



# Panaflex™

## Awning and Sign Facing 945GPS

### For Decorating with Pigmented Translucent Film and Piezo Inkjet Printed Translucent Film

#### Product Description

3M™ Panaflex™ Awning and Sign Facing 945GPS is flexible material with built-in dirt resistance on its smooth, semi-gloss surface. This durable substrate is white-pigmented vinyl with a reinforcing polyester scrim, used for creating signs and awnings. It can be decorated with pigmented translucent film or screen printed or piezo inkjet printed translucent film.

#### Recommended Types of Graphics and End Uses

When constructed and used as described in this Bulletin, these types of graphics and end uses may be warranted by the 3M™ MCS™ Warranty. Please read the entire Bulletin for details.

- Functions as a substrate for creating day and night graphics for use in many types of signs and awnings
- Attach to a variety of frameworks
- Decorate before or after attaching to the framework

#### Limitations of End Uses

3M specifically does not recommend or warrant the following uses, but please contact us to discuss your needs or recommend other products.

- Do not decorate the back side of this material.
- For the best looking signs and awnings, do not remove and then reuse the Panaflex material. Redecorating and reusing the substrate is not recommended or warranted by 3M.

#### Compatible Products

##### 3M Graphic Materials

This Bulletin provides details about the construction options and warranty. Additional specific information about compatible products can be found in the Product and Instruction Bulletins listed in 3M Related Literature at the end of this bulletin.

##### Films

- 3M™ Scotchcal™ Translucent Graphic Film Series 3630
- 3M™ Scotchcal™ Translucent Graphic Film Series IJ3630, FN3660, RG3630
- 3M™ Scotchcal™ Translucent Graphic Film Series 3632GPS
- 3M™ Scotchcal™ High Gloss Overlamine 3640GPS
- 3M™ Scotchcal™ Matte Overlamine 3642GPS
- 3M™ Scotchcal™ Translucent Graphic Film Series 230

##### Screen Printing Inks

- 3M™ Screen Printing Ink Series 1900
- 3M™ Screen Printing UV Ink Series 9800

##### Piezo Inkjet Printers and Inks

###### Ink Series

- 3M™ Piezo Inkjet Ink Series 2200UV
- 3M™ Piezo Inkjet Ink Series 2700UV
- 3M™ Piezo Inkjet Ink Series 2800UV
- 3M™ Piezo Inkjet Ink Series 5400UV
- 3M™ Piezo Inkjet Ink Series 1500v2
- 3M™ Piezo Inkjet Ink Series 4600

###### Printer

- EFI™ VUTEK® PV 200 Printer
- Durst Rho 160R Printer
- EFI™ VUTEK® QS2000/QS3200 Printers
- MacDermid ColorSpan 5400uv Printer
- EFI™ VUTEK® 150, 2360/3360, 3300/5300 and 3000/5000 Printers
- HP Scitex Pressjet-W™ Printer

*continued on the next page*

## Piezo Inkjet Printers and Inks

### Ink Series

- 3M™ Piezo Inkjet Ink Series 4800
- 3M™ Piezo Inkjet Ink Series 5500
- 3M™ Piezo Inkjet Ink Series 6000
- 3M™ Piezo Inkjet Ink Series 6800

### Printer

- HP Scitex TJ8300 Series Digital Press
- Océ Arizona 600 Printer
- Océ Arizona 30s Printer
- Océ Arizona 180 and 90 Printers

## Graphic Protection Options

- 3M™ Scotchcal™ Matte Overlamine 3640GPS
- 3M™ Scotchcal™ Luster Overlamine 3642GPS
- 3M™ Scotchcal™ Luster Overlamine 8519
- 3M™ Scotchcal™ Matte Overlamine 8520

## Characteristics

These are typical values for unprocessed product; processing may change the values. Contact your 3M representative for a custom specification.

### Physical Characteristics

Characteristic	Value
Film	22 mil (nominal) [0.022 inch $\pm$ 0.002 (0.056 cm $\pm$ 0.005)] white pigmented cast vinyl with a reinforcing polyester scrim; smooth front surface, semi-gloss appearance
Weight	19.52 ounces/square yard (670 gr/m <sup>2</sup> )
Gloss (using 60° gloss meter)	17.5 $\pm$ 10
Whiteness index (reflective)	W.I. (E313) = 110 $\pm$ 10
Color (reflective)	CIELAB L* = 90; a* = +7.0; b* = -11.5
Light transmission (opacity)	26% $\pm$ 2%
GPS	Dirt-resistant front and back; however, backside is not warranted for decoration

### Application Characteristics

Characteristic	Value
Strength (minimum)	<b>Tear weft:</b> 85 pounds/inch (15 kg/cm) <b>Tear warp:</b> 113 pounds/inch (20 kg/cm) <b>Tensile weft:</b> 150 pounds/inch (26.6 kg/cm) <b>Tensile warp:</b> 150 pounds/inch (26.6 kg/cm)
Seam strength (minimum)	50 pounds/inch (9 kg/cm) <i>when created by a 3M factory or 3M Warranted Seaming Contractor</i>
Flammability	ASTM -E-84, Class 1
U.L. recognition	U.L. 48 - recognized for sign accessories U.L. 94HB - component recognized plastic
Maximum finished graphic size	625 square feet (58 square meters) per single face (warranted)
Fabrication temperature range	60°F (15°C) or higher <i>material and ambient temperature</i>
Temperature for attaching to hardware and tensioning	45°F (7°C) or higher <i>material and ambient temperature</i>
Roll Sizes	<b>Width</b> <ul style="list-style-type: none"><li>• Seam free: 80 inches (2.03 m)</li><li>• With seams: 84 inches to 40 feet in 6 inch increments (2.1 m to 12.2 m in 15 cm increments)</li></ul> Note: See splice and seam information on page 4. <b>Maximum length:</b> Depends on handling characteristics <b>Maximum roll size:</b> 1500 square feet (139 m <sup>2</sup> )

*continued on next page*

Characteristic	Value
Service temperature range	-50° to +170°F (-45° to +77°C)
Applied shrinkage	0.31 inch shrinkage maximum per 12 inches (0.26 cm shrinkage maximum per 1 m)

## Warranty Information

The warranty given in the Product Bulletin that is current at the time you purchased this substrate is the one that 3M will honor. See the warranty sections following this table for additional information.

### 3M™ MCS™ Warranty for Finished Graphics

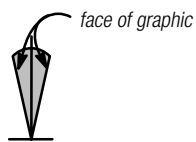
Film	Ink Series	Graphic Protection	Warranty Durability, in years			
			Vertical Exposure		Non-Vertical Exposure	
			US	Desert SW	US	Desert SW
<b>Unprinted Cut Film Decoration Applied to Panaflex Substrate 945GPS</b>						
3630	None	None	6	5	0	0
230	None	None	6	5	0	0
3632GPS	None	None	9	6	6	4
<b>Screen Printed Cut Film Decoration Applied to Panaflex Substrate 945GPS</b>						
3630	1900	3640GPS	9	6	6	4
230	9800	3642GPS				
<b>Piezo Inkjet Printed Cut Film Decoration Applied to Panaflex Substrate 945GPS</b>						
IJ3630	1500v2 2200UV 2800UV 2700UV 4600 4800 5400UV 6000	8519 8520	4	2.8	0	0
FN3630	5000					
RG3630	6800					

### Important Note!

Refer to Instruction Bulletin 5.7 when using multiple layers of film in a sign construction. Certain restrictions apply.

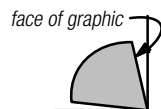
## Definitions

### Vertical Exposure



The face of the graphic is  $\pm 10^\circ$  from vertical.

### Non-vertical Exposure



The face of the graphic is greater than  $10^\circ$  from vertical and greater than  $5^\circ$  from horizontal.

### Desert Southwest

Graphics exposed to solar energy more than half of the time in Arizona, New Mexico and the desert areas of California, Nevada, Utah and Texas. A detailed map is available at [www.3Mgraphics.com](http://www.3Mgraphics.com) under Warranties.

## Graphic Performance Life

The actual performance life of a graphic is affected by all of the following.

- Correct combination of 3M-recommended graphics products
- Proper preparation of the substrate
- Imaging and fabrication methods
- Application methods
- Angle and direction of sun exposure
- Environmental conditions
- Cleaning and maintenance methods

## Application Outside the U.S.

Contact the 3M organization for that country.

## Graphics Made with Components Not Sold or Recommended by 3M

The 3M™ MCS™ Warranty does not cover finished graphics made with other manufacturers' inks, film, graphic protection, flexible substrates and/or application tapes. The user is solely responsible for the graphic appearance, performance and durability of graphic constructions that include non-3M graphic products.

## Warranty and Limited Remedy

The following is made in lieu of all other express or implied warranties, including any implied warranty of merchantability or fitness for a particular purpose or implied warranty arising out of a course of dealing, custom or usage of trade: all 3M products are warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin. 3M will replace or refund the price of any 3M materials that do not meet this warranty within the specified time periods. These remedies are exclusive. In no case shall 3M be liable for any direct, indirect, or consequential damages, including any labor or non 3M materials charges.

See the Graphics Market Center Warranty Brochure, which gives the terms, additional limitations of the warranty, if any, and limitations of liability.

## Seams and Splices



---

Before using any equipment, always follow the manufacturers' instructions for safe operation.

---

### Splices

Panaflex awning and sign facing 945GPS that is 80 inches (203 cm) wide or less may contain a low-visibility splice. A patented process for this splice allows 3M to offer a continuous roll of Panaflex awning and sign facing that is fully usable. The low-visibility splice is barely noticeable in a backlighted graphic. Each roll includes a map that indicates the location of any splices. Refer to the roll map to determine the suitability and limitations of this material for your intended purpose.

### Seams

A roll or a custom sign blank that is wider than 80 inches (203 cm) is fabricated using a 3M or warranted seaming contractor manufactured, standard overlap seam.

## Planning for a Splice or a Seam

If the Panaflex awning and sign facing 945GPS has a splice or a seam, follow these simple precautions when planning your sign face to help protect the splice or seam from damaging stress in high wind conditions.

- Do not allow splices in large seamed sign faces.
- Position any splice at least 4 feet (122 cm) away from the edge of the Panaflex substrate. See FIGURE 1.
- Plan your sign face so the seam is at least 18 inches (46 cm) away from the edge of the Panaflex substrate. See FIGURE 2.

FIGURE 1  
Splice Placement

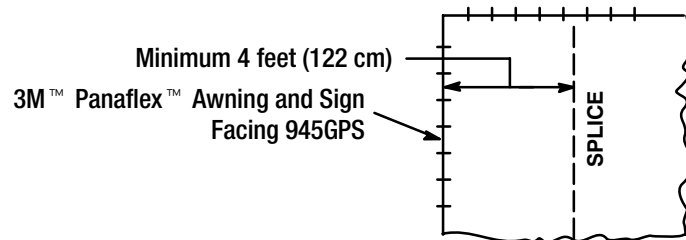
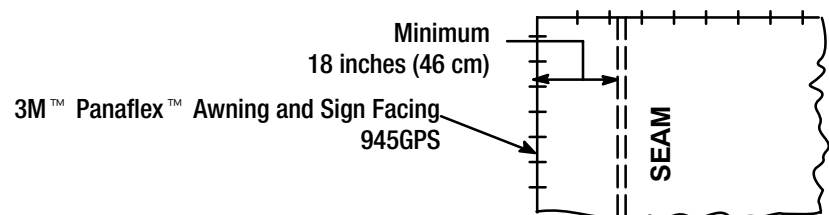


FIGURE 2  
Seam Placement



## Fabrication, Tensioning, and Attachment Guidelines

### Fabrication

Refer to Instruction Bulletin 5.7 for detailed instructions on the application of film to this substrate. All surfaces must be considered contaminated and must be cleaned prior to application of film. Keep in mind that the recommended decorating temperature is 60°F (15°C).

### Attaching and Tensioning

- 3M recommends attaching and tensioning decorated Panaflex awning and sign facing 945GPS in a cabinet or awning frame when both the material and ambient temperature are at least 45°F (7°C), whether the work is being done in a fabricator's shop or in the field.
- Use a commercially-available attachment system for sign face materials of the thickness and strength of Panaflex substrate. Contact the attachment manufacturer for details. Panaflex sign faces over 5 feet width or height should be tensioned at 1/16 inch per lineal foot in each direction. Sign faces under 5 feet should be pulled taut.

### Cold Temperature Field Installation

- Artificially warm the decorated substrate to at least 45°F (7°C) and maintain the temperature before attaching or tensioning the sign face or awning in a cabinet or frame. The method used to artificially warm a work environment in the field is the responsibility of the graphic manufacturer/installer.

**Exception:** A minimum 55°F (13°C) temperature is recommended for attachment and tensioning hardware systems that require the decorated sign facing to be wrapped over an edge and tensioned using a hammer and screwdriver combination.

- Do not stress the decorated substrate by folding, crimping, creasing, or forming it around corners. In cooler temperatures, the films applied to the substrate become less flexible and may crack if handled roughly.
- Check and retension large sign faces as needed when the temperature warms to more than 60°F (15°C). A large sign face is one that is more than 275 square feet (25 m<sup>2</sup>) and has a height that exceeds 11 feet (3.3 m) or a width that exceeds 25 feet (7.5 m).

## Shipping

### Rolling a Finished Sign Face for Shipping

Follow these guidelines if the graphics already have been applied to the substrate.

- For a graphic with a single film layer, use a core that is at least 3 inches (7.6 cm) in diameter.
- For a graphic with multiple film layers, use a core that is at least 6 inches (15 cm) in diameter.
- Roll the graphic with the graphics facing out to help prevent the graphics from popping off.
- Do not use masking tape, which may stain the substrate, to secure the roll.

## Cleaning

Clean the finished graphic annually to maximize the dirt-resistant properties of Panaflex awning and sign facing 945GPS. Clean the graphic more often in unusually dirty environments. Refer to Instruction Bulletin 6.1 for the cleaning recommendations.

## Repair

A Panaflex sign face that is punctured or damaged by sharp objects can be repaired using a kit available from 3M. The appearance of the repaired area depends on the extent of the damage. However, due to the strength and integrity of Panaflex awning and sign facing 945GPS, a tear or a puncture does not expand. Refer to Instruction Bulletin 6.1 for more details.

## Shelf Life and Storage

An awning or sign facing that is decorated as recommended, or undecorated, may be stored for up to three years with the following conditions.

- Away from direct sunlight
- In a cool, dry environment
- Covered with a brown waxed paper slip-sheeting

## Health and Safety



**CAUTION**

When handling any chemical products, read the manufacturers' container labels and the Material Safety Data Sheets (MSDS) for important health, safety and environmental information. To obtain MSDS sheets for 3M products go to [3M.com/MSDS](http://3M.com/MSDS), or by mail or in case of an emergency, call 1-800-364-3577 or 1-651-737-6501.

When using any equipment, always follow the manufacturers' instructions for safe operation.

## 3M Related Literature

Before starting any job, be sure you have the most current Product and Instruction Bulletins.

The information in 3M Product and Instruction Bulletins is subject to change. Current Bulletins are available at [3Mgraphics.com](http://3Mgraphics.com). The following applicable Bulletins provide information and processes you need to properly make the graphics described in this Bulletin. Additional Bulletins may be needed as indicated in the 3M Related Literature section of other 3M components you use.

Bulletin types: PB = Product Bulletin; PB-IB = Product & Instruction Bulletin; IB = Instruction Bulletin

Subject	Type	Bulletin No.
3M™ Scotchcal™ Translucent Graphic Film IJ3630-20 (all versions)	PB	PIJ3630
3M™ Scotchcal™ Translucent Graphic Film Series 3630	PB	3630
3M™ Scotchcal™ Translucent Graphic Film Series 3632GPS	PB	3632
3M™ Scotchcal™ Translucent Graphic Film Series 230	PB	230
Screen printing with ink series 1900	IB	3.12
Screen printing with ink series 1900 - line color - 4-color	IB	3.12 3.11
3M™ Screen Printing UV Ink Series 9800	PB	9800
Screen printing with UV ink series 9800 - line color - 4-color	IB	3.20 3.21

Subject	Type	Bulletin No.
3M™ Piezo Inkjet Ink Series 1500v2	PB-IB	1500
3M™ Piezo Inkjet Ink Series 2200UV	PB-IB	2200UV
3M™ Piezo Inkjet Ink Series 2700UV	PB-IB	2700UV
3M™ Piezo Inkjet Ink Series 2800UV	PB-IB	2800UV
3M™ Piezo Inkjet Ink Series 4600	PB-IB	4600
3M™ Piezo Inkjet Ink Series 4800	PB-IB	4800
3M™ Piezo Inkjet Ink Series 5400UV	PB-IB	5400UV
3M™ Piezo Inkjet Ink Series 5500	PB-IB	5500
3M™ Piezo Inkjet Ink Series 6000	PB-IB	6000
3M™ Piezo Inkjet Ink Series 6800	PB-IB	6800
3M™ Scotchcal™ Matte Overlaminates 3640GPS and 3642GPS	PB	3640/3642
3M™ Scotchcal™ Luster Overlaminates 8519 and 8520	PB	8519/8520
Changeable copyboard backgrounds, sign faces	IB	2.3
Application, substrate selection, preparation and substrate-specific application techniques	IB	5.1
Application, wet method for translucent screen printed, thermal mass transfer and cut graphics	IB	5.7
Cleaning and repairing decorated awnings and sign facings	IB	6.1
3M Graphics Center Warranty Brochure		go to <a href="http://www.3Mgraphics.com">www.3Mgraphics.com</a>

### Warranties

*3M, Comply, Controllac, MCS, Scotchcal and Scotchlite are trademarks of 3M.*

## Bulletin Change Summary

3M no longer manufactures or sell tensioning clamps, so references to Instruction Bulletin 6.3 have been removed. Please review the tension guidelines on page 5 of this Bulletin. Piezo inkjet film IJ3630, FN3630, RG3630 has been added as a decorating option; refer to the film's Product Bulletin for additional details. Information about seams and splices has been improved. No other marked changes affect form, fit or function.



**Commercial Graphics Division**  
 3M Center, Building 220-12E-04  
 PO Box 33220  
 St. Paul, MN 55144-3220 USA  
 General Info. 1-800-374-6772  
 Technical Info. 1-800-328-3908  
 Fax 1-651-736-4233

**3M Canada**  
 P.O. Box 5757  
 London, Ontario  
 Canada N6A 4T1  
 1-800-265-1840  
 Fax 519-452-6245

**3M México, S.A. de C.V.**  
 Av. Santa Fe No. 55  
 Col. Santa Fe, Del. Alvaro Obregón  
 México, D.F. 01210  
 52-55-52-70-04-00  
 Fax 52-55-52-70-22-77

**3M Puerto Rico, Inc.**  
 Puerto Rico Industrial Park  
 P.O. Box 100  
 Carolina, PR 00986-0100  
 787-620-3000  
 Fax 787-750-3035