

A large photograph of a city plaza paved with stainless steel bar grating. In the background, there are city buildings, a person with a bicycle, and a sign for 'OMNI TELEVISION'.

Stainless Steel Bar Grating Welded Bar Press-Locked



Stainless Steel Bar Grating

Stainless Steel Grating

When caustic atmospheres are encountered or when corrosion resistance and/or minimum carbide precipitation are essential considerations, AMICO 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, riveted, 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 listed here are available as standard products. Each conforms with ASTM A-167. In addition, special alloys are available upon request.

Finish

Unless otherwise specified, stainless steel grating shall have a mill finish as fabricated. "As fabricated" means as fabricated in AMICO'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 latter 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 can be removed by passivation. Electro-polishing leaves a passive surface. The swage-locked and press-locked processes will not show discoloration due to welding.

Chemical Composition

	Alloy 304	Alloy 304L	Alloy 316	Alloy 316L
Carbon (max %)	0.08	0.03	0.08	0.03
Manganese (max %)	2.00	2.00	2.00	2.00
Silicon (max %)	0.75	0.75	0.75	0.75
Chromium (% range)	18-20	18-20	16-18	16-18
Phosphorus (max %)	0.045	0.045	0.045	0.045
Sulfur (max %)	0.030	0.030	0.030	0.030
Nickel (% range)	8-10.5	8-12	10-14	10-14
Nitrogen (max %)	0.10	0.10	0.10	0.10
Other Elements	—	—	2-3% Mo	2-3% Mo

General Descriptions

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.

Type 304L is the low carbon modification of Type 304. This minimizes the problem of carbide precipitation during welding.

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.

Type 316L is the low carbon modification of Type 316. This minimizes the problem of carbide precipitation during welding.

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, AMICO's rectangular bar swage-locked (SR) can be produced in stainless steel.

For loads and deflections for other products such as riveted (RS), heavy-duty (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.

	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
Stainless Steel Alloy 304	1.151	1.111	1.036	1.000	.595	1.667
Stainless Steel Alloy 304L	.949	.917	.854	.825	.491	1.375
Stainless Steel Alloy 316	1.151	1.111	1.036	1.000	.595	1.667
Stainless Steel Alloy 316L	.949	.917	.854	.825	.491	1.375

NOTE: Modulus of Elasticity for Stainless Steel Alloys is 28,000,000 psi; Standard carbon steel (ASTM A1011) 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 A1011) is 18,000 psi; Heavy-duty carbon steel (ASTM A36) is 20,000 psi; and Aluminum (ASTM B221, 6061-T6) is 12,000 psi.

Stainless Steel Bar Grating

STAINLESS WELDED 1-3/16" C/C Bearing Bars

19-S-4



Cross Bars 4" C/C

19-S-2



Cross Bars 2" C/C

NON-SERRATED & SERRATED

STAINLESS PRESS-LOCKED 1-3/16" C/C Bearing Bars

19-SP-4



Cross Bars 4" C/C

19-SP-2



Cross Bars 2" C/C

NON-SERRATED & SERRATED

LOAD & DEFLECTION TABLE

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

Bar Size	Symbol	Approx. Weight psf	Sec. Mod Per Ft. Of Width		SPAN (Direction of Bearing Bar)															
					24"	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"	96"	108"			
3/4" x 1/8"	19-S-4	3.9	0.118	U	395	253	175	129	99	78										
	19-S-2	4.4		D	0.114	0.179	0.257	0.350	0.457	0.579										
	19-SP-4	4.3		C	395	316	263	226	197	175										
	19-SP2	5.2		D	0.091	0.143	0.206	0.280	0.366	0.463										
3/4" x 3/16"	19-S-4	5.6	0.178	U	592	379	263	193	148	117										
	19-S-2	6.2		D	0.114	0.179	0.257	0.350	0.457	0.579										
	19-SP-4	6.4		C	592	474	395	338	296	263										
	19-SP2	7.8		D	0.091	0.143	0.206	0.280	0.366	0.463										
1" x 1/8"	19-S-4	5.0	0.211	U	702	449	312	229	175	139	112	93								
	19-S-2	5.5		D	0.086	0.134	0.193	0.263	0.343	0.434	0.536	0.648								
	19-SP-4	5.4		C	702	561	468	401	351	312	281	255								
	19-SP2	6.3		D	0.069	0.107	0.154	0.210	0.274	0.347	0.429	0.519								
1" x 3/16"	19-S-4	7.2	0.316	U	1053	674	468	344	263	208	168	139								
	19-S-2	7.8		D	0.086	0.134	0.193	0.263	0.343	0.434	0.536	0.648								
	19-SP-4	8.1		C	1053	842	702	602	526	468	421	383								
	19-SP2	9.5		D	0.069	0.107	0.154	0.210	0.274	0.347	0.429	0.519	72"	78"	84"					
1-1/4" x 1/8"	19-S-4	6.1	0.329	U	1096	702	487	358	274	217	175	145	122	104	90					
	19-S-2	6.6		D	0.069	0.107	0.154	0.210	0.274	0.347	0.429	0.519	0.617	0.724	0.840					
	19-SP-4	6.8		C	1096	877	731	627	548	487	439	399	365	337	313					
	19-SP2	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-S-4	8.9	0.493	U	1645	1053	731	537	411	325	263	217	183	156	134					
	19-S-2	9.5		D	0.069	0.107	0.154	0.210	0.274	0.347	0.429	0.519	0.617	0.724	0.840					
	19-SP-4	10.2		C	1645	1316	1096	940	822	731	658	598	548	506	470					
	19-SP2	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	96"	108"			
1-1/2" x 1/8"	19-S-4	7.2	0.474	U	1579	1011	702	516	395	312	253	209	175	149	129	99	78			
	19-S-2	7.7		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			
	19-SP-4	7.9		C	1579	1263	1053	902	789	702	632	574	526	486	451	395	351			
	19-SP2	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-S-4	10.5	0.711	U	2368	1516	1053	773	592	468	379	313	263	224	193	148	117			
	19-S-2	11.2		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			
	19-SP-4	11.8		C	2368	1895	1579	1353	1184	1053	947	861	789	729	677	592	526			
	19-SP2	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-S-4	12.2	0.967	U	3224	2063	1433	1053	806	637	516	426	358	305	263	201	159			
	19-S-2	12.8		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			
	19-SP-4	13.5		C	3224	2579	2149	1842	1612	1433	1289	1172	1075	992	921	806	716			
	19-SP2	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-S-4	13.9	1.263	U	4211	2695	1871	1375	1053	832	674	557	468	399	344	263	208			
	19-S-2	14.5		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			
	19-SP-4	15.2		C	4211	3368	2807	2406	2105	1871	1684	1531	1404	1296	1203	1053	936			
	19-SP2	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-S-4	15.5	1.599	U	5329	3411	2368	1740	1332	1053	853	705	592	505	435	333	263			
	19-S-2	16.1		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			
	19-SP-4	16.8		C	5329	4263	3553	3045	2664	2368	2132	1938	1776	1640	1523	1332	1184			
	19-SP2	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-S-4	17.2	1.974	U	6579	4211	2924	2148	1645	1300	1053	870	731	623	537	411	325			
	19-S-2	17.8		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			
	19-SP-4	18.5		C	6579	5263	4386	3759	3289	2924	2632	2392	2193	2024	1880	1645	1462			
	19-SP2	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			

E = modulus of elasticity, 29,000,000 psi

F = fiber stress, 20,000 psi

Material: ASTM A-167

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.

U = safe uniform load, psf

C = safe concentrated load, psf

D = deflection, inches

E = modulus of elasticity, 28,000,000 psi

F = fiber stress, 20,000 psi

Material: ASTM A-167

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.

S/SP-19 PANEL WIDTH (inches)

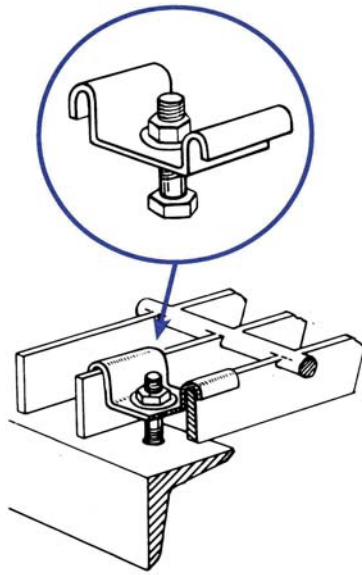
Note: SP-Stainless Press-Locked cross bars typically extend 1/8" each side. S-Stainless Welded cross rods may extend 1/8" each side. Panel widths do not include these extensions.

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 / ₁₆	6 ¹ / ₁₆	7 ¹ / ₄	8 ⁷ / ₁₆	9 ⁵ / ₈	10 ¹³ / ₁₆	12	13 ³ / ₁₆	14 ³ / ₈	15 ³ / ₁₆	16 ³ / ₄	17 ⁵ / 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 ¹ / 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 ³ / ₁₆	22 ³ / ₄	23 ¹⁵ / ₁₆	25 ¹ / ₈	26 ⁵ / ₁₆	27 ¹ / ₂	28 ¹¹ / ₁₆	29 ⁷ / ₈	31 ¹ / ₁₆	32 ¹ / ₄	33 ¹ / ₁₆	34 ⁵ / ₈	35 ¹³ / ₁₆

Note: For gratings with other than 1-3/16" bearing bar spacing, proportionate conversion factors apply.

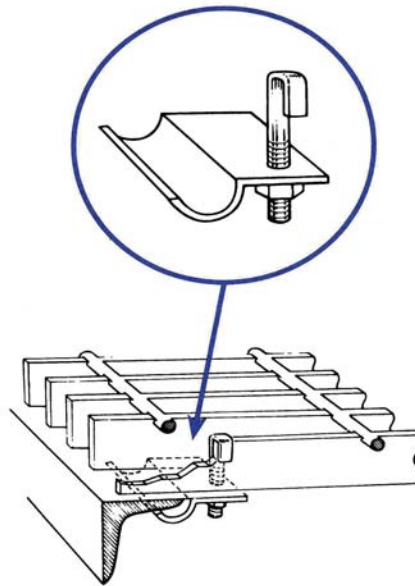
This table is for Alloys 304 and 316. For Alloys 304L and 316L, F=16,500 psi and values for U, C and D should be multiplied by .825.

Anchoring Details



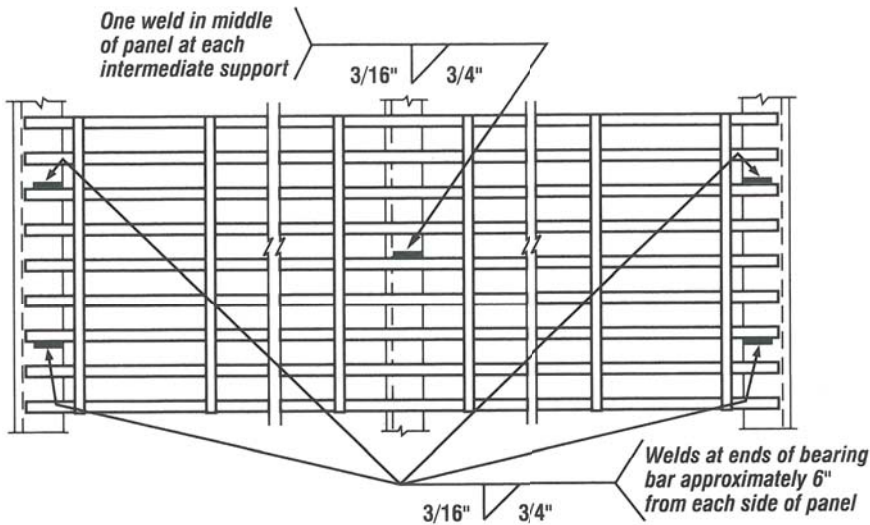
Type H-3 Saddle Clip

The saddle clip bridges two bearing bars and is attached with 1/4" self-tapping bolt, 1/4" self threader, 1/4" weld stud or 1/4" bolt and nut when 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



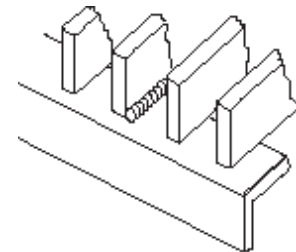
Type H-1 Anchor Clip

A flat head J-bolt secures a preformed plate to the underside of steel bearing bars and structural supporting flange. No drilling needed. Access to the underside of grating is required for installation. Available in carbon steel. J-bolt is 1/4" x 2-1/2" for grating up to 2-1/4" deep and 1/4" x 3-1/2" for 2-1/2" to 3-1/2" deep grating.



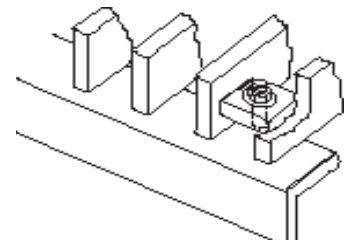
Attachment Locations

Attachments should be placed at intermediate supports in the middle of the panels and at the 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.



Welds

Recommended for all permanently installed grating panels. Welds should be 3/16" fillet welds, 3/4" long located approximately 6" from each side of panel (4 locations) and one weld in middle of panel at each intermediate support.



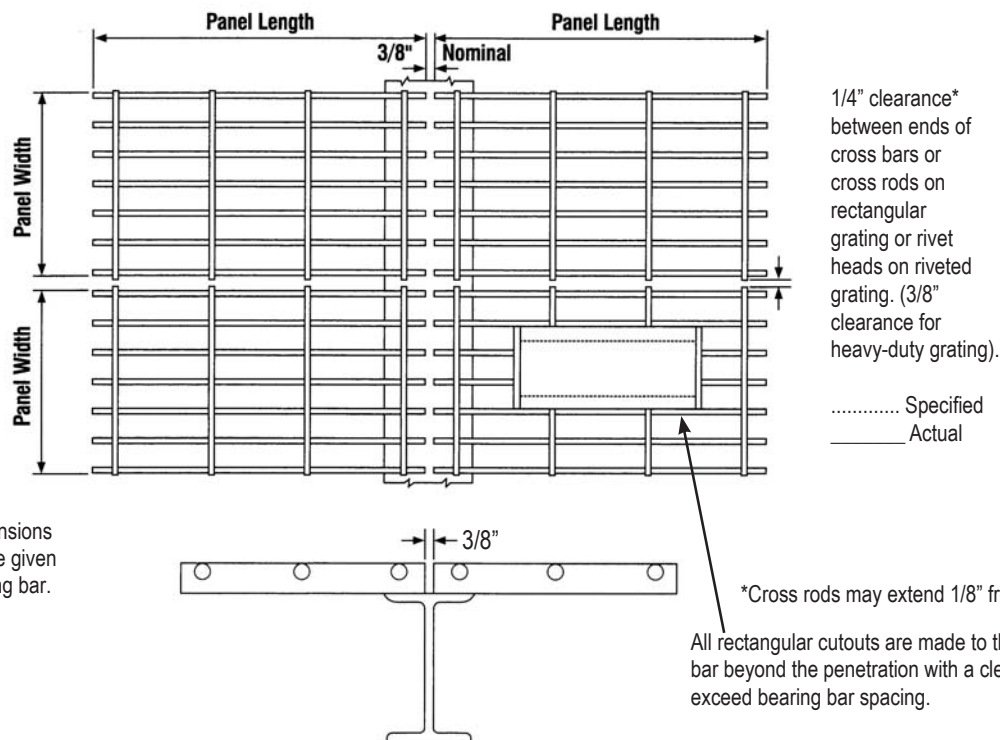
Weld Lugs

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.

Other clips and fasteners available upon request.

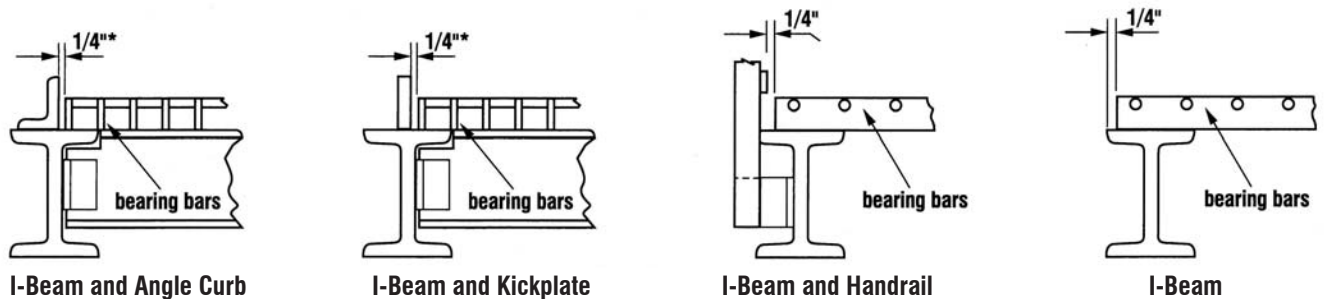
Installation Clearances

PANEL TO PANEL CLEARANCES AND CUTOUT CLEARANCES

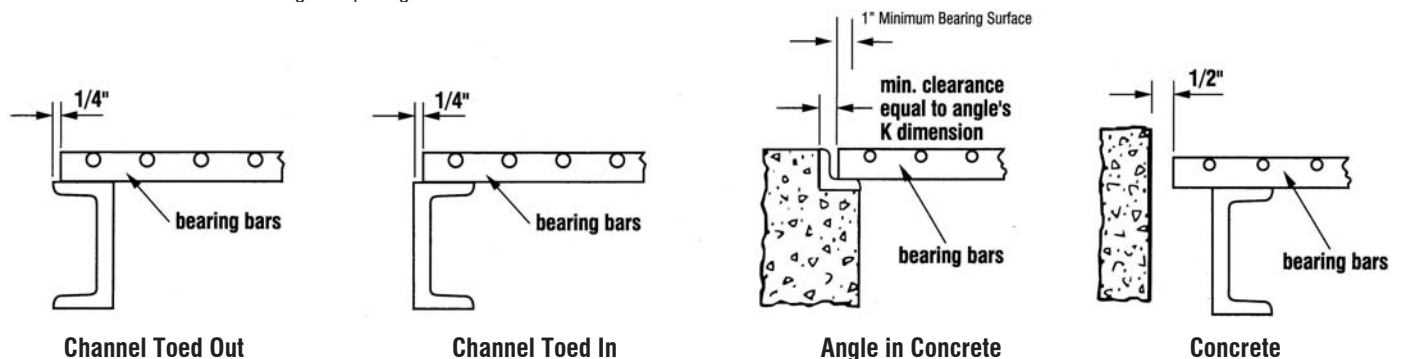


All panel width dimensions (including cutout) are given to the nearest bearing bar.

SUPPORT CLEARANCES



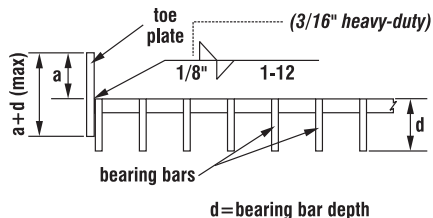
*1/4" is recommended but dimension may vary due to bearing bar spacing. Dimension should not exceed bearing bar spacing.



Welding Standards

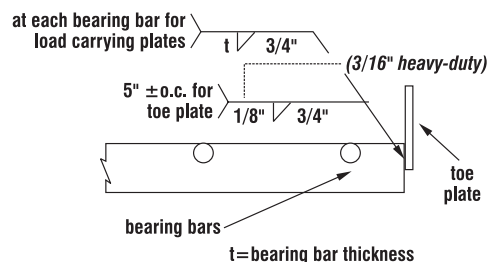
TOEPLATES

Maximum depth of toeplate 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

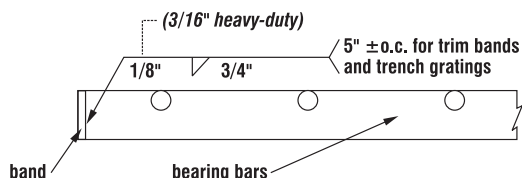
Toeplate to be welded with alternating 1/8" fillet welds, 1" long every 12".



Attachment to End of Bearing Bar

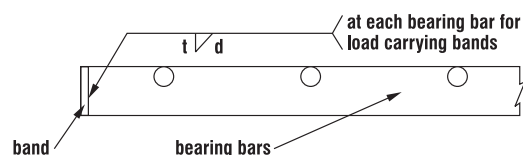
Load carrying toeplates to be welded at each bearing bar with a fillet weld the size of the bearing bar thickness (t), 3/4" long. Non-load carrying toeplates to be welded to bearing bars with 1/8" fillet weld (3/16" for heavy-duty), 3/4" long every 5".

BANDING



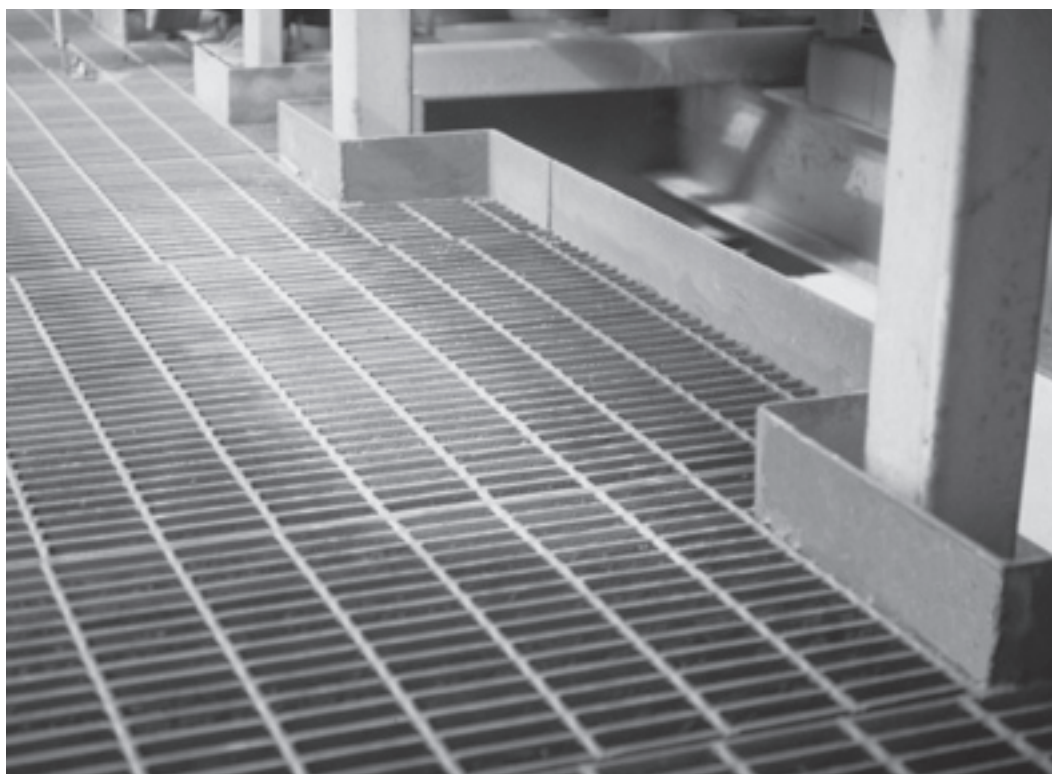
Standard Trim Band

End band to be welded with 1/8" fillet welds (3/16" for heavy duty), 3/4" long every 5".



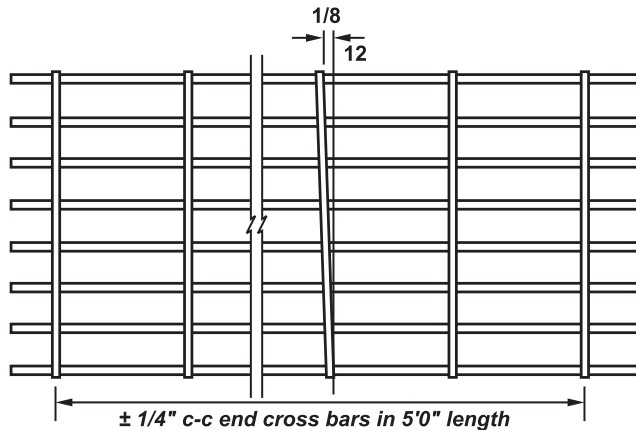
Load Banding (must specify)

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 specification.



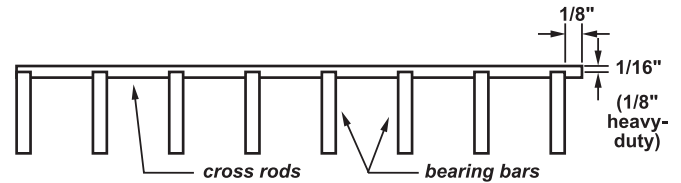
Manufacturing Tolerances

BEARING BAR AND CROSS ROD TOLERANCES



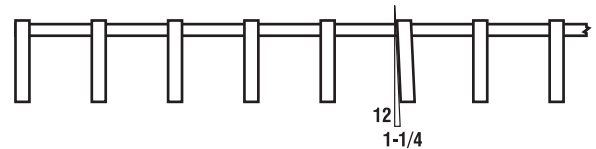
Cross Rod Spacing and Alignment

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 $\pm 1/4$ ".



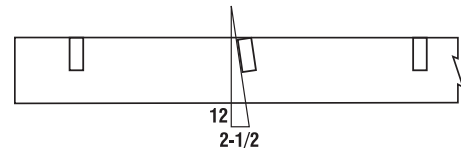
Cross Rod Position

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

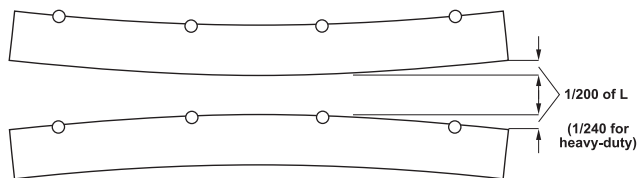
Bearing bar lean must not exceed a slope of 1-1/4 to 12.



Cross Bar Lean

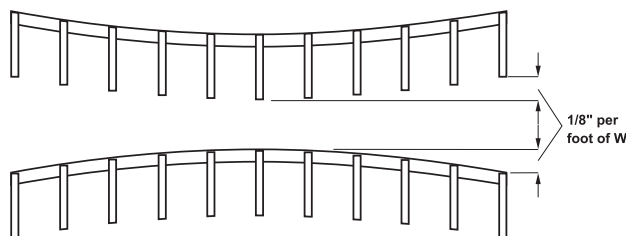
Cross bar lean must not exceed a slope of 2-1/2 to 12.

PANEL TOLERANCES



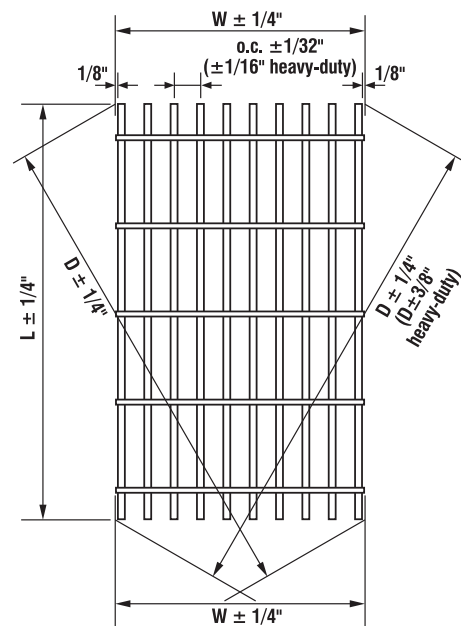
Longitudinal Bow

Longitudinal bow should be less than 1/200 of the length for standard grating (1/240 for heavy duty).



Transverse Bow

Before banding, the transverse 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

AMICO manufactures grating to meet or exceed ANSI/NAAMM MBG531; and Heavy Duty Metal Bar Grating to ANSI/NAAMM MBG532.

UNITED STATES

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