MarCo

SPECIALTY STEEL

Grating Master Catalog

QUALITY | SPEED | RELIABILITY

Panels - Treads - Custom Fabrication

TOC

45,000 sq. ft. facility on 9+ acres

MARCO
SPECIALTY STEEL

Total solutions provider

For over 20 years, Marco Specialty Steel has been providing grating solutions to a wide range of industries including power generation, oil and gas, petrochemical and architectural. We are your single source for the complete line of grating products from Welded Bar Grating, Fiberglass Grating and Safety Grating, in Carbon Steel, Galvanized, Stainless Steel, and Aluminum, with huge inventories on hand for immediate shipment. We offer a complete fabrication shop that can provide complete projects from design ready to install.

When quality counts...
Make it Marco!

Applications

Airplane unloading ramps
Airport light guards
Boat landing ramps and docks
Crating
Crow's nests
Dipping trays
Drainage pit covers
Fencing
Fire escapes
Machinery safety guards
Mezzanine floors
Paint booths
Platforms
Railway crossings
Ramps
Running boards
Scaffolding
Stairs
Tree & pole guards
Trench covers
Ventilating screens
Walkways
And so much more...

Table of Contents

(Click below to follow the link)

Bar Grating 2

Bar Grating Product Description 2
Material Selection 2

Steel Bar Grating 3

Stainless Steel Grating 11

Railroad Grating 13

Heavy-Duty Steel Grating 14

Aluminum Grating 25

Riveted Grating 37

Stair Treads 42

Anchoring Details 48

Installation Clearances 49

Welding Standards 50

Manufacturing Tolerances 51

Glossary 52

Grating Design Data 53

Safety Grating 55

Perfo Grip® Grating 56

Grip Strut® Grating 63

Grate-Lock® Grating 76

Tread-Grip® Channels 77

Tread-Grip® Sheets 78

Button-Hole® Sheets 79

Tread-Grip® Ladder Rungs 80

Stair Treads 81

How To Specify Safety Grating 82

Custom Fabrication 84

BAR GRATING

Welded Steel Grating

Standard Welded: Marco's welded grating is used universally for walkway and mezzanine decking applications. It is ideal for most general industrial and commercial uses. Standard welded grating is generally considered to included grating with bearing bars spaced at 1-3/16" or 15/16 and is available in carbon or stainless steel.

Close-Mesh: Close-mesh grating is similar to standard grating except that spacing of the bearing bars is closer, ranging from 7/16" to 13/16". It is suitable for applications requiring narrow spacing for aesthetic or functional reasons. It is available in carbon or stainless steel.

Railroad: Welded grating with spacings of 1-9/16" and 1-11/16" meet the requirements for AAR approved safety walkway products. This grating is designed specifically for use as railcar brake steps, running boards, walkways and platforms.

Heavy-Duty: Heavy-Duty uses thicker (1/4", 5/16", 3/8") and deeper bearing bars. Although the tables show bars as deep as 6", deeper grating can be custom fabricated on request. Heavy-Duty is used for airfields, highways, industrial floors, ramps, docks, reinforced concrete areas and specialty applications.

Press-Locked Steel & Aluminum Grating

Because this grating is a system of interlocking, perpendicular bars, it provides a smooth clean look ideal for architectural applications such as grilles, dividers and screens. It is used in the same structural applications as its welded steel and rectangular aluminum counterparts. Materials include carbon steel, stainless steel or aluminum. Spacings range from 7/16" to 1-3/16".

Swage-Locked Aluminum Grating

Swage-locked aluminum grating is manufactured with either an "I" or rectangular bearing bar. These bars are permanently locked to the cross rods with a swaging process which reshapes the rods. Because of the flange width, I-bars reduce the open space of the grating yet-bar swage-locked is lighter is lighter weight and less costly than a rectangular bar grating with the same bar thickness.

Riveted Steel & Aluminum Grating

Riveted grating is especially practical for areas Where rolling loads are used because of its smoother surface. it is available in both aluminum and steel.

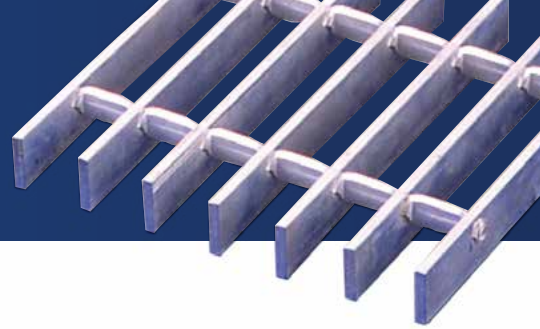
Material Selection

Carbon Steel:
Carbon steel provides an economical, high strength grating for use in most industrial and commercial applications.

Aluminum:
Lightweight, corrosion resistant and non-sparking alloys make aluminum ideal for use in chemical, petroleum, hydro and food processing plants, sewage, water and waster treatment facilities; munitions plants and other volatile areas; aboard ship; etc.

Stainless Steel:
Stainless steel is ideal for use in caustic atmospheres where corrosion resistance and minimum carbide precipitation are important considerations. It is especially applicable for chemical, food and hydro processing areas.

STEEL BAR GRATING



Welded Steel Bar Grating is the most popular of all grating types due to its strength, cost-efficient production and ease of installation. University used in most general industrial plants as well as commercial buildings, it has wide applications as walkways, platforms, safety barriers, drainage cover and ventilation grates.

It is to also ideal for use as mezzanine decking since it supports the same loads as comparable solid flooring. More than that, its cost saving openness maximizes the circulation of air, light, heat, water and sound, while promoting cleanliness. And, when insurance codes permit, additional sprinklers can often be eliminated. Standard panels are available in widths of 2’, 3’ or 4’.

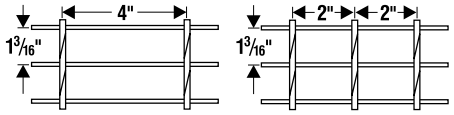
Welded steel bar grating is resistance welded to create a rugged, one piece constructed panel. The bearing bars are automatically resistance welded at the contact point with the cross bars and, under a combination of high heat and pressure, are fused together to form a permanent joint. The cross bars provide a high degree of rigidity, yet retain a smooth flat surface for and easy walking.

Press-Locked Steel Bar Grating is often desirable because of its clean, smooth look and excellent lateral support. It exhibits the same strength, long life and openness as welded grating, although it is not recommended for rolling loads. Instead of welding the joints, however, tremendous hydraulic pressure is used to bond the two close-tolerance slotted bars together. Permanent locking is achieved by forcing the deep cross bar into the notched bearing bar.

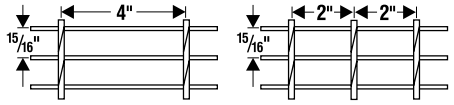
*Further fabrication or galvanizing is **not** recommended after the material leaves Marco.*

Steel Welded Railroad Grating, in 1-9/16” and 1-11/16” spacings, is AAR (Association of American Railroads) approved and specified for brake steps, running boards, walkways and platforms for railroad cars. Designed and engineered specifically for railroad use, Marco railroad grating is used by both new car and car repair facilities since it is interchangeable with other AAR approved gratings. The serrated bearing bars proved additional safety and the openness of bar grating minimizes build up of snow, ice and other debris.

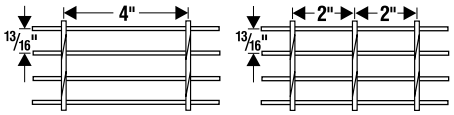
Welded Steel Bar Grating



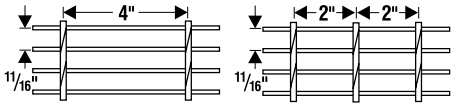
19-W-4 | 19-W-2



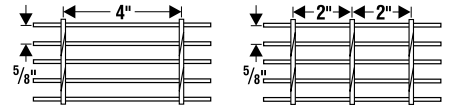
15-W-4 | 15-W-2



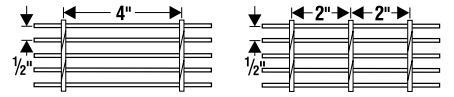
13-W-4 | 13-W-2



11-W-4 | 11-W-2

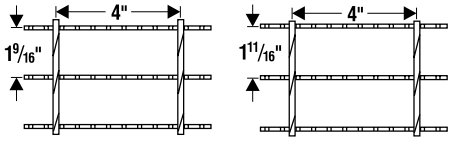


10-W-4 | 10-W-2



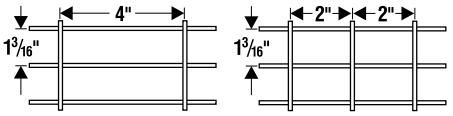
8-W-4 | 8-W-2

Steel Welded Railroad Grating (AAR Approved)

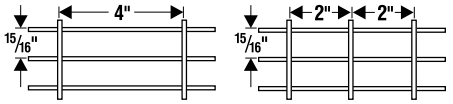


25-W-4 | 27-W-4

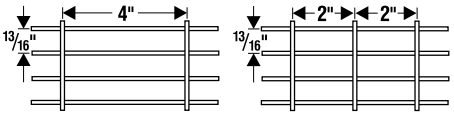
Press-Locked Steel Bar Grating



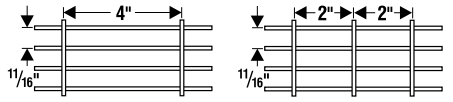
19-P-4 | 19-P-2



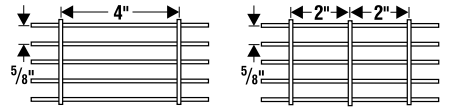
15-P-4 | 15-P-2



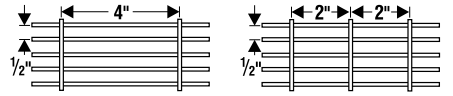
13-P-4 | 13-P-2



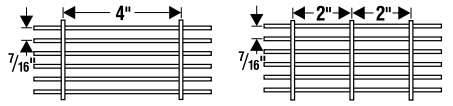
11-P-4 | 11-P-2



10-P-4 | 10-P-2



8-P-4 | 8-P-2



7-P-4 | 7-P-2

Welded

1-3/16" Center to Center of Bearing Bars

19-W-4
Cross Rods 4" C/C

19-W-2
Cross Rods 2" C/C

Press-Locked

1-3/16" Center to Center of Bearing Bars

19-P-4
Cross Bars 4" C/C

19-P-2
Cross Bars 2" C/C

Load & Deflection Table

Material: ASTM-569 standard

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. These can be exceeded for other types of loads with 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 the table.

General: Loads and deflections are theoretical and based on static loading.

Bar Size	Symbol		Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
3/4" x 1/8"	19-4-32	W	3.9	0.118	U	355	227	158	116	89	70							
		P	4.3		D	0.099	0.155	0.223	0.304	0.397	0.503							
	19-2-32	W	4.4		C	355	284	237	203	178	158							
		P	5.2		D	0.079	0.124	0.179	0.243	0.318	0.402							
3/4" x 3/16"	19-4-33	W	5.6	0.178	U	533	341	237	174	133	105							
		P	6.4		D	0.099	0.155	0.223	0.304	0.397	0.503							
	19-2-33	W	6.2		C	533	426	355	305	266	237							
		P	7.8		D	0.079	0.124	0.179	0.243	0.318	0.402							
1" x 1/8"	19-4-42	W	5.0	0.211	U	632	404	281	206	158	125	101	84					
		P	5.4		D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563					
	19-2-42	W	5.5		C	632	505	421	361	316	281	253	230					
		P	6.3		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451					
1" x 3/16"	19-4-43	W	7.2	0.316	U	947	606	421	309	237	187	152	125					
		P	8.1		D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563					
	19-2-43	W	7.8		C	947	758	632	541	474	421	379	344					
		P	9.5		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451					
1-1/4" x 1/8"	19-4-52	W	6.1	0.329	U	987	632	439	322	247	195	158	130	110	93	81		
		P	6.8		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730		
	19-2-52	W	6.6		C	987	789	658	564	493	439	395	359	329	304	282		
		P	8.1		D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584		
1-1/4" x 3/16"	19-4-53	W	8.9	0.493	U	1480	947	658	483	370	292	237	196	164	140	121		
		P	10.2		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730		
	19-2-53	W	9.5		C	1480	1184	987	846	740	658	592	538	493	455	423		
		P	12.1		D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584		
1-1/2" x 1/8"	19-4-62	W	7.2	0.474	U	1421	909	632	464	355	281	227	188	158	135	116	89	70
		P	7.9		D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
	19-2-62	W	7.7		C	1421	1137	947	812	711	632	568	517	474	437	406	355	316
		P	9.2		D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-1/2" x 3/16"	19-4-63	W	10.5	0.711	U	2132	1364	947	696	533	421	341	282	237	202	174	133	105
		P	11.8		D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
	19-4-73	W	11.2		C	2132	1705	1421	1218	1066	947	853	775	711	656	609	533	474
		P	13.8		D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-3/4" x 3/16"	19-4-73	W	12.2	0.967	U	2901	1857	1289	947	725	573	464	384	322	275	237	181	143
		P	13.5		D	0.043	0.067	0.096	0.130	0.170	0.215	0.266	0.322	0.383	0.450	0.521	0.681	0.862
	19-2-73	W	12.8		C	2901	2321	1934	1658	1451	1289	1161	1055	967	893	829	725	645
		P	15.4		D	0.034	0.053	0.077	0.104	0.136	0.172	0.213	0.257	0.306	0.360	0.417	0.545	0.689
2" x 3/16"	19-4-83	W	13.9	1.263	U	3789	2425	1684	1237	947	749	606	501	421	359	309	237	187
		P	15.2		D	0.037	0.058	0.084	0.114	0.149	0.189	0.233	0.282	0.335	0.393	0.456	0.596	0.754
	19-2-83	W	14.5		C	3789	3032	2526	2165	1895	1684	1516	1378	1263	1166	1083	947	842
		P	17.1		D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
2-1/4" x 3/16"	19-4-93	W	15.5	1.599	U	4796	3069	2132	1566	1199	947	767	634	533	454	392	300	237
		P	16.8		D	0.033	0.052	0.074	0.101	0.132	0.168	0.207	0.250	0.298	0.350	0.406	0.530	0.670
	19-2-93	W	16.1		C	4796	3837	3197	2741	2398	2132	1918	1744	1599	1476	1370	1199	1066
		P	18.7		D	0.026	0.041	0.060	0.081	0.106	0.134	0.166	0.200	0.238	0.280	0.324	0.424	0.536
2-1/2" x 3/16"	19-4-103	W	17.2	1.974	U	5921	3789	2632	1933	1480	1170	947	783	658	561	483	370	292
		P	18.5		D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
	19-2-103	P	17.8		C	5921	4737	3947	3383	2961	2632	2368	2153	1974	1822	1692	1480	1316
		P	20.4		D	0.024	0.037	0.054	0.073	0.095	0.121	0.149	0.180	0.215	0.252	0.292	0.381	0.483

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 2,000,000 psi - F= fiber stress, 18,000 psi

W/P-19 PANEL WIDTH (inches) **Note:** P - Press-Locked cross bars typically extend 1/8" each side. W - Welded cross rods may extend 1/8" each side. Panel widths do not include these extensions.

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1/8" Bar	1 5/16	2 1/2	3 11/16	4 7/8	6 1/16	7 1/4	8 7/16	9 5/8	10 13/16	12	13 3/16	14 3/8	15 9/16	16 3/4	17 15/16
3/16" Bar	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**
1/8" Bar	19 1/8	20 5/16	21 1/2	22 11/16	23 7/8	25 1/16	26 1/4	27 7/16	28 5/8	29 13/16	31	32 3/16	33 3/8	34 9/16	35 3/4
3/16" Bar	19 3/16	20 3/8	21 9/16	22 3/4	23 15/16	25 1/8	26 5/16	27 1/2	28 11/16	29 7/8	3 11/16	32 1/4	33 7/16	34 5/8	35 13/16

Welded

15/16" Center to Center of Bearing Bars

15-W-4
Cross Rods 4" C/C

15-W-2
Cross Rods 2" C/C

Press-Locked

15/16" Center to Center of Bearing Bars

15-P-4
Cross Bars 4" C/C

15-P-2
Cross Bars 2" C/C

Load & Deflection Table

Bar Size	Symbol		Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
3/4" x 1/8"	15-4-32	W	4.7	0.150	U	450	288	200	147	113	89							
		P	5.1		D	0.099	0.155	0.223	0.304	0.397	0.503							
	15-2-32	W	5.3		C	450	360	300	257	225	200							
		P	6.1		D	0.079	0.124	0.179	0.243	0.318	0.402							
3/4" x 3/16"	15-4-33	W	6.9	0.225	U	675	432	300	220	169	133	108						
		P	7.7		D	0.099	0.155	0.223	0.304	0.397	0.503	0.621						
	15-2-33	W	7.5		C	675	540	450	386	338	300	270						
		P	9.1		D	0.079	0.124	0.179	0.243	0.318	0.402	0.497						
1" x 1/8"	15-4-42	W	6.1	0.267	U	800	512	356	261	200	158	128	106	89				
		P	6.5		D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670				
	15-2-42	W	6.7		C	800	640	533	457	400	356	320	291	267				
		P	7.5		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536				
1" x 3/16"	15-4-43	W	8.9	0.400	U	1200	768	533	392	300	237	192	159	133				
		P	9.8		D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670				
	15-2-43	W	9.6		C	1200	960	800	686	600	533	480	436	400				
		P	11.2		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536				
1-1/4" x 1/8"	15-4-52	W	7.5	0.417	U	1250	800	556	408	313	247	200	165	139	118	102		
		P	8.2		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730		
	15-2-52	W	8.1		C	1250	1000	833	714	625	556	500	455	417	385	357		
		P	9.5		D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584		
1-1/4" x 3/16"	15-4-53	W	11.0	0.625	U	1875	1200	833	612	469	370	300	248	208	178	153		
		P	12.3		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730		
	15-2-53	W	11.6		C	1875	1500	1250	1071	938	833	750	682	625	577	536		
		P	14.2		D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584		
1-1/2" x 1/8"	15-4-62	W	8.9	0.600	U	1800	1152	800	588	450	356	288	238	200	170	147	113	89
		P	9.6		D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
	15-2-62	W	9.4		C	1800	1440	1200	1029	900	800	720	655	600	554	514	450	400
		P	10.9		D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-1/2" x 3/16"	15-4-63	W	13.1	0.900	U	2700	1728	1200	882	675	533	432	357	300	256	220	169	133
		P	14.4		D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
	15-4-73	W	13.7		C	2700	2160	1800	1543	1350	1200	1080	982	900	831	771	675	600
		P	16.3		D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-3/4" x 3/16"	15-4-73	W	15.2	1.225	U	3675	2352	1633	1200	919	726	588	486	408	348	300	230	181
		P	16.5		D	0.043	0.067	0.096	0.130	0.170	0.215	0.266	0.322	0.383	0.450	0.521	0.681	0.862
	15-2-73	W	15.8		C	3675	2940	2450	2100	1838	1633	1470	1336	1225	1131	1050	919	817
		P	18.4		D	0.034	0.053	0.077	0.104	0.136	0.172	0.213	0.257	0.306	0.360	0.417	0.545	0.689
2" x 3/16"	15-4-83	W	17.3	1.600	U	4800	3072	2133	1567	1200	948	768	635	533	454	392	300	237
		P	18.6		D	0.037	0.058	0.084	0.114	0.149	0.189	0.233	0.282	0.335	0.393	0.456	0.596	0.754
	15-2-83	W	17.9		C	4800	3840	3200	2743	2400	2133	1920	1745	1600	1477	1371	1200	1067
		P	20.5		D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
2-1/4" x 3/16"	15-4-93	W	19.4	2.025	U	6075	3888	2700	1984	1519	1200	972	803	675	575	496	380	300
		P	20.7		D	0.033	0.052	0.074	0.101	0.132	0.168	0.207	0.250	0.298	0.350	0.406	0.530	0.670
	15-2-93	W	20.0		C	6075	4860	4050	3471	3038	2700	2430	2209	2025	1869	1736	1519	1350
		P	22.6		D	0.026	0.041	0.060	0.081	0.106	0.134	0.166	0.200	0.238	0.280	0.324	0.424	0.536
2-1/2" x 3/16"	15-4-103	W	21.4	2.500	U	7500	4800	3333	2449	1875	1481	1200	992	833	710	612	469	370
		P	22.7		D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
	15-2-103	P	22.0		C	7500	6000	5000	4286	3750	3333	3000	2727	2500	2308	2143	1875	1667
		P	24.7		D	0.024	0.037	0.054	0.073	0.095	0.121	0.149	0.180	0.215	0.252	0.292	0.381	0.483

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 29,000,000 psi - F= fiber stress, 18,000 psi

Material: ASTM A-569 standard

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. These can be exceeded for other types of loads with 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 the table.

General: Loads and deflections are theoretical and based on static loading.

W/P-15 PANEL WIDTH (inches)

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

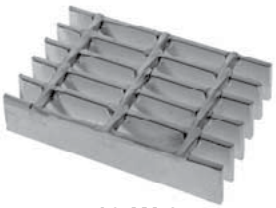
No. of Bars	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
1/8" Bar	18 7/8	19 13/16	20 3/4	21 11/16	22 5/8	23 9/16	24 1/2	25 7/16	26 3/8	27 5/16	28 1/4	29 3/16	30 1/8	3 11/16	32	32 15/16	33 7/8	34 13/16	35 3/4
3/16" Bar	18 15/16	19 7/8	2013/16	21 3/4	22 11/16	23 5/8	24 9/16	25 1/2	26 7/16	27 3/8	28 5/16	29 1/4	30 3/16	3 11/8	32 1/16	33	33 15/16	34 7/8	35 13/16

MARCO SPECIALTY STEEL

Welded Close-Mesh

1-3/16" Center to Center of Bearing Bars

13-W-4
Cross Rods 4" C/C



13-W-2
Cross Rods 2" C/C

Press-Locked Close Mesh

1-3/16" Center to Center of Bearing Bars

13-P-4
Cross Bars 4" C/C

13-P-2
Cross Bars 2" C/C

Load & Deflection Table

Bar Size	Symbol		Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
3/4" x 1/8"	13-4-32	W	5.3	0.173	U	519	332	231	170	130	103							
		P	5.8		D	0.099	0.155	0.223	0.304	0.397	0.503							
	13-2-32	W	5.9		C	519	415	346	297	260	231							
		P	6.7		D	0.079	0.124	0.179	0.243	0.318	0.402							
3/4" x 3/16"	13-4-33	W	7.8	0.260	U	779	779	346	254	195	154	125						
		P	8.6		D	0.099	0.155	0.223	0.304	0.397	0.503	0.621						
	13-2-33	W	8.4		C	779	623	519	445	389	346	312						
		P	10.1		D	0.079	0.124	0.179	0.243	0.318	0.402	0.497						
1" x 1/8"	13-4-42	W	6.9	0.308	U	923	591	410	301	231	182	148	122	103				
		P	7.4		D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670				
	13-2-42	W	7.5		C	923	738	615	527	462	410	369	336	308				
		P	8.3		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536				
1" x 3/16"	13-4-43	W	10.2	0.462	U	1385	886	615	452	346	274	222	183	154				
		P	11.0		D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670				
	13-2-43	W	10.8		C	1385	1108	923	791	692	615	554	503	462				
		P	12.4		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536				
1-1/4" x 1/8"	13-4-52	W	8.5	0.481	U	1442	923	641	471	361	285	231	191	160	137	118		
		P	9.3		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730		
	13-2-52	W	9.1		C	1442	1154	962	824	721	641	577	524	481	444	412		
		P	10.5		D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584		
1-1/4" x 3/16"	13-4-53	W	12.6	0.721	U	2163	1385	962	706	541	427	346	286	240	205	177		
		P	13.9		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730		
	13-2-53	W	13.2		C	2163	1731	1442	1236	1082	962	865	787	721	666	618		
		P	15.8		D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584		
1-1/2" x 1/8"	13-4-62	W	10.1	0.692	U	2077	1329	923	678	519	410	332	275	231	197	170	130	103
		P	10.9		D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
	13-2-62	W	10.7		C	2077	1662	1385	1187	1038	923	831	755	692	639	593	519	462
		P	12.1		D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-1/2" x 3/16"	13-4-63	W	15.0	1.038	U	3115	1994	1385	1017	779	615	498	412	346	295	254	195	154
		P	16.3		D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
	13-2-63	W	15.6		C	3115	2492	2077	1780	1558	1385	1246	1133	1038	959	890	779	692
		P	18.2		D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-3/4" x 3/16"	13-4-73	W	17.4	1.413	U	4240	2714	1885	1385	1060	838	678	561	471	401	346	265	209
		P	18.7		D	0.043	0.067	0.096	0.130	0.170	0.215	0.266	0.322	0.383	0.450	0.521	0.681	0.862
	13-2-73	W	18.0		C	4240	3392	2827	2423	2120	1885	1696	1542	1413	1305	1212	1060	942
		P	20.6		D	0.034	0.053	0.077	0.104	0.136	0.172	0.213	0.257	0.306	0.360	0.417	0.545	0.689
2" x 3/16" 2" x 3/16"	13-4-83	W	19.8	1.846	U	5538	3545	2462	1808	1385	1094	886	732	615	524	452	346	274
		P	21.1		D	0.037	0.058	0.084	0.114	0.149	0.189	0.233	0.282	0.335	0.393	0.456	0.596	0.754
	13-2-83	W	20.4		C	5538	4431	3692	3165	2769	2462	2215	2014	1846	1704	1582	1385	1231
		P	23.0		D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
2-1/4" x 3/16"	13-4-93	W	22.2	2.337	U	7010	4486	3115	2289	1752	1385	1122	927	779	664	572	438	346
		P	23.5		D	0.033	0.052	0.074	0.101	0.132	0.168	0.207	0.250	0.298	0.350	0.406	0.530	0.670
	13-2-93	W	22.8		C	7010	5608	4673	4005	3505	3115	2804	2549	2337	2157	2003	1752	1558
		P	25.4		D	0.026	0.041	0.060	0.081	0.106	0.134	0.166	0.200	0.238	0.280	0.324	0.424	0.536
2-1/2" x 3/16"	13-4-103	W	24.6	2.885	U	8654	5538	3846	2826	2163	1709	1385	1144	962	819	706	541	427
		P	25.9		D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
	13-2-103	P	25.2		C	8654	6923	5769	4945	4327	3846	3462	3147	2885	2663	2473	2163	1923
		P	27.8		D	0.024	0.037	0.054	0.073	0.095	0.121	0.149	0.180	0.215	0.252	0.292	0.381	0.483

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 2,000,000 psi - F= fiber stress, 18,000 psi

Material: ASTM-569 standard

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. These can be exceeded for other types of loads with 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 the table.

General: Loads and deflections are theoretical and based on static loading.

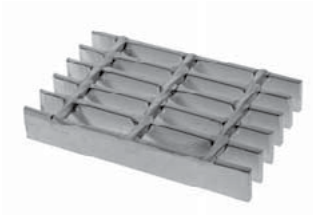
W/P-13 PANEL WIDTH (inches) **Note:** P-Press-Locked cross bars typically extend 1/8" each side. W-Welded cross rods may extend 1/8" each side. Panel widths do not include these extensions.

No. of Bars	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
1/8" Bar	15/16	1 3/4	2 9/16	3 3/8	4 3/16	5	5 13/16	6 5/8	7 7/16	8 1/4	9 1/16	9 7/8	10 11/16	11 1/2	12 5/16	13 1/8
3/16" Bar	1	1 13/16	2 5/8	3 7/16	4 1/4	5 1/16	5 7/8	6 11/16	7 1/2	8 5/16	9 1/8	9 15/16	10 3/4	11 9/16	12 3/8	13 3/16
No. of Bars	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**
1/8" Bar	13 15/16	14 3/4	15 9/16	16 3/8	17 3/16	18	18 13/16	19 5/8	20 7/16	2 11/4	22 1/16	22 7/8	23 11/16	24 1/2	25 5/16	26 1/8
3/16" Bar	14	14 13/16	15 5/8	16 7/16	17 1/4	18 1/16	18 7/8	19 11/16	20 1/2	21 5/16	22 1/8	22 15/16	23 3/4	24 9/16	25 3/8	26 3/16
No. of Bars	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**				
1/8" Bar	26 15/16	27 3/4	28 9/16	29 3/8	30 3/16	31	31 13/16	32 5/8	33 7/16	34 1/4	35 1/16	35 7/8				
3/16" Bar	27	27 13/16	28 5/8	29 7/16	30 1/4	31 1/16	31 7/8	32 11/16	33 1/2	34 5/16	35 1/8	35 15/16				

Welded Close-Mesh

11/16" Center to Center of Bearing Bars

11-W-4
Cross Rods 4" C/C



11-W-2
Cross Rods 2" C/C

Press-Locked Close Mesh

11/16" Center to Center of Bearing Bars

11-P-4
Cross Bars 4" C/C

11-P-2
Cross Bars 2" C/C

Load & Deflection Table

Material: ASTM A-569 standard

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. These can be exceeded for other types of loads with 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 the table.

General: Loads and deflections are theoretical and based on static loading.

Bar Size	Symbol		Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
3/4" x 1/8"	11-4-32	W	6.2	0.205	U	614	393	273	200	153	121	98						
		P	6.6		D	0.099	0.155	0.223	0.304	0.397	0.503	0.621						
	11-2-32	W	6.8		C	614	491	409	351	307	273	245						
		P	7.6		D	0.079	0.124	0.179	0.243	0.318	0.402	0.497						
3/4" x 3/16"	11-4-33	W	9.1	0.307	U	920	589	409	301	230	182	147						
		P	9.9		D	0.099	0.155	0.223	0.304	0.397	0.503	0.621						
	11-2-33	W	9.7		C	920	736	614	526	460	409	368						
		P	11.3		D	0.079	0.124	0.179	0.243	0.318	0.402	0.497	5'-6"	6'-0"				
1" x 1/8"	11-4-42	W	8.1	0.364	U	1091	698	485	356	273	215	175	144	121				
		P	8.5		D	0.074	0.166	0.168	0.228	0.298	0.377	0.466	0.563	0.670				
	11-2-42	W	8.6		C	1091	873	727	623	545	485	436	397	364				
		P	9.4		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	6'-6"			
1" x 3/16"	11-4-43	W	11.9	0.545	U	1636	1074	727	534	409	323	262	216	182	155			
		P	12.7		D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670	0.787			
	11-2-43	W	12.5		C	1636	1309	1091	935	818	727	655	595	545	503			
		P	14.2		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	7'-0"		
1-1/4" x 1/8"	11-4-52	W	10.0	0.568	U	1705	1091	758	557	426	337	273	225	189	161	139		
		P	10.7		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730		
	11-2-52	W	10.5		C	1705	1364	1136	974	852	758	682	620	568	524	487		
		P	12.0		D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584	8'-0"	
1-1/4" x 3/16"	11-4-53	W	14.7	0.852	U	2557	1636	1136	835	639	505	409	338	284	242	209	160	
		P	16.0		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730	0.953	
	11-2-53	W	15.3		C	2557	2045	1705	1461	1278	1136	1023	930	852	787	731	639	
		P	17.9		D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584	0.763	9'-0"
1-1/2" x 1/8"	11-4-62	W	11.9	0.818	U	2455	1571	1091	801	614	485	393	325	273	232	200	153	121
		P	12.6		D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
	11-2-62	W	12.4		C	2455	1964	1636	1403	1227	1091	982	893	818	755	701	614	545
		P	13.9		D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-1/2" x 3/16"	11-4-63	W	17.5	1.227	U	3682	2356	1636	1202	920	727	589	487	409	349	301	230	182
		P	18.8		D	0.050	0.078	0.122	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
	11-2-63	W	18.1		C	3682	2945	2455	2104	1841	1636	1473	1339	1227	1133	1052	920	818
		P	20.7		D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-3/4" x 3/16"	11-4-73	W	20.4	1.670	U	5011	3207	2227	1636	1253	990	802	663	557	474	409	313	247
		P	21.7		D	0.043	0.067	0.096	0.130	0.170	0.215	0.266	0.322	0.383	0.450	0.521	0.681	0.862
	11-2-73	W	21.0		C	5011	4009	3341	2864	2506	2227	2005	1822	1670	1542	1432	1253	1114
		P	23.6		D	0.034	0.053	0.077	0.104	0.136	0.172	0.213	0.257	0.306	0.360	0.417	0.545	0.689
2" x 3/16"	11-4-83	W	23.2	2.182	U	6545	4189	2909	2137	1636	1293	1047	866	727	620	534	409	323
		P	24.5		D	0.037	0.058	0.084	0.144	0.149	0.189	0.233	0.282	0.335	0.393	0.456	0.596	0.754
	11-2-83	W	23.8		C	6545	5236	4364	3740	3273	2909	2618	2380	2182	2014	1870	1636	1455
		P	26.4		D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
2-1/4" x 3/16"	11-4-93	W	26.0	2.761	U	8284	5302	3682	2705	2071	1636	1325	1095	920	784	676	518	409
		P	27.3		D	0.033	0.052	0.074	0.101	0.132	0.168	0.207	0.250	0.298	0.350	0.406	0.530	0.670
	11-2-93	W	26.6		C	8284	6627	5523	4734	4142	3682	3314	3012	2761	2549	2367	2071	1841
		P	29.2		D	0.026	0.041	0.060	0.081	0.106	0.134	0.166	0.200	0.238	0.280	0.324	0.424	0.536
2-1/2" x 3/16"	11-4-103	W	28.8	3.409	U	10227	6545	4545	3340	2557	2020	1636	1352	1136	968	835	639	505
		P	30.1		D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
	11-2-103	P	29.4		C	10227	8182	6818	5844	5114	4545	4091	3719	3409	3147	2922	2557	2273
		P	32.0		D	0.024	0.037	0.054	0.073	0.095	0.121	0.149	0.180	0.215	0.252	0.292	0.381	0.483

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 29,000,000 psi - F= fiber stress, 18,000 psi

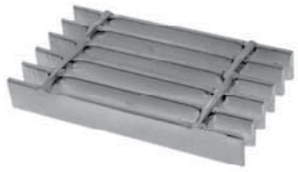
W/P-11 PANEL WIDTH (inches) **Note:** P-Press-Locked cross bars typically extend 1/8" each side. W-Welded cross rods may extend 1/8" each side. Panel widths do not include these extensions..

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1/8" Bar	13 /16	1 1/2	2 3/16	2 7/8	3 9/16	4 1/4	4 15/16	5 5/8	6 5/16	7	7 11/16	8 3/8	9 1/16	9 3/4	10 7/16	11 1/8	11 13/16	12 1/2
3/16" Bar	7/8	1 9/16	2 1/4	2 15/16	3 5/8	4 5/16	5	5 11/16	6 3/8	7 1/16	7 3/4	8 7/16	9 1/8	9 13/16	10 1/2	11 3/16	11 7/8	12 9/16
No. of Bars	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**
1/8" Bar	13 3/16	13 7/8	14 9/16	15 1/4	15 15/16	16 5/8	17 5/16	18	18 11/16	19 3/8	20 1/16	20 3/4	21 7/16	22 1/8	22 13/16	23 1/2	24 3/16	24 7/8
3/16" Bar	13 1/4	13 15/16	14 5/8	15 5/16	16	16 11/16	17 3/8	18 1/16	18 3/4	19 7/16	20 1/8	20 13/16	21 1/2	22 3/16	22 7/8	23 9/16	24 1/4	24 15/16
No. of Bars	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**		
1/8" Bar	25 9/16	26 1/4	26 15/16	27 5/8	28 5/16	29	29 11/16	30 3/8	31 1/16	31 3/4	32 7/16	33 1/8	33 13/16	34 1/2	35 3/16	35 7/8		
3/16" Bar	25 5/8	26 5/16	27	27 11/16	28 3/8	29 1/16	29 3/4	30 7/16	31 1/8	31 13/16	32 1/2	33 3/16	33 7/8	34 9/16	35 1/4	35 15/16		

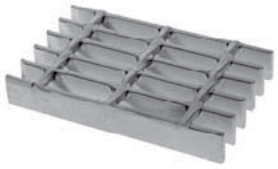
MARCO SPECIALTY STEEL

Welded Close-Mesh

5/8" Center to Center of Bearing Bars



10-W-4
Cross Rods 4" C/C



10-W-2
Cross Rods 2" C/C

Press-Locked Close Mesh

5/8" Center to Center of Bearing Bars

10-P-4
Cross Bars 4" C/C

10-P-2
Cross Bars 2" C/C

Load & Deflection Table

Material: ASTM A-569 standard

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. These can be exceeded for other types of loads with 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 the table.

General: Loads and deflections are theoretical and based on static loading.

Bar Size	Symbol		Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
3/4" x 1/8"	10-4-32	W	6.8	0.225	U	675	432	300	220	169	133	108						
		P	7.2		D	0.099	0.155	0.223	0.304	0.397	0.503	0.621						
	10-2-32	W	7.3		C	675	540	450	386	338	300	270						
		P	8.1		D	0.079	0.124	0.179	0.243	0.318	0.402	0.497						
3/4" x 3/16"	10-4-33	W	9.9	0.338	U	1013	648	450	331	253	200	162	134					
		P	10.7		D	0.099	0.155	0.223	0.304	0.397	0.503	0.621	0.751					
	10-2-33	W	10.5		C	1013	810	675	579	506	450	405	368					
		P	12.2		D	0.079	0.124	0.179	0.243	0.318	0.402	0.497	0.601					
1" x 1/8"	10-4-42	W	8.8	0.400	U	1200	768	533	392	300	237	192	159	133				
		P	9.2		D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670				
	10-2-42	W	9.4		C	1200	960	800	686	600	533	480	436	400				
		P	10.2		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536				
1" x 3/16"	10-4-43	W	13.0	0.600	U	1800	1152	800	588	450	356	288	238	200	170			
		P	13.8		D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670	0.787			
	10-2-43	W	13.6		C	1800	1440	1200	1029	900	800	720	655	600	554			
		P	15.3		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629			
1-1/4" x 1/8"	10-4-52	W	10.9	0.625	U	1875	1200	833	612	469	370	300	248	208	178	153		
		P	11.6		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730		
	10-2-52	W	11.4		C	1875	1500	1250	1071	938	833	750	682	625	577	536		
		P	12.9		D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584		
1-1/4" x 3/16"	10-4-53	W	16.1	0.938	U	2813	1800	1250	918	703	556	450	372	313	266	230	176	
		P	17.4		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730	0.953	
	10-2-53	W	16.7		C	2813	2250	1875	1607	1406	1250	1125	1023	938	865	804	703	
		P	19.3		D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584	0.763	
1-1/2" x 1/8"	10-4-62	W	13.0	0.900	U	2700	1728	1200	882	675	533	432	357	300	256	220	169	133
		P	13.7		D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
	10-2-62	W	13.5		C	2700	2160	1800	1543	1350	1200	1080	982	900	831	771	675	600
		P	15.0		D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-1/2" x 3/16"	10-4-63	W	19.2	1.350	U	4050	2592	1800	1322	1013	800	648	536	450	383	331	253	200
		P	20.5		D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
	10-2-63	W	19.8		C	4050	3240	2700	2314	2025	1800	1620	1473	1350	1246	1157	1013	900
		P	22.4		D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-3/4" x 3/16"	10-4-73	W	22.3	1.838	U	5513	3528	2450	1800	1378	1089	882	729	613	522	450	345	272
		P	23.6		D	0.043	0.067	0.096	0.130	0.170	0.215	0.266	0.322	0.383	0.450	0.521	0.681	0.862
	10-2-73	W	22.9		C	5513	4410	3675	3150	2756	2450	2205	2005	1838	1696	1575	1378	1225
		P	25.5		D	0.034	0.053	0.077	0.104	0.136	0.172	0.213	0.257	0.306	0.360	0.417	0.545	0.689
2" x 3/16"	10-4-83	W	25.4	2.400	U	7200	4608	3200	2351	1800	1422	1152	952	800	682	588	450	356
		P	26.7		D	0.037	0.058	0.084	0.114	0.149	0.189	0.233	0.282	0.335	0.393	0.456	0.596	0.754
	10-2-83	W	26.0		C	7200	5760	4800	4114	3600	3200	2880	2618	2400	2215	2057	1800	1600
		P	28.6		D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
2-1/4" x 3/16"	10-4-93	W	28.5	3.038	U	9113	5832	4050	2976	2278	1800	1458	1205	1013	863	744	570	450
		P	29.8		D	0.033	0.052	0.074	0.101	0.132	0.168	0.207	0.250	0.298	0.350	0.406	0.530	0.670
	10-2-93	W	29.1		C	9113	7290	6075	5207	4556	4050	3645	3314	3038	2804	2604	2278	2025
		P	31.7		D	0.026	0.041	0.060	0.081	0.106	0.134	0.166	0.200	0.238	0.280	0.324	0.424	0.536
2-1/2" x 3/16"	10-4-103	W	31.6	3.750	U	11250	7200	5000	3673	2813	2222	1800	1488	1250	1065	918	703	556
		P	32.9		D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
	10-2-103	W	32.2		C	11250	9000	7500	6429	5625	5000	4500	4091	3750	3462	3214	2813	2500
		P	34.8		D	0.024	0.037	0.054	0.073	0.095	0.121	0.149	0.180	0.215	0.252	0.292	0.381	0.483

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 29,000,000 psi - F= fiber stress, 18,000 psi

W/P-19 PANEL WIDTH (inches) **Note**: P-Press-Locked cross bars typically extend 1/8" each side. W-Welded cross rods may extend 1/8" each side. Panel widths do not include these extensions.

No. of Bars	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
1/8" Bar	3/4	13/8	2	25/8	31/4	37/8	41/2	51/8	53/4	63/8	7	75/8	81/4	87/8	91/2	101/8	103/4	113/8	12
3/16" Bar	13/16	17/16	21/16	211/16	35/16	315/16	49/16	53/16	513/16	67/16	71/16	711/16	85/16	815/16	99/16	103/16	1013/16	117/16	121/16
No. of Bars	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**
1/8" Bar	125/8	131/4	137/8	141/2	151/8	153/4	163/8	17	175/8	181/4	187/8	191/2	201/8	203/4	213/8	22	225/8	231/4	237/8
3/16" Bar	1211/16	135/16	1315/16	131/4	153/16	153/16	167/15	171/6	1711/15	185/16	185/16	189/15	203/16	2013/16	217/16	221/16	2211/16	235/16	2315/16
No. of Bars	40	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**
1/8" Bar	241/2	251/8	263/8	263/8	27	275/8	281/4	287/8	291/2	301/8	303/4	313/8	32	325/8	331/4	337/8	341/2	351/8	353/4
3/16" Bar	249/16	253/16	2513/16	267/16	271/16	2711/16	285/16	2815/16	299/16	303/16	3013/16	317/16	321/16	3211/16	335/16	3315/16	349/16	353/16	3513/16

Welded Close-Mesh

11/16" Center to Center of Bearing Bars

8-W-4
Cross Rods 4" C/C

8-W-2
Cross Rods 2" C/C

Press-Locked Close Mesh

11/16" Center to Center of Bearing Bars

8-P-4
Cross Bars 4" C/C

8-P-2
Cross Bars 2" C/C

Load & Deflection Table

Bar Size	Symbol		Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"							
3/4" x 1/8"	8-4-32	W	8.3	0.281	U	844	540	375	276	211	167	135							
		P	8.7		D	0.099	0.155	0.223	0.304	0.397	0.503	0.621							
	8-2-32	W	8.8		C	844	675	563	482	422	375	338							
		P	9.6		D	0.079	0.124	0.179	0.243	0.318	0.402	0.497	5'-6"						
3/4" x 3/16"	8-4-33	W	12.2	0.422	U	1266	810	563	413	316	250	203	167						
		P	13.0		D	0.099	0.155	0.223	0.304	0.397	0.503	0.621	0.751						
	8-2-33	W	12.8		C	1266	1013	844	723	633	563	506	460						
		P	14.4		D	0.079	0.124	0.179	0.243	0.318	0.402	0.497	0.601	6'-0"					
1" x 1/8"	8-4-42	W	10.9	0.500	U	1500	960	667	490	375	296	240	198	167					
		P	11.3		D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670					
	8-2-42	W	11.4		C	1500	1200	1000	857	750	667	600	545	500					
		P	12.2		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	6'-6"				
1" x 3/16"	8-4-43	W	16.0	0.750	U	2250	1440	1000	735	563	444	360	298	250	213				
		P	16.9		D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670	0.787				
	8-2-43	W	16.7		C	2250	1800	1500	1286	1125	1000	900	818	750	692				
		P	18.3		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	7'-0"			
1-1/4" x 1/8"	8-4-52	W	13.4	0.781	U	2344	1500	1042	765	586	463	375	310	260	222	191			
		P	14.2		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730			
	8-2-52	W	14.0		C	2344	1875	1563	1339	1172	1042	938	852	781	721	670			
		P	15.4		D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584	8'-0"	9'-0"	
1-1/4" x 3/16"	8-4-53	W	19.9	1.172	U	3516	2250	1563	1148	879	694	563	465	391	333	287	220	174	
		P	21.2		D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730	0.953	1.207	
	8-2-53	W	20.5		C	3516	2813	2344	2009	1758	1563	1406	1278	1172	1082	1004	879	781	
		P	23.1		D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584	0.763	0.965	
1-1/2" x 1/8"	8-4-62	W	16.0	1.125	U	3375	2160	1500	1102	844	667	540	446	375	320	276	211	167	
		P	16.7		D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006	
	8-2-62	W	16.6		C	3375	2700	2250	1929	1688	1500	1350	1227	1125	1038	964	844	750	
		P	18.0		D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804	
1-1/2" x 3/16"	8-4-63	W	23.8	1.688	U	5063	3240	2250	1653	1266	1000	810	669	563	479	413	316	250	
		P	25.1		D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006	
	8-2-63	W	24.4		C	5063	4050	3375	2893	2531	2250	2025	1841	1688	1558	1446	1266	1125	
		P	27.0		D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804	
1-3/4" x 3/16"	8-4-73	W	27.6	2.297	U	6891	4410	3063	2250	1723	1361	1103	911	766	652	563	431	340	
		P	28.9		D	0.043	0.067	0.096	0.130	0.170	0.215	0.266	0.322	0.383	0.450	0.521	0.681	0.862	
	8-2-73	W	28.2		C	6891	5513	4594	3938	3445	3063	2756	2506	2297	2120	1969	1723	1531	
		P	30.8		D	0.034	0.053	0.077	0.104	0.136	0.172	0.213	0.257	0.306	0.360	0.417	0.545	0.689	
2" x 3/16"	8-4-83	W	31.5	3.000	U	9000	5760	4000	2939	2250	1778	1440	1190	1000	852	735	563	444	
		P	32.8		D	0.037	0.058	0.084	0.114	0.149	0.189	0.233	0.282	0.335	0.393	0.456	0.596	0.754	
	8-2-83	W	32.1		C	9000	7200	6000	5143	4500	4000	3600	3273	3000	2769	2571	2250	2000	
		P	34.7		D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603	
2-1/4" x 3/16"	8-4-93	W	35.3	3.797	U	11391	7290	5063	3719	2848	2250	1823	1506	1266	1078	930	712	563	
		P	36.6		D	0.033	0.052	0.074	0.101	0.132	0.168	0.207	0.250	0.298	0.350	0.406	0.530	0.670	
	8-2-93	W	35.9		C	11391	9113	7594	6509	5695	5063	4556	4142	3797	3505	3254	2848	2531	
		P	38.5		D	0.026	0.041	0.060	0.081	0.106	0.134	0.166	0.200	0.238	0.280	0.324	0.424	0.536	
2-1/2" x 3/16"	8-4-103	W	39.2	4.688	U	14063	9000	6250	4592	3516	2778	2250	1860	1563	1331	1148	879	694	
		P	40.5		D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603	
	8-2-103	W	39.8		C	14063	11250	9375	8036	7031	6250	5625	5114	4688	4327	4018	3516	3125	
		P	42.4		D	0.024	0.037	0.054	0.073	0.095	0.121	0.149	0.180	0.215	0.252	0.292	0.381	0.483	

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 29,000,000 psi - F= fiber stress, 18,000 psi

Material: ASTM A-569 standard

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. These can be exceeded for other types of loads with 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 the table.

General: Loads and deflections are theoretical and based on static loading.

W/P-8 PANEL WIDTH (inches) **Note**: P-Press-Locked cross bars typically extend 1/8" each side. W-Welded cross rods may extend 1/8" each side. Panel widths do not include these extensions.

No. of Bars	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
1/8" Bar	5/8	11/8	15/8	21/8	25/8	31/8	35/8	41/8	45/8	51/8	55/8	61/8	65/8	71/8	75/8	81/8	85/8	91/8	95/8	91/8	105/8	111/8	115/8	121/8
3/16" Bar	11/16	13/16	111/16	23/16	211/16	33/16	311/16	43/16	411/16	53/16	511/16	63/16	611/16	73/16	711/16	83/16	811/16	93/16	911/16	103/16	1011/16	113/16	1111/16	123/16
No. of Bars	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**
1/8" Bar	125/8	131/8	135/8	141/8	145/8	151/8	155/8	161/8	165/8	171/8	175/8	181/8	185/8	191/8	195/8	201/8	205/8	211/8	215/8	221/8	225/8	231/8	235/8	241/8
3/16" Bar	1211/16	133/16	1311/16	143/16	1411/16	153/16	1511/16	163/16	1611/16	173/16	1711/16	183/16	1811/16	193/16	1911/16	203/16	2011/16	213/16	2011/16	223/16	2211/16	233/16	2311/16	243/16
No. of Bars	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**	**73**	
1/8" Bar	245/8	251/8	255/8	261/8	265/8	271/8	275/8	281/8	291/8	295/8	301/8	305/8	311/8	315/8	321/8	325/8	331/8	335/8	341/8	345/8	351/8	355/8	361/8	
3/16" Bar	2411/16	253/16	2511/16	263/16	2611/16	273/16	2711/16	283/16	293/16	2911/16	303/16	3011/16	313/16	3111/16	323/16	3211/16	333/16	3411/16	343/16	3511/16	353/16	3611/16	363/16	

Press-Locked Close-Mesh

7/16" Center to Center of Bearing Bars

7-P-4
Cross Rods 4" C/C

7-P-2
Cross Rods 2" C/C

ADA Conforming

Load & Deflection Table

Bar Size	Symbol		Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
3/4" x 1/8"	7-4-32	W	9.8	0.321	U	964	617	429	315	241	190	154						
		P			D	0.099	0.155	0.223	0.304	0.397	0.503	0.621						
	7-2-32	W	10.7		C	964	771	643	551	482	429	386						
		P			D	0.079	0.124	0.179	0.243	0.318	0.402	0.497						
3/4" x 3/16"	7-4-33	W	14.6	0.482	U	1446	926	643	472	362	286	231	191					
		P			D	0.099	0.155	0.223	0.304	0.397	0.503	0.621	0.751					
	7-2-33	W	16.1		C	1446	1157	964	827	723	643	579	526					
		P			D	0.079	0.124	0.179	0.243	0.318	0.402	0.497	0.601					
1" x 1/8"	7-4-42	W	12.7	0.571	U	1714	1097	726	560	429	339	274	227	190	162			
		P			D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670	0.787			
	7-2-42	W	13.7		C	1714	1371	1143	980	857	762	686	623	571	527			
		P			D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629			
1" x 3/16"	7-4-43	W	19.0	0.857	U	2571	1646	1143	840	643	508	411	340	286	243	210		
		P			D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670	0.787	0.912		
	7-2-43	W	20.5		C	2571	2057	1741	1469	1286	1143	1029	935	857	791	735		
		P			D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730		
1-1/4" x 1/8"	7-4-52	W	16.0	0.893	U	2679	1741	1190	875	670	529	429	354	298	254	219	167	
		P			D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730	0.953	
	7-2-52	W	17.2		C	2679	2143	1786	1531	1339	1190	1071	974	893	824	765	670	
		P			D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584	0.763	
1-1/4" x 3/16"	7-4-53	W	23.9	1.339	U	4018	2571	1786	1321	1004	794	643	531	446	380	328	251	198
		P			D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730	0.953	1.207
	7-2-53	W	25.8		C	4018	3214	2679	2296	2009	1786	1607	1461	1339	1236	1148	1004	893
		P			D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584	0.763	0.965
1-1/2" x 1/8"	7-4-62	W	18.9	1.286	U	3857	2469	1741	1259	964	762	617	510	429	365	315	241	190
		P			D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
	7-2-62	W	20.2		C	3857	3068	2571	2207	1929	1714	1543	1403	1286	1187	1102	964	857
		P			D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-1/2" x 3/16"	7-4-63	W	28.3	1.929	U	5786	3703	2571	1889	1446	1143	926	765	643	548	472	362	286
		P			D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
	7-2-63	W	30.2		C	5786	4629	3857	3306	2893	2571	2314	2104	1929	1780	1653	1446	1286
		P			D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-3/4" x 3/16"	7-4-73	W	32.7	2.625	U	7875	5040	3500	2571	1969	1556	1260	1041	875	746	643	492	389
		P			D	0.043	0.067	0.096	0.130	0.170	0.215	0.266	0.322	0.383	0.450	0.521	0.681	0.862
	7-2-73	W	34.6		C	7875	6300	5250	4500	3938	3500	3150	2864	2625	2423	2250	1969	1750
		P			D	0.034	0.053	0.077	0.104	0.136	0.172	0.213	0.257	0.306	0.360	0.417	0.545	0.689
2" x 3/16"	7-4-83	W	37.1	3.429	U	10286	6583	4571	3359	2571	2032	1646	1360	1143	974	840	643	508
		P			D	0.037	0.058	0.084	0.114	0.149	0.189	0.233	0.282	0.335	0.393	0.456	0.596	0.754
	7-2-83	W	39.0		C	10286	8229	6857	5878	5143	4571	4114	3740	3429	3165	2939	2571	2286
		P			D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
2-1/4" x 3/16"	7-4-93	W	41.5	4.339	U	13018	8331	5786	4251	3254	2571	2083	1721	1446	1232	1063	814	643
		P			D	0.033	0.052	0.074	0.101	0.132	0.168	0.207	0.250	0.298	0.350	0.406	0.530	0.670
	7-2-93	W	43.4		C	13018	10414	8679	7439	6509	5786	5207	4734	4339	4005	3719	3254	2893
		P			D	0.026	0.041	0.060	0.081	0.106	0.134	0.166	0.200	0.238	0.280	0.324	0.424	0.536
2-1/2" x 3/16"	7-4-103	W	45.9	5.357	U	16071	10286	7143	5248	4018	3175	2571	2125	1786	1522	1312	1004	794
		P			D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
	7-2-103	P	47.8		C	16071	12857	10714	9184	8036	7143	6429	5844	5357	4945	4592	4018	3571
		P			D	0.024	0.037	0.054	0.073	0.095	0.121	0.149	0.180	0.215	0.252	0.292	0.381	0.483

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 29,000,000 psi - F= fiber stress, 18,000 psi

Material: ASTM A-569 standard

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. These can be exceeded for other types of loads with 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 the table.

General: Loads and deflections are theoretical and based on static loading.

P-7 PANEL WIDTH (inches) **Note:** P-Press-Locked cross bars typically extend 1/8" each side. Panel widths do not include these extensions.

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1/8" Bar	9/16	1	1 7/16	1 7/8	2 5/16	2 3/4	3 3/16	3 5/8	4 1/16	4 1/2	4 15/16	5 3/8	5 13/16	6 1/4	6 11/16	7 1/8	7 9/16	8	8 7/16	8 7/8	9 5/16
3/16" Bar	5/8	1 1/16	1 1/2	11 5/16	2 3/8	2 13/16	3 1/4	3 11/16	4 1/8	4 9/16	5	5 7/16	5 7/8	6 5/16	6 3/4	7 3/16	7 5/8	8 1/16	8 1/2	8 15/16	9 3/8
No. of Bars	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**
1/8" Bar	9 3/4	10 3/16	10 5/8	11 1/16	11 1/2	11 15/16	12 3/8	12 13/16	13 1/4	13 11/16	14 1/8	14 9/16	15	15 7/16	15 7/8	16 5/16	16 3/4	17 3/16	17 5/8	18 1/16	18 1/2
3/16" Bar	9 13/16	10 1/4	10 11/16	11 1/8	11 9/16	12	12 7/16	12 7/8	13 5/16	13 3/4	14 3/16	14 5/8	15 1/16	15 1/2	15 15/16	16 3/8	16 13/16	17 1/4	17 11/16	18 1/8	18 9/16
No. of Bars	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**
1/8" Bar	18 15/16	19 3/8	19 13/1	20 1/4	20 11/16	21 1/8	21 9/16	22	22 7/16	22 7/8	23 5/16	23 3/4	24 3/16	24 5/8	25 1/16	25 1/2	25 15/16	26 3/8	26 13/16	27 1/4	27 11/16
3/16" Bar	19	19 7/16	19 7/8	20 5/16	20 3/4	21 3/16	21 5/8	22 1/16	22 1/2	22 15/16	23 3/8	23 13/16	24 1/4	24 11/16	25 1/8	25 9/16	26	26 7/16	26 7/8	27 5/16	27 3/4
No. of Bars	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**		
1/8" Bar	28 1/8	28 9/16	29	29 7/16	29 7/8	30 5/16	30 3/4	31 3/16	31 5/8	32 1/16	32 1/2	32 15/16	33 3/8	33 13/16	34 1/4	34 11/16	35 1/8	35 9/16	36		
3/16" Bar	28 3/16	28 5/8	29 1/16	29 1/2	29 15/16	30 3/8	30 13/16	31 1/4	31 11/16	32 1/8	32 9/16	33	33 7/16	33 7/8	34 5/16	34 3/4	35 3/16	35 5/8	36 1/16		

STAINLESS STEEL GRATING

When caustic atmospheres are encountered, or when corrosion resistance and/or minimum carbide precipitation are essential considerations, Marco's stainless steel grating is the answer. The longer lasting capabilities of stainless steel under these special conditions make it an economical selection over the long term.

It is ideal for use in food processing areas, breweries, bottling plants, dairies and meat packing plants. Stainless steel can also be used in power plants, sewage treatment plants, pumping stations and hydrocarbon processing facilities where various caustic environments are normal. It also has application in shipboard and building industries where saline solutions or atmospheres are present.

Stainless Steel Bar Grating is available in welded bar grating, riveted bar grating, swage-locked and press-locked bar grating. Specify S, RS, SR/SI and SP. Heavy-duty welded bar gratings and Riv-Dexteel® can also be manufactured from stainless steel. Specify HS, RSL and RSH.

The alloys below are available as standard products. Each conforms with ASTM A 167. In addition, special alloys are available upon request.

Chemical Composition

General Description	Alloy	Carbon (max.%)	Manganese (max. %)	Silicon (max.%)	Chromium (% range)	Phophrus (max.%)	Sulfur (max.%)	Nickel (%range)	Nitrogen (max.%)	Other Elments
Type 304 alloys resist most oxidizing acids and can withstand all ordinary rusting. They are immune to foodstuffs, sterilizing solutions, most of the organic chemicals and dyestuffs, and a wide variety of inorganic chemicals. This grade should be considered for use unless some special mechanical, physical or fabricating characteristic is required.	304	0.08	2.0	.75	18-25	0.045	0.030	8-10.5	0.10	-
Type 304 L is the low carbon modification of Type 304. This minimizes the problem of carbide precipitation during welding.	304L	0.03	2.0	.75	18-20	0.045	0.030	8-12	0.10	-
Type 316 alloys have superior corrosion resistance especially to sulfurous acid compounds and many chemicals used by the chemical process industries. It is more resistant to pitting corrosion than typical 18-8 alloys (Chromium Nickel), such as Type 304.	316	0.08	2.0	7.5	16-18	0.045	0.030	10-14	0.10	2-3% Mo
Type 316 L is the low carbon modification of Type 316. This minimizes the problem of carbide precipitation during welding.	316L	0.03	2.0	.75	16-18	0.045	0.030	10-14	0.14	2-3% Mo

Note: The above alloys conform with ASTM A167.

Finish

Unless otherwise specified, stainless steel grating shall have a mill finish as fabricated. "As fabricated" means as fabricated in Marco's shop without a subsequent finishing operation. Stainless steel will show some discoloration around the joints due to welding. Finishes available to remove discoloration include sand blasting and electro-polishing, the later being used where bright finish is desired. Shot blasting or wire brushing should be avoided since these operations can cause iron contamination which, if not removed, will cause rusting and discoloration of the surface. Such contamination cab be removed by passivation. Electro-polishing leaves a passive surface. The swage-locked and press-locked processes will not show discoloration due to welding.

Note: Modulus of Elasticity for Stainless Steel Alloys is 28,000,000 psi; Standard carbon steel (ASTM A569) is 29,000,000 psi; Heavy-duty carbon steel (ASTM A36) is 29,000,000 psi; and Aluminum (ASTM B221) is 10,000,000. Fiber Stress for Stainless Steel Alloys 304 and 316 is 20,000 psi; Stainless Steel Alloys 304L and 316L is 16,500 psi; Standard carbon steel (ASTM A569) is 18,000 psi; Heavy-duty carbon steel (ASTM A36) is 20,000 psi; and Aluminum (ASTM B221, 6061-T6) is 12,000 psi.

Loads and Deflections

A Load and Deflection Table for S-19 AND SP-19 is on the next page. All of the carbon steel bar grating products are available in stainless steel. In addition, Marco's rectangular bar swage-locked (SR) can be produced in stainless steel. For loads and deflections for other products such as riveted (RS), heavy-duct (HS), Riv-Dexteel (RSL and RSH) and swage-locked (RSP), adjustments must be made to the carbon steel and aluminum tables found in this catalog. These adjustments will account for the differences in modulus of elasticity and fiber stress between stainless steel, carbon steel and aluminum.

When using: (Stainless Steel)	Multiply U,C AND D in the standard carbon tables by:		Multiply U,C AND D in the heavy-duty carbon tables by:		Multiply U,C AND D in the KRP aluminum tables by:	
	D	U,C	D	U,C	D	U,C
Alloy 304	1.151	1.111	1.036	1.000	.595	1.667
Alloy 304L	.949	0917	.854	.825	.491	1.375
Alloy 316	1.151	1.111	1.036	1.000	.595	1.667
Alloy 316L	.949	.917	.854	.825	.491	1.375

Stainless Welded

1-3/16" Center to Center of Bearing Bars

19-S-4
Cross Rods 4" C/C

19-S-2
Cross Rods 2" C/C

Stainless Press-Locked

1-3/16" Center to Center of Bearing Bars

19-SP-4
Cross Bars 4" C/C

19-SP-2
Cross Bars 2" C/C

Load & Deflection Table

Material: ASTM-569 standard

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. These can be exceeded for other types of loads with 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 the table.

General: Loads and deflections are theoretical and based on static loading.

Bar Size	Symbol		Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
3/4" x 1/8"	19-4-32	S	3.9	0.118	U	395	253	175	129	99	78							
	19-2-32	SP	4.3		D	0.114	0.179	0.257	0.350	0.457	0.579							
		S	4.4		C	395	316	263	226	197	175							
		SP	5.2		D	0.091	0.143	0.206	0.280	0.366	0.463							
3/4" x 3/16"	19-4-33	S	5.6	0.178	U	592	379	263	193	148	117							
	19-2-33	SP	6.4		D	0.114	0.179	0.257	0.350	0.457	0.579							
		S	6.2		C	592	474	395	338	296	263							
		SP	7.8		D	0.091	0.143	0.206	0.280	0.366	0.463							
1" x 1/8"	19-4-42	S	5.0	0.211	U	702	449	312	229	175	139	112	93					
	19-2-42	SP	5.4		D	0.086	0.134	0.193	0.263	0.343	0.434	0.536	0.648					
		S	5.5		C	702	561	468	401	351	312	281	255					
		SP	6.3		D	0.069	0.107	0.154	0.210	0.274	0.347	0.429	0.519					
1" x 3/16"	19-4-43	S	7.2	0.316	U	1053	674	468	344	263	208	168	139					
	19-2-43	SP	8.1		D	0.086	0.134	0.193	0.263	0.343	0.434	0.536	0.648					
		S	7.8		C	1053	842	702	602	526	468	421	383					
		SP	9.5		D	0.069	0.107	0.154	0.210	0.274	0.347	0.429	0.519					
1-1/4" x 1/8"	19-4-52	S	6.1	0.329	U	1096	702	487	358	274	217	175	145	122	104	90		
	19-2-52	SP	6.8		D	0.069	0.107	0.154	0.210	0.274	0.347	0.429	0.519	0.617	0.724	0.840		
		S	6.6		C	1096	877	731	627	548	487	439	399	365	337	313		
		SP	8.1		D	0.055	0.086	0.123	0.168	0.219	0.278	0.343	0.415	0.494	0.579	0.672		
1-1/4" x 3/16"	19-4-53	S	8.9	0.493	U	1645	1053	731	537	411	325	263	217	183	156	134		
	19-2-53	SP	10.2		D	0.069	0.107	0.154	0.210	0.274	0.347	0.429	0.519	0.617	0.724	0.840		
		S	9.5		C	1645	1316	1096	940	822	731	658	598	548	506	470		
		SP	12.1		D	0.055	0.086	0.123	0.168	0.219	0.278	0.343	0.415	0.494	0.579	0.672		
1-1/2" x 1/8"	19-4-62	S	7.2	0.474	U	1579	1011	702	516	395	312	253	209	175	149	129	99	78
	19-2-62	SP	7.9		D	0.057	0.089	0.129	0.175	0.229	0.289	0.357	0.432	0.514	0.604	0.700	0.914	1.157
		S	7.7		C	1579	1263	1053	902	789	702	632	574	526	486	451	395	351
		SP	9.2		D	0.046	0.071	0.103	0.140	0.183	0.231	0.286	0.346	0.411	0.483	0.560	0.731	0.926
1-1/2" x 3/16"	19-4-63	S	10.5	0.711	U	2368	1516	1053	773	592	468	379	313	263	224	193	148	117
	19-2-63	SP	11.8		D	0.057	0.089	0.129	0.175	0.229	0.289	0.357	0.432	0.514	0.604	0.700	0.914	1.157
		S	11.2		C	2368	1895	1579	1353	1184	1053	947	861	789	729	677	592	526
		SP	13.8		D	0.046	0.071	0.103	0.140	0.183	0.231	0.286	0.346	0.411	0.483	0.560	0.731	0.926
1-3/4" x 3/16"	19-4-73	S	12.2	1.263	U	3224	2063	1433	1053	806	637	516	426	358	305	263	201	159
	19-2-73	SP	13.5		D	0.049	0.077	0.110	0.150	0.196	0.248	0.306	0.370	0.441	0.517	0.600	0.784	0.992
		S	12.8		C	3224	2579	2149	1842	1612	1433	1289	1172	1075	992	921	806	716
		SP	15.4		D	0.039	0.061	0.088	0.120	0.157	0.198	0.245	0.296	0.353	0.414	0.480	0.627	0.793
2" x 3/16"	19-4-83	S	13.9	1.599	U	4211	2695	1871	1375	1053	832	674	557	468	399	344	263	208
	19-2-83	SP	15.2		D	0.043	0.067	0.096	0.131	0.171	0.217	0.268	0.324	0.386	0.453	0.525	0.686	0.868
		S	14.5		C	4211	3368	2807	2406	2105	1871	1684	1531	1404	1296	1203	1053	936
		SP	17.1		D	0.034	0.054	0.077	0.105	0.137	0.174	0.214	0.259	0.309	0.362	0.420	0.549	0.694
2-1/4" x 3/16"	19-4-93	S	15.5	3.797	U	5329	3411	2368	1740	1332	1053	853	705	592	505	435	333	263
	19-2-93	SP	16.8		D	0.038	0.060	0.086	0.117	0.152	0.193	0.238	0.288	0.343	0.402	0.467	0.610	0.771
		S	16.1		C	5329	4263	3553	3045	2664	2368	2132	1938	1776	1640	1523	1332	1184
		SP	18.7		D	0.030	0.048	0.069	0.093	0.122	0.154	0.190	0.230	0.274	0.322	0.373	0.488	0.617
2-1/2" x 3/16"	19-4-103	S	17.2	1.974	U	6579	4211	2924	2148	1645	1300	1053	870	731	623	537	411	325
	19-2-103	SP	18.5		D	0.034	0.054	0.077	0.105	0.137	0.174	0.214	0.259	0.309	0.362	0.420	0.549	0.694
		S	17.8		C	6579	5263	4386	3759	3289	2924	2632	2392	2193	2024	1880	1645	1462
		SP	20.4		D	0.027	0.043	0.062	0.084	0.110	0.139	0.171	0.207	0.247	0.290	0.336	0.439	0.555

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 2,000,000 psi - F= fiber stress, 18,000 psi

Note: For gratings with other than 1-3/16" bearing bar spacing, proportionate conversion factors apply. This table is for Alloys 304 and 316. For Alloys 304L and 316L, F=16,500 psi and values for U, C and D should be multiplied by .825.

S/SP-19 PANEL WIDTH (inches)

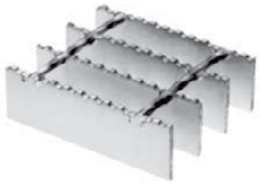
Note: SP-Stainless Press-Locked cross bars typically extend 1/8" each side. S-Stainless Welded cross rods may extend 1/8" each side. Panel widths do not include these extensions.

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1/8" Bar	1 5/16	2 1/2	3 11/16	4 7/8	6 1/16	7 1/4	8 7/16	9 5/8	10 13/16	12	13 3/16	14 3/8	15 9/16	16 3/4	17 15/16
3/16" Bar	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**
1/8" Bar	19 1/8	20 5/16	21 1/2	22 11/16	23 7/8	25 1/16	26 1/4	27 7/16	28 5/8	29 13/16	31	32 3/16	33 3/8	34 9/16	35 3/4
3/16" Bar	19 3/16	20 3/8	21 9/16	22 3/4	23 15/16	25 1/8	26 5/16	27 1/2	28 11/16	29 7/8	3 11/16	32 1/4	33 7/16	34 5/8	35 13/16

RAILROAD GRATING

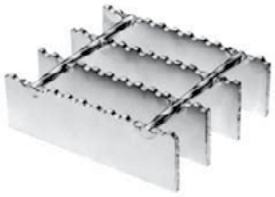
Railroad Grating (AAR Approved)

1-9/16" Center to Center of Bearing Bars



25-W-4
Cross Rods 4" C/C

1-11/16" Center to Center of Bearing Bars



27-W-4
Cross Rods 4" C/C

W-25/W-27 PANEL WIDTH (inches) **Note:** W-Welded cross rods may extend 1/8" each side. Panel widths do not include these extensions.

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

AAR Group Number	Bar Size	Symbol	Approx. Weight (psf)	Unsupported Length
1	1"x1/8"	25-W4-42	3.85	4'
1	1"x3/16"	25-W4-43	5.67	4'
1	1"x3/16"	27-W4-43	5.47	4'
2	1-1/2"x3/16"	27-W4-63	7.88	7'
3	2"x3/16"	27-W4-83	10.29	10'

- Approved for conformity to Association of American Railroads (AAR) Specifications, Rule 53 in the Field Manual of the AAR Interchange Rules.
- Designed and engineered to meet AAR specifications for running boards, dome platforms, brake steps and crossover platform applications.
- Conforms to the requirements for Group No. 1, Group No. 2 and Group No. 3. Unsupported length for each of these Groups is 4'-,7' and 10', respectively.

HEAVY-DUTY STEEL GRATING

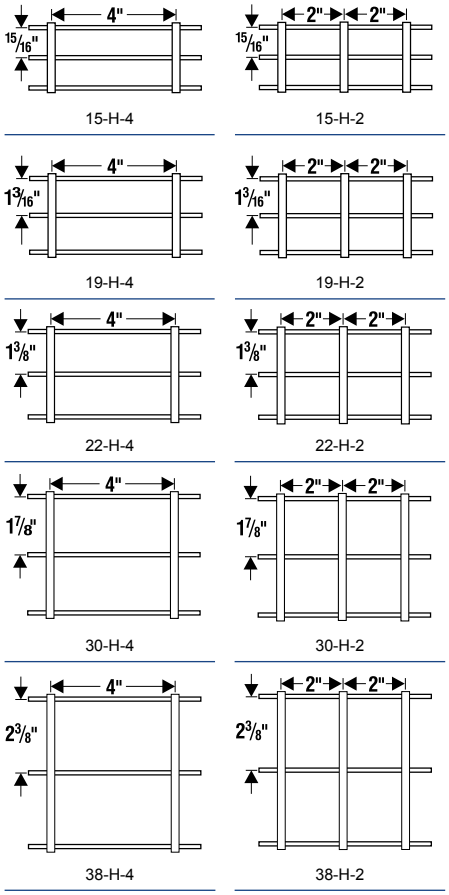
Heavy-Duty Welded Grating has the strength for heavy-duty load areas such as airfields, highways, industrial plants, truck and bus terminals, parking lots and railroad yards. Common uses are flooring, driveways, subway and tunnel ventilation grilles, curb inlet grates, ramps, docks, etc.

It is a sturdy grating to carry loads and maintain the same level over many years of use. Whenever rolling wheel loads are to be used over the grating, we recommend the grating be load banded to add lateral strength. Serrations are available on bars up to 3/8" thick to provide additional traction for rolling loads.

Standard heavy-duty bar grating is resistance-welded for durability, strength and safety using an automated electric/hydraulic welding process. High temperatures, combined, with high pressure, fuse the bearing bars and cross bars together to form a permanent joint.

Also, Marco is one of the few manufacturers that has the capability of providing you with those "really big" grates. Our heavy-duty fabrication department regularly custom fabricates grating to meet specific project requirements. Virtually any bar size and depth can be made to order

Heavy-Duty Welded Steel Bar Grating



CUSTOM TRENCH GRATES

EMBEDDED ANGLES

Heavy-Duty Welded

15/16" Center to Center of Bearing Bars

15-H-4
Cross Rods 4" C/C

15-H-2
Cross Rods 2" C/C

Material: ASTM A-36

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

General: Loads and deflections are theoretical and based on static loading.

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. These can be exceeded for other types of loads with engineer's approval. For deflections of uniform and concentrated loads, consult Marco's engineering departments.

U= safe uniform load, psf
C= safe concentrated load, pfw
D= deflection, inches
E= modulus of elasticity, 29,000,000 psi
F= fiber stress, 20,000 psi

Load & Deflection Table

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 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"	15-4-44	11.7	0.533	U	1,778	1,138	790	580	444	351	284	235	198	145	111
	15-2-44	12.3		C	1,778	1,422	1,185	1,016	889	790	711	646	593	508	444
1" x 5/16"	15-4-45	15.3	0.667	U	2,222	1,422	988	726	556	439	356	294	247	181	139
	15-2-45	16.8		C	2,222	1,778	1,481	1,270	1,111	988	889	808	741	635	556
1" x 3/8"	15-4-46	18.1	0.800	U	2,667	1,707	1,185	871	667	527	427	353	296	218	167
	15-2-46	19.6		C	2,667	2,133	1,778	1,524	1,333	1,185	1,067	970	889	762	667
1-1/4" x 1/4"	15-4-54	14.5	0.833	U	2,778	1,778	1,235	907	694	549	444	367	309	227	174
	15-2-54	15.1		C	2,778	2,222	1,852	1,587	1,389	1,235	1,111	1,010	926	794	694
1-1/4" x 5/16"	15-4-55	18.8	1.042	U	3,472	2,222	1,543	1,134	868	686	556	459	386	283	217
	15-2-55	20.3		C	3,472	2,778	2,315	1,984	1,736	1,543	1,389	1,263	1,157	992	868
1-1/4" x 3/8"	15-4-56	22.2	1.250	U	4,167	2,667	1,852	1,361	1,042	823	667	551	463	340	260
	15-2-56	23.7		C	4,167	3,333	2,778	2,381	2,083	1,852	1,667	1,515	1,389	1,190	1,042
1-1/2" x 1/4"	15-4-64	17.2	1.200	U	4,000	2,560	1,778	1,306	1,000	790	640	529	444	327	250
	15-2-64	17.7		C	4,000	3,200	2,667	2,286	2,000	1,778	1,600	1,455	1,333	1,143	1,000
1-1/2" x 5/16"	15-4-65	22.3	1.500	U	5,000	3,200	2,222	1,633	1,250	988	800	661	556	408	313
	15-2-65	23.8		C	5,000	4,000	3,333	2,857	2,500	2,222	2,000	1,818	1,667	1,429	1,250
1-1/2" x 3/8"	15-4-66	26.4	1.800	U	6,000	3,840	2,667	1,959	1,500	1,185	960	793	667	490	375
	15-2-66	27.9		C	6,000	4,800	4,000	3,429	3,000	2,667	2,400	2,182	2,000	1,714	1,500
1-3/4" x 1/4"	15-4-74	20.0	1.633	U	5,444	3,484	2,420	1,778	1,361	1,075	871	720	605	444	340
	15-2-74	20.6		C	5,444	4,356	3,630	3,111	2,722	2,420	2,178	1,980	1,815	1,556	1,361
1-3/4" x 5/16"	15-4-75	25.7	2.042	U	6,806	4,356	3,025	2,222	1,701	1,344	1,089	900	756	556	425
	15-2-75	27.2		C	6,806	5,444	4,537	3,889	3,403	3,025	2,722	2,475	2,269	1,944	1,701
1-3/4" x 3/8"	15-4-76	30.5	2.450	U	8,167	5,227	3,630	2,667	2,042	1,613	1,307	1,080	907	667	510
	15-2-76	32.0		C	8,167	6,533	5,444	4,667	4,083	3,630	3,267	2,970	2,722	2,333	2,042
2" x 1/4"	15-4-84	22.8	2.133	U	7,111	4,551	3,160	2,322	1,778	1,405	1,138	940	790	580	444
	15-2-84	23.4		C	7,111	5,689	4,741	4,063	3,556	3,160	2,844	2,586	2,370	2,032	1,778
2" x 5/16"	15-4-85	29.2	2.667	U	8,889	5,689	3,951	2,902	2,222	1,756	1,422	1,175	988	726	556
	15-2-85	30.7		C	8,889	7,111	5,926	5,079	4,444	3,951	3,556	3,232	2,963	2,540	2,222
2" x 3/8"	15-4-86	34.7	3.200	U	10,667	6,827	4,741	3,483	2,667	2,107	1,707	1,410	1,185	871	667
	15-2-86	36.2		C	10,667	8,533	7,111	6,095	5,333	4,741	4,267	3,879	3,556	3,048	2,667
2-1/4" x 1/4"	15-4-94	25.6	2.700	U	9,000	5,760	4,000	2,939	2,250	1,778	1,440	1,190	1,000	735	563
	15-2-94	26.2		C	9,000	7,200	6,000	5,143	4,500	4,000	3,600	3,273	3,000	2,571	2,250
2-1/4" x 5/16"	15-4-95	32.6	3.375	U	11,250	7,200	5,000	3,673	2,813	2,222	1,800	1,488	1,250	918	703
	15-2-95	34.1		C	11,250	9,000	7,500	6,429	5,625	5,000	4,500	4,091	3,750	3,214	2,813
2-1/4" x 3/8"	15-4-96	38.8	4.050	U	13,500	8,640	6,000	4,408	3,375	2,667	2,160	1,785	1,500	1,102	844
	15-2-96	40.3		C	13,500	10,800	9,000	7,714	6,750	6,000	5,400	4,909	4,500	3,857	3,375
2-1/2" x 1/4"	15-4-104	28.3	3.333	U	11,111	7,111	4,938	3,628	2,778	2,195	1,778	1,469	1,235	907	694
	15-2-104	28.9		C	11,111	8,889	7,407	6,349	5,556	4,938	4,444	4,040	3,704	3,175	2,778
2-1/2" x 5/16"	15-4-105	36.1	4.167	U	13,889	8,889	6,173	4,535	3,472	2,743	2,222	1,837	1,543	1,134	868
	15-2-105	37.6		C	13,889	11,111	9,259	7,937	6,944	6,173	5,556	5,051	4,630	3,968	3,472
2-1/2" x 3/8"	15-4-106	42.9	5.000	U	16,667	10,667	7,407	5,442	4,167	3,292	2,667	2,204	1,852	1,361	1,042
	15-2-106	44.4		C	16,667	13,333	11,111	9,524	8,333	7,407	6,667	6,061	5,556	4,762	4,167
2-3/4" x 1/4"	15-4-114	32.0	4.033	U	13,444	8,604	5,975	4,390	3,361	2,656	2,151	1,778	1,494	1,098	840
	15-2-114	33.5		C	13,444	10,756	8,963	7,683	6,722	5,975	5,378	4,889	4,481	3,841	3,361
2-3/4" x 5/16"	15-4-115	40.1	5.042	U	16,806	10,756	7,469	5,488	4,201	3,320	2,689	2,222	1,867	1,372	1,050
	15-2-115	42.1		C	16,806	13,444	11,204	9,603	8,403	7,469	6,722	6,111	5,602	4,802	4,201
2-3/4" x 3/8"	15-4-116	47.6	6.050	U	20,167	12,907	8,963	6,585	5,042	3,984	3,227	2,667	2,241	1,646	1,260
	15-2-116	49.7		C	20,167	16,133	13,444	11,524	10,083	8,963	8,067	7,333	6,722	5,762	5,762

15-H-4 & 15-H-2 (continued)

15/16" Center to Center of Bearing Bars

Load & Deflection Table

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	7'-0"	8'-0"
3" x 1/4"	15-4-124	34.8	4.800	U	16,000	10,240	7,111	5,224	4,000	3,160	2,560	2,116	1,778	1,306	1,000
	15-2-124	36.3		C	16,000	12,800	10,667	9,143	8,000	7,111	6,400	5,818	5,333	4,571	4,000
3" x 5/16"	15-4-125	43.6	6.000	U	20,000	12,800	8,889	6,531	5,000	3,951	3,200	2,645	2,222	1,633	1,250
	15-2-125	45.6		C	20,000	16,000	13,333	11,429	10,000	8,889	8,000	7,273	6,667	5,714	5,000
3" x 3/8"	15-4-126	51.8	7.200	U	24,000	15,360	10,667	7,837	6,000	4,741	3,840	3,174	2,667	1,959	1,500
	15-2-126	53.8		C	24,000	19,200	16,000	13,714	12,000	10,667	9,600	8,727	8,000	6,857	6,000
3-1/4" x 1/4"	15-4-134	37.5	5.633	U	18,778	12,018	8,346	6,132	4,694	3,709	3,004	2,483	2,086	1,533	1,174
	15-2-134	39.0		C	18,778	15,022	12,519	10,730	9,389	8,346	7,511	6,828	6,259	5,365	4,694
3-1/4" x 5/16"	15-4-135	47.0	7.042	U	23,472	15,022	10,432	7,664	5,868	4,636	3,756	3,104	2,608	1,916	1,467
	15-2-135	49.1		C	23,472	18,778	15,648	13,413	11,736	10,432	9,389	8,535	7,824	6,706	5,868
3-1/4" x 3/8"	15-4-136	55.9	8.450	U	28,167	18,027	12,519	9,197	7,042	5,564	4,507	3,725	3,130	2,299	1,760
	15-2-136	58.0		C	28,167	22,533	18,778	16,095	14,083	12,519	11,267	10,242	9,389	8,048	7,042
3-1/2" x 1/4"	15-4-144	40.3	6.533	U	21,778	13,938	9,679	7,111	5,444	4,302	3,484	2,880	2,420	1,778	1,361
	15-2-144	41.8		C	21,778	17,422	14,519	12,444	10,889	9,679	8,711	7,919	7,259	6,222	5,444
3-1/2" x 5/16"	15-4-145	50.5	8.167	U	27,222	17,422	12,099	8,889	6,806	5,377	4,356	3,600	3,025	2,222	1,701
	15-2-145	52.5		C	27,222	21,778	18,148	15,556	13,611	12,099	10,889	9,899	9,074	7,778	6,806
3-1/2" x 3/8"	15-4-146	60.1	9.800	U	32,667	20,907	14,519	10,667	8,167	6,453	5,227	4,320	3,630	2,667	2,042
	15-2-146	62.1		C	32,667	26,133	21,778	18,667	16,333	14,519	13,067	11,879	10,889	9,333	8,167
4" x 1/4"	15-4-164	45.9	8.533	U	28,444	18,204	12,642	9,288	7,111	5,619	4,551	3,761	3,160	2,322	1,778
	15-2-164	47.4		C	28,444	22,756	18,963	16,254	14,222	12,642	11,378	10,343	9,481	8,127	7,111
4" x 5/16"	15-4-165	57.4	10.667	U	35,556	22,756	15,802	11,610	8,889	7,023	5,689	4,702	3,951	2,902	2,222
	15-2-165	59.4		C	35,556	28,444	23,704	20,317	17,778	15,802	14,222	12,929	11,852	10,159	8,889
4" x 3/8"	15-4-166	68.3	12.800	U	42,667	27,307	18,963	13,932	10,667	8,428	6,827	5,642	4,741	3,483	2,667
	15-2-166	70.4		C	42,667	34,133	28,444	24,381	21,333	18,963	17,067	15,515	14,222	12,190	10,667
4-1/2" x 1/4"	15-4-184	51.4	10.800	U	36,000	23,040	16,000	11,755	9,000	7,111	5,760	4,760	4,000	2,939	2,250
	15-2-184	52.9		C	36,000	28,800	24,000	20,571	18,000	16,000	14,400	13,091	12,000	10,286	9,000
4-1/2" x 5/16"	15-4-185	64.3	13.500	U	45,000	28,800	20,000	14,694	11,250	8,889	7,200	5,950	5,000	3,673	2,813
	15-2-185	66.4		C	45,000	36,000	30,000	25,714	22,500	20,000	18,000	16,364	15,000	12,857	11,250
4-1/2" x 3/8"	15-4-186	76.6	16.200	U	54,000	34,560	24,000	17,633	13,500	10,667	8,640	7,140	6,000	4,408	3,375
	15-2-186	78.7		C	54,000	43,200	36,000	30,857	27,000	24,000	21,600	19,636	18,000	15,429	13,500
5" x 1/4"	15-4-204	56.9	13.333	U	44,444	28,444	19,753	14,512	11,111	8,779	7,111	5,877	4,938	3,628	2,778
	15-2-204	58.4		C	44,444	35,556	29,630	25,397	22,222	19,753	17,778	16,162	14,815	12,698	11,111
5" x 5/16"	15-4-205	71.2	16.667	U	55,556	35,556	24,691	18,141	13,889	10,974	8,889	7,346	6,173	4,535	3,472
	15-2-205	73.3		C	55,556	44,444	37,037	31,746	27,778	24,691	22,222	20,202	18,519	15,873	13,889
5" x 3/8"	15-4-206	84.9	20.000	U	66,667	42,667	29,630	21,769	16,667	13,169	10,667	8,815	7,407	5,442	4,167
	15-2-206	87.0		C	66,667	53,333	44,444	38,095	33,333	29,630	26,667	24,242	22,222	19,048	16,667
6" x 1/4"	15-4-244	68.0	19.200	U	64,000	40,960	28,444	20,898	16,000	12,642	10,240	8,463	7,111	5,224	4,000
	15-2-244	69.5		C	64,000	51,200	42,667	36,571	32,000	28,444	25,600	23,273	21,333	18,286	16,000
6" x 5/16"	15-4-245	85.1	24.000	U	80,000	51,200	35,556	26,122	20,000	15,802	12,800	10,579	8,889	6,531	5,000
	15-2-245	87.1		C	80,000	64,000	53,333	45,714	40,000	35,556	32,000	29,091	26,667	22,857	20,000
6" x 3/8"	15-4-246	101.5	28.800	U	96,000	61,440	42,667	31,347	24,000	18,963	15,360	12,694	10,667	7,837	6,000
	15-2-246	103.5		C	96,000	76,800	64,000	54,857	48,000	42,667	38,400	34,909	32,000	27,429	24,000

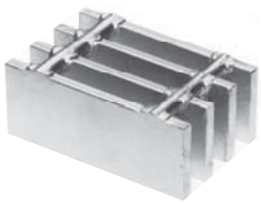
U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 29,000,000 psi - F= fiber stress, 20,000 psi

H-15 PANEL WIDTH (inches) **Note:** H-Heavy-Duty cross rods may extend 1/8" each side. Panel widths do not include these extensions.

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

Heavy-Duty Welded

1-3/16" Center to Center of Bearing Bars



19-H-4
Cross Rods 4" C/C

19-H-2
Cross Rods 2" C/C

Material: ASTM A-36 standard

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

General: Loads and deflections are theoretical and based on static loading.

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. These can be exceeded for other types of loads with engineer's approval. For deflections of uniform and concentrated loads, consult Marco's engineering departments.

U= safe uniform load, psf
C= safe concentrated load, pfw
D= deflection, inches
E= modulus of elasticity, 29,000,000 psi
F= fiber stress, 20,000 psi

Load & Deflection Table

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 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"	19-4-44	9.4	0.421	U	1,404	898	624	458	351	277	225	186	156	115	88
	19-2-44	10.0		C	1,404	1,123	936	802	702	624	561	510	468	401	351
1" x 5/16"	19-4-45	12.5	0.526	U	1,754	1,123	780	573	439	347	281	232	195	143	110
	19-2-45	14.0		C	1,754	1,404	1,170	1,003	877	780	702	638	585	501	439
1" x 3/8"	19-4-46	14.7	0.632	U	2,105	1,347	936	687	526	416	337	278	234	172	132
	19-2-46	16.2		C	2,105	1,684	1,404	1,203	1,053	936	842	766	702	602	526
1-1/4" x 1/4"	19-4-54	11.6	0.658	U	2,193	1,404	975	716	548	433	351	290	244	179	137
	19-2-54	12.2		C	2,193	1,754	1,462	1,253	1,096	975	877	797	731	627	548
1-1/4" x 5/16"	19-4-55	15.2	0.822	U	2,741	1,754	1,218	895	685	541	439	362	305	224	171
	19-2-55	16.8		C	2,741	2,193	1,827	1,566	1,371	1,218	1,096	997	914	783	685
1-1/4" x 3/8"	19-4-56	18.0	0.987	U	3,289	2,105	1,462	1,074	822	650	526	435	365	269	206
	19-2-56	19.5		C	3,289	2,632	2,193	1,880	1,645	1,462	1,316	1,196	1,096	940	822
1-1/2" x 1/4"	19-4-64	13.8	0.947	U	3,158	2,021	1,404	1,031	789	624	505	418	351	258	197
	19-2-64	14.3		C	3,158	2,526	2,105	1,805	1,579	1,404	1,263	1,148	1,053	902	789
1-1/2" x 5/16"	19-4-65	18.0	1.184	U	3,947	2,526	1,754	1,289	987	780	632	522	439	322	247
	19-2-65	19.5		C	3,947	3,158	2,632	2,256	1,974	1,754	1,579	1,435	1,316	1,128	987
1-1/2" x 3/8"	19-4-66	21.3	1.421	U	4,737	3,032	2,105	1,547	1,184	936	758	626	526	387	296
	19-2-66	22.8		C	4,737	3,789	3,158	2,707	2,368	2,105	1,895	1,722	1,579	1,353	1,184
1-3/4" x 1/4"	19-4-74	16.0	1.289	U	4,298	2,751	1,910	1,404	1,075	849	688	568	478	351	269
	19-2-74	16.6		C	4,298	3,439	2,865	2,456	2,149	1,910	1,719	1,563	1,433	1,228	1,075
1-3/4" x 5/16"	19-4-75	20.7	1.612	U	5,373	3,439	2,388	1,754	1,343	1,061	860	710	597	439	336
	19-2-75	22.3		C	5,373	4,298	3,582	3,070	2,686	2,388	2,149	1,954	1,791	1,535	1,343
1-3/4" x 3/8"	19-4-76	24.6	1.934	U	6,447	4,126	2,865	2,105	1,612	1,274	1,032	853	716	526	403
	19-2-76	26.1		C	6,447	5,158	4,298	3,684	3,224	2,865	2,579	2,344	2,149	1,842	1,612
2" x 1/4"	19-4-84	18.2	1.684	U	5,614	3,593	2,495	1,833	1,404	1,109	898	742	624	458	351
	19-2-84	18.8		C	5,614	4,491	3,743	3,208	2,807	2,495	2,246	2,041	1,871	1,604	1,404
2" x 5/16"	19-4-85	23.5	2.105	U	7,018	4,491	3,119	2,291	1,754	1,386	1,123	928	780	573	439
	19-2-85	25.0		C	7,018	5,614	4,678	4,010	3,509	3,119	2,807	2,552	2,339	2,005	1,754
2" x 3/8"	19-4-86	27.9	2.526	U	8,421	5,389	3,743	2,750	2,105	1,663	1,347	1,114	936	687	526
	19-2-86	29.4		C	8,421	6,737	5,614	4,812	4,211	3,743	3,368	3,062	2,807	2,406	2,105
2-1/4" x 1/4"	19-4-94	20.4	2.132	U	7,105	4,547	3,158	2,320	1,776	1,404	1,137	940	789	580	444
	19-2-94	21.1		C	7,105	5,684	4,737	4,060	3,553	3,158	2,842	2,584	2,368	2,030	1,776
2-1/4" x 5/16"	19-4-95	26.2	2.664	U	8,882	5,684	3,947	2,900	2,220	1,754	1,421	1,174	987	725	555
	19-2-95	27.8		C	8,882	7,105	5,921	5,075	4,441	3,947	3,553	3,230	2,961	2,538	2,220
2-1/4" x 3/8"	19-4-96	31.1	3.197	U	10,658	6,821	4,737	3,480	2,664	2,105	1,705	1,409	1,184	870	666
	19-2-96	32.6		C	10,658	8,526	7,105	6,090	5,329	4,737	4,263	3,876	3,553	3,045	2,664
2-1/2" x 1/4"	19-4-104	22.6	2.632	U	8,772	5,614	3,899	2,864	2,193	1,733	1,404	1,160	975	716	548
	19-2-104	23.3		C	8,772	7,018	5,848	5,013	4,386	3,899	3,509	3,190	2,924	2,506	2,193
2-1/2" x 5/16"	19-4-105	29.0	3.289	U	10,965	7,018	4,873	3,580	2,741	2,166	1,754	1,450	1,218	895	685
	19-2-105	30.5		C	10,965	8,772	7,310	6,266	5,482	4,873	4,386	3,987	3,655	3,133	2,741
2-1/2" x 3/8"	19-4-106	34.4	3.947	U	13,158	8,421	5,848	4,296	3,289	2,599	2,105	1,740	1,462	1,074	822
	19-2-106	35.9		C	13,158	10,526	8,772	7,519	6,579	5,848	5,263	4,785	4,386	3,759	3,289
2-3/4" x 1/4"	19-4-114	25.7	3.184	U	10,614	6,793	4,717	3,466	2,654	2,097	1,698	1,404	1,179	866	663
	19-2-114	27.2		C	10,614	8,491	7,076	6,065	5,307	4,717	4,246	3,860	3,538	3,033	2,654
2-3/4" x 5/16"	19-4-115	32.3	3.980	U	13,268	8,491	5,897	4,332	3,317	2,621	2,123	1,754	1,474	1,083	829
	19-2-115	34.3		C	13,268	10,614	8,845	7,581	6,634	5,897	5,307	4,825	4,423	3,791	3,317
2-3/4" x 3/8"	19-4-116	38.3	4.776	U	15,921	10,189	7,076	5,199	3,980	3,145	2,547	2,105	1,769	1,300	995
	19-2-116	40.3		C	15,921	12,737	10,614	9,098	7,961	7,076	6,368	5,789	5,307	4,549	3,980

19-H-4 & 19-H-2 (continued)

1-3/16" Center to Center of Bearing Bars

Load & Deflection Table

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	7'-0"	8'-0"
3" x 1/4"	19-4-124	27.9	3.789	U	12,632	8,084	5,614	4,125	3,158	2,495	2,021	1,670	1,404	1,031	789
	19-2-124	29.4		C	12,632	10,105	8,421	7,218	6,316	5,614	5,053	4,593	4,211	3,609	3,158
3" x 5/16"	19-4-125	35.0	4.737	U	15,789	10,105	7,018	5,156	3,947	3,119	2,526	2,088	1,754	1,289	987
	19-2-125	37.1		C	15,789	12,632	10,526	9,023	7,895	7,018	6,316	5,742	5,263	4,511	3,947
3" x 3/8"	19-4-126	41.6	5.684	U	18,947	12,126	8,421	6,187	4,737	3,743	3,032	2,505	2,105	1,547	1,184
	19-2-126	43.6		C	18,947	15,158	12,632	10,827	9,474	8,421	7,579	6,890	6,316	5,414	4,737
3-1/4" x 1/4"	19-4-134	30.1	4.447	U	14,825	9,488	6,589	4,841	3,706	2,928	2,372	1,960	1,647	1,210	927
	19-2-134	31.6		C	14,825	11,860	9,883	8,471	7,412	6,589	5,930	5,391	4,942	4,236	3,706
3-1/4" x 5/16"	19-4-135	37.8	5.559	U	18,531	11,860	8,236	6,051	4,633	3,660	2,965	2,450	2,059	1,513	1,158
	19-2-135	39.8		C	18,531	14,825	12,354	10,589	9,265	8,236	7,412	6,738	6,177	5,294	4,633
3-1/4" x 3/8"	19-4-136	44.9	6.671	U	22,237	14,232	9,883	7,261	5,559	4,392	3,558	2,940	2,471	1,815	1,390
	19-2-136	46.9		C	22,237	17,789	14,825	12,707	11,118	9,883	8,895	8,086	7,412	6,353	5,559
3-1/2" x 1/4"	19-4-144	32.4	5.158	U	17,193	11,004	7,641	5,614	4,298	3,396	2,751	2,273	1,910	1,404	1,075
	19-2-144	33.9		C	17,193	13,754	11,462	9,825	8,596	7,641	6,877	6,252	5,731	4,912	4,298
3-1/2" x 5/16"	19-4-145	40.5	6.447	U	21,491	13,754	9,552	7,018	5,373	4,245	3,439	2,842	2,388	1,754	1,343
	19-2-145	42.6		C	21,491	17,193	14,327	12,281	10,746	9,552	8,596	7,815	7,164	6,140	5,373
3-1/2" x 3/8"	19-4-146	42.6	7.737	U	25,789	16,505	11,462	8,421	6,447	5,094	4,126	3,410	2,865	2,105	1,612
	19-2-146	50.2		C	25,789	20,632	17,193	14,737	12,895	11,462	10,316	9,378	8,596	7,368	6,447
4" x 1/4"	19-4-164	36.8	6.737	U	22,456	14,372	9,981	7,333	5,614	4,436	3,593	2,969	2,495	1,833	1,404
	19-2-164	38.3		C	22,456	17,965	14,971	12,832	11,228	9,981	8,982	8,166	7,485	6,416	5,614
4" x 5/16"	19-4-165	46.0	8.421	U	28,070	17,965	12,476	9,166	7,018	5,545	4,491	3,712	3,119	2,291	1,754
	19-2-165	48.1		C	28,070	22,456	18,713	16,040	14,035	12,476	11,228	10,207	9,357	8,020	7,018
4" x 3/8"	19-4-166	54.7	10.105	U	33,684	21,558	14,971	10,999	8,421	6,654	5,389	4,454	3,743	2,750	2,105
	19-2-166	56.8		C	33,684	26,947	22,456	19,248	16,842	14,971	13,474	12,249	11,228	9,624	8,421
4-1/2" x 1/4"	19-4-184	41.2	8.526	U	28,421	18,189	12,632	9,280	7,105	5,614	4,547	3,758	3,158	2,320	1,776
	19-4-185	42.7		C	28,421	22,737	18,947	16,241	14,211	12,632	11,368	10,335	9,474	8,120	7,105
4-1/2" x 5/16"	19-2-185	51.5	10.658	U	35,526	22,737	15,789	11,600	8,882	7,018	5,684	4,698	3,947	2,900	2,220
	19-4-186	53.6		C	35,526	28,421	23,684	20,301	17,763	15,789	14,211	12,919	11,842	10,150	8,882
4-1/2" x 3/8"	19-2-186	61.3	12.789	U	42,632	27,284	18,947	13,921	10,658	8,421	6,821	5,637	4,737	3,480	2,664
	19-4-204	63.4		C	42,632	34,105	28,421	24,361	21,316	18,947	17,053	15,502	14,211	12,180	10,658
5" x 1/4"	19-2-204	45.6	10.526	U	35,088	22,456	15,595	11,457	8,772	6,931	5,614	4,640	3,899	2,864	2,193
	19-4-205	47.1		C	35,088	28,070	23,392	20,050	17,544	15,595	14,035	12,759	11,696	10,025	8,772
5" x 5/16"	19-2-205	57.0	13.158	U	43,860	28,070	19,493	14,322	10,965	8,664	7,018	5,800	4,873	3,580	2,741
	19-4-206	59.1		C	43,860	35,088	29,240	25,063	21,930	19,493	17,544	15,949	14,620	12,531	10,965
5" x 3/8"	19-2-206	67.9	15.789	U	52,632	33,684	23,392	17,186	13,158	10,396	8,421	6,960	5,848	4,296	3,289
	19-4-244	70.0		C	52,632	42,105	35,088	30,075	26,316	23,392	21,053	19,139	17,544	15,038	13,158
6" x 1/4"	19-2-244	54.4	15.158	U	50,526	32,337	22,456	16,498	16,498	9,981	8,084	6,681	5,614	4,125	3,158
	19-4-245	55.9		C	50,526	40,421	33,684	28,872	25,263	22,456	20,211	18,373	16,842	14,436	12,632
6" x 5/16"	19-2-245	68.0	18.947	U	63,158	40,421	28,070	20,623	15,789	12,476	10,105	8,351	7,018	5,156	3,947
	19-4-246	70.1		C	63,158	50,526	42,105	36,090	31,579	28,070	25,263	22,967	21,053	18,045	15,789
6" x 3/8"	19-2-246	81.1	22.737	U	75,789	48,505	33,684	24,748	18,947	14,971	12,126	10,022	8,421	6,187	4,737
	19-2-245	83.1		C	75,789	60,632	50,526	43,308	37,895	33,684	30,316	27,560	25,263	21,654	18,947

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 29,000,000 psi - F= fiber stress, 20,000 psi

H-19 PANEL WIDTH (inches) **Note:** H-Heavy-Duty cross rods may extend 1/8" each side. Panel widths do not include these extensions.

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1/4" Bar	1 7/16	2 5/8	31 3/16	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	19 1/4
5/16" Bar	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	19 5/16
3/8" Bar	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	19 3/8

No. of Bars	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1/4" Bar	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" Bar	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" Bar	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

Heavy-Duty Welded

1-3/8" Center to Center of Bearing Bars

22-H-4
Cross Rods 4" C/C

22-H-2
Cross Rods 2" C/C

Material: ASTM A-36

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

General: Loads and deflections are theoretical and based on static loading.

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. These can be exceeded for other types of loads with engineer's approval. For deflections of uniform and concentrated loads, consult Marco's engineering departments.

U= safe uniform load, psf
C= safe concentrated load, pfw
D= deflection, inches
E= modulus of elasticity, 29,000,000 psi

Load & Deflection Table

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Ft of Width		SPAN (Length of Bearing Bar) 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"	22-4-44	8.3	0.364	U	1,212	776	539	396	303	239	194	160	135	99	76
	22-2-44	8.9		C	1,212	970	808	693	606	539	485	441	404	346	303
1" x 5/16"	22-4-45	11.0	0.455	U	1,515	970	673	495	379	299	242	200	168	124	95
	22-2-45	12.6		C	1,515	1,212	1,010	866	758	673	606	551	505	433	379
1" x 3/8"	22-4-46	12.9	0.545	U	1,818	1,164	808	594	455	359	291	240	202	148	114
	22-2-46	14.4		C	1,818	1,455	1,212	1,039	909	808	727	661	606	519	455
1-1/4" x 1/4"	22-4-54	10.2	0.568	U	1,894	1,212	842	618	473	374	303	250	210	155	118
	22-2-54	10.8		C	1,894	1,515	1,263	1,082	947	842	758	689	631	541	473
1-1/4" x 5/16"	22-4-55	13.4	0.710	U	2,367	1,515	1,052	773	592	468	379	313	263	193	148
	22-2-55	14.9		C	2,367	1,894	1,578	1,353	1,184	1,052	947	861	789	676	592
1-1/4" x 3/8"	22-4-56	15.8	0.852	U	2,841	1,818	1,263	928	710	561	455	376	316	232	178
	22-2-56	17.3		C	2,841	2,273	1,894	1,623	1,420	1,263	1,136	1,033	947	812	710
1-1/2" x 1/4"	22-4-64	12.0	0.818	U	2,727	1,745	1,212	891	682	539	436	361	303	223	170
	22-2-64	12.6		C	2,727	2,182	1,818	1,558	1,364	1,212	1,091	992	909	779	682
1-1/2" x 5/16"	22-4-65	15.8	1.023	U	3,409	2,182	1,515	1,113	852	673	545	451	379	278	213
	22-2-65	17.3		C	3,409	2,727	2,273	1,948	1,705	1,515	1,364	1,240	1,136	974	852
1-1/2" x 3/8"	22-4-66	18.7	1.227	U	4,091	2,618	1,818	1,336	1,023	808	655	541	455	334	256
	22-2-66	20.2		C	4,091	3,273	2,727	2,338	2,045	1,818	1,636	1,488	1,364	1,169	1,023
1-3/4" x 1/4"	22-4-74	14.0	1.114	U	3,712	2,376	1,650	1,212	928	733	594	491	412	303	232
	22-2-74	14.6		C	3,712	2,970	2,475	2,121	1,856	1,650	1,485	1,350	1,237	1,061	928
1-3/4" x 5/16"	22-4-75	18.2	1.392	U	4,640	2,970	2,062	1,515	1,160	917	742	614	516	379	290
	22-2-75	19.7		C	4,640	3,712	3,093	2,652	2,320	2,062	1,856	1,687	1,547	1,326	1,160
1-3/4" x 3/8"	22-4-76	21.5	1.670	U	5,568	3,564	2,475	1,818	1,392	1,100	891	736	619	455	348
	22-2-76	23.0		C	5,568	4,455	3,712	3,182	2,784	2,475	2,227	2,025	1,856	1,591	1,392
2" x 1/4"	22-4-84	15.9	1.455	U	4,848	3,103	2,155	1,583	1,212	958	776	641	539	396	303
	22-2-84	16.5		C	4,848	3,879	3,232	2,771	2,424	2,155	1,939	1,763	1,616	1,385	1,212
2" x 5/16"	22-4-85	20.6	1.818	U	6,061	3,879	2,694	1,979	1,515	1,197	970	801	673	495	379
	22-2-85	22.1		C	6,061	4,848	4,040	3,463	3,030	2,694	2,424	2,204	2,020	1,732	1,515
2" x 3/8"	22-4-86	24.4	2.182	U	7,273	4,655	3,232	2,375	1,818	1,437	1,164	962	808	594	455
	22-2-86	25.9		C	7,273	5,818	4,848	4,156	3,636	3,232	2,909	2,645	2,424	2,078	1,818
2-1/4" x 1/4"	22-4-94	17.8	1.841	U	6,136	3,927	2,727	2,004	1,534	1,212	982	811	682	501	384
	22-2-94	18.4		C	6,136	4,909	4,091	3,506	3,068	2,727	2,455	2,231	2,045	1,753	1,534
2-1/4" x 5/16"	22-4-95	23.0	2.301	U	7,670	4,909	3,409	2,505	1,918	1,515	1,227	1,014	852	626	479
	22-2-95	24.5		C	7,670	6,136	5,114	4,383	3,835	3,409	3,068	2,789	2,557	2,192	1,918
2-1/4" x 3/8"	22-4-96	27.2	2.761	U	9,205	5,891	4,091	3,006	2,301	1,818	1,473	1,217	1,023	751	575
	22-2-96	28.7		C	9,205	7,364	6,136	5,260	4,602	4,091	3,682	3,347	3,068	2,630	2,301
2-1/2" x 1/4"	22-4-104	19.7	2.273	U	7,576	4,848	3,367	2,474	1,894	1,894	1,212	1,002	842	618	473
	22-2-104	20.3		C	7,576	6,061	5,051	4,329	3,788	3,367	3,030	2,755	2,525	2,165	1,894
2-1/2" x 5/16"	22-4-105	25.4	2.841	U	9,470	6,061	4,209	3,092	2,367	1,871	1,515	1,252	1,052	773	592
	22-2-105	26.9		C	9,470	7,576	6,313	5,411	4,735	4,209	3,788	3,444	3,157	2,706	2,367
2-1/2" x 3/8"	22-4-106	30.1	3.409	U	11,364	7,273	5,051	3,711	2,841	2,245	1,818	1,503	1,263	928	710
	22-2-106	31.6		C	11,364	9,091	7,576	6,494	5,682	5,051	4,545	4,132	3,788	3,247	2,841
2-3/4" x 1/4"	22-4-114	22.5	2.750	U	9,167	5,867	4,074	2,993	2,292	1,811	1,467	1,212	1,019	748	573
	22-2-114	24.0		C	9,167	7,333	6,111	5,238	4,583	4,074	3,667	3,333	3,056	2,619	2,292
2-3/4" x 5/16"	22-4-115	28.3	3.438	U	11,458	7,333	5,093	3,741	2,865	2,263	1,833	1,515	1,273	935	716
	22-2-115	30.3		C	11,458	9,167	7,639	6,548	5,729	5,093	4,583	4,167	3,819	3,274	2,865
2-3/4" x 3/8"	22-4-116	33.5	4.125	U	13,750	8,800	6,111	4,490	3,438	2,716	2,200	1,818	1,528	1,122	859
	22-2-116	35.5		C	13,750	11,000	9,167	7,857	6,875	6,111	5,500	5,000	4,583	3,929	3,438

22-H-4 & 22-H-2 (continued)

1-3/8" Center to Center of Bearing Bars

Load & Deflection Table

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	7'-0"	8'-0"
3" x 1/4"	22-4-124	24.5	3.273	U	10,909	6,982	4,848	3,562	2,727	2,155	1,745	1,443	1,212	891	682
	22-2-124	26.0		C	10,909	8,727	7,273	6,234	5,455	4,848	4,364	3,967	3,636	3,117	2,727
3" x 5/16"	22-4-125	30.7	4.091	U	13,636	8,727	6,061	4,453	3,409	2,694	2,182	1,803	1,515	1,113	852
	22-2-125	32.7		C	13,636	10,909	9,091	7,792	6,818	6,061	5,455	4,959	4,545	3,896	3,409
3" x 3/8"	22-4-126	36.4	4.909	U	16,364	10,473	7,273	5,343	4,091	3,232	2,618	2,164	1,818	1,336	1,023
	22-2-126	38.4		C	16,364	13,091	10,909	9,351	8,182	7,273	6,545	5,950	5,455	4,675	4,091
3-1/4" x 1/4"	22-4-134	26.4	3.841	U	12,803	8,194	5,690	4,181	3,201	2,529	2,048	1,693	1,423	1,045	800
	22-2-134	27.9		C	12,803	10,242	8,535	7,316	6,402	5,690	5,121	4,656	4,268	3,658	3,201
3-1/4" x 5/16"	22-4-135	33.1	4.801	U	16,004	10,242	7,113	5,226	4,001	3,161	2,561	2,116	1,778	1,306	1,000
	22-2-135	35.1		C	16,004	12,803	10,669	9,145	8,002	7,113	6,402	5,820	5,335	4,573	4,001
3-1/4" x 3/8"	22-4-136	39.2	5.761	U	19,205	12,291	8,535	6,271	4,801	3,793	3,073	2,539	2,134	1,568	1,200
	22-2-136	41.3		C	19,205	15,364	12,803	10,974	9,602	8,535	7,682	6,983	6,402	5,487	4,801
3-1/2" x 1/4"	22-4-144	28.3	4.455	U	14,848	9,503	6,599	4,848	3,712	2,933	2,376	1,963	1,650	1,212	928
	22-2-144	29.8		C	14,848	11,879	9,899	8,485	7,424	6,599	5,939	5,399	4,949	4,242	3,712
3-1/2" x 5/16"	22-4-145	35.5	5.568	U	18,561	11,879	8,249	6,061	4,640	3,666	2,970	2,454	2,062	1,515	1,160
	22-2-145	37.5		C	18,561	14,848	12,374	10,606	9,280	8,249	7,424	6,749	6,187	5,303	4,640
3-1/2" x 3/8"	22-4-146	42.1	6.682	U	22,273	14,255	9,899	7,273	5,568	4,400	3,564	2,945	2,475	1,818	1,392
	22-2-146	44.1		C	22,273	17,818	14,848	12,727	11,136	9,899	8,909	8,099	7,424	6,364	5,568
4" x 1/4"	22-4-164	32.1	5.818	U	19,394	12,412	8,620	6,333	4,848	3,831	3,103	2,564	2,155	1,583	1,212
	22-2-164	33.6		C	19,394	15,515	12,929	11,082	9,697	8,620	7,758	7,052	6,465	5,541	4,848
4" x 5/16"	22-4-165	40.2	7.273	U	24,242	15,515	10,774	7,916	6,061	4,789	3,879	3,206	2,694	1,979	1,515
	22-2-165	42.3		C	24,242	19,394	16,162	13,853	12,121	10,774	9,697	8,815	8,081	6,926	6,061
4" x 3/8"	22-4-166	47.8	8.727	U	29,091	18,618	12,929	9,499	7,273	5,746	4,655	3,847	3,232	2,375	1,818
	22-2-166	49.8		C	29,091	23,273	19,394	16,623	14,545	12,929	11,636	10,579	9,697	8,312	7,273
4-1/2" x 1/4"	22-4-184	35.9	7.364	U	24,545	15,709	10,909	8,015	6,136	4,848	3,927	3,246	2,727	2,004	1,534
	22-2-184	37.4		C	24,545	19,636	16,364	14,026	12,273	10,909	9,818	8,926	8,182	7,013	6,136
4-1/2" x 5/16"	22-4-185	45.0	9.205	U	30,682	19,636	13,636	10,019	7,670	6,061	4,909	4,057	3,409	2,505	1,918
	22-2-185	47.0		C	30,682	24,545	20,455	17,532	15,341	13,636	12,273	11,157	10,227	8,766	7,670
4-1/2" x 3/8"	22-4-186	53.5	11.045	U	36,818	23,564	16,364	12,022	9,205	7,273	5,891	4,869	4,091	3,006	2,301
	22-2-186	55.5		C	36,818	29,455	24,545	21,039	18,409	16,364	14,727	13,388	12,273	10,519	9,205
5" x 1/4"	22-4-204	39.8	9.091	U	30,303	19,394	13,468	9,895	7,576	5,986	4,848	4,007	3,367	2,474	1,894
	22-2-204	41.3		C	30,303	24,242	20,202	17,316	15,152	13,468	12,121	11,019	10,101	8,658	7,576
5" x 5/16"	22-4-205	49.8	11.364	U	37,879	24,242	16,835	12,369	9,470	7,482	6,061	5,009	4,209	3,092	2,367
	22-2-205	51.8		C	37,879	30,303	25,253	21,645	18,939	16,835	15,152	13,774	12,626	10,823	9,470
5" x 3/8"	22-4-206	59.2	13.636	U	45,455	29,091	20,202	14,842	11,364	8,979	7,273	6,011	5,051	3,711	2,841
	22-2-206	61.3		C	45,455	36,364	30,303	25,974	22,727	20,202	18,182	16,529	15,152	12,987	11,364
6" x 1/4"	22-4-244	47.4	13.091	U	43,636	27,927	19,394	14,249	10,909	8,620	6,982	5,770	4,848	3,562	2,727
	22-2-244	48.9		C	43,636	34,909	29,091	24,935	21,818	19,394	17,455	15,868	14,545	12,468	10,909
6" x 5/16"	22-4-245	59.3	16.364	U	54,545	34,909	24,242	17,811	13,636	10,774	8,727	7,213	6,061	4,453	3,409
	22-2-245	61.4		C	54,545	43,636	36,364	31,169	27,273	24,242	21,818	19,835	18,182	15,584	13,636
6" x 3/8"	22-4-246	70.7	19.636	U	65,455	41,891	29,091	21,373	16,364	12,929	10,473	8,655	7,273	5,343	4,091
	22-2-246	72.7		C	65,455	52,364	43,636	37,403	32,727	29,091	26,182	23,802	21,818	18,701	16,364

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 29,000,000 psi - F= fiber stress, 20,000 psi

HP-22 PANEL WIDTH (inches) **Note**: H-Heavy-Duty cross rods may extend 1/8" each side. Panel widths do not include these extensions.

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1/4" Bar	1 5/8	3	4 3/8	5 3/4	71/8	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" Bar	1 11/16	3 1/16	4 7/16	5 13/16	73/16	8 9/16	9 15/16	11 5/16	12 11/16	14 1/16	15 7/6	16 3/16	18 3/16	19 9/16	20 15/16
3/8" Bar	13/4	3 1/8	4 1/2	5 7/8	71/4	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

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

Heavy-Duty Welded

1-3/8" Center to Center of Bearing Bars

30-H-4
Cross Rods 4" C/C

30-H-2
Cross Rods 2" C/C

Material: ASTM A-36

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

General: Loads and deflections are theoretical and based on static loading.

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. These can be exceeded for other types of loads with engineer's approval. For deflections of uniform and concentrated loads, consult MARC engineering departments.

U= safe uniform load, psf
C= safe concentrated load, pfw
D= deflection, inches
E= modulus of elasticity, 29,000,000 psi
F= fiber stress, 20,000 psi

Load & Deflection Table

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 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"	30-4-44	6.3		U	889	569	395	290	222	176	142	118	99	73	56
	30-2-44	6.9	0.267	C	889	711	593	508	444	395	356	323	296	254	222
1" x 5/16"	30-4-45	8.6		U	1,111	711	494	363	278	219	178	147	123	91	69
	30-2-45	10.1	0.333	C	1,111	889	741	635	556	494	444	404	370	317	278
1" x 3/8"	30-4-46	10.0		U	1,333	853	593	435	333	263	213	176	148	109	83
	30-2-46	11.5	0.400	C	1,333	1,067	889	762	667	593	533	485	444	381	333
1-1/4" x 1/4"	30-4-54	7.7		U	1,389	889	617	454	347	274	222	184	154	113	87
	30-2-54	8.3	0.417	C	1,389	1,111	926	794	694	617	556	505	463	397	347
1-1/4" x 5/16"	30-4-55	10.4		U	1,736	1,111	772	567	434	343	278	230	193	142	109
	30-2-55	11.9	0.521	C	1,736	1,894	1,157	992	868	772	694	631	579	496	434
1-1/4" x 3/8"	30-4-56	12.1		U	2,083	1,333	926	680	521	412	333	275	231	170	130
	30-2-56	13.6	0.625	C	2,083	1,667	1,389	1,190	1,042	926	833	758	694	595	521
1-1/2" x 1/4"	30-4-64	9.1		U	2,000	1,280	889	653	500	395	320	264	222	163	125
	30-2-64	9.6	0.600	C	2,000	1,600	1,333	1,143	1,000	889	800	727	667	571	500
1-1/2" x 5/16"	30-4-65	12.1		U	2,500	1,600	1,111	816	625	494	400	331	278	204	156
	30-2-65	13.6	0.750	C	2,500	2,000	1,667	1,429	1,250	1,111	1,000	909	833	714	625
1-1/2" x 3/8"	30-4-66	14.3		U	3,000	1,920	1,333	980	750	593	480	397	333	245	188
	30-2-66	15.8	0.900	C	3,000	2,400	2,000	1,714	1,500	1,333	1,200	1,091	1,000	857	750
1-3/4" x 1/4"	30-4-74	10.6		U	2,722	1,742	1,210	889	681	538	436	360	302	222	170
	30-2-74	11.2	0.817	C	2,722	2,178	1,815	1,556	1,361	1,210	1,089	990	907	778	681
1-3/4" x 5/16"	30-4-75	13.9		U	3,403	2,178	1,512	1,111	851	672	544	450	378	278	213
	30-2-75	15.4	1.021	C	3,403	2,722	2,269	1,944	1,701	1,512	1,361	1,237	1,134	972	851
1-3/4" x 3/8"	30-4-76	16.4		U	4,083	2,613	1,815	1,333	1,021	807	653	540	454	333	255
	30-2-76	17.9	1.225	C	4,083	3,267	2,722	2,333	2,042	1,815	1,633	1,485	1,361	1,167	1,021
2" x 1/4"	30-4-84	12.0		U	3,556	2,276	1,580	1,161	702	569	569	470	395	290	222
	30-2-84	12.6	1.067	C	3,556	2,844	2,370	2,032	1,778	1,580	1,422	1,293	1,185	1,016	889
2" x 5/16"	30-4-85	15.7		U	4,444	2,844	1,975	1,451	1,111	878	711	588	494	363	278
	30-2-85	17.2	1.333	C	4,444	3,556	2,963	2,540	2,222	1,975	1,778	1,616	1,481	1,270	1,111
2" x 3/8"	30-4-86	18.5		U	5,333	3,413	2,370	1,741	1,333	1,053	853	705	593	435	333
	30-2-86	20.0	1.600	C	5,333	4,267	3,556	3,048	2,667	2,370	2,133	1,939	1,778	1,524	1,333
2-1/4" x 1/4"	30-4-94	13.4		U	4,500	2,880	2,000	1,469	1,125	889	720	595	500	367	281
	30-2-94	14.0	1.350	C	4,500	3,600	3,000	2,571	2,250	2,000	1,800	1,636	1,500	1,286	1,125
2-1/4" x 5/16"	30-4-95	17.5		U	5,625	3,600	2,500	1,837	1,406	1,111	900	744	625	459	352
	30-2-95	19.0	1.688	C	5,625	4,500	3,750	3,214	2,813	2,500	2,250	2,045	1,875	1,607	1,406
2-1/4" x 3/8"	30-4-96	20.6		U	6,750	4,320	3,000	2,204	1,688	1,333	1,080	893	750	551	422
	30-2-96	22.1	2.025	C	6,750	5,400	4,500	3,857	3,375	3,000	2,700	2,455	2,250	1,929	1,688
2-1/2" x 1/4"	30-4-104	14.8		U	5,556	3,556	2,469	1,814	1,389	1,097	889	735	617	454	347
	30-2-104	15.4	1.667	C	5,556	4,444	3,704	3,175	2,778	2,469	2,222	2,020	1,852	1,587	1,389
2-1/2" x 5/16"	30-4-105	19.2		U	6,944	4,444	3,086	2,268	1,736	1,372	1,111	918	772	567	434
	30-2-105	20.7	2.083	C	6,944	5,556	4,630	3,968	3,472	3,086	2,778	2,525	2,315	1,984	1,736
2-1/2" x 3/8"	30-4-106	22.8		U	8,333	5,333	3,704	2,721	2,083	1,646	1,333	1,102	926	680	521
	30-2-106	24.3	2.500	C	8,333	6,667	5,556	4,762	4,167	3,704	3,333	3,030	2,778	2,381	2,083
2-3/4" x 1/4"	30-4-114	17.1		U	6,722	4,302	2,988	2,195	1,681	1,328	1,076	889	747	549	420
	30-2-114	18.6	2.017	C	6,722	5,378	4,481	3,841	3,361	2,988	2,689	2,444	2,241	1,921	1,681
2-3/4" x 5/16"	30-4-115	21.6		U	8,403	5,378	3,735	2,744	2,101	1,660	1,344	1,111	934	686	525
	30-2-115	23.6	2.521	C	8,403	6,722	5,602	4,802	4,201	3,735	3,361	3,056	2,801	2,401	2,101
2-3/4" x 3/8"	30-4-116	25.4		U	10,083	6,453	4,481	3,293	2,521	1,992	1,613	1,333	1,120	823	630
	30-2-116	27.5	3.025	C	10,083	8,067	6,722	5,762	5,042	4,481	4,033	3,667	3,361	2,881	2,521

30-H-4 & 30-H-2 (continued)

1-3/8" Center to Center of Bearing Bars

Load & Deflection Table

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	7'-0"	8'-0"
3" x 1/4"	30-4-124	18.6	2.400	U	8,000	5,120	3,556	2,612	2,000	1,580	1,280	1,058	889	653	500
	30-2-124	20.1		C	8,000	6,400	5,333	4,571	4,000	3,556	3,200	2,909	2,909	2,286	2,000
3" x 5/16"	30-4-125	23.3	3.000	U	10,000	6,400	4,444	3,265	2,500	1,975	1,600	1,322	1,111	816	625
	30-2-125	25.4		C	10,000	8,000	6,667	5,714	5,000	4,444	4,000	3,636	3,333	2,857	2,500
3" x 3/8"	30-4-126	25.4	3.600	U	12,000	7,680	5,333	3,918	3,000	2,370	1,920	1,587	1,333	980	750
	30-2-126	29.6		C	12,000	9,600	8,000	6,857	6,000	5,333	4,800	4,364	4,000	3,429	3,000
3-1/4" x 1/4"	30-4-134	20.0	2.817	U	9,389	6,009	4,173	3,066	2,347	1,855	1,502	1,242	1,043	766	587
	30-2-134	21.5		C	9,389	7,511	6,259	5,365	4,694	4,173	3,756	3,414	3,130	2,683	2,347
3-1/4" x 5/16"	30-4-135	25.1	3.521	U	11,736	7,511	5,216	3,832	2,934	2,318	1,878	1,552	1,304	958	734
	30-2-135	27.1		C	11,736	9,389	7,824	6,706	5,868	5,216	4,694	4,268	3,912	3,353	2,934
3-1/4" x 3/8"	30-4-136	29.7	4.225	U	14,083	9,013	6,259	4,599	3,521	2,782	2,253	1,862	1,565	1,150	880
	30-2-136	31.7		C	14,083	11,267	9,389	8,048	7,042	6,259	5,633	5,121	4,694	4,024	3,521
3-1/2" x 1/4"	30-4-144	21.4	3.267	U	10,889	6,969	4,840	3,556	2,722	2,151	1,742	1,440	1,210	889	681
	30-2-144	22.9		C	10,889	8,711	7,259	6,222	5,444	4,840	4,356	3,960	3,630	3,111	2,722
3-1/2" x 5/16"	30-4-145	26.9	4.083	U	13,611	8,711	6,049	4,444	3,403	2,689	2,178	1,800	1,512	1,111	851
	30-2-145	28.9		C	13,611	10,889	9,074	7,778	6,806	6,049	5,444	4,949	4,537	3,889	3,403
3-1/2" x 3/8"	30-4-146	31.8	4.900	U	16,333	10,453	7,259	5,333	4,083	3,226	2,613	2,160	1,815	1,333	1,021
	30-2-146	33.8		C	16,333	13,067	10,889	9,333	8,167	7,259	6,533	5,939	5,444	4,667	4,083
4" x 1/4"	30-4-164	24.2	4.267	U	14,222	9,102	6,321	4,644	3,556	2,809	2,276	1,881	1,580	1,161	889
	30-2-164	25.7		C	14,222	11,378	9,481	8,127	7,111	6,321	5,689	5,172	4,741	4,063	3,556
4" x 5/16"	30-4-165	30.4	5.333	U	17,778	11,378	7,901	5,805	4,444	3,512	2,844	2,351	1,975	1,451	1,111
	30-2-165	32.5		C	17,778	14,222	11,852	10,159	8,889	7,901	7,111	6,465	5,926	5,079	4,444
4" x 3/8"	30-4-166	36.0	6.400	U	21,333	13,653	9,481	6,966	5,333	4,214	3,413	2,821	2,370	1,741	1,333
	30-2-166	38.1		C	21,333	17,067	14,222	12,190	10,667	9,481	8,533	7,758	7,111	6,095	5,333
4-1/2" x 1/4"	30-4-184	27.1	5.400	U	18,000	11,520	8,000	5,878	4,500	3,556	2,880	2,380	2,000	1,469	1,125
	30-2-184	28.6		C	18,000	14,400	12,000	10,286	9,000	8,000	7,200	6,545	6,000	5,143	4,500
4-1/2" x 5/16"	30-4-185	34.0	6.750	U	22,500	14,400	10,000	7,347	5,625	4,444	3,600	2,975	2,500	1,837	1,406
	30-2-185	36.0		C	22,500	18,000	15,000	12,857	11,250	10,000	9,000	8,182	7,500	6,429	5,625
4-1/2" x 3/8"	30-4-186	40.3	8.100	U	27,000	17,280	12,000	8,816	6,750	5,333	4,320	3,570	3,000	2,204	1,688
	30-2-186	42.3		C	27,000	21,600	18,000	15,429	13,500	12,000	10,800	9,818	9,000	7,714	6,750
5" x 1/4"	30-4-204	29.9	6.667	U	22,222	14,222	9,877	7,256	5,556	4,390	3,556	2,938	2,469	1,814	1,389
	30-2-204	31.4		C	22,222	17,778	14,815	12,698	11,111	9,877	8,889	8,081	7,407	6,349	5,556
5" x 5/16"	30-4-205	37.5	8.333	U	27,778	17,778	12,346	9,070	6,944	5,487	4,444	3,673	3,086	2,268	1,736
	30-2-205	39.6		C	27,778	22,222	18,519	15,873	13,889	12,346	11,111	10,101	9,259	7,937	6,944
5" x 3/8"	30-4-206	44.5	10.000	U	33,333	21,333	14,815	10,884	8,333	6,584	5,333	4,408	3,704	2,721	2,083
	30-2-206	46.6		C	33,333	26,667	22,222	19,048	16,667	14,815	13,333	12,121	11,111	9,524	8,333
6" x 1/4"	30-4-244	35.6	9.600	U	32,000	20,480	14,222	10,449	8,000	6,321	5,120	4,231	3,556	2,612	2,000
	30-2-244	37.1		C	32,000	25,600	21,333	18,286	16,000	14,222	12,800	11,636	10,667	9,143	8,000
6" x 5/16"	30-4-245	44.6	12.000	U	40,000	25,600	17,778	13,061	10,000	7,901	6,400	5,289	4,444	3,265	2,500
	30-2-245	46.7		C	40,000	32,000	26,667	22,857	20,000	17,778	16,000	14,545	13,333	11,429	10,000
6" x 3/8"	30-4-246	53.0	14.400	U	48,000	30,720	21,333	15,673	12,000	9,481	7,680	6,347	5,333	3,918	3,000
	30-2-246	55.1		C	48,000	38,400	32,000	27,429	24,000	21,333	19,200	17,455	16,000	13,714	12,000

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 29,000,000 psi - F= fiber stress, 20,000 psi

H-30 PANEL WIDTH (inches) **Note**: H-Heavy-Duty cross rods may extend 1/8" each side. Panel widths do not include these extensions.

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1/4" Bar	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	30 1/4	32 1/8	34	35 7/8
5/16" Bar	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	24 13/16	24 11/16	26 9/16	28 7/16	30 5/16	32 3/16	34 1/15	35 15/16
3/8" Bar	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	24 7/8	24 3/4	26 5/8	28 1/2	30 3/8	32 1/4	34 1/8	36

Heavy-Duty Welded

2-3/8" Center to Center of Bearing Bars

38-H-4
Cross Rods 4" C/C

38-H-2
Cross Rods 2" C/C

Material: ASTM A-36

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

General: Loads and deflections are theoretical and based on static loading.

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. These can be exceeded for other types of loads with engineer's approval. For deflections of uniform and concentrated loads, consult MARC engineering departments.

U= safe uniform load, psf
C= safe concentrated load, pfw
D= deflection, inches
E= modulus of elasticity, 29,000,000 psi
F= fiber stress, 20,000 psi

Load & Deflection Table

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 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"	38-4-44	5.2	0.211	U	702	449	312	229	175	139	112	93	78	57	44
	38-2-44	5.8		C	702	561	468	401	351	312	281	255	234	201	175
1" x 5/16"	38-4-45	7.2	0.263	U	877	561	390	286	219	173	140	116	97	72	55
	38-2-45	8.7		C	877	702	585	501	439	390	351	319	292	251	219
1" x 3/8"	38-4-46	8.3	0.316	U	1,053	674	468	344	263	208	168	139	117	86	66
	38-2-46	9.8		C	1,053	842	702	602	526	468	421	383	351	301	263
1-1/4" x 1/4"	38-4-54	6.3	0.329	U	1,096	702	487	358	274	217	175	145	122	90	69
	38-2-54	6.9		C	1,096	877	731	627	548	487	439	399	365	313	274
1-1/4" x 5/16"	38-4-55	8.6	0.411	U	1,371	877	609	448	343	271	219	181	152	112	86
	38-2-55	10.1		C	1,371	1,096	914	783	685	609	548	498	457	392	343
1-1/4" x 3/8"	38-4-56	10.0	0.493	U	1,645	1,053	731	537	411	325	263	217	183	134	103
	38-2-56	11.5		C	1,645	1,316	1,096	940	822	731	658	598	548	470	411
1-1/2" x 1/4"	38-4-64	7.4	0.474	U	1,579	1,011	702	516	395	312	253	209	175	129	99
	38-2-64	7.9		C	1,579	1,263	1,053	902	789	702	632	574	526	451	395
1-1/2" x 5/16"	38-4-65	10.0	0.592	U	1,974	1,263	877	644	493	390	316	261	219	161	123
	38-2-65	11.5		C	1,974	1,579	1,316	1,128	987	877	789	718	658	564	493
1-1/2" x 3/8"	38-4-66	11.7	0.711	U	2,368	1,516	1,053	773	592	468	379	313	263	193	148
	38-2-66	13.2		C	2,368	1,895	1,579	1,353	1,184	1,053	947	861	789	677	592
1-3/4" x 1/4"	38-4-74	8.6	0.645	U	2,149	1,375	955	702	537	425	344	284	239	175	134
	38-2-74	9.2		C	2,149	1,719	1,433	1,228	1,075	955	860	781	716	614	537
1-3/4" x 5/16"	38-4-75	11.4	0.806	U	2,686	1,719	1,194	877	672	531	430	355	298	219	168
	38-2-75	12.9		C	2,686	2,149	1,791	1,535	1,343	1,194	1,075	977	895	768	672
1-3/4" x 3/8"	38-4-76	13.4	0.967	U	3,224	2,063	1,433	1,053	806	637	516	426	358	263	201
	38-2-76	14.9		C	3,224	2,579	2,149	1,842	1,612	1,433	1,289	1,172	1,075	921	806
2" x 1/4"	38-4-84	9.7	0.842	U	2,807	1,796	1,248	917	702	554	449	371	312	229	175
	38-2-84	10.3		C	2,807	2,246	1,871	1,604	1,404	1,248	1,123	1,021	936	802	702
2" x 5/16"	38-4-85	12.9	1.053	U	3,509	2,246	1,559	1,146	877	693	561	464	390	286	219
	38-2-85	14.4		C	3,509	2,807	2,339	2,005	1,754	1,559	1,404	1,276	1,170	1,003	877
2" x 3/8"	38-4-86	15.1	1.263	U	4,211	2,695	1,871	1,375	1,053	832	674	557	468	344	263
	38-2-86	16.6		C	4,211	3,368	2,807	2,406	2,105	1,871	1,684	1,531	1,404	1,203	1,053
2-1/4" x 1/4"	38-4-94	10.8	1.066	U	3,553	2,274	1,579	1,160	888	702	568	470	395	290	222
	38-2-94	11.5		C	3,553	2,842	2,368	2,030	1,776	1,579	1,421	1,292	1,184	1,015	888
2-1/4" x 5/16"	38-4-95	14.3	1.332	U	4,441	2,842	1,974	1,450	1,110	877	711	587	493	363	278
	38-2-95	15.8		C	4,441	3,553	2,961	2,538	2,220	1,974	1,776	1,615	1,480	1,269	1,110
2-1/4" x 3/8"	38-4-96	16.8	1.599	U	5,329	3,411	2,368	1,740	1,332	1,053	853	705	592	435	333
	38-2-96	18.3		C	5,329	4,263	3,553	3,045	2,664	2,368	2,132	1,938	1,776	1,523	1,332
2-1/2" x 1/4"	38-4-104	12.0	1.316	U	4,386	2,807	1,949	1,432	1,096	866	702	580	487	358	274
	38-2-104	12.6		C	4,386	3,509	2,924	2,506	2,193	1,949	1,754	1,595	1,462	1,253	1,096
2-1/2" x 5/16"	38-4-105	15.7	1.645	U	5,482	3,509	2,437	1,790	1,371	1,083	877	725	609	448	343
	38-2-105	17.2		C	5,482	4,386	3,655	3,133	2,741	2,437	2,193	1,994	1,827	1,566	1,371
2-1/2" x 3/8"	38-4-106	18.5	1.974	U	6,579	4,211	2,924	2,148	1,645	1,300	1,053	870	731	537	411
	38-2-106	20.0		C	6,579	5,263	4,386	3,759	3,289	2,924	2,632	2,392	2,193	1,880	1,645
2-3/4" x 1/4"	38-4-114	14.0	1.592	U	5,307	3,396	2,359	1,733	1,327	1,048	849	702	590	433	332
	38-2-114	15.5		C	5,307	4,246	3,538	3,033	2,654	2,359	2,123	1,930	1,769	1,516	1,327
2-3/4" x 5/16"	38-4-115	17.7	1.990	U	6,634	4,246	2,948	2,166	1,658	1,310	1,061	877	737	542	415
	38-2-115	19.7		C	6,634	5,307	4,423	3,791	3,317	2,948	2,654	2,412	2,211	1,895	1,658
2-3/4" x 3/8"	38-4-116	20.7		U	7,961	5,095	3,538	2,599	1,990	1,572	1,274	1,053	885	650	498
	38-2-116	22.8	2.388	C	7,961	6,368	5,307	4,549	3,980	3,538	3,184	2,895	2,654	2,274	1,990

38-H-4 & 38-H-2 (continued)

2-3/8" Center to Center of Bearing Bars

Load & Deflection Table

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	7'-0"	8'-0"
3" x 1/4"	38-4-124	15.1		U	6,316	4,042	2,807	2,062	1,579	1,248	1,011	835	702	516	395
	38-2-124	16.7	1.895	C	6,316	5,053	4,211	3,609	3,158	2,807	2,526	2,297	2,105	1,805	1,579
3" x 5/16"	38-4-125	19.1		U	7,895	5,053	3,509	2,578	1,974	1,559	1,263	1,044	877	644	493
	38-2-125	21.1	2.368	C	7,895	6,316	5,263	4,511	3,947	3,509	3,158	2,871	2,632	2,256	1,974
3" x 3/8"	38-4-126	22.4		U	9,474	6,063	4,211	3,093	2,368	1,871	1,516	1,253	1,053	773	592
	38-2-126	24.5	2.842	C	9,474	7,579	6,316	5,414	4,737	4,211	3,789	3,445	3,158	2,707	2,368
3-1/4" x 1/4"	38-4-134	16.3		U	7,412	4,744	3,294	2,420	1,853	1,464	1,186	980	824	605	463
	38-2-134	17.8	2.224	C	7,412	5,930	4,942	4,236	3,706	3,294	2,965	2,695	2,471	2,118	1,853
3-1/4" x 5/16"	38-4-135	20.5		U	9,265	5,930	4,118	3,025	2,316	1,830	1,482	1,225	1,029	756	579
	38-2-135	22.5	2.780	C	9,265	7,412	6,177	5,294	4,633	4,118	3,706	3,369	3,088	2,647	2,316
3-1/4" x 3/8"	38-4-136	24.1		U	11,118	7,116	4,942	3,631	2,780	2,196	1,779	1,470	1,235	908	695
	38-2-136	26.2	3.336	C	11,118	8,895	7,412	6,353	5,559	4,942	4,447	4,043	3,706	3,177	2,780
3-1/2" x 1/4"	38-4-144	17.4		U	8,596	5,502	3,821	2,807	2,149	1,698	1,375	1,137	955	702	537
	38-2-144	18.9	2.579	C	8,596	6,877	5,731	4,912	4,298	3,821	3,439	3,126	2,865	2,456	2,149
3-1/2" x 5/16"	38-4-145	21.9		U	10,746	6,877	4,776	3,509	2,686	2,123	1,719	1,421	1,194	877	672
	38-2-145	24.0	3.224	C	10,746	8,596	7,164	6,140	5,373	4,776	4,298	3,907	3,582	3,070	2,686
3-1/2" x 3/8"	38-4-146	25.8		U	12,895	8,253	5,731	4,211	3,224	2,547	2,063	1,705	1,433	1,053	806
	38-2-146	27.9	3.868	C	12,895	10,316	8,596	7,368	6,447	5,731	5,158	4,689	4,298	3,684	3,224
4" x 1/4"	38-4-164	19.7		U	11,228	7,186	4,990	3,666	2,807	2,218	1,796	1,485	1,248	917	702
	38-2-164	21.2	3.368	C	11,228	8,982	7,485	6,416	5,614	4,990	4,491	4,083	3,743	3,208	2,807
4" x 5/16"	38-4-165	24.8		U	14,035	8,982	6,238	4,583	3,509	2,772	2,246	1,856	1,559	1,146	877
	38-2-165	26.8	4.211	C	14,035	11,228	9,357	8,020	7,018	6,238	5,614	5,104	4,678	4,010	3,509
4" x 3/8"	38-4-166	29.2		U	16,842	10,779	7,485	5,499	4,211	3,327	2,695	2,227	1,871	1,375	1,053
	38-2-166	31.3	5.053	C	16,842	13,474	11,228	9,624	8,421	7,485	6,737	6,124	5,614	4,812	4,211
4-1/2" x 1/4"	38-4-184	22.0		U	14,211	9,095	6,316	4,640	3,553	2,807	2,274	1,879	1,579	1,160	888
	38-2-184	23.5	4.263	C	14,211	11,368	9,474	8,120	7,105	6,316	5,684	5,167	4,737	4,060	3,553
4-1/2" x 5/16"	38-4-185	27.6		U	17,763	11,368	7,895	5,800	4,441	3,509	2,842	2,349	1,974	1,450	1,110
	38-2-185	29.6	5.329	C	17,763	14,211	11,842	10,150	8,882	7,895	7,105	6,459	5,921	5,075	4,441
4-1/2" x 3/8"	38-4-186	32.6		U	21,316	13,642	9,474	6,960	5,329	4,211	3,411	2,819	2,368	1,740	1,332
	38-2-186	34.7	6.395	C	21,316	17,053	14,211	12,180	10,658	9,474	8,526	7,751	7,105	6,090	5,329
5" x 1/4"	38-4-204	24.2		U	17,544	11,228	7,797	5,729	4,386	3,465	2,807	2,320	1,949	1,432	1,096
	38-2-204	25.7	5.263	C	17,544	14,035	11,696	10,025	8,772	7,797	7,018	6,380	5,848	5,013	4,386
5" x 5/16"	38-4-205	30.4		U	21,930	14,035	9,747	7,161	5,482	4,332	3,509	2,900	2,437	1,790	1,371
	38-2-205	32.5	6.579	C	21,930	17,544	14,620	12,531	10,965	9,747	8,772	7,974	7,310	6,266	5,482
5" x 3/8"	38-4-206	36.0		U	26,316	16,842	11,696	8,593	6,579	5,198	4,211	3,480	2,924	2,148	1,645
	38-2-206	38.1	7.895	C	26,316	21,053	17,544	15,038	13,158	11,696	10,526	9,569	8,772	7,519	6,579
6" x 1/4"	38-4-244	28.8		U	25,263	16,168	11,228	8,249	6,316	4,990	4,042	3,341	2,807	2,062	1,579
	38-2-244	30.3	7.579	C	25,263	20,211	16,842	14,436	12,632	11,228	10,105	9,187	8,421	7,218	6,316
6" x 5/16"	38-4-245	36.1		U	31,579	20,211	14,035	10,311	7,895	6,238	5,053	4,176	3,509	2,578	1,974
	38-2-245	38.1	9.474	C	31,579	25,263	21,053	18,045	15,789	14,035	12,632	11,483	10,526	9,023	7,895
6" x 3/8"	38-4-246	42.8		U	37,895	24,253	16,842	12,374	9,474	7,485	6,063	5,011	4,211	3,093	2,368
	38-2-246	44.9	11.368	C	37,895	30,316	25,263	21,654	18,947	16,842	15,158	13,780	12,632	10,827	9,474

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 29,000,000 psi - F= fiber stress, 20,000 psi

H-38 PANEL WIDTH (inches) **Note:** H-Heavy-Duty cross rods may extend 1/8" each side. Panel widths do not include these extensions.

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1/4" Bar	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" Bar	2 11/16	5 5/16	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 15/16	35 15/16
3/8" Bar	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	35

ALUMINUM GRATING

Aluminum Grating is corrosion resistant, non-sparking, rustproof and has many applications due to its light weight and high strength. It is ideally suited for use in corrosive environments and finds wide applications as walk ways and platforms in sewage treatment plants, refineries, chemical processing plants, pumping and compressor stations, and aboard ships and barges. Because it does not rust, it is commonly used in breweries, bottling plants, and food preparation and storage facilities. In munition plants, other volatile industries and areas, its non-sparking properties make it a must for safety. It is available in standard or anodized finishes.

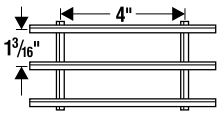
Swage-Locked I-Bar Grating is the most widely used and provides the strength equal to a rectangular bar of the same depth, but at far less weight and cost. The I-bars are permanently locked to the cross rods (positioned every 2” or 4”)m by a swaging process.

Swage-Locked Rectangular Bar Grating uses the swaging process to permanently lock the cross rods (positioned every 2” or 4”) to the rectangular bars.

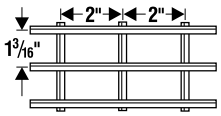
Press-Locked Rectangular Bar Grating is constructed with the two close-tolerance slotted bars bonded together (positioned every 2” or 4”) using tremendous hydraulic pressure. Permanent locking is achieved by forcing the deep cross bar into the bearing bar. Both the cross bars and the bearing bars provide walking surfaces in the press-locked design.

Rectangular Bar Grating in either the swage-locked or press-locked styles is your best choice when lateral stiffness is required. The rectangular bar is also available in a serrated surface for additional safety.

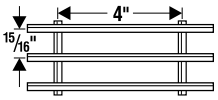
Swage-Locked Rectangular Bar Aluminum Grating



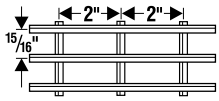
19-SR-4



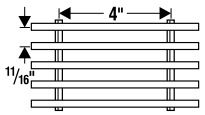
19-SR-2



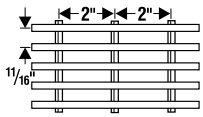
15-SR-4



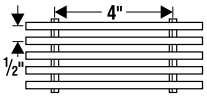
15-SR-2



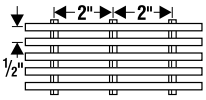
11-SR-4



11-SR-2

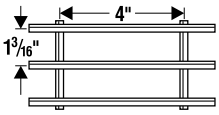


8-SR-4

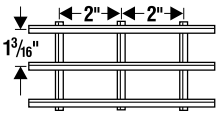


8-SR-2

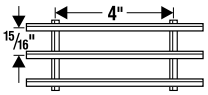
Swage-Locked I-Bar Aluminum Grating



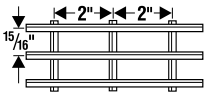
19-SI-4



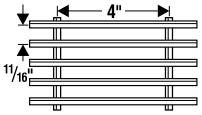
19-SI-2



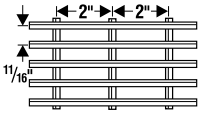
15-SI-4



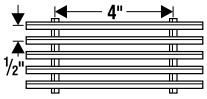
15-SI-2



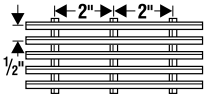
11-SI-4



11-SI-2

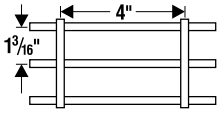


8-SI-4

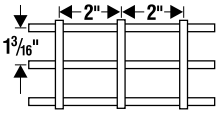


8-SI-2

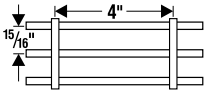
Press-Locked Rectangular Bar Aluminum Grating



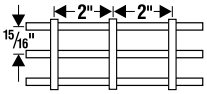
19-AP-4



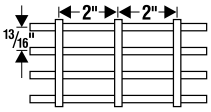
19-AP-2



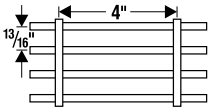
15-AP-4



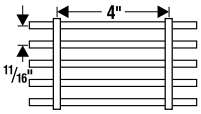
15-AP-2



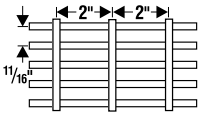
13-AP-4



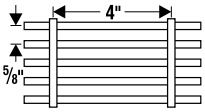
13-AP-2



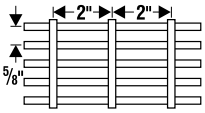
11-AP-4



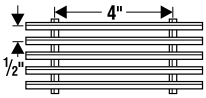
11-AP-2



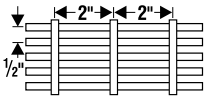
10-AP-4



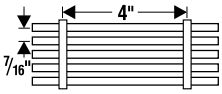
10-AP-2



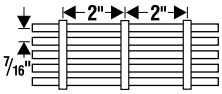
8-AP-4



8-AP-2



7-AP-4



7-AP-2

I-Bar Swage-Locked

1-3/16" Center to Center of Bearing Bars

19-SI-4
Cross Rods 4" C/C

19-SI-2
Cross Rods 2" C/C

Load & Deflection Table

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
1" x 1/4"	19-4-44 19-2-44	2.00 2.30	0.316	U	632	404	281	206	158	125							
				D	0.144	0.255	0.324	0.441	0.576	0.729							
				C	632	505	421	361	316	281							
				D	0.115	0.180	0.259	0.353	0.461	0.583							
1-1/4" x 1/4"	19-4-54 19-2-54	2.38 2.68	0.493	U	987	632	439	322	247	195	158						
				D	0.155	0.180	0.259	0.353	0.461	0.583	0.720						
				C	987	789	658	564	493	439	395						
				D	0.092	0.144	0.207	0.282	0.369	0.467	0.576						
1-1/2" x 1/4"	19-4-64 19-2-64	2.74 3.04	0.711	U	1421	909	632	464	355	281	227	188					
				D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726					
				C	1421	1137	947	812	711	632	568	517					
				D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581					
1-3/4" x 1/4"	19-4-74 19-2-74	3.09 3.39	0.967	U	1934	1238	860	632	484	382	309	256	215	183			
				D	0.082	0.129	0.185	0.252	0.329	0.417	0.514	0.622	0.741	0.869			
				C	1934	1547	1289	1105	967	860	774	703	645	595			
				D	0.066	0.103	0.148	0.202	0.263	0.333	0.411	0.498	0.592	0.695			
2" x 1/4"	19-4-84 19-2-84	3.49 3.79	1.263	U	2526	1617	1123	825	632	499	404	334	281	239	206		
				D	0.072	0.113	0.162	0.221	0.288	0.365	0.450	0.545	0.648	0.761	0.882		
				C	2526	2021	1684	1444	1263	1123	1011	919	842	777	772		
				D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706		
2-1/4" x 1/4"	19-4-94 19-2-94	3.89 4.14	1.599	U	3197	2046	1421	1044	799	632	512	423	355	303	261	200	
				D	0.064	0.100	0.144	0.196	0.256	0.324	0.400	0.484	0.576	0.676	0.784	1.024	
				C	3197	2558	2132	1827	1599	1421	1279	1163	1066	984	914	799	
				D	0.051	0.080	0.115	0.157	0.205	0.259	0.320	0.387	0.461	0.541	0.627	0.189	
2-1/2" x 1/4"	19-4-104 19-2-104	4.23 4.53	1.974	U	3947	2526	1754	1289	987	780	632	522	439	374	322	247	195
				D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
				C	3947	3158	2632	2256	1974	1754	1579	1435	1316	1215	1128	987	877
				D	0.046	0.072	0.104	0.141	0.184	0.233	0.288	0.348	0.415	0.487	0.564	0.737	0.933

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 10,000,000 psi - F= fiber stress, 12,000 psi

Material: ASTM B-221, 6063 or 6061

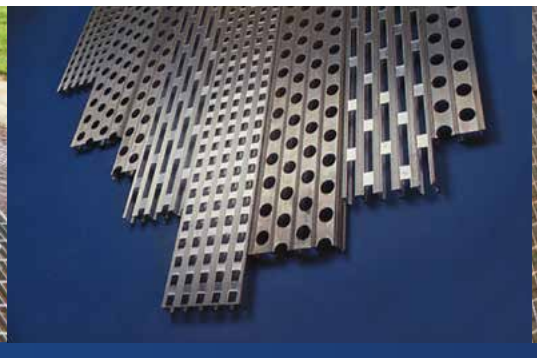
Deflection: Spans and loads to the right of the bold line exceed 1/4" deflection for uniform load of 100 psf which provides safe pedestrian comfort. These can be exceeded for other types of loads with engineer's approval. For deflections of uniform and concentrated loads, consult MARC engineering departments.

General: Loads and deflections are theoretical and based on static loading.

Finish: Mill finish unless other wise specified.

SI-19 PANEL WIDTH (inches) **Note:** Includes 1/4" (1/8" each side) for extended cross rods on swage-locked (SI).

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1/4" Bar	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	19 1/2	20 11/16	21 7/8	23 1/16
No. of Bars	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**								
1/4" Bar	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								



I-Bar Swage-Locked

15/16" Center to Center of Bearing Bars

15-SI-4
Cross Rods 4" C/C

15-SI-2
Cross Rods 2" C/C

Load & Deflection Table

Material: ASTM B-221, 6063 or 6061

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. These can be exceeded for other types of loads with engineer's approval.

General: Loads and deflections are theoretical and based on static loading.

Finish: Mill finish unless otherwise specified.

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-6"	5'-6"	6'-0"	6'-6"	7'-0"	8-0"	9'-0"
1" x 1/4"	15-4-44 15-2-44	2.45 2.75	0.400	U	800	512	356	261	200	158							
				D	0.144	0.225	0.324	0.441	0.576	0.729							
				C	800	640	533	457	400	356							
				D	0.115	0.180	0.259	0.353	0.461	0.583							
1-1/4" x 1/4"	15-4-54 15-2-54	2.91 3.21	0.625	U	1250	800	556	408	313	247	200	165					
				D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871					
				C	1250	1000	833	714	625	556	500	455					
				D	0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697					
1-1/2" x 1/4"	15-4-64 15-2-64	3.36 3.66	0.900	U	1800	1152	800	588	450	356	288	238	200				
				D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726	0.864				
				C	1800	1440	1200	1029	900	800	720	655	600				
				D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691				
1-3/4" x 1/4"	15-4-74 15-2-74	3.80 4.10	0.225	U	2450	1568	1089	800	613	484	392	324	272	232			
				D	0.082	0.129	0.185	0.252	0.329	0.417	0.514	0.622	0.741	0.869			
				C	2450	1960	1633	1400	1225	1089	980	891	817	754			
				D	0.066	0.103	0.148	0.202	0.263	0.333	0.411	0.498	0.592	0.695			
2" x 1/4"	15-4-84 15-2-84	4.30 4.60	1.600	U	3200	2048	1422	1045	800	632	512	423	356	303	261		
				D	0.072	0.113	0.162	0.221	0.288	0.365	0.450	0.545	0.648	0.761	0.882		
				C	3200	2560	2133	1829	1600	1422	1280	1164	1067	985	914		
				D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706		
2-1/4" x 1/4"	15-4-94 15-2-94	4.74 5.04	2.025	U	4050	2592	1800	1322	1013	800	648	536	450	383	331	253	200
				D	0.064	0.100	0.144	0.196	0.256	0.324	0.400	0.484	0.576	0.676	0.784	1.024	1.296
				C	4050	3240	2700	2314	2025	1800	1620	1473	1350	1246	1157	1031	900
				D	0.051	0.080	0.115	0.157	0.205	0.259	0.320	0.387	0.461	0.541	0.627	0.819	1.037
2-1/2" x 1/4"	15-4-104 15-2-104	5.23 5.53	2.500	U	5000	3200	2222	1633	1250	988	800	661	556	473	408	313	247
				D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
				C	5000	4000	3333	2857	2500	2222	2000	1818	1667	1538	1429	1250	1111
				D	0.046	0.072	0.104	0.141	0.184	0.233	0.288	0.348	0.415	0.487	0.564	0.737	0.933

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 10,000,000 psi - F= fiber stress, 12,000 psi

SI-15 PANEL WIDTH (inches) **Note:** Includes 1/4" (1/8" each side) for extended cross rods on swage-locked (SI).

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

Custom fabrication and manufacturing!

I-Bar Swage-Locked

11/16" Center to Center of Bearing Bars

11-SI-4
Cross Rods 4" C/C

11-SI-2
Cross Rods 2" C/C

Load & Deflection Table

Material: ASTM B-221, 6063 or 6061

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. These can be exceeded for other types of loads with engineer's approval.

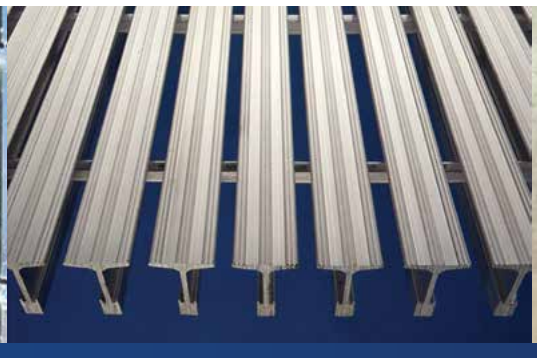
General: Loads and deflections are theoretical and based on static loading.

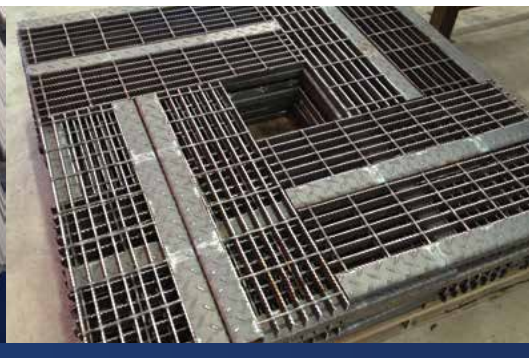
Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"						
1" x 1/4"	11-4-44 11-2-44	3.2 3.5	0.545	U	1091	698	485	356	273	215	175						
				D	0.144	0.225	0.324	0.441	0.576	0.729	0.900						
				C	1091	873	727	623	545	485	436						
				D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	5'-6"					
1-1/4" x 1/4"	11-4-54 11-2-54	3.8 4.2	0.852	U	1705	1091	758	557	426	337	273	225					
				D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871					
				C	1705	1364	1136	974	852	758	682	620					
				D	0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697	6'-0"	6'-6"			
1-1/2" x 1/4"	11-4-64 11-2-64	4.5 4.8	1.227	U	2455	1571	1091	801	614	485	393	325	273	232			
				D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726	0.864	1.014			
				C	2455	1964	1636	1403	1227	1091	982	893	818	755			
				D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691	0.811	7'-0"		
1-3/4" x 1/4"	11-4-74 11-2-74	5.1 5.4	1.670	U	3341	2138	1485	1091	835	660	535	442	371	316	273		
				D	0.082	0.129	0.185	0.252	0.329	0.417	0.514	0.622	0.741	0.869	1.008		
				C	3341	2673	2227	1909	1670	1485	1336	1215	1114	1028	955		
				D	0.066	0.103	0.148	0.202	0.263	0.333	0.411	0.498	0.592	0.695	0.806	8'-0"	9'-0"
2" x 1/4"	11-4-84 11-2-84	5.8 6.1	2.182	U	4364	2793	1939	1425	1091	862	698	577	485	413	356	273	215
				D	0.072	0.113	0.162	0.221	0.288	0.365	0.450	0.545	0.648	0.761	0.882	1.152	1.458
				C	4364	3491	2909	2494	2182	1939	1745	1587	1455	1343	1247	1091	970
				D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
2-1/4" x 1/4"	11-4-94 11-2-94	6.4 6.8	2.761	U	5523	3535	2455	1803	1381	1091	884	730	614	523	451	345	273
				D	0.064	0.100	0.144	0.196	0.256	0.324	0.400	0.484	0.576	0.676	0.784	1.024	1.296
				C	5523	4418	3682	3156	2761	2455	2209	2008	1841	1699	1578	1381	1227
				D	0.051	0.080	0.115	0.157	0.205	0.259	0.320	0.387	0.461	0.541	0.627	0.819	1.037
2-1/2" x 1/4"	11-4-104 11-2-104	7.1 7.4	3.409	U	6818	4364	3030	2226	1705	1347	1091	902	758	646	557	426	337
				D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
				C	6818	5455	4545	3896	3409	3030	2727	2479	2273	2098	1948	1705	1515
				D	0.046	0.072	0.104	0.141	0.184	0.233	0.288	0.348	0.415	0.487	0.564	0.737	0.933

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 10,000,000 psi - F= fiber stress, 12,000 psi

SI-11 PANEL WIDTH (inches) **Note:** Includes 1/4" (1/8" each side) for extended cross rods on swage-locked (SI).

No. of Bars	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
1/4" Bar	1 3/16	1 7/8	2 9/16	3 1/4	3 15/16	4 5/8	5 5/16	6	6 11/16	7 3/8	8 1/16	8 3/4	9 7/16	10 1/8	10 13/16	11 1/2	12 3/16	12 7/8	13 9/16
No. of Bars	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**
1/4" Bar	12 13/16	13 1/4	13 11/16	14 1/8	14 9/16	15	15 7/16	15 7/8	16 5/16	16 3/4	17 3/16	17 5/8	18 1/16	18 1/2	18 15/16	19 3/8	19 13/1	20 1/4	20 11/16
No. of Bars	**40**	**41**	**42**	**43**	**44**	**45**													
1/4" Bar	25 1/16	25 1/2	25 15/16	26 3/8	26 13/16	27 1/4													





I-Bar Swage-Locked

1/2" Center to Center of Bearing Bars

8-SI-4
Cross Rods 4" C/C

8-SI-2
Cross Rods 2" C/C

Load & Deflection Table

Material: ASTM B-221, 6063 or 6061

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. These can be exceeded for other types of loads with engineer's approval.

General: Loads and deflections are theoretical and based on static loading.

Finish: Mill finish unless otherwise specified.

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"					
1" x 1/4"	8-4-44 8-2-44	4.2 4.5	0.750	U	1500	960	667	490	375	296	240	198					
				D	0.144	0.225	0.324	0.441	0.576	0.729	0.900	1.089					
				C	1500	1200	1000	857	750	667	600	545					
				D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871	6'-0"				
1-1/4" x 1/4"	8-4-54 8-2-54	5.0 5.4	1.172	U	2344	1500	1042	756	586	463	375	310	260				
				D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871	1.037				
				C	2344	1875	1563	1339	1172	1042	938	852	781				
				D	0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697	0.829	6'-6"	7'-0"		
1-1/2" x 1/4"	8-4-64 8-2-64	5.9 6.2	1.688	U	3375	2160	1500	1102	844	667	540	446	375	320	276		
				D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726	0.864	1.014	1.176		
				C	3375	2700	2250	1929	1688	1500	1350	1227	1125	1038	964		
				D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691	0.811	0.941	8'-0"	
1-3/4" x 1/4"	8-4-74 8-2-74	6.8 7.1	2.297	U	4594	2940	2042	1500	1148	907	735	607	510	435	375	287	
				D	0.082	0.129	0.185	0.252	0.329	0.417	0.514	0.622	0.741	0.869	1.008	1.317	
				C	4594	3675	3063	2625	2297	2042	1838	1670	1531	1431	1313	1148	
				D	0.066	0.103	0.148	0.202	0.263	0.333	0.411	0.498	0.592	0.695	0.806	1.053	9'-0"
2" x 1/4"	8-4-84 8-2-84	7.6 7.9	3.000	U	6000	3840	2667	1959	1500	1185	960	793	667	568	490	375	296
				D	0.072	0.113	0.162	0.221	0.288	0.365	0.450	0.545	0.648	0.761	0.882	1.152	1.458
				C	6000	4800	4000	3429	3000	2667	2400	2182	2000	1846	1741	1500	1333
				D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
2-1/4" x 1/4"	8-4-94 8-2-94	8.4 8.7	3.797	U	7594	4860	3375	2480	1898	1500	1215	1004	844	719	620	475	375
				D	0.064	0.100	0.144	0.196	0.256	0.324	0.400	0.484	0.576	0.676	0.784	1.024	1.296
				C	7594	6075	5063	4339	3797	3375	3038	2761	2531	2337	2170	1898	1688
				D	0.051	0.080	0.115	0.157	0.205	0.259	0.320	0.387	0.461	0.541	0.627	0.819	1.037
2-1/2" x 1/4"	8-4-104 8-2-104	9.3 9.7	4.688	U	9375	6000	4167	3061	2344	1852	1500	1240	1042	888	765	586	463
				D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
				C	9375	7500	6250	5357	4688	4167	3750	3409	3125	2885	2679	2344	2083
				D	0.046	0.072	0.104	0.141	0.184	0.233	0.288	0.348	0.415	0.487	0.564	0.737	0.933

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 10,000,000 psi - F= fiber stress, 12,000 psi

SI-8 PANEL WIDTH (inches) **Note:** Includes 1/4" (1/8" each side) for extended cross rods on swage-locked (SI).

No. of Bars	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
1/4" Bar	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8	8 1/2	9	9 1/2	10
No. of Bars	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**
1/4" Bar	10 1/2	11	11 1/2	12	12 1/2	13	13 1/2	14	14 1/2	15	15 1/2	16	16 1/2	17	17 1/2	18	18 1/2	19	19 1/2
No. of Bars	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**					
1/4" Bar	20	20 1/2	21	21 1/2	22	22 1/2	**23**	**23 1/2**	**24**	**24 1/2**	**25**	**25 1/2**	**26**	**26 1/2**					

Huge inventory!

Rectangular Bar Swage-Locked

1-3/16" Center to Center of Bearing Bars

19-SR-4
Cross Rods 4" C/C

19-SR-2
Cross Rods 2" C/C

Press-Locked

1-3/16" Center to Center of Bearing Bars

19-AP-4
Cross Bars 4" C/C

19-AP-2
Cross Bars 2" C/C

Load & Deflection Table

Bar Size	Symbol		Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
3/4" x 1/8"	19-4-32	SR	1.5	0.118	U	237	152	105	77									
		AP	1.5		D	0.192	0.300	0.432	0.588									
	19-2-32	SR	1.8		C	237	189	158	135									
		AP	1.8		D	0.154	0.240	0.346	0.470									
3/4" x 3/16"	19-4-33	SR	2.1	0.178	U	355	227	158	116									
		AP	2.3		D	0.192	0.300	0.432	0.588									
	19-2-33	SR	2.4		C	355	284	237	203									
		AP	2.8		D	0.154	0.240	0.346	0.470									
1" x 1/8"	19-4-42	SR	1.9	0.211	U	421	269	187	137	105								
		AP	1.9		D	0.144	0.225	0.324	0.441	0.576								
	19-2-42	SR	2.2		C	421	337	281	241	211								
		AP	2.2		D	0.115	0.180	0.259	0.353	0.461								
1" x 3/16"	19-4-43	SR	2.7	0.316	U	632	404	281	206	158	125							
		AP	2.8		D	0.144	0.225	0.324	0.441	0.576	0.729							
	19-2-43	SR	3.0		C	632	505	421	361	316	281							
		AP	3.3		D	0.115	0.180	0.259	0.353	0.461	0.583							
1-1/4" x 1/8"	19-4-52	SR	2.3	0.329	U	658	421	292	215	164	130							
		AP	2.4		D	0.115	0.180	0.259	0.353	0.461	0.583							
	19-2-52	SR	2.6		C	658	526	439	376	329	292							
		AP	2.8		D	0.092	0.144	0.207	0.282	0.369	0.467							
1-1/4" x 3/16"	19-4-53	SR	3.2	0.493	U	987	632	439	322	247	195	158						
		AP	3.6		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720						
	19-2-53	SR	3.6		C	987	789	658	564	493	439	395						
		AP	4.3		D	0.092	0.144	0.207	0.282	0.369	0.467	0.576						
1-1/2" x 1/8"	19-4-62	SR	2.7	0.474	U	947	606	421	309	237	187	152						
		AP	2.8		D	0.096	0.150	0.216	0.294	0.384	0.486	0.600						
	19-2-62	SR	3.0		C	947	758	632	541	474	421	379						
		AP	3.2		D	0.077	0.120	0.173	0.235	0.307	0.389	0.480						
1-1/2" x 3/16"	19-4-63	SR	3.8	0.711	U	1421	909	632	464	355	281	227	188					
		AP	4.2		D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726					
	19-2-63	SR	4.1		C	1421	1137	947	812	711	632	568	517					
		AP	4.8		D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581					
1-3/4" x 3/16"	19-4-73	SR	4.4	0.967	U	1934	1238	860	632	484	382	309	256	215	183			
		AP	4.8		D	0.082	0.129	0.185	0.252	0.329	0.417	0.514	0.622	0.741	0.869			
	19-2-73	SR	4.7		C	1934	1547	1289	1105	967	860	774	703	645	595			
		AP	5.4		D	0.066	0.103	0.202	0.104	0.263	0.333	0.411	0.498	0.592	0.695			
2" x 3/16"	19-4-83	SR	5.0	1.263	U	2526	1617	1123	825	632	499	404	334	281	239	206		
		AP	5.3		D	0.072	0.113	0.162	0.221	0.288	0.365	0.450	0.545	0.648	0.761	0.882		
	19-2-83	SR	5.3		C	2526	2021	1684	1444	1263	1123	1011	919	842	777	722		
		AP	6.0		D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706		
2-1/4" x 3/16"	19-4-93	SR	5.6	1.599	U	3197	2046	1421	1044	799	632	512	423	355	303	261	200	
		AP	5.9		D	0.064	0.100	0.144	0.196	0.256	0.324	0.400	0.484	0.576	0.676	0.784	1.024	
	19-2-93	SR	5.9		C	3197	2558	2132	1827	1599	1421	1279	1163	1066	984	914	799	
		AP	6.6		D	0.051	0.080	0.115	0.157	0.205	0.259	0.320	0.387	0.461	0.541	0.627	0.819	
2-1/2" x 3/16"	19-4-103	SR	6.2	1.974	U	3947	2526	1754	1289	987	780	632	522	439	374	322	247	195
		AP	6.5		D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
	19-2-103	SR	6.5		C	3947	3158	2632	2256	1974	1754	1579	1435	1316	1215	1128	987	877
		AP	7.2		D	0.046	0.072	0.104	0.141	0.184	0.233	0.288	0.348	0.415	0.487	0.564	0.737	0.737

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 10,000,000 psi - F= fiber stress, 12,000 psi

Material: ASTM B-221,6063 or 6061

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. These can be exceeded for other types of loads with 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 the table.

General: Loads and deflections are theoretical and based on static loading.

Finish: Mill finish unless otherwise specified.

SR/AP-19 PANEL WIDTH (inches) **Note:** Includes ¼" (1/8" each side) for extended cross rods on swage locked (SR) and extended cross on press-locked (AP).

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1/8" Bar	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
3/16" Bar	1 5/8	2 13/16	4	5 3/16	6 3/8	7 9/16	8 3/4	9 15/16	11 1/8	12 5/16	13 1/2	14 11/16	15 7/8	17 1/16	18 1/4
No. of Bars	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**
1/8" Bar	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
3/16" Bar	19 7/16	20 5/8	21 13/16	23	24 3/16	25 3/8	26 9/16	27 3/4	28 15/16	30 1/8	31 5/16	32 1/2	33 11/16	34 7/8	36 1/16

Rectangular Bar Swage-Locked

15/16" Center to Center of Bearing Bars

15-SR-4
Cross Rods 4" C/C

15-SR-2
Cross Rods 2" C/C

Press-Locked

15/16" Center to Center of Bearing Bars

15-AP-4
Cross Bars 4" C/C

15-AP-2
Cross Bars 2" C/C

Load & Deflection Table

Bar Size	Symbol		Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
3/4" x 1/8"	15-4-32	SR	1.8	0.118	U	300	192	133	98									
		AP	1.8		D	0.192	0.300	0.432	0.588									
	15-2-32	SR	2.1		C	300	240	200	171									
		AP	2.1		D	0.154	0.240	0.346	0.470									
3/4" x 3/16"	15-4-33	SR	2.5	0.178	U	450	288	200	147	113								
		AP	2.7		D	0.192	0.300	0.432	0.588	0.768								
	15-2-33	SR	2.8		C	450	360	300	257	225								
		AP	3.2		D	0.154	0.240	0.346	0.470	0.614								
1" x 1/8"	15-4-42	SR	2.3	0.211	U	533	341	237	174	133								
		AP	2.3		D	0.144	0.225	0.324	0.441	0.576								
	15-2-42	SR	2.6		C	533	427	356	305	267								
		AP	2.6		D	0.115	0.180	0.259	0.353	0.461								
1" x 3/16"	15-4-43	SR	3.3	0.316	U	800	512	356	261	200	158							
		AP	3.4		D	0.144	0.225	0.324	0.441	0.576	0.729							
	15-2-43	SR	3.6		C	800	640	533	457	400	356							
		AP	3.9		D	0.115	0.180	0.259	0.353	0.461	0.583							
1-1/4" x 1/8"	15-4-52	SR	2.8	0.329	U	833	533	370	272	208	165	133						
		AP	2.9		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720						
	15-2-52	SR	3.1		C	833	667	556	476	417	370	333						
		AP	3.3		D	0.092	0.144	0.207	0.282	0.369	0.467	0.576						
1-1/4" x 3/16"	15-4-53	SR	4.0	0.493	U	1250	800	556	408	313	247	200	165					
		AP	4.3		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871					
	15-2-53	SR	4.3		C	1250	1000	833	714	625	556	500	455					
		AP	5.0		D	0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697					
1-1/2" x 1/8"	15-4-62	SR	3.3	0.474	U	1200	768	533	392	300	237	192	159					
		AP	3.4		D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726					
	15-2-62	SR	3.6		C	1200	960	800	686	600	533	480	436					
		AP	3.8		D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581					
1-1/2" x 3/16"	15-4-63	SR	4.7	0.711	U	1800	1152	800	588	450	356	288	238	200				
		AP	5.1		D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726	0.864				
	15-2-63	SR	5.0		C	1800	1440	1200	1029	900	800	720	655	600				
		AP	5.8		D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691				
1-3/4" x 3/16"	15-4-73	SR	5.5	0.967	U	2450	1568	1089	800	613	484	392	324	272	232			
		AP	5.8		D	0.082	0.129	0.185	0.252	0.329	0.417	0.514	0.622	0.741	0.869			
	15-2-73	SR	5.8		C	2450	1960	1633	1400	1225	1089	980	891	817	754			
		AP	6.5		D	0.066	0.103	0.148	0.202	0.263	0.333	0.411	0.498	0.592	0.695			
2" x 3/16"	15-4-83	SR	6.2	1.263	U	3200	2048	1422	1045	800	632	512	423	356	303	261		
		AP	6.5		D	0.072	0.113	0.162	0.221	0.288	0.365	0.450	0.545	0.648	0.761	0.882		
	15-2-83	SR	6.5		C	3200	2560	2133	1829	1600	1422	1280	1164	1067	985	914		
		AP	7.2		D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706		
2-1/4" x 3/16"	15-4-93	SR	6.9	1.599	U	4050	2592	1800	1322	1013	800	648	536	450	383	331	253	200
		AP	7.3		D	0.064	0.100	0.144	0.196	0.256	0.324	0.400	0.484	0.576	0.676	0.784	1.024	1.296
	15-2-93	SR	7.2		C	4050	3240	2700	2314	2025	1800	1620	1473	1350	1246	1157	1013	900
		AP	8.0		D	0.051	0.080	0.115	0.157	0.205	0.259	0.320	0.387	0.461	0.541	0.627	0.819	1.037
2-1/2" x 3/16"	15-4-103	SR	7.7	1.974	U	5000	3200	2222	1633	1250	988	800	661	556	473	408	313	247
		AP	8.0		D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
	15-2-103	SR	8.0		C	5000	4000	3333	2857	2500	2222	2000	1818	1667	1538	1429	1250	1111
		AP	8.7		D	0.046	0.072	0.104	0.141	0.184	0.233	0.288	0.348	0.415	0.487	0.564	0.737	0.933

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 10,000,000 psi - F= fiber stress, 12,000 psi

Material: ASTM B-221, 6063 or 6061

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. These can be exceeded for other types of loads with 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 the table.

General: Loads and deflections are theoretical and based on static loading.

Finish: Mill finish unless otherwise specified.

SR/AP-15 PANEL WIDTH (inches) **Note:** Includes 1/4" (1/8" each side) for extended cross rods on swage-locked (SR) and extended cross bars on press-locked (AP).

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

No. of Bars	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
1/8" Bar	19 1/8	20 1/16	21	22 15/16	22 7/8	23 13/16	24 3/4	25 11/16	26 5/8	27 9/16	28 1/2	29 7/16	30 3/8	31 5/16	32 1/4	33 3/16	34 1/8	35 1/16	36
3/16" Bar	19 3/16	20 1/8	21 9/16	22	22 15/16	23 7/8	24 13/16	25 3/4	28 11/16	27 5/8	28 9/16	29 1/2	30 7/16	31 3/8	32 5/16	33 1/4	34 3/16	35 1/8	36 1/16

Press-Locked Close Mesh

13/16" Center to Center of Bearing Bars

13-AP-4
Cross Rods 4" C/C

13-AP-2
Cross Rods 2" C/C

Load & Deflection Table

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
3/4" x 1/8"	13-4-32	2.0	0.173	U	346	222	154	113									
	13-2-32	2.4		D	0.192	0.300	0.432	0.588									
				C	346	277	231	198									
				D	0.154	0.240	0.346	0.470									
3/4" x 3/16"	13-4-33	3.0	0.260	U	519	332	231	170	130								
	13-2-33	3.5		D	0.192	0.300	0.432	0.588	0.768								
				C	519	415	346	297	260								
				D	0.154	0.240	0.346	0.470	0.614								
1" x 1/8"	13-4-42	2.6	0.308	U	615	394	274	201	154								
	13-2-42	2.9		D	0.144	0.225	0.324	0.441	0.576								
				C	615	492	410	352	308								
				D	0.115	0.180	0.259	0.353	0.461								
1" x 3/16"	13-4-43	3.9	0.462	U	923	591	410	301	231	182							
	13-2-43	4.4		D	0.144	0.225	0.324	0.441	0.576	0.729							
				C	923	738	615	527	462	410							
				D	0.115	0.180	0.259	0.353	0.461	0.583							
1-1/4" x 1/8"	13-4-52	3.3	0.481	U	962	615	427	314	240	190							
	13-2-52	3.7		D	0.115	0.180	0.259	0.353	0.461	0.583							
				C	962	769	641	549	481	427							
				D	0.092	0.144	0.207	0.282	0.369	0.467							
1-1/4" x 3/16"	13-4-53	4.9	0.721	U	1442	923	641	471	361	285	231	191					
	13-2-53	5.6		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871					
				C	1442	1152	962	824	721	641	577	524					
				D	0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697					
1-1/2" x 1/8"	13-4-62	3.8	0.692	U	1385	886	615	452	346	274	222	183					
	13-2-62	4.3		D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726					
				C	1385	1108	923	791	692	615	554	503					
				D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581					
1-1/2" x 3/16"	13-4-63	5.7	1.038	U	2077	1329	923	678	519	410	332	275	231				
	13-2-63	6.4		D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726	0.864				
				C	2077	1329	923	678	519	410	332	275	692				
				D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691				
1-3/4" x 3/16"	13-4-73	6.6	1.413	U	2827	1809	1256	923	707	558	452	374	314	268			
	13-2-73	7.3		D	0.082	0.129	0.185	0.252	0.329	0.417	0.514	0.622	0.741	0.869			
				C	2827	2262	1885	1651	1431	1256	1131	1028	942	870			
				D	0.066	0.103	0.148	0.202	0.263	0.333	0.411	0.498	0.592	0.695			
2" x 3/16"	13-4-83	7.4	1.846	U	3692	2363	1641	1206	923	729	591	488	410	350	301		
	13-2-83	8.1		D	0.072	0.113	0.162	0.221	0.288	0.365	0.450	0.545	0.648	0.761	0.882		
				C	3692	2954	2462	2110	1846	1641	1477	1343	1231	1136	1055		
				D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706		
2-1/4" x 3/16"	13-4-93	8.3	2.337	U	4673	2991	2077	1526	1168	923	748	618	519	442	381	292	231
	13-2-93	8.9		D	0.064	0.100	0.144	0.196	0.256	0.324	0.400	0.484	0.576	0.676	0.784	1.024	1.296
				C	4673	3738	3115	2670	2337	2077	1869	1699	1558	1438	1335	1168	1038
				D	0.051	0.080	0.115	0.157	0.205	0.259	0.320	0.387	0.461	0.541	0.627	0.819	1.037
2-1/2" x 3/16"	13-4-103	9.1	2.885	U	5769	3692	2564	1884	1442	1140	923	763	641	546	471	361	285
	13-2-103	9.8		D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
				C	5769	4615	3846	3297	2885	2564	2308	2098	1932	1775	1648	1442	1282
				D	0.046	0.072	0.104	0.141	0.184	0.233	0.288	0.348	0.415	0.487	0.564	0.737	0.933

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 29,000,000 psi - F= fiber stress, 20,000 psi

Material: ASTM A-36

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. These can be exceeded for other types of loads with engineer's approval. For deflections of uniform and concentrated loads, consult MARC engineering departments.

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

General: Loads and deflections are theoretical and based on static loading.

Finish: Mill finish unless otherwise specified.

AP-13 PANEL WIDTH (inches) **Note:** Includes 1/4" (1/8" each side) for extended cross rods on swage-locked (SR) and extended cross bars on press-locked (AP).

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

No. of Bars	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
1/8" Bar	16 5/8	17 7/16	18 1/4	19 1/16	19 7/8	20 11/16	21 1/2	22 5/16	23 1/8	23 15/16	24 3/4	25 9/16	26 3/8	27 3/16	28	28 13/16	29 5/8	30 7/16	31 1/4
3/16" Bar	16 11/16	17 1/2	18 5/16	19 1/8	19 15/16	20 3/4	21 9/16	22 3/8	23 3/16	24	24 13/16	25 5/8	26 7/16	27 1/4	28 1/16	28 7/8	29 11/16	30 1/2	31 5/16

No. of Bars	40	41	42	43	44	45
1/8" Bar	32 1/16	32 7/8	33 11/16	34 1/2	35 5/16	361/8
3/16" Bar	32 1/8	32 15/16	33 3/4	34 9/16	35 3/8	36 3/16

Rectangular Bar Swage-Locked Close Mesh

11/16" Center to Center of Bearing Bars

11-SR-4
Cross Rods 4" C/C

11-SR-2
Cross Rods 2" C/C

Press-Locked Close Mesh

11/16" Center to Center of Bearing Bars

11-AP-4
Cross Bars 4" C/C

11-AP-2
Cross Bars 2" C/C

Load & Deflection Table

Material: ASTM B-221,6063 or 6061

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. These can be exceeded for other types of loads with 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 the table.

General: Loads and deflections are theoretical and based on static loading.

Finish: Mill finish unless otherwise specified.

Bar Size	Symbol		Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
3/4" x 1/8"	11-4-32	SR	2.3	0.205	U	409	262	182	134	102								
		AP	2.3		D	0.192	0.300	0.432	0.588	0.768								
	11-2-32	SR	2.6		C	409	327	273	234	205								
		AP	2.7		D	0.154	0.240	0.346	0.470	0.614								
3/4" x 3/16"	11-4-33	SR	3.3	0.307	U	614	393	273	200	153								
		AP	3.5		D	0.192	0.300	0.432	0.588	0.768								
	11-2-33	SR	3.6		C	614	491	409	351	307								
		AP	4.0		D	0.154	0.240	0.346	0.470	0.614								
1" x 1/8"	11-4-42	SR	3.0	0.364	U	727	465	323	237	182	144							
		AP	3.0		D	0.144	0.225	0.324	0.441	0.576	0.729							
	11-2-42	SR	3.3		C	727	582	485	416	364	323							
		AP	3.3		D	0.115	0.180	0.259	0.353	0.461	0.583							
1" x 3/16"	11-4-43	SR	4.3	0.545	U	1091	698	485	356	273	215	175						
		AP	4.5		D	0.144	0.225	0.324	0.441	0.576	0.729	0.900						
	11-2-43	SR	4.6		C	1091	873	727	623	545	485	436						
		AP	5.0		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720						
1-1/4" x 1/8"	11-4-52	SR	3.6	0.568	U	1136	727	505	371	284	224	182						
		AP	3.8		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720						
	11-2-52	SR	4.0		C	1136	909	758	649	568	505	455						
		AP	4.2		D	0.092	0.144	0.207	0.282	0.369	0.467	0.576						
1-1/4" x 3/16"	11-4-53	SR	5.3	0.852	U	1705	1091	758	557	426	337	273	225					
		AP	5.6		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871					
	11-2-53	SR	5.6		C	1705	1364	1136	974	852	758	682	620					
		AP	6.3		D	0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697					
1-1/2" x 1/8"	11-4-62	SR	4.3	0.818	U	1636	1047	727	534	409	323	262	216	182				
		AP	4.4		D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726	0.864				
	11-2-62	SR	4.6		C	1636	1309	1091	935	818	727	655	595	545				
		AP	4.9		D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691				
1-1/2" x 3/16"	11-4-63	SR	6.3	1.227	U	2455	1571	1091	801	614	485	393	325	273	232			
		AP	6.6		D	0.096	0.150	0.216	0.216	0.384	0.486	0.600	0.726	0.864	1.014			
	11-2-63	SR	6.6		C	2455	1964	1636	1403	1227	1091	982	893	818	755			
		AP	7.3		D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691	0.811			
1-3/4" x 3/16"	11-4-73	SR	7.3	1.670	U	3341	2138	1485	1091	835	660	535	442	371	316	273		
		AP	7.6		D	0.082	0.129	0.185	0.252	0.329	0.417	0.514	0.622	0.741	0.869	1.008		
	11-2-73	SR	7.6		C	3341	2673	2227	1909	1670	1485	1336	1215	1114	1028	955		
		AP	8.3		D	0.066	0.103	0.148	0.202	0.263	0.333	0.411	0.498	0.592	0.695	0.806		
2" x 3/16"	11-4-83	SR	8.3	2.182	U	4364	2793	1939	1425	1091	862	698	577	485	413	356	273	215
		AP	8.6		D	0.072	0.113	0.162	0.221	0.288	0.365	0.450	0.545	0.648	0.761	0.882	1.152	1.458
	11-2-83	SR	8.6		C	4364	3491	2909	2499	2182	1939	1745	1587	1455	1343	1247	1091	970
		AP	9.3		D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
2-1/4" x 3/16"	11-4-93	SR	9.3	2.761	U	5523	3535	2455	1803	1381	1091	884	730	614	523	451	345	273
		AP	9.6		D	0.064	0.100	0.144	0.196	0.256	0.324	0.400	0.484	0.576	0.676	0.784	1.204	1.296
	11-2-93	SR	9.6		C	5523	4418	3682	3156	2761	2455	2209	2008	1841	1699	1578	1381	1227
		AP	10.3		D	0.051	0.080	0.115	0.157	0.205	0.259	0.320	0.387	0.461	0.541	0.627	0.819	1.037
2-1/2" x 3/16"	11-4-103	SR	10.3	3.409	U	6818	4364	3030	2226	1705	1347	1091	902	758	646	557	426	337
		AP	10.6		D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
	11-2-103	SR	10.6		C	6818	5455	4545	3896	3409	3030	2727	2479	2273	2098	1948	1705	1515
		AP	11.3		D	0.046	0.072	0.104	0.141	0.184	0.233	0.288	0.348	0.415	0.487	0.564	0.737	0.933

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 10,000,000 psi - F= fiber stress, 12,000 psi

SR/AP-11 PANEL WIDTH (inches) **Note:** Includes 1/4" (1/8" each side) for extended cross bars on press-locked (AP).

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

No. of Bars	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
1/8" Bar	14 1/8	14 13/16	15 1/2	16 3/16	16 7/8	17 9/16	18 1/4	18 15/16	19 5/8	20 5/16	21	21 11/16	22 3/8	23 1/16	23 3/4	24 7/16	25 1/8	25 13/16	26 1/2
3/16" Bar	14 3/16	14 7/8	15 9/16	16 1/4	16 15/16	17 9/16	18 5/16	19	19 11/16	20 3/8	21 1/16	21 3/4	22 7/16	23 1/8	23 3/16	24 1/2	25 3/16	25 7/8	26 9/16

No. of Bars	40	41	42	43	44	45	46	47	48	49	50	51	52	53
1/8" Bar	27 3/16	27 7/8	28 9/16	29 1/4	29 15/16	30 5/8	31 5/16	32	32 11/16	33 3/8	34 1/16	34 3/4	35 7/16	36 1/8
3/16" Bar	27 1/4	27 15/16	28 5/8	29 5/16	30	30 11/16	31 3/8	32 1/16	32 3/4	33 7/16	34 1/8	34 13/16	35 1/2	36 3/16

Press-Locked Close Mesh

5/8" Center to Center of Bearing Bars

10-AP-4
Cross Bars 4" C/C

10-AP-2
Cross Bars 2" C/C

Load & Deflection Table

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'0"	4'6"	5'0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
3/4" x 1/8"	10-4-32	2.5	0.225	U	450	288	200	147	113								
	10-2-32	2.9		D	0.192	0.300	0.432	0.588	0.768								
				C	450	360	300	257	225								
				D	0.154	0.240	0.346	0.470	0.614								
3/4" x 3/16"	10-4-33	3.8	0.338	U	675	432	300	220	169								
	10-2-33	4.3		D	0.192	0.300	0.432	0.588	0.768								
				C	675	540	450	386	338								
				D	0.154	0.240	0.346	0.470	0.614								
1" x 1/8"	10-4-42	3.3	0.400	U	800	512	356	261	200	158							
	10-2-42	3.6		D	0.144	0.225	0.324	0.441	0.576	0.729							
				C	800	640	533	457	400	356							
				D	0.115	0.180	0.259	0.353	0.461	0.583							
1" x 3/16"	10-4-43	4.9	0.600	U	1200	768	533	392	300	237	192						
	10-2-43	5.4		D	0.144	0.225	0.324	0.441	0.576	0.729	0.900						
				C	1200	960	800	686	600	533	480						
				D	0.115	0.180	0.259	0.353	0.461	0.583	0.720						
1-1/4" x 1/8"	10-4-52	4.1	0.625	U	1250	800	556	408	313	247	200	200					
	10-2-52	4.5		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871					
				C	1250	1000	833	714	625	556	556	455					
				D	0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697					
1-1/4" x 3/16"	10-4-53	6.1	0.938	U	1875	1200	833	612	469	370	300	248	208				
	10-2-53	6.8		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871	1.037				
				C	1875	1500	1250	1071	938	833	750	682	625				
				D	0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697	0.829				
1-1/2" x 1/8"	10-4-62	4.8	0.900	U	1800	1152	800	588	450	356	288	238	200				
	10-2-62	5.3		D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726	0.864				
				C	1800	1440	1200	1029	900	800	720	655	600				
				D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691				
1-1/2" x 3/16"	10-4-63	7.2	1.350	U	2700	1728	1200	882	675	533	432	357	300	256			
	10-2-63	7.9		D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726	0.864	1.014			
				C	2700	2160	1800	1543	1350	1200	1080	982	900	831			
				D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691	0.811			
1-3/4" x 3/16"	10-4-73	8.3	1.838	U	3675	2352	1633	1200	919	726	588	486	408	348	300	230	
	10-2-73	9.0		D	0.082	0.129	0.185	0.252	0.329	0.417	0.514	0.622	0.741	0.869	1.008	1.317	
				C	3675	2940	2450	2100	1838	1633	1470	1336	1225	1131	1050	919	
				D	0.066	0.103	0.148	0.202	0.263	0.333	0.411	0.498	0.592	0.695	0.806	1.053	
2" x 3/16"	10-4-83	9.4	2.400	U	4800	3072	2133	1567	1200	948	768	635	533	454	392	300	237
	10-2-83	10.1		D	0.072	0.113	0.162	0.221	0.288	0.365	0.450	0.545	0.648	0.761	0.882	1.152	1.458
				C	4800	3840	3200	2743	2400	2133	1920	1745	1600	1477	1371	1200	1067
				D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
2-1/4" x 3/16"	10-4-93	10.5	3.038	U	6075	3888	2700	1984	1519	1200	972	803	675	575	496	380	300
	10-2-93	11.2		D	0.064	0.100	0.144	0.196	0.256	0.324	0.400	0.484	0.576	0.676	0.784	1.024	1.296
				C	6075	4860	4050	3471	3038	2700	2430	2209	2025	1869	1736	1519	1350
				D	0.051	0.080	0.115	0.157	0.205	0.259	0.320	0.387	0.461	0.541	0.627	0.819	1.037
2-1/2" x 3/16"	10-4-103	11.6	3.750	U	7500	4800	3333	2449	1875	1481	1200	992	833	710	612	469	370
	10-2-103	12.3		D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
				C	7500	6000	5000	4286	3750	3333	3000	2727	2500	2308	2143	1857	1667
				D	0.046	0.072	0.104	0.141	0.184	0.233	0.288	0.348	0.415	0.487	0.564	0.737	0.933

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 10,000,000 psi - F= fiber stress, 12,000 psi

Material: ASTM B-221,6063 or 6061

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. These can be exceeded for other types of loads with 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 the table.

General: Loads and deflections are theoretical and based on static loading.

Finish: Mill finish unless otherwise specified.

AP-10 PANEL WIDTH (inches) **Note**: Includes 1/4" (1/8" each side) for extended cross bars on press-locked (AP).

No. of Bars	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
1/8" Bar	1	1 5/8	313/16	2 7/8	3 1/2	4 1/8	4 3/4	5 3/8	6	6 5/8	7 1/4	7 7/8	8 1/2	9 1/8	9 3/4	10 3/8	11	11 5/8	12 1/4
3/16" Bar	1 1/16	1 11/16	2 5/16	2 15/16	3 9/16	4 3/16	4 13/16	5 7/16	6 1/16	6 11/16	7 5/16	7 15/16	8 9/16	9 3/16	9 13/16	10 7/16	11 1/16	11 11/16	12 5/16
No. of Bars	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**
1/8" Bar	12 7/8	13 1/2	14 1/8	14 3/4	15 3/8	16	16 5/8	17 1/4	17 7/8	18 1/2	19 1/8	19 3/4	20 3/8	21	21 5/8	22 1/4	22 7/8	23 1/2	24 1/8
3/16" Bar	12 15/16	13 9/16	14 3/16	14 13/16	15 7/16	16 1/16	16 11/16	17 5/16	17 15/16	18 9/16	19 3/16	19 13/16	20 7/16	21 1/16	21 11/16	22 5/16	22 15/16	23 9/16	24 3/16
No. of Bars	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**
1/8" Bar	24 3/4	25 3/8	26	26 5/8	27 1/4	27 7/8	28 1/2	29 1/8	29 3/4	30 3/8	31	31 5/8	32 1/4	32 7/8	33 1/2	34 1/8	34 3/4	35 3/8	36
3/16" Bar	24 13/16	25 7/16	26 1/16	26 11/16	27 5/16	27 15/16	28 9/16	29 3/16	29 13/16	30 7/16	31 1/16	31 11/16	32 5/16	32 15/16	33 9/16	34 3/16	34 13/16	35 7/16	36 1/16

Rectangular Bar Swage-Locked Close Mesh

1/2" Center to Center of Bearing Bars

8-SR-4
Cross Rods 4" C/C

8-SR-2
Cross Rods 2" C/C

Press-Locked Close Mesh

1/2" Center to Center of Bearing Bars

8-AP-4
Cross Bars 4" C/C

8-AP-2
Cross Bars 2" C/C

Load & Deflection Table

Bar Size	Symbol		Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
3/4" x 1/8"	8-4-32	SR	3.0	0.281	U	563	360	250	184	141								
		AP	3.1		D	0.192	0.300	0.432	0.588	0.768								
	8-2-32	SR	3.4		C	563	450	375	321	281								
		AP	3.4		D	0.154	0.240	0.346	0.470	0.614								
3/4" x 3/16"	8-4-33	SR	4.4	0.422	U	844	540	375	276	211	167							
		AP	4.6		D	0.192	0.300	0.432	0.588	0.768	0.972							
	8-2-33	SR	4.7		C	844	675	563	482	422	375							
		AP	5.1		D	0.154	0.240	0.346	0.470	0.614	0.778							
1" x 1/8"	8-4-42	SR	3.9	0.500	U	1000	640	444	327	250	198	160						
		AP	4.0		D	0.144	0.225	0.324	0.441	0.576	0.729	0.900						
	8-2-42	SR	4.3		C	1000	800	667	571	500	444	400						
		AP	4.3		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720						
1" x 3/16"	8-4-43	SR	5.8	0.750	U	1500	960	667	490	375	296	240	198					
		AP	5.9		D	0.144	0.225	0.324	0.441	0.576	0.729	0.900	1.089					
	8-2-43	SR	6.1		C	1500	1200	1000	857	750	667	600	545					
		AP	6.4		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871					
1-1/4" x 1/8"	8-4-52	SR	4.9	0.781	U	1563	1000	694	510	391	309	250	207					
		AP	5.0		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871					
	8-2-52	SR	5.2		C	1563	1250	1042	893	781	694	625	568					
		AP	5.4		D	0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697					
1-1/4" x 3/16"	8-4-53	SR	7.1	1.172	U	2344	1500	1042	765	586	463	375	310	260				
		AP	7.5		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871	1.037				
	8-2-53	SR	7.4		C	2344	1875	1563	1339	1172	1042	938	852	781				
		AP	8.1		D	0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697	0.829				
1-1/2" x 1/8"	8-4-62	SR	5.8	1.125	U	2250	1440	1000	735	563	444	360	298	250	213			
		AP	5.9		D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726	0.864	1.014			
	8-2-62	SR	6.1		C	2250	1800	1500	1286	1125	1000	900	818	750	692			
		AP	6.3		D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691	0.811			
1-1/2" x 3/16"	8-4-63	SR	8.5	1.688	U	3375	2160	1500	1102	844	667	540	446	375	320	276		
		AP	8.8		D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726	0.864	1.014	1.176		
	8-2-63	SR	8.8		C	3375	2700	2250	1929	1688	1500	1350	1227	1125	1038	964		
		AP	9.5		D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691	0.811	0.941		
1-3/4" x 3/16"	8-4-73	SR	9.8	2.297	U	4594	2940	2042	1500	1148	907	735	607	510	435	375	287	
		AP	10.2		D	0.082	0.129	0.185	0.252	0.329	0.417	0.514	0.622	0.741	0.869	1.008	1.317	
	8-2-73	SR	10.2		C	4594	3675	3063	2625	2297	2042	1838	1670	1531	1413	1313	1148	
		AP	10.9		D	0.066	0.103	0.148	0.202	0.263	0.333	0.411	0.498	0.592	0.695	0.806	1.053	
2" x 3/16"	8-4-83	SR	11.2	3.000	U	6000	3840	2667	1959	1500	1185	960	793	667	568	490	375	296
		AP	11.5		D	0.072	0.113	0.162	0.221	0.288	0.365	0.450	0.545	0.648	0.761	0.882	1.152	1.458
	8-2-83	SR	11.5		C	6000	4800	4000	3429	3000	2667	2400	2182	2000	1846	1714	1500	1333
		AP	12.2		D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
2-1/4" x 3/16"	8-4-93	SR	12.6	3.797	U	7594	4860	3375	2480	1898	1500	1215	1004	844	719	620	475	375
		AP	12.9		D	0.064	0.100	0.144	0.196	0.256	0.324	0.400	0.484	0.576	0.676	0.784	1.024	1.296
	8-2-93	SR	12.9		C	7594	6075	5063	4339	3797	3375	3038	2761	2531	2337	2170	1898	1688
		AP	13.6		D	0.051	0.080	0.115	0.157	0.205	0.259	0.320	0.387	0.461	0.541	0.627	0.819	1.037
2-1/2" x 3/16"	8-4-103	SR	13.9	4.688	U	9375	6000	4167	3061	2344	1852	1500	1240	1042	888	765	586	463
		AP	14.3		D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
	8-2-103	SR	14.2		C	9375	7500	6250	5357	4688	4167	3750	3409	3125	2885	2679	2344	2083
		AP	14.9		D	0.046	0.072	0.104	0.141	0.184	0.233	0.288	0.348	0.415	0.487	0.564	0.737	0.933

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 10,000,000 psi - F= fiber stress, 12,000 psi

Material: ASTM B-221, 6063 or 6061

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. These can be exceeded for other types of loads with 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 the table.

General: Loads and deflections are theoretical and based on static loading.

Finish: Mill finish unless otherwise specified.

SR/AP-8 PANEL WIDTH (inches) **Note**: Includes 1/4" (1/8" each side) for extended cross rods on swage-locked (SR) and extended cross bars on press-locked (AP).

No. of Bars	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
1/8" Bar	7/8	1 3/8	1 7/8	2 3/8	2 7/8	3 7/8	3 7/8	4 3/8	4 7/8	5 3/8	5 7/8	6 3/8	6 7/8	7 3/8	7 7/8	8 3/8	8 7/8	9 3/8	9 7/8
3/16" Bar	15/16	1 7/16	1 15/16	2 7/16	2 15/16	3 7/16	3 15/16	4 7/16	4 15/16	5 7/16	5 15/16	6 7/16	6 7/16	7 7/16	7 15/16	8 7/16	8 15/16	9 15/16	10 7/16
No. of Bars	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**
1/8" Bar	10 3/8	10 7/8	11 3/8	11 7/8	12 3/8	12 7/8	13 3/8	13 7/8	14 3/8	14 7/8	15 3/8	15 7/8	16 3/8	16 7/8	17 3/8	17 7/8	18 3/8	18 7/8	19 3/8
3/16" Bar	10 15/16	11 7/16	11 15/16	12 7/16	12 15/16	13 7/16	13 15/16	14 7/16	14 7/16	14 15/16	15 7/16	15 15/16	16 7/16	16 15/16	17 7/16	17 15/16	18 7/16	18 15/16	19 7/16
No. of Bars	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**
1/8" Bar	19 7/8	20 3/8	20 7/8	21 3/8	21 7/8	22 3/8	22 7/8	23 3/8	23 7/8	24 3/8	24 7/8	25 3/8	25 7/8	26 3/8	26 7/8	27 3/8	27 7/8	28 3/8	28 7/8
3/16" Bar	19 15/16	20 7/16	20 15/16	21 7/16	21 15/16	22 7/16	22 15/16	23 7/16	23 15/16	24 7/16	24 15/16	25 7/16	25 15/16	26 7/16	26 15/16	27 7/16	27 15/16	28 7/16	28 15/16
No. of Bars	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**					
1/8" Bar	29 3/8	29 7/8	30 3/8	30 7/8	31 3/8	31 7/8	32 3/8	32 7/8	33 3/8	33 7/8	34 3/8	34 7/8	35 3/8	35 7/8					
3/16" Bar	29 7/16	29 15/16	30 7/16	30 15/16	31 7/16	31 15/16	32 7/16	32 15/16	33 7/16	33 15/16	34 7/16	34 15/16	35 7/16	35 15/16					

Press-Locked Close Mesh

7/16" Center to Center of Bearing Bars

7-AP-4
Cross Bars 4" C/C

7-AP-2
Cross Bars 2" C/C

Load & Deflection Table

Material: ASTM B-221,6063 or 6061

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. These can be exceeded for other types of loads with 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 the table.

General: Loads and deflections are theoretical and based on static loading.

Finish: Mill finish unless otherwise specified.

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
3/4" x 1/8"	7-4-32	3.4	0.321	U	643	411	286	210	161								
	7-2-32	3.8		D	0.192	0.300	0.432	0.588	0.768								
				C	643	514	429	367	367								
				D	0.154	0.240	0.346	0.470	0.614	0.778							
3/4" x 3/16"	7-4-33	5.2	0.482	U	964	617	429	315	241	190							
	7-2-33	5.7		D	0.192	0.300	0.432	0.588	0.768	0.972							
				C	964	771	643	551	482	429							
				D	0.154	0.240	0.346	0.470	0.614	0.778	0.900						
1" x 1/8"	7-4-42	4.5	0.571	U	1143	731	508	373	286	226	183						
	7-2-42	4.8		D	0.144	0.225	0.324	0.441	0.576	0.729	0.900						
				C	1143	914	762	653	571	508	457						
				D	0.115	0.180	0.259	0.353	0.461	0.583	0.720						
1" x 3/16"	7-4-43	6.7	0.857	U	1714	1097	762	560	429	339	274	227					
	7-2-43	7.2		D	0.144	0.225	0.324	0.441	0.576	0.729	0.900	1.089					
				C	1714	1371	1143	980	857	857	686	623					
				D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871					
1-1/4" x 1/8"	7-4-52	5.6	0.893	U	1786	1143	794	583	446	353	286	236					
	7-2-52	6.1		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871					
				C	1786	1429	1190	1020	893	794	714	649					
				D	0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697					
1-1/4" x 3/16"	7-4-53	8.4	1.339	U	2679	1714	1190	875	670	529	429	354	298	254			
	7-2-53	9.1		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871	1.037	1.217			
				C	2679	2143	1786	1531	1339	1190	1071	974	893	824			
				D	0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697	0.829	0.973			
1-1/2" x 1/8"	7-4-62	6.7	1.286	U	2571	1646	1143	840	643	508	411	340	286	243			
	7-2-62	7.1		D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726	0.864	1.014			
				C	2571	2057	1714	1469	1286	1143	1029	935	857	791			
				D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691	0.811			
1-1/2" x 3/16"	7-4-63	10.0	1.929	U	3857	2469	1714	1259	964	762	617	510	429	365	315		
	7-2-63	10.7		D	0.096	0.150	0.216	0.216	0.384	0.486	0.600	0.726	0.864	1.014	1.176		
				C	3857	3086	2571	2204	1929	1714	1543	1403	1286	1187	1102		
				D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691	0.811	0.941		
1-3/4" x 3/16"	7-4-73	11.5	2.625	U	5250	3360	2333	1714	1313	1037	840	694	583	497	429	328	259
	7-2-73	12.2		D	0.082	0.129	0.185	0.252	0.329	0.417	0.514	0.622	0.741	0.869	1.008	1.317	1.666
				C	5250	4200	3500	3000	2625	2333	2100	1909	1750	1615	1500	1313	1167
				D	0.066	0.103	0.148	0.202	0.263	0.333	0.411	0.498	0.592	0.695	0.806	1.053	1.333
2" x 3/16"	7-4-83	13.1	3.429	U	6857	4389	3048	2239	1714	1354	1097	907	762	649	560	429	339
	7-2-83	13.8		D	0.072	0.113	0.162	0.221	0.288	0.365	0.450	0.545	0.648	0.761	0.882	1.152	1.458
				C	6857	5486	4571	3918	3429	3048	2743	2494	2286	2110	1959	1714	1524
				D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
2-1/4" x 3/16"	7-4-93	14.6	4.339	U	8679	5554	3857	2834	2170	1714	1389	1148	964	822	708	542	429
	7-2-93	15.3		D	0.064	0.100	0.144	0.196	0.256	0.324	0.400	0.484	0.576	0.676	0.784	1.204	1.296
				C	8679	6943	5786	4959	4339	3857	3471	3156	2893	2670	2480	2170	1929
				D	0.051	0.080	0.115	0.157	0.205	0.259	0.320	0.387	0.461	0.541	0.627	0.819	1.037
2-1/2" x 3/16"	7-4-103	16.2	5.357	U	10714	6857	4762	3499	2679	2116	1714	1417	1190	1014	875	670	529
	7-2-103	16.9		D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
				C	10714	8571	7143	6122	5357	4762	4286	3896	3571	3297	3061	2679	2381
				D	0.046	0.072	0.104	0.141	0.184	0.233	0.288	0.348	0.415	0.487	0.564	0.737	0.933

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 10,000,000 psi - F= fiber stress, 12,000 psi

AP-7 PANEL WIDTH (inches) **Note:** Includes 1/4" (1/8" each side) for extended cross bars on press-locked (AP).

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1/8" Bar	3/16	1 1/4	1 11/16	2 1/8	2 9/16	3	3 7/16	3 7/8	4 5/16	4 3/4	5 3/16	5 5/8	6 1/16	6 1/2	6 15/16	7 3/8	7 13/16	8 1/4	8 11/16	9 1/8	9 9/16
3/16" Bar	7/8	1 5/16	1 3/4	2 3/16	2 5/8	3 1/16	3 1/2	3 15/16	4 3/8	4 13/16	5 1/4	5 11/16	6 1/8	6 9/16	7	7 7/16	7 7/8	8 5/16	8 3/4	9 3/16	9 5/8

No. of Bars	23	24	25	26	27	28	29	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1/8" Bar	10	10 7/16	10 7/8	11 5/16	11 3/4	12 3/16	12 5/8	13 1/2	13 15/16	14 3/8	14 13/16	15 1/4	15 11/16	16 1/8	16 9/16	17	17 7/16	17 7/8	18 5/16	18 3/4	19 3/16
3/16" Bar	10 1/16	10 1/2	10 15/16	11 3/8	11 11/16	12 1/4	12 11/16	13 9/16	14	14 7/16	14 7/8	15 5/16	15 3/4	16 3/16	16 5/8	17 1/16	17 1/2	17 15/16	18 3/8	18 13/8	19 1/4

No. of Bars	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
1/8" Bar	19 5/8	20 1/16	20 1/2	20 15/16	21 3/8	21 13/16	22 1/4	22 11/16	23 1/8	23 9/16	24	24 7/16	24 7/8	25 5/16	25 3/4	26 3/16	26 5/8	27 1/16	27 1/2	27 15/16	28 3/8
3/16" Bar	19 11/16	20 1/8	20 9/16	21	21 7/16	21 7/8	22 5/16	22 3/4	23 3/16	23 5/8	24 1/16	24 1/2	24 15/16	25 3/8	25 13/16	26 1/4	26 11/16	27 1/8	27 9/16	28	28 7/16

No. of Bars	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83
1/8" Bar	28 13/16	29 1/4	29 11/16	30 1/8	30 9/16	31	31 7/16	31 7/8	32 5/16	32 3/4	33 3/16	33 5/8	34 1/16	34 1/2	34 15/16	35 3/8	35 13/16	36 1/4
3/16" Bar	28 7/8	29 5/16	29 3/4	30 3/16	30 5/8	31 1/16	31 1/2	31 15/16	32 3/8	32 13/16	33 1/4	33 11/16	34 1/8	34 9/16	35	35 7/16	35 7/8	36 5/16

RIVETED GRATING

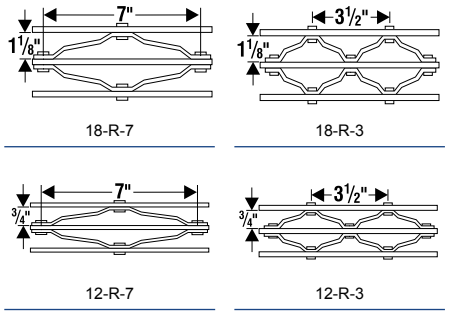
Riveted Bar Grating is the first choice by many engineers for many applications. Compared to welded or swaged-locked grating, riveted has a greater load carrying capacity for the same span and depth of grating. Reticulated bars, riveted to the bearing bars increase resistance to bucking caused by vehicular loading conditions.

Marco riveted carbon steel and aluminum gratings utilize rivets which are individually cold-pressed using hydraulically and mechanically operated riveting tools. Thus, the bearing bars and reticulated bars are sealed together as a high-strength joint, freeing the grating from the residual stresses that cause warp and joint failures.

It is unparalleled where rolling stock and wheeled equipment are used, especially those with casters. The reticulated bars present a smoother surface for this traffic. It is very popular for use as flooring, ramps, docks and other surfaces and it is ideally suited for walkways because of its added walking comfort.

Marco can match your existing riveted grating when you are replacing or expanding your installation. On special order, heavy-duty bar sizes and/or widths greater than shown are also available.

Steel & Aluminum Riveted Grating



Note: Spacing for riveted grating is inside to inside of bearing bars.

MARCO SPECIALTY STEEL

Steel Riveted Grating

1-1/8" Inside Face to Inside Face of Bearing Bars

18-R-7
7" Rivet Centers–1/4" Dia. Rivets

18-R-3
3-1/2" Rivet Centers–1/4" Dia. Rivets

Load & Deflection Table

Material: ASTM A-569

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. These can be exceeded for other types of loads with engineer's approval.

Serrated Bars: Normally we serrate the reticuline bar and raise it slightly above the top surface of the bearing bars. We can also serrate the bearing bars. When bearing bars are serrated, the depth of grating required for a specified load is 1/4" deeper than that shown in the table.

General: Loads and deflections are theoretical and based on static loading.

Finish: Mill finish unless otherwise specified.

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width			SPAN (Length of Bearing Bar) 2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"
3/4" x 1/8"	18-7-32 18-3-32	6.5 7.3	0.113	3/4" x 1/8" CRIMP BAR	U	338	216	150	110	84	67							
					D	0.099	0.155	0.223	0.304	0.397	0.503							
					C	338	270	225	193	169	150							
					D	0.079	0.124	0.179	0.243	0.318	0.402							
3/4" x 3/16"	18-7-33 18-3-33	7.7 8.4	0.161		U	482	309	214	157	121	95							
					D	0.099	0.155	0.223	0.304	0.397	0.503							
					C	482	386	321	276	241	214							
					D	0.079	0.124	0.179	0.243	0.318	0.402							
1" x 1/8"	18-7-42 18-3-42	7.5 8.3	0.200		U	600	384	267	196	150	119	96	79					
					D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563					
					C	600	480	400	343	300	267	240	218					
					D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451					
1" x 3/16"	18-7-43 18-3-43	9.2 9.9	0.286		U	857	549	381	280	214	169	137	113					
					D	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563					
					C	857	686	571	490	429	381	343	312					
					D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451					
1-1/4" x 1/8"	18-7-52 18-3-52	8.6 9.4	0.313		U	938	600	417	306	234	185	150	124	104	89	77		
					D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730		
					C	938	750	625	536	469	417	375	341	313	288	268		
					D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584		
1-1/4" x 3/16"	18-7-53 18-3-53	10.7 11.4	0.446		U	1339	857	595	437	335	265	214	177	149	127	109		
					D	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730		
					C	1339	1071	893	765	670	595	536	487	446	412	383		
					D	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584		
1-1/2" x 1/8"	18-7-62 18-3-62	10.7 11.7	0.450	1" x 1/8" CRIMP BAR	U	1350	864	600	441	338	267	216	179	150	128	110	84	67
					D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
					C	1350	1080	900	771	675	600	540	491	450	415	386	338	300
					D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-1/2" x 3/16"	18-7-63 18-3-63	13.2 14.2	0.643		U	1929	1234	857	630	482	381	309	255	214	183	157	121	95
					D	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
					C	1929	1543	1286	1102	964	857	771	701	643	593	551	482	429
					D	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-3/4" x 3/16"	18-7-73 18-3-73	14.7 15.7	0.875		U	2625	1680	1167	857	656	519	420	347	292	249	214	164	130
					D	0.043	0.067	0.096	0.130	0.170	0.215	0.266	0.322	0.383	0.450	0.521	0.681	0.862
					C	2625	2100	1750	1500	1313	1167	1050	955	875	808	750	656	583
					D	0.034	0.053	0.077	0.104	0.136	0.172	0.213	0.257	0.306	0.360	0.417	0.545	0.689
2" x 3/16"	18-7-83 18-3-83	16.2 17.2	1.143		U	3429	2194	1524	1120	857	677	549	453	381	325	280	214	169
					D	0.037	0.058	0.084	0.114	0.149	0.189	0.233	0.282	0.335	0.393	0.456	0.596	0.754
					C	3429	2743	2286	1959	1714	1524	1371	1247	1143	1055	980	857	762
					D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
2-1/4" x 3/16"	18-7-93 18-3-93	17.7 18.7	1.446		U	4339	2777	1929	1417	1085	857	694	574	482	411	354	271	214
					D	0.033	0.052	0.074	0.101	0.132	0.168	0.207	0.250	0.298	0.350	0.406	0.530	0.670
					C	4339	3471	2893	2480	2170	1929	1736	1578	1446	1335	1240	1085	964
					D	0.026	0.041	0.060	0.081	0.106	0.134	0.166	0.200	0.238	0.280	0.324	0.424	0.536
2-1/2" x 3/16"	18-7-103 18-3-103	19.2 20.2	1.786		U	5357	3429	2381	1749	1339	1058	857	708	595	507	437	335	265
					D	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
					C	5357	4286	3571	3061	2679	2381	2143	1948	1786	1648	1531	1339	1190
					D	0.024	0.037	0.054	0.073	0.095	0.121	0.149	0.180	0.215	0.252	0.292	0.381	0.483

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 2,000,000 psi - F= fiber stress, 18,000 psi

18-R-7 & 18-R-3 PANEL WIDTH (inches) **Note:** Dimensions include 1/4" for rivet heads (1/8" each side).

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

No. of Bars	18	19	20	21	22	23	24	25	26	27	28	29	30
1/8" Bar	21 5/8	22 7/8	24 1/8	25 3/8	26 5/8	27 7/8	29 1/8	30 3/8	31 5/8	32 7/8	34 1/8	35 3/8	36 5/8
3/16" Bar	22 3/4	24 1/16	25 3/8	26 11/16	28	29 5/16	30 5/8	31 15/16	33 1/4	34 9/16	35 7/8	37 3/16	38 7/16

MARCO SPECIALTY STEEL

Steel Riveted Grating

3/4" Inside Face to Inside Face of Bearing Bars

12-R-7
7" Rivet Centers–1/4" Dia. Rivets

12-R-3
3-1/2" Rivet Centers–1/4" Dia. Rivets

Load & Deflection Table

Material: ASTM A-569

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. These can be exceeded for other types of loads with engineer's approval.

Serrated Bars: Normally we serrate the reticuline bar and raise it slightly above the top surface of the bearing bars. We can also serrate the bearing bars. When bearing bars are serrated, the depth of grating required for a specified load is 1/4" deeper than that shown in the table.

General: Loads and deflections are theoretical and based on static loading.

Finish: Mill finish unless otherwise specified.

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'0"	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	8'0"	9'0"
3/4" x 1/8"	12-7-32	9.0	0.161	3/4" x 1/8" CRIMP BAR	U 482	309	214	157	121	95							
	12-3-32	9.6			D 0.099	0.155	0.223	0.304	0.397	0.503							
					C 482	386	321	276	241	214							
					D 0.079	0.124	0.179	0.243	0.318	0.402							
3/4" x 3/16"	12-7-33	10.5	0.225		U 675	432	300	220	169	133	108						
	12-3-33	11.0			D 0.099	0.155	0.223	0.304	0.397	0.503	0.621						
					C 675	540	450	386	338	300	270						
					D 0.079	0.124	0.179	0.243	0.318	0.402	0.497						
1" x 1/8"	12-7-42	10.5	0.286		U 857	549	381	280	214	169	137	113					
	12-3-42	11.1			D 0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563					
					C 857	686	571	490	429	381	343	312					
					D 0.060	0.093	0.134	0.182	0.238	0.372	0.372	0.451					
1" x 3/16"	12-7-43	12.6	0.400		U 1200	768	533	392	300	237	192	159	133				
	12-3-43	13.1			D 0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670				
					C 1200	960	800	686	600	533	480	436	400				
					D 0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536				
1-1/4" x 1/8"	12-7-52	12.0	0.446		U 1339	857	595	437	355	265	214	177	149	127	109		
	12-3-52	12.6			D 0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730		
					C 1339	1071	893	765	670	595	536	487	446	412	383		
					D 0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584		
1-1/4" x 3/16"	12-7-53	14.7	0.625		U 1875	1200	833	612	469	370	300	248	208	178	153		
	12-3-53	15.2			D 0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730		
					C 1857	1500	1250	1071	938	833	750	682	625	577	536		
					D 0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584		
1-1/2" x 1/8"	12-7-62	15.0	0.643	1" x 1/8" CRIMP BAR	U 1929	1234	857	630	482	381	309	255	214	183	157	121	95
	12-3-62	15.7			D 0.050	0.078	0.112	0.152	0.251	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
					C 1929	1543	1286	1102	964	857	771	701	643	593	551	482	429
					D 0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-1/2" x 3/16"	12-7-63	18.1	0.900		U 2700	1728	1200	882	675	533	432	357	300	256	220	169	133
	12-3-63	18.8			D 0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.794	1.006
					C 2700	2160	1800	1543	1350	1200	1080	982	900	831	771	675	600
					D 0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.636	0.804
1-3/4" x 3/16"	12-7-73	20.2	1.225		U 3675	2352	1633	1200	919	726	588	486	408	348	300	230	181
	12-3-73	20.9			D 0.043	0.067	0.096	0.130	0.170	0.215	0.266	0.322	0.383	0.450	0.521	0.681	0.862
					C 3 675	2940	2450	2100	1838	1633	1470	1336	1225	1131	1050	919	817
					D 0.034	0.053	0.077	0.104	0.136	0.172	0.213	0.257	0.306	0.360	0.417	0.545	0.689
2" x 3/16"	12-7-83	22.3	1.600		U 4800	3072	2133	1567	1200	948	768	635	533	454	392	300	237
	12-3-83	23.0			D 0.037	0.058	0.084	0.114	0.149	0.189	0.233	0.282	0.335	0.393	0.456	0.596	0.754
					C 4800	3840	3200	2743	2400	2133	1920	1745	1600	1477	1371	1200	1067
					D 0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
2-1/4" x 3/16"	12-7-93	24.4	2.025		U 6075	3888	2700	1984	1591	1200	972	803	675	575	496	380	300
	12-3-93	25.1			D 0.033	0.052	0.074	0.101	0.132	0.168	0.207	0.250	0.298	0.350	0.406	0.530	0.670
					C 6075	4860	4050	3471	3038	2700	2430	2209	2025	1869	1736	1591	1350
					D 0.026	0.041	0.060	0.081	0.106	0.134	0.166	0.200	0.238	0.280	0.324	0.424	0.536
2-1/2" x 3/16"	12-7-103	26.5	2.500		U 7500	4800	3333	2449	1875	1481	1200	992	833	710	612	469	370
	12-3-103	27.1			D 0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.477	0.603
					C 7500	6000	5000	4286	3750	3333	3000	2727	2500	2308	2143	1875	1667
					D 0.024	0.037	0.054	0.073	0.095	0.121	0.149	0.180	0.215	0.252	0.292	0.381	0.483

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 29,000,000 psi - F= fiber stress, 18,000 psi

12-R-7 & 12-R-3 PANEL WIDTH (inches) **Note:** Dimensions include 1/4" for rivet heads (1/8" each side).

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1/8" Bar	1 1/4	2 1/8	3	3 7/8	4 3/4	5 5/8	6 1/2	7 3/8	8 1/4	9 1/8	10	10 7/8	11 3/4	12 5/8
3/16" Bar	7/8	1 5/16	1 3/4	2 3/16	2 5/8	3 1/16	3 1/2	3 15/16	4 3/8	4 13/16	5 1/4	5 11/16	6 1/8	6 9/16
No. of Bars	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**
1/8" Bar	13 1/2	14 3/8	15 1/4	16 1/8	17	17 7/8	18 3/4	19 5/8	20 1/2	21 3/8	22 1/4	23 1/8	24	24 7/8
3/16" Bar	7	7 7/16	7 7/8	8 5/16	8 3/4	9 3/16	9 5/8	10 1/16	10 1/2	10 15/16	23 7/8	24 13/16	25 3/4	26 11/16
No. of Bars	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	
1/8" Bar	25 3/4	26 5/8	27 1/2	28 3/8	29 1/4	30 1/8	31	31 7/8	32 3/4	33 5/8	34 1/2	35 3/8	36 1/4	
3/16" Bar	27 5/8	28 9/16	29 1/2	30 7/16	31 3/8	32 5/16	33 1/4	34 3/16	35 1/8	36 1/16	37	37 15/16	38 7/8	

MARCO SPECIALTY STEEL

Aluminum Riveted Grating

1-1/8" Inside Face to Inside Face of Bearing Bars

18-R-7
7" Rivet Centers–1/4" Dia. Rivets

18-R-3
3-1/2" Rivet Centers–1/4" Dia. Rivets

Load & Deflection Table

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar) 2'-0"	2'6"	3'-0"	3'6"	4'0"	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	8'0"	9'0"
3/4" x 1/8"	18-7-32	2.3	0.113	U	225	144	100	73	56	44							
	18-3-32	2.6		D	0.192	0.300	0.432	0.588	0.768	0.972							
				C	225	180	150	129	113	100							
				D	0.154	0.240	0.346	0.470	0.614	0.778							
3/4" x 3/16"	18-7-33	2.7	0.161	U	321	206	143	105	80	63							
	18-3-33	3.0		D	0.192	0.300	0.432	0.588	0.768	0.972							
				C	321	257	214	184	161	143							
				D	0.154	0.240	0.346	0.470	0.614	0.778							
1" x 1/8"	18-7-42	2.7	0.200	U	400	256	178	131	100	79	64	53					
	18-3-42	3.0		D	0.144	0.225	0.324	0.441	0.576	0.729	0.900	1.089					
				C	400	320	267	229	200	178	160	145					
				D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871					
1" x 3/16"	18-7-43	3.2	0.286	U	571	366	254	187	143	113	91	76					
	18-3-43	3.6		D	0.144	0.225	0.324	0.441	0.576	0.729	0.900	1.089					
				C	571	457	381	327	286	254	229	208					
				D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871					
1-1/4" x 1/8"	18-7-52	3.0	0.313	U	625	400	278	204	156	123	100	83	69	59	51		
	18-3-52	3.4		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871	1.037	1.217	1.411		
				C	625	500	417	357	313	278	250	227	208	192	179		
				D	0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697	0.829	0.973	1.129		
1-1/4" x 3/16"	18-7-53	3.8	0.446	U	893	571	397	292	223	176	143	118	99	85	73		
	18-3-53	4.1		D	0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871	1.037	1.217	1.411		
				C	893	714	595	510	446	397	357	325	298	275	255		
				D	0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697	0.829	0.973	1.129		
1-1/2" x 1/8"	18-7-62	3.8	0.450	U	900	576	400	294	225	178	144	119	100	85	73	56	44
	18-3-62	4.2		D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726	0.864	1.014	1.176	1.536	1.944
				C	900	720	600	514	450	400	360	327	300	277	257	225	200
				D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691	0.811	0.941	1.229	1.555
1-1/2" x 3/16"	18-7-63	4.6	0.643	U	1286	823	571	420	321	254	206	170	143	122	105	80	63
	18-3-63	5.0		D	0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726	0.864	1.014	1.176	1.536	1.944
				C	1286	1029	857	735	643	571	514	468	429	396	367	321	286
				D	0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691	0.811	0.941	1.229	1.555
1-3/4" x 3/16"	18-7-73	5.1	0.875	U	1750	1120	778	571	438	346	280	231	194	166	143	109	86
	18-3-73	5.6		D	0.082	0.129	0.185	0.252	0.329	0.417	0.514	0.622	0.741	0.869	1.008	1.317	1.666
				C	1750	1400	1167	1000	875	778	700	636	583	538	500	438	398
				D	0.066	0.103	0.148	0.202	0.263	0.333	0.411	0.498	0.592	0.695	0.806	1.053	1.333
2" x 3/16"	18-7-83	5.7	1.143	U	2286	1463	1016	746	571	451	366	302	254	216	187	143	113
	18-3-83	6.1		D	0.072	0.113	0.162	0.221	0.288	0.365	0.450	0.545	0.648	0.761	0.882	1.152	1.458
				C	2286	1829	1524	1306	1143	1016	914	831	762	703	653	571	508
				D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
2-1/4" x 3/16"	18-7-93	6.2	1.446	U	2893	1851	1286	945	723	571	463	383	321	274	236	181	143
	18-3-93	6.6		D	0.064	0.100	0.144	0.196	0.256	0.324	0.400	0.484	0.576	0.676	0.784	1.024	1.296
				C	2893	2314	1929	1653	1446	1286	1157	1052	964	890	827	723	643
				D	0.051	0.080	0.115	0.157	0.205	0.259	0.320	0.387	0.461	0.541	0.627	0.819	1.037
2-1/2" x 3/16"	18-7-103	6.7	1.786	U	3571	2286	1587	1166	893	705	571	472	397	338	292	223	176
	18-3-103	7.1		D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
				C	3571	2857	2381	2041	1786	1587	1429	1299	1190	1099	1020	893	794
				D	0.046	0.072	0.104	0.141	0.184	0.233	0.288	0.348	0.415	0.487	0.564	0.737	0.933

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 10,000,000 psi - F= fiber stress, 12,000 psi

Material: ASTM B-221

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. These can be exceeded for other types of loads with engineer's approval.

Serrated Bars: Normally we serrate the reticuline bar and raise it slightly above the top surface of the bearing bars. We can also serrate the bearing bars. When bearing bars are serrated, the depth of grating required for a specified load is 1/4" deeper than that shown in the table.

General: Loads and deflections are theoretical and based on static loading.

Finish: Mill finish unless otherwise specified.

18-AR-7 & 18-AR-3 PANEL WIDTH (inches) **Note:** Dimensions include 1/4" for rivet heads (1/8" each side).

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1/8" Bar	1 5/8	2 7/8	4 1/8	5 3/8	6 5/8	7 7/8	9 1/8	10 3/8	11 5/8	12 7/8	14 1/8	15 3/8	16 5/8	17 7/8	19 1/8	20 3/8
3/16" Bar	1 3/4	3 1/16	4 3/8	5 11/16	7	8 5/16	9 5/8	10 15/16	12 1/4	13 9/16	14 7/8	16 3/16	17 1/2	18 13/16	20 1/8	217/16

No. of Bars	18	19	20	21	22	23	24	25	26	27	28	29	30
1/8" Bar	21 5/8	22 7/8	24 1/8	25 3/8	26 5/8	27 7/8	29 1/8	30 3/8	31 5/8	32 7/8	34 1/8	35 3/8	36 5/8
3/16" Bar	22 3/4	24 1/16	25 3/8	26 11/16	28	29 5/16	30 5/8	31 15/16	33 1/4	34 9/16	35 7/8	37 3/16	38 7/16

Aluminum Riveted Grating

3/4" Inside Face to Inside Face of Bearing Bars

12-AR-7
7" Rivet Centers–1/4" Dia. Rivets

12-AR-3
3-1/2" Rivet Centers–1/4" Dia. Rivets

Load & Deflection Table

Material: ASTM B-221,6063 or 6061

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. These can be exceeded for other types of loads with engineer's approval.

Serrated Bars: Normally we serrate the reticuline bar and raise it slightly above the top surface of the bearing bars. We can also serrate the bearing bars. When bearing bars are serrated, the depth of grating required for a specified load is 1/4" deeper than that shown in the table.

General: Loads and deflections are theoretical and based on static loading.

Finish: Mill finish unless otherwise specified.

Bar Size	Symbol	Approx. Weight psf	Sec mod Per Fl of Width		SPAN (Length of Bearing Bar)												
					2'-0"	2'6"	3'-0"	3'6"	4'-0"	4'-6"							
3/4" x 1/8"	12-7-32	3.2	0.161	3/4" x 1/8" CRIMP BAR	U 321	206	143	105	80	63							
	12-3-32	3.4			D 0.192	0.300	0.432	0.588	0.768	0.972							
					C 321	257	214	184	161	143							
					D 0.154	0.240	0.346	0.470	0.614	0.778							
3/4" x 3/16"	12-7-33	3.7	0.225		U 450	288	200	147	113	89							
	12-3-33	3.9			D 0.192	0.300	0.432	0.588	0.768	0.972							
					C 450	360	300	257	225	200							
					D 0.154	0.240	0.346	0.470	0.614	0.778	5'-0"	5'-6"					
1" x 1/8"	12-7-42	3.7	0.286		U 571	366	254	187	143	113	91	76					
	12-3-42	4.0			D 0.144	0.225	0.324	0.441	0.576	0.729	0.900	1.089					
					C 571	457	381	327	286	254	229	208					
					D 0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871					
1" x 3/16"	12-7-43	4.4	0.400		U 800	512	356	261	200	158	128	106					
	12-3-43	4.7			D 0.144	0.225	0.324	0.441	0.576	0.729	0.900	1.089					
					C 800	640	533	457	400	356	320	291					
					D 0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871	6'-0"	6'-6"	7'-0"		
1-1/4" x 1/8"	12-7-52	4.2	0.446		U 893	571	397	292	223	176	143	118	99	85	73		
	12-3-52	4.5			D 0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871	1.037	1.217	1.411		
					C 893	714	595	510	446	397	357	325	298	275	255		
					D 0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697	0.829	0.973	1.129		
1-1/4" x 3/16"	12-7-53	5.1	0.625		U 1250	800	556	408	313	247	200	165	139	118	102		
	12-3-53	5.4			D 0.115	0.180	0.259	0.353	0.461	0.583	0.720	0.871	1.037	1.217	1.411		
					C 1250	1000	833	714	625	556	500	455	417	385	357		
					D 0.092	0.144	0.207	0.282	0.369	0.467	0.576	0.697	0.829	0.973	1.129	8'-0"	9'-0"
1-1/2" x 1/8"	12-7-62	5.2	0.643	1" x 1/8" CRIMP BAR	U 1286	823	571	420	321	254	206	170	143	122	105	80	63
	12-3-62	5.6			D 0.096	0.150	0.216	0.294	0.384	0.486	0.600	0.726	0.864	1.014	1.176	1.536	1.944
					C 1286	1029	857	735	643	571	514	468	429	396	367	321	286
					D 0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691	0.811	0.941	1.229	1.555
1-1/2" x 3/16"	12-7-63	6.3	0.900		U 1800	1152	800	588	450	356	288	238	200	170	147	113	89
	12-3-63	6.6			D 0.096	0.150	0.216	0.216	0.384	0.486	0.600	0.726	0.864	1.014	1.176	1.536	1.944
					C 1800	1440	1200	1029	900	800	720	655	600	554	514	450	400
					D 0.077	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691	0.811	0.941	1.229	1.555
1-3/4" x 3/16"	12-7-73	7.1	1.225		U 2450	1568	1089	800	613	484	392	324	272	232	200	153	121
	12-3-73	7.4			D 0.082	0.129	0.185	0.252	0.329	0.417	0.514	0.622	0.741	0.869	1.008	1.317	1.666
					C 2450	1960	1633	1400	1225	1089	980	891	817	754	700	613	544
					D 0.066	0.103	0.148	0.202	0.263	0.333	0.411	0.498	0.592	0.695	0.806	1.053	1.333
2" x 3/16"	12-7-83	7.8	1.600		U 3200	2048	1422	1045	800	632	512	423	356	303	261	200	158
	12-3-83	8.1			D 0.072	0.113	0.162	0.221	0.288	0.365	0.450	0.545	0.648	0.761	0.882	1.152	1.458
					C 3200	2560	2133	1829	1600	1422	1280	1164	1067	985	914	800	711
					D 0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
2-1/4" x 3/16"	12-7-93	8.5	2.025		U 4050	2592	1800	1322	1013	800	648	536	450	383	331	253	200
	12-3-93	8.8			D 0.064	0.100	0.144	0.196	0.256	0.324	0.400	0.484	0.576	0.676	0.784	1.204	1.296
					C 4050	3240	2700	2314	2025	1800	1620	1473	1350	1246	1157	1013	900
					D 0.051	0.080	0.115	0.157	0.205	0.259	0.320	0.387	0.461	0.541	0.627	0.819	1.037
2-1/2" x 3/16"	12-7-103	9.2	2.500		U 5000	3200	2222	1633	1250	988	800	661	556	473	408	313	247
	12-3-103	9.5			D 0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608	0.706	0.922	1.166
					C 5000	4000	3333	2857	2500	2222	2000	1818	1667	1538	1429	1250	1111
					D 0.046	0.072	0.104	0.141	0.184	0.233	0.288	0.348	0.415	0.487	0.564	0.737	0.933

U= safe uniform load, psf - C= safe concentrated load, pfw - D= deflection, inches - E= modulus of elasticity, 10,000,000 psi - F= fiber stress, 12,000 psi

12-AR-7 & 12-AR-3 PANEL WIDTH (inches) **Note**: Includes 1/4" (1/8" each side) for extended cross bars on press-locked (AP).

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1/8" Bar	1 1/4	2 1/8	3	3 7/8	4 3/4	5 5/8	6 1/2	7 3/8	8 1/4	9 1/8	10	10 7/8	11 3/4	12 5/8	13 1/2	14 3/8	15 1/4	16 1/8	17	17 7/8	18 3/4
3/16" Bar	1 3/8	2 5/16	3 1/4	4 3/16	5 1/8	6 1/16	7	7 15/16	8 7/8	9 13/16	10 3/4	11 11/16	12 5/8	13 9/16	14 1/2	15 7/16	16 3/8	17 5/16	18 1/4	19 3/16	20 1/8

No. of Bars	23	24	25t	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
1/8" Bar	19 5/8	20 1/2	21 3/8	22 1/4	23 1/8	24	24 7/8	25 3/4	26 5/8	27 1/2	28 3/8	29 1/4	30 1/8	31	31 7/8	32 3/4	33 5/8	34 1/2	35 3/8	36 1/4
3/16" Bar	21 1/16	22	22 15/16	23 7/8	24 13/16	25 3/4	26 11/16	27 5/8	28 9/16	29 1/2	30 7/16	31 3/8	32 5/16	33 1/4	34 3/16	35 1/8	36 1/16	37	37 15/16	38 7/8

STAIR TREADS

Manufactured to match the full line of our grating, there is a Marco stair tread to meet your needs. Marco stair treads are safe, self-cleaning, skid-resistant and economical. Steel and aluminum stair treads are available in a variety of styles: welded, riveted, press-locked, swage-locked.

Welded Steel Stair Treads are the most widely used for their strength and ease of installation and are universally used in most industrial and commercial applications.

Riveted Steel Stair Treads have a greater load carrying capacity for the same span and depth of bearing bar and greater walking comfort. Both can be ordered with a serrated surface for additional safety.

Aluminum Stair Treads, due to their light weight, high strength, corrosion resistance, rust proof and non-sparking properties, they are ideally suited for corrosive environments, food preparation, storage areas, and volatile areas.

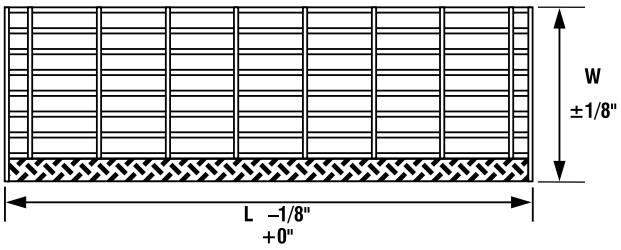
Swage-Locked I-Bar Stair Treads offer you high strength at less weight and lower cost.

Rectangular Bar, press-locked or swage-locked, stair treads provide a higher strength and stiffness-to-weight ratio and are available with a serrated surface when additional safety is required.

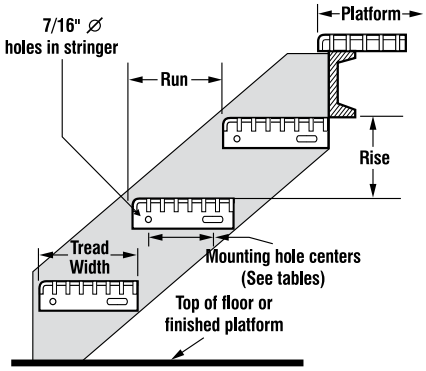
All stair treads are custom fabricated to meet the size, width and length specifications of particular job. In addition, standard end plates can be custom fabricated to meet special bolt hole size or location requirements.

Both steel and aluminum nosings are available to add strength at the point of greatest impact and provide a definitive visible edge for extra safety. Choose our checkered plate nosing for normal use. For additional safety, choose our cast iron or aluminum abrasive nosings or our corrugated aluminum nosings, or dimple nosing available in carbon stainless or aluminum.

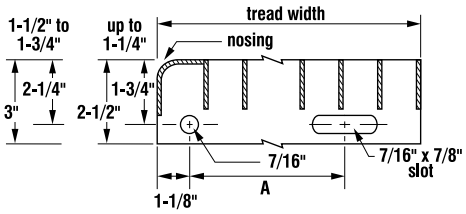
Stair Tread Tolerances and Details



Tread Length And Width Tolerance

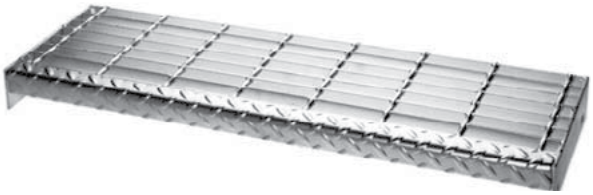


Typical Stair Tread Stringer Detail

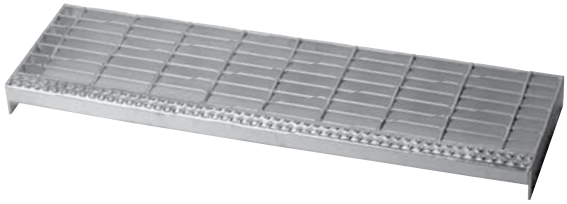


Typical Tread Dimensions

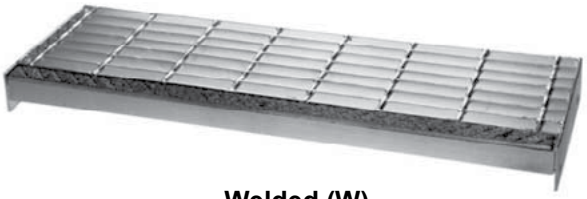
Steel/Welded & Press-Locked



Welded (W)
Checkered Plate Nosing (CP)



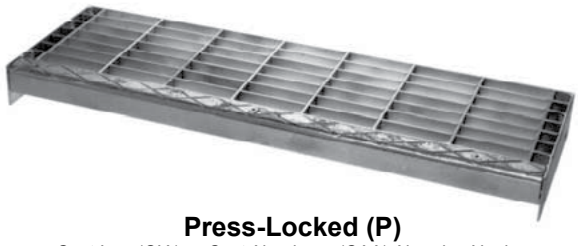
Welded (W)
Dimple Plate Nosing (DP)



Welded (W)

Steel / Welded & Press-Locked

Press-Locked (P)
Checkered Plate Nosing (CP)



Press-Locked (P)
Cast Iron (CIA) or Cast Aluminum (CAA) Abrasive Nosing

Maximum Tread Lengths

Bearing Bar Size	Bearing Bar Spacing			
	1-3/16" (19 space)		15/16" (15 space)	
	Plain	Serrated	Plain	Serrated
3/4" x 3/16"	2'-4"	1'-7"	2'-8"	1'-9"
1" x 1/8"	2'-7"	1'-11"	3'-0"	2'-1"
1" x 3/16"	3'-5"	2'-4"	4'-0"	2'-8"
1-1/4" x 1/8"	3'-7"	2'-7"	4'-2"	3'-0"
1-1/4" x 3/16"	4'-8"	3'-5"	5'-1"	4'-0"
1-1/2" x 3/16"	5'-6"	4'-8"	5'-6"	5'-1"

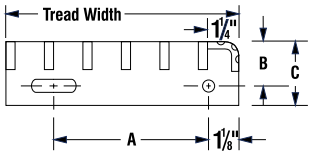
When tread length exceeds 5'-6", design tread for 300 lb. concentrated loads at 1/3 points. Maximum tread length based on 300 lb concentrated load on front 5 in of tread at center of tread length and deflection limitation of 1/240 of length.

End Plate Dimensions

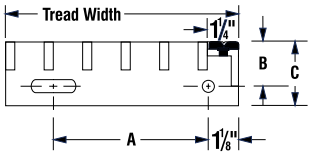
Grating Depth	"B" dimension	"C" dimension
up to 1-1/4"	1-3/4"	2-1/2"
*1-1/2" to 1-3/4"	2-1/4"	3"

See Tread Width and Bolt Hole Spacing for 'A' dimension.
* and all aluminum

With Checkered Plate Nosing



With Checkered Plate Nosing



Tread Width and Bolt Hole Spacing

19-W-4 and 19-P-4

No. of Bearing Bars and Nosing	Bearing Bar		**Bolt Hole Spacing "A"
	1/8"	3/16"	
	Tread Width		
5	6-1/8"	6-3/16"	2-1/2"
6	7-5/16"	7-3/8"	4-1/2"
7	8-1/2"	8-9/16"	4-1/2"
8	9-11/16"	9-3/4"	7"
9	10-7/8"	10-15/16"	7"
10	12-1/16"	12-1/8"	7"

**See drawing above.

15-W-4 and 15-P-4

No. of Bearing Bars and Nosing	Bearing Bar		**Bolt Hole Spacing "A"
	1/8"	3/16"	
	Tread Width		
6	6-1/16"	6-1/8"	2-1/2"
7	7"	7-1/16"	4-1/2"
8	7-15/16"	8"	4-1/2"
9	8-7/8"	8-15/16"	4-1/2"
10	9-13/16"	9-7/8"	7"
11	10-3/4"	10-13/16"	7"

**See drawing above.

Stair Tread Weights (per lineal inch of tread length)

19-W-4 and 19-P-4

No. of Bearing Bars and Nosing	Bearing Bar Size						
	Nosing	1/8" x 1"	1/8" x 1-1/4"	3/16" x 3/4"	3/16" x 1"	3/16" x 1-1/4"	3/16" x 1-1/2"
5	CP/DP	.29	.32	.31	.36	.41	.48
	CIA	.39	.42	.41	.46	.51	.56
6	CP/DP	.34	.38	.36	.43	.49	.55
	CIA	.43	.48	.46	.53	.59	.65
7	CP/DP	.38	.43	.41	.50	.57	.64
	CIA	.48	.53	.51	.59	.67	.74
8	CP/DP	43	.49	.46	.56	.65	.73
	CIA	.53	.59	.56	.66	.75	.83
9	CP/DP	.48	.55	.52	.63	.73	.83
	CIA	.58	.65	.62	.73	.83	.93
10	CP/DP	.53	.60	.58	.70	.81	.92
	CIA	.63	.70	.68	.80	.90	1.02

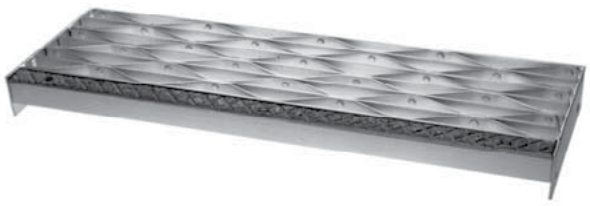
15-W-4 and 15-P-4

No. of Bearing Bars and Nosing	Bearing Bar Size						
	Nosing	1/8" x 1"	1/8" x 1-1/4"	3/16" x 3/4"	3/16" x 1"	3/16" x 1-1/4"	3/16" x 1-1/2"
6	CP/DP	.33	.37	.36	.43	.50	.56
	CIA	.43	.47	.46	.53	.60	.66
7	CP/DP	.38	.43	.41	.49	.57	.65
	CIA	.48	.53	.51	.59	.67	.75
8	CP/DP	.42	.48	.46	.55	.65	.74
	CIA	.52	.58	.56	.65	.75	.84
9	CP/DP	.47	.54	.51	.62	.73	.84
	CIA	.57	.64	.61	.72	.83	.93
10	CP/DP	.52	.59	.56	.68	.81	.92
	CIA	.62	.69	.66	.78	.91	1.02
11	CP/DP	.56	.65	.61	.75	.88	1.01
	CIA	.66	.74	.71	.85	.98	1.11

CP-Checkered Plate - DP-Dimple Plate - CIA-Cast Iron Abrasion - CAA-Cast Aluminum Abrasion

Steel / Riveted

Riveted (R)
Checker Plate Nosing (CP)



Riveted (R)
Cast Iron (CIA) or Cast Aluminum (CAA) Abrasive Nosing

Maximum Tread Lengths

Bearing Bar Size	Bearing Bar Spacing			
	1-1/4" (18 space)		3/4" (12 Space)	
	Plain	Serrated	Plain	Serrated
3/4" x 3/16"	2'-0"	1'-5"	2'-8"	1'-9"
1" x 1/8"	2'-7"	1'-11"	3'-0"	2'-1"
1" x 3/16"	2'-10"	2'-0"	4'-0"	2'-8"
1-1/4" x 1/8"	3'-7"	2'-7"	4'-2"	3'-0"
1-1/4" x 3/16"	3'-10"	2'-10"	5'-1"	4'-0"
1-1/2" x 3/16"	5'-2"	3'-10"	5'-6"	5'-1"

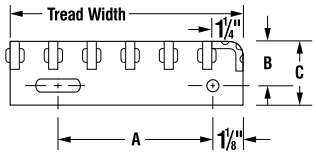
When tread length exceeds 5'-6", design tread for 300 lb. concentrated loads at 1/3 points. Maximum tread length based on 300 lb. concentrated load on front 5 in of tread at center of tread length and deflection limitation of 1/240 of length. Maximum lengths for serrated apply only if bearing bars are serrated.

End Plate Dimensions

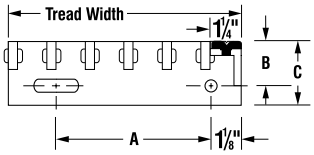
Grating Depth	"B" dimension	"C" dimension
up to 1-1/4"	1-3/4"	2-1/2"
* 1-1/2" to 1-3/4"	2-1/4"	3"

See Tread Width and Bolt Hole Spacing for 'A' dimension.
*and all aluminum

With Checkered Plate Nosing



With Checkered Plate Nosing



Tread Width and Bolt Hole Spacing

18-R-7

No. of Bearing Bars and Nosing	Bearing Bar Tread Width 1/8"	Bearing Bar Tread Width 3/16"	**Bolt Hole spacing "A"
5	6-3/8"	6-11/16"	2-1/2"
6	7-5/8"	8"	4-1/2"
7	8-7/8"	9-5/16"	4-1/2"
8	10-1/8"	10-5/8"	7"
9	11-3/8"	11-15/16"	7"
10	12-5/8"	13-1/4"	7"

**See drawing above

12-R-7

No. of Bearing Bars and Nosing	Bearing Bar Tread Width 1/8"	Bearing Bar Tread Width 3/16"	**Bolt Hole spacing "A"
6	5-3/4"	6-1/8"	2-1/2"
7	6-5/8"	7-1/16"	4-1/2"
8	7-1/2"	8"	4-1/2"
9	8-3/8"	8-15/16"	4-1/2"
10	9-1/4"	9-7/8"	7"
11	10-1/8"	10-13/16"	7"

**See drawing above

Stair Tread Weights (per lineal inch of tread length)

18-R-7

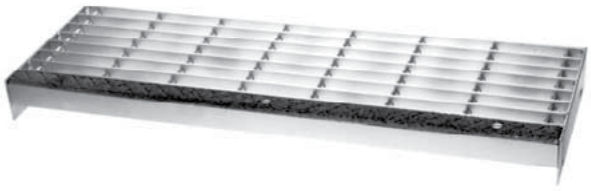
No. of Bearing Bars	Nosing	Bearing Bar Size 1/8" x 1"	1/8" x 1-1/4"	3/16" x 3/4"	3/16" x 1"	3/16" x 1-1/4"	3/16" x 1-1/2"
5	CP	.38	.41	.42	.48	.54	.59
	CIA	.48	.48	.54	.58	.63	.69
6	CP	.45	.49	.49	.57	.64	.71
	CIA	.55	.59	.62	.67	.74	.81
7	CP	.53	.57	.57	.66	.75	.84
	CIA	.63	.67	.70	.76	.85	.94
8	CP	.60	.65	.65	.75	.85	.96
	CIA	.70	.75	.79	.85	.95	1.06
9	CP	.67	.72	.73	.85	.96	1.08
	CIA	.77	.82	.88	.95	1.06	1.18
10	CP	.74	.80	.81	.94	1.07	1.20
	CIA	.84	.90	.95	1.04	1.17	1.30

12-R-7

No. of Bearing Bars	Nosing	Bearing Bar Size 1/8" x 1"	1/8" x 1-1/4"	3/16" x 3/4"	3/16" x 1"	3/16" x 1-1/4"	3/16" x 1-1/2"
6	CP	.45	.49	.47	.55	.61	.68
	CIA	.55	.59	.57	.65	.71	.78
7	CP	.52	.57	.55	.63	.71	.80
	CIA	.61	.67	.64	.73	.81	.89
8	CP	.58	.64	.62	.72	.81	.91
	CIA	.68	.74	.72	.82	.91	1.01
9	CP	.65	.72	.69	.81	.91	1.02
	CIA	.75	.82	.79	.91	1.01	1.12
10	CP	.72	.80	.77	.90	1.01	1.14
	CIA	.82	.90	.86	.99	1.11	1.24
11	CP	.79	.88	.84	.98	1.11	1.25
	CIA	.89	.97	.94	1.08	1.21	1.35

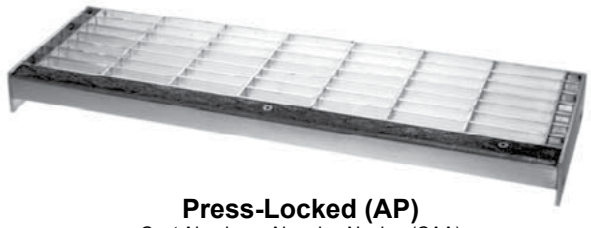
Aluminum / Rectangular Bar Swage-Locked & Press-Locked

Swage-Locked
Corrugated Aluminum Nosing (CORR) (SR)



Swage-Locked (SR)
Cast Aluminum Abrasive Nosing (CAA)

Press-Locked (AP)
Corrugated Aluminum Nosing (CORR)



Press-Locked (AP)
Cast Aluminum Abrasive Nosing (CAA)

Maximum Tread Lengths

Bearing Bar Size	Bearing Bar Spacing			
	1-3/16"	(19 space)	15/16"	(15 space)
	Plain	Serrated	Plain	Serrated
1" x 3/16"	2'-4"	1'-10"	2'-6"	2'-1"
1-1/4" x 3/16"	2'-10"	2'-4"	3'-1"	2'-6"
1-1/2" x 3/16"	3'-6"	2'-10"	3'-10"	3'-1"
1-3/4" x 3/16"	4'-3"	3'-6"	4'-8"	3'-10"

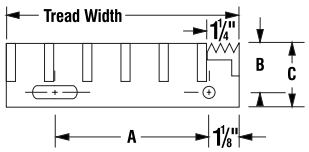
When tread length exceeds 5'-6", design tread for 300 lb. concentrated loads at 1/3 points. Maximum tread length based on 300 lb. concentrated load on front 5 in of tread at center of tread length and deflection limitation of 1/240 of length.

End Plate Dimensions

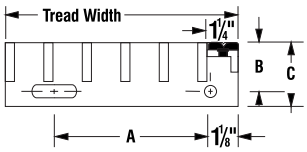
Grating Depth	"B" dimension	"C" dimension
up to 1-1/4"	1-3/4"	2-1/2"
*1-1/2" to 1-3/4"	2-1/4"	3"

See Tread Width and Bolt Hole Spacing for 'A' dimension.
* and all aluminum

With Checkered Plate Nosing



With Checkered Plate Nosing



Tread Width and Bolt Hole Spacing

19-W-4 and 19-P-4

No. of Bearing Bars and Nosing	Bearing Bar 3/16" Tread Width	**Bolt Hole Spacing "A"
5	6-3/16"	2-1/2"
6	7-3/8"	4-1/2"
7	8-9/16"	4-1/2"
8	9-3/4"	7"
9	10-15/16"	7"
10	12-1/8"	7"

**See drawing above.

15-W-4 and 15-P-4

No. of Bearing Bars and Nosing	Bearing Bar 3/16" Tread Width	**Bolt Hole Spacing "A"
6	6-1/8"	2-1/2"
7	7-1/16"	4-1/2"
8	8"	4-1/2"
9	8-15/16"	4-1/2"
10	9-7/8"	7"
11	10-13/16"	7"

**See drawing above.

Stair Tread Weights (per lineal inch of tread length)

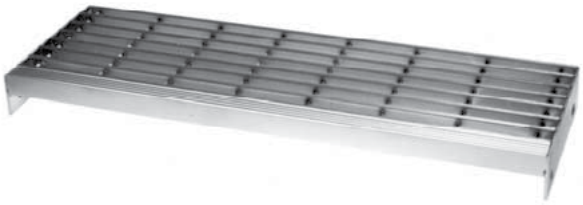
19-W-4 and 19-P-4

No. of Bearing Bars and Nosing	Nosing	Bearing Bar 1" x 3/16"	1-1/4" x 3/16"	1-1/2" x 3/16"	1-3/4" x 3/16"
5	CORR	.13	.15	.18	.19
	CAA	.17	.19	.21	.23
6	CORR	.16	.18	.21	.23
	CAA	.19	.21	.24	.27
7	CORR	.18	.21	.24	.27
	CAA	.22	.24	.28	.30
8	CORR	.21	.23	.28	.31
	CAA	.24	.27	.31	.34
9	CORR	.23	.27	.31	.35
	CAA	.26	.30	.34	.38
10	CORR	.25	.30	.35	.39
	CAA	.29	.33	.38	.42

15-SR-4 and 15-AP-4

No. of Bearing Bars and Nosing	Nosing	Bearing Bar 1" x 3/16"	1-1/4" x 3/16"	1-1/2" x 3/16"	1-3/4" x 3/16"
6	CORR	.15	.18	.20	.23
	CAA	.19	.21	.24	.26
7	CORR	.17	.20	.23	.26
	CAA	.21	.24	.27	.30
8	CORR	.20	.23	.27	.30
	CAA	.23	.26	.30	.33
9	CORR	.22	.26	.30	.34
	CAA	.25	.29	.33	.37
10	CORR	.24	.28	.33	.37
	CAA	.28	.32	.37	.41
11	CORR	.27	.31	.36	.41
	CAA	.30	.35	.40	.44

Aluminum / I-Bar Swage-Lock



Swage-Locked (SI)
Corrugated Aluminum Nosing (CORR)

Swage-Locked (SI)
Cast Aluminum Abrasive Nosing (CAA)

Maximum Tread Lengths

	Bearing Bar Spacing	
Bearing Bar Size	1-3/16" (19 space)	15/16" (15 space)
1" x 1/4"	2'-4"	2'-6"
1-1/4" x 1/4"	2'-10"	3'-1"
1-1/2" x 1/4"	3'-6"	3'-10"
1-3/4" x 1/4"	4'-3"	4'-8"

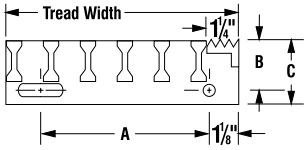
When tread length exceeds 5'-6", design tread for 300 lb. concentrated loads at 1/3 points. Maximum tread length based on 300 lb. concentrated load on front 5 in of tread at center of tread length and deflection limitation of 1/240 of length.

End Plate Dimensions

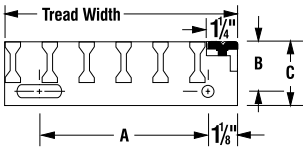
Grating Depth	"B" dimension	"C" dimension
up to 1-1/4"	1-3/4"	2-1/2"
*1-1/2" to 1-3/4"	2-1/4"	3"

See Tread Width and Bolt Hole Spacing for 'A' dimension.
* and all aluminum

With Checkered Plate Nosing



With Checkered Plate Nosing



Tread Width and Bolt Hole Spacing

19-SI-4		
No. of Bearing Bars and Nosing	Bearing Bar 1/4" Tread Width	**Bolt Hole Spacing "A"
5	6-1/4"	2-1/2"
6	7-7/16"	4-1/2"
7	8-5/8"	4-1/2"
8	9-13/16"	7"
9	11"	7"
10	12-3/16"	7"

**See drawing above.

15-SI-4		
No. of Bearing Bars and Nosing	Bearing Bar 1/4" Tread Width	**Bolt Hole Spacing "A"
6	6-3/16"	2-1/2"
7	7-1/8"	4-1/2"
8	8-1/16"	4-1/2"
9	9"	4-1/2"
10	9-15/16"	7"
11	10-7/8"	7"

**See drawing above.

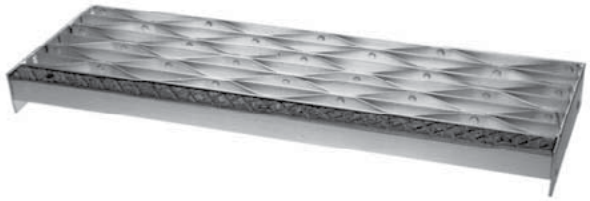
Stair Tread Weights (per lineal inch of tread length)

19-SI-4					
No. of Bearing Bars and Nosing	Bearing Bar				
	Nosing	1" x 1/4"	1-1/4" x 1/4"	1-1/2" x 1/4"	1-3/4" x 1/4"
5	CORR	.11	.13	.14	.15
	CAA	.15	.16	.18	.19
6	CORR	.13	.15	.17	.18
	CAA	.17	.18	.20	.22
7	CORR	.15	.17	.19	.21
	CAA	.19	.20	.23	.24
8	CORR	.17	.19	.22	.24
	CAA	.21	.23	.25	.27
9	CORR	.19	.21	.24	.27
	CAA	.23	.25	.28	.30
10	CORR	.21	.24	.27	.30
	CAA	.25	.27	.30	.33

15-SI-4					
No. of Bearing Bars and Nosing	Bearing Bar				
	Nosing	1" x 1/4"	1-1/4" x 1/4"	1-1/2" x 1/4"	1-3/4" x 1/4"
6	CORR	.13	.14	.16	.18
	CAA	.16	.18	.20	.21
7	CORR	.15	.16	.19	.20
	CAA	.18	.20	.22	.24
8	CORR	.16	.18	.21	.23
	CAA	.20	.22	.24	.26
9	CORR	.18	.21	.23	.26
	CAA	.22	.24	.27	.29
10	CORR	.20	.23	.26	.28
	CAA	.23	.26	.29	.32
11	CORR	.22	.25	.28	.31
	CAA	.25	.28	.32	.35

Aluminum / Riveted

Riveted (R)
Corrugated Aluminum Nosing (CORR)



Riveted (R)
Cast Aluminum Abrasive Nosing (CAA)

Maximum Tread Lengths

Bearing Bar Size	Bearing Bar Spacing			
	1-1/4" (18 space)		3/4" (12 space)	
	Plain	Serrated	Plain	Serrated
3/4" x 3/16"	1'-7"	1'-3"	2'-1"	1'-5"
1" x 1/8"	2'-0"	1'-6"	2'-3"	1'-8"
1" x 3/16"	2'-2"	1'-7"	2'-6"	2'-1"
1-1/4" x 1/8"	2'-6"	2'-0"	2'-8"	2'-3"
1-1/4" x 3/16"	2'-7"	2'-2"	3'-1"	2'-6"
1-1/2" x 3/16"	3'-2"	2'-7"	3'-10"	3'-1"

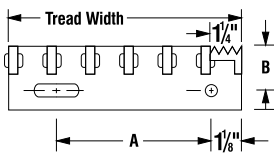
When tread length exceeds 5'-6", design tread for 300 lb. concentrated loads at 1/3 points. Maximum tread length based on 300 lb. concentrated load on front 5 in of tread at center of tread length and deflection limitation of 1/240 of length.

End Plate Dimensions

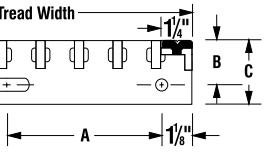
Grating Depth	"B" dimension	"C" dimension
up to 1-1/4"	1-3/4"	2-1/2"
*1-1/2" to 1-3/4"	2-1/4"	3"

See Tread Width and Bolt Hole Spacing for 'A' dimension.
* and all aluminum

With Checkered Plate Nosing



With Checkered Plate Nosing



Tread Width and Bolt Hole Spacing

18-AR-7

No. of Bearing Bars and Nosing	Bearing Bar Tread Width 1/8"	Bearing Bar Tread Width 3/16"	**Bolt Hole Spacing "A"
5	6-3/8"	6-11/16"	2-1/2"
6	7-5/8"	8"	4-1/2"
7	8-7/8"	9-5/16"	4-1/2"
8	10-1/8"	10-5/8"	7"
9	11-3/8"	11-15/16"	7"
10	12-5/8"	13-1/4"	7"

**See drawing above.

12-AR-7

No. of Bearing Bars and Nosing	Bearing Bar Tread Width 1/8"	Bearing Bar Tread Width 3/16"	**Bolt Hole Spacing "A"
6	5-3/4"	6-1/8"	2-1/2"
7	6-5/8"	7-1/16"	4-1/2"
8	7-1/2"	8"	4-1/2"
9	8-3/8"	8-15/16"	4-1/2"
10	9-1/4"	9-7/8"	7"
11	10-1/8"	10-13/16"	7"

**See drawing above.

Stair Tread Weights (per lineal inch of tread length)

18-AR-7

No. of Bearing Bars and Nosing	Nosing	Bearing Bar 1/8" x 1"	1/8" x 1-1/4"	3/16" x 3/4"	3/16" x 1"	3/16" x 1-1/4"	3/16" x 1-1/2"
5	CORR	.14	.15	.15	.18	.20	.22
	CAA	.18	.18	.20	.22	.23	.26
6	CORR	.17	.18	.18	.21	.24	.26
	CAA	.20	.22	.23	.25	.27	.30
7	CORR	.20	.21	.21	.24	.28	.31
	CAA	.23	.25	.26	.28	.32	.35
8	CORR	.22	.24	.24	.28	.32	.36
	CAA	.26	.28	.29	.32	.35	.39
9	CORR	.25	.27	.27	.32	.36	.40
	CAA	.29	.30	.33	.35	.39	.44
10	CORR	.27	.30	.30	.35	.40	.44
	CAA	.31	.33	.35	.39	.43	.48

12-AR-7

No. of Bearing Bars and Nosing	Nosing	Bearing Bar 1/8" x 1"	1/8" x 1-1/4"	3/16" x 3/4"	3/16" x 1"	3/16" x 1-1/4"	3/16" x 1-1/2"
6	CORR	.17	.18	.17	.20	.23	.25
	CAA	.20	.22	.21	.24	.26	.29
7	CORR	.19	.21	.20	.23	.26	.30
	CAA	.23	.25	.24	.27	.30	.33
8	CORR	.21	.24	.23	.27	.30	.34
	CAA	.25	.27	.27	.30	.34	.37
9	CORR	.24	.27	.26	.30	.34	.38
	CAA	.28	.30	.29	.34	.37	.41
10	CORR	.27	.30	.28	.33	.37	.42
	CAA	.30	.33	.32	.27	.41	.46
11	CORR	.29	.33	.31	.36	.41	.46
	CAA	.33	.36	.35	.40	.45	.50

ANCHORING DETAILS

Clip Assemblies

Saddle Clip

The saddle clip bridges two bearing bars and is attached with 1/4” self-tapping bolt, 1/4” self threader, 1/4” weld stud hole is drilled through supporting flange. Available for 15/16”, 1-3/16”, and 1-3/8” bearing bar spacings (15,19 and 22 space) in carbon and stainless steel. Fasteners should be specified separate from clips.

Gratefast Clip

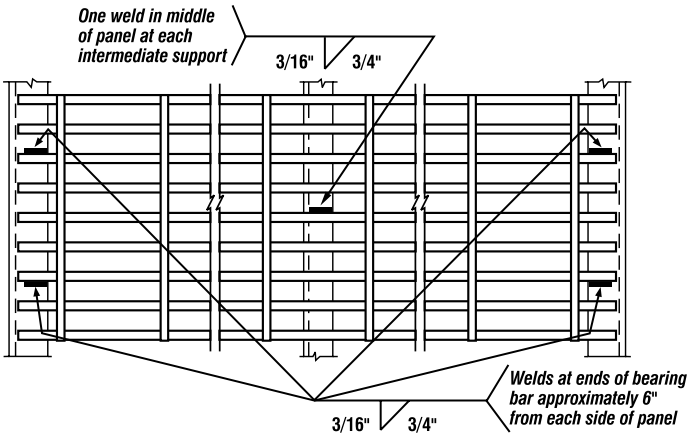
G-Clip

Fastens grating to a horizontal-facing steel structural member edge.

The model GG- describes an assembly of fastener parts identical but for materials of construction, that each contain three common parts.

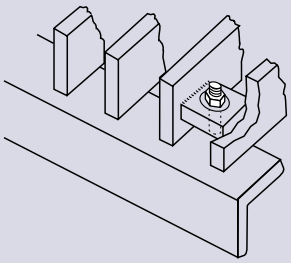
1. unique top for better holding strength and to suit 19W4 grating
2. patented bottom connects to the beam underside
3. a hex-headed cap screw connects the two, and its length suits the grating height being installed.

Attachment Locations



Attachments should be placed at intermediate supports in the middle of the panels and at four bearing bar ends, 6” from each side of panel. Welds should be 3/16” fillet welds, 3/4” long. Heavy-Duty grating may require additional welding to meet application needs.

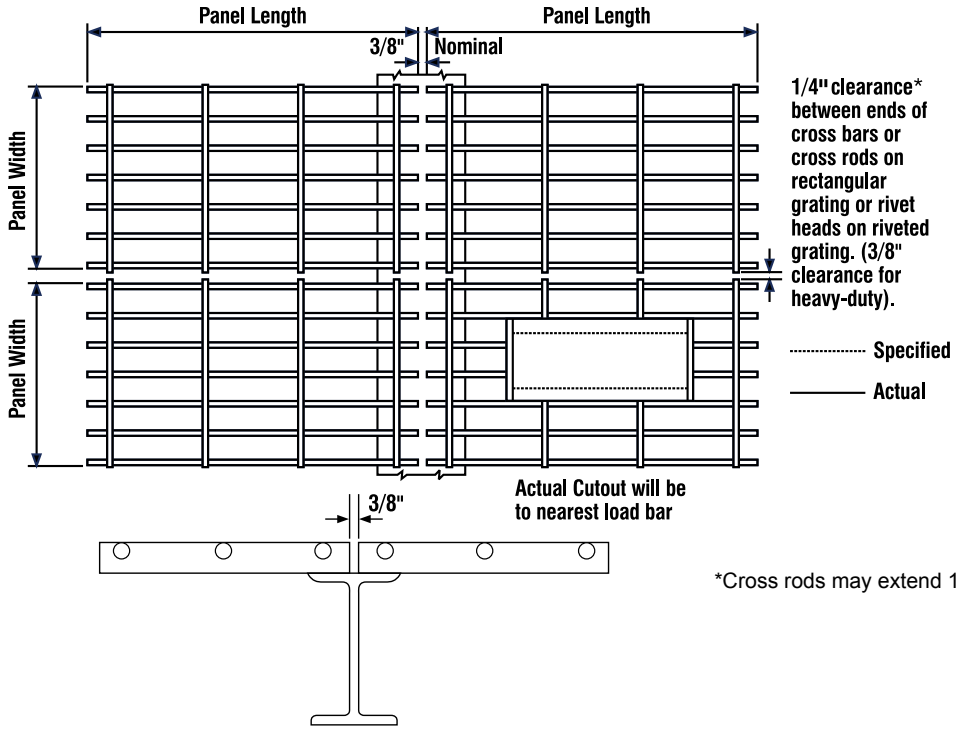
Weld Lugs



Weld lugs may be used for installations where grating is subject to removal. Weld lugs are shop fabricated and must be specified at time of grating order. Fasteners are 1/4” minimum and supplied by others. Location is the same as “Attachment Locations” diagram.

INSTALLATION CLEARANCES

Panel To Panel & Cutout Clearances

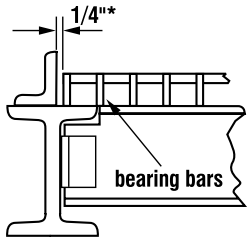


*Cross rods may extend 1/8" from bearing bars.

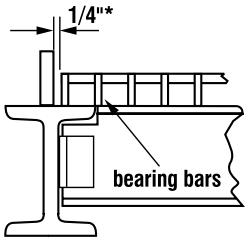
Support Clearances

*1/4" is recommended but dimension may vary due to bearing bar spacing. Dimension should not exceed bearing bar spacing.

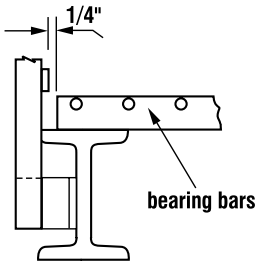
I-Beam and Angle Curb



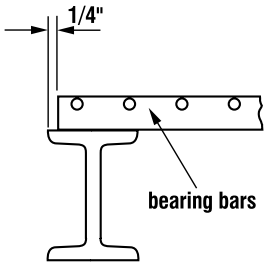
I-Beam and Kickplate



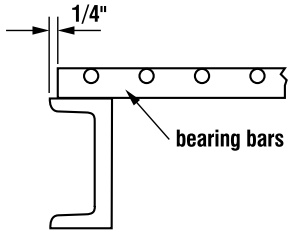
I-Beam and Handrail



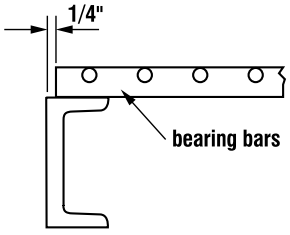
I-Beam



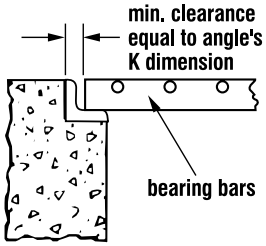
Channel Toed Out



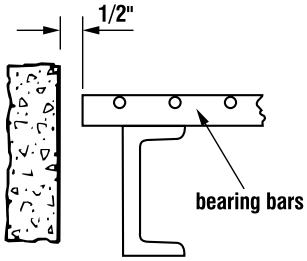
Channel Toed In



Angle in Concrete



Concrete

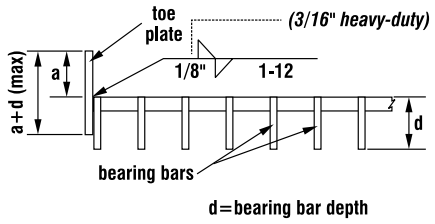


Toe Plates

Maximum depth of toe plate is (a+d). It should not extend below the bearing bars. The minimum recommended dimension for “a”, the projection of toe plate above the grating, is 4”.

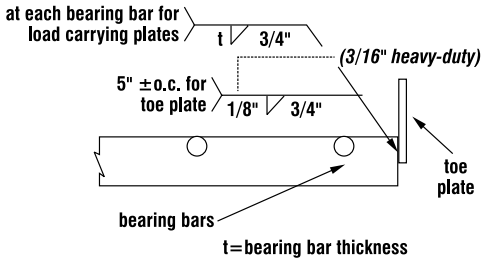
Attachment to Length of Bearing Bar

Toe plate to be welded with alternating 1/8” fillet welds, 1” long every 12”.



Attachment to End of Bearing Bar

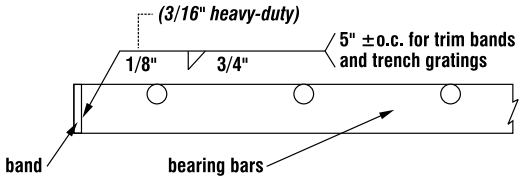
Load carrying toe plates to be welded at each bearing bar with a fillet weld the size of the bearing bar thickness (t), 3/4” long. Non-load carrying toe plates to be welded to bearing bars with 1/8” fillet weld (3/16” for heavy duty), 3/4” long every 5”.



Banding

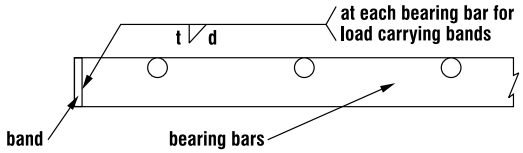
Standard Trim Band

End band to be welded with 1/8” fillet welds (3/16” for Heavy-Duty), 3/4” long every 5”.



Load Banding (must specify)

Load carrying end band to be welded with fillet weld the size of bearing bar thickness (t) and the length of bearing bar depth (d) at each bearing bar. This spec is for standard grating. Refer to NAAMM MBG 532 for Heavy-Duty spec.

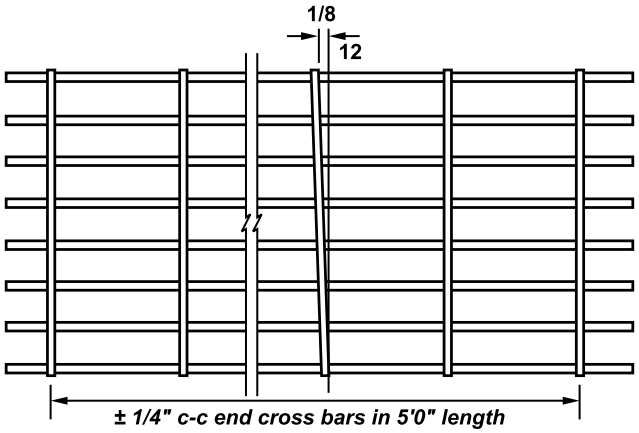


MANUFACTURING TOLERANCES

Bearing Bar & Cross Rod Tolerances

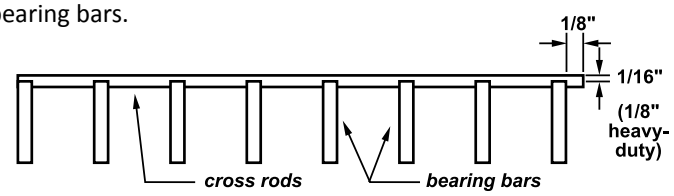
Cross Rod Spacing and Alignment

Cross rods should not vary more than 1/8 in 12 in either direction from perpendicular alignment with bearing bars. The tolerance of the cross bar spacing for 5' in length is ±1/4".



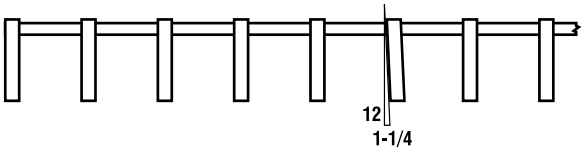
Cross Rod Position

The top of the cross rod should not project more than 1/16" above the top of the bearing bars for standard grating (1/8" for heavy-duty) and should not extend more than 1/8" from side of bearing bars.



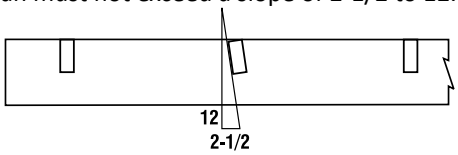
Bearing Bar Lean

Bearing bar lean must not exceed a slope of 1-1/4 to 12.



Cross Bar Lean

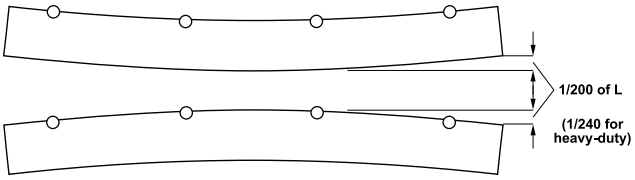
Cross bar lean must not exceed a slope of 2-1/2 to 12.



Panel Tolerances

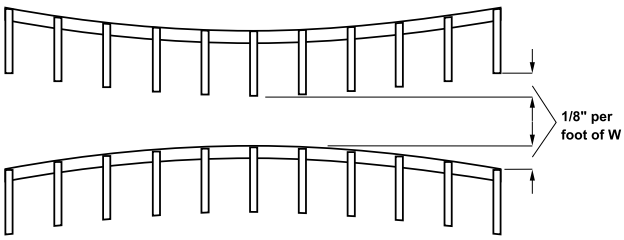
Longitudinal Bow

Longitudinal bow should be less than 1/200 of the length for standard grating (1/240 for Heavy-Duty).



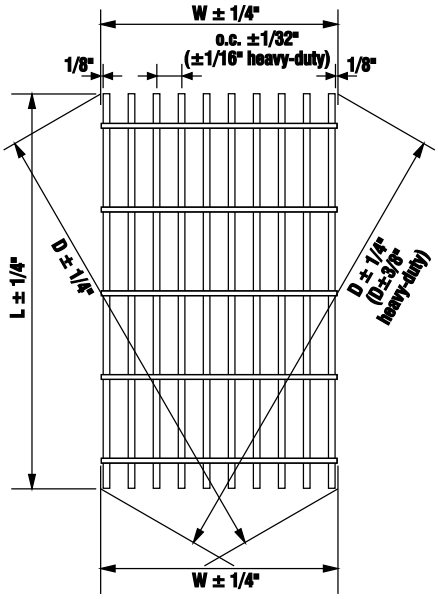
Tranverse Bow

Before banding, the tranverse bow should be less than 1/8" per foot of width.



Overall Dimensions and Squareness

D= Overall diagonal dimension
W= Length of cross rods including extensions outside of bearing bars
L= Length of bearing bars



GLOSSARY

Anchor - A device by which grating is attached to its supports.

Band - A flat bar welded to a side or end of a grating panel, or along the line of a cutout, and extending neither above or below the bearing bars.

Load-carrying Band-A band used in a cutout to transfer the load from unsupported bearing bars in the cutout to the supported bearing bars.

Trim Band-A band which carries no load, but is used chiefly to improve appearance and to protect open ends of bearing bars.

Bearing Bars - Load carrying bars extending in the direction of the grating span.

Bearing Bar centers (spacing) - The distance center to center of the bearing bars.

Carriers (Punched Plate) - Flats or angles which are welded to the grating panel and nosing of a stair tread and are attached to a stair stringer to support the tread.

Clear opening - The distance between faces of bearing bars in a rectangular grating, or between a bent connecting bar and bearing bar in a riveted grating.

Cross Rods or Cross Bars - The connecting rods or bars which extend perpendicular across bearing bars. where they intersect the bearing bars, they are welded, forged or mechanically locked to them.

Cross Rod or Cross Bar centers (spacing) - The distance center to center of the cross rods or bars.

Curved cut - A cutout following a curved pattern.

Cutout - An area of grating removed to clear an obstruction or to permit pipes, ducts, columns, etc. to pass through the grating.

End Gauge - The distance from the centerline of the last cross rod to the end of the panel.

Finish - The coating, usually paint or galvanizing, which is applied to the grating.

Grating - An open grid assembly of metal bars in which the bearing bars, running in one direction, are spaced by rigid cross bars attached to them.

I-Bar - An extruded aluminum bearing bar having a cross sectional shape resembling the letter "**I**".

Length - The dimension of a grating panel measured parallel to the bearing bars.

Nosing - A special L-section member serving as the front or leading edge of a stair tread, or of grating at the head of a stair. Usually manufactured of checkered plate, cast iron or aluminum abrasive material.

Press-Locked - A method for manufacturing grating where the bearing bars are locked in position by a specialized press fit with cross bar deformation instead of riveting or welding.

Radially Cut Grating - Rectangular grating which is cut into panels shaped as annular segments, for use in circular or annular areas.

Reticuline Bar - A sinuously bent connecting bar extending between two adjacent bearing bars, alternately contacting and being riveted to each.

Reversible Grating - Grating so constructed that it may be installed either side up, with no difference in appearance or carrying capacity.

Rivet Centers - The distance center to center of rivets along one bearing bar.

Riveted Grating - Grating composed of straight bearing bars and bent connecting bars which are joined at their contact points by riveting.

Serrated Grating - Grating which has the top surfaces of the bearing bars notched for slip resistance.

Span of Grating - The distance between points of grating support, or the direction of this dimension. It must always be measured parallel to the bearing bars.

Straight Cut - That portion of the cut edge or cutout of grating which follows a straight line.

Swage-Locked - Grating manufactured by altering the cross sectional shape of a metal cross bar by applying pressure through dies.

Toeplate - A flat bar attached flat against the outer edge of a grating panel or rear edge of tread, and projecting above the top surface of grating or tread to form a lip or curb.

Tread - A panel of grating having carrier end plates and nosing attached by welding, and designed specifically to serve as a stair tread.

Welded Grating - Grating in which the bearing bars and cross bars are joined at their intersections by resistance welding or conventional had welding. A resistance weld is obtained by the heat produced by the resistance of the material to the flow of electric current causing the material to become plastic. At this point, the pressure on the cross bar is rapidly increased causing the cross bar to penetrate the bearing bar so that they are fused together.

Width- The overall dimension of a grating panel, measured perpendicular to the bearing bars.

Design Nomenclature

b = thickness of rectangular bearing bar, inches

d = depth of bearing bar, inches

A_w = center to center distance between bearing bars in welded and press-locked gratings, inches

C = concentrated load at midspan = 4FSw/L pounds per foot of width (pfw)

D_c = deflection under concentrated load = $CL^3/48$ Elw inches

E = modulus of elasticity, pounds per square inch (psi)

Steel: E = 29,000,000 psi = 29 $(10)^8$

Stainless Steel: E = 28,000,000 psi = 28 $(10)^8$

Aluminum: E = 10,000,000 psi = $(10)^7$

F = allowable fiber unit stress, psi

ASTM A-569: F = 18,000 psi (Steel, Carbon Hot Rolled Sheet and Strip, Commercial Quality AISI 1020)

ASTM A-36: F = 20,000 psi (Structural Steel (Bars only))

ASTM A167: F = 20,000 psi (Type 304L and 316, Stainless Steel)

F = 16,500 psi (Type 304L and 316L, Stainless steel)

ASTM B-221: F = 12,000 psi (6061-T6 Alloy)

F = 10,000 psi (6063-T6 Alloy)

I_b = moment of inertia of a rectangular bar = $bd^3/12$ in^4

I_w = moment of inertia of grating per foot of width = KI in^4

K = number of bearing bars per foot of grating width = $12/A_w$

L = span of grating between reaction points, inches

M_b = maximum bending moment of bearing bar, in-lbs.

M_w = maximum bending moment of grating per foot of width, in-lbs.

M_u = maximum bending moment under uniform load = $FS_w = UI^2/96$ in-lbs.

M_c = maximum bending moment under concentrated load = FS_w = CL/4 in-lbs.

S_b = section modulus of a rectangular bar = $bd^2/6$ $in.^3$

S_w = section modulus per foot of grating width = KS_b $in.^3$

U = uniform load = $96fS_w/L^2$ psf = $96M/L^2$ pounds per square foot (psf)

Sample Calculation: Steel

Type of Grating = 19-W-4-63 welded carbon steel grating

Size of Bar = 1-1/2 x 3/16

Span = 54 inches

A_w = bearing bar spacing = 1.1875 inches

K = number of bearing bars in panel width = $12/A_w$ = 12/1.1875 = 10.105

F = allowable fiber stress = 18,000 psi

E = 29,000,000 psi

S_w = section modulus of grating per foot of width = kbd2/6 = 10.105 x 0.1875 $(1.5)^2/6$ = 0.711 $in.^3$

I_w = moment of inertia of grating per foot of width = $Kbd^3/12$ = 10.105 x 0.1875 $(1.5)^3/12$ = 0.533 $in.^3$

M_w = maximum bending moment for grating per foot of width = FSw = 18,000 x 0.711 = 12,800 in.- lbs.

Allowable Concentrated Load and Deflection for 19-W-4-63:

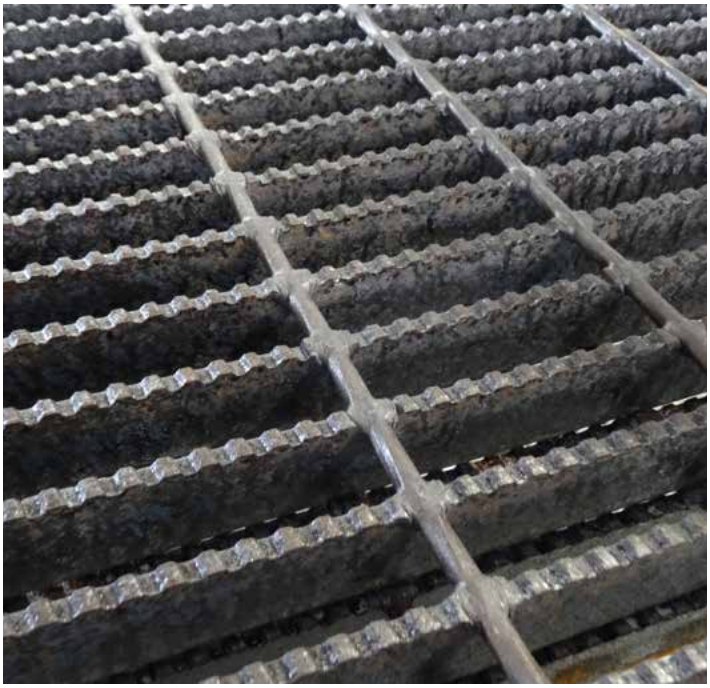
C = allowable load = $4M_w/L$ = 4x 12,800/54 = 948 pfw

D_c = deflection = $Cl^3/48EI_W$ = 948 x $54^3/(48x29x10^6$ x 0.533) = 0.201 inches

Allowable Uniform Load and Deflection for 19-W-4-63:

U = allowable load = $96M_w/L^2$ = 96 x $12{,}800/54^2$ = 421 psf

D_u = deflection = $5UL^4/4608EI_w$ = 5 x 421 x $54^4/(4608$ x 29 x 10^6 x 0.533) = 0.251 inches)



Sample Calculation: Aluminum

For a span of 5'-0", the minimum size bearing bar to sustain 225 psf load is:

Type of Grating = 19-SI-4-64 aluminum swage-locked grating

Size of I-Bar = 1-1/2 x 1/4

Equivalent Rectangular Bar for calculation purposes = 1-1/2 x 3/16 (see note 3)

Span = 60 inches

$\mathbf{A_w}$ = bearing bar spacing = 1.1875 inches

K = number of bearing bars in panel width = 12/Aw = 12/1.1875 = 10.105

F= allowable fiber stress = 12,000 psi

E = 10,000,000 psi

$\mathbf{S_w}$ = section modulus of grating per foot of width = $Kbd^2/6$ = 10.105 x 0.1875 $(1.5)^2/6$ = 0.711 in^3

$\mathbf{I_w}$ = moment of inertia of grating per foot of width = $Kbd^3/12$ = 10.105 0.1875 (1.5)3/12 = 0.533 in^3

$\mathbf{M_w}$= maximum bending moment for grating per foot of width = FS_w = 12,000 x 0.711 = 8,532 in-lbs.

Allowable Uniform Load and Deflection for 19-SI-4-64:

U = allowable load = $96Mw/L^2$ = 96 x Mw/602 = 96 x 12,000 x 0.711/602 = 227.5 psf

$\mathbf{D_u}$ = deflection = $5UL^4/4608EIg$ = 5 x 227.5 x 604/(4608 x 10 x 10^6 x 0.533) = 0.6 inches

Deflection is directly proportional to load (actual load/allowable load):

D_{actual} = D_u x $U_{actual}/U_{allowable}$ = 0.6 x 225/227.5 = 0.5934 inches

D_{actual} = 0.5934 inches > recommended limitation of deflection = L/240=.25 inches

Try a grating with a larger moment of inertia to reduce deflection:

19-SI-4-64 (1-1/2 x 3/16 equivalent rectangular bar):

If D_u = .25 inches, then I_w required = $5UL^4/4608EDu$ = 5 x 225 x 604/(4608 x 10 x 106 x .25) = 1.2656 in^4

Using a larger size: 19-SI-4-94 (Rectangular bar equivalent = 2-1/4 x 3/16)

$\mathbf{I_w}$ = K x I_b = 10.105 x 0.1780 = 1.799 in^4

Allowable Uniform Load and Deflection for 19-SI-4-94:

U = allowable load = 512 lbs.

D = deflection = $5UL^4/4608EI_g$ = 5 x 512 x 60^4/(4608 x 10 x 10^6 x 1.799) = 0.40 inches

Deflection is directly proportional to load (actual load/allowable load):

$\mathbf{D_u}$ = Du x $U_{actual}/U_{allowable}$ = 0.40 (225)/512 = 0.176 inches
OK deflection < L/240 (.25 inches)

Notes:

1. For additional information, see NAAMM's MBG-534, Engineering Design Manual
2. Uniform loads in these examples and in the standard load tables include the weight of the gratings. In designing for uniform loads, the weight of the grating, as well as any other dead load, must be added.
3. Aluminum I-Bar Grating Design Information

I-Bar Size	Comparable Rectangular Bar Size	Area (in2)	Weight (plf)	I (in4)	S (in3)
1" x 1/4"	1" x 3/16"	.120	.144	.0156	.0313
1-1/4" x 1/4"	1-1/4" x 3/16"	.150	.180	.0305	.0488
1-1/2" x 1/4"	1-1/2" x 3/16"	.180	.216	.0507	.0703
1-3/4" x 1/4"	1-3/4" x 3/16"	.210	.252	.0837	.0957
2" x 1/4"	2" x 3/16"	.240	.288	.1250	.1250
2-1/4" x 1/4"	2-1/4" x 3/16"	.270	.324	.1780	.1582
2-1/2" x 1/2"	2-1/2" x 3/16"	.300	.360	.2441	.1953

This table is to be used by engineers to select aluminum I-bar sizes through hand calculations. In most cases, the Load and Span tables in the front of his catalog can be used for product selection.

Other Calculations

For partially distributed uniform loads, forklift and other wheeled loads (carts, pallet jacks, etc.), and other load calculations, contact Marco's engineering departments for assistance.

SAFETY GRATING

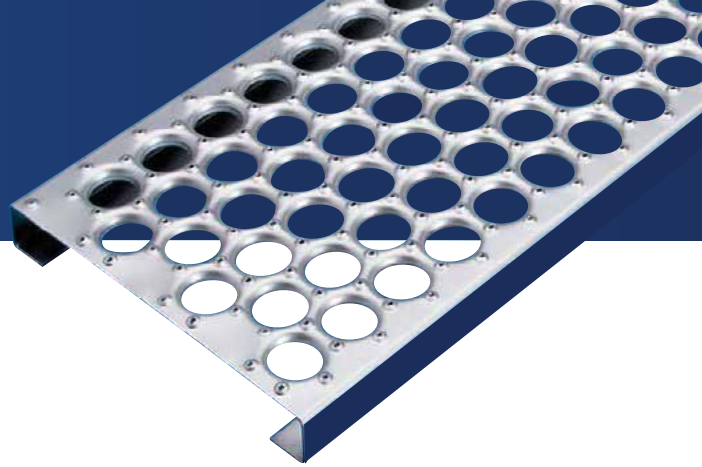
Perfo Grip Safety Grating has a unique pattern and is formed by a cold forming process which produces raised, perforated buttons and debossed holes. The result is a perforated safety grating which offers maximum slip protection, longer lasting performance and open area for flow of air, hear and light in nearly all conditions and in all directions.

Grip Strut Safety Grating is a one-piece metal plank grating manufactured by a cold forming process in the shape of a channel. These nonslip diamond serrated surfaces are ideal for inside or outside locations where mud, ice, snow, oil and detergents can create hazardous walking conditions. The openings are small enough to catch most falling tools and other dangerous objects while the open design is convenient for cleaning.

Grate-Lock® Grating is an easy-to-install system of interlocking grating planks, treads and accessories. The cost-saving design improves loading performance and is available in many sizes and gauges. Interlocking sections provide strength for extra wide designs. Grate-Lock® is available textured for a safer working surface or non-textured for wheeled traffic or rack decking.

Tread-Grip® Products are for industrial applications and provide non-slip gripping surfaces that exceed all Federal Specifications for slip resistance and our quality system is certified to the ISO 9002 specification. These perforated-button treads make the difference. This flooring is designed and produced to retain a larger percent of its original non-slip characteristics over a longer period of time than other types of surfaces that rely on “outside” corners to provide friction.

PERFO GRIP® GRATING

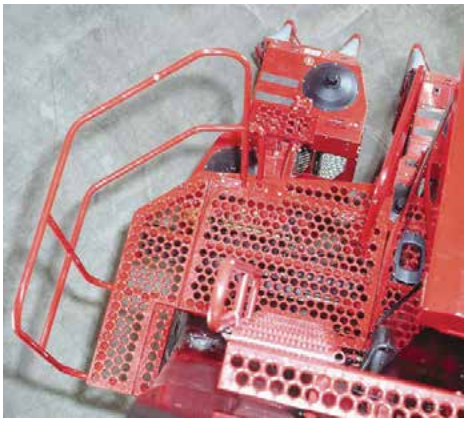


Standard Stock Size Channels

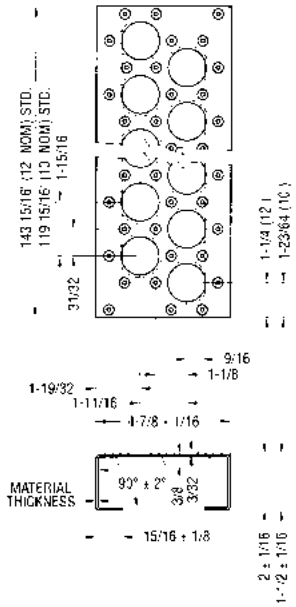
Standard Sizes:

- Pre-Galvanized or HRP&O Steel
- 13 and 11 Gauge
- .125” 5052-H32 Aluminum
- 10’ or 12’ Lengths

Width	Channel Height	13 Gauge Steel Wt./ln. ft.	11 Gauge Steel Wt./ln. ft.	Aluminum Wt./ ln. ft.
5”	1-1/2”	2.56	3.41	—
	2”	2.87	3.82	1.36
7”	1-1/2”	3.25	4.33	—
	2”	3.25	4.33	1.55
10”	1-1/2”	4.02	5.36	—
	2”	4.02	5.36	1.91
12”	1-1/2”	4.40	5.87	—
	2”	4.40	5.87	2.09
18”	1-1/2”	5.63	7.50	—
	2”	5.63	7.50	2.67
24”	1-1/2”	—	—	—
	2”	—	9.45	—



5” Wide Channel



Safe Allowable Design Loads

Allowable Loads and Deflections:

U – uniform load (lb./sq.ft.)

C – concentrated load (lb.)

D – deflection (in.)

Spans to the left of heavy line produce a deflection of 1/4” or less under a uniform load of 100 lb./sq.ft.

Material	Plank Width In.	Channel Depth In.	Weight lb./lin. ft.		Span 2’0”	2’6”	3’0”	3’6”	4’0”	4’6”	5’0”	5’6”	6’0”	6’6”	7’0”	7’-6”	8’0”	9’0”	10’0”	11’0”	12’0”
Steel 13 ga.	5	1-1/2	2.56	U	2228	1426	990	727	557	440	356	295	248	211	182	154	139	110	89	74	62
				D	0.058	0.091	0.130	0.177	0.232	0.293	0.362	0.438	0.522	0.612	0.710	0.837	0.927	1.174	1.449	1.753	2.086
				C	928	743	619	530	464	413	371	338	309	286	265	244	232	206	186	169	155
				D	0.046	0.072	0.104	0.142	0.185	0.235	0.290	0.351	0.417	0.490	0.568	0.669	0.742	0.939	1.159	1.402	1.669
		2	2.87	U	2491	2039	1416	1040	796	629	510	421	354	302	260	221	199	157	127	105	88
				D	0.033	0.065	0.094	0.128	0.167	0.211	0.261	0.316	0.376	0.441	0.511	0.603	0.668	0.845	1.043	1.263	1.503
				C	1304	1043	869	745	652	579	521	474	435	401	372	343	326	290	261	237	217
				D	0.033	0.052	0.075	0.102	0.134	0.169	0.209	0.253	0.301	0.353	0.409	0.482	0.534	0.676	0.835	1.010	1.202
Steel 11 ga.	5	1-1/2	3.41	U	2832	1812	1259	925	708	559	453	374	315	268	231	196	177	140	113	94	79
				D	0.055	0.086	0.124	0.169	0.221	0.279	0.345	0.417	0.496	0.582	0.676	0.796	0.882	1.117	1.379	1.668	1.985
				C	1172	937	781	670	586	521	469	426	391	361	335	308	293	260	234	213	195
				D	0.044	0.069	0.099	0.135	0.176	0.223	0.276	0.334	0.397	0.466	0.540	0.637	0.706	0.893	1.103	1.588	1.588
		2	3.82	U	4278	2738	1901	1397	1070	845	685	566	475	405	349	296	267	211	171	141	119
				D	0.044	0.069	0.100	0.136	0.178	0.225	0.278	0.336	0.400	0.469	0.544	0.642	0.711	0.900	1.111	1.344	1.599
				C	1738	1390	1159	993	869	772	695	632	579	535	497	457	435	386	348	316	290
				D	0.036	0.056	0.080	0.109	0.142	0.180	0.222	0.269	0.320	0.375	0.435	0.513	0.569	0.720	0.889	1.075	1.280
Alum. Alloy 5052 125”	5	2	1.36	U	3124	1999	1388	1020	781	617	500	413	347	296	255	216	195	154	125	103	87
				D	0.091	0.142	0.204	0.278	0.363	0.459	0.567	0.686	0.817	0.958	1.112	1.310	1.452	1.837	2.268	2.745	3.266
				C	1270	1016	846	725	635	564	508	462	423	391	363	334	317	282	254	231	212
				D	0.073	0.114	0.164	0.223	0.292	0.369	0.456	0.552	0.657	0.771	0.894	1.054	1.168	1.478	1.824	2.207	2.627

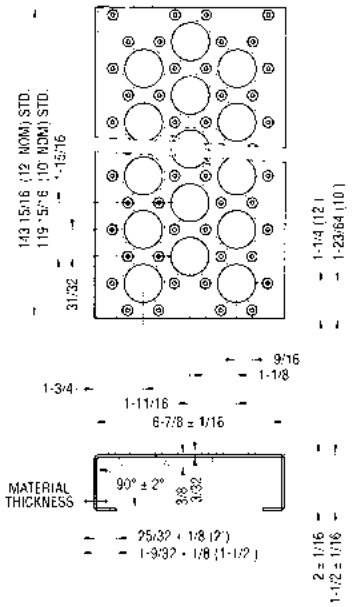
Engineering Data For Both Channels

Material		Channel Depth, In.	$Sxin^3$	$Ixin^4$
Steel	13 ga.	1-1/2 2	0.282 0.396	0.199 0.388
	11 ga.	1-1/2 2	0.356 0.528	0.264 0.486
Aluminum Alloy	.125”	2	0.553	0.502

Strut Loading

Material		Type Load	Load	Defl., In.
Steel	13 ga.	U C	2491 1519	0.011 0.027
	11 ga.	U C	4278 2557	0.012 0.027
Aluminum Alloy	.125”	U C	3124 1821	0.032 0.054

7” Wide Channel



Safe Allowable Design Loads

Allowable Loads and Deflections:

U – uniform load (lb./sq.ft.)

C – concentrated load (lb.)

D – deflection (in.)

Spans to the left of heavy line produce a deflection of 1/4” or less under a uniform load of 100 lb./sq.ft.

Material	Plank Width In.	Channel Depth In.	Weight lb./lin. ft.		Span 2’0”	2’6”	3’0”	3’6”	4’0”	4’6”	5’0”	5’6”	6’0”	6’6”	7’0”	7’-6”	8’0”	9’0”	10’0”	11’0”	12’0”
Steel 13 ga.	5	1-1/2	3.25	U	1760	1177	818	601	460	363	294	243	204	174	150	127	115	91	74	61	51
				D	0.050	0.082	0.118	0.161	0.210	0.266	0.328	0.397	0.472	0.554	0.643	0.758	0.840	1.063	1.312	1.588	1.890
				C	1073	858	715	613	537	477	429	390	358	330	307	282	268	238	215	195	179
				D	0.042	0.066	0.094	0.129	0.168	0.213	0.262	0.318	0.378	0.444	0.514	0.606	0.672	0.850	1.050	1.270	1.512
		2	3.25	U	1796	1466	1018	748	573	453	367	303	255	217	187	159	143	113	92	76	64
				D	0.033	0.067	0.096	0.131	0.170	0.216	0.266	0.322	0.384	0.450	0.522	0.615	0.682	0.863	1.066	1.289	1.534
				C	1016	1016	867	743	650	578	520	473	433	400	371	342	325	289	260	236	217
				D	0.027	0.052	0.077	0.104	0.136	0.173	0.213	0.258	0.307	0.360	0.418	0.492	0.546	0.690	0.852	1.031	1.228
Steel 11 ga.	5	1-1/2	4.33	U	2356	1508	1047	769	589	465	377	311	262	223	192	163	147	116	94	78	65
				D	0.051	0.080	0.116	0.158	0.206	0.260	0.321	0.389	0.463	0.543	0.630	0.743	0.823	1.042	1.286	1.556	1.852
				C	1350	1080	900	771	675	600	540	491	450	415	386	355	337	300	270	245	225
				D	0.041	0.064	0.093	0.126	0.165	0.208	0.257	0.311	0.370	0.435	0.504	0.594	0.658	0.833	1.029	1.245	1.481
		2	4.33	U	2736	1751	1216	893	684	540	438	362	304	259	223	189	171	135	109	90	76
				D	0.040	0.063	0.091	0.123	0.161	0.204	0.252	0.305	0.363	0.426	0.494	0.582	0.645	0.816	1.008	1.220	1.451
				C	1538	1288	1073	920	805	715	644	585	537	495	460	424	402	358	322	293	268
				D	0.034	0.050	0.073	0.099	0.129	0.163	0.202	0.244	0.290	0.341	0.395	0.466	0.516	0.653	0.806	0.976	1.161
Alum. Alloy 5052 125”	5	2	1.55	U	2270	1453	1009	741	568	448	363	300	252	215	185	157	142	112	91	75	63
				D	0.088	0.137	0.198	0.269	0.351	0.445	0.549	0.664	0.791	0.928	1.076	1.269	1.406	1.779	2.196	2.657	3.163
				C	1056	1056	883	757	662	589	530	482	442	408	378	349	331	294	265	241	221
				D	0.056	0.110	0.159	0.216	0.283	0.358	0.442	0.534	0.636	0.746	0.865	1.020	1.130	1.431	1.766	2.137	2.543

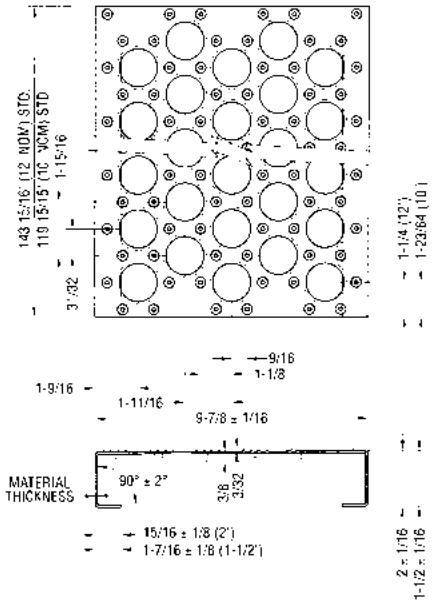
Engineering Data For Both Channels

Material		Channel Depth, In.	$Sxin^3$	$Ixin^4$
Steel	13 ga.	1-1/2 2	0.326 0.395	0.254 0.379
	11 ga.	1-1/2 2	0.410 0.489	0.326 0.496
Aluminum Alloy	.125”	2	0.577	0.541

Strut Loading

Material		Type Load	Load	Defl., In.
Steel	13 ga.	U C	1796 1016	0.032 0.052
	11 ga.	U C	2736 1538	0.036 0.055
Aluminum Alloy	.125”	U C	2270 1056	0.088 0.112

10” Wide Channel



Safe Allowable Design Loads

Allowable Loads and Deflections:

U – uniform load (lb./sq.ft.)

C – concentrated load (lb.)

D – deflection (in.)

Spans to the left of heavy line produce a deflection of 1/4” or less under a uniform load of 100 lb./sq.ft.

Material	Plank Width In.	Channel Depth In.	Weight lb./lin. ft.		Span 2’0”	2’6”	3’0”	3’6”	4’0”	4’6”	5’0”	5’6”	6’0”	6’6”	7’0”	7’-6”	8’0”	9’0”	10’0”	11’0”	12’0”
Steel 13 ga.	10	1-1/2	4.02	U	1232	968	672	494	378	299	242	200	168	143	123	105	95	75	61	50	42
				D	0.050	0.097	0.139	0.190	0.248	0.313	0.387	0.468	0.557	0.654	0.758	0.894	0.991	1.254	1.548	1.873	2.229
				C	646	646	646	646	630	560	504	458	420	388	360	332	315	280	252	229	210
				D	0.025	0.050	0.086	0.136	0.198	0.251	0.310	0.375	0.446	0.523	0.607	0.715	0.792	1.003	1.238	1.498	1.783
		2	4.02	U	1240	1066	740	544	416	329	267	220	185	158	136	115	104	82	67	55	46
				D	0.030	0.064	0.092	0.125	0.164	0.207	0.256	0.309	0.368	0.432	0.501	0.591	0.654	0.828	1.022	1.237	1.472
				C	544	544	544	544	544	544	544	498	456	421	391	360	342	304	274	249	228
				D	0.013	0.025	0.044	0.070	0.104	0.148	0.203	0.247	0.294	0.346	0.401	0.472	0.523	0.663	0.818	0.990	1.178
Steel 11 ga.	10	1-1/2	5.36	U	1914	1225	851	625	479	378	306	253	213	181	156	133	120	95	77	63	53
				D	0.062	0.097	0.139	0.190	0.248	0.314	0.387	0.468	0.557	0.654	0.759	0.894	0.991	1.254	1.548	1.873	2.229
				C	1077	1077	1047	897	785	698	628	571	523	483	449	413	393	349	314	285	262
				D	0.034	0.066	0.111	0.152	0.198	0.251	0.310	0.375	0.446	0.523	0.607	0.715	0.793	1.003	1.239	1.499	1.784
		2	5.36	U	2128	1362	946	695	532	420	340	281	236	201	174	147	133	105	85	70	59
				D	0.041	0.064	0.093	0.126	0.165	0.209	0.258	0.312	0.371	0.435	0.505	0.595	0.659	0.834	1.030	1.246	1.483
				C	908	908	908	908	876	778	700	637	584	539	500	461	438	389	350	318	292
				D	0.017	0.033	0.058	0.091	0.132	0.167	0.206	0.249	0.297	0.348	0.404	0.476	0.527	0.668	0.824	0.997	1.187
Alum. Alloy 5052 125”	10	2	1.91	U	1534	982	682	501	383	303	245	203	170	145	125	106	96	76	61	51	43
				D	0.085	0.133	0.191	0.260	0.340	0.430	0.531	0.643	0.765	0.898	1.041	1.227	1.360	1.721	2.125	2.571	3.060
				C	631	631	631	631	631	561	505	459	421	389	361	332	316	281	253	230	210
				D	0.034	0.067	0.115	0.183	0.273	0.346	0.427	0.517	0.615	0.722	0.837	0.987	1.094	1.384	1.709	2.068	2.461

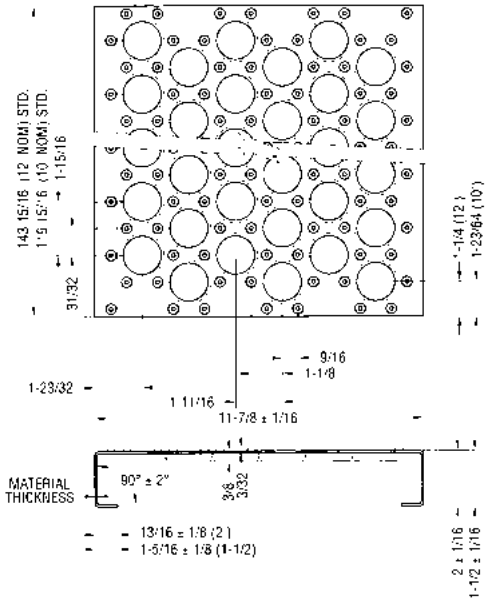
Engineering Data For Both Channels

Material		Channel Depth, In.	Sxin^3	Ixin^4
Steel	13 ga.	1-1/2 2	0.383 0.416	0.253 0.416
	11 ga.	1-1/2 2	0.477 0.532	0.315 0.528
Aluminum Alloy	.125”	2	0.550	0.533

Strut Loading

Material		Type Load	Load	Defl., In.
Steel	13 ga.	U C	1551 544	0.139 0.108
	11 ga.	U C	2206 908	0.136 0.108
Aluminum Alloy	.125”	U C	1540 631	0.279 0.223

12” Wide Channel



Safe Allowable Design Loads

Allowable Loads and Deflections:

U – uniform load (lb./sq.ft.)

C – concentrated load (lb.)

D – deflection (in.)

Spans to the left of heavy line produce a deflection of 1/4” or less under a uniform load of 100 lb./sq.ft.

Material	Plank Width In.	Channel Depth In.	Weight lb./lin. ft.		Span 2’0”	2’6”	3’0”	3’6”	4’0”	4’6”	5’0”	5’6”	6’0”	6’6”	7’0”	7’-6”	8’0”	9’0”	10’0”	11’0”	12’0”
Steel 13 ga.	12	1-1/2	4.40	U	802	758	527	387	296	234	190	157	132	112	97	82	74	59	47		
				D	0.038	0.088	0.126	0.172	0.225	0.284	0.351	0.425	0.506	0.594	0.688	0.811	0.899	1.138	1.405		
				C	401	401	401	401	401	401	401	401	395	365	339	312	296	263	237		
				D	0.015	0.030	0.051	0.081	0.122	0.173	0.237	0.316	0.405	0.475	0.551	0.649	0.719	0.910	1.124		
		2	4.40	U	756	756	615	452	346	273	221	183	154	131	113	96	86	68	55	46	
				D	0.022	0.054	0.092	0.125	0.163	0.206	0.254	0.308	0.366	0.430	0.499	0.588	0.651	0.824	1.018	1.231	
				C	372	372	372	372	372	372	372	372	372	372	372	362	344	306	275	250	
				D	0.009	0.017	0.030	0.047	0.070	0.100	0.138	0.183	0.238	0.302	0.377	0.470	0.521	0.659	0.814	0.985	
Steel 11 ga.	12	1-1/2	5.87	U	1357	962	668	491	376	297	241	199	167	142	123	104	94	74	60	50	42
				D	0.052	0.090	0.129	0.176	0.230	0.291	0.359	0.435	0.517	0.607	0.830	0.830	0.919	1.163	1.436	1.738	2.068
				C	684	684	684	684	684	670	603	548	503	464	431	397	377	335	302	274	251
				D	0.021	0.041	0.070	0.112	0.167	0.233	0.287	0.348	0.414	0.485	0.563	0.664	0.735	0.931	1.149	1.390	1.655
		2	5.87	U	1250	1197	831	611	467	369	299	247	208	177	153	129	117	92	75	62	52
				D	0.030	0.069	0.100	0.136	0.178	0.225	0.278	0.336	0.400	0.470	0.545	0.642	0.711	0.900	1.111	1.345	1.601
				C	635	635	635	635	635	635	635	635	630	581	540	497	472	420	378	344	315
				D	0.012	0.023	0.040	0.064	0.096	0.136	0.187	0.248	0.320	0.376	0.436	0.514	0.569	0.720	0.889	1.076	1.280
Alum. Alloy 5052 125”	12	2	2.09	U	901	798	554	407	312	246	200	165	139	118	102	86	78	62	50	41	
				D	0.063	0.137	0.197	0.268	0.350	0.443	0.547	0.662	0.788	0.924	1.072	1.264	1.400	1.772	2.188	2.648	
				C	433	433	433	433	433	433	433	433	416	384	356	328	312	277	249	227	
				D	0.025	0.049	0.084	0.130	0.200	0.285	0.390	0.520	0.633	0.743	0.862	1.016	1.126	1.425	1.760	2.129	

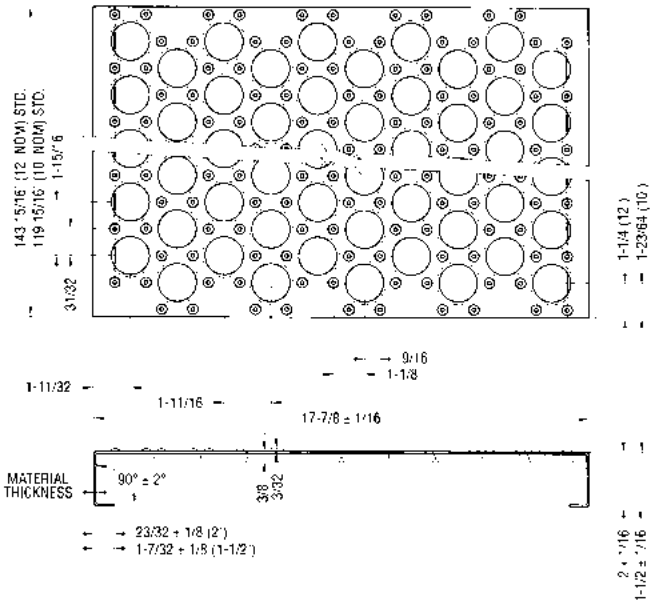
Engineering Data For Both Channels

Material		Channel Depth, In.	Sxin^3	Ixin^4
Steel	13 ga.	1-1/2 2	0.360 0.418	0.262 0.420
	11 ga.	1-1/2 2	0.458 0.574	0.326 0.528
Aluminum Alloy	.125”	2	0.543	0.511

Strut Loading

Material		Type Load	Load	Defl., In.
Steel	13 ga.	U C	756 372	0.198 0.159
	11 ga.	U C	1250 635	0.204 0.164
Aluminum Alloy	.125”	U C	901 433	0.403 0.322

18” Wide Channel



Safe Allowable Design Loads

Allowable Loads and Deflections:

U – uniform load (lb./sq.ft.)

C – concentrated load (lb.)

D – deflection (in.)

Spans to the left of heavy line produce a deflection of 1/4” or less under a uniform load of 100 lb./sq.ft.

Material	Plank Width In.	Channel Depth In.	Weight lb./lin. ft.		Span 2’0”	2’6”	3’0”	3’6”	4’0”	4’6”	5’0”	5’6”	6’0”	6’6”	7’0”	7’-6”	8’0”	9’0”	10’0”	11’0”	12’0”
Steel 13 ga.	18	1-1/2	5.63	U	302	302	300	221	169	134	108	89	75	64	55	47	42				
				D	0.024	0.059	0.123	0.167	0.218	0.276	0.341	0.412	0.491	0.576	0.668	0.787	0.872				
				C	226	226	226	226	226	225	203	184	169	156	145	133	127				
				D	0.010	0.019	0.033	0.052	0.078	0.110	0.136	0.165	0.196	0.230	0.267	0.315	0.349				
		2	5.63	U	276	276	276	236	180	143	115	95	80	68	59	50	45				
				D	0.015	0.037	0.077	0.122	0.159	0.202	0.249	0.301	0.358	0.421	0.488	0.575	0.637				
				C	209	209	209	209	209	209	209	199	182	168	156	144	137				
				D	0.006	0.012	0.021	0.033	0.049	0.069	0.095	0.120	0.143	0.168	0.195	0.230	0.255				
Steel 11 ga.	18	1-1/2	7.50	U	526	526	439	322	247	195	158	130	110	93	81	68	62	49			
				D	0.034	0.083	0.144	0.196	0.256	0.324	0.401	0.485	0.577	0.677	0.785	0.925	1.025	1.298			
				C	392	392	392	392	366	326	293	266	244	225	209	193	183	163			
				D	0.014	0.027	0.046	0.074	0.103	0.130	0.160	0.194	0.231	0.271	0.314	0.370	0.410	0.519			
		2	7.50	U	489	489	418	307	235	186	151	124	105	89	77	65	59	46			
				D	0.021	0.052	0.093	0.126	0.165	0.209	0.258	0.312	0.372	0.436	0.506	0.596	0.660	0.836			
				C	363	363	363	363	353	314	282	257	235	217	202	186	177	157			
				D	0.008	0.017	0.029	0.045	0.066	0.084	0.103	0.125	0.149	0.174	0.202	0.238	0.264	0.334			
Alum. Alloy 5052 125”	18	2	2.67	U	438	434	302	222	170	134	109	90	75	64	55	47	42				
				D	0.057	0.136	0.196	0.267	0.349	0.442	0.546	0.660	0.786	0.922	1.070	1.261	1.397				
				C	324	324	324	290	254	226	203	185	169	156	145	134	127				
				D	0.022	0.044	0.076	0.108	0.140	0.178	0.219	0.265	0.316	0.371	0.430	0.507	0.562				

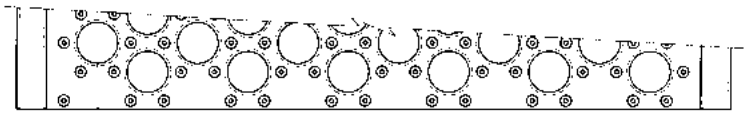
Engineering Data For Both Channels

Material		Channel Depth, In.	$Sx in^3$	$Ix in^4$
Steel	13 ga.	1-1/2 2	0.308 0.332	0.231 0.341
	11 ga.	1-1/2 2	0.445 0.429	0.284 0.425
Aluminum Alloy	.125”	2	0.442	0.417

Strut Loading

Material		Type Load	Load	Defl., In.
Steel	13 ga.	U C	276 209	0.459 0.367
	11 ga.	U C	489 363	0.451 0.360
Aluminum Alloy	.125”	U C	438 324	0.919 0.735

Walkway



Safe Allowable Design Loads

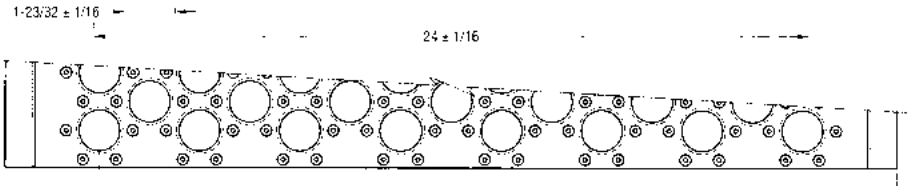
Allowable Loads and Deflections:

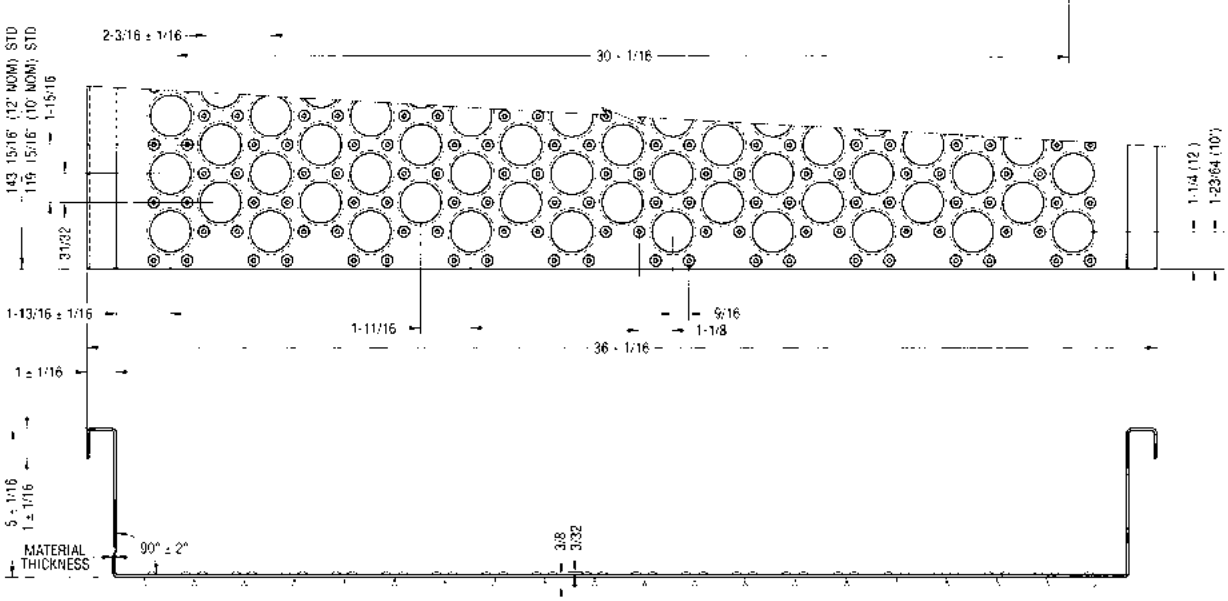
U – uniform load (lb./sq.ft.)

C – concentrated load (lb.)

D – deflection (in.)

Spans to the left of heavy line produce a deflection of 1/4" or less under a uniform load of 100 lb./sq.ft.





Material	Plank Width In.	Gauge	Channel Depth In.	Weight lb./ln.ft.		SPAN 2'0"	3'0"	4'0"	5'0"	6'0"	7'0"	8'0"	9'0"	10'0"	11'0"	12'0"
Steel	24	13	5	9.25	U	169	169	169	169	169	169	169	142	115	95	80
					D	0.001	0.004	0.014	0.033	0.069	0.128	0.218	0.297	0.366	0.443	0.527
					C	167	167	167	167	167	167	167	167	167	167	167
					D	0.000	0.001	0.003	0.005	0.004	0.014	0.022	0.031	0.042	0.056	0.073
		11	5	12.33	U	432	432	432	432	432	375	287	227	184	152	128
					D	0.002	0.008	0.025	0.062	0.129	0.208	0.271	0.343	0.424	0.513	0.610
					C	430	430	430	430	430	430	430	430	430	430	430
					D	0.000	0.001	0.003	0.062	0.009	0.014	0.020	0.029	0.040	0.053	0.068
	30	13	5	10.6	U	107	107	107	107	107	107	107	107	107	92	77
					D	0.001	0.003	0.010	0.025	0.052	0.097	0.165	0.265	0.404	0.449	0.535
					C	134	134	134	134	134	134	134	134	134	134	134
					D	0.000	0.001	0.002	0.004	0.007	0.011	0.017	0.024	0.032	0.043	0.056
		11	5	14.2	U	294	294	294	294	294	294	241	190	154	127	107
					D	0.001	0.007	0.021	0.052	0.109	0.201	0.256	0.324	0.400	0.484	0.576
					C	344	344	344	344	344	344	344	344	344	344	344
					D	0.000	0.001	0.002	0.004	0.007	0.011	0.016	0.023	0.031	0.042	0.054
	36	13	5	12.0	U	64	64	64	64	64	64	64	64	64	64	64
					D	0.000	0.002	0.007	0.017	0.036	0.066	0.113	0.181	0.276	0.405	0.573
					C	96	96	96	96	96	96	96	96	96	96	96
					D	0.000	0.001	0.001	0.003	0.005	0.008	0.011	0.016	0.022	0.030	0.038
		11	5	15.9	U	170	170	170	170	170	170	170	153	124	102	86
					D	0.001	0.005	0.015	0.036	0.074	0.138	0.235	0.339	0.419	0.507	0.603
					C	264	264	264	264	264	264	264	264	264	264	264
					D	0.000	0.001	0.003	0.006	0.010	0.016	0.024	0.035	0.048	0.063	0.082

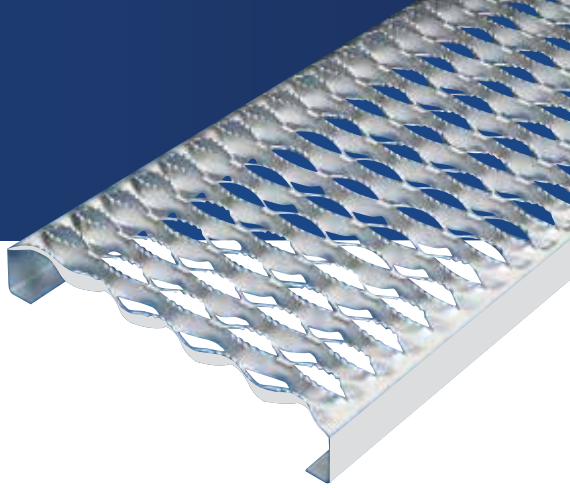
Engineering Data For Both Channels

Material	W	ga.	Chan. D, in.	$Sxin^3$	$Ixin^4$
Steel	24"	13	5	1.759	4.911
		11	5	2.792	6.739
	30"	13	5	2.110	5.810
		11	5	2.926	7.482
	36"	13	5	2.196	5.364
		11	5	2.823	6.895

Strut Loading

Material		Type Load	Load	Defl., in.
Steel 24" Width	13 ga.	U	238	1.130
		C	167	0.641
	11 ga.	U	610	1.130
		C	455	0.641
Steel 30" Width	13 ga.	U	107	1.251
		C	134	1.001
	11 ga.	U	294	1.251
		C	368	1.001
Steel 36" Width	13 ga.	U	80	2.263
		C	96	1.442
	11 ga.	U	215	2.280
		C	264	1.442

GRIP STRUT® GRATING



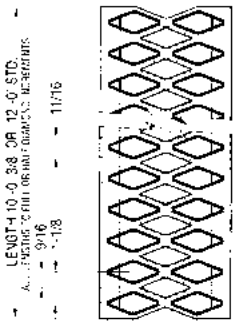
Standard Stock Size Channels

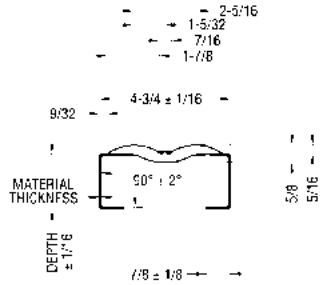
Standard Sizes:

- Pre-Galvanized or HRP&O Steel
- 14 and 12 Gauge Steel
- .080” and .100” 5052-H32 Aluminum
- 16 Gauge Stainless Steel 304-2B
- 10’ or 12’ Lengths

Width	Channel Height	10 Foot Length	12 Foot Length	14 Gauge Steel Wt./ln.ft.	12 Gauge Steel WT./ln.ft.	.080 Aluminum Wt./ln.ft.	.100 Aluminum Wt./ln.ft.	16 Gauge Stainless Wt./ln.ft.
4-3/4” (2 Diamond)	1-1/2”	121-1/2”	144”	2.3	3.2	.8	1.1	—
	2”	121-1/2”	144”	2.6	3.6	.9	1.2	—
7” (3 Diamond)	1-1/2”	121-1/2”	144”	3.0	4.1	1.0	1.4	—
	2”	121-1/2”	144”	3.2	4.5	1.2	1.5	—
9-1/2” (4 Diamond)	1-1/2”	121-1/2”	144”	3.6	5.0	1.3	1.6	—
	2”	121-1/2”	144”	3.8	5.4	1.4	1.7	3.2
11-3/4” (5 Diamond)	1-1/2”	121-1/2”	144”	4.2	5.9	1.5	1.9	—
	2”	121-1/2”	144”	4.4	6.2	1.6	2.0	3.7
18-3/4” (5 Diamond)	1-1/2”	120-3/8”	144”	6.1	8.5	—	—	—
	2”	120-3/8”	144”	6.3	8.9	—	2.8	—
24” (5 Diamond)	1-1/2”	120-3/8”	144”	—	—	—	—	—
	2”	120-3/8”	144”	—	10.4	—	—	—

4 3/4" Wide
2 Diamond Channel





Safe Allowable Design Loads

Allowable Loads and Deflections:

U – uniform load (lb./sq.ft.)

C – concentrated load (lb.)

D – deflection (in.)

Spans to the left of heavy line produce a deflection of 1/4" or less under a uniform load of 100 lb./sq.ft.

Material	Channel Depth In.	Weight lb./lin. ft.	Catalog Number		SPAN 2'0"	2'6"	3'0"	3'6"	4'0"	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	7'-6"	8'0"	9'0"	10'0"	11'0"	12'0"
Steel 14 ga.	1-1/2	2.3	DS-P-021514	U	1447	926	643	472	362	286	232	191	161	137	118	100	90	71	58	48	40
				D	0.068	0.106	0.152	0.208	0.271	0.343	0.424	0.513	0.610	0.716	0.830	0.979	1.084	1.372	1.694	2.050	2.440
				C	573	458	382	327	286	255	229	208	191	176	164	151	143	127	115	104	95
				D	0.054	0.085	0.122	0.166	0.217	0.274	0.339	0.410	0.488	0.573	0.664	0.783	0.867	1.098	1.355	1.640	1.952
	2	2.54	DS-P-022014	U	1811	1522	1057	777	595	470	381	314	264	225	194	165	149	117	95	79	66
				D	0.042	0.085	0.123	0.167	0.219	0.277	0.342	0.413	0.492	0.577	0.670	0.789	0.874	1.107	1.366	1.653	1.968
				C	941	753	628	538	471	418	377	342	314	290	269	248	235	209	188	171	157
				D	0.044	0.068	0.098	0.134	0.175	0.221	0.273	0.331	0.394	0.462	0.536	0.631	0.700	0.885	1.093	1.323	1.574
	2-1/2	2.78	DS-P-022514	U	1795	1525	1059	778	596	471	381	315	265	226	195	165	149	118	95	79	66
				D	0.038	0.079	0.114	0.155	0.203	0.256	0.316	0.383	0.456	0.535	0.620	0.731	0.810	1.025	1.266	1.532	1.823
				C	941	753	628	538	471	418	377	342	314	290	269	248	235	209	188	171	157
				D	0.041	0.063	0.091	0.124	0.162	0.205	0.253	0.306	0.365	0.428	0.496	0.585	0.648	0.820	1.013	1.225	1.458
Steel 12 ga.	1-1/2	3.06	DS-P-021512	U	2071	1325	920	676	518	409	331	274	230	196	169	143	129	102	83	68	58
				D	0.072	0.112	0.161	0.220	0.287	0.363	0.448	0.542	0.645	0.757	0.878	1.036	1.147	1.452	1.793	2.169	2.582
				C	820	656	564	468	410	364	328	298	273	252	234	216	205	182	164	149	137
				D	0.057	0.090	0.129	0.176	0.229	0.290	0.359	0.434	0.516	0.606	0.703	0.828	0.918	1.162	1.434	1.735	2.065
	2	3.41	DS-P-022012	U	3127	2001	1390	1021	782	618	500	413	347	296	255	217	195	154	125	103	87
				D	0.051	0.080	0.155	0.156	0.204	0.259	0.319	0.386	0.460	0.540	0.626	0.738	0.817	1.034	1.277	1.545	1.839
				C	1238	990	825	707	619	550	495	450	413	381	354	326	309	275	248	225	206
				D	0.041	0.064	0.092	0.125	0.163	0.207	0.255	0.309	0.368	0.432	0.501	0.590	0.654	0.828	1.022	1.236	1.471
	2-1/2	3.75	DS-P-022512	U	3444	2720	1889	1388	1062	839	680	562	472	402	347	294	266	210	170	140	118
				D	0.031	0.060	0.087	0.118	0.154	0.195	0.241	0.291	0.346	0.407	0.471	0.556	0.616	0.779	0.962	1.164	1.385
				C	1682	1346	1121	961	841	748	673	612	561	518	481	443	421	374	336	306	280
				D	0.031	0.048	0.069	0.094	0.123	0.156	0.192	0.233	0.277	0.325	0.377	0.445	0.493	0.623	0.770	0.931	1.108
Alum. Alloy 5052 .080"	1-1/2	.84	DS-A-021508	U	1171	750	521	382	293	231	187	155	130	111	96	81	73	58	47		
				D	0.142	0.222	0.320	0.436	0.569	0.720	0.889	1.075	1.280	1.502	1.742	2.053	2.275	2.880	3.555		
				C	464	371	309	265	232	206	186	169	155	143	133	122	116	103	93		
				D	0.114	0.179	0.257	0.350	0.457	0.579	0.715	0.865	1.029	1.208	1.401	1.651	1.830	2.316	2.859		
	2	.93	DS-A-022008	U	1446	1024	711	523	400	316	256	212	178	152	131	111	100	79	64	53	44
				D	0.084	0.146	0.210	0.285	0.373	0.472	0.582	0.705	0.839	0.984	1.141	1.345	1.491	1.887	2.329	2.818	3.354
				C	634	507	422	362	317	282	253	230	211	195	181	167	158	141	127	115	106
				D	0.075	0.117	0.169	0.229	0.300	0.379	0.468	0.567	0.674	0.791	0.918	1.082	1.199	1.517	1.873	2.267	2.697

Material	Channel Depth In.	Weight lb./lin. ft.	Catalog Number		SPAN 2'0"	2'6"	3'0"	3'6"	4'0"	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	7'-6"	8'0"	9'0"	10'0"	11'0"	12'0"
Alum. Alloy 5052 .100"	1-1/2	1.02	DS-A-022508	U	1434	1417	984	723	554	437	354	293	246	210	181	153	138	109	89	73	62
				D	0.052	0.124	0.179	0.243	0.318	0.402	0.601	0.601	0.715	0.839	0.973	1.147	1.271	1.609	1.986	2.404	2.860
				C	877	702	585	501	439	390	351	319	292	270	251	231	219	195	175	159	146
				D	0.064	0.100	0.144	0.196	0.256	0.323	0.399	0.483	0.575	0.675	0.783	0.923	1.022	1.294	1.597	1.933	2.300
	1-1/2	1.04	DS-A-021510	U	1264	809	562	413	316	250	202	167	140	120	103	88	79	62	51	42	
				D	0.141	0.221	0.318	0.433	0.566	0.716	0.884	1.069	1.272	1.493	1.732	2.042	2.262	2.863	3.535	4.277	
				C	500	400	334	286	250	222	200	182	167	154	143	132	125	111	100	91	
				D	0.114	0.178	0.256	0.348	0.455	0.576	0.711	0.860	1.023	1.201	1.393	1.642	1.819	2.302	2.843	3.440	
	2	1.15	DS-A-022010	U	1145	1295	899	661	506	400	324	268	225	192	165	140	126	100	81	67	56
				D	0.061	0.169	0.243	0.331	0.432	0.547	0.675	0.817	0.973	1.141	1.324	1.561	1.729	2.188	2.702	3.269	3.890
				C	801	641	534	458	401	356	320	291	267	247	229	211	200	178	160	146	134
				D	0.087	0.136	0.196	0.266	0.348	0.440	0.543	0.657	0.782	0.918	1.065	1.255	1.391	1.760	2.173	2.629	3.129
	2-1/2	1.27	DS-A-022510	U	2209	1755	1219	895	686	542	439	363	305	260	224	190	171	135	110	91	71
				D	0.066	0.128	0.184	0.250	0.327	0.413	0.510	0.618	0.735	0.863	1.001	1.179	1.307	1.654	2.042	2.471	2.940
				C	1086	869	724	621	543	483	434	395	362	334	310	286	271	241	217	197	181
				D	0.066	0.103	0.148	0.201	0.263	0.333	0.411	0.497	0.591	0.694	0.805	0.948	1.051	1.330	1.642	1.987	2.365

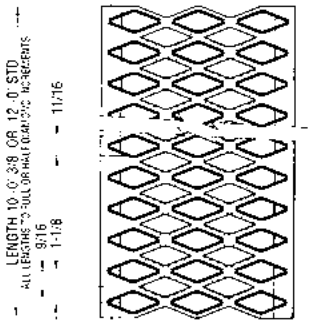
Engineering Data For Both Channels

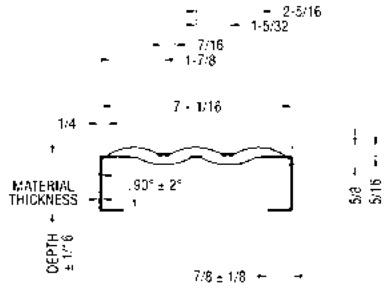
Material		Channel Depth, In.	$Sxin^3$	$Ixin^4$
Steel	14 ga.	1-1/2	0.174	0.105
		2	0.286	0.214
		2-1/2	0.286	0.231
	12 ga.	1-1/2	0.249	0.142
		2	0.376	0.301
		2-1/2	0.511	0.543
Aluminum Alloy	.080"	1-1/2	0.202	0.117
		2	0.276	0.244
		2-1/2	0.382	0.396
	.100"	1-1/2	0.218	0.127
		2	0.349	0.266
		2-1/2	0.473	0.477

Strut Loading

Material		Type Load	Load	Defl., In.
Steel	14 ga.	U	1811	0.006
		C	1718	0.022
	12 ga.	U	3444	0.011
		C	3678	0.022
Aluminum Alloy	.080"	U	1446	0.010
		C	877	0.032
	.100"	U	2209	0.016
		C	1086	0.034

7” Wide
3 Diamond Channel





Safe Allowable Design Loads

Allowable Loads and Deflections:

U – uniform load (lb./sq.ft.)

C – concentrated load (lb.)

D – deflection (in.)

Spans to the left of heavy line produce a deflection of 1/4” or less under a uniform load of 100 lb./sq.ft.

Material	Channel Depth in.	Weight lb./lin. ft.	Catalog Number		SPAN 2'0"	2'6"	3'0"	3'6"	4'0"	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	7'-6"	8'0"	9'0"	10'0"	11'0"	12'0"
Steel 14 ga.	1-1/2	2.87	DS-P-031514	U	971	621	431	317	243	192	155	128	108	92	79	67	61	48			
				D	0.067	0.105	0.151	0.205	0.268	0.339	0.419	0.507	0.603	0.708	0.821	0.967	1.072	1.357			
				C	566	453	377	324	283	252	226	206	189	174	162	149	142	126			
				D	0.054	0.084	0.121	0.164	0.214	0.271	0.335	0.405	0.482	0.566	0.657	0.774	0.857	1.085			
	2	3.12	DS-P-032014	U	1229	1026	712	523	401	317	256	212	178	152	131	111	100	79	64	53	45
				D	0.042	0.085	0.122	0.166	0.217	0.275	0.339	0.410	0.488	0.573	0.665	0.784	0.868	1.099	1.357	1.642	1.954
				C	935	748	623	534	467	415	374	340	312	288	267	246	234	208	187	170	156
				D	0.043	0.068	0.098	0.133	0.174	0.220	0.271	0.328	0.391	0.459	0.532	0.627	0.695	0.879	1.085	1.313	1.563
	2-1/2	3.37	DS-P-032514	U	1218	1218	976	717	549	434	351	290	244	208	179	152	137	108	88	73	61
				D	0.022	0.054	0.089	0.122	0.159	0.201	0.249	0.301	0.358	0.420	0.487	0.574	0.636	0.805	0.994	1.203	1.432
				C	1280	1024	854	732	640	569	512	466	427	394	366	337	320	285	256	233	213
				D	0.032	0.050	0.072	0.097	0.127	0.161	0.199	0.241	0.286	0.336	0.390	0.459	0.509	0.644	0.795	0.962	1.145
Steel 12 ga.	1-1/2	3.84	DS-P-031512	U	1377	881	612	450	344	272	220	182	153	130	112	95	86	68	55	46	
				D	0.073	0.115	0.165	0.225	0.293	0.371	0.459	0.555	0.660	0.775	0.899	1.059	1.174	1.486	1.834	2.220	
				C	803	643	535	459	402	357	321	292	268	247	229	211	201	178	161	146	
				D	0.059	0.092	0.132	0.180	0.235	0.297	0.367	0.444	0.528	0.620	0.939	0.939	0.939	1.189	1.467	1.776	
	2	4.19	DS-P-032012	U	2088	1336	928	682	522	412	334	276	232	198	170	145	130	103	84	69	58
				D	0.052	0.081	0.116	0.158	0.207	0.261	0.323	0.391	0.465	0.545	0.633	0.746	0.826	1.046	1.291	1.562	1.859
				C	1218	974	812	696	609	541	487	443	406	375	348	321	304	271	244	221	203
				D	0.041	0.065	0.093	0.165	0.165	0.209	0.258	0.312	0.372	0.436	0.506	0.597	0.661	0.837	1.033	1.250	1.487
	2-1/2	4.53	DS-P-032512	U	2337	1845	1282	942	721	570	461	381	320	273	235	200	180	142	115	95	80
				D	0.032	0.062	0.089	0.121	0.158	0.200	0.246	0.298	0.355	0.416	0.483	0.569	0.631	0.798	0.986	1.193	1.419
				C	1682	1346	1121	961	841	748	673	612	561	518	481	443	421	374	336	306	280
				D	0.032	0.049	0.071	0.097	0.126	0.160	0.197	0.239	0.284	0.333	0.386	0.455	0.505	0.639	0.789	0.954	1.136
	3	4.88	DS-P-033012	U	2322	2322	1710	1257	962	760	616	509	428	364	314	267	241	190	154	127	107
				D	0.020	0.048	0.073	0.099	0.130	0.164	0.203	0.245	0.292	0.343	0.397	0.468	0.519	0.657	0.811	0.981	1.168
				C	2245	1796	1497	1283	1122	998	898	816	748	691	641	591	561	499	449	408	374
				D	0.026	0.041	0.058	0.079	0.104	0.131	0.162	0.196	0.234	0.274	0.318	0.375	0.415	0.525	0.649	0.785	0.934

Material	Channel Depth in.	Weight lb./lin. ft.	Catalog Number		SPAN 2'0"	2'6"	3'0"	3'6"	4'0"	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	7'-6"	8'0"	9'0"	10'0"	11'0"	12'0"
Alum. Alloy 5052 .080"	1-1/2	1.05	DS-A-031508	U	787	504	350	257	197	155	126	104	87	74	64	54	49				
				D	0.147	0.230	0.331	0.450	0.588	0.745	0.919	1.112	1.324	1.554	1.802	2.124	2.353				
				C	459	367	306	262	230	204	184	167	153	141	131	121	115				
				D	0.118	0.185	0.266	0.362	0.473	0.599	0.739	0.895	1.065	1.249	1.449	1.708	1.893				
	2	1.14	DS-A-032008	U	981	685	476	349	268	211	171	142	119	101	87	74	67	53	43		
				D	0.087	0.147	0.212	0.288	0.377	0.477	0.588	0.712	0.847	0.994	1.153	1.359	1.506	1.906	2.353		
				C	624	500	416	357	312	278	250	227	208	192	178	164	156	139	125		
				D	0.076	0.118	0.170	0.232	0.303	0.383	0.473	0.573	0.681	0.800	0.927	1.093	1.211	1.533	1.893		
	2-1/2	1.24	DS-A-032508	U	973	947	657	483	370	292	237	196	164	140	121	102	92	73	59	49	41
				D	0.053	0.125	0.181	0.246	0.321	0.406	0.501	0.607	0.722	0.847	0.983	1.159	1.284	1.625	2.006	2.427	2.888
				C	863	691	575	493	432	384	345	314	288	266	247	227	216	192	173	157	144
				D	0.065	0.101	0.145	0.198	0.258	0.327	0.403	0.488	0.581	0.682	0.790	0.932	1.032	1.307	1.613	1.952	2.323
	3	1.33	DS-A-033008	U	965	965	864	635	486	384	311	257	216	184	159	135	121	96	78	64	54
				D	0.031	0.076	0.141	0.191	0.250	0.316	0.391	0.473	0.563	0.660	0.766	0.903	1.000	1.266	1.563	1.891	2.250
				C	971	907	756	648	567	504	454	412	378	349	324	298	284	252	227	206	189
				D	0.043	0.079	0.113	0.154	0.201	0.254	0.314	0.380	0.452	0.531	0.616	0.726	0.804	1.018	1.257	1.521	1.810
Alum. Alloy 5052 .100"	1-1/2	1.30	DS-A-031510	U	740	473	329	242	185	146	118	98	82	70	60	51	46				
				D	0.129	0.202	0.290	0.395	0.516	0.653	0.807	0.976	1.161	1.363	1.581	1.863	2.065				
				C	432	345	288	247	216	192	173	157	144	133	123	114	108				
				D	0.104	0.162	0.233	0.318	0.415	0.525	0.649	0.785	0.934	1.096	1.271	1.499	1.660				
	2	1.42	DS-A-032010	U	1373	879	610	448	343	271	220	182	153	130	112	95	86	68	55	45	
				D	0.111	0.174	0.251	0.341	0.446	0.564	0.696	0.843	1.003	1.177	1.365	1.609	1.783	2.256	2.786	3.370	
				C	801	641	534	458	401	356	320	291	267	247	229	211	200	178	160	146	
				D	0.090	0.140	0.202	0.274	0.358	0.454	0.560	0.678	0.806	0.946	1.098	1.294	1.434	1.814	2.240	2.711	
	2-1/2	1.53	DS-A-032510	U	1499	972	675	496	380	300	243	201	169	144	124	105	95	75	61	50	42
				D	0.078	0.122	0.176	0.240	0.313	0.396	0.489	0.592	0.705	0.827	0.959	1.131	1.253	1.586	1.958	2.369	2.819
				C	886	709	591	506	443	394	354	322	295	273	253	233	222	197	177	161	148
				D	0.063	0.098	0.142	0.193	0.252	0.319	0.394	0.476	0.567	0.665	0.771	0.909	1.008	1.275	1.574	1.905	2.267
	3	1.65	DS-A-033010	U	1489	1269	881	647	496	392	317	262	220	188	162	137	124	98	79	66	55
				D	0.048	0.099	0.143	0.195	0.255	0.322	0.398	0.482	0.573	0.673	0.780	0.919	1.019	1.289	1.592	1.926	2.292
				C	1157	926	771	661	579	514	463	421	386	356	331	305	289	257	231	210	193
				D	0.051	0.080	0.115	0.157	0.205	0.259	0.320	0.387	0.461	0.541	0.627	0.739	0.819	1.037	1.280	1.549	1.843

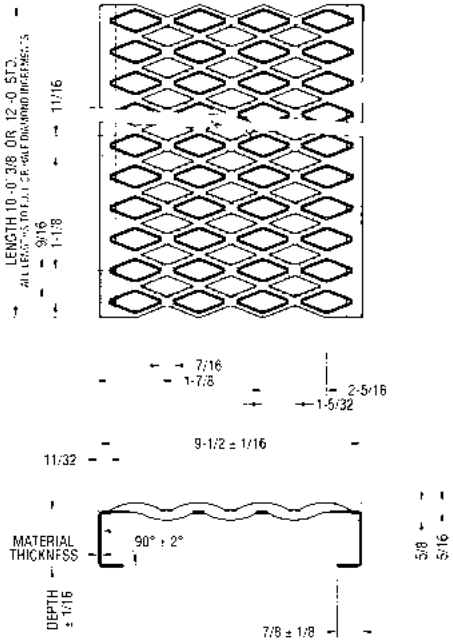
Engineering Data For Both Channels

Material		Channel Depth, In.	$Sxin^3$	$Ixin^4$
Steel	14 ga.	1-1/2	0.172	0.105
		2	0.284	0.214
		2-1/2	0.389	0.400
	12 ga.	1-1/2	0.244	0.136
		2	0.370	0.293
		2-1/2	0.511	0.530
		3	0.682	0.860
Aluminum Alloy	.080"	1-1/2	0.200	0.112
		2	0.272	0.238
		2-1/2	0.376	0.386
		3	0.494	0.651
	.100"	1-1/2	0.188	0.120
		2	0.349	0.258
		2-1/2	0.386	0.406
		3	0.504	0.652

Strut Loading

Material		Type Load	Load	Defl., In.
Steel	14 ga.	U	1218	0.019
		C	1166	0.047
	12 ga.	U	2337	0.015
		C	2496	0.047
Aluminum Alloy	.080"	U	981	0.042
		C	816	0.096
	.100"	U	1499	0.054
		C	981	0.096

9 1/2" Wide
4 Diamond Channel



Safe Allowable Design Loads

Allowable Loads and Deflections:

U – uniform load (lb./sq.ft.)

C – concentrated load (lb.)

D – deflection (in.)

Spans to the left of heavy line produce a deflection of 1/4" or less under a uniform load of 100 lb./sq.ft.

Material	Channel Depth in.	Weight lb./lin. ft.	Catalog Number		SPAN 2'0"	2'6"	3'0"	3'6"	4'0"	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	7'-6"	8'0"	9'0"	10'0"	11'0"	12'0"
Steel 14 ga.	1-1/2	3.50	DS-P-041514	U	748	479	333	244	187	148	120	99	83	71	61	52	47				
				D	0.068	0.107	0.153	0.209	0.273	0.345	0.426	0.515	0.613	0.720	0.835	0.984	1.091				
				C	593	474	395	339	296	263	237	215	198	182	169	156	148				
				D	0.055	0.085	0.123	0.167	0.218	0.276	0.341	0.412	0.491	0.576	0.668	0.787	0.872				
	2	3.75	DS-P-042014	U	905	769	534	392	300	237	192	159	134	114	98	83	75	59	48	40	
				D	0.040	0.083	0.120	0.163	0.213	0.270	0.333	0.403	0.479	0.562	0.652	0.769	0.852	1.078	1.331	1.610	
				C	859	761	634	544	476	423	381	346	317	293	272	250	238	211	190	173	
				C	0.038	0.067	0.096	0.130	0.170	0.216	0.266	0.322	0.383	0.450	0.522	0.615	0.681	0.862	1.065	1.288	
	2-1/2	4.00	DS-P-042514	U	897	897	748	550	421	333	269	223	187	159	137	117	105	83	67	56	47
				D	0.022	0.053	0.091	0.124	0.162	0.205	0.252	0.306	0.364	0.427	0.495	0.583	0.646	0.818	1.010	1.222	1.454
				C	1333	1067	889	762	667	593	533	485	444	410	381	351	333	296	267	242	222
				D	0.032	0.050	0.073	0.099	0.129	0.164	0.202	0.244	0.291	0.341	0.396	0.467	0.517	0.654	0.808	0.978	1.163
Steel 12 ga.	1-1/2	4.71	DS-P-041512	U	1069	684	475	349	267	211	171	141	119	101	87	74	67	53	43		
				D	0.074	0.116	0.167	0.227	0.296	0.375	0.463	0.560	0.666	0.782	0.907	1.069	1.184	1.499	1.850		
				C	846	677	564	483	423	376	338	308	282	260	242	223	211	188	169		
				D	0.059	0.093	0.133	0.181	0.237	0.300	0.370	0.448	0.533	0.625	0.725	0.855	0.947	1.199	1.480		
	2	5.06	DS-P-042012	U	1609	1030	715	525	402	318	257	213	179	152	131	111	101	79	64	53	45
				D	0.049	0.077	0.111	0.151	0.197	0.250	0.308	0.373	0.444	0.521	0.604	0.712	0.789	0.998	1.233	1.491	1.775
				C	1274	1019	849	728	637	566	510	463	425	392	364	335	318	283	255	232	212
				D	0.039	0.062	0.089	0.121	0.158	0.200	0.247	0.298	0.355	0.417	0.483	0.570	0.631	0.799	0.986	1.193	1.420
	2-1/2	5.39	DS-P-042512	U	1722	1360	944	694	531	420	340	281	236	201	173	147	133	105	85	70	59
				D	0.030	0.057	0.082	0.112	0.146	0.185	0.228	0.276	0.329	0.386	0.448	0.528	0.585	0.740	0.913	1.105	1.315
				C	1682	1346	1121	961	841	748	673	612	561	518	481	443	421	374	336	306	280
				D	0.029	0.046	0.066	0.090	0.117	0.148	0.183	0.221	0.263	0.309	0.358	0.422	0.468	0.592	0.731	0.884	1.052
	3	5.71	DS-P-043012	U	1711	1711	1305	959	734	580	470	388	326	278	240	203	183	145	117	97	82
				D	0.019	0.046	0.072	0.099	0.129	0.163	0.201	0.243	0.290	0.340	0.394	0.465	0.515	0.652	0.805	0.974	1.159
				C	1940	1859	1549	1328	1162	1033	930	845	775	715	664	612	581	516	465	423	387
				D	0.021	0.040	0.058	0.079	0.103	0.130	0.161	0.195	0.232	0.272	0.315	0.372	0.412	0.521	0.644	0.779	0.927

Material	Channel Depth in.	Weight lb./lin. ft.	Catalog Number		SPAN 2'0"	2'6"	3'0"	3'6"	4'0"	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	7'-6"	8'0"	9'0"	10'0"	11'0"	12'0"
Alum. Alloy 5052. .080"	1-1/2	1.29	DS-A-041508	U	580	371	258	189	145	115	93	77	64	55	47	40					
				D	0.132	0.206	0.297	0.404	0.527	0.667	0.824	0.997	1.186	1.392	1.614	1.903					
				C	459	367	306	262	230	204	184	167	153	141	131	121					
				D	0.106	0.166	0.238	0.325	0.424	0.537	0.662	0.802	0.954	1.119	1.298	1.530					
	2	1.38	DS-A-042008	U	723	527	366	269	206	163	132	109	91	78	67	57	51	41			
				D	0.084	0.149	0.215	0.292	0.382	0.483	0.597	0.722	0.859	1.009	1.170	1.379	1.528	1.933			
				C	601	522	435	373	326	290	261	237	217	201	186	172	163	145			
				D	0.071	0.120	0.173	0.235	0.307	0.389	0.480	0.581	0.691	0.811	0.941	1.109	1.229	1.555			
	2-1/2	1.47	DS-A-042508	U	717	717	502	369	283	223	181	149	126	107	92	78	71	56	45		
				D	0.049	0.120	0.174	0.236	0.309	0.391	0.483	0.584	0.695	0.816	0.946	1.115	1.236	1.564	1.931		
				C	709	709	597	512	448	398	358	326	298	276	256	236	224	199	179		
				D	0.049	0.096	0.140	0.190	0.248	0.314	0.388	0.470	0.559	0.656	0.761	0.897	0.994	1.258	1.553		
	3	1.57	DS-A-043008	U	711	711	585	430	329	260	211	174	146	125	107	91	82	65	53	44	
				D	0.030	0.074	0.126	0.172	0.225	0.284	0.351	0.425	0.505	0.593	0.688	0.811	0.898	1.137	1.404	1.698	
				C	716	716	695	596	521	463	417	379	347	321	298	274	261	232	208	190	
				D	0.031	0.060	0.102	0.138	0.181	0.229	0.282	0.341	0.406	0.477	0.553	0.652	0.722	0.914	1.129	1.366	
Alum. Alloy 5052 .100"	1-1/2	1.60	DS-A-041510	U	580	371	258	189	145	115	93	77	64	55	47	40					
				D	0.137	0.215	0.309	0.420	0.549	0.695	0.858	1.038	1.236	1.450	1.682	1.982					
				C	459	367	306	262	230	204	184	167	153	141	131	121					
				D	0.110	0.173	0.248	0.338	0.442	0.559	0.690	0.835	0.994	1.166	1.352	1.594					
	2	1.71	DS-A-042010	U	1032	660	459	337	258	204	165	136	115	98	84	71	65				
				D	0.115	0.179	0.258	0.351	0.458	0.580	0.716	0.866	1.031	1.210	1.403	1.654	1.833				
				C	723	654	545	467	409	363	327	297	272	251	234	215	204				
				D	0.081	0.144	0.207	0.282	0.368	0.466	0.576	0.697	0.829	0.973	1.128	1.330	1.474				
	2-1/2	1.83	DS-A-042510	U	1104	878	609	448	343	271	219	181	152	130	112	95	86	68	55	45	
				D	0.063	0.121	0.175	0.238	0.310	0.393	0.485	0.587	0.698	0.820	0.951	1.121	1.242	1.572	1.940	2.348	
				C	966	869	724	621	543	483	434	395	362	334	310	286	271	241	217	197	
				D	0.055	0.098	0.140	0.191	0.250	0.316	0.390	0.472	0.562	0.659	0.765	0.901	0.999	1.264	1.560	1.888	
	3	1.95	DS-A-043010	U	1097	1097	796	585	448	354	287	237	199	170	146	124	112	88	72	59	50
				D	0.039	0.142	0.142	0.193	0.253	0.320	0.395	0.478	0.568	0.667	0.774	0.912	1.010	1.279	1.579	1.910	2.274
				C	945	945	946	811	709	631	568	516	473	437	405	373	355	315	284	258	236
				D	0.034	0.066	0.114	0.156	0.203	0.257	0.317	0.384	0.457	0.536	0.622	0.733	0.813	1.028	1.270	1.536	1.828
Stain. Steel 304 16 ga. 316L 16 ga.	2	3.12	DS-S-042016	U	539	539	402	295	226	179	145	119	100	86	74	63	56	45			
				D	0.032	0.079	0.123	0.167	0.218	0.276	0.340	0.412	0.490	0.575	0.667	0.787	0.872	1.103			
				C	715	572	477	409	358	318	286	260	238	220	204	188	179	159			
				D	0.043	0.068	0.098	0.133	0.174	0.221	0.272	0.330	0.392	0.460	0.534	0.629	0.697	0.883			
	2	3.12	DS-L-042016	U	450	393	273	201	154	121	98	81	68	58	50	43					
				D	0.027	0.057	0.081	0.111	0.145	0.183	0.226	0.274	0.326	0.382	0.443	0.523					
				C	487	389	324	278	243	216	195	177	162	150	139	128					
				D	0.029	0.045	0.065	0.089	0.116	0.147	0.181	0.219	0.261	0.306	0.355	0.419					

Engineering Data For Both Channels

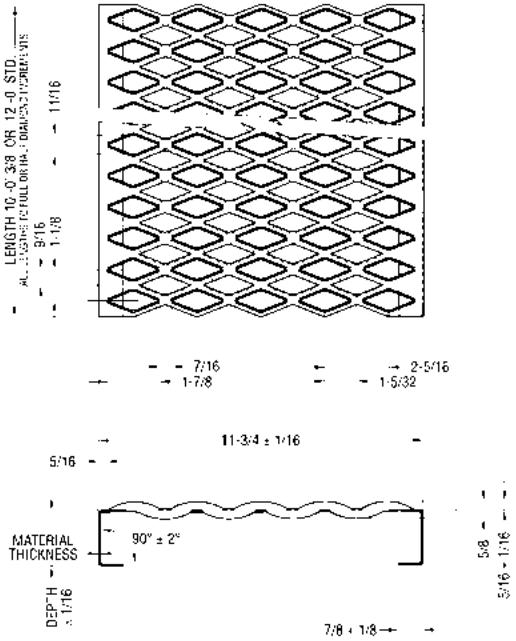
Material		Channel Depth, in.	$Sxin^3$	$Ixin^4$
Steel	14 ga.	1-1/2	0.180	0.108
		2	0.289	0.222
		2-1/2	0.405	0.410
	12 ga.	1-1/2	0.257	0.142
		2	0.387	0.321
		2-1/2	0.511	0.572
		3	0.706	0.897
Aluminum Alloy	.080"	1-1/2	0.200	0.125
		2	0.284	0.245
		2-1/2	0.390	0.416
		3	0.454	0.666
	.100"	1-1/2	0.200	0.120
		2	0.356	0.256
		2-1/2	0.473	0.502
		3	0.618	0.806
Stainless Steel-S	16 ga.	2	0.239	0.163
Stainless Steel-L	16 ga.	2	0.195	0.175

Strut Loading

Material		Type Load	Load	Defl., In.
Steel	14 ga.	U	905	0.047
		C	859	0.086
	12 ga.	U	1722	0.039
		C	1839	0.086
Aluminum Alloy	.080"	U	723	0.106
		C	601	0.178
	.100"	U	1100	0.134
		C	723	0.178
Stainless Steel-S	16 ga.	U	539	0.030
		C	777	0.086
Stainless Steel-L	16 ga.	U	450	0.026
		C	647	0.076

MARCO SPECIALTY STEEL

11 3/4” Wide
5 Diamond Channel



Safe Allowable Design Loads

Allowable Loads and Deflections:

U – uniform load (lb./sq.ft.)

C – concentrated load (lb.)

D – deflection (in.)

Spans to the left of heavy line produce a deflection of 1/4” or less under a uniform load of 100 lb./sq.ft.

Material	Channel Depth in.	Weight lb./lin. ft.	Catalog Number		SPAN 2'0"	2'6"	3'0"	3'6"	4'0"	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	7'-6"	8'0"	9'0"	10'0"	11'0"	12'0"
Steel 14 ga.	1-1/2	4.13	DS-P-051514	U	598	383	266	195	150	118	96	79	66	57	49	41					
				D	0.069	0.108	0.156	0.212	0.277	0.351	0.433	0.524	0.624	0.732	0.849	1.001					
				C	586	469	391	335	293	260	234	213	195	180	167	154					
				D	0.055	0.087	0.125	0.170	0.222	0.281	0.347	0.419	0.499	0.586	0.679	0.801					
	2	4.33	DS-P-052014	U	732	622	432	317	243	192	155	128	108	92	79	67	61	48			
				D	0.041	0.085	0.123	0.168	0.219	0.277	0.342	0.414	0.492	0.578	0.670	0.790	0.875	1.108			
				C	692	692	634	544	476	423	381	346	317	293	272	250	238	211			
				D	0.032	0.062	0.098	0.134	0.175	0.222	0.274	0.331	0.394	0.462	0.536	0.632	0.700	0.886			
	2-1/2	4.58	DS-P-052514	U	718	718	598	439	336	266	215	178	149	127	110	93	84	66	54	44	
				D	0.022	0.053	0.090	0.122	0.160	0.202	0.249	0.302	0.359	0.421	0.489	0.576	0.638	1.808	1.997	1.207	
				C	692	692	692	692	658	585	527	479	439	405	376	346	329	293	263	239	
				D	0.017	0.033	0.057	0.090	0.128	0.162	0.199	0.241	0.287	0.337	0.391	0.461	0.511	0.646	0.798	0.966	
Steel 12 ga.	1-1/2	5.49	DS-P-051512	U	851	544	378	278	213	168	136	112	95	81	69	59	53	42			
				D	0.073	0.114	0.164	0.233	0.291	0.369	0.455	0.551	0.656	0.770	0.839	1.052	1.166	1.475			
				C	833	666	555	476	416	370	333	303	278	256	238	219	208	185			
				D	0.058	0.091	0.131	0.179	0.233	0.295	0.364	0.441	0.525	0.616	0.714	0.842	0.933	1.180			
	2	5.84	DS-P-052012	U	1288	824	572	420	322	254	206	170	143	122	105	89	80	64	52	43	
				D	0.050	0.078	0.133	0.154	0.201	0.254	0.314	0.380	0.452	0.530	0.615	0.725	0.803	1.017	1.255	1.519	
				C	1261	1009	840	720	630	560	504	458	420	388	360	332	315	280	252	229	
				D	0.040	0.063	0.090	0.123	0.161	0.203	0.251	0.304	0.361	0.424	0.492	0.580	0.643	0.813	1.004	1.215	
	2-1/2	6.18	DS-P-052512	U	1385	1090	763	561	429	339	275	227	191	163	140	119	107	85	69	57	48
				D	0.030	0.059	0.084	0.115	0.150	0.190	0.234	0.284	0.338	0.396	0.460	0.542	0.600	0.760	0.938	1.135	1.351
				C	1477	1346	1121	961	841	748	673	612	561	518	481	443	421	374	336	306	280
				D	0.026	0.047	0.068	0.092	0.120	0.152	0.188	0.227	0.270	0.317	0.368	0.433	0.480	0.608	0.750	0.908	1.081
	3	6.52	DS-P-053012	U	1380	1380	1041	765	586	463	375	310	260	222	191	162	146	116	94	77	65
				D	0.019	0.046	0.071	0.097	0.127	0.161	0.199	0.240	0.286	0.336	0.389	0.459	0.508	0.643	0.794	0.961	1.144
				C	1563	1563	1530	1311	1147	1020	918	834	765	706	656	604	574	510	459	417	382
				D	0.017	0.034	0.057	0.078	0.102	0.129	0.159	0.192	0.229	0.269	0.311	0.367	0.407	0.515	0.636	0.769	0.915

Material	Channel Depth in.	Weight lb./lin. ft.	Catalog Number		SPAN 2'0"	2'6"	3'0"	3'6"	4'0"	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	7'-6"	8'0"	9'0"	10'0"	11'0"	12'0"
Alum. Alloy 5052. .080"	1-1/2	150	DS-A-051508	U	469	300	208	153	117	93	75	62	52	44							
				D	0.136	0.213	0.306	0.417	0.545	0.689	0.851	1.030	1.225	1.438							
				C	459	367	306	262	230	204	184	167	153	141							
				D	0.109	0.171	0.246	0.335	0.438	0.554	0.684	0.828	0.985	1.156							
	2	1.59	DS-A-052008	U	586	421	292	215	165	130	105	87	73	62	54	46	41				
				D	0.084	0.147	0.212	0.288	0.377	0.477	0.588	0.712	0.847	0.994	1.153	1.359	1.506				
				C	488	488	429	367	321	286	257	234	214	198	184	169	161				
				D	0.057	0.112	0.170	0.232	0.303	0.383	0.473	0.573	0.681	0.800	0.927	1.093	1.211				
	2-1/2	1.68	DS-A-052508	U	583	582	404	297	227	180	146	120	101	86	74	63	57	45			
				D	0.050	0.122	0.176	0.240	0.313	0.396	0.489	0.592	0.705	0.827	0.959	1.131	1.253	1.586			
				C	578	578	578	506	443	394	354	322	295	273	253	233	222	197			
				D	0.021	0.080	0.138	0.193	0.252	0.319	0.394	0.476	0.567	0.665	0.771	0.909	1.008	1.275			
	3	1.78	DS-A-053008	U	572	572	470	346	265	209	169	140	118	100	86	73	66	52	42		
				D	0.031	0.076	0.129	0.176	0.229	0.290	0.358	0.434	0.516	0.606	0.703	0.828	0.918	1.161	1.434		
				C	573	573	573	573	521	463	417	379	347	321	298	274	261	232	208		
				D	0.013	0.049	0.085	0.136	0.184	0.234	0.288	0.349	0.415	0.487	0.565	0.666	0.738	0.934	1.153		
Alum. Alloy 5052 .100"	1-1/2	1.86	DS-A-051510	U	520	333	231	170	130	103	83	69	58	49	42						
				D	0.141	0.220	0.316	0.431	0.563	0.712	0.879	1.064	1.266	1.486	1.723						
				C	510	408	340	291	255	227	204	185	170	157	146						
				D	0.113	0.177	0.255	0.346	0.452	0.573	0.707	0.855	1.018	1.195	1.386						
	2	1.98	DS-A-052010	U	859	550	382	281	215	170	137	114	95	81	70	59	54	42			
				D	0.105	0.164	0.236	0.321	0.420	0.531	0.656	0.793	0.944	1.108	1.285	1.515	1.679	2.125			
				C	615	615	534	458	401	356	320	291	267	247	229	211	200	178			
				D	0.065	0.126	0.190	0.258	0.337	0.427	0.527	0.638	0.759	0.891	1.034	1.218	1.350	1.709			
	2-1/2	2.09	DS-A-052510	U	893	710	493	362	277	219	177	147	123	105	91	77	69	55	44		
				D	0.065	0.125	0.180	0.244	0.319	0.404	0.499	0.604	0.719	0.843	0.978	1.153	1.277	1.617	1.996		
				C	781	781	724	621	543	483	434	395	362	334	310	286	271	241	217		
				D	0.046	0.090	0.144	0.197	0.257	0.325	0.401	0.486	0.578	0.678	0.786	0.927	1.027	1.300	1.605		
	3	2.09	DS-A-053010	U	897	897	644	473	362	286	232	192	161	137	118	100	91	72	58	48	40
				D	0.109	0.265	0.144	0.196	0.256	0.324	0.400	0.484	0.576	0.676	0.784	0.924	1.024	1.295	1.599	1.935	2.303
				C	773	773	773	773	703	624	562	511	468	432	401	370	351	312	281	255	234
				D	0.077	0.151	0.261	0.414	0.206	0.260	0.322	0.389	0.463	0.543	0.630	0.823	0.823	1.042	1.286	1.556	1.852
Stain. Steel 304 16 ga. 316L 16 ga.	2	3.58	DS-S-052016	U	436	436	325	239	183	144	117	97	81	69	60	51	46				
				D	0.030	0.073	0.112	0.153	0.200	0.253	0.312	0.377	0.449	0.527	0.611	0.720	0.798				
				C	715	572	477	409	358	318	286	260	238	220	204	188	179				
				D	0.040	0.062	0.090	0.122	0.160	0.202	0.249	0.302	0.359	0.422	0.489	0.576	0.639				
	2	3.58	DS-L-052016	U	364	318	221	162	124	98	80	66	55	47	41						
				D	0.026	0.056	0.080	0.109	0.142	0.180	0.222	0.269	0.320	0.376	0.436						
				C	487	389	324	278	243	216	195	177	162	150	139						
				D	0.029	0.045	0.064	0.087	0.114	0.144	0.178	0.216	0.257	0.301	0.349						

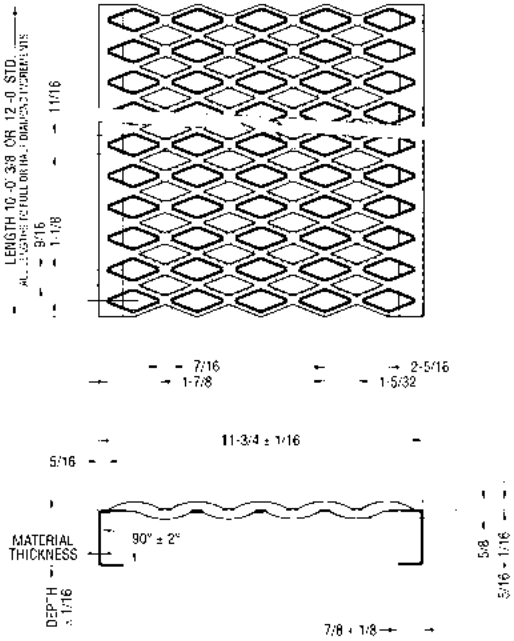
Engineering Data For Both Channels

Material		Channel Depth, in.	$Sx in^3$	$Ix in^4$
Steel	14 ga.	1-1/2	0.178	0.105
		2	0.289	0.216
		2-1/2	0.400	0.410
	12 ga.	1-1/2	0.253	0.142
		2	0.383	0.312
		2-1/2	0.511	0.557
		3	0.697	0.897
Aluminum Alloy	.080"	1-1/2	0.200	0.121
		2	0.280	0.245
		2-1/2	0.386	0.406
		3	0.454	0.652
	.100"	1-1/2	0.222	0.130
		2	0.349	0.274
		2-1/2	0.473	0.488
		3	0.612	0.788
Stainless Steel-S	16 ga.	2	0.239	0.178
Stainless Steel-L	16 ga.	2	0.195	0.178

Strut Loading

Material		Type Load	Load	Defl., In.
Steel	14 ga.	U	1364	0.165
		C	692	0.132
	12 ga.	U	1385	0.075
		C	1477	0.134
Aluminum Alloy	.080"	U	586	0.198
		C	488	0.270
	.100"	U	897	0.209
		C	615	0.246
Stainless Steel-S	16 ga.	U	436	0.046
		C	777	0.132
Stainless Steel-L	16 ga.	U	364	0.040
		C	647	0.116

18 3/4” Wide
8 Diamond Channel



Safe Allowable Design Loads

Allowable Loads and Deflections:

U – uniform load (lb./sq.ft.)

C – concentrated load (lb.)

D – deflection (in.)

Spans to the left of heavy line produce a deflection of 1/4” or less under a uniform load of 100 lb./sq.ft.

Material	Channel Depth in.	Weight lb./lin. ft.	Catalog Number		SPAN 2'0"	2'6"	3'0"	3'6"	4'0"	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	7'-6"	8'0"	9'0"	10'0"	11'0"	12'0"
Steel 14 ga.	1-1/2	5.86	GT-P-081514	U	417	267	185	136	104	82	67	55	46								
				D	0.070	0.110	0.158	0.216	0.282	0.356	0.440	0.532	0.634								
				C	326	261	217	186	163	145	130	119	109								
				D	0.028	0.044	0.063	0.086	0.113	0.143	0.176	0.213	0.253								
	2	6.11	GT-P-082014	U	460	361	251	184	141	112	90	75	63	53	46						
				D	0.039	0.076	0.110	0.150	0.196	0.248	0.306	0.370	0.440	0.517	0.599						
				C	401	353	294	252	221	196	176	160	147	136	126						
				D	0.018	0.031	0.044	0.060	0.078	0.099	0.122	0.148	0.176	0.207	0.240						
	2-1/2	6.36	GT-P-082514	U	474	474	395	290	222	176	142	118	99	84	73	62	56	44			
				D	0.020	0.050	0.086	0.118	0.154	0.195	0.240	0.291	0.346	0.406	0.471	0.555	0.615	0.778			
				C	450	450	444	381	333	296	267	242	222	205	190	175	167	148			
				D	0.010	0.020	0.035	0.047	0.061	0.078	0.096	0.116	0.138	0.162	0.188	0.222	0.246	0.311			
	3	7.93	GT-P-081512	U	527	337	234	172	132	104	84	70	59	50	43						
				D	0.070	0.109	0.157	0.214	0.279	0.354	0.436	0.528	0.628	0.738	0.855						
				C	413	330	275	236	207	184	165	150	138	127	118						
				D	0.028	0.044	0.063	0.086	0.112	0.141	0.175	0.211	0.251	0.295	0.342						
Steel 12 ga.	2	8.27	GT-P-082012	U	805	515	358	263	201	159	129	106	89	76	66	56	50	40			
				D	0.077	0.120	0.173	0.236	0.308	0.390	0.481	0.582	0.693	0.813	0.943	1.111	1.231	1.558			
				C	629	503	419	359	314	279	251	229	210	193	180	165	157	140			
				D	0.031	0.048	0.069	0.094	0.123	0.156	0.192	0.233	0.277	0.325	0.377	0.445	0.493	0.623			
	2-1/2	8.61	GT-P-082512	U	870	696	483	355	272	215	174	144	121	103	89	75	68	54	43		
				D	0.032	0.062	0.090	0.122	0.159	0.202	0.249	0.301	0.358	0.421	0.488	0.575	0.637	0.806	0.995		
				C	740	679	566	485	425	377	340	309	283	261	243	223	212	189	170		
				D	0.014	0.025	0.036	0.049	0.064	0.081	0.100	0.120	0.143	0.168	0.195	0.230	0.255	0.323	0.398		
	3	8.95	GT-P-083012	U	858	942	654	481	368	291	236	195	164	139	120	102	92	73	59	49	41
				D	0.018	0.049	0.071	0.096	0.126	0.159	0.196	0.237	0.282	0.331	0.384	0.453	0.502	0.636	0.785	0.949	1.130
				C	902	902	775	664	581	516	465	423	387	358	332	306	290	258	232	211	194
				D	0.010	0.019	0.028	0.038	0.050	0.064	0.078	0.095	0.113	0.133	0.154	0.181	0.201	0.254	0.314	0.380	0.452

Material	Channel Depth in.	Weight lb./lin. ft.	Catalog Number		SPAN 2'0"	2'6"	3'0"	3'6"	4'0"	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	7'-6"	8'0"	9'0"	10'0"	11'0"	12'0"
Allum. Alloy 5052. .080"	1-1/2	2.16	GT-A-081508	U	306	196	136	100	76	60	49	40									
				D	0.138	0.215	0.310	0.422	0.551	0.697	0.861	1.042									
				C	240	192	160	137	120	107	96	87									
				D	0.055	0.087	0.125	0.170	0.222	0.280	0.346	0.419									
	2	2.25	GT-A-082008	U	365	266	185	136	104	82	66	55	46								
				D	0.079	0.141	0.202	0.276	0.360	0.455	0.562	0.680	0.810								
				C	309	261	217	186	163	145	130	119	109								
				D	0.034	0.057	0.081	0.111	0.145	0.183	0.226	0.274	0.326								
	2-1/2	2.34	GT-A-082508	U	361	361	253	186	142	112	91	75	63	54	46						
				D	0.049	0.120	0.174	0.236	0.309	0.391	0.483	0.584	0.695	0.816	0.946						
				C	321	321	298	256	224	199	179	163	149	138	128						
				D	0.022	0.043	0.070	0.095	0.124	0.157	0.194	0.235	0.279	0.328	0.380						
	3	2.44	GT-A-083008	U	358	358	289	212	163	129	104	86	72	62	53	45	41				
				D	0.030	0.074	0.124	0.169	0.221	0.279	0.345	0.417	0.496	0.583	0.676	0.797	0.883				
				C	333	333	333	293	256	228	205	186	171	158	146	135	128				
				D	0.014	0.028	0.049	0.068	0.089	0.112	0.139	0.168	0.200	0.234	0.272	0.320	0.355				
Allum. Alloy 5052. .080"	1-1/2	2.69	GT-A-081510	U	351	225	156	115	88	69	56	46									
				D	0.134	0.210	0.303	0.412	0.538	0.681	0.840	1.017									
				C	276	220	184	157	138	122	110	100									
				D	0.054	0.084	0.122	0.166	0.216	0.274	0.338	0.409									
	2	2.80	GT-A-082010	U	524	336	233	171	131	104	84	69	58	50	43						
				D	0.095	0.148	0.213	0.209	0.379	0.480	0.593	0.717	0.854	1.002	1.162						
				C	410	328	273	234	205	182	164	149	137	126	117						
				D	0.038	0.060	0.086	0.117	0.153	0.193	0.238	0.288	0.343	0.403	0.467						
	2-1/2	2.92	GT-A-082510	U	556	483	335	246	189	149	121	100	84	71	62	52	47				
				D	0.060	0.126	0.182	0.274	0.323	0.409	0.505	0.611	0.727	0.854	0.990	1.167	1.293				
				C	518	475	396	339	297	264	237	216	198	183	170	156	148				
				D	0.028	0.051	0.073	0.100	0.130	0.164	0.203	0.246	0.292	0.343	0.398	0.469	0.520				
	3	3.03	GT-A-083010	U	554	554	442	325	249	197	159	132	111	94	81	69	62	49	40		
				D	0.039	0.095	0.156	0.213	0.278	0.352	0.434	0.526	0.625	0.734	0.851	1.003	1.112	1.407	1.737		
				C	586	586	520	446	390	347	312	284	260	240	223	205	195	173	156		
				D	0.021	0.041	0.063	0.086	0.112	0.141	0.175	0.211	0.251	0.295	0.342	0.403	0.447	0.566	0.699		

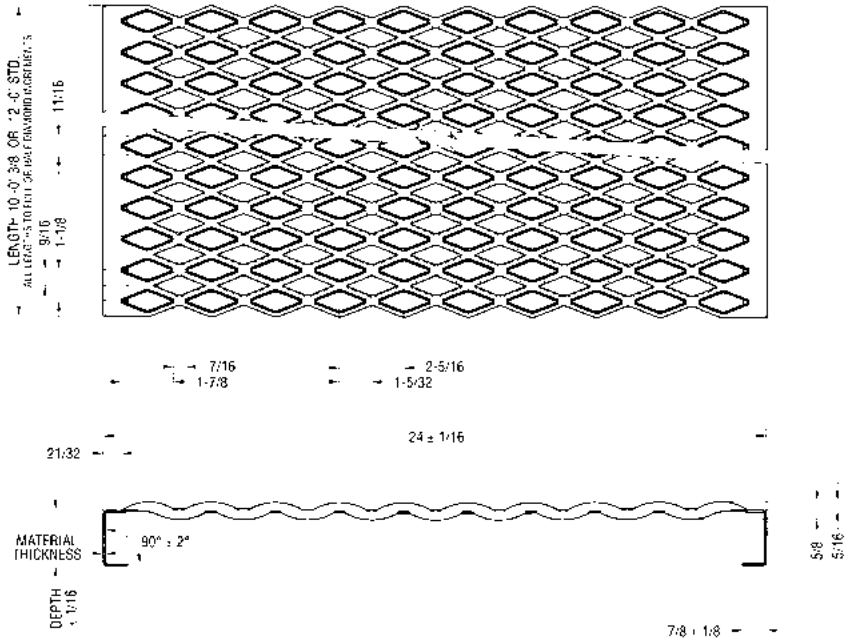
Engineering Data For Both Channels

Material		Channel Depth, in.	$Sxin^3$	$Ixin^4$
Steel	14 ga.	1-1/2	0.198	0.115
		2	0.268	0.224
		2-1/2	0.405	0.431
	12 ga.	1-1/2	0.251	0.147
		2	0.382	0.203
		2-1/2	0.516	0.530
		3	0.706	0.920
Aluminum Alloy	.080"	1-1/2	0.209	0.125
		2	0.284	0.260
		2-1/2	0.390	0.416
		3	0.446	0.666
	.100"	1-1/2	0.240	0.147
		2	0.357	0.310
		2-1/2	0.517	0.527
		3	0.680	0.806

Strut Loading

Material		Type Load	Load	Defl., In.
Steel	14 ga.	U	510	0.418
		C	401	0.335
	12 ga.	U	954	0.424
Aluminum Alloy	.080"	U	740	0.339
		C		
	.100"	U	381	0.873
		C	309	0.698

24” Wide
10 Diamond Channel



Safe Allowable Design Loads

Allowable Loads and Deflections:

U – uniform load (lb./sq.ft.)

C – concentrated load (lb.)

D – deflection (in.)

Spans to the left of heavy line produce a deflection of 1/4” or less under a uniform load of 100 lb./sq.ft.

Material	Channel Depth in.	Weight lb./lin. ft	Catalog Number		SPAN 2’0”	2’6”	3’0”	3’6”	4’0”	4’6”	5’0”	5’6”	6’0”	6’6”	7’0”	7’-6”	8’0”	9’0”	10’0”	11’0”	12’0”
Steel 14 ga.	2	7.44	GT-P-102014	U	358	343	238	175	134	106	86	71	60	51	44						
				D	0.029	0.069	0.099	0.134	0.175	0.222	0.274	0.332	0.395	0.463	0.537						
				C	531	429	358	307	268	238	215	195	179	165	153						
				D	0.017	0.027	0.039	0.054	0.070	0.089	0.110	0.133	0.158	0.185	0.215						
	3	7.95	GT-P-103014	U	304	304	304	243	186	147	119	99	83	71	61	52	47				
				D	0.010	0.024	0.051	0.075	0.098	0.125	0.154	0.186	0.221	0.260	0.301	0.355	0.394				
				C	299	299	299	299	299	299	298	271	249	229	213	196	186				
				D	0.004	0.008	0.013	0.021	0.032	0.045	0.062	0.074	0.089	0.104	0.121	0.142	0.157				
Steel 12 ga.	2	10.1	GT-P-102012	U	491	417	290	213	163	129	104	86	72	62	53	45	41				
				D	0.033	0.069	0.099	0.134	0.176	0.222	0.274	0.332	0.395	0.464	0.538	0.634	0.702				
				C	489	489	435	372	326	290	261	237	217	201	186	172	163				
				D	0.013	0.026	0.039	0.054	0.070	0.089	0.110	0.133	0.158	0.185	0.215	0.253	0.281				
	3	10.8	GT-P-103012	U	653	653	565	415	318	251	203	168	141	120	104	88	79	63	51	42	
				D	0.016	0.049	0.071	0.097	0.126	0.160	0.197	0.239	0.284	0.333	0.387	0.456	0.505	0.639	0.789	0.955	
				C	646	646	646	646	635	565	508	462	424	391	363	334	318	282	254	231	
				D	0.006	0.013	0.022	0.034	0.051	0.064	0.079	0.096	0.114	0.133	0.155	0.182	0.202	0.256	0.316	0.382	

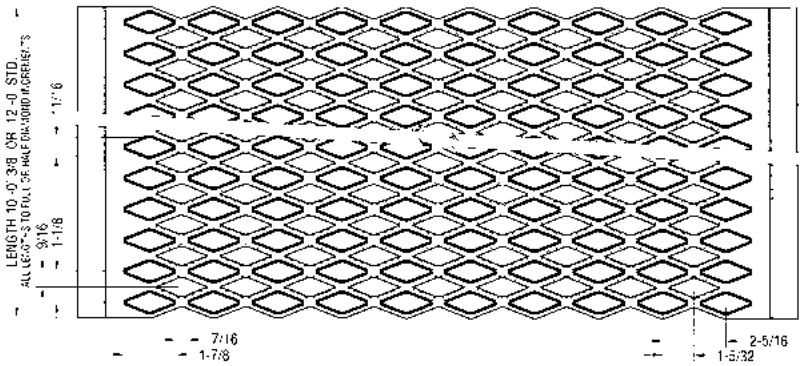
Engineering Data For Both Channels

Material		Channel Depth, In.	$Sxin^3$	$Ixin^4$
Steel	13 ga.	2	0.326	0.304
		3	0.453	0.753
	12 ga.	2	0.396	0.369
		3	0.772	1.000

Strut Loading

Material		Type Load	Load	Defl., In.
Steel	13 ga.	U	304	0.690
		C	299	0.552
	12 ga.	U	491	0.690
		C	489	0.552

24” Wide
10 Diamond Walkway



Safe Allowable Design Loads

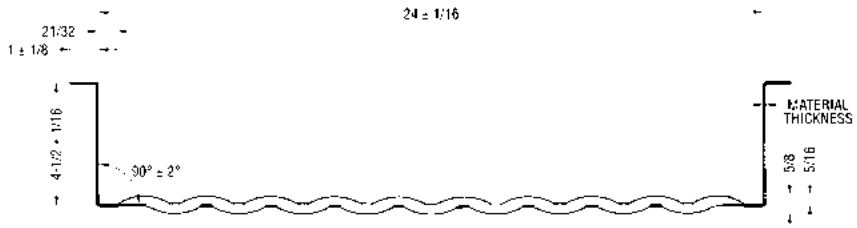
Allowable Loads and Deflections:

U – uniform load (lb./sq.ft.)

C – concentrated load (lb.)

D – deflection (in.)

Spans to the left of heavy line produce a deflection of 1/4” or less under a uniform load of 100 lb./sq.ft.



Material	Channel Depth in	Weight lb./lin. ft.	Catalog Number	SPAN 2’0”	2’6”	3’0”	3’6”	4’0”	4’6”	5’0”	5’6”	6’0”	6’6”	7’0”	7’-6”	8’0”	9’0”	10’0”	11’0”	12’0”
			GT-P-104514 U	342	342	342	342	307	243	197	163	137	116	100	85	77	61	49	41	
Steel	4.5	8.81	D	0.004	0.010	0.020	0.037	0.057	0.072	0.088	0.107	0.127	0.150	0.173	0.204	0.227	0.287	0.354	0.428	
14 ga.	(114.3)	(13.1)	C	358	358	358	358	358	358	358	358	358	358	351	324	307	273	246	224	
			D	0.002	0.003	0.006	0.009	0.013	0.019	0.026	0.034	0.044	0.057	0.069	0.082	0.091	0.115	0.142	0.171	
			GT-P-104512 U	664	664	664	593	454	359	291	240	202	172	148	126	114	90	73	60	50
Steel	4.5	11.94	D	0.005	0.013	0.028	0.045	0.059	0.075	0.092	0.111	0.132	0.155	0.180	0.213	0.235	0.298	0.368	0.445	0.530
12 ga.	(114.3)	(17.8)	C	703	703	703	703	703	703	703	661	606	559	519	478	454	404	363	330	303
			D	0.002	0.004	0.008	0.012	0.018	0.026	0.036	0.045	0.053	0.062	0.072	0.085	0.094	0.119	0.147	0.178	0.212

Engineering Data For Both Channels

Material		Channel Depth, In.	Sx_{in}^3	Ix_{in}^4
Steel	14 ga.	4-1/2	0.747	2.158
	12 ga.	4-1/2	1.104	3.068

Strut Loading

Material		Type Load	Load	Defl., In.
Steel	14 ga.	U	362	0.690
		C	358	0.552
	12 ga.	U	695	0.690
		C	703	0.552

GRATE-LOCK® INTERLOCKING SAFETY GRATING

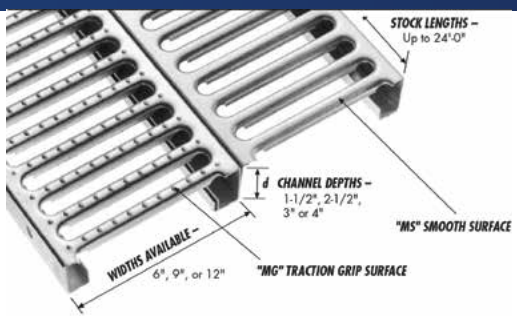
Grate-Lock® Grating is an easy-to-install system of interlocking grating planks, treads and accessories that provides safe, sturdy footing for mezzanine floors, platforms, walkways and other applications where nonslip performance is required. Hundreds of sole-gripping dimples insure a safe surface in all kinds of weather and environments. The grating is available textured for safer working surfaces, non-textured for wheeled traffic or rack decking.

The unique design of Grate-Lock® Grating gives you more design options at less cost than other grating systems. Increased load performance (see charts) has been achieved through interlocking planks, stronger rung design and an expanded selection of leg heights and material gauges. Grate-Lock® Grating lets you specify lighter gauge steel for substantial material saving.

Grate-Lock® Grating provides the broadest line products of any manufacturer. Available in three plank widths, four plank heights, three gauges and lengths to 24'. Interlocking sections provide the strength you need for extra-wide designs.

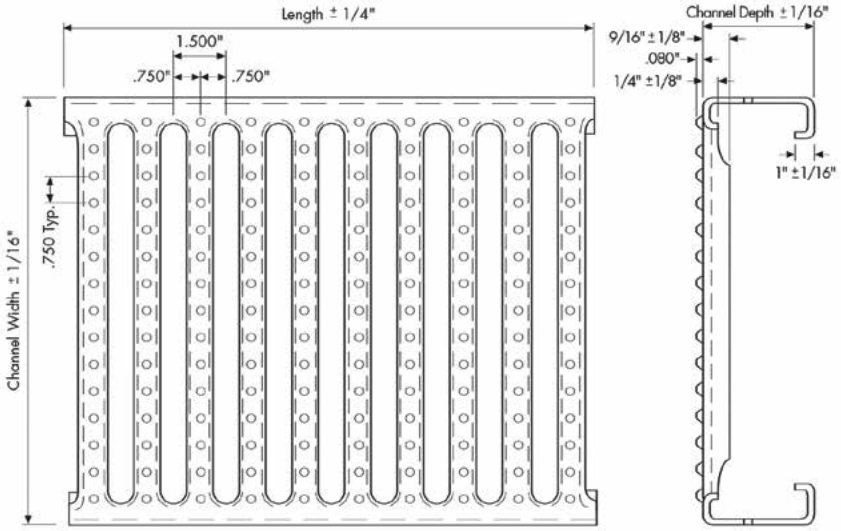
Bolt-together slotted assemblies saves time in the field. Kickplates and plank sections are pre-punched. For additional ease, planks can be straight, curved or angle cut with hand tools. Our line includes kickplates, hold-down clamps, attachment hardware and stair treads for complete job design.

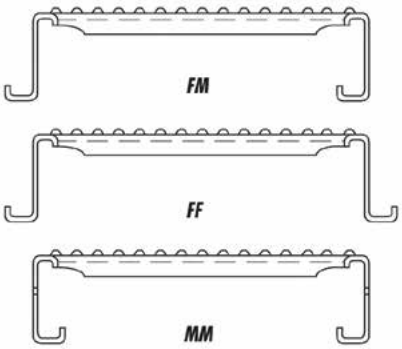
We have constructed our load tables using the most stringent interpretation of the AISI standards: Our safe allowable loads guard against harmful local distortion as well as failure. Some manufacturers have prepared allowable load tables guarding against failure only.



Materials

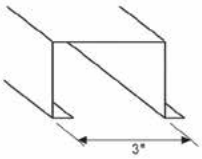
- Pre-Galvanized Steel ASTM A-924-G90 14, 16 & 18 gauge
- HRPO Uncoated Steel ASTM A-569 14, 16 & 18 gauge





Solid Filler Plank

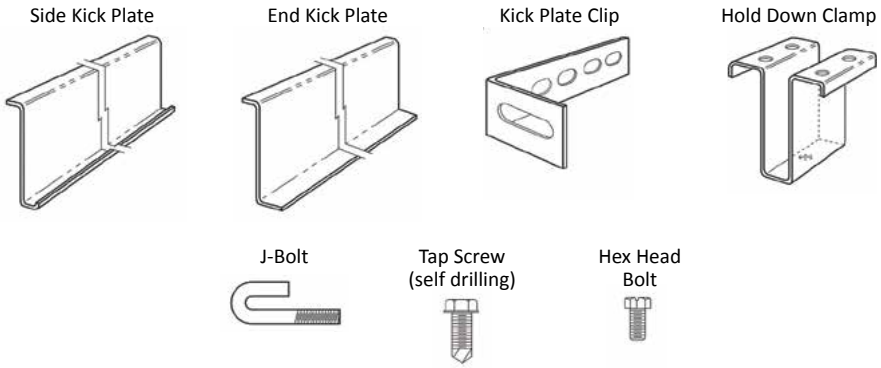
Solid surface 3" wide plank In male/female profile. Ideal for closing non-incremental Platform widths.



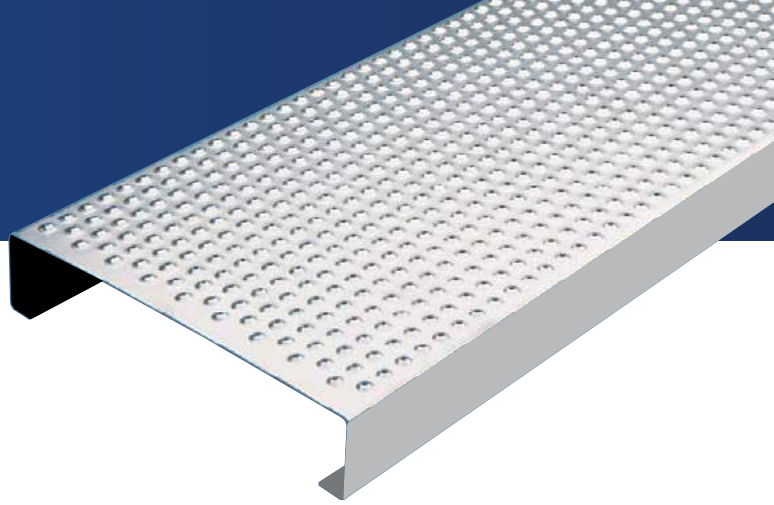
System Components

Item	Height
Side Kickplate (14 Ga.) 12-Ft. Lengths	6-1/2", 7", 8"
End Kickplate (14 Ga.) 12-Ft. Lengths	6-1/2", 7", 8"
Kickplate Clip	--
Hold-Down Clamp	2-1/2", 3", 4"
J-Bolt	2-1/2"
Tapscrew (self-drilling)	1"
3/8" Hex Head Bolt with Nut & Washer	1"

Grate-Lock® Fasteners



TREAD-GRIP® CHANNELS



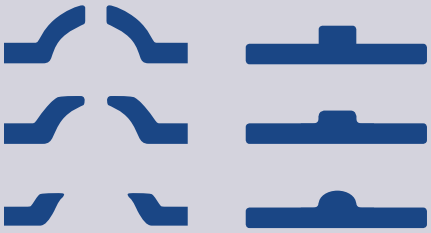
Standard Stock Size Channels

Stock Sizes:

- Pre-Galvanized or HRP&O Steel
- 13 and 11 gauge
- .125” 5052-H32 aluminum
- Low Open Area – Debris and tools will not fall through
- Custom sizes available
- Channels also available in Button-Hole® Patterns
- Safe Load Tables available upon request
- 10’ or 12’ lengths

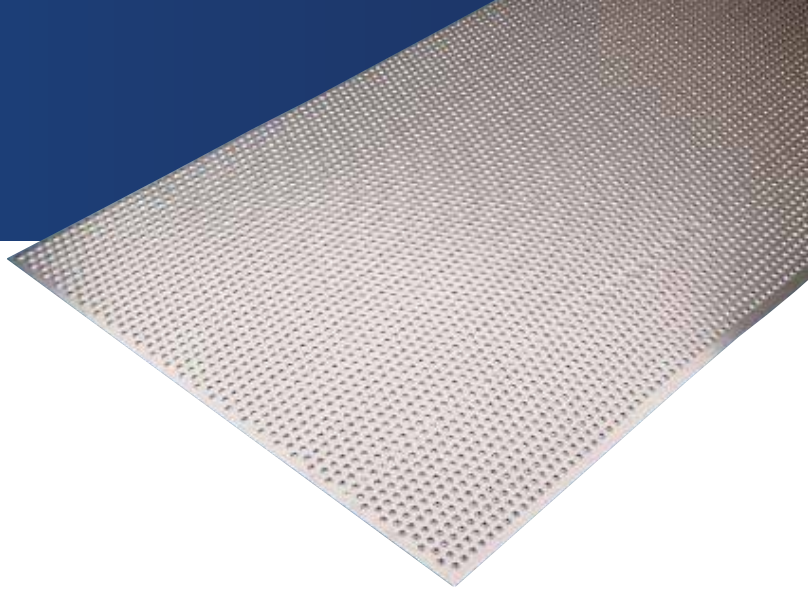
Width	Channel Height	13 Gauge Steel Wt./ln. ft.	11 Gauge Steel Wt./ln. ft.	Aluminum Wt./ln. ft.
7”	1-1/2”	3.63	4.82	—
	2”	3.63	4.82	1.73
10”	1-1/2”	4.57	6.09	—
	2”	4.57	6.09	2.17
12”	1-1/2”	5.13	6.85	—
	2”	5.13	6.85	2.44

Wearability



Marco’s perforated-button treads make the difference. Because of the way these treads are designed and produced, Perfo Grip® grating and Tread-Grip® flooring retain a larger percent of their original non-slip characteristics over a longer period of time then a other types of surfaces that rely on “outside” corners to provide friction.

TREAD-GRIP® SHEETS



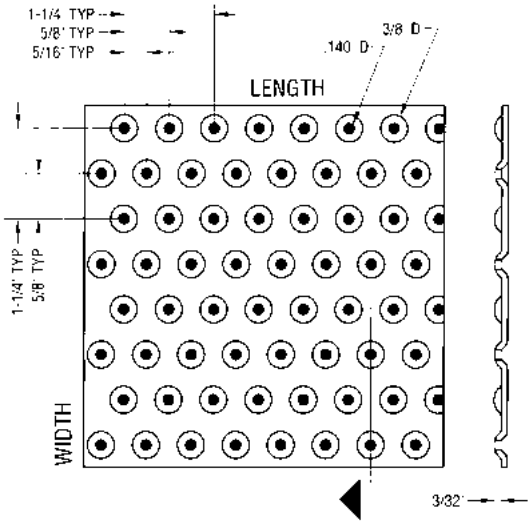
Standard Stock Size Channels

Standard Sizes:

- HRP&O Steel 11, 12, 13, 14 and 16 gauge
- .125” 5052-H32 Aluminum
- 36” wide x 120” long
- Other finishes and sizes available on special order
- 304-2B Stainless – 16 gauge in the Chevron or 1-1/4” square pattern only
- Pre-Galvanized available on special inquiry

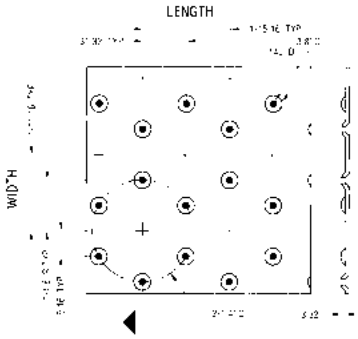
Material	lb./sq. ft.
16 Gauge HRP&O Steel	2.4
14 Gauge HRP&O Steel	3.0
13 Gauge HRP&O Steel	3.6
12 Gauge HRP&O Steel	4.2
11 Gauge HRP&O Steel	4.8
.125” Aluminum	1.7

Tread-Grip®

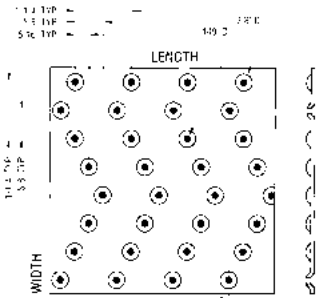


Optional Patterns Available

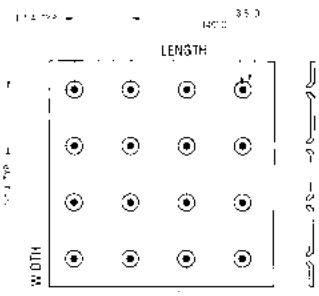
Safe-Deck™



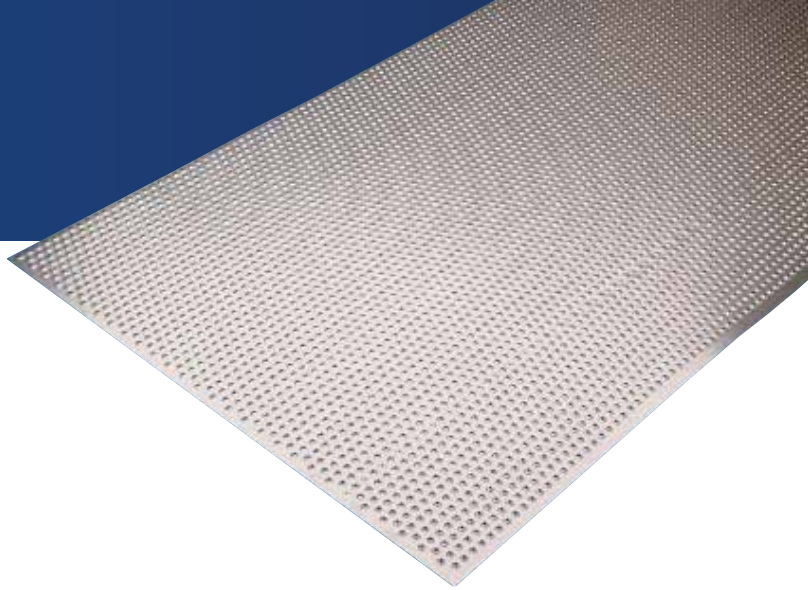
Chevron



1-1/4” Square



BUTTON-HOLE® SHEETS



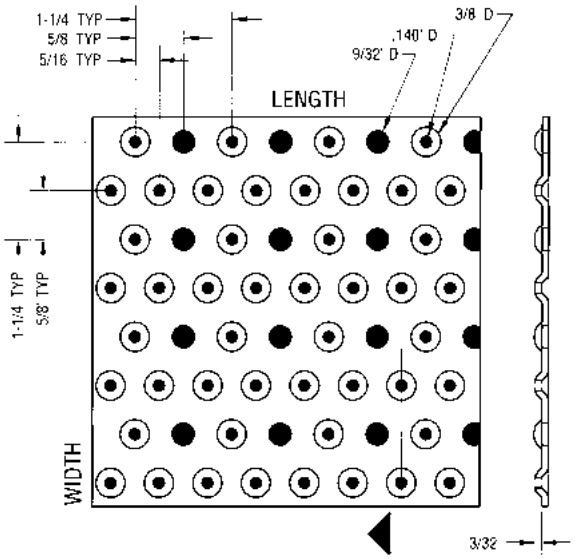
Standard Stock Size Channels

Standard Sizes:

- HRP&O Steel 11, 12, 13, 14 and 16 gauge
- .125” 5052-H32 Aluminum
- 36” Wide x 120” long
- Other Finishes and sizes available on special order
- 304-2B Stainless – 16 gauge in the Chevron or 1-1/4” square pattern only
- Pre-Galvanized available on special inquiry

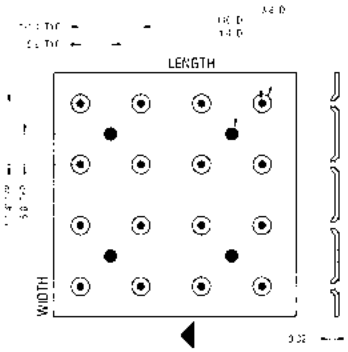
Material	lb./sq. ft.
16 Gauge HRP&O Steel	2.3
14 Gauge HRP&O Steel	2.9
13 Gauge HRP&O Steel	3.5
12 Gauge HRP&O Steel	4.1
11 Gauge HRP&O Steel	4.7
.125” Aluminum	1.6

Button-Hole®

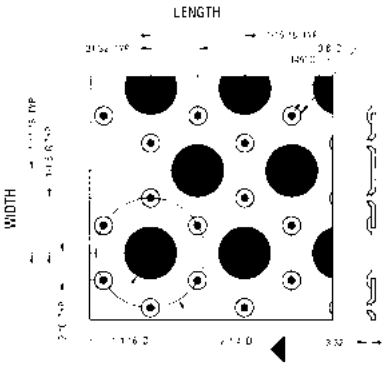


Optional Patterns Available

Square



Jumbo



TREAD-GRIP® LADDER RUNGS

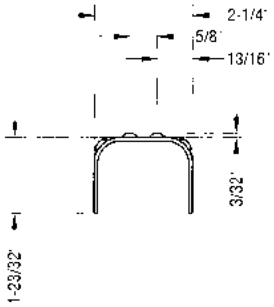
Standard Ladder Rungs

Standard Sizes:

- 16”, 18”, 48-3/4”, 60” lengths
- .125” Aluminum
- 16 gauge 304-2B Stainless Steel
- Safe allowable design loads shown are concentrated at center of span on simple beam

4 Row Stock Ladder Rungs

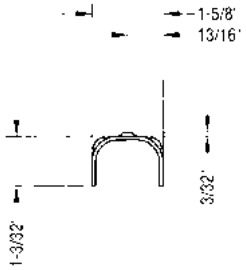
Material	Safe Allowable Concentrated Load lb.				Weight lb./In. ft.
	16” Span	18” Span	20” Span	24” Span	
11 Gauge Steel	1138	1012	911	759	1.947
13 Gauge Steel	862	766	689	574	1.411
.125" Aluminum	810	720	649	540	0.723
16 Gauge Stainless Steel	580	516	464	387	1.066



3 Row Stock Ladder Rungs

Material	Safe Allowable Concentrated Load lb.				Weight lb./In. ft.
	16” Span	18” Span	20” Span	24” Span	
11 Gauge Steel	474	422	379	316	1.214
13 Gauge Steel	375	334	300	250	0.888
.125" Aluminum	337	299	269	224	0.451
16 Gauge Stainless Steel	260	231	208	N/A	0.675

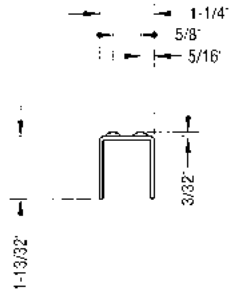
Does not meet OSHA 1910.26/1910.27 (Minimum Concentrated Load 200 lb. Live Load) in application of this span.



2 Row Stock Ladder Rungs

Material	Safe Allowable Concentrated Load lb.				Weight lb./In. ft.
	16” Span	18” Span	20” Span	24” Span	
11 Gauge Steel	664	590	531	443	1.469
13 Gauge Steel	508	451	401	338	1.070
.125" Aluminum	471	418	377	314	0.545
16 Gauge Stainless Steel	345	306	276	230	0.811

These loads are based on Simple Beam Calculation. The Minimum Safety Factor = 1.67. Maximum deflection does not exceed L/240.



STAIR TREADS

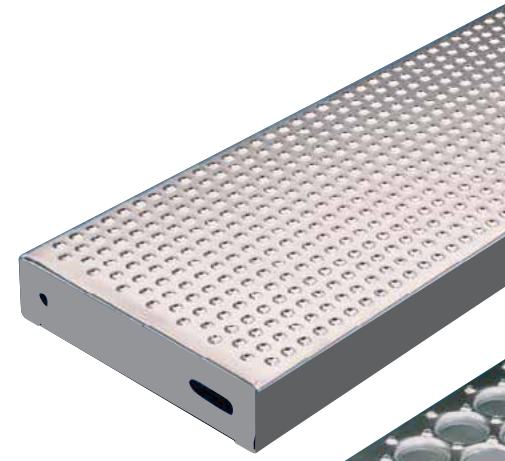
Perfo Grip® & Tread-Grip®

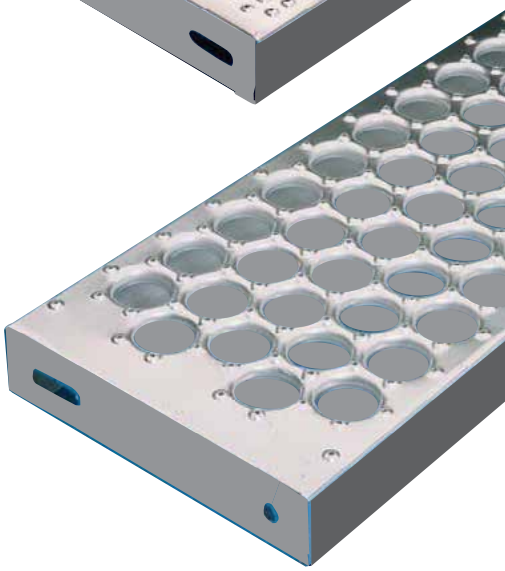
Standard Sizes:

- Pre-Galvanized or HRP&O Steel – 13 and 11 gauge
- .125” 5052-H32 Aluminum
- Margins all sides
- Integral end caps with mounting holes and slots
- Custom sizes available

Length	Width	Height
24"	10” & 12”	2”
30"	10” & 12”	2”
36"	10” & 12”	2”
48"	10” & 12”	2”

Nominal Channel Width	Dimension “A”
5"	2"
7"	4"
10"	7"
12"	9"
18”	15”

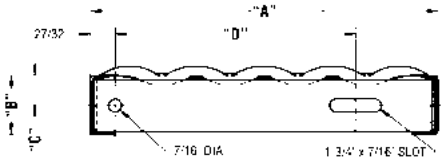


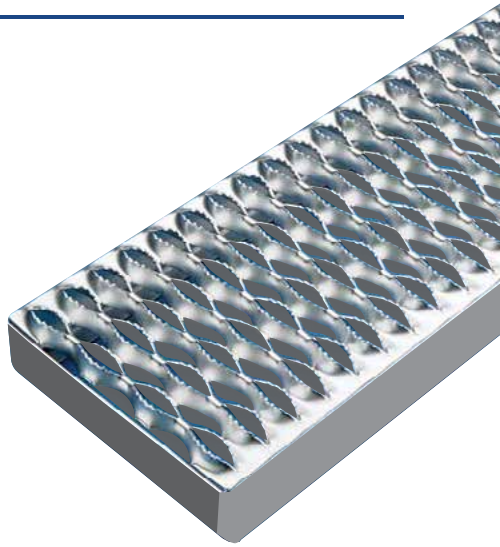


Grip Strut®

Standard Sizes:

- 24”, 30”, 36” and 48” lengths
- Pre-Galvanized or HRP&O Steel – 14 and 12 gauge
- .100” 5052-H32 Aluminum





A	B	C	D
4-3/4” (2 Diamond)	1-1/2”	3/4”	2-5/8”
	2”	1”	2-5/8”
7” (3 Diamond)	1-1/2”	3/4”	3-3/8”
	2”	1”	3-3/8”
9-1/2” (4 Diamond)	1-1/2”	3/4”	5-7/8
	2”	1”	5-7/8
11-3/4” (5 Diamond)	1-1/2”	3/4”	8-1/8”
	2”	1”	8-1/8”

HOW TO SPECIFY SAFETY GRATING

Part 1: General

1.1 Scope

A. Purpose: These specifications are presented as a general guide to the architect or structural engineer in preparing projected specifications.

B. Grip Strut® and Perfo Grip® Safety Grating and Stair Treads:

1. Do not use these products without prior structural design by a qualified engineer or architect.
2. Furnish and install as specified in all areas where shown on the drawings.

C. Intended Use:

1. Grip Strut® and Perfo Grip® Safety Grating:
   a. For general purpose use in plants and process facilities by industry, commerce, and public utilities.

b. For mobile and stationary equipment.

2. Grip Strut® and Perfo Grip® Safety Grating Stair Treads:
   a. For utility stairs and fire escapes in commercial, and private building when permitted by local building codes.
   b. Not for staircase used regularly by the general public where flat closed surfaces are desired.

1.2 Qualifications

A. Grip Strut® and Perfo Grip® Safety Grating Stair Treads, and accessories:

1. Manufactured by Marco Specialty Steel.
2. Installed in accordance with its current printed directions.
3. Safety Grating:
   a. Meet Safe allowable loads and deflections as required by qualified engineer or architect.
   b. Slip Resistance: Federal Specification RR-G-1602C, Section 4.4.3.

1.3 Contractor Submittals

A. Erection drawing of grating layout, framing and supports, unit dimensions, type and location of fasteners and welds.

B. Manufacturer's shop details, including section, cut outs, and banding details.

C. Catalog cuts or calculations verifying performance to safe allowable loads and deflection criteria.

1.4 Storage and Handling

A. Store and handle materials to avoid damage.

B. Remove damaged and deteriorated materials from the premises. Dented material can jeopardize structural integrity of product.

Part 2: Products

2.1 Grating Materials

A. Safety Grating Walkways: Grip Strut® OR Perfo Grip®.

B. Material:

1. Carbon Hot Rolled, Pickled and Oiled Steel: ASTM A1011
2. Mill Galvanized Steel: ASTM A653 and A924.
3. Stainless Steel Alloy: Type 304-2B & 316L-2B (Tread-Grip® Only).
4. Aluminum Alloy: 5052-H32

C. Material gauge or thickness:

1. Grip Strut®: 14 gauge steel, 16 gauge stainless, .080 or .100" thick aluminum.
2. Perfo Grip®: 13 gauge steel, 11 gauge steel and .125 thick aluminum.

D. Selection Width:

1. Grip Strut®:
   a. Channels: 18-3/4" (8 diamond)
      24" (10 diamond)
   b. Walkway 24" (10 diamond)
2. Perfo Grip®:
   a. Channels: 5", 7", 10", 12", 18".
   b. Walkway: 24", 30", 36".

E. Selection Height:

1. Grip Strut®
   a. Channels: 1-1/2", 2", 2-1/2", 3".
   b. Walkway: 4-1/2".
2. Perfo Grip®:
   a. Channels: 1-1/2", 2".
   b. Walkway: 5".

F. Selection Length:

1. Grip Strut®:
   a. Standard length: 10(120-3/8") or 12' (144")
   b. Other: To Order in full or half diamond length increments only.
2. Perfo Grip®:
   a. Standard length: 10 or 12'.
   b. Other: To order.

G. Open Area:

1. Grip Strut® or Perfo Grip® provide maximum open area for and ventilation.

H. Slip Resistance: Federal Specification RR-G-1602C.

Part 3: Execution

3.1 General

Install grating in accordance with manufacturer's recommendations, structural drawings, and approved erection and drawings.

3.2 Condition of Surfaces

A. Prior to grating installation:

1. Inspect supports for correct size, layout and alignment.
2. Verify that surfaces to receive grating are free of debris, burrs, bridging, welds, and other irregularities.
3. Bearing surfaces:
   a. Recommended minimum: 1-1/2".
   b. Smooth and level so adjoining sections provide a safe, even walking surface.
4. Notify the design or consulting engineer or owner's agent in writing of defects detrimental to proper application of grating so defects can be remedied before grating is applied.

3.3 Grating Installation

A. Recommended Clearance:

1. Steel:
   a. Perimeter: 1/4" minimum.
   b. End joints: 3/8" maximum.
   c. Between panels: 1/8" general use; 1/4" maximum.
2. Concrete:
   a. Perimeter: 1/2"
   b. Between panels: 1/4" maximum.

B. Positioning and banding:

1. Position flat and square with ends bearing min. 1-1"/2 on supporting structure.
2. Band random cut ends, diagonals, and coped corners:
   a. With a minimum 1/8 thick bar.
   b. Equal to overall grating thickness.
   c. Welded at contact point at the discretion of the design engineer.
   d. When additional supports are required, do not use banding as a replacement.

3.4 Grating Attachment

A. Attach grating to supports without warp or deflection.

B. With anchoring device or welding, attach planks at every point of contact with supporting structure.

C. Multiple-width applications:

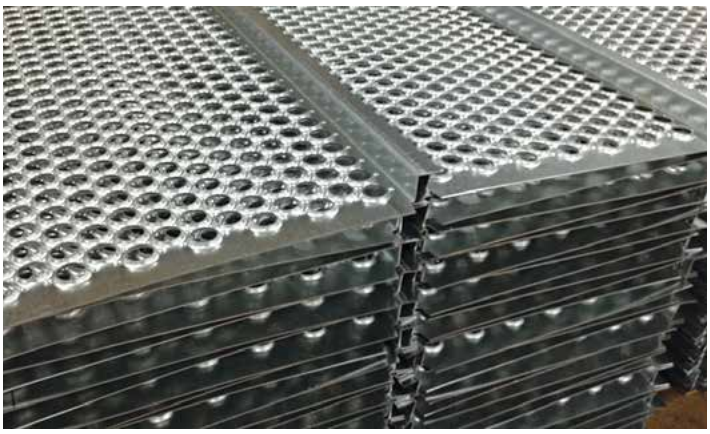
1. In field of platform, attach plank to supporting structure with a minimum of one attachment at each end of plank on alternate sides.
2. Spans exceeding 8 ft. Weld or bolt side channels of adjacent planks together at midpoint of span.

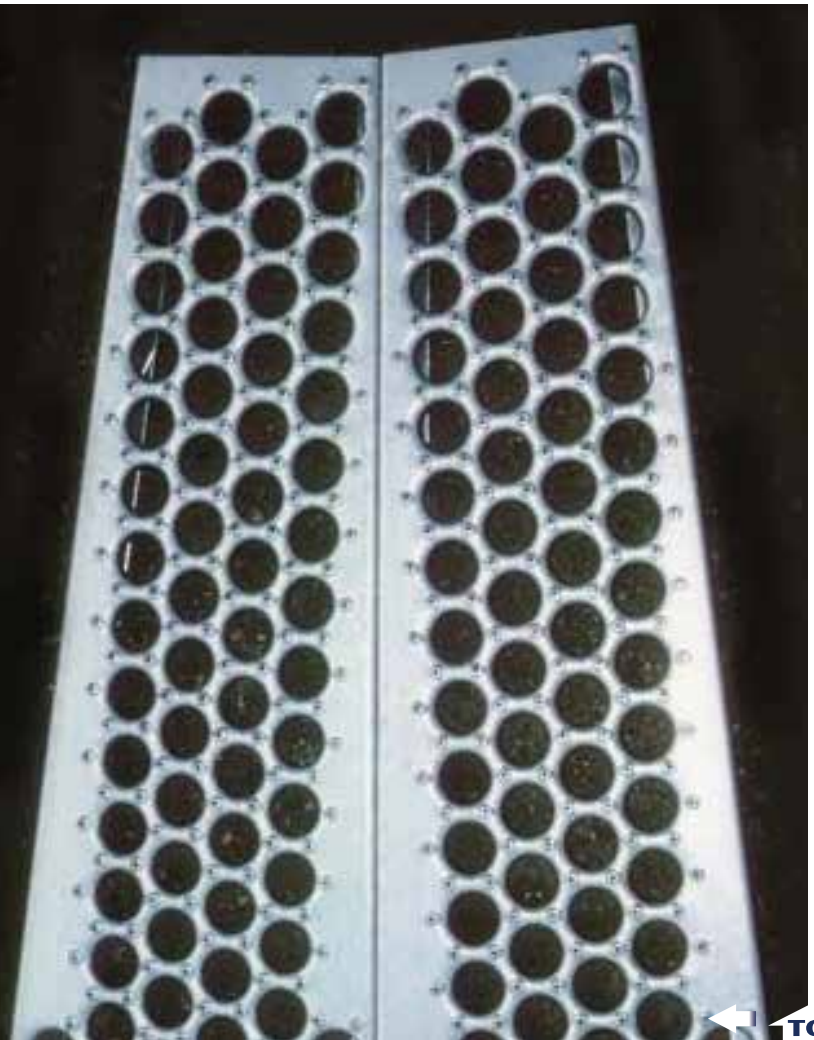
D. Fastener Attachments: Secure each to supporting members and at every point of contact:

1. Grip Strut®: Use two diamond washers and 5/16" carriage bolts and nuts.
2. Perfo Grip®: Use two bolt seat washers and 1/2" or 3/8" carriage bolts & nuts.

E. Weld Attachment:

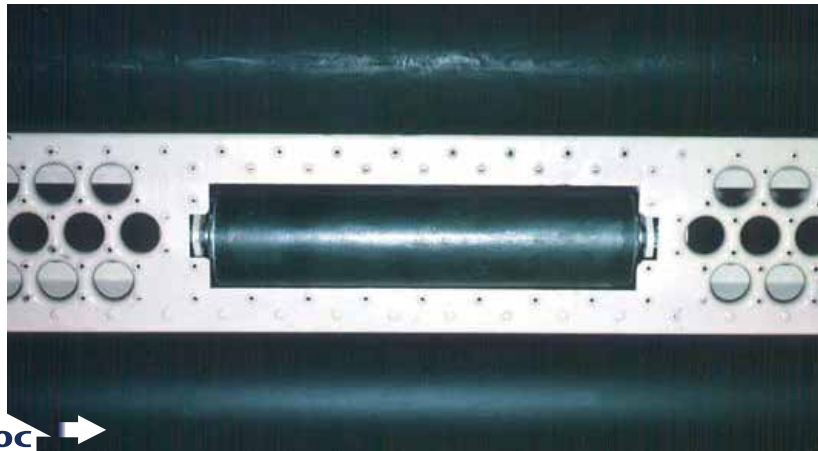
1. Weld channels between supports to provide uniform deflection in adjacent panels.
2. Side channel: Secure to supports by fusion welding with 1/8" fillet weld 1" long.
3. Adjacent plank: Weld together with 1/8" fillet welds 1" long, 24" on center staggered top and bottom.

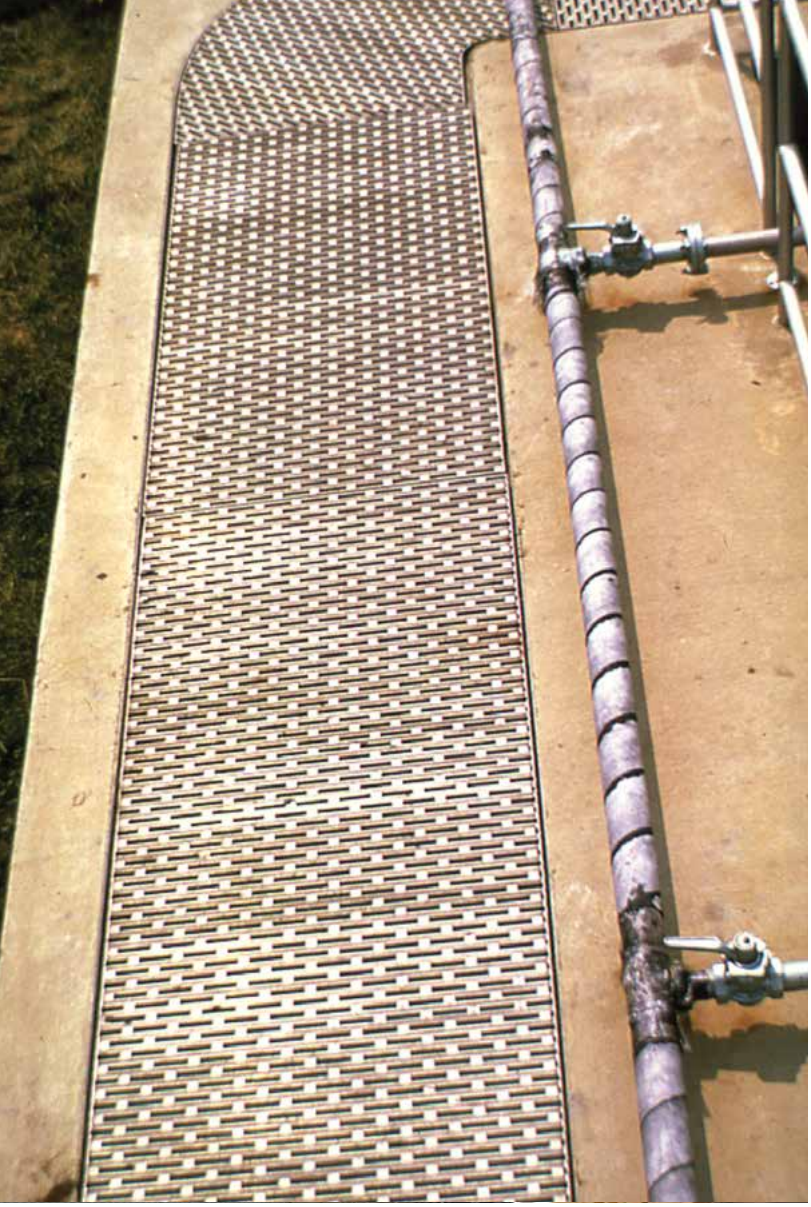




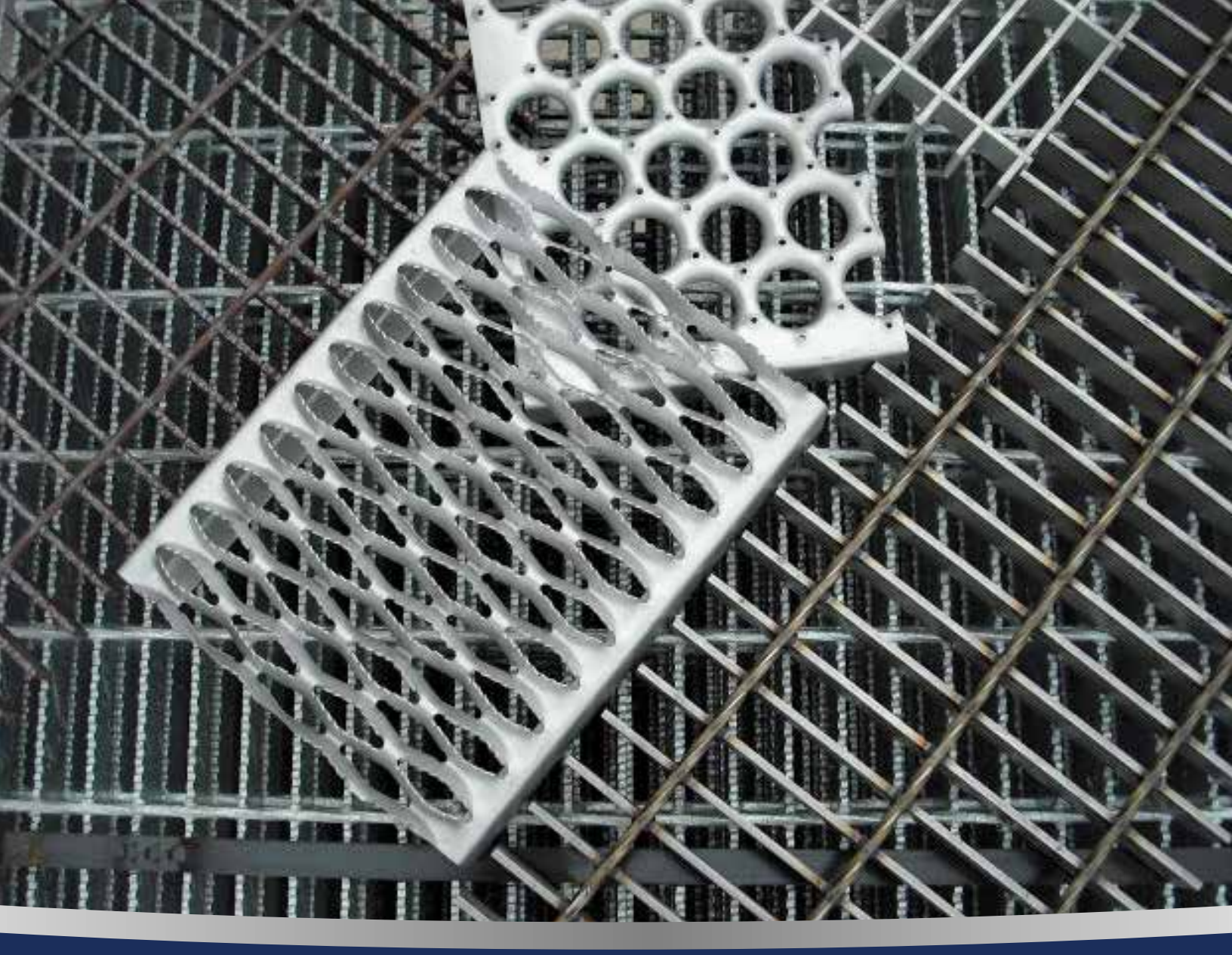
Custom Fabrication

Marco Specialty Steel specializes in custom products. Our unique ability to “interrupt” the grating pattern, provide end margins, wiped ends and leading edge holes offers the end user unlimited design flexibility. Additional value added features such as MIG, TIG and spotwelding, as well as in-house prime and finish paint capability allows Marco to supply a completely finished product, ready for application without further processing.





UNIT C
TOC



MARCO
SPECIALTY STEEL

Address
9140 Tavenor Lane
Houston, Texas 77075

Mailing
P.O. Box 750518
Houston, Texas 77275

Phone
713-649-5310
800-200-3047

Fax
713-649-5305

Website
www.marcospecialtysteel.com