



Using 3M™ Wedge Clamp System For 3M™ Panaflex™ Awning and Sign Facing

Note: This bulletin has been completely rewritten and reorganized; please read it thoroughly, even if you are familiar with the 3M™ Wedge Clamp system.

Optimum Installation Conditions

Cold temperatures cause decorated 3M™ Panaflex™ Awning and Sign Facing to become less flexible. When attaching the finished sign face to a cabinet or framing in cold weather, the applied graphics may crack, especially where folding, crimping, creasing or forming the material to sharp corners is necessary.

For the best results with most tensioning systems, we recommend artificially warming the decorated sign facing, the cabinet or framing and the air to at least 45°F (8°C) before attaching or tensioning the sign face in a cabinet or frame. This applies when the work is done either in a fabricator's shop or in the field. Even in an enclosed building, night time temperatures can cool the sign facing and other components to below the recommended temperature.

Note: Our testing shows that some tensioning systems are more successful with Panaflex awning and sign facing if the temperature is at least 55°F (12°C). Contact our technical service department for more information.

Work Area

Provide a clean work area, large enough to permit laying out the entire sign face. This is necessary for rapid layout of the clamp location lines and installing the wedge clamps and Tinnerman™ clips.

Tools

- Reversible, variable speed drill
- inch hollow-shaft nut driver with modified shaft to fit drill motor
- Chalk line and chalk dispenser
- foot (15 m) measuring tape
- Razor cutter or scissors
- Water-soluble ink marking pen or grease pencil
- Mild detergent and water for clean up of sign face

Seams and Splices

Sign facing that is 80 inches (203 cm) wide or less may contain a low-visibility splice. A roll or a custom sign face blank that is wider than 80 inches (203 cm) is fabricated using a 3M manufactured, standard overlap seam.

The fabricator should already have taken the following factors into consideration in designing and decorating the sign face. However, to ensure that the sign face can withstand the conditions it is exposed to, you should double check these items:

- Inspect the sign face and make sure that it does not contain both a splice and a seam. Mixing splices and seams in the same sign face voids the blowout warranty.
- Position any splice at least 4 feet (122 cm) away from any mounting clamp or material support that is perpendicular (at right angles) to the splice. See Figure 1.

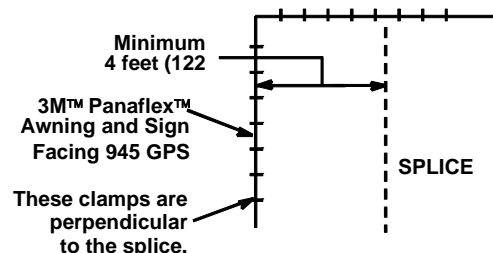


Figure 1. 3M™ Panaflex™ Awning and Sign Facing 945 GPS with Splices

- Be sure any seam is at least 18 inches (46 cm) away from any attachment hardware that is perpendicular (at right angles) to the seam. See Figure 2.

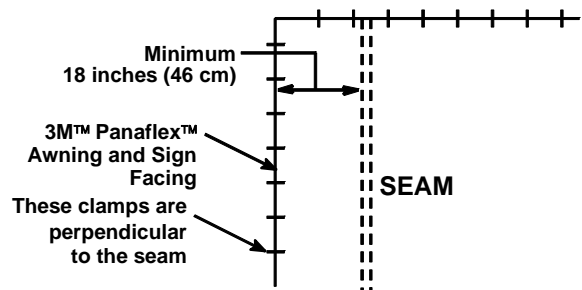


Figure 2. 3M™ Panaflex™ Awning and Sign Facing with Seams

3M™ Panaflex™ Sign Face Worksheet

Part 1	Vertical	Horizontal
A. Measure the Receiver dimensions in inches (<i>mm</i>); see Figure 3 or Figure 4.	_____	_____
B. Subtract 3-1/2" (<i>89 mm</i>) for hardware.	- 3.5" (- <i>89 mm</i>)	- 3.5" (- <i>89 mm</i>)
C. Subtotal.	= _____	= _____
D. Subtract a Tension Factor For most faces use 1/16 inch per 12 inches (<i>1.6 mm per 305 mm</i>) For faces smaller than 6 feet, use 3/8 inch (<i>9.5 mm</i>)	- _____	- _____
E. These are your Clamp Location Line Dimensions:	= _____LV	= _____LH
Part 2		
F. Enter the Clamp Location Line Dimensions from Step E.	_____	_____
G. Divide by 2.	÷ 2	÷ 2
H. These are the dimensions from centerline symbol to the Clamp Location Lines; see Figure 6, page 3.	= _____CV	= _____CH
Part 3		
I. Enter the vertical and horizontal Clamp Location Line Dimensions from Step E and multiply them by one another.	_____	× _____
J. Divide by 144 (<i>100</i>) to obtain the Sign Face Area.	÷ 144 (<i>100</i>) = _____sq ft (<i>m²</i>)	
Part 4		
K. Enter the Clamp Location Line Dimensions from Step E.	_____	_____
L. Subtract a standard indent of 6 inches (<i>152 mm</i>).	- 6" (- <i>152 mm</i>)	- 6" (- <i>152 mm</i>)
M. This is the space within which the clamps must fit:	= _____MV	= _____MH
N. To determine the number of clamps per side (<i>S</i>), read Step 6, page 5, which determines the clamp spacing distance; the clamp spacing distance is <i>Y</i> in this equation.	(Y ÷ MV) + 1 = _____S	(Y ÷ MH) + 1 = _____S

1. Complete the Worksheet

This procedure assumes you already know the sign cabinet dimensions.

Complete the Worksheet on page 2. Where needed, it refers you to the appropriate sections of this bulletin for further explanation or preliminary calculations.

The 3M™ Wedge Clamp may be used with or without the hook.

- If you are using the hook, measure the receiver dimensions with the hook. See Figure 3.
- If you are attaching the clamp directly to angle iron, measure the receiver dimensions as shown in Figure 4. Be sure you elongate the holes in the angle iron to allow some lateral movement.

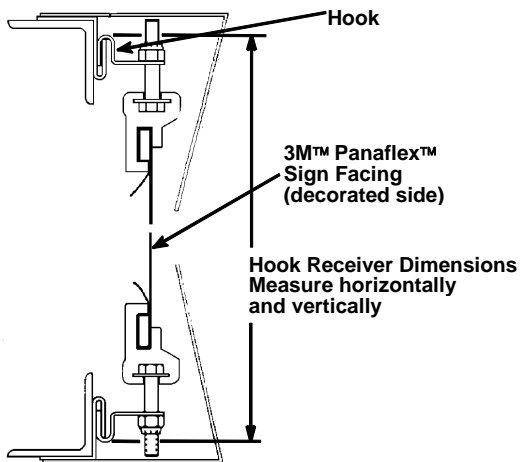


Figure 3. Measure Receiver Dimensions with Hook

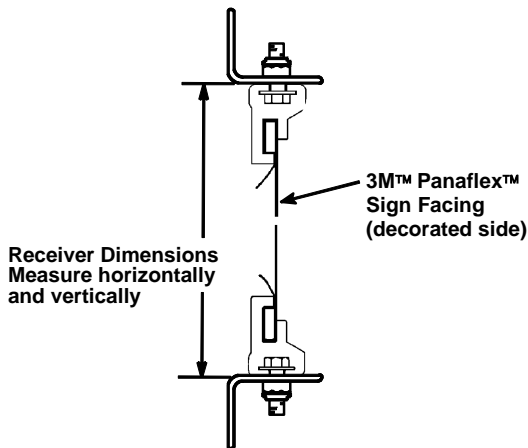


Figure 4. Measure Receiver Dimensions without Hook

2. Mark the Centerlines

⚠ Caution

Do not use ball point ink pens to mark the sign face. Such marks cannot be removed. Use only water soluble marking pens or grease pencils.

The centerline is dictated by how the copy must be located in the sign cabinet. In most cases, the copy is centered in the cabinet. Use a chalk line to mark the vertical and horizontal centerlines.

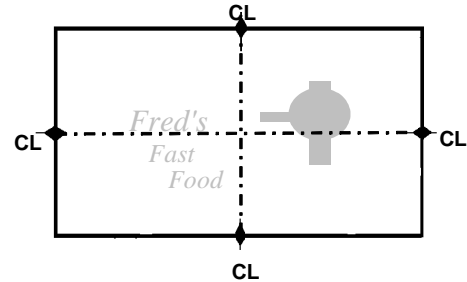


Figure 5. Locating and Marking Centerlines

3. Mark the Clamp Location Lines

- Use the results for CV from Step H of the Worksheet. From several places along the **horizontal** centerline, measure the **vertical** dimension (CV) outward and mark. See Figure 6.

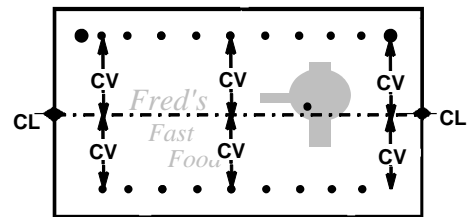


Figure 6. Measuring CV Outward From Centerlines

- Use the results for CH from Step H of the Worksheet. From several places along the **vertical** centerline, measure the **horizontal** dimension (CH) outward and mark. See Figure 7.

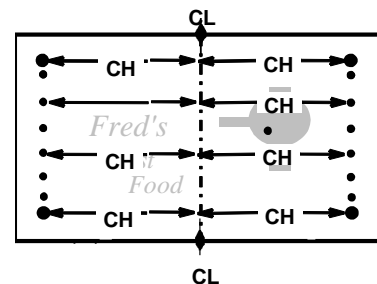


Figure 7. Measuring CH Outward From Centerlines

- c. Strike a chalk line to connect the each of the horizontal and each of the vertical clamp location line marks as shown in Figure 8. Make sure the lines are the same as the LH and LV dimensions from Step E of the Worksheet.

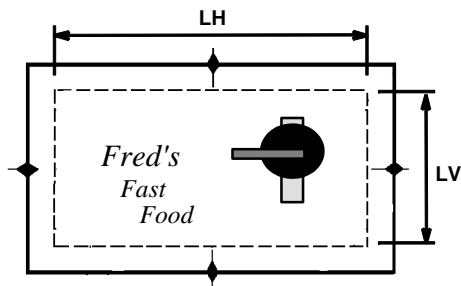


Figure 8. Chalking the Clamp Location Lines

4. Determine the Design Wind Velocity Area

Using the map in Figure 9, find the exact location that the sign will be located. This is the Design Wind Velocity value, or the typical maximum wind velocity of these areas. These are only guidelines, however, and do not take into consideration higher winds caused by unusual weather systems, or the special conditions that signs located on buildings may incur.

Note: For areas outside the United States, contact your local weather bureau for a map for your area.

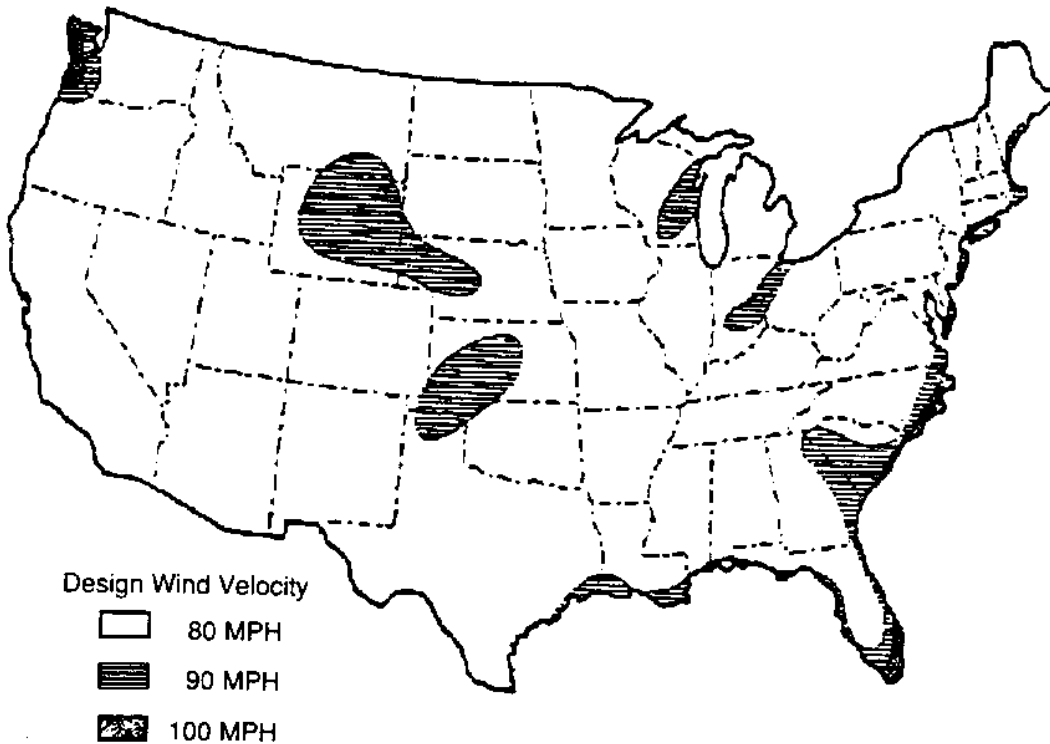


Figure 9. U.S. Isotach Map

5. Determine the Design Wind Pressure

Use the table below to determine the required Design Wind Pressure. The pressure is dependent on both the height the sign is from the ground and the Design Wind Velocity Area determined in the previous step.

Note: The 3M Blowout Warranty assumes the correct wind speed assumptions are made.

Height from Ground Level to Top of Sign Cabinet		Design Wind Pressure					
		80 mph (129 km) area		90 mph (145 km) area		100 mph (161 km) area	
feet	meters	psf	kg/m ²	psf	kg/m ²	psf	kg/m ²
15 - 30	12.5 - 27	30	146	40	195	50	244
30 - 50	27 - 45	35	171	45	220	55	269
50 - 100	45 - 90	40	195	50	244	60	293
100 - 150	90 - 135	45	220	55	269	65	317
150 - 200	135 - 180	50	244	60	293	70	342
200 - 300	180 - 270	55	269	65	317	75	365

6. Determine the Clamp-to-Clamp Spacing Distance

- In the following table, locate the Design Wind Pressure you calculated in Step 5.
- Follow horizontally across the table to the appropriate Sign Face Area, which you calculated in Step J of the Worksheet. If the area is between two numbers in the row, round to the larger number.
- Follow vertically down the table to find the correct maximum Clamp Spacing Distance, which is based on center-to-center of the clamp. The clamp is 1.5 inches (38 mm) wide.

Example

At a wind load pressure of 35 psf, a 240 square foot (22 m²) sign face--rounded up to 247 square feet--requires a maximum of 11 inches (279 mm) center-to-center clamp spacing.

Design Wind Pressure	Sign Face Area										
30 psf 146 kg/m ²	Square Feet	186	224	273	337	422	500				
	m ²	17	21	26	32	39	47				
35 psf 171 kg/m ²	Square Feet	37	165	201	247	310	396	500			
	m ²	13	15	19	23	29	37	47			
40 psf 195 kg/m ²	Square Feet	105	126	153	189	237	303	397	500		
	m ²	10	12	14	18	22	28	37	47		
45 psf 220 kg/m ²	Square Feet	83	99	121	149	187	240	314	424	500	
	m ²	8	9	11	14	18	22	29	40	47	
50 psf 244 kg/m ²	Square Feet	67	80	98	121	152	194	254	343	420	500
	m ²	6	8	9	11	14	18	24	32	39	47
Center-to-Center Clamp Spacing Distance											
Spacing Distance	Inches	14	13	12	11	10	9	8	7	6.5	6
	mm	356	330	305	279	254	229	203	178	165	152

7. Mark the Clamp Positions

- From each vertical and horizontal corner of the clamp location lines, make a mark 3 inches (76 mm) from the corner. This is the location of the first clamp in each corner. You will have 8 marks.
- From the first mark, make the remaining marks spaced at the intervals (Z) you calculated in Step O of the Worksheet. Refer to Figure 10.

Note: Locating the first clamps 3 inches (76 mm) from the corner eliminates wrinkles and puckers in the corners of the sign face.

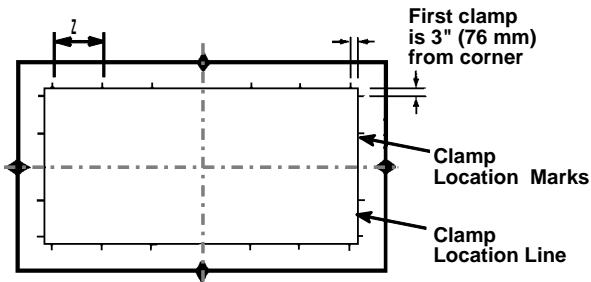


Figure 10. Mark the Clamp Positions

8. Clamp Installation

- Before you install the clamp, notice that there is a short left and a long leg. Make absolutely certain that the **short leg faces the decorated side of the sign face** as shown in Figure 11. If wedge clamp is mounted backwards, the clamp can come loose.

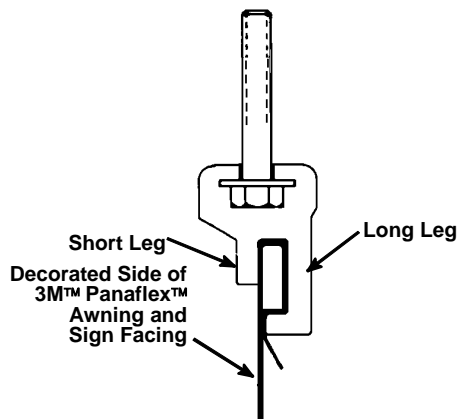


Figure 11. Correct Orientation of the 3M™ Wedge Clamp

- Wrap the sign face over the holding bar along the Clamp Location Line.
- Push the clamp over the sign face and then slide it over the holding bar as shown in Figure 12.

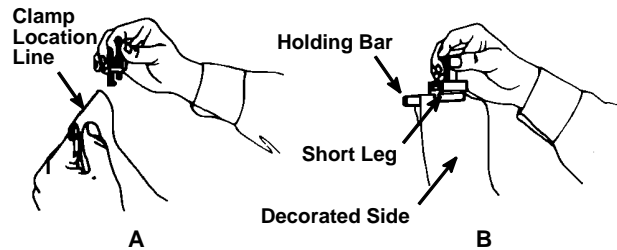


Figure 12. Installing the Wedge Clamp

- Place a Tinnerman™ clips over the sign face and holding bar on each side of the wedge clamp. See Figure 13.

✓ Important Note

Tinnerman clips are critical to prevent the sign face from slipping through the wedge clamp.

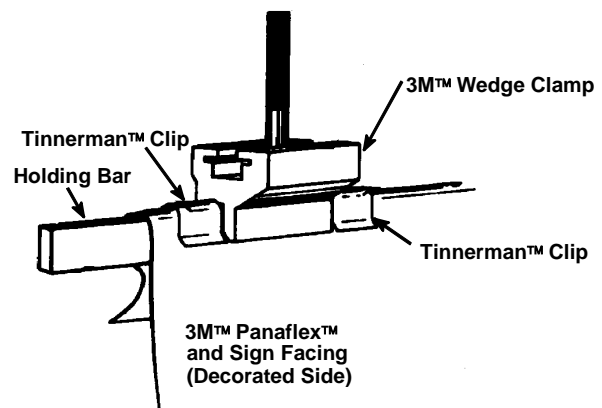


Figure 13. Installing Tinnerman™ Clips

- e. When the wedge clamp is attached to the sign face using the hook method, place the hook and a locking nut on the bolt. See Figure 14.

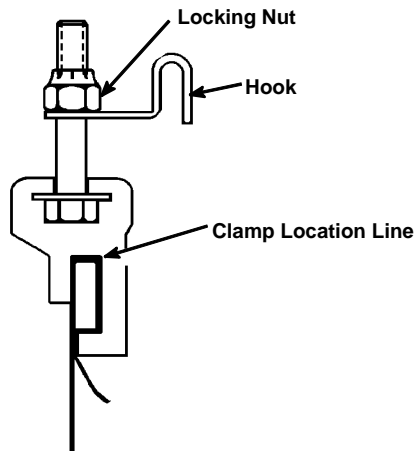


Figure 14. Placing the Hook and Locking Nut

9. Prepare to Move the Sign Face

Carefully fold the sign face in loose folds before moving it to the sign cabinet for installation or storing it.

- Do not allow the hardware to scratch the decorated surface.
- Use slip sheeting if the sign face will remain folded overnight.
- Fold opposite ends of the sign face into the center, repeating this process until the loosely folded sign face is small enough to handle easily.

Note: If the sign face is decorated with 3M™ Scotchcal™ Translucent Film Series 3630, fold the material so the decorated surfaces are to the OUTSIDE of the fold.

Note: If the sign face will be stored for a period of time before installation, protect it well, keep it away from extreme heat and cold, and store it lying flat.

10. Hanging the Sign Face

- a. Mark the sign cabinet at the center points of all four sides for placement of the centerline hardware clamps.
- b. Start at the top center of the sign cabinet and hang the sign face all along the top.
- c. Slide the face along the top Hook Receiver (small movement only) until it is visually centered on the cabinet mark.
- d. Attach the side and bottom hooks, starting with the center clamps.
- e. Recheck the overall visual appearance.

11. Tension the Sign Face

- a. **Always tension the long dimension first on any sign face.**
- b. Tighten the locking nuts on all wedge clamps around the sign face until the distance between the hook and the top of the wedge clamp is 1/2 inch (13 mm). See Figure 15.
- c. The sign face should feel tight and be wrinkle-free when properly tensioned.
- d. **DO NOT** tension the sign face more than the specified tension factor of 1/16 inch per 12 inches. When tensioning sign faces where the dimension is 6 feet or less, tension until the face feels tight. **DO NOT** over tension.
- e. Make sure the Clamp Location Lines remain straight after tensioning the sign face.

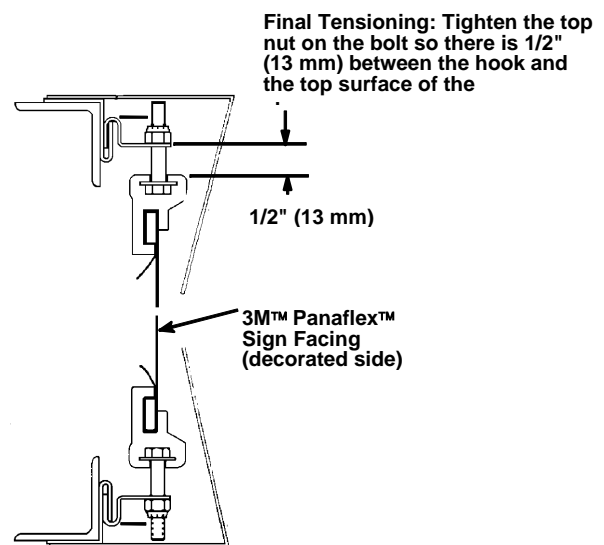


Figure 15. Final Tensioning

Maintenance

Use warm water and mild liquid detergent or liquid cleaner to clean 3M™ Panaflex™ Sign Facing. For more stubborn dirt, see Instruction Bulletin 6.1. Gasoline, paint, lacquer thinner and other organic solvents are not recommended for use.

✓ Important Note

Do not trim off the warranty logo and date from the lower left corner of the sign face. This identification is required if a warranty claim is made.

For the United Kingdom and Republic of Ireland:-

Health & Safety

Refer to the package label and the Material Safety Data Sheet for health, safety, and handling information on the products referenced in this bulletin. For 3M products, if necessary, you may contact our Toxicology/Product Responsibility Department on 01344 858000.

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