/_{16}$ | $33^{9}/_{16}$ | $35^{15}/_{16}$ |
| 3/8" Bars | $2^{3}/_{4}$ | $5^{1}/_{8}$ | $7^{1}/_{2}$ | $9^{7}/_{8}$ | $12^{1}/_{4}$ | $14^{5}/_{8}$ | 17 | $19^{3}/_{8}$ | $21^{3}/_{4}$ | $24^{1}/_{8}$ | $26^{1}/_{2}$ | $28^{7}/_{8}$ | $31^{1}/_{4}$ | $33^{5}/_{8}$ | 36 |
| 1/2" Bars | $2^{7}/_{8}$ | $5^{1}/_{4}$ | $7^{1}/_{8}$ | 10 | $12^{3}/_{8}$ | $14^{3}/_{4}$ | $17^{1}/_{8}$ | $19^{1}/_{2}$ | $21^{7}/_{8}$ | $24^{1}/_{4}$ | $26^{5}/_{8}$ | 29 | $31^{3}/_{8}$ | $33^{3}/_{4}$ | $36^{1}/_{8}$ |

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart continues on page 52)

No. Bars/Ft. of Grating Width = 5.053 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 x 1/4 | 0.211 | 0.105 | 5.42 | U | 2813 | 1250 | 703 | 450 | 313 | 230 | 176 | 139 |
| | | | | Du | 0.021 | 0.047 | 0.083 | 0.130 | 0.187 | 0.255 | 0.333 | 0.421 |
| | | | | C | 1407 | 938 | 703 | 563 | 469 | 402 | 352 | 313 |
| | | | | Dc | 0.017 | 0.037 | 0.066 | 0.104 | 0.150 | 0.204 | 0.266 | 0.337 |
| 1 x 3/8 | 0.316 | 0.158 | 7.57 | U | 4213 | 1873 | 1053 | 674 | 468 | 344 | 263 | 208 |
| | | | | Du | 0.021 | 0.047 | 0.083 | 0.129 | 0.186 | 0.253 | 0.331 | 0.419 |
| | | | | C | 2107 | 1404 | 1053 | 843 | 702 | 602 | 527 | 468 |
| | | | | Dc | 0.017 | 0.037 | 0.066 | 0.103 | 0.149 | 0.203 | 0.265 | 0.335 |
| 1-1/4 x 1/4 | 0.329 | 0.206 | 6.49 | U | 4387 | 1950 | 1097 | 702 | 487 | 358 | 274 | 217 |
| | | | | Du | 0.017 | 0.037 | 0.066 | 0.103 | 0.149 | 0.202 | 0.264 | 0.335 |
| | | | | C | 2193 | 1462 | 1097 | 877 | 731 | 627 | 548 | 487 |
| | | | | Dc | 0.013 | 0.030 | 0.053 | 0.083 | 0.119 | 0.162 | 0.211 | 0.267 |
| 1-1/4 x 3/8 | 0.493 | 0.308 | 9.17 | U | 6573 | 2921 | 1643 | 1052 | 730 | 537 | 411 | 325 |
| | | | | Du | 0.017 | 0.037 | 0.066 | 0.104 | 0.149 | 0.203 | 0.265 | 0.336 |
| | | | | C | 3287 | 2191 | 1643 | 1315 | 1096 | 939 | 822 | 730 |
| | | | | Dc | 0.013 | 0.030 | 0.053 | 0.083 | 0.119 | 0.162 | 0.212 | 0.268 |
| 1-1/2 x 1/4 | 0.474 | 0.355 | 7.59 | U | 6320 | 2809 | 1580 | 1011 | 702 | 516 | 395 | 312 |
| | | | | Du | 0.014 | 0.031 | 0.055 | 0.086 | 0.124 | 0.169 | 0.221 | 0.280 |
| | | | | C | 3160 | 2107 | 1580 | 1264 | 1053 | 903 | 790 | 702 |
| | | | | Dc | 0.011 | 0.025 | 0.044 | 0.069 | 0.099 | 0.135 | 0.177 | 0.224 |
| 1-1/2 x 5/16 | 0.592 | 0.444 | 9.17 | U | 7893 | 3508 | 1973 | 1263 | 877 | 644 | 493 | 390 |
| | | | | Du | 0.014 | 0.031 | 0.055 | 0.086 | 0.124 | 0.169 | 0.221 | 0.279 |
| | | | | C | 3947 | 2631 | 1973 | 1579 | 1316 | 1128 | 987 | 877 |
| | | | | Dc | 0.011 | 0.025 | 0.044 | 0.069 | 0.099 | 0.135 | 0.177 | 0.233 |
| 1-1/2 x 3/8 | 0.711 | 0.533 | 10.78 | U | 9480 | 4213 | 2370 | 1517 | 1053 | 774 | 593 | 468 |
| | | | | Du | 0.014 | 0.031 | 0.055 | 0.086 | 0.124 | 0.169 | 0.221 | 0.279 |
| | | | | C | 4740 | 3160 | 2370 | 1896 | 1580 | 1354 | 1185 | 1053 |
| | | | | Dc | 0.011 | 0.025 | 0.044 | 0.069 | 0.099 | 0.135 | 0.177 | 0.224 |
| 1-3/4 x 1/4 | 0.645 | 0.564 | 8.66 | U | 8600 | 3822 | 2150 | 1376 | 956 | 702 | 538 | 425 |
| | | | | Du | 0.012 | 0.027 | 0.047 | 0.074 | 0.107 | 0.145 | 0.190 | 0.240 |
| | | | | C | 4300 | 2867 | 2150 | 1720 | 1433 | 1229 | 1075 | 956 |
| | | | | Dc | 0.010 | 0.021 | 0.038 | 0.059 | 0.085 | 0.116 | 0.151 | 0.192 |
| 1-3/4 x 3/8 | 0.967 | 0.846 | 12.40 | U | 12893 | 5730 | 3223 | 2063 | 1433 | 1053 | 806 | 637 |
| | | | | Du | 0.012 | 0.027 | 0.047 | 0.074 | 0.106 | 0.145 | 0.189 | 0.240 |
| | | | | C | 6447 | 4298 | 3223 | 2579 | 2149 | 1842 | 1612 | 1433 |
| | | | | Dc | 0.010 | 0.021 | 0.038 | 0.059 | 0.085 | 0.116 | 0.151 | 0.192 |
| 2 x 1/4 | 0.842 | 0.842 | 9.72 | U | 11227 | 4990 | 2807 | 1796 | 1247 | 916 | 702 | 554 |
| | | | | Du | 0.010 | 0.023 | 0.041 | 0.065 | 0.093 | 0.127 | 0.166 | 0.209 |
| | | | | C | 5613 | 3742 | 2807 | 2245 | 1871 | 1604 | 1403 | 1247 |
| | | | | Dc | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.132 | 0.168 |
| 2 x 5/16 | 1.053 | 1.053 | 11.89 | U | 14040 | 6240 | 3510 | 2246 | 1560 | 1146 | 878 | 693 |
| | | | | Du | 0.010 | 0.023 | 0.041 | 0.065 | 0.093 | 0.127 | 0.166 | 0.209 |
| | | | | C | 7020 | 4680 | 3510 | 2808 | 2340 | 2006 | 1755 | 1560 |
| | | | | Dc | 0.008 | 0.019 | 0.033 | 0.052 | 0.074 | 0.101 | 0.132 | 0.168 |
| 2 x 3/8 | 1.263 | 1.263 | 14.01 | U | 16840 | 7484 | 4210 | 2694 | 1871 | 1375 | 1053 | 832 |
| | | | | Du | 0.010 | 0.023 | 0.041 | 0.065 | 0.093 | 0.127 | 0.166 | 0.210 |
| | | | | C | 8420 | 5613 | 4210 | 3368 | 2807 | 2406 | 2105 | 1871 |
| | | | | Dc | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.132 | 0.168 |
| 2-1/4 x 1/4 | 1.066 | 1.199 | 10.78 | U | 14213 | 6317 | 3553 | 2274 | 1579 | 1160 | 888 | 702 |
| | | | | Du | 0.009 | 0.021 | 0.037 | 0.058 | 0.083 | 0.113 | 0.147 | 0.186 |
| | | | | C | 7107 | 4738 | 3553 | 2843 | 2369 | 2030 | 1777 | 1579 |
| | | | | Dc | 0.007 | 0.017 | 0.029 | 0.046 | 0.066 | 0.090 | 0.118 | 0.149 |
| 2-1/4 x 3/8 | 1.599 | 1.799 | 15.63 | U | 21320 | 9476 | 5330 | 3411 | 2369 | 1740 | 1333 | 1053 |
| | | | | Du | 0.009 | 0.021 | 0.037 | 0.058 | 0.083 | 0.113 | 0.147 | 0.186 |
| | | | | C | 10660 | 7107 | 5330 | 4264 | 3553 | 3046 | 2665 | 2369 |
| | | | | Dc | 0.007 | 0.017 | 0.029 | 0.046 | 0.066 | 0.090 | 0.118 | 0.149 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4” greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

## STATIC LOAD & DEFLECTION TABLE

(Chart begins on page 51)

No. Bars/Ft. of Grating Width = 5.053 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 60 | 66 | 72 | 78 | 84 | 90 | 96 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 x 1/4 | 0.211 | 0.105 | 5.42 | U | 113 | 93 | 78 | 67 | 57 | 50 | 44 |
| | | | | Du | 0.522 | 0.629 | 0.747 | 0.884 | 1.011 | 1.169 | 1.332 |
| | | | | C | 281 | 256 | 234 | 216 | 201 | 188 | 176 |
| | | | | Dc | 0.415 | 0.504 | 0.598 | 0.701 | 0.815 | 0.938 | 1.065 |
| 1 x 3/8 | 0.316 | 0.158 | 7.57 | U | 169 | 139 | 117 | 100 | 86 | 75 | 66 |
| | | | | Du | 0.519 | 0.625 | 0.745 | 0.877 | 1.014 | 1.165 | 1.328 |
| | | | | C | 421 | 383 | 351 | 324 | 301 | 281 | 263 |
| | | | | Dc | 0.414 | 0.501 | 0.596 | 0.699 | 0.811 | 0.931 | 1.058 |
| 1-1/4 x 1/4 | 0.329 | 0.206 | 6.49 | U | 175 | 145 | 122 | 104 | 90 | 78 | 69 |
| | | | | Du | 0.412 | 0.500 | 0.596 | 0.699 | 0.814 | 0.930 | 1.065 |
| | | | | C | 439 | 399 | 366 | 337 | 313 | 292 | 274 |
| | | | | Dc | 0.331 | 0.400 | 0.476 | 0.558 | 0.647 | 0.742 | 0.845 |
| 1-1/4 x 3/8 | 0.493 | 0.308 | 9.17 | U | 263 | 217 | 183 | 156 | 134 | 117 | 103 |
| | | | | Du | 0.414 | 0.500 | 0.597 | 0.702 | 0.811 | 0.933 | 1.063 |
| | | | | C | 657 | 598 | 548 | 506 | 470 | 438 | 411 |
| | | | | Dc | 0.331 | 0.401 | 0.477 | 0.560 | 0.650 | 0.745 | 0.848 |
| 1-1/2 x 1/4 | 0.474 | 0.355 | 7.59 | U | 253 | 209 | 176 | 150 | 129 | 112 | 99 |
| | | | | Du | 0.346 | 0.418 | 0.499 | 0.585 | 0.677 | 0.775 | 0.886 |
| | | | | C | 632 | 575 | 527 | 486 | 451 | 421 | 395 |
| | | | | Dc | 0.276 | 0.335 | 0.398 | 0.467 | 0.541 | 0.621 | 0.707 |
| 1-1/2 x 5/16 | 0.592 | 0.444 | 9.17 | U | 316 | 261 | 219 | 187 | 161 | 140 | 123 |
| | | | | Du | 0.345 | 0.417 | 0.496 | 0.583 | 0.675 | 0.774 | 0.880 |
| | | | | C | 789 | 718 | 658 | 607 | 564 | 526 | 493 |
| | | | | Dc | 0.276 | 0.334 | 0.397 | 0.466 | 0.541 | 0.620 | 0.706 |
| 1-1/2 x 3/8 | 0.711 | 0.533 | 10.78 | U | 379 | 313 | 263 | 224 | 193 | 169 | 148 |
| | | | | Du | 0.345 | 0.417 | 0.496 | 0.582 | 0.675 | 0.778 | 0.882 |
| | | | | C | 948 | 862 | 790 | 729 | 677 | 632 | 593 |
| | | | | Dc | 0.276 | 0.334 | 0.397 | 0.466 | 0.541 | 0.621 | 0.707 |
| 1-3/4 x 1/4 | 0.645 | 0.564 | 8.66 | U | 344 | 284 | 239 | 204 | 176 | 153 | 134 |
| | | | | Du | 0.296 | 0.358 | 0.426 | 0.501 | 0.581 | 0.666 | 0.755 |
| | | | | C | 860 | 782 | 717 | 662 | 614 | 573 | 538 |
| | | | | Dc | 0.237 | 0.286 | 0.341 | 0.400 | 0.464 | 0.532 | 0.606 |
| 1-3/4 x 3/8 | 0.967 | 0.846 | 12.40 | U | 516 | 426 | 358 | 305 | 263 | 229 | 201 |
| | | | | Du | 0.296 | 0.358 | 0.426 | 0.499 | 0.579 | 0.665 | 0.755 |
| | | | | C | 1289 | 1172 | 1074 | 992 | 921 | 860 | 806 |
| | | | | Dc | 0.236 | 0.286 | 0.340 | 0.400 | 0.464 | 0.532 | 0.606 |
| 2 x 1/4 | 0.842 | 0.842 | 9.72 | U | 449 | 371 | 312 | 266 | 229 | 200 | 175 |
| | | | | Du | 0.259 | 0.313 | 0.373 | 0.438 | 0.507 | 0.583 | 0.661 |
| | | | | C | 1123 | 1021 | 936 | 864 | 802 | 748 | 702 |
| | | | | Dc | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.465 | 0.530 |
| 2 x 5/16 | 1.053 | 1.053 | 11.89 | U | 562 | 464 | 390 | 332 | 287 | 250 | 219 |
| | | | | Du | 0.259 | 0.313 | 0.372 | 0.437 | 0.508 | 0.583 | 0.661 |
| | | | | C | 1404 | 1276 | 1170 | 1080 | 1003 | 936 | 878 |
| | | | | Dc | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.466 | 0.530 |
| 2 x 3/8 | 1.263 | 1.263 | 14.01 | U | 674 | 557 | 468 | 399 | 344 | 299 | 263 |
| | | | | Du | 0.259 | 0.313 | 0.373 | 0.438 | 0.507 | 0.581 | 0.662 |
| | | | | C | 1684 | 1531 | 1403 | 1295 | 1203 | 1123 | 1053 |
| | | | | Dc | 0.207 | 0.250 | 0.298 | 0.350 | 0.408 | 0.466 | 0.530 |
| 2-1/4 x 1/4 | 1.066 | 1.199 | 10.78 | U | 569 | 470 | 395 | 336 | 290 | 253 | 222 |
| | | | | Du | 0.230 | 0.278 | 0.331 | 0.388 | 0.451 | 0.518 | 0.588 |
| | | | | C | 1421 | 1292 | 1184 | 1093 | 1015 | 948 | 888 |
| | | | | Dc | 0.184 | 0.223 | 0.265 | 0.311 | 0.361 | 0.414 | 0.471 |
| 2-1/4 x 3/8 | 1.599 | 1.799 | 15.63 | U | 853 | 705 | 592 | 505 | 435 | 379 | 333 |
| | | | | Du | 0.230 | 0.278 | 0.331 | 0.389 | 0.450 | 0.517 | 0.588 |
| | | | | C | 2132 | 1938 | 1777 | 1640 | 1523 | 1421 | 1333 |
| | | | | Dc | 0.184 | 0.223 | 0.265 | 0.311 | 0.361 | 0.414 | 0.471 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

## STATIC LOAD & DEFLECTION TABLE

(Chart continues on page 54)

No. Bars/Ft. of Grating Width = 5.053 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-1/2 x 1/4 | 1.316 | 1.645 | 11.89 | U | 17547 | 7799 | 4387 | 2807 | 1950 | 1432 | 1097 | 867 |
| | | | | Du | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.133 | 0.168 |
| | | | | C | 8773 | 5849 | 4387 | 3509 | 2924 | 2507 | 2193 | 1950 |
| | | | | Dc | 0.007 | 0.015 | 0.027 | 0.041 | 0.060 | 0.081 | 0.106 | 0.134 |
| 2-1/2 x 5/16 | 1.645 | 2.056 | 14.57 | U | 21933 | 9748 | 5483 | 3509 | 2437 | 1790 | 1371 | 1037 |
| | | | | Du | 0.008 | 0.019 | 0.033 | 0.052 | 0.074 | 0.101 | 0.132 | 0.175 |
| | | | | C | 10967 | 7311 | 5483 | 4387 | 3656 | 3133 | 2742 | 2384 |
| | | | | Dc | 0.007 | 0.015 | 0.026 | 0.041 | 0.060 | 0.081 | 0.106 | 0.140 |
| 2-1/2 x 3/8 | 1.974 | 2.467 | 17.25 | U | 26320 | 11698 | 6580 | 4211 | 2924 | 2149 | 1645 | 1300 |
| | | | | Du | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.132 | 0.168 |
| | | | | C | 13160 | 8773 | 6580 | 5264 | 4387 | 3760 | 3290 | 2924 |
| | | | | Dc | 0.007 | 0.015 | 0.027 | 0.041 | 0.060 | 0.081 | 0.106 | 0.134 |
| 3 x 1/4 | 1.895 | 2.842 | 16.06 | U | 25267 | 11230 | 6317 | 4043 | 2807 | 2063 | 1579 | 1248 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.085 | 0.110 | 0.140 |
| | | | | C | 12633 | 8422 | 6317 | 5053 | 4211 | 3610 | 3158 | 2807 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.035 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3 x 5/16 | 2.369 | 3.553 | 19.30 | U | 31587 | 14039 | 7897 | 5054 | 3510 | 2579 | 1974 | 1560 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.085 | 0.110 | 0.140 |
| | | | | C | 15793 | 10529 | 7897 | 6317 | 5264 | 4512 | 3948 | 3510 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.034 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3 x 3/8 | 2.842 | 4.263 | 22.53 | U | 37893 | 16841 | 9473 | 6063 | 4210 | 3093 | 2368 | 1871 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.085 | 0.110 | 0.140 |
| | | | | C | 18947 | 12631 | 9473 | 7579 | 6316 | 5413 | 4737 | 4210 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.035 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3 x 1/2 | 3.790 | 5.685 | 28.95 | U | 50533 | 22459 | 12633 | 8085 | 5615 | 4125 | 3158 | 2495 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.084 | 0.110 | 0.140 |
| | | | | C | 25267 | 16844 | 12633 | 10107 | 8422 | 7219 | 6317 | 5615 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.034 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3-1/2 x 1/4 | 2.579 | 4.513 | 18.24 | U | 34387 | 15283 | 8597 | 5502 | 3821 | 2807 | 2149 | 1698 |
| | | | | Du | 0.006 | 0.013 | 0.024 | 0.037 | 0.053 | 0.072 | 0.095 | 0.120 |
| | | | | C | 17193 | 11462 | 8597 | 6877 | 5731 | 4912 | 4298 | 3821 |
| | | | | Dc | 0.005 | 0.011 | 0.019 | 0.030 | 0.043 | 0.058 | 0.076 | 0.096 |
| 3-1/2 x 3/8 | 3.869 | 6.770 | 25.72 | U | 51587 | 22927 | 12897 | 8254 | 5732 | 4211 | 3224 | 2547 |
| | | | | Du | 0.006 | 0.013 | 0.024 | 0.037 | 0.053 | 0.072 | 0.095 | 0.120 |
| | | | | C | 25793 | 17196 | 12897 | 10317 | 8598 | 7370 | 6448 | 5732 |
| | | | | Dc | 0.005 | 0.011 | 0.019 | 0.030 | 0.043 | 0.058 | 0.076 | 0.096 |
| 3-1/2 x 1/2 | 5.158 | 9.027 | 33.25 | U | 68773 | 30566 | 17193 | 11004 | 7641 | 5614 | 4298 | 3396 |
| | | | | Du | 0.006 | 0.013 | 0.024 | 0.037 | 0.053 | 0.072 | 0.095 | 0.120 |
| | | | | C | 34387 | 22924 | 17193 | 13755 | 11462 | 9825 | 8597 | 7641 |
| | | | | Dc | 0.005 | 0.011 | 0.019 | 0.030 | 0.043 | 0.058 | 0.076 | 0.096 |
| 4 x 1/4 | 3.369 | 6.737 | 20.36 | U | 44920 | 19964 | 11230 | 7187 | 4991 | 3667 | 2808 | 2218 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 22460 | 14973 | 11230 | 8984 | 7487 | 6417 | 5615 | 4991 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| 4 x 5/16 | 4.211 | 8.422 | 24.66 | U | 56147 | 24954 | 14037 | 8983 | 6239 | 4583 | 3509 | 2773 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 28073 | 18716 | 14037 | 11229 | 9358 | 8021 | 7018 | 6239 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| 4 x 3/8 | 5.053 | 10.106 | 28.95 | U | 67373 | 29944 | 16843 | 10780 | 7486 | 5500 | 4211 | 3327 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 33687 | 22458 | 16843 | 13475 | 11229 | 9625 | 8422 | 7486 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| 4 x 1/2 | 6.737 | 13.475 | 37.54 | U | 89827 | 39923 | 22457 | 14372 | 9981 | 7333 | 5614 | 4436 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 44913 | 29942 | 22457 | 17965 | 14971 | 12832 | 11228 | 9981 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

## STATIC LOAD & DEFLECTION TABLE

(Chart begins on page 53)

No. Bars/Ft. of Grating Width = 5.053 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 60 | 66 | 72 | 78 | 84 | 90 | 96 |
| 2-1/2 x 1/4 | 1.316 | 1.645 | 11.89 | U | 702 | 580 | 487 | 415 | 358 | 312 | 274 |
| | | | | Du | 0.207 | 0.250 | 0.298 | 0.349 | 0.405 | 0.466 | 0.529 |
| | | | | C | 1755 | 1595 | 1462 | 1350 | 1253 | 1170 | 1097 |
| | | | | Dc | 0.166 | 0.200 | 0.238 | 0.280 | 0.324 | 0.373 | 0.424 |
| 2-1/2 x 5/16 | 1.645 | 2.056 | 14.57 | U | 877 | 725 | 609 | 519 | 448 | 390 | 343 |
| | | | | Du | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.466 | 0.530 |
| | | | | C | 2193 | 1994 | 1828 | 1687 | 1567 | 1462 | 1371 |
| | | | | Dc | 0.166 | 0.200 | 0.238 | 0.280 | 0.325 | 0.372 | 0.424 |
| 2-1/2 x 3/8 | 1.974 | 2.467 | 17.25 | U | 1053 | 870 | 731 | 623 | 537 | 468 | 411 |
| | | | | Du | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.466 | 0.529 |
| | | | | C | 2632 | 2393 | 2193 | 2025 | 1880 | 1755 | 1645 |
| | | | | Dc | 0.166 | 0.200 | 0.238 | 0.280 | 0.325 | 0.373 | 0.424 |
| 3 x 1/4 | 1.895 | 2.842 | 16.06 | U | 1011 | 835 | 702 | 598 | 516 | 449 | 395 |
| | | | | Du | 0.173 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.442 |
| | | | | C | 2527 | 2297 | 2106 | 1944 | 1805 | 1684 | 1579 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3 x 5/16 | 2.369 | 3.553 | 19.30 | U | 1263 | 1044 | 877 | 748 | 645 | 562 | 494 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.292 | 0.338 | 0.388 | 0.442 |
| | | | | C | 3159 | 2872 | 2632 | 2430 | 2256 | 2106 | 1974 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3 x 3/8 | 2.842 | 4.263 | 22.53 | U | 1516 | 1253 | 1053 | 897 | 773 | 674 | 592 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.441 |
| | | | | C | 3789 | 3445 | 3158 | 2915 | 2707 | 2526 | 2368 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3 x 1/2 | 3.790 | 5.685 | 28.95 | U | 2021 | 1671 | 1404 | 1196 | 1031 | 898 | 790 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.442 |
| | | | | C | 5053 | 4594 | 4211 | 3887 | 3610 | 3369 | 3158 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3-1/2 x 1/4 | 2.579 | 4.513 | 18.24 | U | 1375 | 1137 | 955 | 814 | 702 | 611 | 537 |
| | | | | Du | 0.148 | 0.179 | 0.213 | 0.250 | 0.290 | 0.332 | 0.378 |
| | | | | C | 3439 | 3126 | 2866 | 2645 | 2456 | 2292 | 2149 |
| | | | | Dc | 0.118 | 0.143 | 0.170 | 0.200 | 0.232 | 0.266 | 0.303 |
| 3-1/2 x 3/8 | 3.869 | 6.770 | 25.72 | U | 2063 | 1705 | 1433 | 1221 | 1053 | 917 | 806 |
| | | | | Du | 0.148 | 0.179 | 0.213 | 0.250 | 0.290 | 0.333 | 0.378 |
| | | | | C | 5159 | 4690 | 4299 | 3968 | 3685 | 3439 | 3224 |
| | | | | Dc | 0.118 | 0.143 | 0.170 | 0.200 | 0.232 | 0.266 | 0.303 |
| 3-1/2 x 1/2 | 5.158 | 9.027 | 33.25 | U | 2751 | 2273 | 1910 | 1628 | 1404 | 1223 | 1075 |
| | | | | Du | 0.148 | 0.179 | 0.213 | 0.250 | 0.290 | 0.333 | 0.378 |
| | | | | C | 6877 | 6252 | 5731 | 5290 | 4912 | 4585 | 4298 |
| | | | | Dc | 0.118 | 0.143 | 0.170 | 0.200 | 0.232 | 0.266 | 0.303 |
| 4 x 1/4 | 3.369 | 6.737 | 20.36 | U | 1797 | 1485 | 1248 | 1063 | 917 | 799 | 702 |
| | | | | Du | 0.129 | 0.157 | 0.186 | 0.219 | 0.254 | 0.291 | 0.331 |
| | | | | C | 4492 | 4084 | 3743 | 3455 | 3209 | 2995 | 2808 |
| | | | | Dc | 0.104 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| 4 x 5/16 | 4.211 | 8.422 | 24.66 | U | 2246 | 1856 | 1560 | 1329 | 1146 | 998 | 877 |
| | | | | Du | 0.129 | 0.156 | 0.186 | 0.219 | 0.253 | 0.291 | 0.331 |
| | | | | C | 5615 | 5104 | 4679 | 4319 | 4041 | 3743 | 3509 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| 4 x 3/8 | 5.053 | 10.106 | 28.95 | U | 2695 | 2227 | 1871 | 1595 | 1375 | 1198 | 1053 |
| | | | | Du | 0.129 | 0.157 | 0.186 | 0.219 | 0.254 | 0.291 | 0.331 |
| | | | | C | 6737 | 6125 | 5614 | 5183 | 4812 | 4492 | 4211 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| 4 x 1/2 | 6.737 | 13.475 | 37.54 | U | 3593 | 2969 | 2495 | 2126 | 1833 | 1597 | 1404 |
| | | | | Du | 0.129 | 0.156 | 0.186 | 0.219 | 0.253 | 0.291 | 0.331 |
| | | | | C | 8983 | 8166 | 7486 | 6910 | 6416 | 5988 | 5614 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart continues on page 56)

No. Bars/Ft. of Grating Width = 5.053 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-1/2 x 1/4 | 4.263 | 9.593 | 22.53 | U | 56840 | 25262 | 14210 | 9094 | 6316 | 4640 | 3553 | 2807 |
| | | | | Du | 0.005 | 0.010 | 0.018 | 0.029 | 0.041 | 0.056 | 0.074 | 0.093 |
| | | | | C | 28420 | 18947 | 14210 | 11368 | 9473 | 8120 | 7105 | 6316 |
| | | | | Dc | 0.004 | 0.008 | 0.015 | 0.023 | 0.033 | 0.045 | 0.059 | 0.075 |
| 4-1/2 x 3/8 | 6.395 | 14.389 | 32.18 | U | 85267 | 37896 | 21317 | 13643 | 9474 | 6961 | 5329 | 4211 |
| | | | | Du | 0.005 | 0.010 | 0.018 | 0.029 | 0.041 | 0.056 | 0.074 | 0.093 |
| | | | | C | 42633 | 28422 | 21317 | 17053 | 14211 | 12181 | 10658 | 9474 |
| | | | | Dc | 0.004 | 0.008 | 0.015 | 0.023 | 0.033 | 0.045 | 0.059 | 0.075 |
| 4-1/2 x 1/2 | 8.527 | 19.186 | 41.84 | U | 113693 | 50530 | 28423 | 18191 | 12633 | 9281 | 7106 | 5614 |
| | | | | Du | 0.005 | 0.010 | 0.018 | 0.029 | 0.041 | 0.056 | 0.074 | 0.093 |
| | | | | C | 56847 | 37898 | 28423 | 22739 | 18949 | 16242 | 14212 | 12633 |
| | | | | Dc | 0.004 | 0.008 | 0.015 | 0.023 | 0.033 | 0.045 | 0.059 | 0.074 |
| 5 x 1/4 | 5.264 | 13.159 | 24.66 | U | 70187 | 31194 | 17547 | 11230 | 7799 | 5730 | 4387 | 3466 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 35093 | 23396 | 17547 | 14037 | 11698 | 10027 | 8773 | 7799 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5 x 5/16 | 6.579 | 16.449 | 30.01 | U | 87720 | 38987 | 21930 | 14035 | 9747 | 7161 | 5483 | 4332 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 43860 | 29240 | 21930 | 17544 | 14620 | 12531 | 10965 | 9747 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5 x 3/8 | 7.895 | 19.738 | 35.42 | U | 105267 | 46785 | 26317 | 16843 | 11696 | 8593 | 6579 | 5198 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 52633 | 35089 | 26317 | 21053 | 17544 | 15038 | 13158 | 11696 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5 x 1/2 | 10.527 | 26.318 | 46.13 | U | 140360 | 62382 | 35090 | 22458 | 15596 | 11458 | 8773 | 6931 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 70180 | 46787 | 35090 | 28072 | 23393 | 20051 | 17545 | 15596 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5-1/2 x 1/4 | 6.369 | 17.514 | 26.80 | U | 84920 | 37742 | 21230 | 13587 | 9436 | 6932 | 5308 | 4194 |
| | | | | Du | 0.004 | 0.008 | 0.015 | 0.024 | 0.034 | 0.046 | 0.060 | 0.076 |
| | | | | C | 42460 | 28307 | 21230 | 16984 | 14153 | 12131 | 10615 | 9436 |
| | | | | Dc | 0.003 | 0.007 | 0.012 | 0.019 | 0.027 | 0.037 | 0.048 | 0.061 |
| 5-1/2 x 3/8 | 9.553 | 26.272 | 38.60 | U | 127373 | 56610 | 31843 | 20380 | 14153 | 10398 | 7961 | 6290 |
| | | | | Du | 0.004 | 0.008 | 0.015 | 0.024 | 0.034 | 0.046 | 0.060 | 0.076 |
| | | | | C | 63687 | 42458 | 31843 | 25475 | 21229 | 18196 | 15922 | 14153 |
| | | | | Dc | 0.003 | 0.007 | 0.012 | 0.019 | 0.027 | 0.037 | 0.048 | 0.061 |
| 5-1/2 x 1/2 | 12.738 | 35.029 | 50.42 | U | 169840 | 75484 | 42460 | 27174 | 18871 | 13864 | 10615 | 8387 |
| | | | | Du | 0.004 | 0.008 | 0.015 | 0.024 | 0.034 | 0.046 | 0.060 | 0.076 |
| | | | | C | 84920 | 56613 | 42460 | 33968 | 28307 | 24263 | 21230 | 18871 |
| | | | | Dc | 0.003 | 0.007 | 0.012 | 0.019 | 0.027 | 0.037 | 0.048 | 0.061 |
| 6 x 1/4 | 7.580 | 22.739 | 28.95 | U | 101067 | 44919 | 25267 | 16171 | 11230 | 8250 | 6317 | 4991 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 50533 | 33689 | 25267 | 20213 | 16844 | 14438 | 12633 | 11230 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |
| 6 x 5/16 | 9.474 | 28.423 | 35.42 | U | 126320 | 56142 | 31580 | 20211 | 14036 | 10312 | 7895 | 6238 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 63160 | 42107 | 31580 | 25264 | 21053 | 18046 | 15790 | 14036 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |
| 6 x 3/8 | 11.369 | 34.108 | 41.83 | U | 151587 | 67372 | 37897 | 24254 | 16843 | 12374 | 9474 | 7486 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 75793 | 50529 | 37897 | 30317 | 25264 | 21655 | 18948 | 16843 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |
| 6 x 1/2 | 15.159 | 45.477 | 54.72 | U | 202120 | 89831 | 50530 | 32339 | 22458 | 16500 | 12633 | 9981 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 101060 | 67373 | 50530 | 40424 | 33687 | 28874 | 25265 | 22458 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart begins on page 55)

No. Bars/Ft. of Grating Width = 5.053 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 60 | 66 | 72 | 78 | 84 | 90 | 96 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-1/2 x 1/4 | 4.263 | 9.593 | 22.53 | U | 2274 | 1879 | 1579 | 1345 | 1160 | 1010 | 888 |
| | | | | Du | 0.115 | 0.139 | 0.166 | 0.194 | 0.225 | 0.259 | 0.294 |
| | | | | C | 5684 | 5167 | 4737 | 4372 | 4060 | 3789 | 3553 |
| | | | | Dc | 0.092 | 0.111 | 0.132 | 0.155 | 0.180 | 0.207 | 0.235 |
| 4-1/2 x 3/8 | 6.395 | 14.389 | 32.18 | U | 3411 | 2819 | 2369 | 2018 | 1740 | 1516 | 1332 |
| | | | | Du | 0.115 | 0.139 | 0.166 | 0.194 | 0.225 | 0.259 | 0.294 |
| | | | | C | 8527 | 7752 | 7106 | 6559 | 6090 | 5684 | 5329 |
| | | | | Dc | 0.092 | 0.111 | 0.132 | 0.155 | 0.180 | 0.207 | 0.235 |
| 4-1/2 x 1/2 | 8.527 | 19.186 | 41.84 | U | 4548 | 3758 | 3158 | 2691 | 2320 | 2021 | 1776 |
| | | | | Du | 0.115 | 0.139 | 0.166 | 0.194 | 0.225 | 0.259 | 0.294 |
| | | | | C | 11369 | 10336 | 9474 | 8746 | 8121 | 7580 | 7106 |
| | | | | Dc | 0.092 | 0.111 | 0.132 | 0.155 | 0.180 | 0.207 | 0.235 |
| 5 x 1/4 | 5.264 | 13.159 | 24.66 | U | 2807 | 2320 | 1950 | 1661 | 1432 | 1248 | 1097 |
| | | | | Du | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 7019 | 6381 | 5849 | 5399 | 5013 | 4679 | 4387 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5 x 5/16 | 6.579 | 16.449 | 30.01 | U | 3509 | 2900 | 2437 | 2076 | 1790 | 1559 | 1371 |
| | | | | Du | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 8772 | 7975 | 7310 | 6748 | 6266 | 5848 | 5483 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5 x 3/8 | 7.895 | 19.738 | 35.42 | U | 4211 | 3480 | 2924 | 2492 | 2148 | 1871 | 1645 |
| | | | | Du | 0.104 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 10527 | 9570 | 8772 | 8097 | 7519 | 7018 | 6579 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5 x 1/2 | 10.527 | 26.318 | 46.13 | U | 5614 | 4640 | 3899 | 3322 | 2864 | 2495 | 2193 |
| | | | | Du | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 14036 | 12760 | 11697 | 10797 | 10026 | 9357 | 8773 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5-1/2 x 1/4 | 6.369 | 17.514 | 26.80 | U | 3397 | 2807 | 2359 | 2010 | 1733 | 1510 | 1327 |
| | | | | Du | 0.094 | 0.114 | 0.135 | 0.159 | 0.184 | 0.212 | 0.241 |
| | | | | C | 8492 | 7720 | 7077 | 6532 | 6066 | 5661 | 5308 |
| | | | | Dc | 0.075 | 0.091 | 0.108 | 0.127 | 0.147 | 0.169 | 0.193 |
| 5-1/2 x 3/8 | 9.553 | 26.272 | 38.60 | U | 5095 | 4211 | 3538 | 3015 | 2599 | 2264 | 1990 |
| | | | | Du | 0.094 | 0.114 | 0.135 | 0.159 | 0.184 | 0.212 | 0.241 |
| | | | | C | 12737 | 11579 | 10614 | 9798 | 9098 | 8492 | 7961 |
| | | | | Dc | 0.075 | 0.091 | 0.108 | 0.127 | 0.147 | 0.169 | 0.193 |
| 5-1/2 x 1/2 | 12.738 | 35.029 | 50.42 | U | 6794 | 5615 | 4718 | 4020 | 3466 | 3019 | 2654 |
| | | | | Du | 0.094 | 0.114 | 0.135 | 0.159 | 0.184 | 0.212 | 0.241 |
| | | | | C | 16984 | 15440 | 14153 | 13065 | 12131 | 11323 | 10615 |
| | | | | Dc | 0.075 | 0.091 | 0.108 | 0.127 | 0.147 | 0.169 | 0.193 |
| 6 x 1/4 | 7.580 | 22.739 | 28.95 | U | 4043 | 3341 | 2807 | 2392 | 2063 | 1797 | 1579 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 10107 | 9188 | 8422 | 7774 | 7219 | 6738 | 6317 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |
| 6 x 5/16 | 9.474 | 28.423 | 35.42 | U | 5053 | 4176 | 3509 | 2990 | 2578 | 2246 | 1974 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 12632 | 11484 | 10527 | 9717 | 9023 | 8421 | 7895 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |
| 6 x 3/8 | 11.369 | 34.108 | 41.83 | U | 6063 | 5011 | 4211 | 3588 | 3094 | 2695 | 2369 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 15159 | 13781 | 12632 | 11661 | 10828 | 10106 | 9474 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |
| 6 x 1/2 | 15.159 | 45.477 | 54.72 | U | 8085 | 6682 | 5614 | 4784 | 4125 | 3593 | 3158 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 20212 | 18375 | 16843 | 15548 | 14437 | 13475 | 12633 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# Model Specification: 38-W-4 Heavy-Duty Steel Bar Gratings

September 14, 2022

Specifier Notes: Architect or engineer should carefully review and edit this section to meet the requirements of the project and local building codes. Coordinate this section with other specification sections and the drawings and delete any unused "Specifier Notes" and options shown in **"red"** after editing.

This section covers Pleasant Mount Welding, Inc.'s "38-W-4 Heavy-Duty Steel Bar Grating." Consult PMWI (www.pmwi.net) for assistance in editing this section for specific applications. Call 570.282.6164 or email sales@pmwi.net with any questions.

## SECTION 055300 - Metal Fabrications: Metal Gratings

## Part 1: General

### 1.1 Section Includes

A. Prefabricated, heavy-duty carbon steel bar gratings.

B. Prefabricated support frames for gratings.

C. Miscellaneous installation hardware and accessories.

### 1.2 Reference Standards

A. ANSI A326.3-2017: American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials.

B. ASTM Grade-36 Carbon Steel.

C. ASTM A-510: Carbon Steel Wire Rods.

D. ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

### 1.3 Action Submittals

A. Product Data: The contractor shall submit the manufacturer's catalog pages including load tables, anchor details and standard installation details.

B. Shop Drawings: The contractor shall submit for approval shop drawings for the fabrication and erection of all gratings, based on construction drawings of current issue. Include plans, elevations, and details of sections and connections as required. Show type and location of all fasteners.

C. Samples of grating and anchorage system shall be submitted for approval.

### 1.4 Quality Assurance

A. Manufacturer Qualification: A company specializing in the manufacture of metal bar gratings with not less than 5 years of documented experience.

B. Fabrication tolerances shall be in accordance with applicable provisions and recommendations of ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

## Part 2: Products

### 2.1 Source Requirements:

Design is based upon use of gratings as manufactured by Pleasant Mount Welding, Inc. and terminology used herein may include reference to the specific performance or product of this manufacturer. Such reference shall be construed only as establishing the quality of materials, operational features and workmanship used under this section and shall not, in any way, be construed as limiting competition.

### 2.2 Manufacturers:

Acceptable manufacturers include Pleasant Mount Welding, Inc. (45 Dundaff Street, Carbondale, PA 18407, 570-282-6164, www.pmwi.net) or approved equal.

### 2.3 Manufactured Units:

A. **Description:** Heavy-Duty Carbon Steel Bar Grating type **38-W-4 with a Galvanized finish**. Heavy-duty cross bars are welded perpendicular to heavy-duty main bearing bars.

1. Main Bearing Bar Spacing: **2-3/8"** on center.
2. Main Bearing Bar Depth: based on loading requirements and clear span as shown on drawings.
3. Main Bearing Bar Thickness: **1/4" | 5/16" | 3/8" | 1/2"** as shown on drawings.
4. Cross Bar Spacing: **4"** on center.
5. Top Surface of Main Bearing Bars: **Smooth | Serrated | SlipNOT® Slip Resistance Coating**

B. **Fabrication:** Load Band ends of grating with bars of the same thickness as main bearing bars. Weld banding flush with the top surface of grating. Depth of banding is to be 1/2" less than the depth of the main bearing bars (as shown in drawings). **Include welded anchor blocks 1/4" from the bottom surface with hole to accept washer and attachment bolts.**

C. **Steel Frames: Carbon Steel ASTM Grade-36 frames shall be provided as shown on contract drawings to support and attach gratings. Include anchors as shown for locking frame into concrete as shown on the plans. Galvanize frames after fabrication per ASTM A-123.**

D. **Design Criteria:**

1. **Loading:** Unless shown otherwise on the contract drawings, gratings shall be designed and manufactured to meet live load conditions of **AASHTO HS-20 with 30% impact factor**. Main bearing bar depth shall be as shown in contract drawings or as recommended by the manufacturer to meet loading requirements and clear span conditions.

2. **Traction / Slip-Resistance**: When a traction surface is required, it is to be tested per ANSI A326.3-2017. Top surface shall provide a minimum Wet Dynamic Coefficient of Friction (Wet DCOF) of 0.45 to meet high traction classification.

E. **Materials:** Main bearing bars and rectangular cross bars are to be type ASTM Grade-36 Carbon Steel. Round cross bars are to be per ASTM A-510. Banding is to be carbon steel per ASTM Grade-36.

F. **Fabrication Tolerances** shall be in accordance with ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

G. **Top Surface:** When required, **SlipNOT® Slip Resistance Coating** will be included in order to meet or exceed Wet Dynamic COF requirements of paragraph 2.3 D.2 above.

H. **Finish:** Gratings and frames shall be **Hot-Dip Galvanized per ASTM A-123 or Powder Coated Black [or other color] as shown on drawings.**

**2.4 Accessories:**

Provide appropriate fasteners for type, grade, and class required for approved anchorage system. **Include lifting devices and all other accessories as shown on the drawings.**

## Part 3: Execution

**3.1 Field Verification:**

Take field measurements prior to preparation of final shop drawings (and fabrication where required) to ensure proper fitting of the work.

**3.2 Installation**

A. Prior to grating installation, contractor shall inspect supports for correct alignment and conditions for proper attachment and support of the gratings. Metal shall be used for all grating supports and provide the minimum bearing surface for the depth of grating per ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual. Ends of all bearing bars at cutouts for penetrations are to be supported in like manner. Any inconsistencies between contract drawings and supporting structure deemed detrimental to grating placement shall be reported in writing to the engineer, architect or owner's agent prior to placement.

B. Install grating in accordance with shop drawings and standard installation clearances as recommended by ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

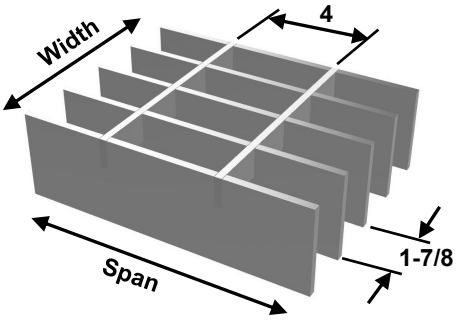
**3.3 Grating Attachment:**

Use approved attachment system and fasteners to secure grating to supporting members as shown on plans.

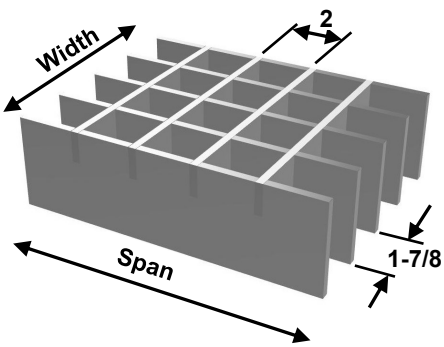
# 30-SPACE

# HEAVY DUTY WELDED STEEL GRATING

### 30-W-4




### 30-W-2




| % Open Area* | | | | | |
|---|---|---|---|---|---|
| BB Size | CB Ctrs | Bearing Bar Thickness | | | |
| | | 1/4" | 5/16" | 3/8" | 1/2" |
| Thru 2-1/2" | 4" cc | 79% | 76% | 73% | - |
| | 2" cc | 72% | 70% | 67% | - |
| 3" to 6" | 4" cc | 82% | 78% | 75% | 69% |
| | 2" cc | 77% | 74% | 71% | 65% |

## VEHICULAR LOAD TABLE

| Bearing Bar Size (Inches) | Weight ** (Lbs./Sqft.) | Section Properties | | Maximum Safe Clear Span (Inches) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Sx ** ($In^3$/Ft. Width) | Ix ** ($In^4$/Ft. Width) | Auto Traffic | 1 Ton | 3 Ton | 5 Ton | H-15 | H20/ HL-93 | H-25 |
| 1 x 1/4 | 6.57 | 0.267 | 0.133 | 10 | 6 | 5 | 6 | 8 | 9 | 9 |
| 1 x 3/8 | 9.32 | 0.400 | 0.200 | 13 | 8 | 6 | 8 | 9 | 11 | 12 |
| 1-1/4 x 1/4 | 7.92 | 0.417 | 0.260 | 13 | 8 | 6 | 8 | 10 | 11 | 12 |
| 1-1/4 x 3/8 | 11.31 | 0.625 | 0.391 | 18 | 11 | 8 | 10 | 12 | 13 | 15 |
| 1-1/2 x 1/4 | 9.32 | 0.600 | 0.450 | 17 | 11 | 8 | 9 | 12 | 13 | 14 |
| 1-1/2 x 5/16 | 11.31 | 0.750 | 0.563 | 21 | 13 | 9 | 10 | 13 | 15 | 16 |
| 1-1/2 x 3/8 | 13.36 | 0.900 | 0.675 | 24 | 15 | 10 | 12 | 14 | 16 | 18 |
| 1-3/4 x 1/4 | 10.67 | 0.817 | 0.715 | 22 | 14 | 10 | 11 | 14 | 15 | 11 |
| 1-3/4 x 3/8 | 15.40 | 1.225 | 1.072 | 31 | 20 | 13 | 14 | 17 | 19 | 21 |
| 2 x 1/4 | 12.01 | 1.067 | 1.067 | 27 | 18 | 12 | 13 | 16 | 18 | 19 |
| 2 x 5/16 | 14.76 | 1.333 | 1.333 | 33 | 22 | 14 | 15 | 18 | 20 | 22 |
| 2 x 3/8 | 17.45 | 1.600 | 1.600 | 39 | 26 | 16 | 17 | 20 | 22 | 24 |
| 2-1/4 x 1/4 | 13.35 | 1.350 | 1.519 | 34 | 22 | 14 | 15 | 18 | 20 | 22 |
| 2-1/4 x 3/8 | 19.50 | 2.025 | 2.278 | 47* | 32 | 20 | 20 | 23 | 25 | 27 |
| 2-1/2 x 1/4 | 14.76 | 1.667 | 2.083 | 41 | 27 | 17 | 17 | 20 | 22 | 24 |
| 2-1/2 x 5/16 | 18.15 | 2.083 | 2.604 | 50 | 33 | 20 | 20 | 24 | 25 | 27 |
| 2-1/2 x 3/8 | 21.55 | 2.500 | 3.125 | 53* | 39 | 24 | 23 | 27 | 29 | 30 |
| 3 x 1/4 | 19.50 | 2.400 | 3.600 | 55* | 38 | 23 | 23 | 26 | 28 | 30 |
| 3 x 5/16 | 23.60 | 3.000 | 4.500 | 60* | 47 | 28 | 27 | 31 | 32 | 34 |
| 3 x 3/8 | 27.69 | 3.600 | 5.400 | 63* | 56 | 33 | 31 | 36 | 37 | 39 |
| 3 x 1/2 | 35.82 | 4.800 | 7.200 | 70* | 61* | 42 | 40 | 45 | 46 | 47 |
| 3-1/2 x 1/4 | 22.25 | 3.267 | 5.717 | 65* | 51 | 30 | 29 | 33 | 34 | 36 |
| 3-1/2 x 3/8 | 31.72 | 4.900 | 8.575 | 74* | 65* | 43 | 41 | 46 | 47 | 48 |
| 3-1/2 x 1/2 | 41.26 | 6.533 | 11.433 | 81* | 72* | 57 | 53 | 59 | 58* | 58* |
| 4 x 1/4 | 24.94 | 4.267 | 8.533 | 74* | 65* | 38 | 36 | 41 | 42 | 43 |
| 4 x 5/16 | 30.38 | 5.333 | 10.667 | 80* | 70* | 47 | 44 | 50 | 50 | 51 |
| 4 x 3/8 | 35.82 | 6.400 | 12.800 | 85* | 74* | 56 | 52 | 58 | 58 | 59 |
| 4 x 1/2 | 46.70 | 8.533 | 17.067 | 93* | 82* | 67* | 64* | 67* | 66* | 66* |
| 4-1/2 x 1/4 | 27.69 | 5.400 | 12.150 | 83* | 73* | 47 | 44 | 50 | 51 | 52 |
| 4-1/2 x 3/8 | 39.92 | 8.100 | 18.225 | 95* | 84* | 68* | 64 | 68* | 67* | 67* |
| 4-1/2 x 1/2 | 52.14 | 10.800 | 24.300 | 96* | 92* | 75* | 73* | 75* | 74* | 74* |
| 5 x 1/4 | 30.38 | 6.667 | 16.667 | 92* | 81* | 58 | 54 | 60 | 60 | 61 |
| 5 x 5/16 | 37.16 | 8.333 | 20.833 | 96* | 88* | 71 | 66 | 71* | 71* | 70* |
| 5 x 3/8 | 44.01 | 10.000 | 25.000 | 96* | 93* | 76* | 73* | 76* | 75* | 75* |
| 5 x 1/2 | 57.58 | 13.333 | 33.333 | 96* | 96* | 84* | 81* | 83* | 82* | 82* |
| 5-1/2 x 1/4 | 33.10 | 8.067 | 22.183 | 96* | 89* | 69 | 64 | 72 | 71 | 71 |
| 5-1/2 x 3/8 | 48.04 | 12.100 | 33.275 | 96* | 96* | 84* | 81* | 83* | 82* | 82* |
| 5-1/2 x 1/2 | 63.02 | 16.133 | 44.367 | 96* | 96* | 92* | 89* | 92* | 90* | 90* |
| 6 x 1/4 | 35.82 | 9.600 | 28.800 | 96* | 96* | 80* | 75 | 79* | 78* | 78* |
| 6 x 5/16 | 44.01 | 12.000 | 36.000 | 96* | 96* | 86* | 83* | 86* | 84* | 84* |
| 6 x 3/8 | 52.14 | 14.400 | 43.200 | 96* | 96* | 91* | 88* | 91* | 90* | 89* |
| 6 x 1/2 | 68.46 | 19.200 | 57.600 | 96* | 96* | 96* | 96* | 96* | 96* | 96* |

*Maximum spans are limited by maximum allowable stress or the lesser deflection of L/400 or 1/8" to a maximum simple span of 8'-0" (2,438mm). **Based on 6.4 bars/ft. of grating width. Bearing bars 1-7/8" center-to-center spacing. When serrated grating is specified, the depth of grating required for a specified load will be 1/4" greater than that shown in these tables. Weights shown are for 4" cross bar centers. Add 1.13 lbs/sqft. (3/8" Dia. CB) or 3.18 lbs./sqft. (1-1/4" x 1/4" CB) for 2" cross bar centers. Cross bars are determined based on project applications and bearing bar height.

# HEAVY DUTY WELDED STEEL GRATING

## MAXIMUM SAFE CONCENTRATED LOADS

| Bearing Bar Size (Inches) | Maximum Safe Concentrated Load* (Lbs./Ft. of Grating Width) - Clear Span | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1'-0" | 1'-6" | 2'-0" | 2'-6" | 3'-0" | 3'-6" | 4'-0" | 4'-6" | 5'-0" | 5'-6" | 6'-0" | 7'-0" | 8'-0" |
| 1 x 1/4 | 1780 | 1187 | 890 | 712 | 593 | 509 | | | | | | | |
| 1 x 3/8 | 2667 | 1778 | 1333 | 1067 | 889 | 762 | | | | | | | |
| 1-1/4 x 1/4 | 2780 | 1853 | 1390 | 1112 | 927 | 794 | 695 | | | | | | |
| 1-1/4 x 3/8 | 4167 | 2778 | 2083 | 1667 | 1389 | 1190 | 1042 | | | | | | |
| 1-1/2 x 1/4 | 4000 | 2667 | 2000 | 1600 | 1333 | 1143 | 1000 | 889 | | | | | |
| 1-1/2 x 5/16 | 5000 | 3333 | 2500 | 2000 | 1667 | 1429 | 1250 | 1111 | | | | | |
| 1-1/2 x 3/8 | 6000 | 4000 | 3000 | 2400 | 2000 | 1714 | 1500 | 1333 | | | | | |
| 1-3/4 x 1/4 | 5447 | 3631 | 2723 | 2179 | 1816 | 1556 | 1362 | 1210 | 1089 | | | | |
| 1-3/4 x 3/8 | 8167 | 5444 | 4083 | 3267 | 2722 | 2333 | 2042 | 1815 | 1633 | | | | |
| 2 x 1/4 | 7113 | 4742 | 3557 | 2845 | 2371 | 2032 | 1778 | 1581 | 1423 | | | | |
| 2 x 5/16 | 8887 | 5924 | 4443 | 3555 | 2962 | 2539 | 2222 | 1975 | 1777 | | | | |
| 2 x 3/8 | 10667 | 7111 | 5333 | 4267 | 3556 | 3048 | 2667 | 2370 | 2133 | | | | |
| 2-1/4 x 1/4 | 9000 | 6000 | 4500 | 3600 | 3000 | 2571 | 2250 | 2000 | 1800 | 1636 | | | |
| 2-1/4 x 3/8 | 13500 | 9000 | 6750 | 5400 | 4500 | 3857 | 3375 | 3000 | 2700 | 2455 | | | |
| 2-1/2 x 1/4 | 11113 | 7409 | 5557 | 4445 | 3704 | 3175 | 2778 | 2470 | 2223 | 2021 | 1852 | | |
| 2-1/2 x 5/16 | 13887 | 9258 | 6943 | 5555 | 4629 | 3968 | 3472 | 3086 | 2777 | 2525 | 2314 | | |
| 2-1/2 x 3/8 | 16667 | 11111 | 8333 | 6667 | 5556 | 4762 | 4167 | 3704 | 3333 | 3030 | 2778 | | |
| 3 x 1/4 | 16000 | 10667 | 8000 | 6400 | 5333 | 4571 | 4000 | 3556 | 3200 | 2909 | 2667 | | |
| 3 x 5/16 | 20000 | 13333 | 10000 | 8000 | 6667 | 5714 | 5000 | 4444 | 4000 | 3636 | 3333 | | |
| 3 x 3/8 | 24000 | 16000 | 12000 | 9600 | 8000 | 6857 | 6000 | 5333 | 4800 | 4364 | 4000 | | |
| 3 x 1/2 | 32000 | 21333 | 16000 | 12800 | 10667 | 9143 | 8000 | 7111 | 6400 | 5818 | 5333 | | |
| 3-1/2 x 1/4 | 21780 | 14520 | 10890 | 8712 | 7260 | 6223 | 5445 | 4840 | 4356 | 3960 | 3630 | 3111 | |
| 3-1/2 x 3/8 | 32667 | 21778 | 16333 | 13067 | 10889 | 9333 | 8167 | 7259 | 6533 | 5939 | 5444 | 4667 | |
| 3-1/2 x 1/2 | 43553 | 29036 | 21777 | 17421 | 14518 | 12444 | 10888 | 9679 | 8711 | 7919 | 7259 | 6222 | |
| 4 x 1/4 | 28447 | 18964 | 14223 | 11379 | 9482 | 8128 | 7112 | 6321 | 5689 | 5172 | 4741 | 4064 | |
| 4 x 5/16 | 35553 | 23702 | 17777 | 14221 | 11851 | 10158 | 8888 | 7901 | 7111 | 6464 | 5926 | 5079 | |
| 4 x 3/8 | 42667 | 28444 | 21333 | 17067 | 14222 | 12190 | 10667 | 9481 | 8533 | 7758 | 7111 | 6095 | |
| 4 x 1/2 | 56887 | 37924 | 28443 | 22755 | 18962 | 16253 | 14222 | 12641 | 11377 | 10343 | 9481 | 8127 | |
| 4-1/2 x 1/4 | 36000 | 24000 | 18000 | 14400 | 12000 | 10286 | 9000 | 8000 | 7200 | 6545 | 6000 | 5143 | 4500 |
| 4-1/2 x 3/8 | 54000 | 36000 | 27000 | 21600 | 18000 | 15429 | 13500 | 12000 | 10800 | 9818 | 9000 | 7714 | 6750 |
| 4-1/2 x 1/2 | | 48000 | 36000 | 28800 | 24000 | 20571 | 18000 | 16000 | 14400 | 13091 | 12000 | 10286 | 9000 |
| 5 x 1/4 | | 29631 | 22223 | 17779 | 14816 | 12699 | 11112 | 9877 | 8889 | 8081 | 7408 | 6350 | 5556 |
| 5 x 5/16 | | 37036 | 27777 | 22221 | 18518 | 15872 | 13888 | 12345 | 11111 | 10101 | 9259 | 7936 | 6944 |
| 5 x 3/8 | | 44444 | 33333 | 26667 | 22222 | 19048 | 16667 | 14815 | 13333 | 12121 | 11111 | 9524 | 8333 |
| 5 x 1/2 | | 59258 | 44443 | 35555 | 29629 | 25396 | 22222 | 19753 | 17777 | 16161 | 14814 | 12698 | 11111 |
| 5-1/2 x 1/4 | | 35853 | 26890 | 21512 | 17927 | 15366 | 13445 | 11951 | 10756 | 9778 | 8963 | 7683 | 6723 |
| 5-1/2 x 3/8 | | 53778 | 40333 | 32267 | 26889 | 23048 | 20167 | 17926 | 16133 | 14667 | 13444 | 11524 | 10083 |
| 5-1/2 x 1/2 | | | 53777 | 43021 | 35851 | 30730 | 26888 | 23901 | 21511 | 19555 | 17926 | 15365 | 13444 |
| 6 x 1/4 | | | 32000 | 25600 | 21333 | 18286 | 16000 | 14222 | 12800 | 11636 | 10667 | 9143 | 8000 |
| 6 x 5/16 | | | 40000 | 32000 | 26667 | 22857 | 20000 | 17778 | 16000 | 14545 | 13333 | 11429 | 10000 |
| 6 x 3/8 | | | 48000 | 38400 | 32000 | 27429 | 24000 | 21333 | 19200 | 17455 | 16000 | 13714 | 12000 |
| 6 x 1/2 | | | | 51200 | 42667 | 36571 | 32000 | 28444 | 25600 | 23273 | 21333 | 18286 | 16000 |

| % Open Area* | | | | | |
|---|---|---|---|---|---|
| BB Size | CB Ctrs | Bearing Bar Thickness | | | |
| | | 1/4" | 5/16" | 3/8" | 1/2" |
| Thru 2-1/2" | 4" cc | 79% | 76% | 73% | - |
| | 2" cc | 72% | 70% | 67% | - |
| 3" to 6" | 4" cc | 82% | 78% | 75% | 69% |
| | 2" cc | 77% | 74% | 71% | 65% |

*Loads are theoretical, and are based on a unit stress of 20,000 psi.*

*Based on 6.4 bars/ft. of grating width. Bearing bars 1-7/8" center-to-center spacing. **Note:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

### Panel Width Chart (in.) - 30-W-4 & 30-W-2

Dimensions are Out-to-Out of Bearing Bars**

| No. of Bars | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4" Bars | $2^{1}/_{8}$ | 4 | $5^{7}/_{8}$ | $7^{3}/_{4}$ | $9^{5}/_{8}$ | $11^{1}/_{2}$ | $13^{3}/_{8}$ | $15^{1}/_{4}$ | $17^{1}/_{8}$ | 19 | $20^{7}/_{8}$ | $22^{3}/_{4}$ | $24^{5}/_{8}$ | $26^{1}/_{2}$ | $28^{3}/_{8}$ |
| 5/16" Bars | $2^{3}/_{16}$ | $4^{1}/_{16}$ | $5^{15}/_{16}$ | $7^{13}/_{16}$ | $9^{11}/_{16}$ | $11^{9}/_{16}$ | $13^{7}/_{16}$ | $15^{5}/_{16}$ | $17^{3}/_{16}$ | $19^{1}/_{16}$ | $20^{15}/_{16}$ | $22^{13}/_{16}$ | $24^{11}/_{16}$ | $26^{9}/_{16}$ | $28^{7}/_{16}$ |
| 3/8" Bars | $2^{1}/_{4}$ | $4^{1}/_{8}$ | 6 | $7^{7}/_{8}$ | $9^{3}/_{4}$ | $11^{5}/_{8}$ | $13^{1}/_{2}$ | $15^{3}/_{8}$ | $17^{1}/_{4}$ | $19^{1}/_{8}$ | 21 | $22^{7}/_{8}$ | $24^{3}/_{4}$ | $26^{5}/_{8}$ | $28^{1}/_{2}$ |
| 1/2" Bars | $2^{3}/_{8}$ | $4^{1}/_{4}$ | $6^{1}/_{8}$ | 8 | $9^{7}/_{8}$ | $11^{3}/_{4}$ | $13^{5}/_{8}$ | $15^{1}/_{2}$ | $17^{3}/_{8}$ | $19^{1}/_{4}$ | $21^{1}/_{8}$ | 23 | $24^{7}/_{8}$ | $26^{3}/_{4}$ | $28^{5}/_{8}$ |

| No. of Bars | 17 | 18 | 19 | 20 |
|---|---|---|---|---|
| 1/4" Bars | $30^{1}/_{4}$ | $32^{1}/_{8}$ | 34 | $35^{7}/_{8}$ |
| 5/16" Bars | $30^{5}/_{16}$ | $32^{3}/_{16}$ | $34^{1}/_{16}$ | $35^{15}/_{16}$ |
| 3/8" Bars | $30^{3}/_{8}$ | $32^{1}/_{4}$ | $34^{1}/_{8}$ | 36 |
| 1/2" Bars | $30^{1}/_{2}$ | $32^{3}/_{8}$ | $34^{1}/_{4}$ | $36^{1}/_{8}$ |

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart continues on page 63)

No. Bars/Ft. of Grating Width = 6.400 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 x 1/4 | 0.267 | 0.133 | 6.57 | U | 3560 | 1582 | 890 | 570 | 396 | 291 | 223 | 176 |
| | | | | Du | 0.021 | 0.047 | 0.083 | 0.130 | 0.187 | 0.255 | 0.333 | 0.421 |
| | | | | C | 1780 | 1187 | 890 | 712 | 593 | 509 | 445 | 396 |
| | | | | Dc | 0.017 | 0.037 | 0.067 | 0.104 | 0.149 | 0.204 | 0.266 | 0.337 |
| 1 x 3/8 | 0.400 | 0.200 | 9.32 | U | 5333 | 2370 | 1333 | 853 | 593 | 435 | 333 | 263 |
| | | | | Du | 0.021 | 0.047 | 0.083 | 0.129 | 0.186 | 0.253 | 0.331 | 0.418 |
| | | | | C | 2667 | 1778 | 1333 | 1067 | 889 | 762 | 667 | 593 |
| | | | | Dc | 0.017 | 0.037 | 0.066 | 0.104 | 0.149 | 0.203 | 0.265 | 0.335 |
| 1-1/4 x 1/4 | 0.417 | 0.260 | 7.92 | U | 5560 | 2471 | 1390 | 890 | 618 | 454 | 348 | 275 |
| | | | | Du | 0.017 | 0.037 | 0.066 | 0.104 | 0.149 | 0.203 | 0.266 | 0.337 |
| | | | | C | 2780 | 1853 | 1390 | 1112 | 927 | 794 | 695 | 618 |
| | | | | Dc | 0.013 | 0.030 | 0.053 | 0.083 | 0.120 | 0.163 | 0.212 | 0.269 |
| 1-1/4 x 3/8 | 0.625 | 0.391 | 11.31 | U | 8333 | 3704 | 2083 | 1333 | 926 | 680 | 521 | 412 |
| | | | | Du | 0.017 | 0.037 | 0.066 | 0.103 | 0.149 | 0.203 | 0.265 | 0.335 |
| | | | | C | 4167 | 2778 | 2083 | 1667 | 1389 | 1190 | 1042 | 926 |
| | | | | Dc | 0.013 | 0.030 | 0.053 | 0.083 | 0.119 | 0.162 | 0.212 | 0.268 |
| 1-1/2 x 1/4 | 0.600 | 0.450 | 9.32 | U | 8000 | 3556 | 2000 | 1280 | 889 | 653 | 500 | 395 |
| | | | | Du | 0.014 | 0.031 | 0.055 | 0.086 | 0.124 | 0.169 | 0.221 | 0.279 |
| | | | | C | 4000 | 2667 | 2000 | 1600 | 1333 | 1143 | 1000 | 889 |
| | | | | Dc | 0.011 | 0.025 | 0.044 | 0.069 | 0.099 | 0.135 | 0.177 | 0.224 |
| 1-1/2 x 5/16 | 0.750 | 0.563 | 11.31 | U | 10000 | 4444 | 2500 | 1600 | 1111 | 816 | 625 | 494 |
| | | | | Du | 0.014 | 0.031 | 0.055 | 0.086 | 0.124 | 0.169 | 0.220 | 0.279 |
| | | | | C | 5000 | 3333 | 2500 | 2000 | 1667 | 1429 | 1250 | 1111 |
| | | | | Dc | 0.011 | 0.025 | 0.044 | 0.069 | 0.099 | 0.135 | 0.176 | 0.223 |
| 1-1/2 x 3/8 | 0.900 | 0.675 | 13.36 | U | 12000 | 5333 | 3000 | 1920 | 1333 | 980 | 750 | 593 |
| | | | | Du | 0.014 | 0.031 | 0.055 | 0.086 | 0.124 | 0.169 | 0.221 | 0.280 |
| | | | | C | 6000 | 4000 | 3000 | 2400 | 2000 | 1714 | 1500 | 1333 |
| | | | | Dc | 0.011 | 0.025 | 0.044 | 0.069 | 0,099 | 0.135 | 0.177 | 0.223 |
| 1-3/4 x 1/4 | 0.817 | 0.715 | 10.67 | U | 10893 | 4841 | 2723 | 1743 | 1210 | 889 | 681 | 538 |
| | | | | Du | 0.012 | 0.027 | 0.047 | 0.074 | 0.106 | 0.145 | 0.189 | 0.239 |
| | | | | C | 5447 | 3631 | 2723 | 2179 | 1816 | 1556 | 1362 | 1210 |
| | | | | Dc | 0.010 | 0.021 | 0.038 | 0.059 | 0.085 | 0.116 | 0.151 | 0.191 |
| 1-3/4 x 3/8 | 1.225 | 1.072 | 15.40 | U | 16333 | 7259 | 4083 | 2613 | 1815 | 1333 | 1021 | 807 |
| | | | | Du | 0.012 | 0.027 | 0.047 | 0.074 | 0.106 | 0.145 | 0.189 | 0.240 |
| | | | | C | 8167 | 5444 | 4083 | 3267 | 2722 | 2333 | 2042 | 1815 |
| | | | | Dc | 0.010 | 0.021 | 0.038 | 0.059 | 0.085 | 0.116 | 0.151 | 0.192 |
| 2 x 1/4 | 1.067 | 1.067 | 12.01 | U | 14227 | 6323 | 3557 | 2276 | 1581 | 1161 | 889 | 703 |
| | | | | Du | 0.010 | 0.023 | 0.041 | 0.065 | 0.093 | 0.127 | 0.166 | 0.210 |
| | | | | C | 7113 | 4742 | 3557 | 2845 | 2371 | 2032 | 1778 | 1581 |
| | | | | Dc | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.132 | 0.168 |
| 2 x 5/16 | 1.333 | 1.333 | 14.76 | U | 17773 | 7899 | 4443 | 2844 | 1975 | 1451 | 1111 | 878 |
| | | | | Du | 0.010 | 0.023 | 0.041 | 0.065 | 0.093 | 0.127 | 0.166 | 0.210 |
| | | | | C | 8887 | 5924 | 4443 | 3555 | 2962 | 2539 | 2222 | 1975 |
| | | | | Dc | 0.008 | 0.019 | 0.033 | 0.052 | 0.074 | 0.101 | 0.132 | 0.168 |
| 2 x 3/8 | 1.600 | 1.600 | 17.45 | U | 21333 | 9481 | 5333 | 3413 | 2370 | 1741 | 1333 | 1053 |
| | | | | Du | 0.010 | 0.023 | 0.041 | 0.065 | 0.093 | 0.127 | 0.166 | 0.209 |
| | | | | C | 10667 | 7111 | 5333 | 4267 | 3556 | 3048 | 2667 | 2370 |
| | | | | Dc | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.132 | 0.168 |
| 2-1/4 x 1/4 | 1.350 | 1.519 | 13.35 | U | 18000 | 8000 | 4500 | 2880 | 2000 | 1469 | 1125 | 889 |
| | | | | Du | 0.009 | 0.021 | 0.037 | 0.058 | 0.083 | 0.113 | 0.147 | 0.186 |
| | | | | C | 9000 | 6000 | 4500 | 3600 | 3000 | 2571 | 2250 | 2000 |
| | | | | Dc | 0.007 | 0.017 | 0.029 | 0.046 | 0.066 | 0.090 | 0.118 | 0.149 |
| 2-1/4 x 3/8 | 2.025 | 2.278 | 19.50 | U | 27000 | 12000 | 6750 | 4320 | 3000 | 2204 | 1688 | 1333 |
| | | | | Du | 0.009 | 0.021 | 0.037 | 0.058 | 0.083 | 0.113 | 0.147 | 0.186 |
| | | | | C | 13500 | 9000 | 6750 | 5400 | 4500 | 3857 | 3375 | 3000 |
| | | | | Dc | 0.007 | 0.017 | 0.029 | 0.046 | 0.066 | 0.090 | 0.118 | 0.149 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4” greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart begins on page 62)

No. Bars/Ft. of Grating Width = 6.400 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 60 | 66 | 72 | 78 | 84 | 90 | 96 |
| 1 x 1/4 | 0.267 | 0.133 | 6.57 | U | 142 | 118 | 99 | 84 | 73 | 63 | 56 |
| | | | | Du | 0.518 | 0.630 | 0.749 | 0.875 | 1.023 | 1.163 | 1.338 |
| | | | | C | 356 | 324 | 297 | 274 | 254 | 237 | 223 |
| | | | | Dc | 0.415 | 0.503 | 0.599 | 0.702 | 0.813 | 0.933 | 1.066 |
| 1 x 3/8 | 0.400 | 0.200 | 9.32 | U | 213 | 176 | 148 | 126 | 109 | 95 | 83 |
| | | | | Du | 0.516 | 0.625 | 0.744 | 0.873 | 1.015 | 1.166 | 1.319 |
| | | | | C | 533 | 485 | 444 | 410 | 381 | 356 | 333 |
| | | | | Dc | 0.414 | 0.501 | 0.595 | 0.699 | 0.811 | 0.932 | 1.058 |
| 1-1/4 x 1/4 | 0.417 | 0.260 | 7.92 | U | 222 | 184 | 154 | 132 | 113 | 99 | 87 |
| | | | | Du | 0.414 | 0.502 | 0.596 | 0.703 | 0.810 | 0.935 | 1.063 |
| | | | | C | 556 | 505 | 463 | 428 | 397 | 371 | 348 |
| | | | | Dc | 0.332 | 0.401 | 0.478 | 0.561 | 0.650 | 0.747 | 0.851 |
| 1-1/4 x 3/8 | 0.625 | 0.391 | 11.31 | U | 333 | 275 | 231 | 197 | 170 | 148 | 130 |
| | | | | Du | 0.413 | 0.499 | 0.594 | 0.698 | 0.810 | 0.929 | 1.057 |
| | | | | C | 833 | 758 | 694 | 641 | 595 | 556 | 521 |
| | | | | Dc | 0.331 | 0.400 | 0.476 | 0.559 | 0.648 | 0.745 | 0.847 |
| 1-1/2 x 1/4 | 0.600 | 0.450 | 9.32 | U | 320 | 264 | 222 | 189 | 163 | 142 | 125 |
| | | | | Du | 0.345 | 0.417 | 0.496 | 0.582 | 0.675 | 0.775 | 0.883 |
| | | | | C | 800 | 727 | 667 | 615 | 571 | 533 | 500 |
| | | | | Dc | 0.276 | 0.334 | 0.397 | 0.466 | 0.540 | 0.620 | 0.706 |
| 1-1/2 x 5/16 | 0.750 | 0.563 | 11.31 | U | 400 | 331 | 278 | 237 | 204 | 178 | 156 |
| | | | | Du | 0.345 | 0.417 | 0.497 | 0.583 | 0.675 | 0.776 | 0.881 |
| | | | | C | 1000 | 909 | 833 | 769 | 714 | 667 | 625 |
| | | | | Dc | 0.276 | 0.333 | 0.397 | 0.466 | 0.540 | 0.620 | 0.706 |
| 1-1/2 x 3/8 | 0.900 | 0.675 | 13.36 | U | 480 | 397 | 333 | 284 | 245 | 213 | 188 |
| | | | | Du | 0.345 | 0.418 | 0.496 | 0.583 | 0.676 | 0.775 | 0.885 |
| | | | | C | 1200 | 1091 | 1000 | 923 | 857 | 800 | 750 |
| | | | | Dc | 0.276 | 0.334 | 0.397 | 0.466 | 0.541 | 0.621 | 0.706 |
| 1-3/4 x 1/4 | 0.817 | 0.715 | 10.67 | U | 436 | 360 | 303 | 258 | 222 | 194 | 170 |
| | | | | Du | 0.296 | 0.358 | 0.426 | 0.500 | 0.578 | 0.666 | 0.756 |
| | | | | C | 1089 | 990 | 908 | 838 | 778 | 726 | 681 |
| | | | | Dc | 0.236 | 0.286 | 0.341 | 0.400 | 0.463 | 0.532 | 0.605 |
| 1-3/4 x 3/8 | 1.225 | 1.072 | 15.40 | U | 653 | 540 | 454 | 387 | 333 | 290 | 255 |
| | | | | Du | 0.295 | 0.358 | 0.426 | 0.500 | 0.579 | 0.664 | 0.756 |
| | | | | C | 1633 | 1485 | 1361 | 1256 | 1167 | 1089 | 1021 |
| | | | | Dc | 0.236 | 0.286 | 0.340 | 0.399 | 0.464 | 0.532 | 0.605 |
| 2 x 1/4 | 1.067 | 1.067 | 12.01 | U | 569 | 470 | 395 | 337 | 290 | 253 | 222 |
| | | | | Du | 0.259 | 0.313 | 0.372 | 0.437 | 0.506 | 0.582 | 0.661 |
| | | | | C | 1423 | 1293 | 1186 | 1094 | 1016 | 948 | 889 |
| | | | | Dc | 0.207 | 0.250 | 0.298 | 0.350 | 0.405 | 0.465 | 0.530 |
| 2 x 5/16 | 1.333 | 1.333 | 14.76 | U | 711 | 588 | 494 | 421 | 363 | 316 | 278 |
| | | | | Du | 0.259 | 0.313 | 0.373 | 0.437 | 0.507 | 0.582 | 0.663 |
| | | | | C | 1777 | 1616 | 1481 | 1367 | 1270 | 1185 | 1111 |
| | | | | Dc | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.466 | 0.530 |
| 2 x 3/8 | 1.600 | 1.600 | 17.45 | U | 853 | 705 | 593 | 505 | 435 | 379 | 333 |
| | | | | Du | 0.259 | 0.313 | 0.373 | 0.437 | 0.507 | 0.582 | 0.661 |
| | | | | C | 2133 | 1939 | 1778 | 1641 | 1524 | 1422 | 1333 |
| | | | | Dc | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.465 | 0.530 |
| 2-1/4 x 1/4 | 1.350 | 1.519 | 13.35 | U | 720 | 595 | 500 | 426 | 367 | 320 | 281 |
| | | | | Du | 0.230 | 0.278 | 0.331 | 0.388 | 0.450 | 0.517 | 0.588 |
| | | | | C | 1800 | 1636 | 1500 | 1385 | 1286 | 1200 | 1125 |
| | | | | Dc | 0.184 | 0.222 | 0.265 | 0.311 | 0.361 | 0.414 | 0.471 |
| 2-1/4 x 3/8 | 2.025 | 2.278 | 19.50 | U | 1080 | 893 | 750 | 639 | 551 | 480 | 422 |
| | | | | Du | 0.230 | 0.278 | 0.331 | 0.389 | 0.451 | 0.517 | 0.589 |
| | | | | C | 2700 | 2455 | 2250 | 2077 | 1929 | 1800 | 1688 |
| | | | | Dc | 0.184 | 0.223 | 0.265 | 0.311 | 0.361 | 0.414 | 0.471 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart continues on page 65)

No. Bars/Ft. of Grating Width = 6.400 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-1/2 x 1/4 | 1.667 | 2.083 | 14.76 | U | 22227 | 9879 | 5557 | 3556 | 2470 | 1814 | 1389 | 1098 |
| | | | | Du | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.132 | 0.168 |
| | | | | C | 11113 | 7409 | 5557 | 4445 | 3704 | 3175 | 2778 | 2470 |
| | | | | Dc | 0.007 | 0.015 | 0.027 | 0.041 | 0.060 | 0.081 | 0.106 | 0.134 |
| 2-1/2 x 5/16 | 2.083 | 2.604 | 18.15 | U | 27773 | 12344 | 6943 | 4444 | 3086 | 2267 | 1736 | 1372 |
| | | | | Du | 0.008 | 0.019 | 0.033 | 0.052 | 0.074 | 0.101 | 0.132 | 0.168 |
| | | | | C | 13887 | 9258 | 6943 | 5555 | 4629 | 3968 | 3472 | 3086 |
| | | | | Dc | 0.007 | 0.015 | 0.026 | 0.041 | 0.060 | 0.081 | 0.106 | 0.134 |
| 2-1/2 x 3/8 | 2.500 | 3.125 | 21.55 | U | 33333 | 14815 | 8333 | 5333 | 3704 | 2721 | 2083 | 1646 |
| | | | | Du | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.132 | 0.168 |
| | | | | C | 16667 | 11111 | 8333 | 6667 | 5556 | 4762 | 4167 | 3704 |
| | | | | Dc | 0.007 | 0.015 | 0.027 | 0.041 | 0.060 | 0.081 | 0.106 | 0.134 |
| 3 x 1/4 | 2.400 | 3.600 | 19.50 | U | 32000 | 14222 | 8000 | 5120 | 3556 | 2612 | 2000 | 1580 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.085 | 0.110 | 0.140 |
| | | | | C | 16000 | 10667 | 8000 | 6400 | 5333 | 4571 | 4000 | 3556 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.035 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3 x 5/16 | 3.000 | 4.500 | 23.60 | U | 40000 | 17778 | 10000 | 6400 | 4444 | 3265 | 2500 | 1975 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.084 | 0.110 | 0.140 |
| | | | | C | 20000 | 13333 | 10000 | 8000 | 6667 | 5714 | 5000 | 4444 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.034 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3 x 3/8 | 3.600 | 5.400 | 27.69 | U | 48000 | 21333 | 12000 | 7680 | 5333 | 3918 | 3000 | 2370 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.085 | 0.110 | 0.140 |
| | | | | C | 24000 | 16000 | 12000 | 9600 | 8000 | 6857 | 6000 | 5333 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.035 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3 x 1/2 | 4.800 | 7.200 | 35.82 | U | 64000 | 28444 | 16000 | 10240 | 7111 | 5224 | 4000 | 3160 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.084 | 0.110 | 0.140 |
| | | | | C | 32000 | 21333 | 16000 | 12800 | 10667 | 9143 | 8000 | 7111 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.034 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3-1/2 x 1/4 | 3.267 | 5.717 | 22.25 | U | 43560 | 19360 | 10890 | 6970 | 4840 | 3556 | 2723 | 2151 |
| | | | | Du | 0.006 | 0.013 | 0.024 | 0.037 | 0.053 | 0.072 | 0.095 | 0.120 |
| | | | | C | 21780 | 14520 | 10890 | 8712 | 7260 | 6223 | 5445 | 4840 |
| | | | | Dc | 0.005 | 0.011 | 0.019 | 0.030 | 0.043 | 0.058 | 0.076 | 0.096 |
| 3-1/2 x 3/8 | 4.900 | 8.575 | 31.72 | U | 65333 | 29037 | 16333 | 10453 | 7259 | 5333 | 4083 | 3226 |
| | | | | Du | 0.006 | 0.013 | 0.024 | 0.037 | 0.053 | 0.072 | 0.095 | 0.120 |
| | | | | C | 32667 | 21778 | 16333 | 13067 | 10889 | 9333 | 8167 | 7259 |
| | | | | Dc | 0.005 | 0.011 | 0.019 | 0.030 | 0.043 | 0.058 | 0.076 | 0.096 |
| 3-1/2 x 1/2 | 6.533 | 11.433 | 41.26 | U | 87107 | 38714 | 21777 | 13937 | 9679 | 7111 | 5444 | 4302 |
| | | | | Du | 0.006 | 0.013 | 0.024 | 0.037 | 0.053 | 0.072 | 0.095 | 0.120 |
| | | | | C | 43553 | 29036 | 21777 | 17421 | 14518 | 12444 | 10888 | 9679 |
| | | | | Dc | 0.005 | 0.011 | 0.019 | 0.030 | 0.043 | 0.058 | 0.076 | 0.096 |
| 4 x 1/4 | 4.267 | 8.533 | 24.94 | U | 56893 | 25286 | 14223 | 9103 | 6321 | 4644 | 3556 | 2810 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 28447 | 18964 | 14223 | 11379 | 9482 | 8128 | 7112 | 6321 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| 4 x 5/16 | 5.333 | 10.667 | 30.38 | U | 71107 | 31603 | 17777 | 11377 | 7901 | 5805 | 4444 | 3511 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 35553 | 23702 | 17777 | 14221 | 11851 | 10158 | 8888 | 7901 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| 4 x 3/8 | 6.400 | 12.800 | 35.82 | U | 85333 | 37926 | 21333 | 13653 | 9481 | 6966 | 5333 | 4214 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 42667 | 28444 | 21333 | 17067 | 14222 | 12190 | 10667 | 9481 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| 4 x 1/2 | 8.533 | 17.067 | 46.70 | U | 113773 | 50556 | 28443 | 18204 | 12641 | 9288 | 7111 | 5618 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 56887 | 37924 | 28443 | 22755 | 18962 | 16253 | 14222 | 12641 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DELECTION TABLE

(Chart begins on page 64)

No. Bars/Ft. of Grating Width = 6.400 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus $in.^3$/ Foot of Grating Width | Moment of Inertia $in.^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 60 | 66 | 72 | 78 | 84 | 90 | 96 |
| 2-1/2 x 1/4 | 1.667 | 2.083 | 14.76 | U | 889 | 735 | 617 | 526 | 454 | 395 | 347 |
| | | | | Du | 0.207 | 0.251 | 0.298 | 0.350 | 0.406 | 0.466 | 0.529 |
| | | | | C | 2223 | 2021 | 1852 | 1710 | 1588 | 1482 | 1389 |
| | | | | Dc | 0.166 | 0.200 | 0.238 | 0.280 | 0.325 | 0.373 | 0.424 |
| 2-1/2 x 5/16 | 2.083 | 2.604 | 18.15 | U | 1111 | 918 | 771 | 657 | 567 | 494 | 434 |
| | | | | Du | 0.207 | 0.250 | 0.298 | 0.349 | 0.406 | 0.466 | 0.530 |
| | | | | C | 2777 | 2525 | 2314 | 2136 | 1984 | 1852 | 1736 |
| | | | | Dc | 0.165 | 0.200 | 0.238 | 0.280 | 0.324 | 0.372 | 0.424 |
| 2-1/2 x 3/8 | 2.500 | 3.125 | 21.55 | U | 1333 | 1102 | 926 | 789 | 680 | 593 | 521 |
| | | | | Du | 0.207 | 0.250 | 0.298 | 0.350 | 0.405 | 0.466 | 0.530 |
| | | | | C | 3333 | 3030 | 2778 | 2564 | 2381 | 2222 | 2083 |
| | | | | Dc | 0.166 | 0.200 | 0.238 | 0.280 | 0.324 | 0.372 | 0.424 |
| 3 x 1/4 | 2.400 | 3.600 | 19.50 | U | 1280 | 1058 | 889 | 757 | 653 | 569 | 500 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.441 |
| | | | | C | 3200 | 2909 | 2667 | 2462 | 2286 | 2133 | 2000 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3 x 5/16 | 3.000 | 4.500 | 23.60 | U | 1600 | 1322 | 1111 | 947 | 816 | 711 | 625 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.441 |
| | | | | C | 4000 | 3636 | 3333 | 3077 | 2857 | 2667 | 2500 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3 x 3/8 | 3.600 | 5.400 | 27.69 | U | 1920 | 1587 | 1333 | 1136 | 980 | 853 | 750 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.441 |
| | | | | C | 4800 | 4364 | 4000 | 3692 | 3429 | 3200 | 3000 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3 x 1/2 | 4.800 | 7.200 | 35.82 | U | 2560 | 2116 | 1778 | 1515 | 1306 | 1138 | 1000 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.441 |
| | | | | C | 6400 | 5818 | 5333 | 4923 | 4571 | 4267 | 4000 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3-1/2 x 1/4 | 3.267 | 5.717 | 22.25 | U | 1742 | 1440 | 1210 | 1031 | 889 | 774 | 681 |
| | | | | Du | 0.148 | 0.179 | 0.213 | 0.250 | 0.290 | 0.332 | 0.379 |
| | | | | C | 4356 | 3960 | 3630 | 3351 | 3111 | 2904 | 2723 |
| | | | | Dc | 0.118 | 0.143 | 0.170 | 0.200 | 0.232 | 0.266 | 0.303 |
| 3-1/2 x 3/8 | 4.900 | 8.575 | 31.72 | U | 2613 | 2160 | 1815 | 1546 | 1333 | 1161 | 1021 |
| | | | | Du | 0.148 | 0.179 | 0.213 | 0.250 | 0.290 | 0.332 | 0.378 |
| | | | | C | 6533 | 5939 | 5444 | 5026 | 4667 | 4356 | 4083 |
| | | | | Dc | 0.118 | 0.143 | 0.170 | 0.200 | 0.232 | 0.266 | 0.303 |
| 3-1/2 x 1/2 | 6.533 | 11.433 | 41.26 | U | 3484 | 2880 | 2420 | 2062 | 1778 | 1549 | 1361 |
| | | | | Du | 0.148 | 0.179 | 0.213 | 0.250 | 0.290 | 0.333 | 0.378 |
| | | | | C | 8711 | 7919 | 7259 | 6701 | 6222 | 5807 | 5444 |
| | | | | Dc | 0.118 | 0.143 | 0.170 | 0.200 | 0.232 | 0.266 | 0.303 |
| 4 x 1/4 | 4.267 | 8.533 | 24.94 | U | 2276 | 1881 | 1580 | 1347 | 1161 | 1011 | 889 |
| | | | | Du | 0.129 | 0.157 | 0.186 | 0.219 | 0.254 | 0.291 | 0.331 |
| | | | | C | 5689 | 5172 | 4741 | 4376 | 4064 | 3793 | 3556 |
| | | | | Dc | 0.104 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| 4 x 5/16 | 5.333 | 10.667 | 30.38 | U | 2844 | 2351 | 1975 | 1683 | 1451 | 1264 | 1111 |
| | | | | Du | 0.129 | 0.156 | 0.186 | 0.219 | 0.253 | 0.291 | 0.331 |
| | | | | C | 7111 | 6464 | 5926 | 5470 | 5079 | 4740 | 4444 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| 4 x 3/8 | 6.400 | 12.800 | 35.82 | U | 3413 | 2821 | 2370 | 2020 | 1741 | 1517 | 1333 |
| | | | | Du | 0.129 | 0.157 | 0.186 | 0.219 | 0.253 | 0.291 | 0.331 |
| | | | | C | 8533 | 7758 | 7111 | 6564 | 6095 | 5689 | 5333 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| 4 x 1/2 | 8.533 | 17.067 | 46.70 | U | 4551 | 3761 | 3160 | 2693 | 2322 | 2023 | 1778 |
| | | | | Du | 0.129 | 0.156 | 0.186 | 0.219 | 0.253 | 0.291 | 0.331 |
| | | | | C | 11377 | 10343 | 9481 | 8752 | 8127 | 7585 | 7111 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

## STATIC LOAD & DEFLECTION TABLE

(Chart continues on page 67)

No. Bars/Ft. of Grating Width = 6.400 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-1/2 x 1/4 | 5.400 | 12.150 | 27.69 | U | 72000 | 32000 | 18000 | 11520 | 8000 | 5878 | 4500 | 3556 |
| | | | | Du | 0.005 | 0.010 | 0.018 | 0.029 | 0.041 | 0.056 | 0.074 | 0.093 |
| | | | | C | 36000 | 24000 | 18000 | 14400 | 12000 | 10286 | 9000 | 8000 |
| | | | | Dc | 0.004 | 0.008 | 0.015 | 0.023 | 0.033 | 0.045 | 0.059 | 0.075 |
| 4-1/2 x 3/8 | 8.100 | 18.225 | 39.92 | U | 108000 | 48000 | 27000 | 17280 | 12000 | 8816 | 6750 | 5333 |
| | | | | Du | 0.005 | 0.010 | 0.018 | 0.029 | 0.041 | 0.056 | 0.074 | 0.093 |
| | | | | C | 54000 | 36000 | 27000 | 21600 | 18000 | 15429 | 13500 | 12000 |
| | | | | Dc | 0.004 | 0.008 | 0.015 | 0.023 | 0.033 | 0.045 | 0.059 | 0.075 |
| 4-1/2 x 1/2 | 10.800 | 24.300 | 52.14 | U | 144000 | 64000 | 36000 | 23040 | 16000 | 11755 | 9000 | 7111 |
| | | | | Du | 0.005 | 0.010 | 0.018 | 0.029 | 0.041 | 0.056 | 0.074 | 0.093 |
| | | | | C | 72000 | 48000 | 36000 | 28800 | 24000 | 20571 | 18000 | 16000 |
| | | | | Dc | 0.004 | 0.008 | 0.015 | 0.023 | 0.033 | 0.045 | 0.059 | 0.074 |
| 5 x 1/4 | 6.667 | 16.667 | 30.38 | U | 88893 | 39508 | 22223 | 14223 | 9877 | 7257 | 5556 | 4390 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 44447 | 29631 | 22223 | 17779 | 14816 | 12699 | 11112 | 9877 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5 x 5/16 | 8.333 | 20.833 | 37.16 | U | 111107 | 49381 | 27777 | 17777 | 12345 | 9070 | 6944 | 5487 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 55553 | 37036 | 27777 | 22221 | 18518 | 15872 | 13888 | 12345 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5 x 3/8 | 10.000 | 25.000 | 44.01 | U | 133333 | 59259 | 33333 | 21333 | 14815 | 10884 | 8333 | 6584 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 66667 | 44444 | 33333 | 26667 | 22222 | 19048 | 16667 | 14815 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5 x 1/2 | 13.333 | 33.333 | 57.58 | U | 177773 | 79010 | 44443 | 28444 | 19753 | 14512 | 11111 | 8779 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 88887 | 59258 | 44443 | 35555 | 29629 | 25396 | 22222 | 19753 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5-1/2 x 1/4 | 8.067 | 22.183 | 33.10 | U | 107560 | 47804 | 26890 | 17210 | 11951 | 8780 | 6723 | 5312 |
| | | | | Du | 0.004 | 0.008 | 0.015 | 0.024 | 0.034 | 0.046 | 0.060 | 0.076 |
| | | | | C | 53780 | 35853 | 26890 | 21512 | 17927 | 15366 | 13445 | 11951 |
| | | | | Dc | 0.003 | 0.007 | 0.012 | 0.019 | 0.027 | 0.037 | 0.048 | 0.061 |
| 5-1/2 x 3/8 | 12.100 | 33.275 | 48.04 | U | 161333 | 71704 | 40333 | 25813 | 17926 | 13170 | 10083 | 7967 |
| | | | | Du | 0.004 | 0.008 | 0.015 | 0.024 | 0.034 | 0.046 | 0.060 | 0.076 |
| | | | | C | 80667 | 53778 | 40333 | 32267 | 26889 | 23048 | 20167 | 17926 |
| | | | | Dc | 0.003 | 0.007 | 0.012 | 0.019 | 0.027 | 0.037 | 0.048 | 0.061 |
| 5-1/2 x 1/2 | 16.133 | 44.367 | 63.02 | U | 215107 | 95603 | 53777 | 34417 | 23901 | 17560 | 13444 | 10623 |
| | | | | Du | 0.004 | 0.008 | 0.015 | 0.024 | 0.034 | 0.046 | 0.060 | 0.076 |
| | | | | C | 107553 | 71702 | 53777 | 43021 | 35851 | 30730 | 26888 | 23901 |
| | | | | Dc | 0.003 | 0.007 | 0.012 | 0.019 | 0.027 | 0.037 | 0.048 | 0.061 |
| 6 x 1/4 | 9.600 | 28.800 | 35.82 | U | 128000 | 56889 | 32000 | 20480 | 14222 | 10449 | 8000 | 6321 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 64000 | 42667 | 32000 | 25600 | 21333 | 18286 | 16000 | 14222 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |
| 6 x 5/16 | 12.000 | 36.000 | 44.01 | U | 160000 | 71111 | 40000 | 25600 | 17778 | 13061 | 10000 | 7901 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 80000 | 53333 | 40000 | 32000 | 26667 | 22857 | 20000 | 17778 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |
| 6 x 3/8 | 14.400 | 43.200 | 52.14 | U | 192000 | 85333 | 48000 | 30720 | 21333 | 15673 | 12000 | 9481 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 96000 | 64000 | 48000 | 38400 | 32000 | 27429 | 24000 | 21333 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |
| 6 x 1/2 | 19.200 | 57.600 | 68.46 | U | 256000 | 113778 | 64000 | 40960 | 28444 | 20898 | 16000 | 12642 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 128000 | 85333 | 64000 | 51200 | 42667 | 36571 | 32000 | 28444 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart begins on page 66)

No. Bars/Ft. of Grating Width = 6.400 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 60 | 66 | 72 | 78 | 84 | 90 | 96 |
| 4-1/2 x 1/4 | 5.400 | 12.150 | 27.69 | U | 2880 | 2380 | 2000 | 1704 | 1469 | 1280 | 1125 |
| | | | | Du | 0.115 | 0.139 | 0.166 | 0.194 | 0.225 | 0.259 | 0.294 |
| | | | | C | 7200 | 6545 | 6000 | 5538 | 5143 | 4800 | 4500 |
| | | | | Dc | 0.092 | 0.111 | 0.132 | 0.155 | 0.180 | 0.207 | 0.235 |
| 4-1/2 x 3/8 | 8.100 | 18.225 | 39.92 | U | 4320 | 3570 | 3000 | 2556 | 2204 | 1920 | 1688 |
| | | | | Du | 0.115 | 0.139 | 0.166 | 0.194 | 0.225 | 0.259 | 0.294 |
| | | | | C | 10800 | 9818 | 9000 | 8308 | 7714 | 7200 | 6750 |
| | | | | Dc | 0.092 | 0.111 | 0.132 | 0.155 | 0.180 | 0.207 | 0.235 |
| 4-1/2 x 1/2 | 10.800 | 24.300 | 52.14 | U | 5760 | 4760 | 4000 | 3408 | 2939 | 2560 | 2250 |
| | | | | Du | 0.115 | 0.139 | 0.166 | 0.194 | 0.225 | 0.259 | 0.294 |
| | | | | C | 14400 | 13091 | 12000 | 11077 | 10286 | 9600 | 9000 |
| | | | | Dc | 0.092 | 0.111 | 0.132 | 0.155 | 0.180 | 0.207 | 0.235 |
| 5 x 1/4 | 6.667 | 16.667 | 30.38 | U | 3556 | 2939 | 2469 | 2104 | 1814 | 1580 | 1389 |
| | | | | Du | 0.104 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 8889 | 8081 | 7408 | 6838 | 6350 | 5926 | 5556 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5 x 5/16 | 8.333 | 20.833 | 37.16 | U | 4444 | 3673 | 3086 | 2630 | 2267 | 1975 | 1736 |
| | | | | Du | 0.104 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 11111 | 10101 | 9259 | 8547 | 7936 | 7407 | 6944 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5 x 3/8 | 10.000 | 25.000 | 44.01 | U | 5333 | 4408 | 3704 | 3156 | 2721 | 2370 | 2083 |
| | | | | Du | 0.104 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 13333 | 12121 | 11111 | 10256 | 9524 | 8889 | 8333 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5 x 1/2 | 13.333 | 33.333 | 57.58 | U | 7111 | 5877 | 4938 | 4208 | 3628 | 3160 | 2778 |
| | | | | Du | 0.104 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 17777 | 16161 | 14814 | 13675 | 12698 | 11852 | 11111 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5-1/2 x 1/4 | 8.067 | 22.183 | 33.10 | U | 4302 | 3556 | 2988 | 2546 | 2195 | 1912 | 1681 |
| | | | | Du | 0.094 | 0.114 | 0.135 | 0.159 | 0.184 | 0.212 | 0.241 |
| | | | | C | 10756 | 9778 | 8963 | 8274 | 7683 | 7171 | 6723 |
| | | | | Dc | 0.075 | 0.091 | 0.108 | 0.127 | 0.147 | 0.169 | 0.193 |
| 5-1/2 x 3/8 | 12.100 | 33.275 | 48.04 | U | 6453 | 5333 | 4481 | 3819 | 3293 | 2868 | 2521 |
| | | | | Du | 0.094 | 0.114 | 0.135 | 0.159 | 0.184 | 0.212 | 0.241 |
| | | | | C | 16133 | 14667 | 13444 | 12410 | 11524 | 10756 | 10083 |
| | | | | Dc | 0.075 | 0.091 | 0.108 | 0.127 | 0.147 | 0.169 | 0.193 |
| 5-1/2 x 1/2 | 16.133 | 44.367 | 63.02 | U | 8604 | 7111 | 5975 | 5091 | 4390 | 3824 | 3361 |
| | | | | Du | 0.094 | 0.114 | 0.135 | 0.159 | 0.184 | 0.212 | 0.241 |
| | | | | C | 21511 | 19555 | 17926 | 16547 | 15365 | 14340 | 13444 |
| | | | | Dc | 0.075 | 0.091 | 0.108 | 0.127 | 0.147 | 0.169 | 0.193 |
| 6 x 1/4 | 9.600 | 28.800 | 35.82 | U | 5120 | 4231 | 3556 | 3030 | 2612 | 2276 | 2000 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 12800 | 11636 | 10667 | 9846 | 9143 | 8533 | 8000 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |
| 6 x 5/16 | 12.000 | 36.000 | 44.01 | U | 6400 | 5289 | 4444 | 3787 | 3265 | 2844 | 2500 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 16000 | 14545 | 13333 | 12308 | 11429 | 10667 | 10000 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |
| 6 x 3/8 | 14.400 | 43.200 | 52.14 | U | 7680 | 6347 | 5333 | 4544 | 3918 | 3413 | 3000 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 19200 | 17455 | 16000 | 14769 | 13714 | 12800 | 12000 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |
| 6 x 1/2 | 19.200 | 57.600 | 68.46 | U | 10240 | 8463 | 7111 | 6059 | 5224 | 4551 | 4000 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 25600 | 23273 | 21333 | 19692 | 18286 | 17067 | 16000 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# Model Specification: 30-W-4 Heavy-Duty Steel Bar Gratings

September 14, 2022

Specifier Notes: Architect or engineer should carefully review and edit this section to meet the requirements of the project and local building codes. Coordinate this section with other specification sections and the drawings and delete any unused "Specifier Notes" and options shown in **"red"** after editing.

This section covers Pleasant Mount Welding, Inc.'s "30-W-4 Heavy-Duty Steel Bar Gratings." Consult PMWI (www.pmwi.net) for assistance in editing this section for specific applications. Call 570.282.6164 or email sales@pmwi.net with any questions.

## SECTION 055300 - Metal Fabrications: Metal Gratings

## Part 1: General

### 1.1 Section Includes

A. Prefabricated, heavy-duty carbon steel bar gratings.

B. Prefabricated support frames for gratings.

C. Miscellaneous installation hardware and accessories.

### 1.2 Reference Standards

A. ANSI A326.3-2017: American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials.

B. ASTM Grade-36 Carbon Steel.

C. ASTM A-510: Carbon Steel Wire Rods.

D. ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

### 1.3 Action Submittals

A. Product Data: The contractor shall submit the manufacturer's catalog pages including load tables, anchor details and standard installation details.

B. Shop Drawings: The contractor shall submit for approval shop drawings for the fabrication and erection of all gratings, based on construction drawings of current issue. Include plans, elevations, and details of sections and connections as required. Show type and location of all fasteners.

C. Samples of grating and anchorage system shall be submitted for approval.

### 1.4 Quality Assurance

A. Manufacturer Qualification: A company specializing in the manufacture of metal bar gratings with not less than 5 years of documented experience.

B. Fabrication tolerances shall be in accordance with applicable provisions and recommendations of ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

## Part 2: Products

### 2.1 Source Requirements:

Design is based upon use of gratings as manufactured by Pleasant Mount Welding, Inc. and terminology used herein may include reference to the specific performance or product of this manufacturer. Such reference shall be construed only as establishing the quality of materials, operational features and workmanship used under this section and shall not, in any way, be construed as limiting competition.

### 2.2 Manufacturers:

Acceptable manufacturers include Pleasant Mount Welding, Inc. (45 Dundaff Street, Carbondale, PA 18407, 570-282-6164, www.pmwi.net) or approved equal.

### 2.3 Manufactured Units:

A. **Description:** Heavy-Duty Carbon Steel Bar Grating type **30-W-4 with a Galvanized finish**. Heavy-duty cross bars are welded perpendicular to heavy-duty main bearing bars.

1. Main Bearing Bar Spacing: **1-7/8"** on center.
2. Main Bearing Bar Depth: based on loading requirements and clear span as shown on drawings.
3. Main Bearing Bar Thickness: **1/4" | 5/16" | 3/8" | 1/2"** as shown on drawings.
4. Cross Bar Spacing: **4"** on center.
5. Top Surface of Main Bearing Bars: **Smooth | Serrated | SlipNOT® Slip Resistance Coating**

B. **Fabrication:** Load Band ends of grating with bars of the same thickness as main bearing bars. Weld banding flush with the top surface of grating. Depth of banding is to be 1/2" less than the depth of the main bearing bars (as shown in drawings). **Include welded anchor blocks 1/4" from the bottom surface with hole to accept washer and attachment bolts.**

C. **Steel Frames: Carbon Steel ASTM Grade-36 frames shall be provided as shown on contract drawings to support and attach gratings. Include anchors as shown for locking frame into concrete as shown on the plans. Galvanize frames after fabrication per ASTM A-123.**

D. **Design Criteria:**

1. **Loading:** Unless shown otherwise on the contract drawings, gratings shall be designed and manufactured to meet live load conditions of **AASHTO HS-20 with 30% impact factor**. Main bearing bar depth shall be as shown in contract drawings or as recommended by the manufacturer to meet loading requirements and clear span conditions.

2. **Traction / Slip-Resistance**: When a traction surface is required, it is to be tested per ANSI A326.3-2017. Top surface shall provide a minimum Wet Dynamic Coefficient of Friction (Wet DCOF) of 0.45 to meet high traction classification.

E. **Materials:** Main bearing bars and rectangular cross bars are to be type ASTM Grade-36 Carbon Steel. Round cross bars are to be per ASTM A-510. Banding is to be carbon steel per ASTM Grade-36.

F. **Fabrication Tolerances** shall be in accordance with ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

G. **Top Surface:** When required, **SlipNOT® Slip Resistance Coating** will be included in order to meet or exceed Wet Dynamic COF requirements of paragraph 2.3 D.2 above.

H. **Finish:** Gratings and frames shall be **Hot-Dip Galvanized per ASTM A-123 or Powder Coated Black [or other color] as shown on drawings.**

### 2.4 Accessories:

Provide appropriate fasteners for type, grade, and class required for approved anchorage system. **Include lifting devices and all other accessories as shown on the drawings.**

## Part 3: Execution

### 3.1 Field Verification:

Take field measurements prior to preparation of final shop drawings (and fabrication where required) to ensure proper fitting of the work.

### 3.2 Installation

A. Prior to grating installation, contractor shall inspect supports for correct alignment and conditions for proper attachment and support of the gratings. Metal shall be used for all grating supports and provide the minimum bearing surface for the depth of grating per ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual. Ends of all bearing bars at cutouts for penetrations are to be supported in like manner. Any inconsistencies between contract drawings and supporting structure deemed detrimental to grating placement shall be reported in writing to the engineer, architect or owner's agent prior to placement.

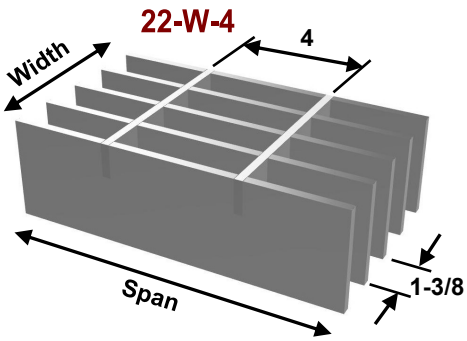
B. Install grating in accordance with shop drawings and standard installation clearances as recommended by ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

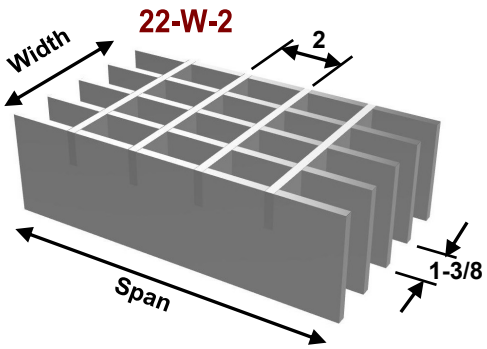
### 3.3 Grating Attachment:

Use approved attachment system and fasteners to secure grating to supporting members as shown on plans.

# 22-SPACE

# HEAVY DUTY WELDED STEEL GRATING




| % Open Area* | | | | | |
|---|---|---|---|---|---|
| BB Size | CB Ctrs | Bearing Bar Thickness | | | |
| | | 1/4" | 5/16" | 3/8" | 1/2" |
| Thru 2-1/2" | 4" cc | 75% | 70% | 66% | - |
| | 2" cc | 68% | 64% | 60% | - |
| 3" to 6" | 4" cc | 77% | 72% | 68% | 60% |
| | 2" cc | 72% | 68% | 64% | 56% |

## VEHICULAR LOAD TABLE

| Bearing Bar Size (Inches) | Weight ** (Lbs./Sqft.) | Section Properties | | Maximum Safe Clear Span (Inches) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Sx ** ($In^3$/Ft. Width) | Ix ** ($In^4$/Ft. Width) | Auto Traffic | 1 Ton | 3 Ton | 5 Ton | H-15 | H20/ HL-93 | H-25 |
| 1 x 1/4 | 8.55 | 0.364 | 0.182 | 11 | 6 | 6 | 7 | 9 | 10 | 11 |
| 1 x 3/8 | 12.30 | 0.545 | 0.273 | 15 | 9 | 7 | 9 | 11 | 12 | 13 |
| 1-1/4 x 1/4 | 10.38 | 0.568 | 0.355 | 16 | 9 | 7 | 9 | 11 | 12 | 14 |
| 1-1/4 x 3/8 | 15.01 | 0.852 | 0.533 | 21 | 13 | 9 | 11 | 13 | 15 | 17 |
| 1-1/2 x 1/4 | 12.30 | 0.818 | 0.614 | 21 | 12 | 9 | 11 | 13 | 15 | 17 |
| 1-1/2 x 5/16 | 15.01 | 1.023 | 0.767 | 25 | 15 | 11 | 12 | 15 | 17 | 19 |
| 1-1/2 x 3/8 | 17.80 | 1.227 | 0.920 | 29 | 18 | 12 | 13 | 16 | 18 | 20 |
| 1-3/4 x 1/4 | 14.13 | 1.114 | 0.974 | 27 | 16 | 11 | 13 | 15 | 18 | 20 |
| 1-3/4 x 3/8 | 20.59 | 1.670 | 1.462 | 36* | 23 | 15 | 16 | 20 | 22 | 24 |
| 2 x 1/4 | 15.97 | 1.455 | 1.455 | 34 | 21 | 14 | 15 | 18 | 20 | 22 |
| 2 x 5/16 | 19.72 | 1.818 | 1.818 | 40* | 25 | 17 | 17 | 21 | 23 | 25 |
| 2 x 3/8 | 23.38 | 2.182 | 2.182 | 44* | 30 | 19 | 20 | 24 | 25 | 28 |
| 2-1/4 x 1/4 | 17.80 | 1.841 | 2.071 | 41 | 26 | 17 | 18 | 21 | 23 | 25 |
| 2-1/4 x 3/8 | 26.18 | 2.761 | 3.106 | 51* | 38 | 24 | 24 | 28 | 30 | 32 |
| 2-1/2 x 1/4 | 19.72 | 2.273 | 2.841 | 50 | 31 | 20 | 20 | 24 | 26 | 28 |
| 2-1/2 x 5/16 | 24.34 | 2.841 | 3.551 | 54* | 39 | 24 | 24 | 29 | 30 | 32 |
| 2-1/2 x 3/8 | 28.97 | 3.409 | 4.261 | 57* | 46 | 28 | 28 | 33 | 34 | 36 |
| 3 x 1/4 | 25.43 | 3.273 | 4.909 | 60* | 44 | 27 | 27 | 32 | 33 | 35 |
| 3 x 5/16 | 31.02 | 4.091 | 6.136 | 64* | 55 | 33 | 33 | 38 | 39 | 41 |
| 3 x 3/8 | 36.60 | 4.909 | 7.363 | 68* | 59* | 40 | 38 | 44 | 45 | 47 |
| 3 x 1/2 | 47.69 | 6.545 | 9.818 | 75* | 65* | 52 | 50 | 55* | 54* | 55* |
| 3-1/2 x 1/4 | 29.19 | 4.454 | 7.795 | 70* | 60 | 36 | 35 | 41 | 42 | 44 |
| 3-1/2 x 3/8 | 42.10 | 6.682 | 11.693 | 80* | 69* | 53 | 50 | 58 | 58 | 58* |
| 3-1/2 x 1/2 | 55.11 | 8.909 | 15.590 | 88* | 76* | 63* | 61* | 64* | 63* | 63* |
| 4 x 1/4 | 32.85 | 5.818 | 11.636 | 80* | 69* | 46 | 45 | 51 | 52 | 53 |
| 4 x 5/16 | 40.27 | 7.273 | 14.545 | 86* | 74* | 57 | 54 | 62 | 62* | 62* |
| 4 x 3/8 | 47.69 | 8.727 | 17.454 | 91* | 79* | 65* | 63* | 66* | 66* | 66* |
| 4 x 1/2 | 62.52 | 11.636 | 23.272 | 96* | 87* | 72* | 70* | 73* | 72* | 72* |
| 4-1/2 x 1/4 | 36.60 | 7.363 | 16.568 | 90* | 77* | 58 | 55 | 63 | 63 | 64 |
| 4-1/2 x 3/8 | 53.27 | 11.045 | 24.851 | 96* | 89* | 73* | 71* | 74* | 74* | 74* |
| 4-1/2 x 1/2 | 69.94 | 14.727 | 33.135 | 96* | 96* | 81* | 79* | 82* | 81* | 81* |
| 5 x 1/4 | 40.27 | 9.091 | 22.727 | 96* | 86* | 71 | 67 | 72* | 72* | 71* |
| 5 x 5/16 | 49.52 | 11.363 | 28.408 | 96* | 93* | 77* | 75* | 78* | 77* | 77* |
| 5 x 3/8 | 58.86 | 13.636 | 34.090 | 96* | 96* | 82* | 79* | 82* | 82* | 81* |
| 5 x 1/2 | 77.36 | 18.181 | 45.453 | 96* | 96* | 90* | 87* | 91* | 90* | 90* |
| 5-1/2 x 1/4 | 43.98 | 11.000 | 30.249 | 96* | 95* | 78* | 76* | 79* | 79* | 78* |
| 5-1/2 x 3/8 | 64.36 | 16.499 | 45.374 | 96* | 96* | 90* | 87* | 91* | 90* | 89* |
| 5-1/2 x 1/2 | 84.78 | 21.999 | 60.498 | 96* | 96* | 96* | 96* | 96* | 96* | 96* |
| 6 x 1/4 | 47.69 | 13.091 | 39.272 | 96* | 96* | 86* | 83* | 86* | 86* | 85* |
| 6 x 5/16 | 58.86 | 16.363 | 49.089 | 96* | 96* | 92* | 90* | 93* | 92* | 92* |
| 6 x 3/8 | 69.94 | 19.636 | 58.907 | 96* | 96* | 96* | 95* | 96* | 96* | 96* |
| 6 x 1/2 | 92.20 | 26.181 | 78.543 | 96* | 96* | 96* | 96* | 96* | 96* | 96* |

*Maximum spans are limited by maximum allowable stress or the lesser deflection of L/400 or 1/8" to a maximum simple span of 8'-0" (2,438mm). **Based on 8.727 bars/ft. of grating width. Bearing bars 1-3/8" center-to-center spacing. When serrated grating is specified, the depth of grating required for a specified load will be 1/4" greater than that shown in these tables. Weights shown are for 4" cross bar centers. Add 1.13 lbs/sqft. (3/8" Dia. CB) or 3.18 lbs./sqft. (1-1/4" x 1/4" CB) for 2" cross bar centers. Cross bars are determined based on project applications and bearing bar height.

# HEAVY DUTY WELDED STEEL GRATING

## MAXIMUM SAFE CONCENTRATED LOADS

| Bearing Bar Size (Inches) | Maximum Safe Concentrated Load* (Lbs./Ft. of Grating Width) - Clear Span | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1'-0" | 1'-6" | 2'-0" | 2'-6" | 3'-0" | 3'-6" | 4'-0" | 4'-6" | 5'-0" | 5'-6" | 6'-0" | 7'-0" | 8'-0" |
| 1 x 1/4 | 2427 | 1618 | 1213 | 971 | 809 | 693 | | | | | | | |
| 1 x 3/8 | 3633 | 2422 | 1817 | 1453 | 1211 | 1038 | | | | | | | |
| 1-1/4 x 1/4 | 3787 | 2524 | 1893 | 1515 | 1262 | 1082 | 947 | | | | | | |
| 1-1/4 x 3/8 | 5680 | 3787 | 2840 | 2272 | 1893 | 1623 | 1420 | | | | | | |
| 1-1/2 x 1/4 | 5453 | 3636 | 2727 | 2181 | 1818 | 1558 | 1363 | 1212 | | | | | |
| 1-1/2 x 5/16 | 6820 | 4547 | 3410 | 2728 | 2273 | 1949 | 1705 | 1516 | | | | | |
| 1-1/2 x 3/8 | 8180 | 5453 | 4090 | 3272 | 2727 | 2337 | 2045 | 1818 | | | | | |
| 1-3/4 x 1/4 | 7427 | 4951 | 3713 | 2971 | 2476 | 2122 | 1857 | 1650 | 1485 | | | | |
| 1-3/4 x 3/8 | 11133 | 7422 | 5567 | 4453 | 3711 | 3181 | 2783 | 2474 | 2227 | | | | |
| 2 x 1/4 | 9700 | 6467 | 4850 | 3880 | 3233 | 2771 | 2425 | 2156 | 1940 | | | | |
| 2 x 5/16 | 12120 | 8080 | 6060 | 4848 | 4040 | 3463 | 3030 | 2693 | 2424 | | | | |
| 2 x 3/8 | 14547 | 9698 | 7273 | 5819 | 4849 | 4156 | 3637 | 3233 | 2909 | | | | |
| 2-1/4 x 1/4 | 12273 | 8182 | 6137 | 4909 | 4091 | 3507 | 3068 | 2727 | 2455 | 2232 | | | |
| 2-1/4 x 3/8 | 18407 | 12271 | 9203 | 7363 | 6136 | 5259 | 4602 | 4090 | 3681 | 3347 | | | |
| 2-1/2 x 1/4 | 15153 | 10102 | 7577 | 6061 | 5051 | 4330 | 3788 | 3367 | 3031 | 2755 | 2526 | | |
| 2-1/2 x 5/16 | 18940 | 12627 | 9470 | 7576 | 6313 | 5411 | 4735 | 4209 | 3788 | 3444 | 3157 | | |
| 2-1/2 x 3/8 | 22727 | 15151 | 11363 | 9091 | 7576 | 6493 | 5682 | 5050 | 4545 | 4132 | 3788 | | |
| 3 x 1/4 | 21820 | 14547 | 10910 | 8728 | 7273 | 6234 | 5455 | 4849 | 4364 | 3967 | 3637 | | |
| 3 x 5/16 | 27273 | 18182 | 13637 | 10909 | 9091 | 7792 | 6818 | 6061 | 5455 | 4959 | 4546 | | |
| 3 x 3/8 | 32727 | 21818 | 16363 | 13091 | 10909 | 9350 | 8182 | 7273 | 6545 | 5950 | 5454 | | |
| 3 x 1/2 | 43633 | 29089 | 21817 | 17453 | 14544 | 12467 | 10908 | 9696 | 8727 | 7933 | 7272 | | |
| 3-1/2 x 1/4 | 29693 | 19796 | 14847 | 11877 | 9898 | 8484 | 7423 | 6599 | 5939 | 5399 | 4949 | 4242 | |
| 3-1/2 x 3/8 | 44547 | 29698 | 22273 | 17819 | 14849 | 12728 | 11137 | 9899 | 8909 | 8099 | 7424 | 6364 | |
| 3-1/2 x 1/2 | 59393 | 39596 | 29697 | 23757 | 19798 | 16970 | 14848 | 13199 | 11879 | 10799 | 9899 | 8485 | |
| 4 x 1/4 | 38787 | 25858 | 19393 | 15515 | 12929 | 11082 | 9697 | 8619 | 7757 | 7052 | 6464 | 5541 | |
| 4 x 5/16 | 48487 | 32324 | 24243 | 19395 | 16162 | 13853 | 12122 | 10775 | 9697 | 8816 | 8081 | 6927 | |
| 4 x 3/8 | 58180 | 38787 | 29090 | 23272 | 19393 | 16623 | 14545 | 12929 | 11636 | 10578 | 9697 | 8311 | |
| 4 x 1/2 | | 51716 | 38787 | 31029 | 25858 | 22164 | 19393 | 17239 | 15515 | 14104 | 12929 | 11082 | |
| 4-1/2 x 1/4 | | 32724 | 24543 | 19635 | 16362 | 14025 | 12272 | 10908 | 9817 | 8925 | 8181 | 7012 | 6136 |
| 4-1/2 x 3/8 | | 49089 | 36817 | 29453 | 24544 | 21038 | 18404 | 16363 | 14727 | 13388 | 12272 | 10519 | 9204 |
| 4-1/2 x 1/2 | | | 49090 | 39272 | 32727 | 28051 | 24545 | 21818 | 19636 | 17851 | 16363 | 14026 | 12273 |
| 5 x 1/4 | | | 30303 | 24243 | 20202 | 17316 | 15152 | 13468 | 12121 | 11019 | 10101 | 8658 | 7576 |
| 5 x 5/16 | | | 37877 | 30301 | 25251 | 21644 | 18938 | 16834 | 15151 | 13733 | 12626 | 10822 | 9469 |
| 5 x 3/8 | | | 45453 | 36363 | 30302 | 25973 | 22727 | 20201 | 18181 | 16528 | 15151 | 12987 | 11363 |
| 5 x 1/2 | | | | 48483 | 40402 | 34630 | 30302 | 26935 | 24241 | 22038 | 20201 | 17315 | 15151 |
| 5-1/2 x 1/4 | | | | 29333 | 24444 | 20952 | 18333 | 16296 | 14667 | 13333 | 12222 | 10476 | 9167 |
| 5-1/2 x 3/8 | | | | 43997 | 36664 | 31427 | 27498 | 24443 | 21999 | 19999 | 18332 | 15713 | 13749 |
| 5-1/2 x 1/2 | | | | 58664 | 48887 | 41903 | 36665 | 32591 | 29332 | 26665 | 24443 | 20951 | 18333 |
| 6 x 1/4 | | | | 34909 | 29091 | 24935 | 21818 | 19394 | 17455 | 15868 | 14546 | 12468 | 10909 |
| 6 x 5/16 | | | | 43635 | 36362 | 31168 | 27272 | 24241 | 21817 | 19834 | 18181 | 15584 | 13636 |
| 6 x 3/8 | | | | 52363 | 43636 | 37402 | 32727 | 29090 | 26181 | 23801 | 21818 | 18701 | 16363 |
| 6 x 1/2 | | | | | 58180 | 49869 | 43635 | 38787 | 34908 | 31735 | 29090 | 24934 | 21818 |

| % Open Area* | | | | | |
|---|---|---|---|---|---|
| BB Size | CB Ctrs | Bearing Bar Thickness | | | |
| | | 1/4" | 5/16" | 3/8" | 1/2" |
| Thru 2-1/2" | 4" cc | 75% | 70% | 66% | - |
| | 2" cc | 68% | 64% | 60% | - |
| 3" to 6" | 4" cc | 77% | 72% | 68% | 60% |
| | 2" cc | 72% | 68% | 64% | 56% |

*Loads are theoretical, and are based on a unit stress of 20,000 psi.*

*Based on 8.727 bars/ft. of grating width. Bearing bars 1-3/8" center-to-center spacing. **Note:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

### Panel Width Chart (in.) - 22-W-4 & 22-W-2

Dimensions are Out-to-Out of Bearing Bars**

| No. of Bars | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4" Bars | 1 5/8 | 3 | 4 3/8 | 5 3/4 | 7 1/8 | 8 1/2 | 9 7/8 | 11 1/4 | 12 5/8 | 14 | 15 3/8 | 16 3/4 | 18 1/8 | 19 1/2 | 20 7/8 |
| 5/16" Bars | 1 11/16 | 3 1/16 | 4 7/16 | 5 13/16 | 7 3/16 | 8 9/16 | 9 15/16 | 11 5/16 | 12 11/16 | 14 1/16 | 15 7/16 | 16 13/16 | 18 3/16 | 19 9/16 | 20 15/16 |
| 3/8" Bars | 1 3/4 | 3 1/8 | 4 1/2 | 5 7/8 | 7 1/4 | 8 5/8 | 10 | 11 3/8 | 12 3/4 | 14 1/8 | 15 1/2 | 16 7/8 | 18 1/4 | 19 5/8 | 21 |
| 1/2" Bars | 1 7/8 | 3 1/4 | 4 5/8 | 6 | 7 3/8 | 8 3/4 | 10 1/8 | 11 1/2 | 12 7/8 | 14 1/4 | 15 5/8 | 17 | 18 3/8 | 19 3/4 | 21 1/8 |

| No. of Bars | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4" Bars | 22 1/4 | 23 5/8 | 25 | 26 3/8 | 27 3/4 | 29 1/8 | 30 1/2 | 31 7/8 | 33 1/4 | 34 5/8 | 36 | | | | |
| 5/16" Bars | 22 5/16 | 23 11/16 | 25 1/16 | 26 7/16 | 27 13/16 | 29 3/16 | 30 9/16 | 31 15/16 | 33 5/16 | 34 11/16 | 36 1/16 | | | | |
| 3/8" Bars | 22 3/8 | 23 3/4 | 25 1/8 | 26 1/2 | 27 7/8 | 29 1/4 | 30 5/8 | 32 | 33 3/8 | 34 3/4 | 36 1/8 | | | | |
| 1/2" Bars | 22 1/2 | 23 7/8 | 25 1/4 | 26 5/8 | 28 | 29 3/8 | 30 3/4 | 32 1/8 | 33 1/2 | 34 7/8 | 36 1/4 | | | | |

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart continues on page 74)

No. Bars/Ft. of Grating Width = 8.727 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus $in.^3$/ Foot of Grating Width | Moment of Inertia $in.^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 x 1/4 | 0.364 | 0.182 | 8.55 | U | 4853 | 2157 | 1213 | 777 | 539 | 396 | 303 | 240 |
| | | | | Du | 0.021 | 0.047 | 0.083 | 0.129 | 0.186 | 0.253 | 0.331 | 0.420 |
| | | | | C | 2427 | 1618 | 1213 | 971 | 809 | 693 | 607 | 539 |
| | | | | Dc | 0.017 | 0.037 | 0.066 | 0.104 | 0.149 | 0.203 | 0.265 | 0.335 |
| 1 x 3/8 | 0.545 | 0.273 | 12.30 | U | 7267 | 3230 | 1817 | 1163 | 807 | 593 | 454 | 359 |
| | | | | Du | 0.021 | 0.047 | 0.083 | 0.129 | 0.186 | 0.253 | 0.331 | 0.418 |
| | | | | C | 3633 | 2422 | 1817 | 1453 | 1211 | 1038 | 908 | 807 |
| | | | | Dc | 0.017 | 0.037 | 0.066 | 0.103 | 0.149 | 0.202 | 0.264 | 0.334 |
| 1-1/4 x 1/4 | 0.568 | 0.355 | 10.38 | U | 7573 | 3366 | 1893 | 1212 | 841 | 618 | 473 | 374 |
| | | | | Du | 0.017 | 0.037 | 0.066 | 0.104 | 0.149 | 0.203 | 0.265 | 0.335 |
| | | | | C | 3787 | 2524 | 1893 | 1515 | 1262 | 1082 | 947 | 841 |
| | | | | Dc | 0.013 | 0.030 | 0.053 | 0.083 | 0.119 | 0.162 | 0.212 | 0.268 |
| 1-1/4 x 3/8 | 0.852 | 0.533 | 15.01 | U | 11360 | 5049 | 2840 | 1818 | 1262 | 927 | 710 | 561 |
| | | | | Du | 0.017 | 0.037 | 0.066 | 0.103 | 0.149 | 0.203 | 0.265 | 0.335 |
| | | | | C | 5680 | 3787 | 2840 | 2272 | 1893 | 1623 | 1420 | 1262 |
| | | | | Dc | 0.013 | 0.030 | 0.053 | 0.083 | 0.119 | 0.162 | 0.212 | 0.268 |
| 1-1/2 x 1/4 | 0.818 | 0.614 | 12.30 | U | 10907 | 4847 | 2727 | 1745 | 1212 | 890 | 682 | 539 |
| | | | | Du | 0.014 | 0.031 | 0.055 | 0.086 | 0.124 | 0.169 | 0.221 | 0.279 |
| | | | | C | 5453 | 3636 | 2727 | 2181 | 1818 | 1558 | 1363 | 1212 |
| | | | | Dc | 0.011 | 0.025 | 0.044 | 0.069 | 0.099 | 0.135 | 0.176 | 0.223 |
| 1-1/2 x 5/16 | 1.023 | 0.767 | 15.01 | U | 13640 | 6062 | 3410 | 2182 | 1516 | 1113 | 853 | 674 |
| | | | | Du | 0.014 | 0.031 | 0.055 | 0.086 | 0.124 | 0.169 | 0.221 | 0.280 |
| | | | | C | 6820 | 4547 | 3410 | 2728 | 2273 | 1949 | 1705 | 1516 |
| | | | | Dc | 0.011 | 0.025 | 0.044 | 0.069 | 0.099 | 0.135 | 0.177 | 0.224 |
| 1-1/2 x 3/8 | 1.227 | 0.920 | 17.80 | U | 16360 | 7371 | 4090 | 2618 | 1818 | 1336 | 1023 | 808 |
| | | | | Du | 0.014 | 0.031 | 0.055 | 0.086 | 0.124 | 0.169 | 0.221 | 0.279 |
| | | | | C | 8180 | 5453 | 4090 | 3272 | 2727 | 2337 | 2045 | 1818 |
| | | | | Dc | 0.011 | 0.025 | 0.044 | 0.069 | 0.099 | 0.135 | 0.177 | 0.224 |
| 1-3/4 x 1/4 | 1.114 | 0.974 | 14.13 | U | 14853 | 6601 | 3713 | 2377 | 1650 | 1213 | 928 | 733 |
| | | | | Du | 0.012 | 0.027 | 0.047 | 0.074 | 0.107 | 0.145 | 0.189 | 0.239 |
| | | | | C | 7427 | 4951 | 3713 | 2971 | 2476 | 2122 | 1857 | 1650 |
| | | | | Dc | 0.010 | 0.021 | 0.038 | 0.059 | 0.085 | 0.116 | 0.152 | 0.192 |
| 1-3/4 x 3/8 | 1.670 | 1.462 | 20.59 | U | 22267 | 9896 | 5567 | 3563 | 2474 | 1818 | 1392 | 1100 |
| | | | | Du | 0.012 | 0.027 | 0.047 | 0.074 | 0.106 | 0.145 | 0.189 | 0.239 |
| | | | | C | 11133 | 7422 | 5567 | 4453 | 3711 | 3181 | 2783 | 2474 |
| | | | | Dc | 0.010 | 0.021 | 0.038 | 0.059 | 0.085 | 0.116 | 0.151 | 0.191 |
| 2 x 1/4 | 1.455 | 1.455 | 15.97 | U | 19400 | 8622 | 4850 | 3104 | 2156 | 1584 | 1213 | 958 |
| | | | | Du | 0.010 | 0.023 | 0.041 | 0.065 | 0.093 | 0.127 | 0.166 | 0.210 |
| | | | | C | 9700 | 6467 | 4850 | 3880 | 3233 | 2771 | 2425 | 2156 |
| | | | | Dc | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.132 | 0.168 |
| 2 x 5/16 | 1.818 | 1.818 | 19.72 | U | 24240 | 10773 | 6060 | 3878 | 2693 | 1979 | 1515 | 1197 |
| | | | | Du | 0.010 | 0.023 | 0.041 | 0.065 | 0.093 | 0.127 | 0.166 | 0.209 |
| | | | | C | 12120 | 8080 | 6060 | 4848 | 4040 | 3463 | 3030 | 2693 |
| | | | | Dc | 0.008 | 0.019 | 0.033 | 0.052 | 0.074 | 0.101 | 0.132 | 0.168 |
| 2 x 3/8 | 2.182 | 2.182 | 23.38 | U | 29093 | 12930 | 7273 | 4655 | 3233 | 2375 | 1818 | 1437 |
| | | | | Du | 0.010 | 0.023 | 0.041 | 0.065 | 0.093 | 0.127 | 0.166 | 0.210 |
| | | | | C | 14547 | 9698 | 7273 | 5819 | 4849 | 4156 | 3637 | 3233 |
| | | | | Dc | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.132 | 0.168 |
| 2-1/4 x 1/4 | 1.841 | 2.071 | 17.80 | U | 24547 | 10910 | 6137 | 3927 | 2727 | 2004 | 1534 | 1212 |
| | | | | Du | 0.009 | 0.021 | 0.037 | 0.058 | 0.083 | 0.113 | 0.147 | 0.186 |
| | | | | C | 12273 | 8182 | 6137 | 4909 | 4091 | 3507 | 3068 | 2727 |
| | | | | Dc | 0.007 | 0.017 | 0.029 | 0.046 | 0.066 | 0.090 | 0.118 | 0.149 |
| 2-1/4 x 3/8 | 2.761 | 3.106 | 26.18 | U | 36813 | 16361 | 9203 | 5890 | 4090 | 3005 | 2301 | 1818 |
| | | | | Du | 0.009 | 0.021 | 0.037 | 0.058 | 0.083 | 0.113 | 0.147 | 0.186 |
| | | | | C | 18407 | 12271 | 9203 | 7363 | 6136 | 5259 | 4602 | 4090 |
| | | | | Dc | 0.007 | 0.017 | 0.029 | 0.046 | 0.066 | 0.090 | 0.118 | 0.149 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart begins on page 73)

No. Bars/Ft. of Grating Width = 8.727 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 60 | 66 | 72 | 78 | 84 | 90 | 96 |
| 1 x 1/4 | 0.364 | 0.182 | 8.55 | U | 194 | 160 | 135 | 115 | 99 | 86 | 76 |
| | | | | Du | 0.517 | 0.624 | 0.746 | 0.875 | 1.013 | 1.160 | 1.327 |
| | | | | C | 485 | 441 | 404 | 373 | 347 | 324 | 303 |
| | | | | Dc | 0.414 | 0.500 | 0.595 | 0.699 | 0.812 | 0.932 | 1.058 |
| 1 x 3/8 | 0.545 | 0.273 | 12.30 | U | 291 | 240 | 202 | 172 | 148 | 129 | 114 |
| | | | | Du | 0.517 | 0.624 | 0.744 | 0.873 | 1.010 | 1.160 | 1.327 |
| | | | | C | 727 | 661 | 606 | 559 | 519 | 484 | 454 |
| | | | | Dc | 0.413 | 0.500 | 0.595 | 0.698 | 0.810 | 0.929 | 1.057 |
| 1-1/4 x 1/4 | 0.568 | 0.355 | 10.38 | U | 303 | 250 | 210 | 179 | 155 | 135 | 118 |
| | | | | Du | 0.414 | 0.500 | 0.595 | 0.698 | 0.813 | 0.934 | 1.056 |
| | | | | C | 757 | 688 | 631 | 583 | 541 | 505 | 473 |
| | | | | Dc | 0.331 | 0.400 | 0.477 | 0.560 | 0.649 | 0.745 | 0.847 |
| 1-1/4 x 3/8 | 0.852 | 0.533 | 15.01 | U | 454 | 376 | 316 | 269 | 232 | 202 | 178 |
| | | | | Du | 0.413 | 0.501 | 0.596 | 0.699 | 0.811 | 0.930 | 1.061 |
| | | | | C | 1136 | 1033 | 947 | 874 | 811 | 757 | 710 |
| | | | | Dc | 0.331 | 0.400 | 0.476 | 0.559 | 0.648 | 0.744 | 0.847 |
| 1-1/2 x 1/4 | 0.818 | 0.614 | 12.30 | U | 436 | 361 | 303 | 258 | 223 | 194 | 170 |
| | | | | Du | 0.344 | 0.417 | 0.496 | 0.582 | 0.677 | 0.776 | 0.880 |
| | | | | C | 1091 | 992 | 909 | 839 | 779 | 727 | 682 |
| | | | | Dc | 0.276 | 0.334 | 0.397 | 0.466 | 0.540 | 0.620 | 0.706 |
| 1-1/2 x 5/16 | 1.023 | 0.767 | 15.01 | U | 546 | 451 | 379 | 323 | 278 | 242 | 213 |
| | | | | Du | 0.345 | 0.417 | 0.497 | 0.583 | 0.675 | 0.775 | 0.883 |
| | | | | C | 1364 | 1240 | 1137 | 1049 | 974 | 909 | 853 |
| | | | | Dc | 0.276 | 0.334 | 0.397 | 0.466 | 0.541 | 0.621 | 0.707 |
| 1-1/2 x 3/8 | 1.227 | 0.920 | 17.80 | U | 654 | 541 | 454 | 387 | 334 | 291 | 256 |
| | | | | Du | 0.345 | 0.418 | 0.496 | 0.583 | 0.676 | 0.777 | 0.884 |
| | | | | C | 1636 | 1487 | 1363 | 1258 | 1169 | 1091 | 1023 |
| | | | | Dc | 0.276 | 0.334 | 0.397 | 0.466 | 0.541 | 0.621 | 0.707 |
| 1-3/4 x 1/4 | 1.114 | 0.974 | 14.13 | U | 594 | 491 | 413 | 352 | 303 | 264 | 232 |
| | | | | Du | 0.296 | 0.358 | 0.426 | 0.501 | 0.580 | 0.665 | 0.757 |
| | | | | C | 1485 | 1350 | 1238 | 1143 | 1061 | 990 | 928 |
| | | | | Dc | 0.237 | 0.286 | 0.341 | 0.400 | 0.464 | 0.532 | 0.606 |
| 1-3/4 x 3/8 | 1.670 | 1.462 | 20.59 | U | 891 | 736 | 619 | 527 | 454 | 396 | 348 |
| | | | | Du | 0.296 | 0.357 | 0.426 | 0.499 | 0.579 | 0.665 | 0.756 |
| | | | | C | 2227 | 2024 | 1856 | 1713 | 1590 | 1484 | 1392 |
| | | | | Dc | 0.236 | 0.286 | 0.340 | 0.399 | 0.463 | 0.532 | 0.605 |
| 2 x 1/4 | 1.455 | 1.455 | 15.97 | U | 776 | 641 | 539 | 459 | 396 | 345 | 303 |
| | | | | Du | 0.259 | 0.313 | 0.373 | 0.437 | 0.507 | 0.582 | 0.662 |
| | | | | C | 1940 | 1764 | 1617 | 1492 | 1386 | 1293 | 1213 |
| | | | | Dc | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.465 | 0.530 |
| 2 x 5/16 | 1.818 | 1.818 | 19.72 | U | 970 | 801 | 673 | 574 | 495 | 431 | 379 |
| | | | | Du | 0.259 | 0.313 | 0.372 | 0.437 | 0.507 | 0.582 | 0.663 |
| | | | | C | 2424 | 2204 | 2020 | 1865 | 1731 | 1616 | 1515 |
| | | | | Dc | 0.207 | 0.250 | 0.298 | 0.350 | 0.405 | 0.466 | 0.530 |
| 2 x 3/8 | 2.182 | 2.182 | 23.38 | U | 1164 | 962 | 808 | 689 | 594 | 517 | 455 |
| | | | | Du | 0.259 | 0.313 | 0.372 | 0.437 | 0.507 | 0.582 | 0.663 |
| | | | | C | 2909 | 2645 | 2424 | 2238 | 2078 | 1940 | 1818 |
| | | | | Dc | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.466 | 0.530 |
| 2-1/4 x 1/4 | 1.841 | 2.071 | 17.80 | U | 982 | 811 | 682 | 581 | 501 | 436 | 384 |
| | | | | Du | 0.230 | 0.278 | 0.331 | 0.389 | 0.451 | 0.517 | 0.589 |
| | | | | C | 2455 | 2232 | 2046 | 1888 | 1753 | 1636 | 1534 |
| | | | | Dc | 0.184 | 0.223 | 0.265 | 0.311 | 0.360 | 0.414 | 0.471 |
| 2-1/4 x 3/8 | 2.761 | 3.106 | 26.18 | U | 1473 | 1217 | 1023 | 871 | 751 | 654 | 575 |
| | | | | Du | 0.230 | 0.278 | 0.331 | 0.388 | 0.450 | 0.517 | 0.588 |
| | | | | C | 3681 | 3347 | 3068 | 2832 | 2630 | 2454 | 2301 |
| | | | | Dc | 0.184 | 0.223 | 0.265 | 0.311 | 0.361 | 0.414 | 0.471 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

## STATIC LOAD & DEFLECTION TABLE

(Chart continues on page 76)

No. Bars/Ft. of Grating Width = 8.727 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-1/2 x 1/4 | 2.273 | 2.841 | 19.72 | U | 30307 | 13470 | 7577 | 4849 | 3367 | 2474 | 1894 | 1497 |
| | | | | Du | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.132 | 0.168 |
| | | | | C | 15153 | 10102 | 7577 | 6061 | 5051 | 4330 | 3788 | 3367 |
| | | | | Dc | 0.007 | 0.015 | 0.027 | 0.041 | 0.060 | 0.081 | 0.106 | 0.134 |
| 2-1/2 x 5/16 | 2.841 | 3.551 | 24.34 | U | 37880 | 16836 | 9470 | 6061 | 4209 | 3092 | 2368 | 1871 |
| | | | | Du | 0.008 | 0.019 | 0.033 | 0.052 | 0.074 | 0.101 | 0.132 | 0.168 |
| | | | | C | 18940 | 12627 | 9470 | 7576 | 6313 | 5411 | 4735 | 4209 |
| | | | | Dc | 0.007 | 0.015 | 0.026 | 0.041 | 0.060 | 0.081 | 0.106 | 0.134 |
| 2-1/2 x 3/8 | 3.409 | 4.261 | 28.97 | U | 45453 | 20201 | 11363 | 7273 | 5050 | 3710 | 2841 | 2245 |
| | | | | Du | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.132 | 0.168 |
| | | | | C | 22727 | 15151 | 11363 | 9091 | 7576 | 6493 | 5682 | 5050 |
| | | | | Dc | 0.007 | 0.015 | 0.027 | 0.041 | 0.060 | 0.081 | 0.106 | 0.134 |
| 3 x 1/4 | 3.273 | 4.909 | 25.43 | U | 43640 | 19396 | 10910 | 6982 | 4849 | 3562 | 2728 | 2155 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.085 | 0.110 | 0.140 |
| | | | | C | 21820 | 14547 | 10910 | 8728 | 7273 | 6234 | 5455 | 4849 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.035 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3 x 5/16 | 4.091 | 6.136 | 31.02 | U | 54547 | 24243 | 13637 | 8727 | 6061 | 4453 | 3409 | 2694 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.084 | 0.110 | 0.140 |
| | | | | C | 27273 | 18182 | 13637 | 10909 | 9091 | 7792 | 6818 | 6061 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.034 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3 x 3/8 | 4.909 | 7.363 | 36.60 | U | 65453 | 29090 | 16363 | 10473 | 7273 | 5343 | 4091 | 3232 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.085 | 0.110 | 0.140 |
| | | | | C | 32727 | 21818 | 16363 | 13091 | 10909 | 9350 | 8182 | 7273 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.035 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3 x 1/2 | 6.545 | 9.818 | 47.69 | U | 87267 | 38785 | 21817 | 13963 | 9696 | 7124 | 5454 | 4309 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.084 | 0.110 | 0.140 |
| | | | | C | 43633 | 29089 | 21817 | 17453 | 14544 | 12467 | 10908 | 9696 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.034 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3-1/2 x 1/4 | 4.454 | 7.795 | 29.19 | U | 59387 | 26394 | 14847 | 9502 | 6599 | 4848 | 3712 | 2933 |
| | | | | Du | 0.006 | 0.013 | 0.024 | 0.037 | 0.053 | 0.072 | 0.095 | 0.120 |
| | | | | C | 29693 | 19796 | 14847 | 11877 | 9898 | 8484 | 7423 | 6599 |
| | | | | Dc | 0.005 | 0.011 | 0.019 | 0.030 | 0.043 | 0.058 | 0.076 | 0.096 |
| 3-1/2 x 3/8 | 6.682 | 11.693 | 42.10 | U | 89093 | 39597 | 22273 | 14255 | 9899 | 7273 | 5568 | 4400 |
| | | | | Du | 0.006 | 0.013 | 0.024 | 0.037 | 0.053 | 0.072 | 0.095 | 0.120 |
| | | | | C | 44547 | 29698 | 22273 | 17819 | 14849 | 12728 | 11137 | 9899 |
| | | | | Dc | 0.005 | 0.011 | 0.019 | 0.030 | 0.043 | 0.058 | 0.076 | 0.096 |
| 3-1/2 x 1/2 | 8.909 | 15.590 | 55.11 | U | 118787 | 52794 | 29697 | 19006 | 13199 | 9697 | 7424 | 5866 |
| | | | | Du | 0.006 | 0.013 | 0.024 | 0.037 | 0.053 | 0.072 | 0.095 | 0.120 |
| | | | | C | 59393 | 39596 | 29697 | 23757 | 19798 | 16970 | 14848 | 13199 |
| | | | | Dc | 0.005 | 0.011 | 0.019 | 0.030 | 0.043 | 0.058 | 0.076 | 0.096 |
| 4 x 1/4 | 5.818 | 11.636 | 32.85 | U | 77573 | 34477 | 19393 | 12412 | 8619 | 6333 | 4848 | 3831 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 38787 | 25858 | 19393 | 15515 | 12929 | 11082 | 9697 | 8619 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| 4 x 5/16 | 7.273 | 14.545 | 40.27 | U | 96973 | 43099 | 24243 | 15516 | 10775 | 7916 | 6061 | 4789 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 48487 | 32324 | 24243 | 19395 | 16162 | 13853 | 12122 | 10775 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| 4 x 3/8 | 8.727 | 17.454 | 47.69 | U | 116360 | 51716 | 29090 | 18618 | 12929 | 9499 | 7272 | 5746 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 58180 | 38787 | 29090 | 23272 | 19393 | 16623 | 14545 | 12929 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| 4 x 1/2 | 11.636 | 23.272 | 62.52 | U | 155147 | 68954 | 38787 | 24823 | 17239 | 12665 | 9697 | 7662 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 77573 | 51716 | 38787 | 31029 | 25858 | 22164 | 19393 | 17239 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

## STATIC LOAD & DEFLECTION TABLE

(Chart begins on page 75)

No. Bars/Ft. of Grating Width = 8.727 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 60 | 66 | 72 | 78 | 84 | 90 | 96 |
| 2-1/2 x 1/4 | 2.273 | 2.841 | 19.72 | U | 1212 | 1002 | 842 | 717 | 619 | 539 | 474 |
| | | | | Du | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.466 | 0.530 |
| | | | | C | 3031 | 2755 | 2526 | 2331 | 2165 | 2020 | 1894 |
| | | | | Dc | 0.166 | 0.200 | 0.238 | 0.280 | 0.325 | 0.372 | 0.424 |
| 2-1/2 x 5/16 | 2.841 | 3.551 | 24.34 | U | 1515 | 1252 | 1052 | 897 | 773 | 673 | 592 |
| | | | | Du | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.465 | 0.530 |
| | | | | C | 3788 | 3444 | 3157 | 2914 | 2706 | 2525 | 2368 |
| | | | | Dc | 0.166 | 0.200 | 0.238 | 0.280 | 0.324 | 0.372 | 0.424 |
| 2-1/2 x 3/8 | 3.409 | 4.261 | 28.97 | U | 1818 | 1503 | 1263 | 1076 | 928 | 808 | 710 |
| | | | | Du | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.466 | 0.530 |
| | | | | C | 4545 | 4132 | 3788 | 3496 | 3247 | 3030 | 2841 |
| | | | | Dc | 0.166 | 0.200 | 0.238 | 0.280 | 0.325 | 0.372 | 0.424 |
| 3 x 1/4 | 3.273 | 4.909 | 25.43 | U | 1746 | 1443 | 1212 | 1033 | 891 | 776 | 682 |
| | | | | Du | 0.173 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.442 |
| | | | | C | 4364 | 3967 | 3637 | 3357 | 3117 | 2909 | 2728 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3 x 5/16 | 4.091 | 6.136 | 31.02 | U | 2182 | 1803 | 1515 | 1291 | 1113 | 970 | 852 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.441 |
| | | | | C | 5455 | 4959 | 4546 | 4196 | 3896 | 3636 | 3409 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3 x 3/8 | 4.909 | 7.363 | 36.60 | U | 2618 | 2164 | 1818 | 1549 | 1336 | 1164 | 1023 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.442 |
| | | | | C | 6545 | 5950 | 5454 | 5035 | 4675 | 4364 | 4091 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3 x 1/2 | 6.545 | 9.818 | 47.69 | U | 3491 | 2885 | 2424 | 2065 | 1781 | 1551 | 1364 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.442 |
| | | | | C | 8727 | 7933 | 7272 | 6713 | 6233 | 5818 | 5454 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3-1/2 x 1/4 | 4.454 | 7.795 | 29.19 | U | 2375 | 1963 | 1650 | 1406 | 1212 | 1056 | 928 |
| | | | | Du | 0.148 | 0.179 | 0.213 | 0.250 | 0.290 | 0.333 | 0.378 |
| | | | | C | 5939 | 5399 | 4949 | 4568 | 4242 | 3959 | 3712 |
| | | | | Dc | 0.118 | 0.143 | 0.170 | 0.200 | 0.232 | 0.266 | 0.303 |
| 3-1/2 x 3/8 | 6.682 | 11.693 | 42.10 | U | 3564 | 2945 | 2475 | 2109 | 1818 | 1584 | 1392 |
| | | | | Du | 0.148 | 0.179 | 0.213 | 0.250 | 0.290 | 0.333 | 0.378 |
| | | | | C | 8909 | 8099 | 7424 | 6853 | 6364 | 5940 | 5568 |
| | | | | Dc | 0.118 | 0.143 | 0.170 | 0.200 | 0.232 | 0.266 | 0.303 |
| 3-1/2 x 1/2 | 8.909 | 15.590 | 55.11 | U | 4751 | 3927 | 3300 | 2812 | 2424 | 2112 | 1856 |
| | | | | Du | 0.148 | 0.179 | 0.213 | 0.250 | 0.290 | 0.333 | 0.378 |
| | | | | C | 11879 | 10799 | 9899 | 9137 | 8485 | 7919 | 7424 |
| | | | | Dc | 0.118 | 0.143 | 0.170 | 0.200 | 0.232 | 0.266 | 0.303 |
| 4 x 1/4 | 5.818 | 11.636 | 32.85 | U | 3103 | 2564 | 2155 | 1836 | 1583 | 1379 | 1212 |
| | | | | Du | 0.129 | 0.156 | 0.186 | 0.219 | 0.253 | 0.291 | 0.331 |
| | | | | C | 7757 | 7052 | 6464 | 5967 | 5541 | 5172 | 4848 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| 4 x 5/16 | 7.273 | 14.545 | 40.27 | U | 3879 | 3206 | 2694 | 2295 | 1979 | 1724 | 1515 |
| | | | | Du | 0.129 | 0.156 | 0.186 | 0.219 | 0.253 | 0.291 | 0.331 |
| | | | | C | 9697 | 8816 | 8081 | 7459 | 6927 | 6465 | 6061 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| 4 x 3/8 | 8.727 | 17.454 | 47.69 | U | 4654 | 3847 | 3232 | 2754 | 2375 | 2069 | 1818 |
| | | | | Du | 0.129 | 0.157 | 0.186 | 0.219 | 0.254 | 0.291 | 0.331 |
| | | | | C | 11636 | 10578 | 9697 | 8951 | 8311 | 7757 | 7273 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| 4 x 1/2 | 11.636 | 23.272 | 62.52 | U | 6206 | 5129 | 4310 | 3672 | 3166 | 2758 | 2424 |
| | | | | Du | 0.129 | 0.156 | 0.186 | 0.219 | 0.253 | 0.291 | 0.331 |
| | | | | C | 15515 | 14104 | 12929 | 11934 | 11082 | 10343 | 9697 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart continues on page 78)

No. Bars/Ft. of Grating Width = 8.727 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-1/2 x 1/4 | 7.363 | 16.568 | 36.60 | U | 98173 | 43633 | 24543 | 15708 | 10908 | 8014 | 6136 | 4848 |
| | | | | Du | 0.005 | 0.010 | 0.018 | 0.029 | 0.041 | 0.056 | 0.074 | 0.093 |
| | | | | C | 49087 | 32724 | 24543 | 19635 | 16362 | 14025 | 12272 | 10908 |
| | | | | Dc | 0.004 | 0.008 | 0.015 | 0.023 | 0.033 | 0.045 | 0.059 | 0.075 |
| 4-1/2 x 3/8 | 11.045 | 24.851 | 53.27 | U | 147267 | 65452 | 36817 | 23563 | 16363 | 12022 | 9204 | 7272 |
| | | | | Du | 0.005 | 0.010 | 0.018 | 0.029 | 0.041 | 0.056 | 0.074 | 0.093 |
| | | | | C | 73633 | 49089 | 36817 | 29453 | 24544 | 21038 | 18408 | 16363 |
| | | | | Dc | 0.004 | 0.008 | 0.015 | 0.023 | 0.033 | 0.045 | 0.059 | 0.075 |
| 4-1/2 x 1/2 | 14.727 | 33.135 | 69.94 | U | 196360 | 87271 | 49090 | 31418 | 21818 | 16029 | 12273 | 9697 |
| | | | | Du | 0.005 | 0.010 | 0.018 | 0.029 | 0.041 | 0.056 | 0.074 | 0.093 |
| | | | | C | 98180 | 65453 | 49090 | 39272 | 32727 | 28051 | 24545 | 21818 |
| | | | | Dc | 0.004 | 0.008 | 0.015 | 0.023 | 0.033 | 0.045 | 0.059 | 0.074 |
| 5 x 1/4 | 9.091 | 22.727 | 40.27 | U | 121213 | 53873 | 30303 | 19394 | 13468 | 9895 | 7576 | 5986 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 60607 | 40404 | 30303 | 24243 | 20202 | 17316 | 15152 | 13468 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5 x 5/16 | 11.363 | 28.408 | 49.52 | U | 151507 | 67336 | 37877 | 24241 | 16834 | 12368 | 9469 | 7482 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 75753 | 50502 | 37877 | 30301 | 25251 | 21644 | 18938 | 16834 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5 x 3/8 | 13.636 | 34.090 | 58.86 | U | 181813 | 80806 | 45453 | 29090 | 20201 | 14842 | 11363 | 8978 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 90907 | 60604 | 45453 | 36363 | 30302 | 25973 | 22727 | 20201 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5 x 1/2 | 18.181 | 45.453 | 77.36 | U | 242413 | 107739 | 60603 | 38786 | 26935 | 19789 | 15151 | 11971 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 121207 | 80804 | 60603 | 48483 | 40402 | 34630 | 30302 | 26935 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5-1/2 x 1/4 | 11.000 | 30.249 | 43.98 | U | 146667 | 65185 | 36667 | 23467 | 16296 | 11973 | 9167 | 7243 |
| | | | | Du | 0.004 | 0.008 | 0.015 | 0.024 | 0.034 | 0.046 | 0.060 | 0.076 |
| | | | | C | 73333 | 48889 | 36667 | 29333 | 24444 | 20952 | 18333 | 16296 |
| | | | | Dc | 0.003 | 0.007 | 0.012 | 0.019 | 0.027 | 0.037 | 0.048 | 0.061 |
| 5-1/2 x 3/8 | 16.499 | 45.374 | 64.36 | U | 219987 | 97772 | 54997 | 35198 | 24443 | 17958 | 13749 | 10864 |
| | | | | Du | 0.004 | 0.008 | 0.015 | 0.024 | 0.034 | 0.046 | 0.060 | 0.076 |
| | | | | C | 109993 | 73329 | 54997 | 43997 | 36664 | 31427 | 27498 | 24443 |
| | | | | Dc | 0.003 | 0.007 | 0.012 | 0.019 | 0.027 | 0.037 | 0.048 | 0.061 |
| 5-1/2 x 1/2 | 21.999 | 60.498 | 84.78 | U | 293320 | 130364 | 73330 | 46931 | 32591 | 23944 | 18333 | 14485 |
| | | | | Du | 0.004 | 0.008 | 0.015 | 0.024 | 0.034 | 0.046 | 0.060 | 0.076 |
| | | | | C | 146660 | 97773 | 73330 | 58664 | 48887 | 41903 | 36665 | 32591 |
| | | | | Dc | 0.003 | 0.007 | 0.012 | 0.019 | 0.027 | 0.037 | 0.048 | 0.061 |
| 6 x 1/4 | 13.091 | 39.272 | 47.69 | U | 174547 | 77576 | 43637 | 27927 | 19394 | 14249 | 10909 | 8620 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 87273 | 58182 | 43637 | 34909 | 29091 | 24935 | 21818 | 19394 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |
| 6 x 5/16 | 16.363 | 49.089 | 58.86 | U | 218173 | 96966 | 54543 | 34908 | 24241 | 17810 | 13636 | 10774 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 109087 | 72724 | 54543 | 43635 | 36362 | 31168 | 27272 | 24241 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |
| 6 x 3/8 | 19.636 | 58.907 | 69.94 | U | 261813 | 116361 | 65453 | 41890 | 29090 | 21373 | 16363 | 12929 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 130907 | 87271 | 65453 | 52363 | 43636 | 37402 | 32727 | 29090 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |
| 6 x 1/2 | 26.181 | 78.543 | 92.20 | U | 349080 | 155147 | 87270 | 55853 | 38787 | 28496 | 21818 | 17239 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 174540 | 116360 | 87270 | 69816 | 58180 | 49869 | 43635 | 38787 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

## STATIC LOAD & DEFLECTION TABLE

(Chart begins on page 77)

No. Bars/Ft. of Grating Width = 8.727 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 60 | 66 | 72 | 78 | 84 | 90 | 96 |
| 4-1/2 x 1/4 | 7.363 | 16.568 | 36.60 | U | 3927 | 3245 | 2727 | 2324 | 2004 | 1745 | 1534 |
| | | | | Du | 0.115 | 0.139 | 0.166 | 0.194 | 0.225 | 0.259 | 0.294 |
| | | | | C | 9817 | 8925 | 8181 | 7552 | 7012 | 6545 | 6136 |
| | | | | Dc | 0.092 | 0.111 | 0.132 | 0.155 | 0.180 | 0.207 | 0.235 |
| 4-1/2 x 3/8 | 11.045 | 24.851 | 53.27 | U | 5891 | 4868 | 4091 | 3486 | 3005 | 2618 | 2301 |
| | | | | Du | 0.115 | 0.139 | 0.166 | 0.194 | 0.225 | 0.259 | 0.294 |
| | | | | C | 14727 | 13388 | 12272 | 11328 | 10519 | 9818 | 9204 |
| | | | | Dc | 0.092 | 0.111 | 0.132 | 0.155 | 0.180 | 0.207 | 0.235 |
| 4-1/2 x 1/2 | 14.727 | 33.135 | 69.94 | U | 7854 | 6491 | 5454 | 4648 | 4007 | 3491 | 3068 |
| | | | | Du | 0.115 | 0.139 | 0.166 | 0.194 | 0.225 | 0.259 | 0.294 |
| | | | | C | 19636 | 17851 | 16363 | 15105 | 14026 | 13091 | 12273 |
| | | | | Dc | 0.092 | 0.111 | 0.132 | 0.155 | 0.180 | 0.207 | 0.235 |
| 5 x 1/4 | 9.091 | 22.727 | 40.27 | U | 4849 | 4007 | 3367 | 2869 | 2474 | 2155 | 1894 |
| | | | | Du | 0.104 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 12121 | 11019 | 10101 | 9324 | 8658 | 8081 | 7576 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5 x 5/16 | 11.363 | 28.408 | 49.52 | U | 6060 | 5008 | 4209 | 3585 | 3092 | 2693 | 2367 |
| | | | | Du | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 15151 | 13773 | 12626 | 11654 | 10822 | 10100 | 9469 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5 x 3/8 | 13.636 | 34.090 | 58.86 | U | 7273 | 6010 | 5050 | 4303 | 3710 | 3232 | 2841 |
| | | | | Du | 0.104 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 18181 | 16528 | 15151 | 13986 | 12987 | 12121 | 11363 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5 x 1/2 | 18.181 | 45.453 | 77.36 | U | 9697 | 8014 | 6734 | 5738 | 4947 | 4310 | 3788 |
| | | | | Du | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 24241 | 22038 | 20201 | 18647 | 17315 | 16161 | 15151 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5-1/2 x 1/4 | 11.000 | 30.249 | 43.98 | U | 5867 | 4848 | 4074 | 3471 | 2993 | 2607 | 2292 |
| | | | | Du | 0.094 | 0.114 | 0.135 | 0.159 | 0.184 | 0.212 | 0.241 |
| | | | | C | 14667 | 13333 | 12222 | 11282 | 10476 | 9778 | 9167 |
| | | | | Dc | 0.075 | 0.091 | 0.108 | 0.127 | 0.147 | 0.169 | 0.193 |
| 5-1/2 x 3/8 | 16.499 | 45.374 | 64.36 | U | 8799 | 7272 | 6111 | 5207 | 4490 | 3911 | 3437 |
| | | | | Du | 0.094 | 0.114 | 0.135 | 0.159 | 0.184 | 0.212 | 0.241 |
| | | | | C | 21999 | 19999 | 18332 | 16922 | 15713 | 14666 | 13749 |
| | | | | Dc | 0.075 | 0.091 | 0.108 | 0.127 | 0.147 | 0.169 | 0.193 |
| 5-1/2 x 1/2 | 21.999 | 60.498 | 84.78 | U | 11733 | 9697 | 8148 | 6942 | 5986 | 5215 | 4583 |
| | | | | Du | 0.094 | 0.114 | 0.135 | 0.159 | 0.184 | 0.212 | 0.241 |
| | | | | C | 29332 | 26665 | 24443 | 22563 | 20951 | 19555 | 18333 |
| | | | | Dc | 0.075 | 0.091 | 0.108 | 0.127 | 0.147 | 0.169 | 0.193 |
| 6 x 1/4 | 13.091 | 39.272 | 47.69 | U | 6982 | 5770 | 4849 | 4131 | 3562 | 3103 | 2727 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 17455 | 15868 | 14546 | 13427 | 12468 | 11636 | 10909 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |
| 6 x 5/16 | 16.363 | 49.089 | 58.86 | U | 8727 | 7212 | 6060 | 5164 | 4453 | 3879 | 3409 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 21817 | 19834 | 18181 | 16783 | 15584 | 14545 | 13636 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |
| 6 x 3/8 | 19.636 | 58.907 | 69.94 | U | 10473 | 8655 | 7273 | 6197 | 5343 | 4654 | 4091 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 26181 | 23801 | 21818 | 20139 | 18701 | 17454 | 16363 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |
| 6 x 1/2 | 26.181 | 78.543 | 92.20 | U | 13963 | 11540 | 9697 | 8262 | 7124 | 6206 | 5454 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 34908 | 31735 | 29090 | 26852 | 24934 | 23272 | 21818 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# Model Specification: 22-W-4 Heavy-Duty Steel Bar Gratings

September 14, 2022

Specifier Notes: Architect or engineer should carefully review and edit this section to meet the requirements of the project and local building codes. Coordinate this section with other specification sections and the drawings and delete any unused "Specifier Notes" and options shown in **"red"** after editing.

This section covers Pleasant Mount Welding, Inc.'s "22-W-4 Heavy-Duty Steel Bar Gratings." Consult PMWI (www.pmwi.net) for assistance in editing this section for specific applications. Call 570.282.6164 or email sales@pmwi.net with any questions.

## SECTION 055300 - Metal Fabrications: Metal Gratings

## Part 1: General

### 1.1 Section Includes

A. Prefabricated, heavy-duty carbon steel bar gratings.

B. Prefabricated support frames for gratings.

C. Miscellaneous installation hardware and accessories.

### 1.2 Reference Standards

A. ANSI A326.3-2017: American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials.

B. ASTM Grade-36 Carbon Steel.

C. ASTM A-510: Carbon Steel Wire Rods.

D. ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

### 1.3 Action Submittals

A. Product Data: The contractor shall submit the manufacturer's catalog pages including load tables, anchor details and standard installation details.

B. Shop Drawings: The contractor shall submit for approval shop drawings for the fabrication and erection of all gratings, based on construction drawings of current issue. Include plans, elevations, and details of sections and connections as required. Show type and location of all fasteners.

C. Samples of grating and anchorage system shall be submitted for approval.

### 1.4 Quality Assurance

A. Manufacturer Qualification: A company specializing in the manufacture of metal bar gratings with not less than 5 years of documented experience.

B. Fabrication tolerances shall be in accordance with applicable provisions and recommendations of ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

## Part 2: Products

### 2.1 Source Requirements:

Design is based upon use of gratings as manufactured by Pleasant Mount Welding, Inc. and terminology used herein may include reference to the specific performance or product of this manufacturer. Such reference shall be construed only as establishing the quality of materials, operational features and workmanship used under this section and shall not, in any way, be construed as limiting competition.

### 2.2 Manufacturers:

Acceptable manufacturers include Pleasant Mount Welding, Inc. (45 Dundaff Street, Carbondale, PA 18407, 570-282-6164, www.pmwi.net) or approved equal.

### 2.3 Manufactured Units:

A. **Description:** Heavy-Duty Carbon Steel Bar Grating type **22-W-4 with a Galvanized finish**. Heavy-duty cross bars are welded perpendicular to heavy-duty main bearing bars.

1. Main Bearing Bar Spacing: **1-3/8"** on center.
2. Main Bearing Bar Depth: based on loading requirements and clear span as shown on drawings.
3. Main Bearing Bar Thickness: **1/4" | 5/16" | 3/8" | 1/2"** as shown on drawings.
4. Cross Bar Spacing: **4"** on center.
5. Top Surface of Main Bearing Bars: **Smooth | Serrated | SlipNOT® Slip Resistance Coating**

B. **Fabrication:** Load Band ends of grating with bars of the same thickness as main bearing bars. Weld banding flush with the top surface of grating. Depth of banding is to be 1/2" less than the depth of the main bearing bars (as shown in drawings). **Include welded anchor blocks 1/4" from the bottom surface with hole to accept washer and attachment bolts.**

C. **Steel Frames: Carbon Steel ASTM Grade-36 frames shall be provided as shown on contract drawings to support and attach gratings. Include anchors as shown for locking frame into concrete as shown on the plans. Galvanize frames after fabrication per ASTM A-123.**

D. **Design Criteria:**

1. **Loading:** Unless shown otherwise on the contract drawings, gratings shall be designed and manufactured to meet live load conditions of **AASHTO HS-20 with 30% impact factor**. Main bearing bar depth shall be as shown in contract drawings or as recommended by the manufacturer to meet loading requirements and clear span conditions.

2. **Traction / Slip-Resistance**: When a traction surface is required, it is to be tested per ANSI A326.3-2017. Top surface shall provide a minimum Wet Dynamic Coefficient of Friction (Wet DCOF) of 0.45 to meet high traction classification.

E. **Materials:** Main bearing bars and rectangular cross bars are to be type ASTM Grade-36 Carbon Steel. Round cross bars are to be per ASTM A-510. Banding is to be carbon steel per ASTM Grade-36.

F. **Fabrication Tolerances** shall be in accordance with ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

G. **Top Surface:** When required, **SlipNOT® Slip Resistance Coating** will be included in order to meet or exceed Wet Dynamic COF requirements of paragraph 2.3 D.2 above.

H. **Finish:** Gratings and frames shall be **Hot-Dip Galvanized per ASTM A-123 or Powder Coated Black [or other color] as shown on drawings.**

### 2.4 Accessories:

Provide appropriate fasteners for type, grade, and class required for approved anchorage system. **Include lifting devices and all other accessories as shown on the drawings.**

## Part 3: Execution

### 3.1 Field Verification:

Take field measurements prior to preparation of final shop drawings (and fabrication where required) to ensure proper fitting of the work.

### 3.2 Installation

A. Prior to grating installation, contractor shall inspect supports for correct alignment and conditions for proper attachment and support of the gratings. Metal shall be used for all grating supports and provide the minimum bearing surface for the depth of grating per ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual. Ends of all bearing bars at cutouts for penetrations are to be supported in like manner. Any inconsistencies between contract drawings and supporting structure deemed detrimental to grating placement shall be reported in writing to the engineer, architect or owner's agent prior to placement.

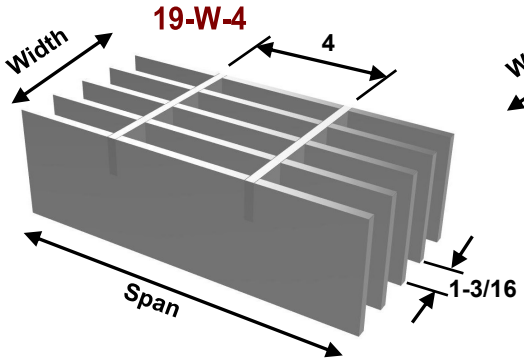
B. Install grating in accordance with shop drawings and standard installation clearances as recommended by ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

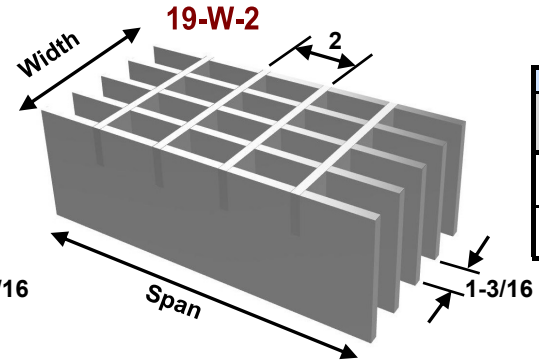
### 3.3 Grating Attachment:

Use approved attachment system and fasteners to secure grating to supporting members as shown on plans.

# 19-SPACE

# HEAVY DUTY WELDED STEEL GRATING




| % Open Area* | | | | | |
|---|---|---|---|---|---|
| BB Size | CB Ctrs | Bearing Bar Thickness | | | |
| | | 1/4" | 5/16" | 3/8" | 1/2" |
| Thru 2-1/2" | 4" cc | 72% | 67% | 62% | - |
| | 2" cc | 65% | 61% | 56% | - |
| 3" to 6" | 4" cc | 74% | 69% | 64% | 54% |
| | 2" cc | 70% | 65% | 60% | 51% |

## VEHICULAR LOAD TABLE

| Bearing Bar Size (Inches) | Weight ** (Lbs./Sqft.) | Section Properties | | Maximum Safe Clear Span (Inches) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Sx ** ($In^3$/Ft. Width) | Ix ** ($In^4$/Ft. Width) | Auto Traffic | 1 Ton | 3 Ton | 5 Ton | H-15 | H20/ HL-93 | H-25 |
| 1 x 1/4 | 9.72 | 0.421 | 0.211 | 12 | 7 | 6 | 7 | 9 | 10 | 12 |
| 1 x 3/8 | 14.06 | 0.632 | 0.316 | 16 | 9 | 8 | 9 | 11 | 13 | 14 |
| 1-1/4 x 1/4 | 11.84 | 0.658 | 0.411 | 17 | 10 | 8 | 9 | 12 | 13 | 15 |
| 1-1/4 x 3/8 | 17.20 | 0.987 | 0.617 | 23 | 14 | 10 | 12 | 14 | 16 | 18 |
| 1-1/2 x 1/4 | 14.06 | 0.947 | 0.711 | 23 | 13 | 10 | 11 | 14 | 16 | 18 |
| 1-1/2 x 5/16 | 17.20 | 1.184 | 0.888 | 27 | 16 | 11 | 13 | 16 | 18 | 20 |
| 1-1/2 x 3/8 | 20.43 | 1.421 | 1.066 | 30* | 19 | 13 | 14 | 18 | 20 | 22 |
| 1-3/4 x 1/4 | 16.19 | 1.289 | 1.128 | 29 | 17 | 12 | 14 | 17 | 19 | 21 |
| 1-3/4 x 3/8 | 23.66 | 1.934 | 1.692 | 38* | 25 | 17 | 18 | 21 | 23 | 26 |
| 2 x 1/4 | 18.31 | 1.684 | 1.684 | 37 | 22 | 15 | 16 | 20 | 22 | 24 |
| 2 x 5/16 | 22.65 | 2.105 | 2.105 | 42* | 28 | 18 | 19 | 23 | 25 | 27 |
| 2 x 3/8 | 26.90 | 2.526 | 2.526 | 46* | 33 | 21 | 22 | 26 | 28 | 30 |
| 2-1/4 x 1/4 | 20.43 | 2.132 | 2.398 | 45* | 28 | 18 | 19 | 23 | 25 | 27 |
| 2-1/4 x 3/8 | 30.13 | 3.197 | 3.597 | 53* | 41 | 26 | 26 | 31 | 32 | 34 |
| 2-1/2 x 1/4 | 22.65 | 2.632 | 3.289 | 52* | 34 | 22 | 22 | 27 | 28 | 30 |
| 2-1/2 x 5/16 | 28.01 | 3.289 | 4.112 | 56* | 42 | 27 | 27 | 31 | 33 | 35 |
| 2-1/2 x 3/8 | 33.36 | 3.947 | 4.934 | 59* | 50 | 31 | 31 | 36 | 38 | 40 |
| 3 x 1/4 | 28.95 | 3.789 | 5.684 | 62* | 49 | 30 | 30 | 35 | 37 | 39 |
| 3 x 5/16 | 35.41 | 4.737 | 7.105 | 67* | 57* | 37 | 36 | 42 | 43 | 45 |
| 3 x 3/8 | 41.88 | 5.684 | 8.526 | 71* | 61* | 44 | 43 | 49 | 50 | 52 |
| 3 x 1/2 | 54.72 | 7.579 | 11.368 | 78* | 67* | 56* | 55 | 57* | 57* | 57* |
| 3-1/2 x 1/4 | 33.29 | 5.158 | 9.026 | 72* | 62* | 40 | 39 | 45 | 46 | 48 |
| 3-1/2 x 3/8 | 48.25 | 7.737 | 13.539 | 83* | 71* | 58 | 56 | 60* | 60* | 60* |
| 3-1/2 x 1/2 | 63.30 | 10.316 | 18.052 | 91* | 78* | 65* | 64* | 66* | 66* | 66* |
| 4 x 1/4 | 37.54 | 6.737 | 13.473 | 83* | 71* | 51 | 50 | 57 | 58 | 59 |
| 4 x 5/16 | 46.13 | 8.421 | 16.842 | 89* | 76* | 63 | 61 | 65* | 65* | 65* |
| 4 x 3/8 | 54.72 | 10.105 | 20.210 | 95* | 81* | 68* | 66* | 69* | 68* | 68* |
| 4 x 1/2 | 71.89 | 13.473 | 26.947 | 96* | 89* | 74* | 73* | 76* | 75* | 75* |
| 4-1/2 x 1/4 | 41.88 | 8.526 | 19.184 | 96* | 80* | 64 | 61 | 68* | 67* | 67* |
| 4-1/2 x 3/8 | 61.18 | 12.789 | 28.776 | 96* | 91* | 76* | 74* | 77* | 77* | 77* |
| 4-1/2 x 1/2 | 80.48 | 17.052 | 38.367 | 96* | 96* | 84* | 82* | 85* | 85* | 84* |
| 5 x 1/4 | 46.13 | 10.526 | 26.315 | 96* | 89* | 74* | 72* | 75* | 75* | 75* |
| 5 x 5/16 | 56.84 | 13.158 | 32.894 | 96* | 96* | 80* | 78* | 81* | 80* | 80* |
| 5 x 3/8 | 67.65 | 15.789 | 39.473 | 96* | 96* | 85* | 83* | 86* | 85* | 85* |
| 5 x 1/2 | 89.07 | 21.052 | 52.630 | 96* | 96* | 93* | 91* | 95* | 94* | 94* |
| 5-1/2 x 1/4 | 50.42 | 12.737 | 35.025 | 96* | 96* | 81* | 79* | 83* | 82* | 82* |
| 5-1/2 x 3/8 | 74.02 | 19.105 | 52.538 | 96* | 96* | 93* | 91* | 95* | 94* | 93* |
| 5-1/2 x 1/2 | 97.66 | 25.473 | 70.051 | 96* | 96* | 96* | 96* | 96* | 96* | 96* |
| 6 x 1/4 | 54.72 | 15.158 | 45.473 | 96* | 96* | 89* | 87* | 90* | 89* | 89* |
| 6 x 5/16 | 67.65 | 18.497 | 56.841 | 96* | 96* | 96* | 93* | 96* | 96* | 96* |
| 6 x 3/8 | 80.48 | 22.736 | 68.209 | 96* | 96* | 96* | 96* | 96* | 96* | 96* |
| 6 x 1/2 | 106.25 | 30.315 | 90.945 | 96* | 96* | 96* | 96* | 96* | 96* | 96* |

*Maximum spans are limited by maximum allowable stress or the lesser deflection of L/400 or 1/8" to a maximum simple span of 8'-0" (2,438mm). **Based on 10.105 bars/ft. of grating width. Bearing bars 1-3/16" center-to-center spacing. When serrated grating is specified, the depth of grating required for a specified load will be 1/4" greater than that shown in these tables. Weights shown are for 4" cross bar centers. Add 1.13 lbs/sqft. (3/8" Dia. CB) or 3.18 lbs./sqft. (1-1/4" x 1/4" CB) for 2" cross bar centers. Cross bars are determined based on project applications and bearing bar height.

# 19-SPACE

# HEAVY DUTY WELDED STEEL GRATING

## MAXIMUM SAFE CONCENTRATED LOADS

| Bearing Bar Size (Inches) | Maximum Safe Concentrated Load* (Lbs./Ft. of Grating Width) - Clear Span | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1'-0" | 1'-6" | 2'-0" | 2'-6" | 3'-0" | 3'-6" | 4'-0" | 4'-6" | 5'-0" | 5'-6" | 6'-0" | 7'-0" | 8'-0" |
| 1 x 1/4 | 2807 | 1871 | 1403 | 1123 | 936 | 802 | | | | | | | |
| 1 x 3/8 | 4213 | 2809 | 2107 | 1685 | 1404 | 1204 | | | | | | | |
| 1-1/4 x 1/4 | 4387 | 2924 | 2193 | 1755 | 1462 | 1253 | 1097 | | | | | | |
| 1-1/4 x 3/8 | 6580 | 4387 | 3290 | 2632 | 2193 | 1880 | 1645 | | | | | | |
| 1-1/2 x 1/4 | 6313 | 4209 | 3157 | 2525 | 2104 | 1804 | 1578 | 1403 | | | | | |
| 1-1/2 x 5/16 | 7893 | 5262 | 3947 | 3157 | 2631 | 2255 | 1973 | 1754 | | | | | |
| 1-1/2 x 3/8 | 9473 | 6316 | 4737 | 3789 | 3158 | 2707 | 2368 | 2105 | | | | | |
| 1-3/4 x 1/4 | 8593 | 5729 | 4297 | 3437 | 2864 | 2455 | 2148 | 1910 | 1719 | | | | |
| 1-3/4 x 3/8 | 12893 | 8596 | 6447 | 5157 | 4298 | 3684 | 3223 | 2865 | 2579 | | | | |
| 2 x 1/4 | 11227 | 7484 | 5613 | 4491 | 3742 | 3208 | 2807 | 2495 | 2245 | | | | |
| 2 x 5/16 | 14033 | 9356 | 7017 | 5613 | 4678 | 4010 | 3508 | 3119 | 2807 | | | | |
| 2 x 3/8 | 16840 | 11227 | 8420 | 6736 | 5613 | 4811 | 4210 | 3742 | 3368 | | | | |
| 2-1/4 x 1/4 | 14213 | 9476 | 7107 | 5685 | 4738 | 4061 | 3553 | 3159 | 2843 | 2584 | | | |
| 2-1/4 x 3/8 | 21313 | 14209 | 10657 | 8525 | 7104 | 6090 | 5328 | 4736 | 4263 | 3875 | | | |
| 2-1/2 x 1/4 | 17547 | 11698 | 8773 | 7019 | 5849 | 5013 | 4387 | 3899 | 3509 | 3190 | 2924 | | |
| 2-1/2 x 5/16 | 21927 | 14618 | 10963 | 8771 | 7309 | 6265 | 5482 | 4873 | 4385 | 3987 | 3654 | | |
| 2-1/2 x 3/8 | 26313 | 17542 | 13157 | 10525 | 8771 | 7518 | 6578 | 5847 | 5263 | 4784 | 4386 | | |
| 3 x 1/4 | 25260 | 16840 | 12630 | 10104 | 8420 | 7217 | 6315 | 5613 | 5052 | 4593 | 4210 | | |
| 3 x 5/16 | 31580 | 21053 | 15790 | 12632 | 10527 | 9023 | 7895 | 7018 | 6316 | 5742 | 5263 | | |
| 3 x 3/8 | 37893 | 25262 | 18947 | 15157 | 12631 | 10827 | 9473 | 8421 | 7579 | 6890 | 6316 | | |
| 3 x 1/2 | 50527 | 33684 | 25263 | 20211 | 16842 | 14436 | 12632 | 11228 | 10105 | 9187 | 8421 | | |
| 3-1/2 x 1/4 | 34387 | 22924 | 17193 | 13755 | 11462 | 9825 | 8597 | 7641 | 6877 | 6252 | 5731 | 4912 | |
| 3-1/2 x 3/8 | 51580 | 34387 | 25790 | 20632 | 17193 | 14737 | 12895 | 11462 | 10316 | 9378 | 8597 | 7369 | |
| 3-1/2 x 1/2 | | 45849 | 34387 | 27509 | 22924 | 19650 | 17193 | 15283 | 13755 | 12504 | 11462 | 9825 | |
| 4 x 1/4 | | 29942 | 22457 | 17965 | 14971 | 12832 | 11228 | 9981 | 8983 | 8166 | 7486 | 6416 | |
| 4 x 5/16 | | 37427 | 28070 | 22456 | 18713 | 16040 | 14035 | 12476 | 11228 | 10207 | 9357 | 8020 | |
| 4 x 3/8 | | 44911 | 33683 | 26947 | 22456 | 19248 | 16842 | 14970 | 13473 | 12248 | 11228 | 9624 | |
| 4 x 1/2 | | 59880 | 44910 | 35928 | 29940 | 25663 | 22455 | 19960 | 17964 | 16331 | 14970 | 12831 | |
| 4-1/2 x 1/4 | | 37893 | 28420 | 22736 | 18947 | 16240 | 14210 | 12631 | 11368 | 10335 | 9473 | 8120 | 7105 |
| 4-1/2 x 3/8 | | 56840 | 42630 | 34104 | 28420 | 24360 | 21315 | 18947 | 17052 | 15502 | 14210 | 12180 | 10658 |
| 4-1/2 x 1/2 | | | 56840 | 45472 | 37893 | 32480 | 28420 | 25262 | 22736 | 20669 | 18947 | 16240 | 14210 |
| 5 x 1/4 | | | 35087 | 28069 | 23391 | 20050 | 17543 | 15594 | 14035 | 12759 | 11696 | 10025 | 8772 |
| 5 x 5/16 | | | 43860 | 35088 | 29240 | 25063 | 21930 | 19493 | 17544 | 15949 | 14620 | 12531 | 10965 |
| 5 x 3/8 | | | 52630 | 42104 | 35087 | 30074 | 26315 | 23391 | 21052 | 19138 | 17543 | 15037 | 13158 |
| 5 x 1/2 | | | | 56139 | 46782 | 40099 | 35087 | 31188 | 28069 | 25518 | 23391 | 20050 | 17543 |
| 5-1/2 x 1/4 | | | | 33965 | 28304 | 24261 | 21228 | 18870 | 16983 | 15439 | 14152 | 12130 | 10614 |
| 5-1/2 x 3/8 | | | | 50947 | 42456 | 36390 | 31842 | 28304 | 25473 | 23158 | 21228 | 18195 | 15921 |
| 5-1/2 x 1/2 | | | | | 56607 | 48520 | 42455 | 37738 | 33964 | 20876 | 28303 | 24260 | 21228 |
| 6 x 1/4 | | | | | 33684 | 28872 | 25263 | 22456 | 20211 | 18373 | 16842 | 14436 | 12632 |
| 6 x 5/16 | | | | | 42104 | 26090 | 31578 | 28070 | 25263 | 22966 | 21052 | 18045 | 15789 |
| 6 x 3/8 | | | | | 50524 | 43307 | 37893 | 33683 | 30315 | 27559 | 25262 | 21653 | 18947 |
| 6 x 1/2 | | | | | | 57743 | 50525 | 44911 | 40420 | 36745 | 33683 | 28871 | 25263 |

| % Open Area* | | | | | |
|---|---|---|---|---|---|
| BB Size | CB Ctrs | Bearing Bar Thickness | | | |
| | | 1/4" | 5/16" | 3/8" | 1/2" |
| Thru 2-1/2" | 4" cc | 72% | 67% | 62% | - |
| | 2" cc | 65% | 61% | 56% | - |
| 3" to 6" | 4" cc | 74% | 69% | 64% | 54% |
| | 2" cc | 70% | 65% | 60% | 51% |

*Loads are theoretical, and are based on a unit stress of 20,000 psi.*

*Based on 10.105 bars/ft. of grating width. Bearing bars 1-3/16" center-to-center spacing. **Note:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

### Panel Width Chart (in.) - 19-W-4 & 19-W-2

Dimensions are Out-to-Out of Bearing Bars**

| No. of Bars | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4" Bars | 1 7/16 | 2 5/8 | 3 13/16 | 5 | 6 3/16 | 7 3/8 | 8 9/16 | 9 3/4 | 10 15/16 | 12 1/8 | 13 5/16 | 14 1/2 | 15 11/16 | 16 7/8 | 18 1/16 |
| 5/16" Bars | 1 1/2 | 2 11/16 | 3 7/8 | 5 1/16 | 6 1/4 | 7 7/16 | 8 5/8 | 9 13/16 | 11 | 12 3/16 | 13 3/8 | 14 9/16 | 15 3/4 | 16 15/16 | 18 1/8 |
| 3/8" Bars | 1 9/16 | 2 3/4 | 3 15/16 | 5 1/8 | 6 5/16 | 7 1/2 | 8 11/16 | 9 7/8 | 11 1/16 | 12 1/4 | 13 7/16 | 14 5/8 | 15 13/16 | 17 | 18 3/16 |
| 1/2" Bars | 1 11/16 | 2 7/8 | 4 1/16 | 5 1/4 | 6 7/16 | 7 5/8 | 8 13/16 | 10 | 11 3/16 | 12 3/8 | 13 9/16 | 14 3/4 | 15 15/16 | 17 1/8 | 18 5/16 |

| No. of Bars | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4" Bars | 19 1/4 | 20 7/16 | 21 5/8 | 22 13/16 | 24 | 25 3/16 | 26 3/8 | 27 9/16 | 28 3/4 | 29 15/16 | 31 1/8 | 32 5/16 | 33 1/2 | 34 11/16 | 35 7/8 |
| 5/16" Bars | 19 5/16 | 20 1/2 | 21 11/16 | 22 7/8 | 24 1/16 | 25 1/4 | 26 7/16 | 27 5/8 | 28 13/16 | 30 | 31 3/16 | 32 3/8 | 33 9/16 | 34 3/4 | 35 15/16 |
| 3/8" Bars | 19 3/8 | 20 9/16 | 21 3/4 | 22 15/16 | 24 1/8 | 25 5/16 | 26 1/2 | 27 11/16 | 28 7/8 | 30 1/16 | 31 1/4 | 32 7/16 | 33 5/8 | 34 13/16 | 36 |
| 1/2" Bars | 19 1/2 | 20 11/16 | 21 7/8 | 23 1/16 | 24 1/4 | 25 7/16 | 26 5/8 | 27 13/16 | 29 | 30 3/16 | 31 3/8 | 32 9/16 | 33 3/4 | 34 15/16 | 36 1/8 |

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart continues on page 85)

No. Bars/Ft. of Grating Width = 10.105 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus $in.^3$/ Foot of Grating Width | Moment of Inertia $in.^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 x 1/4 | 0.421 | 0.211 | 9.72 | U | 5613 | 2495 | 1403 | 898 | 624 | 458 | 351 | 277 |
| | | | | Du | 0.021 | 0.046 | 0.083 | 0.129 | 0.186 | 0.253 | 0.330 | 0.418 |
| | | | | C | 2807 | 1871 | 1403 | 1123 | 936 | 802 | 702 | 624 |
| | | | | Dc | 0.017 | 0.037 | 0.066 | 0.103 | 0.149 | 0.202 | 0.264 | 0.335 |
| 1 x 3/8 | 0.632 | 0.316 | 14.06 | U | 8427 | 3745 | 2107 | 1348 | 936 | 688 | 527 | 416 |
| | | | | Du | 0.021 | 0.047 | 0.083 | 0.129 | 0.186 | 0.254 | 0.331 | 0.419 |
| | | | | C | 4213 | 2809 | 2107 | 1685 | 1404 | 1204 | 1053 | 936 |
| | | | | Dc | 0.017 | 0.037 | 0.066 | 0.103 | 0.149 | 0.203 | 0.265 | 0.335 |
| 1-1/4 x 1/4 | 0.658 | 0.411 | 11.84 | U | 8773 | 3899 | 2193 | 1404 | 975 | 716 | 548 | 433 |
| | | | | Du | 0.017 | 0.037 | 0.066 | 0.104 | 0.149 | 0.203 | 0.265 | 0.335 |
| | | | | C | 4387 | 2924 | 2193 | 1755 | 1462 | 1253 | 1097 | 975 |
| | | | | Dc | 0.013 | 0.030 | 0.053 | 0.083 | 0.119 | 0.162 | 0.212 | 0.268 |
| 1-1/4 x 3/8 | 0.987 | 0.617 | 17.20 | U | 13160 | 5849 | 3290 | 2106 | 1462 | 1074 | 823 | 650 |
| | | | | Du | 0.017 | 0.037 | 0.066 | 0.103 | 0.149 | 0.203 | 0.265 | 0.335 |
| | | | | C | 6580 | 4387 | 3290 | 2632 | 2193 | 1880 | 1645 | 1462 |
| | | | | Dc | 0.013 | 0.030 | 0.053 | 0.083 | 0.119 | 0.162 | 0.212 | 0.268 |
| 1-1/2 x 1/4 | 0.947 | 0.711 | 14.06 | U | 12627 | 5612 | 3157 | 2020 | 1403 | 1031 | 789 | 624 |
| | | | | Du | 0.014 | 0.031 | 0.055 | 0.086 | 0.124 | 0.169 | 0.220 | 0.279 |
| | | | | C | 6313 | 4209 | 3157 | 2525 | 2104 | 1804 | 1578 | 1403 |
| | | | | Dc | 0.011 | 0.025 | 0.044 | 0.069 | 0.099 | 0.135 | 0.176 | 0.223 |
| 1-1/2 x 5/16 | 1.184 | 0.888 | 17.20 | U | 15787 | 7016 | 3947 | 2526 | 1754 | 1289 | 987 | 780 |
| | | | | Du | 0.014 | 0.031 | 0.055 | 0.086 | 0.124 | 0.169 | 0.221 | 0.279 |
| | | | | C | 7893 | 5262 | 3947 | 3157 | 2631 | 2255 | 1973 | 1754 |
| | | | | Dc | 0.011 | 0.025 | 0.044 | 0.069 | 0.099 | 0.135 | 0.177 | 0.223 |
| 1-1/2 x 3/8 | 1.421 | 1.066 | 20.43 | U | 18947 | 8421 | 4737 | 3031 | 2105 | 1547 | 1184 | 936 |
| | | | | Du | 0.014 | 0.031 | 0.055 | 0.086 | 0.124 | 0.169 | 0.221 | 0.279 |
| | | | | C | 9473 | 6316 | 4737 | 3789 | 3158 | 2707 | 2368 | 2105 |
| | | | | Dc | 0.011 | 0.025 | 0.044 | 0.069 | 0.099 | 0.135 | 0.177 | 0.223 |
| 1-3/4 x 1/4 | 1.289 | 1.128 | 16.19 | U | 17187 | 7639 | 4297 | 2750 | 1910 | 1403 | 1074 | 849 |
| | | | | Du | 0.012 | 0.027 | 0.047 | 0.074 | 0.106 | 0.145 | 0.189 | 0.240 |
| | | | | C | 8593 | 5729 | 4297 | 3437 | 2864 | 2455 | 2148 | 1910 |
| | | | | Dc | 0.010 | 0.021 | 0.038 | 0.059 | 0.085 | 0.116 | 0.151 | 0.192 |
| 1-3/4 x 3/8 | 1.934 | 1.692 | 23.66 | U | 25787 | 11461 | 6447 | 4126 | 2865 | 2105 | 1612 | 1273 |
| | | | | Du | 0.012 | 0.027 | 0.047 | 0.074 | 0.106 | 0.145 | 0.189 | 0.239 |
| | | | | C | 12893 | 8596 | 6447 | 5157 | 4298 | 3684 | 3223 | 2865 |
| | | | | Dc | 0.010 | 0.021 | 0.038 | 0.059 | 0.085 | 0.116 | 0.151 | 0.192 |
| 2 x 1/4 | 1.684 | 1.684 | 18.31 | U | 22453 | 9979 | 5613 | 3593 | 2495 | 1833 | 1403 | 1109 |
| | | | | Du | 0.010 | 0.023 | 0.041 | 0.065 | 0.093 | 0.127 | 0.166 | 0.210 |
| | | | | C | 11227 | 7484 | 5613 | 4491 | 3742 | 3208 | 2807 | 2495 |
| | | | | Dc | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.132 | 0.168 |
| 2 x 5/16 | 2.105 | 2.105 | 22.65 | U | 28067 | 12474 | 7017 | 4491 | 3119 | 2291 | 1754 | 1386 |
| | | | | Du | 0.010 | 0.023 | 0.041 | 0.065 | 0.093 | 0.127 | 0.166 | 0.209 |
| | | | | C | 14033 | 9356 | 7017 | 5613 | 4678 | 4010 | 3508 | 3119 |
| | | | | Dc | 0.008 | 0.019 | 0.033 | 0.052 | 0.074 | 0.101 | 0.132 | 0.168 |
| 2 x 3/8 | 2.526 | 2.526 | 26.90 | U | 33680 | 14969 | 8420 | 5389 | 3742 | 2749 | 2105 | 1663 |
| | | | | Du | 0.010 | 0.023 | 0.041 | 0.065 | 0.093 | 0.127 | 0.166 | 0.210 |
| | | | | C | 16840 | 11227 | 8420 | 6736 | 5613 | 4811 | 4210 | 3742 |
| | | | | Dc | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.132 | 0.168 |
| 2-1/4 x 1/4 | 2.132 | 2.398 | 20.43 | U | 28427 | 12634 | 7107 | 4548 | 3159 | 2321 | 1777 | 1404 |
| | | | | Du | 0.009 | 0.021 | 0.037 | 0.058 | 0.083 | 0.113 | 0.147 | 0.186 |
| | | | | C | 14213 | 9476 | 7107 | 5685 | 4738 | 4061 | 3553 | 3159 |
| | | | | Dc | 0.007 | 0.017 | 0.029 | 0.046 | 0.066 | 0.090 | 0.118 | 0.149 |
| 2-1/4 x 3/8 | 3.197 | 3.597 | 30.13 | U | 42627 | 18945 | 10657 | 6820 | 4736 | 3480 | 2664 | 2105 |
| | | | | Du | 0.009 | 0.021 | 0.037 | 0.058 | 0.083 | 0.113 | 0.147 | 0.186 |
| | | | | C | 21313 | 14209 | 10657 | 8525 | 7104 | 6090 | 5328 | 4736 |
| | | | | Dc | 0.007 | 0.017 | 0.029 | 0.046 | 0.066 | 0.090 | 0.118 | 0.149 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart begins on page 84)

No. Bars/Ft. of Grating Width = 10.105 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 60 | 66 | 72 | 78 | 84 | 90 | 96 |
| 1 x 1/4 | 0.421 | 0.211 | 9.72 | U | 225 | 186 | 156 | 133 | 115 | 100 | 88 |
| | | | | Du | 0.517 | 0.626 | 0.743 | 0.873 | 1.015 | 1.163 | 1.325 |
| | | | | C | 561 | 510 | 468 | 432 | 401 | 374 | 351 |
| | | | | Dc | 0.413 | 0.499 | 0.595 | 0.698 | 0.809 | 0.928 | 1.057 |
| 1 x 3/8 | 0.632 | 0.316 | 14.06 | U | 337 | 279 | 234 | 199 | 172 | 150 | 132 |
| | | | | Du | 0.517 | 0.627 | 0.745 | 0.872 | 1.014 | 1.165 | 1.328 |
| | | | | C | 843 | 766 | 702 | 648 | 602 | 562 | 527 |
| | | | | Dc | 0.414 | 0.501 | 0.596 | 0.699 | 0.811 | 0.931 | 1.060 |
| 1-1/4 x 1/4 | 0.658 | 0.411 | 11.84 | U | 351 | 290 | 244 | 208 | 179 | 156 | 137 |
| | | | | Du | 0.414 | 0.501 | 0.597 | 0.701 | 0.811 | 0.932 | 1.059 |
| | | | | C | 877 | 798 | 731 | 675 | 627 | 585 | 548 |
| | | | | Dc | 0.331 | 0.401 | 0.477 | 0.560 | 0.650 | 0.745 | 0.847 |
| 1-1/4 x 3/8 | 0.987 | 0.617 | 17.20 | U | 526 | 435 | 366 | 311 | 269 | 234 | 206 |
| | | | | Du | 0.413 | 0.501 | 0.597 | 0.698 | 0.812 | 0.931 | 1.061 |
| | | | | C | 1316 | 1196 | 1097 | 1012 | 940 | 877 | 823 |
| | | | | Dc | 0.331 | 0.400 | 0.477 | 0.559 | 0.649 | 0.744 | 0.848 |
| 1-1/2 x 1/4 | 0.947 | 0.711 | 14.06 | U | 505 | 417 | 351 | 299 | 258 | 224 | 197 |
| | | | | Du | 0.344 | 0.416 | 0.496 | 0.582 | 0.676 | 0.773 | 0.881 |
| | | | | C | 1263 | 1148 | 1052 | 971 | 902 | 842 | 789 |
| | | | | Dc | 0.276 | 0.334 | 0.397 | 0.466 | 0.540 | 0.620 | 0.705 |
| 1-1/2 x 5/16 | 1.184 | 0.888 | 17.20 | U | 631 | 522 | 439 | 374 | 322 | 281 | 247 |
| | | | | Du | 0.345 | 0.417 | 0.497 | 0.583 | 0.675 | 0.777 | 0.884 |
| | | | | C | 1579 | 1435 | 1316 | 1214 | 1128 | 1052 | 987 |
| | | | | Dc | 0.276 | 0.334 | 0.397 | 0.466 | 0.541 | 0.620 | 0.706 |
| 1-1/2 x 3/8 | 1.421 | 1.066 | 20.43 | U | 758 | 626 | 526 | 448 | 387 | 337 | 296 |
| | | | | Du | 0.345 | 0.417 | 0.496 | 0.582 | 0.676 | 0.776 | 0.882 |
| | | | | C | 1895 | 1722 | 1579 | 1457 | 1353 | 1263 | 1184 |
| | | | | Dc | 0.276 | 0.334 | 0.397 | 0.466 | 0.540 | 0.621 | 0.706 |
| 1-3/4 x 1/4 | 1.289 | 1.128 | 16.19 | U | 687 | 568 | 477 | 407 | 351 | 306 | 269 |
| | | | | Du | 0.295 | 0.358 | 0.425 | 0.500 | 0.580 | 0.666 | 0.758 |
| | | | | C | 1719 | 1562 | 1432 | 1322 | 1228 | 1146 | 1074 |
| | | | | Dc | 0.237 | 0.286 | 0.340 | 0.400 | 0.464 | 0.532 | 0.605 |
| 1-3/4 x 3/8 | 1.934 | 1.692 | 23.66 | U | 1031 | 852 | 716 | 610 | 526 | 458 | 403 |
| | | | | Du | 0.296 | 0.358 | 0.426 | 0.499 | 0.579 | 0.665 | 0.757 |
| | | | | C | 2579 | 2344 | 2149 | 1984 | 1842 | 1719 | 1612 |
| | | | | Dc | 0.237 | 0.286 | 0.341 | 0.400 | 0.464 | 0.532 | 0.606 |
| 2 x 1/4 | 1.684 | 1.684 | 18.31 | U | 898 | 742 | 624 | 531 | 458 | 399 | 351 |
| | | | | Du | 0.259 | 0.313 | 0.373 | 0.437 | 0.507 | 0.582 | 0.662 |
| | | | | C | 2245 | 2041 | 1871 | 1727 | 1604 | 1497 | 1403 |
| | | | | Dc | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.466 | 0.530 |
| 2 x 5/16 | 2.105 | 2.105 | 22.65 | U | 1123 | 928 | 780 | 664 | 573 | 499 | 439 |
| | | | | Du | 0.259 | 0.313 | 0.373 | 0.437 | 0.507 | 0.582 | 0.663 |
| | | | | C | 2807 | 2552 | 2339 | 2159 | 2005 | 1871 | 1754 |
| | | | | Dc | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.465 | 0.530 |
| 2 x 3/8 | 2.526 | 2.526 | 26.90 | U | 1347 | 1113 | 936 | 797 | 687 | 599 | 526 |
| | | | | Du | 0.259 | 0.313 | 0.373 | 0.437 | 0.507 | 0.582 | 0.662 |
| | | | | C | 3368 | 3062 | 2807 | 2591 | 2406 | 2245 | 2105 |
| | | | | Dc | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.465 | 0.530 |
| 2-1/4 x 1/4 | 2.132 | 2.398 | 20.43 | U | 1137 | 940 | 790 | 673 | 580 | 505 | 444 |
| | | | | Du | 0.230 | 0.278 | 0.331 | 0.389 | 0.451 | 0.517 | 0.588 |
| | | | | C | 2843 | 2584 | 2369 | 2187 | 2030 | 1895 | 1777 |
| | | | | Dc | 0.184 | 0.223 | 0.265 | 0.311 | 0.361 | 0.414 | 0.471 |
| 2-1/4 x 3/8 | 3.197 | 3.597 | 30.13 | U | 1705 | 1409 | 1184 | 1009 | 870 | 758 | 666 |
| | | | | Du | 0.230 | 0.278 | 0.331 | 0.389 | 0.451 | 0.517 | 0.588 |
| | | | | C | 4263 | 3875 | 3552 | 3279 | 3045 | 2842 | 2664 |
| | | | | Dc | 0.184 | 0.223 | 0.265 | 0.311 | 0.361 | 0.414 | 0.471 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart continues on page 87)

No. Bars/Ft. of Grating Width = 10.105 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-1/2 x 1/4 | 2.632 | 3.289 | 22.65 | U | 35093 | 15597 | 8773 | 5615 | 3899 | 2865 | 2193 | 1733 |
| | | | | Du | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.132 | 0.168 |
| | | | | C | 17547 | 11698 | 8773 | 7019 | 5849 | 5013 | 4387 | 3899 |
| | | | | Dc | 0.007 | 0.015 | 0.027 | 0.041 | 0.060 | 0.081 | 0.106 | 0.134 |
| 2-1/2 x 5/16 | 3.289 | 4.112 | 28.01 | U | 43853 | 19490 | 10963 | 7017 | 4873 | 3580 | 2741 | 2166 |
| | | | | Du | 0.008 | 0.019 | 0.033 | 0.052 | 0.074 | 0.101 | 0.132 | 0.168 |
| | | | | C | 21927 | 14618 | 10963 | 8771 | 7309 | 6265 | 5482 | 4873 |
| | | | | Dc | 0.007 | 0.015 | 0.026 | 0.041 | 0.060 | 0.081 | 0.106 | 0.134 |
| 2-1/2 x 3/8 | 3.947 | 4.934 | 33.36 | U | 52627 | 23390 | 13157 | 8420 | 5847 | 4296 | 3289 | 2599 |
| | | | | Du | 0.008 | 0.019 | 0.033 | 0.052 | 0.075 | 0.101 | 0.132 | 0.168 |
| | | | | C | 26313 | 17542 | 13157 | 10525 | 8771 | 7518 | 6578 | 5847 |
| | | | | Dc | 0.007 | 0.015 | 0.027 | 0.041 | 0.060 | 0.081 | 0.106 | 0.134 |
| 3 x 1/4 | 3.789 | 5.684 | 28.95 | U | 50520 | 22453 | 12630 | 8083 | 5613 | 4124 | 3158 | 2495 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.085 | 0.110 | 0.140 |
| | | | | C | 25260 | 16840 | 12630 | 10104 | 8420 | 7217 | 6315 | 5613 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.035 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3 x 5/16 | 4.737 | 7.105 | 35.41 | U | 63160 | 28071 | 15790 | 10106 | 7018 | 5156 | 3948 | 3119 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.084 | 0.110 | 0.140 |
| | | | | C | 31580 | 21053 | 15790 | 12632 | 10527 | 9023 | 7895 | 7018 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.034 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3 x 3/8 | 5.684 | 8.526 | 41.88 | U | 75787 | 33683 | 18947 | 12126 | 8421 | 6187 | 4737 | 3743 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.085 | 0.110 | 0.140 |
| | | | | C | 37893 | 25262 | 18947 | 15157 | 12631 | 10827 | 9473 | 8421 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.035 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3 x 1/2 | 7.579 | 11.368 | 54.72 | U | 101053 | 44913 | 25263 | 16169 | 11228 | 8249 | 6316 | 4990 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.084 | 0.110 | 0.140 |
| | | | | C | 50527 | 33684 | 25263 | 20211 | 16842 | 14436 | 12632 | 11228 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.034 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3-1/2 x 1/4 | 5.158 | 9.026 | 33.29 | U | 68773 | 30566 | 17193 | 11004 | 7641 | 5614 | 4298 | 3396 |
| | | | | Du | 0.006 | 0.013 | 0.024 | 0.037 | 0.053 | 0.072 | 0.095 | 0.120 |
| | | | | C | 34387 | 22924 | 17193 | 13755 | 11462 | 9825 | 8597 | 7641 |
| | | | | Dc | 0.005 | 0.011 | 0.019 | 0.030 | 0.043 | 0.058 | 0.076 | 0.096 |
| 3-1/2 x 3/8 | 7.737 | 13.539 | 48.25 | U | 103160 | 45849 | 25790 | 16506 | 11462 | 8421 | 6448 | 5094 |
| | | | | Du | 0.006 | 0.013 | 0.024 | 0.037 | 0.053 | 0.072 | 0.095 | 0.120 |
| | | | | C | 51580 | 34387 | 25790 | 20632 | 17193 | 14737 | 12895 | 11462 |
| | | | | Dc | 0.005 | 0.011 | 0.019 | 0.030 | 0.043 | 0.058 | 0.076 | 0.096 |
| 3-1/2 x 1/2 | 10.316 | 18.052 | 63.30 | U | 137547 | 61132 | 34387 | 22007 | 15283 | 11228 | 8597 | 6792 |
| | | | | Du | 0.006 | 0.013 | 0.024 | 0.037 | 0.053 | 0.072 | 0.095 | 0.120 |
| | | | | C | 68773 | 45849 | 34387 | 27509 | 22924 | 19650 | 17193 | 15283 |
| | | | | Dc | 0.005 | 0.011 | 0.019 | 0.030 | 0.043 | 0.058 | 0.076 | 0.096 |
| 4 x 1/4 | 6.737 | 13.473 | 37.54 | U | 89827 | 39923 | 22457 | 14372 | 9981 | 7333 | 5614 | 4436 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 44913 | 29942 | 22457 | 17965 | 14971 | 12832 | 11228 | 9981 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| 4 x 5/16 | 8.421 | 16.842 | 46.13 | U | 112280 | 49902 | 28070 | 17965 | 12476 | 9166 | 7018 | 5545 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 56140 | 37427 | 28070 | 22456 | 18713 | 16040 | 14035 | 12476 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| 4 x 3/8 | 10.105 | 20.210 | 54.72 | U | 134733 | 59881 | 33683 | 21557 | 14970 | 10999 | 8421 | 6653 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 67367 | 44911 | 33683 | 26947 | 22456 | 19248 | 16842 | 14970 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| 4 x 1/2 | 13.473 | 26.947 | 71.89 | U | 179640 | 79840 | 44910 | 28742 | 19960 | 14664 | 11228 | 8871 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 89820 | 59880 | 44910 | 35928 | 29940 | 25663 | 22455 | 19960 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart begins on page 86)

No. Bars/Ft. of Grating Width = 10.105 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 60 | 66 | 72 | 78 | 84 | 90 | 96 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-1/2 x 1/4 | 2.632 | 3.289 | 22.65 | U | 1404 | 1160 | 975 | 831 | 716 | 624 | 548 |
| | | | | Du | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.466 | 0.530 |
| | | | | C | 3509 | 3190 | 2924 | 2699 | 2507 | 2340 | 2193 |
| | | | | Dc | 0.166 | 0.200 | 0.238 | 0.280 | 0.325 | 0.373 | 0.424 |
| 2-1/2 x 5/16 | 3.289 | 4.112 | 28.01 | U | 1754 | 1450 | 1218 | 1038 | 895 | 780 | 685 |
| | | | | Du | 0.207 | 0.250 | 0.298 | 0.350 | 0.405 | 0.466 | 0.529 |
| | | | | C | 4385 | 3987 | 3654 | 3373 | 3132 | 2924 | 2741 |
| | | | | Dc | 0.165 | 0.200 | 0.238 | 0.280 | 0.324 | 0.372 | 0.424 |
| 2-1/2 x 3/8 | 3.947 | 4.934 | 33.36 | U | 2105 | 1740 | 1462 | 1246 | 1074 | 936 | 822 |
| | | | | Du | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.466 | 0.529 |
| | | | | C | 5263 | 4784 | 4386 | 4048 | 3759 | 3508 | 3289 |
| | | | | Dc | 0.166 | 0.200 | 0.238 | 0.280 | 0.324 | 0.372 | 0.424 |
| 3 x 1/4 | 3.789 | 5.684 | 28.95 | U | 2021 | 1670 | 1403 | 1196 | 1031 | 898 | 789 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.441 |
| | | | | C | 5052 | 4593 | 4210 | 3886 | 3609 | 3368 | 3158 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3 x 5/16 | 4.737 | 7.105 | 35.41 | U | 2526 | 2088 | 1754 | 1495 | 1289 | 1123 | 987 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.441 |
| | | | | C | 6316 | 5742 | 5263 | 4858 | 4511 | 4211 | 3948 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3 x 3/8 | 5.684 | 8.526 | 41.88 | U | 3031 | 2505 | 2105 | 1794 | 1547 | 1347 | 1184 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.441 |
| | | | | C | 7579 | 6890 | 6316 | 5830 | 5413 | 5052 | 4737 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3 x 1/2 | 7.579 | 11.368 | 54.72 | U | 4042 | 3341 | 2807 | 2392 | 2062 | 1797 | 1579 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.441 |
| | | | | C | 10105 | 9187 | 8421 | 7773 | 7218 | 6737 | 6316 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3-1/2 x 1/4 | 5.158 | 9.026 | 33.29 | U | 2751 | 2273 | 1910 | 1628 | 1404 | 1223 | 1075 |
| | | | | Du | 0.148 | 0.179 | 0.213 | 0.250 | 0.290 | 0.333 | 0.379 |
| | | | | C | 6877 | 6252 | 5731 | 5290 | 4912 | 4585 | 4298 |
| | | | | Dc | 0.118 | 0.143 | 0.170 | 0.200 | 0.232 | 0.266 | 0.303 |
| 3-1/2 x 3/8 | 7.737 | 13.539 | 48.25 | U | 4126 | 3410 | 2866 | 2442 | 2105 | 1834 | 1612 |
| | | | | Du | 0.148 | 0.179 | 0.213 | 0.250 | 0.290 | 0.333 | 0.378 |
| | | | | C | 10316 | 9378 | 8597 | 7935 | 7369 | 6877 | 6448 |
| | | | | Dc | 0.118 | 0.143 | 0.170 | 0.200 | 0.232 | 0.266 | 0.303 |
| 3-1/2 x 1/2 | 10.316 | 18.052 | 63.30 | U | 5502 | 4547 | 3821 | 3256 | 2807 | 2445 | 2149 |
| | | | | Du | 0.148 | 0.179 | 0.213 | 0.250 | 0.290 | 0.332 | 0.378 |
| | | | | C | 13755 | 12504 | 11462 | 10581 | 9825 | 9170 | 8597 |
| | | | | Dc | 0.118 | 0.143 | 0.170 | 0.200 | 0.232 | 0.266 | 0.303 |
| 4 x 1/4 | 6.737 | 13.473 | 37.54 | U | 3593 | 2969 | 2495 | 2126 | 1833 | 1597 | 1404 |
| | | | | Du | 0.129 | 0.157 | 0.186 | 0.219 | 0.253 | 0.291 | 0.331 |
| | | | | C | 8983 | 8166 | 7486 | 6910 | 6416 | 5988 | 5614 |
| | | | | Dc | 0.104 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| 4 x 5/16 | 8.421 | 16.842 | 46.13 | U | 4491 | 3712 | 3119 | 2658 | 2291 | 1996 | 1754 |
| | | | | Du | 0.129 | 0.156 | 0.186 | 0.219 | 0.253 | 0.291 | 0.331 |
| | | | | C | 11228 | 10207 | 9357 | 8637 | 8020 | 7485 | 7018 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| 4 x 3/8 | 10.105 | 20.210 | 54.72 | U | 5389 | 4454 | 3743 | 3189 | 2750 | 2395 | 2105 |
| | | | | Du | 0.129 | 0.157 | 0.186 | 0.219 | 0.254 | 0.291 | 0.331 |
| | | | | C | 13473 | 12248 | 11228 | 10364 | 9624 | 8982 | 8421 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| 4 x 1/2 | 13.473 | 26.947 | 71.89 | U | 7186 | 5939 | 4990 | 4252 | 3666 | 3194 | 2807 |
| | | | | Du | 0.129 | 0.156 | 0.186 | 0.219 | 0.253 | 0.291 | 0.331 |
| | | | | C | 17964 | 16331 | 14970 | 13818 | 12831 | 11976 | 11228 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

## STATIC LOAD & DEFLECTION TABLE

(Chart continues on page 89)

No. Bars/Ft. of Grating Width = 10.105 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-1/2 x 1/4 | 8.526 | 19.184 | 41.88 | U | 113680 | 50524 | 28420 | 18189 | 12631 | 9280 | 7105 | 5614 |
| | | | | Du | 0.005 | 0.010 | 0.018 | 0.029 | 0.041 | 0.056 | 0.074 | 0.093 |
| | | | | C | 56840 | 37893 | 28420 | 22736 | 18947 | 16240 | 14210 | 12631 |
| | | | | Dc | 0.004 | 0.008 | 0.015 | 0.023 | 0.033 | 0.045 | 0.059 | 0.075 |
| 4-1/2 x 3/8 | 12.789 | 28.776 | 61.18 | U | 170520 | 75787 | 42630 | 27283 | 18947 | 13920 | 10658 | 8421 |
| | | | | Du | 0.005 | 0.010 | 0.018 | 0.029 | 0.041 | 0.056 | 0.074 | 0.093 |
| | | | | C | 85260 | 56840 | 42630 | 34104 | 28420 | 24360 | 21315 | 18947 |
| | | | | Dc | 0.004 | 0.008 | 0.015 | 0.023 | 0.033 | 0.045 | 0.059 | 0.075 |
| 4-1/2 x 1/2 | 17.052 | 38.367 | 80.48 | U | 227360 | 101049 | 56840 | 36378 | 25262 | 18560 | 14210 | 11228 |
| | | | | Du | 0.005 | 0.010 | 0.018 | 0.029 | 0.041 | 0.056 | 0.074 | 0.093 |
| | | | | C | 113680 | 75787 | 56840 | 45472 | 37893 | 32480 | 28420 | 25262 |
| | | | | Dc | 0.004 | 0.008 | 0.015 | 0.023 | 0.033 | 0.045 | 0.059 | 0.074 |
| 5 x 1/4 | 10.526 | 26.315 | 46.13 | U | 140347 | 62376 | 35087 | 22455 | 15594 | 11457 | 8772 | 6931 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 70173 | 46782 | 35087 | 28069 | 23391 | 20050 | 17543 | 15594 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5 x 5/16 | 13.158 | 32.894 | 56.84 | U | 175440 | 77973 | 43860 | 28070 | 19493 | 14322 | 10965 | 8664 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 87720 | 58480 | 43860 | 35088 | 29240 | 25063 | 21930 | 19493 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5 x 3/8 | 15.789 | 39.473 | 67.65 | U | 210520 | 93564 | 52630 | 33683 | 23391 | 17185 | 13158 | 10396 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 105260 | 70173 | 52630 | 42104 | 35087 | 30074 | 26315 | 23391 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.013 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5 x 1/2 | 21.052 | 52.630 | 89.07 | U | 280693 | 124753 | 70173 | 44911 | 31188 | 22914 | 17543 | 13861 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 140347 | 93564 | 70173 | 56139 | 46782 | 40099 | 35087 | 31188 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.013 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5-1/2 x 1/4 | 12.737 | 35.025 | 50.42 | U | 169827 | 75479 | 42457 | 27172 | 18870 | 13863 | 10614 | 8387 |
| | | | | Du | 0.004 | 0.008 | 0.015 | 0.024 | 0.034 | 0.046 | 0.060 | 0.076 |
| | | | | C | 84913 | 56609 | 42457 | 33965 | 28304 | 24261 | 21228 | 18870 |
| | | | | Dc | 0.003 | 0.007 | 0.012 | 0.019 | 0.027 | 0.037 | 0.048 | 0.061 |
| 5-1/2 x 3/8 | 19.105 | 52.538 | 74.02 | U | 254733 | 113215 | 63683 | 40757 | 28304 | 20795 | 15921 | 12579 |
| | | | | Du | 0.004 | 0.008 | 0.015 | 0.024 | 0.034 | 0.046 | 0.060 | 0.076 |
| | | | | C | 127367 | 84911 | 63683 | 50947 | 42456 | 36390 | 31842 | 28304 |
| | | | | Dc | 0.003 | 0.007 | 0.012 | 0.019 | 0.027 | 0.037 | 0.048 | 0.061 |
| 5-1/2 x 1/2 | 25.473 | 70.051 | 97.66 | U | 339640 | 150951 | 84910 | 54342 | 37738 | 27726 | 21228 | 16772 |
| | | | | Du | 0.004 | 0.008 | 0.015 | 0.024 | 0.034 | 0.046 | 0.060 | 0.076 |
| | | | | C | 169820 | 113213 | 84910 | 67928 | 56607 | 48520 | 42455 | 37738 |
| | | | | Dc | 0.003 | 0.007 | 0.012 | 0.019 | 0.027 | 0.037 | 0.048 | 0.061 |
| 6 x 1/4 | 15.158 | 45.473 | 54.72 | U | 202107 | 89825 | 50527 | 32337 | 22456 | 16499 | 12632 | 9981 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 101053 | 67369 | 50527 | 40421 | 33684 | 28872 | 25263 | 22456 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |
| 6 x 5/16 | 18.497 | 56.841 | 67.65 | U | 252627 | 112279 | 63157 | 40420 | 28070 | 20623 | 15789 | 12475 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 126313 | 84209 | 63157 | 50525 | 42104 | 36090 | 31578 | 28070 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |
| 6 x 3/8 | 22.736 | 68.209 | 80.48 | U | 303147 | 134732 | 75787 | 48503 | 33683 | 24747 | 18947 | 14970 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 151573 | 101049 | 75787 | 60629 | 50524 | 43307 | 37893 | 33683 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |
| 6 x 1/2 | 30.315 | 90.945 | 106.25 | U | 404200 | 179644 | 101050 | 64672 | 44911 | 32996 | 25263 | 19960 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 202100 | 134733 | 101050 | 80840 | 67367 | 57743 | 50525 | 44911 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart begins on page 88)

No. Bars/Ft. of Grating Width = 10.105 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 60 | 66 | 72 | 78 | 84 | 90 | 96 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-1/2 x 1/4 | 8.526 | 19.184 | 41.88 | U | 4547 | 3758 | 3158 | 2691 | 2320 | 2021 | 1776 |
| | | | | Du | 0.115 | 0.139 | 0.166 | 0.194 | 0.225 | 0.259 | 0.294 |
| | | | | C | 11368 | 10335 | 9473 | 8745 | 8120 | 7579 | 7105 |
| | | | | Dc | 0.092 | 0.111 | 0.132 | 0.155 | 0.180 | 0.207 | 0.235 |
| 4-1/2 x 3/8 | 12.789 | 28.776 | 61.18 | U | 6821 | 5637 | 4737 | 4036 | 3480 | 3031 | 2664 |
| | | | | Du | 0.115 | 0.139 | 0.166 | 0.194 | 0.225 | 0.259 | 0.294 |
| | | | | C | 17052 | 15502 | 14210 | 13117 | 12180 | 11368 | 10658 |
| | | | | Dc | 0.092 | 0.111 | 0.132 | 0.155 | 0.180 | 0.207 | 0.235 |
| 4-1/2 x 1/2 | 17.052 | 38.367 | 80.48 | U | 9094 | 7516 | 6316 | 5381 | 4640 | 4042 | 3553 |
| | | | | Du | 0.115 | 0.139 | 0.166 | 0.194 | 0.225 | 0.259 | 0.294 |
| | | | | C | 22736 | 20669 | 18947 | 17489 | 16240 | 15157 | 14210 |
| | | | | Dc | 0.092 | 0.111 | 0.132 | 0.155 | 0.180 | 0.207 | 0.235 |
| 5 x 1/4 | 10.526 | 26.315 | 46.13 | U | 5614 | 4640 | 3899 | 3322 | 2864 | 2495 | 2193 |
| | | | | Du | 0.104 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 14035 | 12759 | 11696 | 10796 | 10025 | 9356 | 8772 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5 x 5/16 | 13.158 | 32.894 | 56.84 | U | 7018 | 5800 | 4873 | 4152 | 3580 | 3119 | 2741 |
| | | | | Du | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 17544 | 16949 | 14620 | 13495 | 12531 | 11696 | 10965 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5 x 3/8 | 15.789 | 39.473 | 67.65 | U | 8421 | 6959 | 5848 | 4983 | 4296 | 3743 | 3289 |
| | | | | Du | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 21052 | 19138 | 17543 | 16194 | 15037 | 14035 | 13158 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5 x 1/2 | 21.052 | 52.630 | 89.07 | U | 11228 | 9279 | 7797 | 6644 | 5728 | 4990 | 4386 |
| | | | | Du | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 28069 | 25518 | 23391 | 21592 | 20050 | 18713 | 17543 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5-1/2 x 1/4 | 12.737 | 35.025 | 50.42 | U | 6793 | 5614 | 4717 | 4020 | 3466 | 3019 | 2654 |
| | | | | Du | 0.094 | 0.114 | 0.135 | 0.159 | 0.184 | 0.212 | 0.241 |
| | | | | C | 16983 | 15439 | 14152 | 13064 | 12130 | 11322 | 10614 |
| | | | | Dc | 0.075 | 0.091 | 0.108 | 0.127 | 0.147 | 0.169 | 0.193 |
| 5-1/2 x 3/8 | 19.105 | 52.538 | 74.02 | U | 10189 | 8421 | 7076 | 6029 | 5199 | 4529 | 3980 |
| | | | | Du | 0.094 | 0.114 | 0.135 | 0.159 | 0.184 | 0.212 | 0.241 |
| | | | | C | 25473 | 23158 | 21228 | 19595 | 18195 | 16982 | 15921 |
| | | | | Dc | 0.075 | 0.091 | 0.108 | 0.127 | 0.147 | 0.169 | 0.193 |
| 5-1/2 x 1/2 | 25.473 | 70.051 | 97.66 | U | 13586 | 11228 | 9434 | 8039 | 6931 | 6038 | 5307 |
| | | | | Du | 0.094 | 0.114 | 0.135 | 0.159 | 0.184 | 0.212 | 0.241 |
| | | | | C | 33964 | 30876 | 28303 | 26126 | 24260 | 22643 | 21228 |
| | | | | Dc | 0.075 | 0.091 | 0.108 | 0.127 | 0.147 | 0.169 | 0.193 |
| 6 x 1/4 | 15.158 | 45.473 | 54.72 | U | 8084 | 6681 | 5614 | 4784 | 4125 | 3593 | 3158 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 20211 | 18373 | 16842 | 15547 | 14436 | 13474 | 12632 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |
| 6 x 5/16 | 18.497 | 56.841 | 67.65 | U | 10105 | 8351 | 7017 | 5979 | 5156 | 4491 | 3947 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 25263 | 22966 | 21052 | 19433 | 18045 | 16842 | 15789 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |
| 6 x 3/8 | 22.736 | 68.209 | 80.48 | U | 12126 | 10021 | 8421 | 7175 | 6187 | 5389 | 4737 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 30315 | 27559 | 25262 | 23319 | 21653 | 20210 | 18947 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |
| 6 x 1/2 | 30.315 | 90.945 | 106.25 | U | 16168 | 13362 | 11228 | 9567 | 8249 | 7186 | 6316 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 40420 | 36745 | 33683 | 31092 | 28871 | 26947 | 25263 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# Model Specification: 19-W-4 Heavy-Duty Steel Bar Gratings

September 14, 2022

Specifier Notes: Architect or engineer should carefully review and edit this section to meet the requirements of the project and local building codes. Coordinate this section with other specification sections and the drawings and delete any unused "Specifier Notes" and options shown in **"red"** after editing.

This section covers Pleasant Mount Welding, Inc.'s "19-W-4 Heavy-Duty Steel Bar Gratings." Consult PMWI (www.pmwi.net) for assistance in editing this section for specific applications. Call 570.282.6164 or email sales@pmwi.net with any questions.

## SECTION 055300 - Metal Fabrications: Metal Gratings

## Part 1: General

### 1.1 Section Includes

A. Prefabricated, heavy-duty carbon steel bar gratings.

B. Prefabricated support frames for gratings.

C. Miscellaneous installation hardware and accessories.

### 1.2 Reference Standards

A. ANSI A326.3-2017: American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials.

B. ASTM Grade-36 Carbon Steel.

C. ASTM A-510: Carbon Steel Wire Rods.

D. ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

### 1.3 Action Submittals

A. Product Data: The contractor shall submit the manufacturer's catalog pages including load tables, anchor details and standard installation details.

B. Shop Drawings: The contractor shall submit for approval shop drawings for the fabrication and erection of all gratings, based on construction drawings of current issue. Include plans, elevations, and details of sections and connections as required. Show type and location of all fasteners.

C. Samples of grating and anchorage system shall be submitted for approval.

### 1.4 Quality Assurance

A. Manufacturer Qualification: A company specializing in the manufacture of metal bar gratings with not less than 5 years of documented experience.

B. Fabrication tolerances shall be in accordance with applicable provisions and recommendations of ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

## Part 2: Products

### 2.1 Source Requirements:

Design is based upon use of gratings as manufactured by Pleasant Mount Welding, Inc. and terminology used herein may include reference to the specific performance or product of this manufacturer. Such reference shall be construed only as establishing the quality of materials, operational features and workmanship used under this section and shall not, in any way, be construed as limiting competition.

### 2.2 Manufacturers:

Acceptable manufacturers include Pleasant Mount Welding, Inc. (45 Dundaff Street, Carbondale, PA 18407, 570-282-6164, www.pmwi.net) or approved equal.

### 2.3 Manufactured Units:

A. **Description:** Heavy-Duty Carbon Steel Bar Grating type **19-W-4 with a Galvanized finish**. Heavy-duty cross bars are welded perpendicular to heavy-duty main bearing bars.

1. Main Bearing Bar Spacing: **1-3/16"** on center.
2. Main Bearing Bar Depth: based on loading requirements and clear span as shown on drawings.
3. Main Bearing Bar Thickness: **1/4" | 5/16" | 3/8" | 1/2"** as shown on drawings.
4. Cross Bar Spacing: **4"** on center.
5. Top Surface of Main Bearing Bars: **Smooth | Serrated | SlipNOT® Slip Resistance Coating**

B. **Fabrication:** Load Band ends of grating with bars of the same thickness as main bearing bars. Weld banding flush with the top surface of grating. Depth of banding is to be 1/2" less than the depth of the main bearing bars (as shown in drawings). **Include welded anchor blocks 1/4" from the bottom surface with hole to accept washer and attachment bolts.**

C. **Steel Frames: Carbon Steel ASTM Grade-36 frames shall be provided as shown on contract drawings to support and attach gratings. Include anchors as shown for locking frame into concrete as shown on the plans. Galvanize frames after fabrication per ASTM A-123.**

D. **Design Criteria:**

1. **Loading:** Unless shown otherwise on the contract drawings, gratings shall be designed and manufactured to meet live load conditions of **AASHTO HS-20 with 30% impact factor**. Main bearing bar depth shall be as shown in contract drawings or as recommended by the manufacturer to meet loading requirements and clear span conditions.

2. **Traction / Slip-Resistance**: When a traction surface is required, it is to be tested per ANSI A326.3-2017. Top surface shall provide a minimum Wet Dynamic Coefficient of Friction (Wet DCOF) of 0.45 to meet high traction classification.

E. **Materials:** Main bearing bars and rectangular cross bars are to be type ASTM Grade-36 Carbon Steel. Round cross bars are to be per ASTM A-510. Banding is to be carbon steel per ASTM Grade-36.

F. **Fabrication Tolerances** shall be in accordance with ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

G. **Top Surface:** When required, **SlipNOT® Slip Resistance Coating** will be included in order to meet or exceed Wet Dynamic COF requirements of paragraph 2.3 D.2 above.

H. **Finish:** Gratings and frames shall be **Hot-Dip Galvanized per ASTM A-123 or Powder Coated Black [or other color] as shown on drawings.**

**2.4 Accessories:**

Provide appropriate fasteners for type, grade, and class required for approved anchorage system. **Include lifting devices and all other accessories as shown on the drawings.**

## Part 3: Execution

**3.1 Field Verification:**

Take field measurements prior to preparation of final shop drawings (and fabrication where required) to ensure proper fitting of the work.

**3.2 Installation**

A. Prior to grating installation, contractor shall inspect supports for correct alignment and conditions for proper attachment and support of the gratings. Metal shall be used for all grating supports and provide the minimum bearing surface for the depth of grating per ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual. Ends of all bearing bars at cutouts for penetrations are to be supported in like manner. Any inconsistencies between contract drawings and supporting structure deemed detrimental to grating placement shall be reported in writing to the engineer, architect or owner's agent prior to placement.

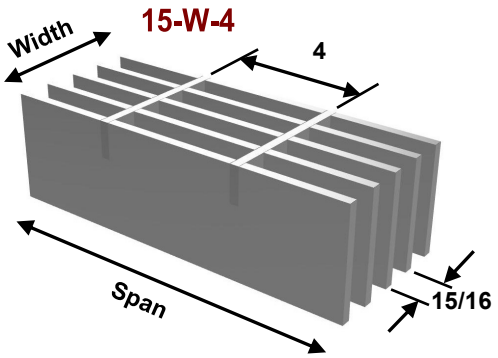
B. Install grating in accordance with shop drawings and standard installation clearances as recommended by ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

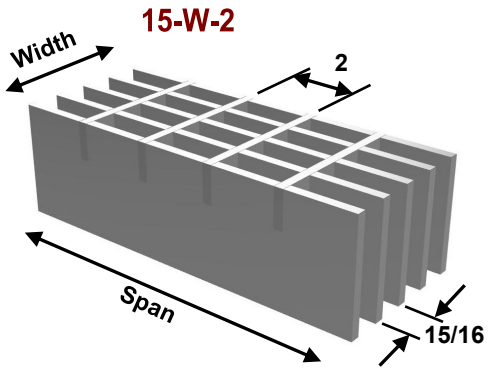
**3.3 Grating Attachment:**

Use approved attachment system and fasteners to secure grating to supporting members as shown on plans.

# 15-SPACE

# HEAVY DUTY WELDED STEEL GRATING




| % Open Area* | | | | |
|---|---|---|---|---|
| BB Size | CB Ctrs | Bearing Bar Thickness | | |
| | | 1/4" | 5/16" | 3/8" |
| Thru 2-1/2" | 4" cc | 66% | 60% | 54% |
| | 2" cc | 60% | 55% | 49% |
| 3" to 6" | 4" cc | 69% | 62% | 56% |
| | 2" cc | 64% | 58% | 53% |

## VEHICULAR LOAD TABLE

| Bearing Bar Size (Inches) | Weight ** (Lbs./Sqft.) | Section Properties | | Maximum Safe Clear Span (Inches) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Sx ** ($In^3$/Ft. Width) | Ix ** ($In^4$/Ft. Width) | Auto Traffic | 1 Ton | 3 Ton | 5 Ton | H-15 | H20/ HL-93 | H-25 |
| 1 x 1/4 | 12.01 | 0.533 | 0.267 | 14 | 8 | 7 | 8 | 10 | 12 | 13 |
| 1 x 3/8 | 17.51 | 0.800 | 0.400 | 19 | 11 | 8 | 10 | 13 | 15 | 16 |
| 1-1/4 x 1/4 | 14.70 | 0.833 | 0.521 | 20 | 11 | 9 | 10 | 13 | 15 | 16 |
| 1-1/4 x 3/8 | 21.48 | 1.250 | 0.781 | 25* | 16 | 11 | 13 | 16 | 18 | 20 |
| 1-1/2 x 1/4 | 17.51 | 1.200 | 0.900 | 27 | 15 | 11 | 13 | 16 | 18 | 29 |
| 1-1/2 x 5/16 | 21.48 | 1.500 | 1.125 | 30* | 19 | 13 | 15 | 18 | 20 | 22 |
| 1-1/2 x 3/8 | 25.58 | 1.800 | 1.350 | 33* | 22 | 15 | 16 | 20 | 22 | 24 |
| 1-3/4 x 1/4 | 20.20 | 1.633 | 1.429 | 34* | 20 | 14 | 15 | 19 | 21 | 23 |
| 1-3/4 x 3/8 | 29.67 | 2.450 | 2.144 | 42* | 30 | 20 | 21 | 25 | 27 | 29 |
| 2 x 1/4 | 22.89 | 2.133 | 2.133 | 42* | 26 | 17 | 19 | 22 | 24 | 27 |
| 2 x 5/16 | 28.39 | 2.667 | 2.667 | 47* | 32 | 21 | 22 | 26 | 28 | 30 |
| 2 x 3/8 | 33.77 | 3.200 | 3.200 | 51* | 38 | 25 | 25 | 30 | 32 | 34 |
| 2-1/4 x 1/4 | 25.58 | 2.700 | 3.038 | 50* | 32 | 21 | 22 | 26 | 28 | 31 |
| 2-1/4 x 3/8 | 37.87 | 4.050 | 4.556 | 57* | 47* | 30 | 31 | 36 | 38 | 40 |
| 2-1/2 x 1/4 | 28.39 | 3.333 | 4.167 | 55* | 40 | 26 | 26 | 31 | 33 | 35 |
| 2-1/2 x 5/16 | 35.18 | 4.167 | 5.208 | 59* | 49 | 31 | 32 | 37 | 39 | 41 |
| 2-1/2 x 3/8 | 41.96 | 5.000 | 6.250 | 63* | 53* | 37 | 37 | 43 | 45 | 46 |
| 3 x 1/4 | 35.82 | 4.800 | 7.200 | 66* | 56 | 36 | 36 | 42 | 43 | 45 |
| 3 x 5/16 | 44.01 | 6.000 | 9.000 | 71* | 60* | 44 | 43 | 50 | 52 | 53 |
| 3 x 3/8 | 52.20 | 7.200 | 10.800 | 76* | 64* | 52 | 51 | 55* | 55* | 56* |
| 3-1/2 x 1/4 | 41.32 | 6.533 | 11.433 | 77* | 65* | 47 | 47 | 54 | 55 | 57 |
| 3-1/2 x 3/8 | 60.27 | 9.800 | 17.150 | 88* | 75* | 63* | 62* | 65* | 64* | 65* |
| 4 x 1/4 | 46.70 | 8.533 | 17.067 | 88* | 75* | 61 | 59 | 64* | 64* | 64* |
| 4 x 5/16 | 57.58 | 10.667 | 21.333 | 95* | 80* | 68* | 66* | 69* | 69* | 69* |
| 4 x 3/8 | 68.46 | 12.800 | 25.600 | 96* | 86* | 72* | 71* | 74* | 73* | 73* |
| 4-1/2 x 1/4 | 52.20 | 10.800 | 24.300 | 96* | 84* | 71* | 69* | 72* | 72* | 72* |
| 4-1/2 x 3/8 | 76.65 | 16.200 | 36.450 | 96* | 96* | 81* | 79* | 83* | 82* | 82* |
| 5 x 1/4 | 57.58 | 13.333 | 33.333 | 96* | 93* | 79* | 77* | 81* | 80* | 80* |
| 5 x 5/16 | 71.15 | 16.667 | 41.667 | 96* | 96* | 85* | 83* | 87* | 86* | 86* |
| 5 x 3/8 | 84.84 | 20.000 | 50.000 | 96* | 96* | 90* | 88* | 92* | 92* | 91* |
| 5-1/2 x 1/4 | 63.02 | 16.133 | 44.367 | 96* | 96* | 86* | 85* | 89* | 88* | 88* |
| 5-1/2 x 3/8 | 92.91 | 24.200 | 66.550 | 96* | 96* | 96* | 96* | 96* | 96* | 96* |
| 6 x 1/4 | 68.46 | 19.200 | 57.600 | 96* | 96* | 94* | 92* | 96* | 96* | 96* |
| 6 x 5/16 | 84.84 | 24.000 | 72.000 | 96* | 96* | 96* | 96* | 96* | 96* | 96* |
| 6 x 3/8 | 101.10 | 28.800 | 86.400 | 96* | 96* | 96* | 96* | 96* | 96* | 96* |

*Maximum spans are limited by maximum allowable stress or the lesser deflection of L/400 or 1/8" to a maximum simple span of 8'-0" (2,438mm). **Based on 12.8 bars/ft. of grating width. Bearing bars 15/16" center-to-center spacing. When serrated grating is specified, the depth of grating required for a specified load will be 1/4" greater than that shown in these tables. Weights shown are for 4" cross bar centers. Add 1.13 lbs/sqft. (3/8" Dia. CB) or 3.18 lbs./sqft. (1-1/4" x 1/4" CB) for 2" cross bar centers. Cross bars are determined based on project applications and bearing bar height.

# 15-SPACE

# HEAVY DUTY WELDED STEEL GRATING

## MAXIMUM SAFE CONCENTRATED LOADS

| Bearing Bar Size (Inches) | Maximum Safe Concentrated Load* (Lbs./Ft. of Grating Width) - Clear Span | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1'-0" | 1'-6" | 2'-0" | 2'-6" | 3'-0" | 3'-6" | 4'-0" | 4'-6" | 5'-0" | 5'-6" | 6'-0" | 7'-0" | 8'-0" |
| 1 x 1/4 | 3553 | 2369 | 1777 | 1421 | 1184 | 1015 | | | | | | | |
| 1 x 3/8 | 5333 | 3556 | 2667 | 2133 | 1778 | 1524 | | | | | | | |
| 1-1/4 x 1/4 | 5553 | 3702 | 2777 | 2221 | 1851 | 1587 | 1388 | | | | | | |
| 1-1/4 x 3/8 | 8333 | 5556 | 4167 | 3333 | 2778 | 2381 | 2083 | | | | | | |
| 1-1/2 x 1/4 | 8000 | 5333 | 4000 | 3200 | 2667 | 2286 | 2000 | 1778 | | | | | |
| 1-1/2 x 5/16 | 10000 | 6667 | 5000 | 4000 | 3333 | 2857 | 2500 | 2222 | | | | | |
| 1-1/2 x 3/8 | 12000 | 8000 | 6000 | 4800 | 4000 | 3429 | 3000 | 2667 | | | | | |
| 1-3/4 x 1/4 | 10887 | 7258 | 5443 | 4355 | 3629 | 3110 | 2722 | 2419 | 2177 | | | | |
| 1-3/4 x 3/8 | 16333 | 10889 | 8167 | 6533 | 5444 | 4667 | 4083 | 3630 | 3267 | | | | |
| 2 x 1/4 | 14220 | 9480 | 7110 | 5688 | 4740 | 4063 | 3555 | 3160 | 2844 | | | | |
| 2 x 5/16 | 17780 | 11853 | 8890 | 7112 | 5927 | 5080 | 4445 | 3951 | 3556 | | | | |
| 2 x 3/8 | 21333 | 14222 | 10667 | 8533 | 7111 | 6095 | 5333 | 4741 | 4267 | | | | |
| 2-1/4 x 1/4 | 18000 | 12000 | 9000 | 7200 | 6000 | 5143 | 4500 | 4000 | 3600 | 3273 | | | |
| 2-1/4 x 3/8 | 27000 | 18000 | 13500 | 10800 | 9000 | 7714 | 6750 | 6000 | 5400 | 4909 | | | |
| 2-1/2 x 1/4 | 22220 | 14813 | 11110 | 8888 | 7407 | 6349 | 5555 | 4938 | 4444 | 4040 | 3703 | | |
| 2-1/2 x 5/16 | 27780 | 18520 | 13890 | 11112 | 9260 | 7937 | 6945 | 6173 | 5556 | 5051 | 4630 | | |
| 2-1/2 x 3/8 | 33333 | 22222 | 16667 | 13333 | 11111 | 9524 | 8333 | 7407 | 6667 | 6061 | 5556 | | |
| 3 x 1/4 | 32000 | 21333 | 16000 | 12800 | 10667 | 9143 | 8000 | 7111 | 6400 | 5818 | 5333 | | |
| 3 x 5/16 | 40000 | 26667 | 20000 | 16000 | 13333 | 11429 | 10000 | 8889 | 8000 | 7273 | 6667 | | |
| 3 x 3/8 | 48000 | 32000 | 24000 | 19200 | 16000 | 13714 | 12000 | 10667 | 9600 | 8727 | 8000 | | |
| 3-1/2 x 1/4 | 43553 | 29036 | 21777 | 17421 | 14518 | 12444 | 10888 | 9679 | 8711 | 7919 | 7259 | 6222 | |
| 3-1/2 x 3/8 | 65333 | 43556 | 32667 | 26133 | 21778 | 18667 | 16333 | 14519 | 13067 | 11879 | 10889 | 9333 | |
| 4 x 1/4 | 56887 | 37924 | 28443 | 22755 | 18962 | 16253 | 14222 | 12641 | 11377 | 10343 | 9481 | 8127 | |
| 4 x 5/16 | | 47409 | 35557 | 28445 | 23704 | 20318 | 17778 | 15803 | 14223 | 12930 | 11852 | 10159 | |
| 4 x 3/8 | | 56889 | 42667 | 34133 | 28444 | 24381 | 21333 | 18963 | 17067 | 15515 | 14222 | 12190 | |
| 4-1/2 x 1/4 | | 48000 | 36000 | 28800 | 24000 | 20571 | 18000 | 16000 | 14400 | 13091 | 12000 | 10286 | 9000 |
| 4-1/2 x 3/8 | | | 54000 | 43200 | 36000 | 30857 | 27000 | 24000 | 21600 | 19636 | 18000 | 15429 | 13500 |
| 5 x 1/4 | | | 44443 | 35555 | 29629 | 25396 | 22222 | 19753 | 17777 | 16161 | 14814 | 12698 | 11111 |
| 5 x 5/16 | | | 55557 | 44445 | 37038 | 31747 | 27778 | 24692 | 22223 | 20202 | 18519 | 15873 | 13889 |
| 5 x 3/8 | | | 66667 | 53333 | 44444 | 38095 | 33333 | 29630 | 26667 | 24242 | 22222 | 19048 | 16667 |
| 5-1/2 x 1/4 | | | 53777 | 43021 | 35851 | 30730 | 26888 | 23901 | 21511 | 19555 | 17926 | 15365 | 13444 |
| 5-1/2 x 3/8 | | | | | 53778 | 46095 | 40333 | 35852 | 32267 | 29333 | 26889 | 23048 | 20167 |
| 6 x 1/4 | | | | | 42667 | 36571 | 32000 | 28444 | 25600 | 23273 | 21333 | 18286 | 16000 |
| 6 x 5/16 | | | | | 53333 | 45714 | 40000 | 35556 | 32000 | 29091 | 26667 | 22857 | 20000 |
| 6 x 3/8 | | | | | | 54857 | 48000 | 42667 | 38400 | 34909 | 32000 | 27429 | 24000 |

| % Open Area* | | | | |
|---|---|---|---|---|
| BB Size | CB Ctrs | Bearing Bar Thickness | | |
| | | 1/4" | 5/16" | 3/8" |
| Thru 2-1/2" | 4" cc | 66% | 60% | 54% |
| | 2" cc | 60% | 55% | 49% |
| 3" to 6" | 4" cc | 69% | 62% | 56% |
| | 2" cc | 64% | 58% | 53% |

*Loads are theoretical, and are based on a unit stress of 20,000 psi.*

*Based on 12.8 bars/ft. of grating width. Bearing bars 15/16" center-to-center spacing. **Note:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

### Panel Width Chart (in.) - 15-W-4 & 15-W-2

**Dimensions are Out-to-Out of Bearing Bars****

| No. of Bars | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4" Bars | $1\frac{3}{16}$ | $2\frac{1}{8}$ | $3\frac{1}{16}$ | 4 | $4\frac{15}{16}$ | $5\frac{7}{8}$ | $6\frac{13}{16}$ | $7\frac{3}{4}$ | $8\frac{11}{16}$ | $9\frac{5}{8}$ | $10\frac{9}{16}$ | $11\frac{1}{2}$ | $12\frac{7}{16}$ | $13\frac{3}{8}$ | $14\frac{5}{16}$ |
| 5/16" Bars | $1\frac{1}{4}$ | $2\frac{3}{16}$ | $3\frac{1}{8}$ | $4\frac{1}{16}$ | 5 | $5\frac{15}{16}$ | $6\frac{7}{8}$ | $7\frac{13}{16}$ | $8\frac{3}{4}$ | $9\frac{11}{16}$ | $10\frac{5}{8}$ | $11\frac{9}{16}$ | $12\frac{1}{2}$ | $13\frac{7}{16}$ | $14\frac{3}{8}$ |
| 3/8" Bars | $1\frac{5}{16}$ | $2\frac{1}{4}$ | $3\frac{3}{16}$ | $4\frac{1}{8}$ | $5\frac{1}{16}$ | 6 | $6\frac{15}{16}$ | $7\frac{7}{8}$ | $8\frac{13}{16}$ | $9\frac{3}{4}$ | $10\frac{11}{16}$ | $11\frac{5}{8}$ | $12\frac{9}{16}$ | $13\frac{1}{2}$ | $14\frac{7}{16}$ |

| No. of Bars | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4" Bars | $15\frac{1}{4}$ | $16\frac{3}{16}$ | $17\frac{1}{8}$ | $18\frac{1}{16}$ | 19 | $19\frac{15}{16}$ | $20\frac{7}{8}$ | $21\frac{13}{16}$ | $22\frac{3}{4}$ | $23\frac{11}{16}$ | $24\frac{5}{8}$ | $25\frac{9}{16}$ | $26\frac{1}{2}$ | $27\frac{7}{16}$ | $28\frac{3}{8}$ |
| 5/16" Bars | $15\frac{5}{16}$ | $16\frac{1}{4}$ | $17\frac{3}{16}$ | $18\frac{1}{8}$ | $19\frac{1}{16}$ | 20 | $20\frac{15}{16}$ | $21\frac{7}{8}$ | $22\frac{13}{16}$ | $23\frac{3}{14}$ | $24\frac{11}{16}$ | $25\frac{5}{8}$ | $26\frac{9}{16}$ | $27\frac{1}{2}$ | $28\frac{7}{16}$ |
| 3/8" Bars | $15\frac{3}{8}$ | $16\frac{5}{16}$ | $17\frac{1}{4}$ | $18\frac{3}{16}$ | $19\frac{1}{8}$ | $20\frac{1}{16}$ | 21 | $21\frac{15}{16}$ | $22\frac{7}{8}$ | $23\frac{13}{16}$ | $24\frac{3}{4}$ | $25\frac{11}{16}$ | $26\frac{5}{8}$ | $27\frac{9}{16}$ | $28\frac{1}{2}$ |

| No. of Bars | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4" Bars | $29\frac{5}{16}$ | $30\frac{1}{4}$ | $31\frac{3}{16}$ | $32\frac{1}{8}$ | $33\frac{1}{16}$ | 34 | $34\frac{15}{16}$ | $35\frac{7}{8}$ | | | | | | | |
| 5/16" Bars | $29\frac{3}{8}$ | $30\frac{5}{16}$ | $31\frac{1}{4}$ | $32\frac{3}{16}$ | $33\frac{1}{8}$ | $34\frac{1}{16}$ | 35 | $35\frac{15}{16}$ | | | | | | | |
| 3/8" Bars | $29\frac{7}{16}$ | $30\frac{3}{8}$ | $31\frac{5}{16}$ | $32\frac{1}{4}$ | $33\frac{3}{16}$ | $34\frac{1}{8}$ | $35\frac{1}{16}$ | 36 | | | | | | | |

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart continues on page 96)

No. Bars/Ft. of Grating Width = 12.800 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus $in.^3$/ Foot of Grating Width | Moment of Inertia $in.^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 x 1/4 | 0.533 | 0.267 | 12.01 | U | 7107 | 3159 | 1777 | 1137 | 790 | 580 | 444 | 351 |
| | | | | Du | 0.021 | 0.046 | 0.083 | 0.129 | 0.186 | 0.253 | 0.330 | 0.418 |
| | | | | C | 3553 | 2369 | 1777 | 1421 | 1184 | 1015 | 888 | 790 |
| | | | | Dc | 0.017 | 0.037 | 0.066 | 0.103 | 0.149 | 0.202 | 0.264 | 0.335 |
| 1 x 3/8 | 0.800 | 0.400 | 17.51 | U | 10667 | 4741 | 2667 | 1707 | 1185 | 871 | 667 | 527 |
| | | | | Du | 0.021 | 0.047 | 0.083 | 0.129 | 0.186 | 0.254 | 0.331 | 0.419 |
| | | | | C | 5333 | 3556 | 2667 | 2133 | 1778 | 1524 | 1333 | 1185 |
| | | | | Dc | 0.017 | 0.037 | 0.066 | 0.103 | 0.149 | 0.203 | 0.265 | 0.335 |
| 1-1/4 x 1/4 | 0.833 | 0.521 | 14.70 | U | 11107 | 4936 | 2777 | 1777 | 1234 | 907 | 694 | 548 |
| | | | | Du | 0.017 | 0.037 | 0.066 | 0.103 | 0.149 | 0.203 | 0.265 | 0.335 |
| | | | | C | 5553 | 3702 | 2777 | 2221 | 1851 | 1587 | 1388 | 1234 |
| | | | | Dc | 0.013 | 0.030 | 0.053 | 0.083 | 0.119 | 0.162 | 0.212 | 0.268 |
| 1-1/4 x 3/8 | 1.250 | 0.781 | 21.48 | U | 16667 | 7407 | 4167 | 2667 | 1852 | 1361 | 1042 | 823 |
| | | | | Du | 0.017 | 0.037 | 0.066 | 0.103 | 0.149 | 0.203 | 0.265 | 0.335 |
| | | | | C | 8333 | 5556 | 4167 | 3333 | 2778 | 2381 | 2083 | 1852 |
| | | | | Dc | 0.013 | 0.030 | 0.053 | 0.083 | 0.119 | 0.162 | 0.212 | 0.268 |
| 1-1/2 x 1/4 | 1.200 | 0.900 | 17.51 | U | 16000 | 7111 | 4000 | 2560 | 1778 | 1306 | 1000 | 790 |
| | | | | Du | 0.014 | 0.031 | 0.055 | 0.086 | 0.124 | 0.169 | 0.221 | 0.279 |
| | | | | C | 8000 | 5333 | 4000 | 3200 | 2667 | 2286 | 2000 | 1778 |
| | | | | Dc | 0.011 | 0.025 | 0.044 | 0.069 | 0.099 | 0.135 | 0.177 | 0.223 |
| 1-1/2 x 5/16 | 1.500 | 1.125 | 21.48 | U | 20000 | 8889 | 5000 | 3200 | 2222 | 1633 | 1250 | 988 |
| | | | | Du | 0.014 | 0.031 | 0.055 | 0.086 | 0.124 | 0.169 | 0.221 | 0.279 |
| | | | | C | 10000 | 6667 | 5000 | 4000 | 3333 | 2857 | 2500 | 2222 |
| | | | | Dc | 0.011 | 0.025 | 0.044 | 0.069 | 0.099 | 0.135 | 0.177 | 0.223 |
| 1-1/2 x 3/8 | 1.800 | 1.350 | 25.58 | U | 24000 | 10667 | 6000 | 3840 | 2667 | 1959 | 1500 | 1185 |
| | | | | Du | 0.014 | 0.031 | 0.055 | 0.086 | 0.124 | 0.169 | 0.221 | 0.279 |
| | | | | C | 12000 | 8000 | 6000 | 4800 | 4000 | 3429 | 3000 | 2667 |
| | | | | Dc | 0.011 | 0.025 | 0.044 | 0.069 | 0.099 | 0.135 | 0.177 | 0.223 |
| 1-3/4 x 1/4 | 1.633 | 1.429 | 20.20 | U | 21773 | 9677 | 5443 | 3484 | 2419 | 1777 | 1361 | 1075 |
| | | | | Du | 0.012 | 0.027 | 0.047 | 0.074 | 0.106 | 0.145 | 0.189 | 0.239 |
| | | | | C | 10887 | 7258 | 5443 | 4355 | 3629 | 3110 | 2722 | 2419 |
| | | | | Dc | 0.009 | 0.021 | 0.038 | 0.059 | 0.085 | 0.116 | 0.151 | 0.191 |
| 1-3/4 x 3/8 | 2.450 | 2.144 | 29.67 | U | 32667 | 14519 | 8167 | 5227 | 3630 | 2667 | 2042 | 1613 |
| | | | | Du | 0.012 | 0.027 | 0.047 | 0.074 | 0.106 | 0.145 | 0.189 | 0.239 |
| | | | | C | 16333 | 10889 | 8167 | 6533 | 5444 | 4667 | 4083 | 3630 |
| | | | | Dc | 0.009 | 0.021 | 0.038 | 0.059 | 0.085 | 0.116 | 0.151 | 0.191 |
| 2 x 1/4 | 2.133 | 2.133 | 22.89 | U | 28440 | 12640 | 7110 | 4550 | 3160 | 2322 | 1778 | 1404 |
| | | | | Du | 0.010 | 0.023 | 0.041 | 0.065 | 0.093 | 0.127 | 0.166 | 0.209 |
| | | | | C | 14220 | 9480 | 7110 | 5688 | 4740 | 4063 | 3555 | 3160 |
| | | | | Dc | 0.008 | 0.019 | 0.033 | 0.052 | 0.074 | 0.101 | 0.132 | 0.168 |
| 2 x 5/16 | 2.667 | 2.667 | 28.39 | U | 35560 | 15804 | 8890 | 5690 | 3951 | 2903 | 2223 | 1756 |
| | | | | Du | 0.010 | 0.023 | 0.041 | 0.065 | 0.093 | 0.127 | 0.166 | 0.209 |
| | | | | C | 17780 | 11853 | 8890 | 7112 | 5927 | 5080 | 4445 | 3951 |
| | | | | Dc | 0.008 | 0.019 | 0.033 | 0.052 | 0.074 | 0.101 | 0.132 | 0.168 |
| 2 x 3/8 | 3.200 | 3.200 | 33.77 | U | 42667 | 18963 | 10667 | 6827 | 4741 | 3483 | 2667 | 2107 |
| | | | | Du | 0.010 | 0.023 | 0.041 | 0.065 | 0.093 | 0.127 | 0.166 | 0.209 |
| | | | | C | 21333 | 14222 | 10667 | 8533 | 7111 | 6095 | 5333 | 4741 |
| | | | | Dc | 0.008 | 0.019 | 0.033 | 0.052 | 0.074 | 0.101 | 0.132 | 0.168 |
| 2-1/4 x 1/4 | 2.700 | 3.038 | 25.58 | U | 36000 | 16000 | 9000 | 5760 | 4000 | 2939 | 2250 | 1778 |
| | | | | Du | 0.009 | 0.021 | 0.037 | 0.057 | 0.083 | 0.113 | 0.147 | 0.186 |
| | | | | C | 18000 | 12000 | 9000 | 7200 | 6000 | 5143 | 4500 | 4000 |
| | | | | Dc | 0.007 | 0.017 | 0.029 | 0.046 | 0.066 | 0.090 | 0.118 | 0.149 |
| 2-1/4 x 3/8 | 4.050 | 4.556 | 37.87 | U | 54000 | 24000 | 13500 | 8640 | 6000 | 4408 | 3375 | 2667 |
| | | | | Du | 0.009 | 0.021 | 0.037 | 0.057 | 0.083 | 0.113 | 0.147 | 0.186 |
| | | | | C | 27000 | 18000 | 13500 | 10800 | 9000 | 7714 | 6750 | 6000 |
| | | | | Dc | 0.007 | 0.017 | 0.029 | 0.046 | 0.066 | 0.090 | 0.118 | 0.149 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart begins on page 95)

No. Bars/Ft. of Grating Width = 12.800 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 60 | 66 | 72 | 78 | 84 | 90 | 96 |
| 1 x 1/4 | 0.533 | 0.267 | 12.01 | U | 284 | 235 | 197 | 168 | 145 | 126 | 111 |
| | | | | Du | 0.516 | 0.625 | 0.742 | 0.871 | 1.012 | 1.158 | 1.321 |
| | | | | C | 711 | 646 | 592 | 547 | 508 | 474 | 444 |
| | | | | Dc | 0.413 | 0.500 | 0.595 | 0.698 | 0.810 | 0.930 | 1.057 |
| 1 x 3/8 | 0.800 | 0.400 | 17.51 | U | 427 | 353 | 296 | 252 | 218 | 190 | 167 |
| | | | | Du | 0.518 | 0.627 | 0.744 | 0.873 | 1.015 | 1.166 | 1.327 |
| | | | | C | 1067 | 970 | 889 | 821 | 762 | 711 | 667 |
| | | | | Dc | 0.414 | 0.501 | 0.596 | 0.700 | 0.811 | 0.931 | 1.060 |
| 1-1/4 x 1/4 | 0.833 | 0.521 | 14.70 | U | 444 | 367 | 309 | 263 | 227 | 197 | 174 |
| | | | | Du | 0.413 | 0.500 | 0.596 | 0.699 | 0.812 | 0.928 | 1.061 |
| | | | | C | 1111 | 1010 | 926 | 854 | 793 | 740 | 694 |
| | | | | Dc | 0.331 | 0.400 | 0.477 | 0.559 | 0.648 | 0.744 | 0.847 |
| 1-1/4 x 3/8 | 1.250 | 0.781 | 21.48 | U | 667 | 551 | 463 | 394 | 340 | 296 | 260 |
| | | | | Du | 0.414 | 0.501 | 0.596 | 0.699 | 0.811 | 0.930 | 1.058 |
| | | | | C | 1667 | 1515 | 1389 | 1282 | 1190 | 1111 | 1042 |
| | | | | Dc | 0.331 | 0.401 | 0.477 | 0.560 | 0.649 | 0.745 | 0.848 |
| 1-1/2 x 1/4 | 1.200 | 0.900 | 17.51 | U | 640 | 529 | 444 | 379 | 327 | 284 | 250 |
| | | | | Du | 0.345 | 0.417 | 0.496 | 0.583 | 0.677 | 0.775 | 0.883 |
| | | | | C | 1600 | 1455 | 1333 | 1231 | 1143 | 1067 | 1000 |
| | | | | Dc | 0.276 | 0.334 | 0.397 | 0.466 | 0.541 | 0.621 | 0.706 |
| 1-1/2 x 5/16 | 1.500 | 1.125 | 21.48 | U | 800 | 661 | 556 | 473 | 408 | 356 | 313 |
| | | | | Du | 0.345 | 0.417 | 0.497 | 0.582 | 0.676 | 0.777 | 0.884 |
| | | | | C | 2000 | 1818 | 1667 | 1538 | 1429 | 1333 | 1250 |
| | | | | Dc | 0.276 | 0.334 | 0.397 | 0.466 | 0.541 | 0.621 | 0.706 |
| 1-1/2 x 3/8 | 1.800 | 1.350 | 25.58 | U | 960 | 793 | 667 | 568 | 490 | 427 | 375 |
| | | | | Du | 0.345 | 0.417 | 0.497 | 0.583 | 0.676 | 0.776 | 0.883 |
| | | | | C | 2400 | 2182 | 2000 | 1846 | 1714 | 1600 | 1500 |
| | | | | Dc | 0.276 | 0.334 | 0.397 | 0.466 | 0.541 | 0.621 | 0.706 |
| 1-3/4 x 1/4 | 1.633 | 1.429 | 20.20 | U | 871 | 720 | 605 | 515 | 444 | 387 | 340 |
| | | | | Du | 0.296 | 0.358 | 0.426 | 0.499 | 0.579 | 0.665 | 0.756 |
| | | | | C | 2177 | 1979 | 1814 | 1675 | 1555 | 1452 | 1361 |
| | | | | Dc | 0.236 | 0.286 | 0.340 | 0.400 | 0.463 | 0.532 | 0.605 |
| 1-3/4 x 3/8 | 2.450 | 2.144 | 29.67 | U | 1307 | 1080 | 907 | 773 | 667 | 581 | 510 |
| | | | | Du | 0.296 | 0.358 | 0.425 | 0.499 | 0.580 | 0.665 | 0.756 |
| | | | | C | 3267 | 2970 | 2722 | 2513 | 2333 | 2178 | 2042 |
| | | | | Dc | 0.236 | 0.286 | 0.340 | 0.400 | 0.463 | 0.532 | 0.605 |
| 2 x 1/4 | 2.133 | 2.133 | 22.89 | U | 1138 | 940 | 790 | 673 | 580 | 506 | 444 |
| | | | | Du | 0.259 | 0.313 | 0.372 | 0.437 | 0.507 | 0.582 | 0.662 |
| | | | | C | 2844 | 2585 | 2370 | 2188 | 2031 | 1896 | 1778 |
| | | | | Dc | 0.207 | 0.250 | 0.298 | 0.350 | 0.405 | 0.466 | 0.530 |
| 2 x 5/16 | 2.667 | 2.667 | 28.39 | U | 1422 | 1176 | 988 | 842 | 726 | 632 | 556 |
| | | | | Du | 0.259 | 0.313 | 0.372 | 0.437 | 0.507 | 0.582 | 0.663 |
| | | | | C | 3556 | 3233 | 2963 | 2735 | 2540 | 2371 | 2223 |
| | | | | Dc | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.466 | 0.530 |
| 2 x 3/8 | 3.200 | 3.200 | 33.77 | U | 1707 | 1410 | 1185 | 1010 | 871 | 759 | 667 |
| | | | | Du | 0.259 | 0.313 | 0.372 | 0.437 | 0.507 | 0.582 | 0.662 |
| | | | | C | 4267 | 3879 | 3556 | 3282 | 3048 | 2844 | 2667 |
| | | | | Dc | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.465 | 0.530 |
| 2-1/4 x 1/4 | 2.700 | 3.038 | 25.58 | U | 1440 | 1190 | 1000 | 852 | 735 | 640 | 563 |
| | | | | Du | 0.230 | 0.278 | 0.331 | 0.388 | 0.451 | 0.517 | 0.589 |
| | | | | C | 3600 | 3273 | 3000 | 2769 | 2571 | 2400 | 2250 |
| | | | | Dc | 0.184 | 0.223 | 0.265 | 0.311 | 0.360 | 0.414 | 0.471 |
| 2-1/4 x 3/8 | 4.050 | 4.556 | 37.87 | U | 2160 | 1785 | 1500 | 1278 | 1102 | 960 | 844 |
| | | | | Du | 0.230 | 0.278 | 0.331 | 0.388 | 0.451 | 0.517 | 0.589 |
| | | | | C | 5400 | 4909 | 4500 | 4154 | 3857 | 3600 | 3375 |
| | | | | Dc | 0.184 | 0.223 | 0.265 | 0.311 | 0.360 | 0.414 | 0.471 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart continues on page 98)

No. Bars/Ft. of Grating Width = 12.800 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-1/2 x 1/4 | 3.333 | 4.167 | 28.39 | U | 44440 | 19751 | 11110 | 7110 | 4938 | 3628 | 2778 | 2195 |
| | | | | Du | 0.008 | 0.019 | 0.033 | 0.052 | 0.074 | 0.101 | 0.132 | 0.168 |
| | | | | C | 22220 | 14813 | 11110 | 8888 | 7407 | 6349 | 5555 | 4938 |
| | | | | Dc | 0.007 | 0.015 | 0.026 | 0.041 | 0.060 | 0.081 | 0.106 | 0.134 |
| 2-1/2 x 5/16 | 4.167 | 5.208 | 35.18 | U | 55560 | 24693 | 13890 | 8890 | 6173 | 4536 | 3473 | 2744 |
| | | | | Du | 0.008 | 0.019 | 0.033 | 0.052 | 0.074 | 0.101 | 0.132 | 0.168 |
| | | | | C | 27780 | 18520 | 13890 | 11112 | 9260 | 7937 | 6945 | 6173 |
| | | | | Dc | 0.007 | 0.015 | 0.026 | 0.041 | 0.060 | 0.081 | 0.106 | 0.134 |
| 2-1/2 x 3/8 | 5.000 | 6.250 | 41.96 | U | 66667 | 29630 | 16667 | 10667 | 7407 | 5442 | 4167 | 3292 |
| | | | | Du | 0.008 | 0.019 | 0.033 | 0.052 | 0.074 | 0.101 | 0.132 | 0.168 |
| | | | | C | 33333 | 22222 | 16667 | 13333 | 11111 | 9524 | 8333 | 7407 |
| | | | | Dc | 0.007 | 0.015 | 0.026 | 0.041 | 0.060 | 0.081 | 0.106 | 0.134 |
| 3 x 1/4 | 4.800 | 7.200 | 35.82 | U | 64000 | 28444 | 16000 | 10240 | 7111 | 5224 | 4000 | 3160 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.084 | 0.110 | 0.140 |
| | | | | C | 32000 | 21333 | 16000 | 12800 | 10667 | 9143 | 8000 | 7111 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.034 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3 x 5/16 | 6.000 | 9.000 | 44.01 | U | 80000 | 35556 | 20000 | 12800 | 8889 | 6531 | 5000 | 3951 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.084 | 0.110 | 0.140 |
| | | | | C | 40000 | 26667 | 20000 | 16000 | 13333 | 11429 | 10000 | 8889 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.034 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3 x 3/8 | 7.200 | 10.800 | 52.20 | U | 96000 | 42667 | 24000 | 15360 | 10667 | 7837 | 6000 | 4741 |
| | | | | Du | 0.007 | 0.016 | 0.028 | 0.043 | 0.062 | 0.084 | 0.110 | 0.140 |
| | | | | C | 48000 | 32000 | 24000 | 19200 | 16000 | 13714 | 12000 | 10667 |
| | | | | Dc | 0.006 | 0.012 | 0.022 | 0.034 | 0.050 | 0.068 | 0.088 | 0.112 |
| 3-1/2 x 1/4 | 6.533 | 11.433 | 41.32 | U | 87107 | 38714 | 21777 | 13937 | 9679 | 7111 | 5444 | 4302 |
| | | | | Du | 0.006 | 0.013 | 0.024 | 0.037 | 0.053 | 0.072 | 0.095 | 0.120 |
| | | | | C | 43553 | 29036 | 21777 | 17421 | 14518 | 12444 | 10888 | 9679 |
| | | | | Dc | 0.005 | 0.011 | 0.019 | 0.030 | 0.043 | 0.058 | 0.076 | 0.096 |
| 3-1/2 x 3/8 | 9.800 | 17.150 | 60.27 | U | 130667 | 58074 | 32667 | 20907 | 14519 | 10667 | 8167 | 6453 |
| | | | | Du | 0.006 | 0.013 | 0.024 | 0.037 | 0.053 | 0.072 | 0.095 | 0.120 |
| | | | | C | 65333 | 43556 | 32667 | 26133 | 21778 | 18667 | 16333 | 14519 |
| | | | | Dc | 0.005 | 0.011 | 0.019 | 0.030 | 0.043 | 0.058 | 0.076 | 0.096 |
| 4 x 1/4 | 8.533 | 17.067 | 46.70 | U | 113773 | 50566 | 28443 | 18204 | 12641 | 9288 | 7111 | 5618 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 56887 | 37924 | 28443 | 22755 | 18962 | 16253 | 14222 | 12641 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| 4 x 5/16 | 10.667 | 21.333 | 57.58 | U | 142227 | 63212 | 35557 | 22756 | 15803 | 11610 | 8889 | 7024 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 71113 | 47409 | 35557 | 28445 | 23704 | 20318 | 17778 | 15803 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| 4 x 3/8 | 12.800 | 25.600 | 68.46 | U | 170667 | 75852 | 42667 | 27307 | 18963 | 13932 | 10667 | 8428 |
| | | | | Du | 0.005 | 0.012 | 0.021 | 0.032 | 0.047 | 0.063 | 0.083 | 0.105 |
| | | | | C | 85333 | 56889 | 42667 | 34133 | 28444 | 24381 | 21333 | 18963 |
| | | | | Dc | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| 4-1/2 x 1/4 | 10.800 | 24.300 | 52.20 | U | 144000 | 64000 | 36000 | 23040 | 16000 | 11755 | 9000 | 7111 |
| | | | | Du | 0.005 | 0.010 | 0.018 | 0.029 | 0.041 | 0.056 | 0.074 | 0.093 |
| | | | | C | 72000 | 48000 | 36000 | 28800 | 24000 | 20571 | 18000 | 16000 |
| | | | | Dc | 0.004 | 0.008 | 0.015 | 0.023 | 0.033 | 0.045 | 0.059 | 0.074 |
| 4-1/2 x 3/8 | 16.200 | 36.450 | 76.65 | U | 216000 | 96000 | 54000 | 34560 | 24000 | 17633 | 13500 | 10667 |
| | | | | Du | 0.005 | 0.010 | 0.018 | 0.029 | 0.041 | 0.056 | 0.074 | 0.093 |
| | | | | C | 108000 | 72000 | 54000 | 43200 | 36000 | 30857 | 27000 | 24000 |
| | | | | Dc | 0.004 | 0.008 | 0.015 | 0.023 | 0.033 | 0.045 | 0.059 | 0.074 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart begins on page 97)

No. Bars/Ft. of Grating Width = 12.800 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 60 | 66 | 72 | 78 | 84 | 90 | 96 |
| 2-1/2 x 1/4 | 3.333 | 4.167 | 28.39 | U | 1778 | 1469 | 1234 | 1052 | 907 | 790 | 694 |
| | | | | Du | 0.207 | 0.250 | 0.298 | 0.350 | 0.405 | 0.465 | 0.529 |
| | | | | C | 4444 | 4040 | 3703 | 3418 | 3174 | 2963 | 2778 |
| | | | | Dc | 0.165 | 0.200 | 0.238 | 0.280 | 0.324 | 0.372 | 0.424 |
| 2-1/2 x 5/16 | 4.167 | 5.208 | 35.18 | U | 2222 | 1837 | 1543 | 1315 | 1134 | 988 | 868 |
| | | | | Du | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.466 | 0.530 |
| | | | | C | 5556 | 5051 | 4630 | 4274 | 3969 | 3704 | 3473 |
| | | | | Dc | 0.166 | 0.200 | 0.238 | 0.280 | 0.324 | 0.372 | 0.424 |
| 2-1/2 x 3/8 | 5.000 | 6.250 | 41.96 | U | 2667 | 2204 | 1852 | 1578 | 1361 | 1185 | 1042 |
| | | | | Du | 0.207 | 0.250 | 0.298 | 0.350 | 0.406 | 0.465 | 0.530 |
| | | | | C | 6667 | 6061 | 5556 | 5128 | 4762 | 4444 | 4167 |
| | | | | Dc | 0.166 | 0.200 | 0.238 | 0.280 | 0.324 | 0.372 | 0.424 |
| 3 x 1/4 | 4.800 | 7.200 | 35.82 | U | 2560 | 2116 | 1778 | 1515 | 1306 | 1138 | 1000 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.441 |
| | | | | C | 6400 | 5818 | 5333 | 4923 | 4571 | 4267 | 4000 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3 x 5/16 | 6.000 | 9.000 | 44.01 | U | 3200 | 2645 | 2222 | 1893 | 1633 | 1422 | 1250 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.441 |
| | | | | C | 8000 | 7273 | 6667 | 6154 | 5714 | 5333 | 5000 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3 x 3/8 | 7.200 | 10.800 | 52.20 | U | 3840 | 3174 | 2667 | 2272 | 1959 | 1707 | 1500 |
| | | | | Du | 0.172 | 0.209 | 0.248 | 0.291 | 0.338 | 0.388 | 0.441 |
| | | | | C | 9600 | 8727 | 8000 | 7385 | 6857 | 6400 | 6000 |
| | | | | Dc | 0.138 | 0.167 | 0.199 | 0.233 | 0.270 | 0.310 | 0.353 |
| 3-1/2 x 1/4 | 6.533 | 11.433 | 41.32 | U | 3484 | 2880 | 2420 | 2062 | 1778 | 1549 | 1361 |
| | | | | Du | 0.148 | 0.179 | 0.213 | 0.250 | 0.290 | 0.333 | 0.378 |
| | | | | C | 8711 | 7919 | 7259 | 6701 | 6222 | 5807 | 5444 |
| | | | | Dc | 0.118 | 0.143 | 0.170 | 0.200 | 0.232 | 0.266 | 0.303 |
| 3-1/2 x 3/8 | 9.800 | 17.150 | 60.27 | U | 5277 | 4320 | 3630 | 3093 | 2667 | 2323 | 2042 |
| | | | | Du | 0.148 | 0.179 | 0.213 | 0.250 | 0.290 | 0.333 | 0.378 |
| | | | | C | 13067 | 11879 | 10889 | 10051 | 9333 | 8711 | 8167 |
| | | | | Dc | 0.118 | 0.143 | 0.170 | 0.200 | 0.232 | 0.266 | 0.303 |
| 4 x 1/4 | 8.533 | 17.067 | 46.70 | U | 4551 | 3761 | 3160 | 2693 | 2322 | 2023 | 1778 |
| | | | | Du | 0.129 | 0.156 | 0.186 | 0.219 | 0.253 | 0.291 | 0.331 |
| | | | | C | 11377 | 10343 | 9481 | 8752 | 8127 | 7585 | 7111 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| 4 x 5/16 | 10.667 | 21.333 | 57.58 | U | 5689 | 4702 | 3951 | 3366 | 2903 | 2528 | 2222 |
| | | | | Du | 0.129 | 0.156 | 0.186 | 0.219 | 0.253 | 0.291 | 0.331 |
| | | | | C | 14223 | 12930 | 11852 | 10941 | 10159 | 9482 | 8889 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| 4 x 3/8 | 12.800 | 25.600 | 68.46 | U | 6827 | 5642 | 4741 | 4039 | 3483 | 3034 | 2667 |
| | | | | Du | 0.129 | 0.156 | 0.186 | 0.219 | 0.253 | 0.291 | 0.331 |
| | | | | C | 17067 | 15515 | 14222 | 13128 | 12190 | 11378 | 10667 |
| | | | | Dc | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| 4-1/2 x 1/4 | 10.800 | 24.300 | 52.20 | U | 5760 | 4760 | 4000 | 3408 | 2939 | 2560 | 2250 |
| | | | | Du | 0.115 | 0.139 | 0.166 | 0.194 | 0.225 | 0.259 | 0.294 |
| | | | | C | 14400 | 13091 | 12000 | 11077 | 10286 | 9600 | 9000 |
| | | | | Dc | 0.092 | 0.111 | 0.132 | 0.155 | 0.180 | 0.207 | 0.235 |
| 4-1/2 x 3/8 | 16.200 | 36.450 | 76.65 | U | 8640 | 7140 | 6000 | 5112 | 4408 | 3840 | 3375 |
| | | | | Du | 0.115 | 0.139 | 0.166 | 0.194 | 0.225 | 0.259 | 0.294 |
| | | | | C | 21600 | 19636 | 18000 | 16615 | 15429 | 14400 | 13500 |
| | | | | Dc | 0.092 | 0.111 | 0.132 | 0.155 | 0.180 | 0.207 | 0.235 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart continues on page 100)

No. Bars/Ft. of Grating Width = 12.800 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus $in.^3$/ Foot of Grating Width | Moment of Inertia $in.^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
| 5 x 1/4 | 13.333 | 33.333 | 57.58 | U | 177773 | 79010 | 44443 | 28444 | 19753 | 14512 | 11111 | 8779 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 88887 | 59258 | 44443 | 35555 | 29629 | 25396 | 22222 | 19753 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5 x 5/16 | 16.667 | 41.667 | 71.15 | U | 222227 | 98767 | 55557 | 35556 | 24692 | 18141 | 13889 | 10974 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 111113 | 74076 | 55557 | 44445 | 37038 | 31747 | 27778 | 24692 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5 x 3/8 | 20.000 | 50.000 | 84.84 | U | 266667 | 118519 | 66667 | 42667 | 29630 | 21769 | 16667 | 13169 |
| | | | | Du | 0.004 | 0.009 | 0.017 | 0.026 | 0.037 | 0.051 | 0.066 | 0.084 |
| | | | | C | 133333 | 88889 | 66667 | 53333 | 44444 | 38095 | 33333 | 29630 |
| | | | | Dc | 0.003 | 0.007 | 0.013 | 0.021 | 0.030 | 0.041 | 0.053 | 0.067 |
| 5-1/2 x 1/4 | 16.133 | 44.367 | 63.02 | U | 215107 | 95603 | 53777 | 34417 | 23901 | 17560 | 13444 | 10623 |
| | | | | Du | 0.004 | 0.008 | 0.015 | 0.024 | 0.034 | 0.046 | 0.060 | 0.076 |
| | | | | C | 107553 | 71702 | 53777 | 43021 | 35851 | 30730 | 26888 | 23901 |
| | | | | Dc | 0.003 | 0.007 | 0.012 | 0.019 | 0.027 | 0.037 | 0.048 | 0.061 |
| 5-1/2 x 3/8 | 24.200 | 66.550 | 92.91 | U | 322667 | 143407 | 80667 | 51627 | 35852 | 26340 | 20167 | 15934 |
| | | | | Du | 0.004 | 0.008 | 0.015 | 0.024 | 0.034 | 0.046 | 0.060 | 0.076 |
| | | | | C | 161333 | 107556 | 80667 | 64533 | 53778 | 46095 | 40333 | 35852 |
| | | | | Dc | 0.003 | 0.007 | 0.012 | 0.019 | 0.027 | 0.037 | 0.048 | 0.061 |
| 6 x 1/4 | 19.200 | 57.600 | 68.46 | U | 256000 | 113778 | 64000 | 40960 | 28444 | 20898 | 16000 | 12642 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 128000 | 85333 | 64000 | 51200 | 42667 | 36571 | 32000 | 28444 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |
| 6 x 5/16 | 24.000 | 72.000 | 84.84 | U | 320000 | 142222 | 80000 | 51200 | 35556 | 26122 | 20000 | 15802 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 160000 | 106667 | 80000 | 64000 | 53333 | 45714 | 40000 | 35556 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |
| 6 x 3/8 | 28.800 | 86.400 | 101.10 | U | 384000 | 170667 | 96000 | 61440 | 42667 | 31347 | 24000 | 18963 |
| | | | | Du | 0.003 | 0.008 | 0.014 | 0.022 | 0.031 | 0.042 | 0.055 | 0.070 |
| | | | | C | 192000 | 128000 | 96000 | 76800 | 64000 | 54857 | 48000 | 42667 |
| | | | | Dc | 0.003 | 0.006 | 0.011 | 0.017 | 0.025 | 0.034 | 0.044 | 0.056 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# HEAVY DUTY WELDED STEEL GRATING

## STATIC LOAD & DEFLECTION TABLE

(Chart begins on page 99)

No. Bars/Ft. of Grating Width = 12.800 — Allowable Fiber Stress = 20,000 psi

U - Uniform Load, Pounds per Square Foot — C - Concentrated Load, Pounds per Foot of Grating Width — D - Deflection, Inches

| Bearing Bar Size (Inches) | Section Modulus in.$^3$/ Foot of Grating Width | Moment of Inertia in.$^4$/ Foot of Grating Width | Approx. Weight (lbs/sqft) | | Span in Inches 60 | 66 | 72 | 78 | 84 | 90 | 96 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 x 1/4 | 13.333 | 33.333 | 57.58 | U | 7111 | 5877 | 4938 | 4208 | 3628 | 3160 | 2778 |
| | | | | Du | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 17777 | 16161 | 14814 | 13675 | 12698 | 11852 | 11111 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5 x 5/16 | 16.667 | 41.667 | 71.15 | U | 8889 | 7346 | 6173 | 5260 | 4535 | 3951 | 3472 |
| | | | | Du | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 22223 | 20202 | 18519 | 17094 | 15873 | 14815 | 13889 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5 x 3/8 | 20.000 | 50.000 | 84.84 | U | 10667 | 8815 | 7407 | 6312 | 5442 | 4741 | 4167 |
| | | | | Du | 0.103 | 0.125 | 0.149 | 0.175 | 0.203 | 0.233 | 0.265 |
| | | | | C | 26667 | 24242 | 22222 | 20513 | 19048 | 17778 | 16667 |
| | | | | Dc | 0.083 | 0.100 | 0.119 | 0.140 | 0.162 | 0.186 | 0.212 |
| 5-1/2 x 1/4 | 16.133 | 44.367 | 63.02 | U | 8604 | 7111 | 5975 | 5091 | 4390 | 3824 | 3361 |
| | | | | Du | 0.094 | 0.114 | 0.135 | 0.159 | 0.184 | 0.212 | 0.241 |
| | | | | C | 21511 | 19555 | 17926 | 16547 | 15365 | 14340 | 13444 |
| | | | | Dc | 0.075 | 0.091 | 0.108 | 0.127 | 0.147 | 0.169 | 0.193 |
| 5-1/2 x 3/8 | 24.200 | 66.550 | 92.91 | U | 12907 | 10667 | 8963 | 7637 | 6585 | 5736 | 5042 |
| | | | | Du | 0.094 | 0.114 | 0.135 | 0.159 | 0.184 | 0.212 | 0.241 |
| | | | | C | 32267 | 29333 | 26889 | 24821 | 23048 | 21511 | 20167 |
| | | | | Dc | 0.075 | 0.091 | 0.108 | 0.127 | 0.147 | 0.169 | 0.193 |
| 6 x 1/4 | 19.200 | 57.600 | 68.46 | U | 10240 | 8463 | 7111 | 6059 | 5224 | 4551 | 4000 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 25600 | 23273 | 21333 | 19692 | 18286 | 17067 | 16000 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |
| 6 x 5/16 | 24.000 | 72.000 | 84.84 | U | 12800 | 10579 | 8889 | 7574 | 6531 | 5689 | 5000 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 32000 | 29091 | 26667 | 24615 | 22857 | 21333 | 20000 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |
| 6 x 3/8 | 28.800 | 86.400 | 101.10 | U | 15360 | 12694 | 10667 | 9089 | 7837 | 6827 | 6000 |
| | | | | Du | 0.086 | 0.104 | 0.124 | 0.146 | 0.169 | 0.194 | 0.221 |
| | | | | C | 38400 | 34909 | 32000 | 29538 | 27429 | 25600 | 24000 |
| | | | | Dc | 0.069 | 0.083 | 0.099 | 0.117 | 0.135 | 0.155 | 0.177 |

**NOTE:** When serrated grating is specified, the depth of grating required for a specific load will be 1/4" greater than that shown in these tables. Loads are theoretical and are based on a unit stress of 20,000 psi.

**Loads shown above DO NOT include the dead load of the grating**

# Model Specification: 15-W-4 Heavy-Duty Steel Bar Gratings

September 14, 2022

Specifier Notes: Architect or engineer should carefully review and edit this section to meet the requirements of the project and local building codes. Coordinate this section with other specification sections and the drawings and delete any unused "Specifier Notes" and options shown in **"red"** after editing.

This section covers Pleasant Mount Welding, Inc.'s "15-W-4 Heavy-Duty Steel Bar Gratings." Consult PMWI (www.pmwi.net) for assistance in editing this section for specific applications. Call 570.282.6164 or email sales@pmwi.net with any questions.

## SECTION 055300 - Metal Fabrications: Metal Gratings

## Part 1: General

### 1.1 Section Includes

A. Prefabricated, heavy-duty carbon steel bar gratings.

B. Prefabricated support frames for gratings.

C. Miscellaneous installation hardware and accessories.

### 1.2 Reference Standards

A. ANSI A326.3-2017: American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials.

B. ASTM Grade-36 Carbon Steel.

C. ASTM A-510: Carbon Steel Wire Rods.

D. ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

### 1.3 Action Submittals

A. Product Data: The contractor shall submit the manufacturer's catalog pages including load tables, anchor details and standard installation details.

B. Shop Drawings: The contractor shall submit for approval shop drawings for the fabrication and erection of all gratings, based on construction drawings of current issue. Include plans, elevations, and details of sections and connections as required. Show type and location of all fasteners.

C. Samples of grating and anchorage system shall be submitted for approval.

### 1.4 Quality Assurance

A. Manufacturer Qualification: A company specializing in the manufacture of metal bar gratings with not less than 5 years of documented experience.

B. Fabrication tolerances shall be in accordance with applicable provisions and recommendations of ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

## Part 2: Products

### 2.1 Source Requirements:

Design is based upon use of gratings as manufactured by Pleasant Mount Welding, Inc. and terminology used herein may include reference to the specific performance or product of this manufacturer. Such reference shall be construed only as establishing the quality of materials, operational features and workmanship used under this section and shall not, in any way, be construed as limiting competition.

### 2.2 Manufacturers:

Acceptable manufacturers include Pleasant Mount Welding, Inc. (45 Dundaff Street, Carbondale, PA 18407, 570-282-6164, www.pmwi.net) or approved equal.

### 2.3 Manufactured Units:

A. **Description:** Heavy-Duty Carbon Steel Bar Grating type **15-W-4 with a Galvanized finish**. Heavy-duty cross bars are welded perpendicular to heavy-duty main bearing bars.

1. Main Bearing Bar Spacing: **15/16"** on center.
2. Main Bearing Bar Depth: based on loading requirements and clear span as shown on drawings.
3. Main Bearing Bar Thickness: **1/4" | 5/16" | 3/8"** as shown on drawings.
4. Cross Bar Spacing: **4"** on center.
5. Top Surface of Main Bearing Bars: **Smooth | Serrated | SlipNOT® Slip Resistance Coating**

B. **Fabrication:** Load Band ends of grating with bars of the same thickness as main bearing bars. Weld banding flush with the top surface of grating. Depth of banding is to be 1/2" less than the depth of the main bearing bars (as shown in drawings). **Include welded anchor blocks 1/4" from the bottom surface with hole to accept washer and attachment bolts.**

C. **Steel Frames: Carbon Steel ASTM Grade-36 frames shall be provided as shown on contract drawings to support and attach gratings. Include anchors as shown for locking frame into concrete as shown on the plans. Galvanize frames after fabrication per ASTM A-123.**

D. **Design Criteria:**

1. **Loading:** Unless shown otherwise on the contract drawings, gratings shall be designed and manufactured to meet live load conditions of **AASHTO HS-20 with 30% impact factor**. Main bearing bar depth shall be as shown in contract drawings or as recommended by the manufacturer to meet loading requirements and clear span conditions.

2. **Traction / Slip-Resistance**: When a traction surface is required, it is to be tested per ANSI A326.3-2017. Top surface shall provide a minimum Wet Dynamic Coefficient of Friction (Wet DCOF) of 0.45 to meet high traction classification.

E. **Materials:** Main bearing bars and rectangular cross bars are to be type ASTM Grade-36 Carbon Steel. Round cross bars are to be per ASTM A-510. Banding is to be carbon steel per ASTM Grade-36.

F. **Fabrication Tolerances** shall be in accordance with ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

G. **Top Surface:** When required, **SlipNOT® Slip Resistance Coating** will be included in order to meet or exceed Wet Dynamic COF requirements of paragraph 2.3 D.2 above.

H. **Finish:** Gratings and frames shall be **Hot-Dip Galvanized per ASTM A-123 or Powder Coated Black [or other color] as shown on drawings.**

**2.4 Accessories:**

Provide appropriate fasteners for type, grade, and class required for approved anchorage system. **Include lifting devices and all other accessories as shown on the drawings.**

## Part 3: Execution

**3.1 Field Verification:**

Take field measurements prior to preparation of final shop drawings (and fabrication where required) to ensure proper fitting of the work.

**3.2 Installation**

A. Prior to grating installation, contractor shall inspect supports for correct alignment and conditions for proper attachment and support of the gratings. Metal shall be used for all grating supports and provide the minimum bearing surface for the depth of grating per ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual. Ends of all bearing bars at cutouts for penetrations are to be supported in like manner. Any inconsistencies between contract drawings and supporting structure deemed detrimental to grating placement shall be reported in writing to the engineer, architect or owner's agent prior to placement.

B. Install grating in accordance with shop drawings and standard installation clearances as recommended by ANSI/NAAMM MBG 532-19: Heavy-Duty Metal Bar Grating Manual.

**3.3 Grating Attachment:**

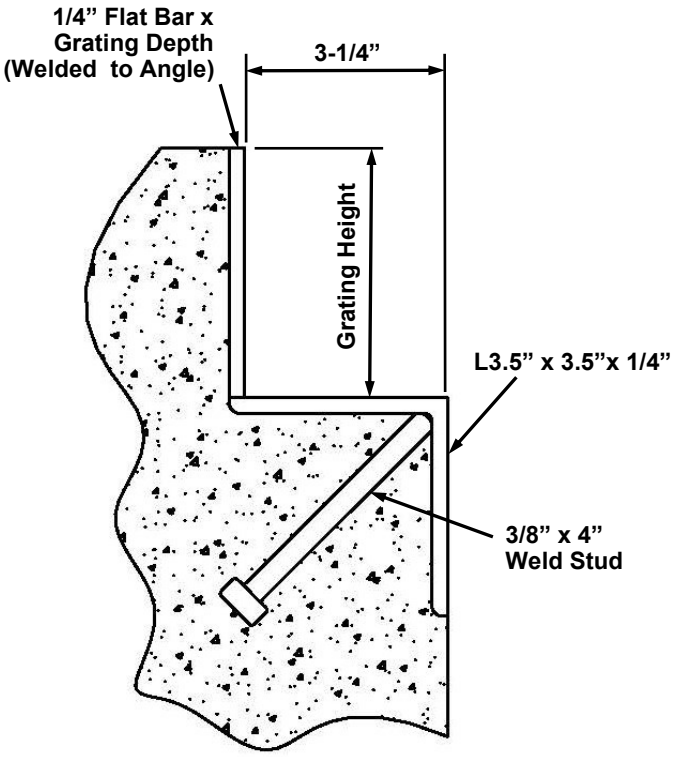
Use approved attachment system and fasteners to secure grating to supporting members as shown on plans.

## GRATING EMBED FRAMES

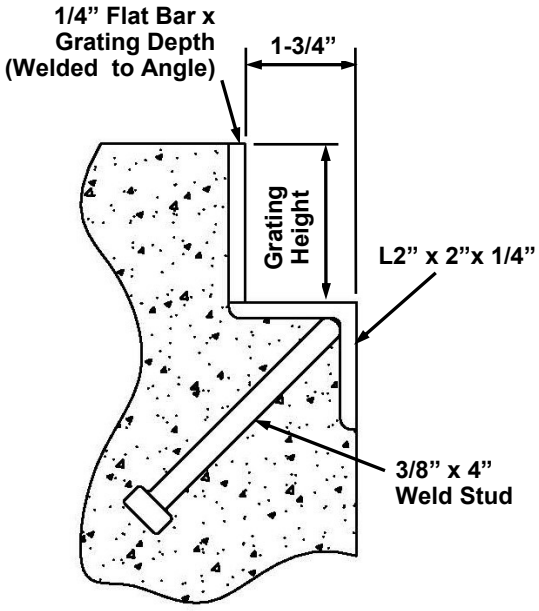
Grating embed frames cast into concrete floors and substructures have many advantages that help to extend the life of all projects where open flooring is required. Steel frames form a permanent perimeter shield for concrete leading edges that are subject to cracking and chipping when left unprotected. During construction these rigid embed frames expedite forming and provide a welded structure that ensures accuracy in the concrete pour. These grating frames provide a uniform bearing surface for our Heavy Duty Welded Steel grating and helps eliminate the potential for rocking or irregular elevations typically experienced when grating is installed directly on poured concrete.

All embed steel frames are available in four sided, one-piece construction and can accommodate any clear opening requirements. Long lengths can be provided with fabricated corners for field installation when required. Embed frames can be provided mill finished, galvanized or with a black powder coat finish. All PMWI steel embed frames are provided with 3/8” x 4” headed concrete stud anchors welded within 6” of each corner and at a maximum 24” center-to-center spacing.

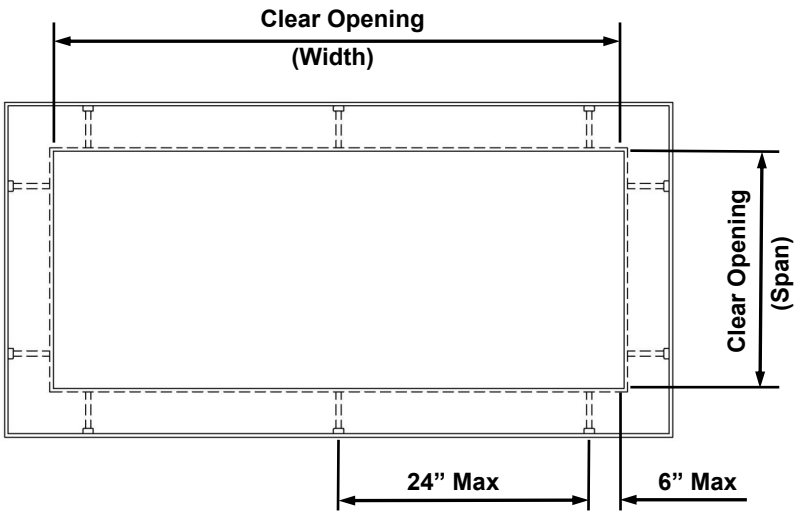
PMWI offers two styles of embed frames as shown. The Light Duty frame provides a minimal amount of bearing surface for lighter loads and the Heavy Duty frame option offers greater load bearing capability for heavier loading conditions.




**Heavy Duty**




**Light Duty**



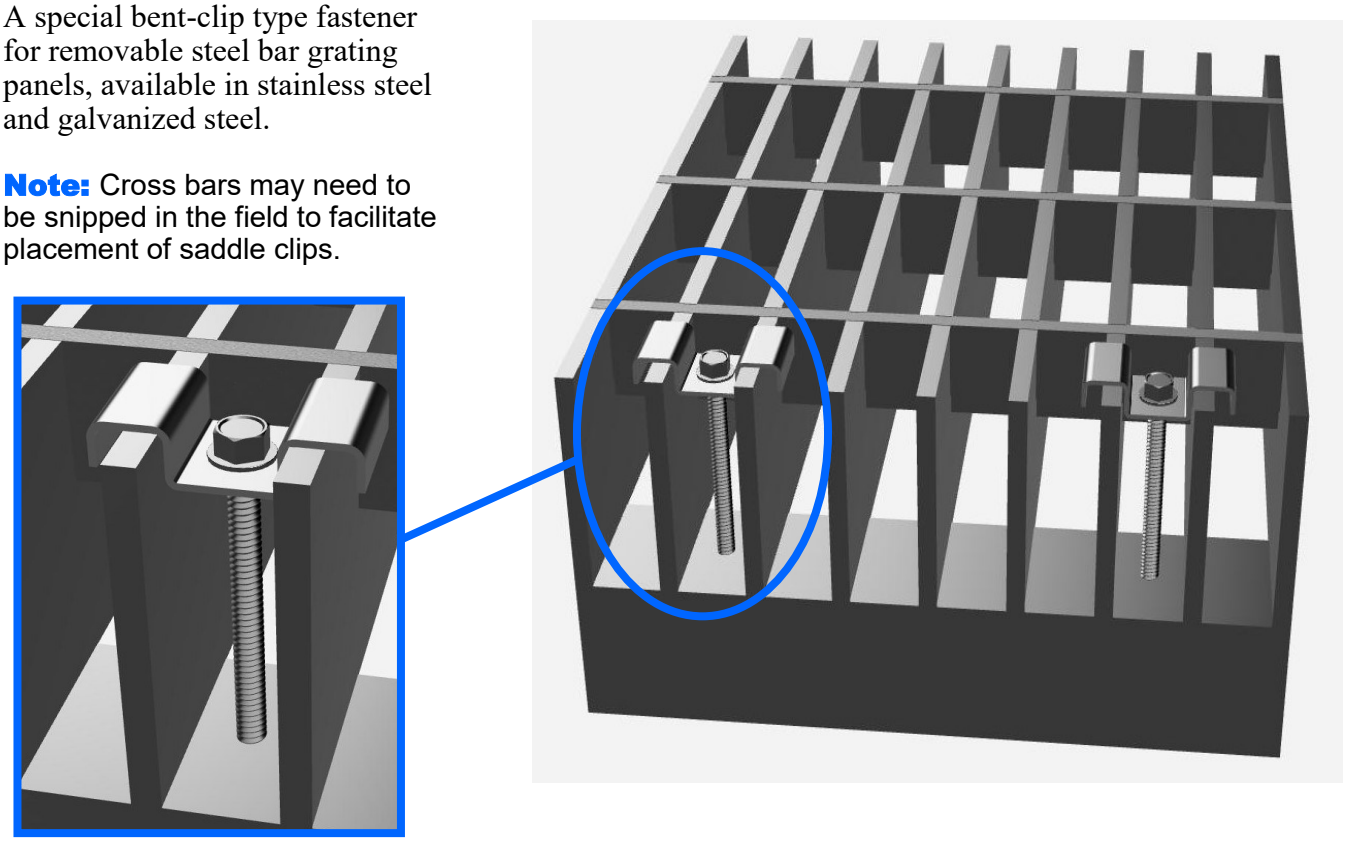

*Frames are available as one-piece welded construction or individual pieces*

# STEEL GRATING ANCHOR DEVICES

## SADDLE CLIP

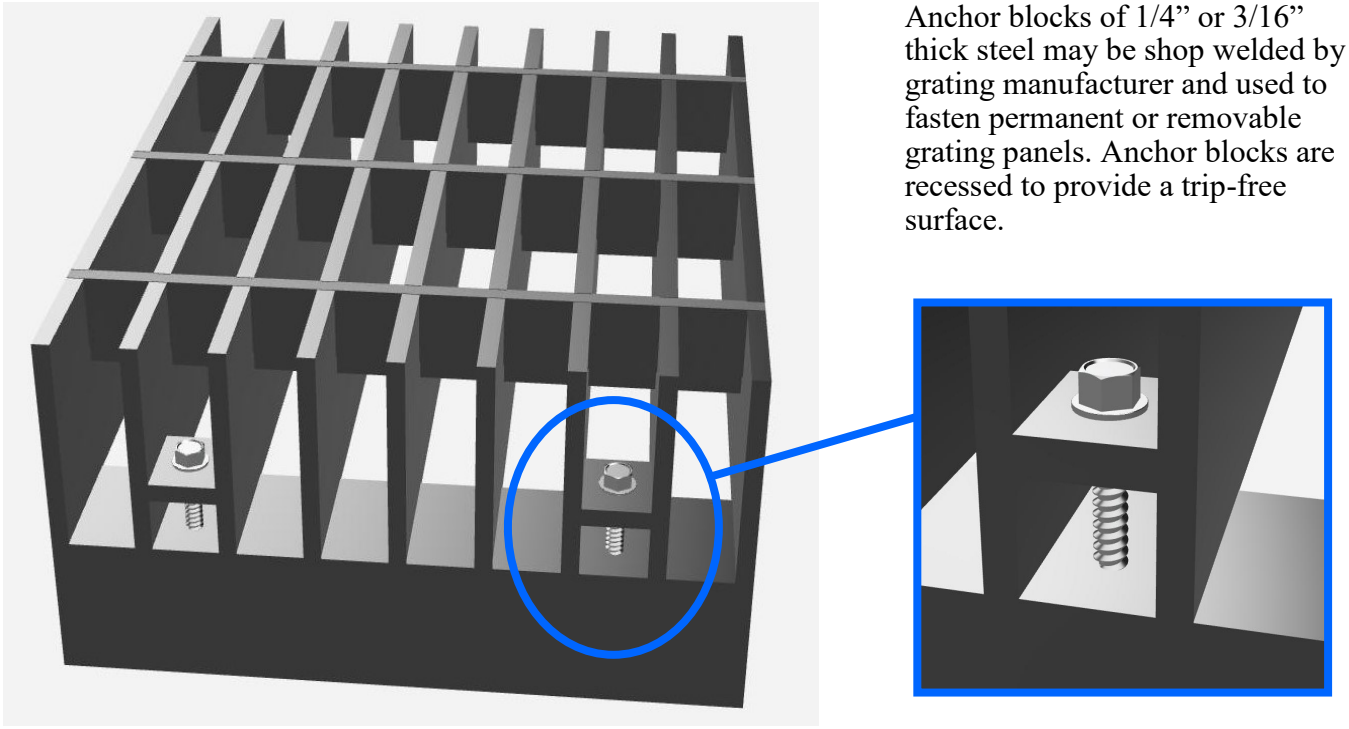
A special bent-clip type fastener for removable steel bar grating panels, available in stainless steel and galvanized steel.

**Note:** Cross bars may need to be snipped in the field to facilitate placement of saddle clips.



## ANCHOR BLOCK

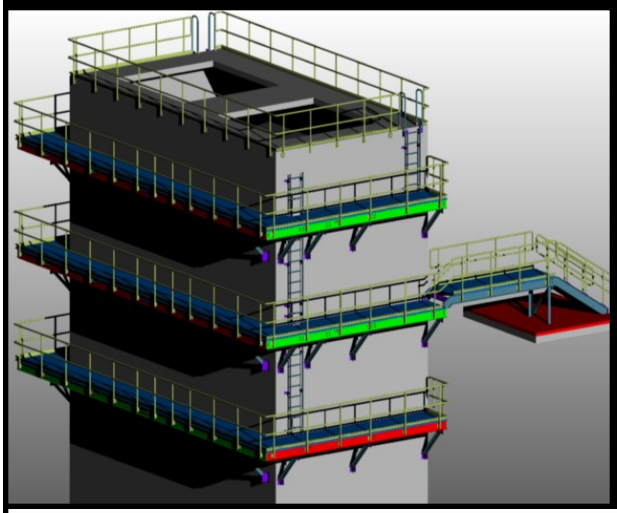
Anchor blocks of 1/4” or 3/16” thick steel may be shop welded by grating manufacturer and used to fasten permanent or removable grating panels. Anchor blocks are recessed to provide a trip-free surface.

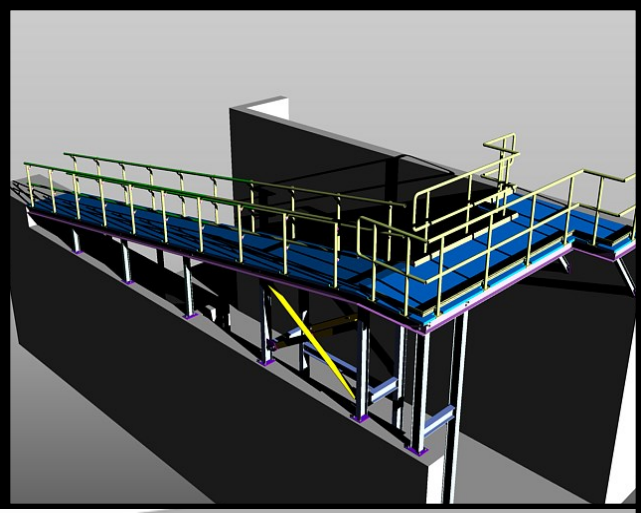


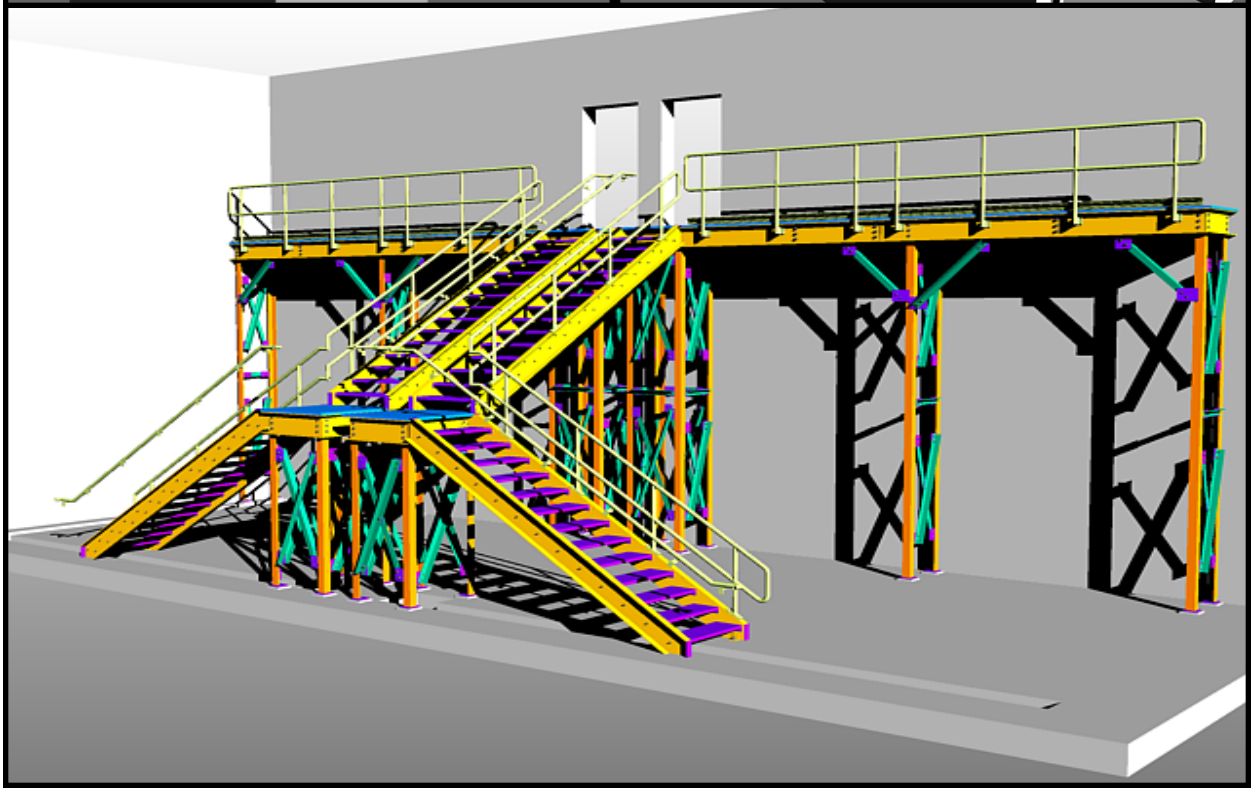
**Note:** Tack welding of grating in the field (by others) is also an acceptable method for anchoring all permanently installed grating.

**Pleasant Mount Welding Inc.**
**continues to advance into the**
**future by now offering drawings in**
**3D modeling software**

ADVANCE STEEL







# ENGINEERING FIRMS

**PMWI HAS COMPLETED MISCELLANEOUS METALS CONTRACTS FOR WATER OR WASTEWATER PROJECTS DESIGNED BY THE FOLLOWING ENGINEERS.**

KARAM ASSOCIATES
CLARK ENGINEERS
GANNETT FLEMING, INC.
BRINJAC KAMBIC & ASSOCIATES
CHARLES MANGANARO CONSULTING ENGINEERS
GLACE ASSOCIATES
BCM ENGINEERS & SCIENTISTS
KILLAM ASSOCIATES
CLOUGH HARBOUR ASSOCIATES
MILNES ENGINEERING
RIELLY ASSOCIATES
DELAWARE ENGINEERING
T & M ASSOCIATES
LANC & TULLY ENGINEERING, INC
STEARNS & WHELER, INC.
C.T. CONSULTANTS, INC.
WHITMAN, REQUARDT & ASSOCIATES
ROY F. WESTON ENGINEERS
HAVENS & EMERSON, INC.
POST, BUCKELY, SCHUH & JERNIGAN, INC.
HAZEN & SAWYER, INC.
ACER ENGINEERS & CONSULTANTS
O'BRIEN & GERE ENGINEERS, INC.
GSEE ENVIROMENTAL CONSULTANTS
SYSTEMS DESIGN ENGINEERING, INC.
PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
GIBSON THOMAS ENGINEERING
SCHOOR ENGINEERING, INC.
GEORGE, MILES & BUHR
ARCHITECT & ENGINEERS
L. ROBERT KIMBALL & ASSOCIATES
EUSTANCE & HOROWITZ, P.C.
THE EADS GROUP
BLACK & VEATCH ENGINEERING
M.S. CONSULTANTS, INC.
NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
MALCOLM PIRNIE, INC.
LAMONT VAN DEVALK ENGINEERING
THE PORT AUTHORITY OF NY & NJ
ENTECH ENGINEERING, INC.
FORCIER ALDRICH & ASSOCIATES
BASKERVILLE DONOVAN, INC.
WRIGHT PIERCE
WEBSTER MARTIN CONSULTING ENGINEERS
GWIN DOBSON & FOREMAN, INC.
CABE ASSOCIATES, INC.
C.F.M. ASSOCIATES
KELLEY ENGINEERING
MAST ENGINEERING
RETTEW ASSOCIATES
THE QUAD THREE GROUP
TAYLOR, WISEMAN & TAYLOR CONSULTING ENGINEERS
BUCK, SEIFERT & JOST, INC.
R.K.R. HESS ASSOCIATES
ALFRED BENESCH & COMPANY CONSULTING ENGINEERS
DAY ENGINEERING
F.X. BROWNE ASSOCIATES
BIPIN GANDHI, PC.
CET ENGINEERING SERVICES
McGOEY, HAUSER & EDSALL CONSULTING ENGINEERS
F & M ASSOCIATES
THE CHESTER ENGINEERS
METCALF & EDDY, INC.
RODHE & SOYKA
BUCHART HORN, INC.
EBASCO SERVICES, INC.
CAMP DRESSER & McKEE
U.S. ARMY CORPS OF ENGINEERS
CH2M HILL
NUSSBAUMER & CLARKE, INC.
K.L.H. ENGINEERS, INC.
MORRIS ASSOCIATES
J.P.W. ENGINEERING
RUMMEL, KLEPPER & KAHL CONSULTING ENGINEERS
KEYSTONE CONSULTING ENGINEERS
LOUREIRO ENGINEERING ASSOCIATES
TATMAN LEE ASSOCIATES, INC.
EDM CONSULTANTS, INC.
PENNONI ASSOCIATES
RICHARD A. ALAIMO ASSOCIATES
LEE T. PURCELL ASSOCIATES
THE NEW YORK CITY TRANSIT AUTHORITY
EARTHTECH, INC.
CECO ASSOCIATES, INC.
THE McGUIRE GROUP
MONTGOMERY WATSON, INC.
FINKBEINER PETTIS & STOUT, INC.
BRINNIER & LARIOS, P.C.
WATER MANAGEMENT SERVICES
UNI-TECH CONSULTING ENGINEERS

# CUSTOMER TESTIMONIALS

" I have been in this business for many years and have never seen shop drawings of this caliber. I am very pleased with the presentation, assemblies, accuracy and details. Keep up the good work."

*Michael Roy, C.H. Nickerson*

" When we receive metals from P.M.W.I. the quality, customer service and on time deliveries are exceptional. The years of experience that P.M.W.I. has in water and wastewater treatment plants is invaluable."

*Dominic Ruggiero, Michael F. Ronca and Sons, Inc.*

"We have purchased all of the miscellaneous metals on our last four large wastewater treatment plants from Pleasant Mount Welding. Not only is their pricing competitive, but the time and detail that they put into the production of their shop drawings ensures that the final product received at the jobsite fits without costly field modifications."

*Rob Knapke, Peterson Construction Company*

" Over the past ten years, I have worked with P.M.W.I. on various water and wastewater treatment plants involving challenging metal work. P.M.W.I. has consistently provided outstanding customer service with a high level of attention to detail, accuracy and quality metal fabrications for projects with aggressive schedules."

*Robert T. Huie, Pizzagalli Construction Company*

" From start to finish the experience of dealing with P.M.W.I. was outstanding. All drawings and products were delivered as promised with painstaking attention to detail. The structural steel was labeled and fabricated correctly and fit perfectly. This was without a doubt the best experience we have had with a fabricator in our 22 years in business."

*Brian Fagersten, President, Sparwick Contracting, Inc.*


**Pleasant Mount Welding, Inc.**

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**Phone 570-282-6164**

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**Drafting Fax 570-281-5931 email: Submittal@PMWI.net**
**Mfg Fax 570-282-7920 email: Delivery@PMWI.net**

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6/23/2026