



Making Digitally Imaged, Single- and Double-Sided Promotional Banners

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General Information

Banners made with 3M™ Banner Materials are intended for use in interior and exterior applications. They may be imaged electrostatically or piezo ink jet printed. Refer to the **Construction Options** on page 2 for product compatibility and usage recommendations.

Products Discussed in This Bulletin

Banner Material

- 3M™ Banner Material 8450 ES
- 3M™ Banner Material RG8450
- 3M™ Single-Sided Banner Material 8451
- 3M™ Banner Material 8452
- 3M™ Mesh Banner Material 8453
- 3M™ Single-Sided Banner Material RG8451
- 3M™ Double-Sided Banner Material RG8452

Overlaminates and Clear Coats

- 3M™ Scotchcal™ Luster Overlaminates 8910 ES
- 3M™ Scotchcal™ Matte Overlaminates 8911 ES
- 3M™ Scotchcal™ Ultra Matte Overlaminates 8915 ES
- 3M™ Scotchcal™ Hot Transfer Flexible Overlaminates 8915 ES
- 3M™ Scotchcal™ Luster Overlaminates 8519
- 3M™ Scotchcal™ Matte Overlaminates 8520
- 3M™ Screen Print Gloss Clear 1920DR
- 3M™ Piezo Ink Jet Protective Clear 8530

Note: 3M no longer recommends or warrants using 3M™ Scotchcal™ Overlaminates 8908 ES or 8909 ES on banners.

Approved Printer Platforms, Inks and Transfer Medias

- Scotchprint® Printer 2000 and Printer 9512
 - Scotchprint® Toner Series 8700
 - 3M™ Trident Transfer Paper ES
 - 3M™ Matte Wear Coat and Image Transfer Media 8604 ES
 - 3M™ Glossy Wear Coat and Image Transfer Media 8605 ES
- Océ Arizona 180 Printer
 - 3M™ Piezo Ink Jet Ink Series 6700
- Océ Arizona 90 or 180 Printer
 - Océ Piezo Ink Jet Ink Series 1700
- VUTEk UltraVu™ 2360/3360 Printers
 - 3M™ Piezo Ink Jet Ink Series 2300
- VUTEk UltraVu™ 3000/3300 and 5000/5300 Printers
 - 3M™ Piezo Ink Jet Ink Series 4000

Note: Ink series 3700, previously used in the Arizona 180 Printer, has been replaced by ink series 6700, effective April 1, 2002.

Other Products

- GBC/Pro-Tech ORCA III™ Laminator
- 3M™ VHB™ Double Coated Foam Tape 4941 or 4945 may be used in creating hems on any of these banner materials.

Note: For the full product names of the 3M products listed on this page, please see page 1.

Constructions Options

Electrostatic Imaging					
Type of Banner	Banner Material	Imaging Media	Toner	Overlaminates/ Clear	Warranted? ³
Single-sided	8450 8452	Trident	8700/8800	8910 ES 8911 ES 8915 ES ¹ 8921 ES	Yes
Single-sided	8450 8451 8452	8604 ES 8605 ES	8700/8800	None ²	No
Double-sided	8450	Trident	8700/8800	8910 ES 8911 ES 8915 ES ¹ 8921 ES	No
Double-sided	8450 8452	8604 ES 8605 ES	8700/8800	None ²	No

¹ Use 8915 for interior applications only.

² An overlaminate must not be used; it will not adhere properly to a wear coat media.

³ Refer to the banner material's product bulletin for warranty details.

Piezo Ink Jet Printed					
Type of Banner	Banner Material	Printer	Ink Series	Overlaminates/ Clear (<i>Optional</i>)	Warranted? ³
Single- or double-sided	8450 8451 8452	UltraVu 2360/3360	2300	8519 8520 8530 ² 1920DR ¹	Yes
		UltraVu 3000/3300 and 5000/5300	4000		Yes
Single sided	8450 8451 8452	Any other VUTEk piezo ink jet printer	Ink approved for that printer	8519 8520 8530 ² 1920DR ¹	No
Single-sided	8453	UltraVu 2360/3360	2300	None	Yes
		UltraVu 3000/3300 and 5000/5300	4000		Yes
Single-sided	RG8450 RG8451 RG8452	Arizona 180 printer	3700	8519 8520 8530 ²	Yes


¹ Overlaminates 1920DR must be screen printed to be warranted.

² Use clear 8530 only on single-sided banners. Do not use 8530 if the graphic is subject to harsh or abrasive cleaning. See Product Bulletin 8530 for details.

³ Refer to the banner material's product bulletin for warranty details.

Note: For the full product names of the 3M products listed on this page, please see page 1.

Health and Safety

 Caution
<p>When handling any chemical products, read the manufacturers' container labels and the Material Safety Data Sheets (MSDS) for important health, safety and environmental information.</p> <p>To obtain MSDS sheets for 3M products:</p> <ul style="list-style-type: none"> • By fax, call 1-800-364-0768 in the US and Canada or 1-650-556-8417 for all other locations. • Electronically, visit us at http://www.3m.com/msds. • By mail, or in case of an emergency, call 1-800-364-3577 or 1-651-737-6501. <p>When using any equipment, always follow the manufacturers' instructions for safe operation.</p>

Design Considerations

Grommets

Grommets may be added to the corners of a banner to provide a method for hanging it. The grommets also stabilize the corners of unfinished or hemmed edges.

Hems

Hems are recommended for banners that are used outdoors. The hem increases the strength and integrity of the finished banner. The overall size of the banner should include a margin of material that can be used to create a hem on all four sides. The hem may also contain a pocket for a pole as well as grommets. Refer to *Finishing the Edges of a Banner* on page 7.

The hem may be secured with tape, such as VHB tape 4941 or 4945, or with stitching. If you are using tape, the width of the hem should be the same width as the tape you use. For a pole pocket, include a sufficient margin on that side to accommodate the pole and the tape or stitching.

Wind Slits

DO NOT make wind slits in the banner. Wind slits have unfinished edges that create weak spots in the banner and void the warranty (if offered). As a result, constant flexing as wind passes through the slit, as well as cold temperatures in some areas, may cause the material to crack and fray prematurely. Design banners to include enough strength in the construction and supporting fixtures to sustain typical high wind speeds for the installation site. Consult a registered professional engineer if you require assistance.

Seams

Although banner material may be seamed, 3M does not warrant seamed banners. The graphics manufacturer must assume responsibility for testing, approving and guaranteeing the suitability of a seamed banner for their customers' needs.

Choose the Correct Graphic Protection

Refer to the table on page 2 to determine the approved protection options for your graphic construction.

Purpose	Over-laminate ¹	Clear Coat ^{1,2}	Protective Clear ^{1,2}
Provide graphic protection	Yes	Yes	Yes
Change gloss	Yes	Yes	Yes
Abrasive washing conditions	Yes	Yes	No

¹ Cannot be used on banners imaged with wear coat and image transfer media.

² Clear coats and protective clear can be used only with piezo ink jet printed graphics.

Piezo Ink Jet Printed Banners

For the best results when printing on banner material 8452, print on the rougher side first and allow to dry thoroughly. Then print on the smoother side. This reduces the potential problem of the material sticking on the post-heat printer surface.


Please refer to Product Bulletins and Instruction Bulletins for the ink series you are using for detailed printing information. These bulletins are listed in 3M Related Literature at the end of this bulletin.

Also see *Finishing the Edges of a Banner*, page 7.

Note: For the full product names of the 3M products listed on this page, please see page 1.

Transferring Electrostatically-Imaged Graphics to Banner Material

Image Transfer Procedure

 Caution
<p>When using any equipment, always follow the manufacturers' instructions for safe operation.</p>

These procedures are for an ORCA III laminator. It is the only laminator 3M recommends. Using a laminator with a single heat roll results in poor image transfer even at lower transfer speeds.

High temperatures and slow speed increases the adhesion of transferred images. However, using too slow a speed at high temperatures (for example, 1 feet/minute at 290°F/150°F) may distort the banner, reduce gloss and even cause delamination.

If the image transfer is not satisfactory at the recommended starting points, change one parameter at a time, starting with the speed. Stay within the recommended range. Make individual adjustments until you achieve satisfactory results.

√ Important Note

These laminator settings were determined in laboratory tests and may not be the optimal conditions for your shop, laminator or graphics. Graphics manufacturers are responsible for testing, adjusting and approving adhesion and appearance for the material used.

ORCA III Settings for Image Transfer

Parameter	Type of Transfer Media	
	Trident	8604 / 8605
Upper roll temperature Start Range	290°F (143°C) 250° - 290°F (126° - 143°C)	275°F (143°C) 275° - 290°F (126° - 143°C)
Lower roll temperature Start Range	150°F (65°C) 120° - 150°F (48° - 65°C)	150°F (65°C) 120° - 150°F (48° - 65°C)
Roll pressure Start Range	80 psi (5.6 bar) 80 - 100 psi (5.6 - 6.9 bar)	80 psi (5.6 bar) 00 - 100 psi (5.6 - 6.9 bar)
Pull roll pressure	40 psi (2.8 bar)	40 psi (2.8 bar)
Pull roll clutch pressure	40 psi (2.8 bar)	40 psi (2.8 bar)
Banner material tension	Low to medium	Low to medium
Transfer media tension	Medium to high	Medium to high
Transfer speed Start Range	2 feet/minute (60 cm/minute) 2.0 - 4.5 feet/minute (60 - 137 cm/minute)	2 feet/minute (60 cm/minute) 2.0 - 4.5 feet/minute (60 - 137 cm/minute)
Cooling fans	On	On

Note: For the full product names of the 3M products listed on this page, please see page 1.

Front Surface Transfer
Trident Transfer Media on Banner Material

1. Figure 1 shows how to thread banner material and Trident transfer media on an ORCA III laminator. You may apply a recommended overlamine during the same transfer process by threading it as shown.

Note: If you plan to image the back surface or apply hot transfer overlamine 8621 ES, be sure the core onto which you wind the finished banner is the correct size to fit onto the banner supply chuck.

2. Start the transfer process at about 2.0 foot/minute (60 cm/minute). As the roll temperature increases, slowly increase the speed to as fast as the transfer allows while still maintaining acceptable toner transfer. A speed range of 2.0 to 4.5 feet/minute (60 to 137 cm/minute) is typical.
3. Maintain sufficient tension on the transfer media to eliminate waves and wrinkles as the media enters the nip of the laminator.

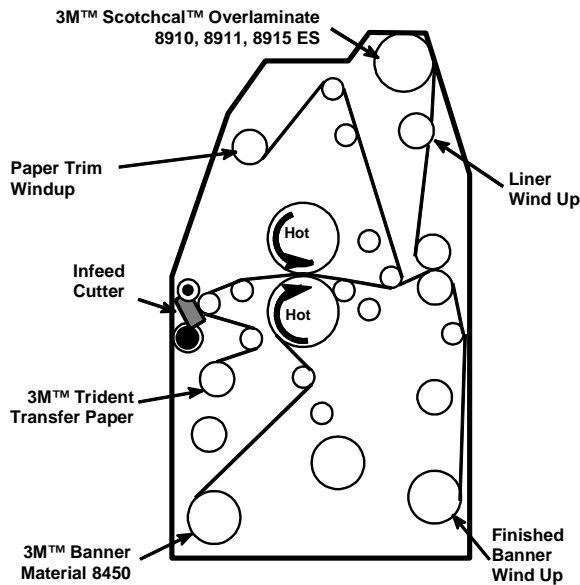


Figure 1. For Front Surface Imaging:
 Transferring the image from Trident transfer media to banner material and applying overlamine

Also see *Finishing the Edges of a Banner*, page 7.

Front Surface Transfer For Media 8604 ES or 8605 ES

1. Figure 2 shows how to thread banner material and media 8604 ES or 8605 ES into the GBC/Pro-Tech ORCA III™ Laminator. Since this material has a built-in wear coat, an overlamine or protective clear must not be used.
2. Continue with Steps 2 to 4 in **Front Surface Transfer For Trident Transfer Media Only**.

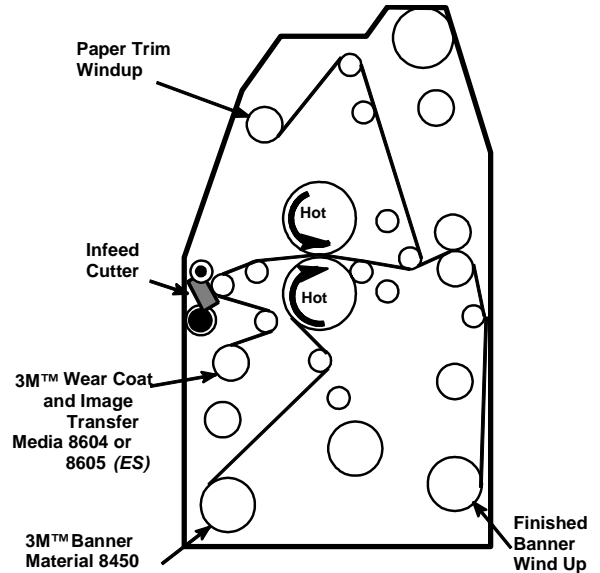


Figure 2. For Front Surface Imaging:
 Transferring the image from media 8604 ES or 8650 ES to banner material

Also see *Finishing the Edges of a Banner*, page 7.

Note: For the full product names of the 3M products listed on this page, please see page 1.

Back Surface Transfer for Media 8604 ES or 8605 ES

Note: Only media 8604 ES or 8605 ES can be used for transferring images to the back (second) surface of banner material 8450 or 8452 (only).

1. If the front surface of the banner has been through the laminator already, the banner should be rolled image side out onto a suitable core. If not, roll it now.
2. See Figure 3 for how to thread the laminator. Since the transfer media has a built-in wear coat, an overlamine must not be used.
3. Start the transfer speed at about 2.0 feet/minute (60 cm/minute). As the rolls heat up, slowly increase the speed to as high as 4.5 feet/minute. However, optimal adhesion usually occurs at about 2.0 feet/minute.
4. Maintain sufficient clutch tension on the transfer media to eliminate waves and wrinkles as the media enters the nip of the laminator.

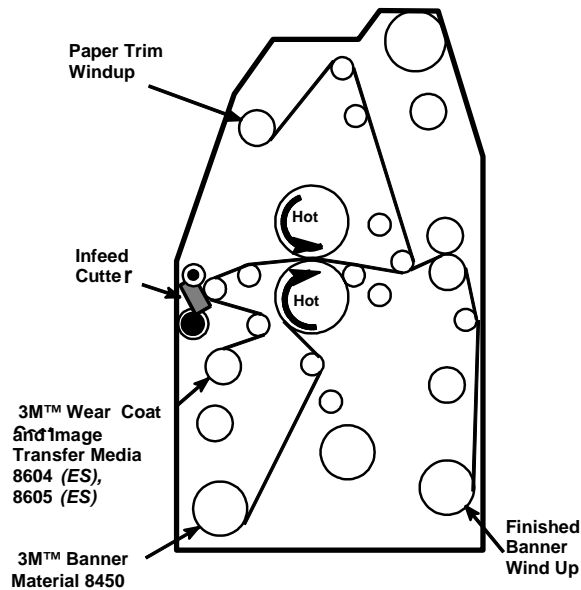


Figure 3. Second Surface Only:
ORCA III threadup for transferring media 8604 ES and 8605 ES to banner material 8450 ES

Also see *Finishing the Edges of a Banner*, page 7.

Applying a Hot Transfer Overlamine

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

Hot transfer overlamine 8921 ES can be applied with most hot roll laminators after the image transfer is completed. However, this procedure describes the use of the ORCA III laminator.

ORCA III Settings for Hot Transfer Overlamine

Parameter	Setting
Upper roll temperature	290°F (143°C)
Lower roll temperature	Off
Roll pressure	50 psi (3.5 bar)
Pull roll pressure	40 psi (2.8 bar)
Pull roll clutch pressure	40 psi (2.8 bar)
Banner material clutch	Low to medium
Overlamine clutch	Medium to high
Transfer speed	2.0 to 3.0 feet/minute (60 to 90 cm/minute)
Cooling fans	On

Laminating Hot Transfer Overlamine

1. Roll the imaged banner material, image side out, onto a core. Be sure the core is a suitable size for the paper supply chuck. This step is necessary for proper tensioning. Mount the core on the laminator and thread it as shown in Figure 4, page 7.
2. Thread the overlamine through the laminator. See Figure 4 if you are using overlamine 8921 ES.
3. Lower the pull roller to keep tension on the laminate while positioning the imaged banner under the nip.
4. Do not allow the overlamine to come in contact with the heated rolls. Position the banner so it completely covers the laminate area.
5. If you are not using an ORCA III laminator, try to follow a similar threadup pattern so the overlamine wraps around the heated roll prior to entering the nip. This preheats and softens the clear for a faster and more complete transfer.
6. As it goes through the laminator, the top coating on the banner is a polyester carrier sheet. The sheet can remain on the banner until further fabrication is needed, such as folding the edges. Do not remove this sheet until the banner is completely cooled.

Note: For the full product names of the 3M products listed on this page, please see page 1.

7. For the best results, remove the polyester carrier sheet at a 180° angle (pulling the sheet back over on itself) to the banner.

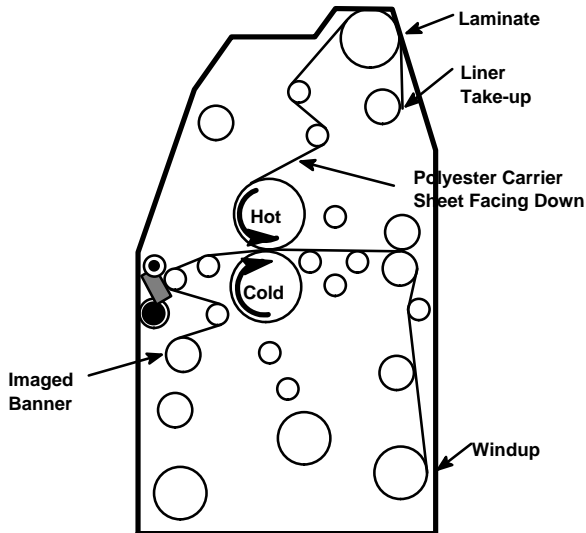


Figure 4. Applying Overlamine 8921 ES to a Banner Imaged With Trident Transfer Media

Finishing the Edges of the Banner

For Electrostatic and Piezo Banners

Caution

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

For better exterior durability, we recommend hemming the edges of the banner material and securing them with stitching or another mechanical fastening system. Grommets may also be used in the corners for added strength.

VHB tape 4941 or 4945, which resists the plasticizers in the banner material, is an excellent choice for securing the edges. Follow these guidelines for using the tape.

1. Select a tape width equal to the width of the hem.
2. Make any necessary cuts in the corners to eliminate the bulk created by the overlapping of vertical and horizontal hems. You can miter the corners or cut out a square of material to create a neat, flat corner.
3. Clean and dry the back side of the banner material with isopropyl alcohol to remove dirt and other contaminants; this ensures proper adhesion.
4. Apply the sticky side of the tape flush with the vertical outer edges of the banner material.
5. Remove the liner from the tape.
6. Fold over the hem to just the width of the tape.

7. Use a rubber roller to apply pressure to the taped area, being sure to squeeze out any air bubbles.
8. If a pole pocket is being created, do that side last. Otherwise, apply the tape for the horizontal hems just as for the vertical hems.

For a Pole Pocket

1. Apply the tape flush with the outer edge of the material. Use multiple layers of the tape to securely hold the pocket.
2. Remove the liner from the tape. Fold over the pocket, leaving sufficient space for the pole.
3. Use a rubber roller to apply pressure to the taped area, being sure to squeeze out any air bubbles.

Shelf Life, Storage and Shipping

- Store the banner material in a clean, dry area, away from direct sunlight, and at an ambient temperature less than 86°F (30°C).
- Process the banner material within six months of receipt from 3M.
- Use processed banners within one year of fabrication.
- Store finished banners either flat or rolled. For rolling, use a minimum 6 inch (15 cm) diameter core, place a brown kraft paper slip sheet over the banner, and roll the banner with the image side out.

Warranty and Limited Remedy

The information contained and techniques described herein are believed to be reliable, but 3M makes no warranties, express or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose. 3M shall not be liable for any loss or damages, whether direct, indirect, special, incidental or consequential, in any way related to the techniques or information described herein.

Scotchprint® Graphics Network

There's a whole other world behind the Scotchprint® Graphics Internet site (www.scotchprint.com) and you can travel there with the Scotchprint® Graphics Network. This password-protected Web site opens the door to exclusive Scotchprint® Graphics product information, services and e-deals (product promotions) that are not available on our regular Internet site.

There's no charge and you can sign up today. Just ask your Commercial Graphics Division sales representative, or contact Lisa Burns (ljburns3@mmm.com or 651-736-9719).

3M Related Literature

Listed below is related 3M technical literature that may be of interest. You may view and print these Bulletins from our Web site at www.scotchprint.com, or order them via our Fax-on-Demand (FOD) system. Call one of these phone numbers to order the desired bulletins, and specify the FOD document number provided in the chart.

United States or Canada: 1-800-364-0768
International: 1-651-732-6506

Subject	Bulletin No.	FOD No.
Product Bulletins		
3M™ Banner Material 8450	8450	3523
3M™ Banner Material RG8450	RG8450	4514
3M™ Single-Sided Banner Material 8451	8451	4552
3M™ Banner Material 8452	8452	4559
3M™ Mesh Banner Material 8452	8453	4572

Subject	Bulletin No.	FOD No.
3M™ Single-Sided Banner Material RG8451	RG8451	4551
3M™ Banner Material RG8452	RG8452	4571
3M™ Trident Transfer Paper	Trident	3567
3M™ Wear Coat and Image Transfer Media 8604 ES and 8605 ES	8604/ 8605	3561
Scotchprint® Toner Series 8700/8800	8700	3514
3M™ Piezo Ink Jet Ink -Series 2300 -Series 3700 -Series 4000 -Series 6700	2300 3700 4000 6700	4538 4512 4515 4559
3M™ Scotchcal™ Overlaminates -Luster 8910 ES -Matte 8911 ES -Ultra Matte 8915 ES -Hot Transfer Flexible 8921 ES	8910 8911 8915 8921	3519 3520 3522 3530
3M™ Scotchcal™ Overlaminates 8519 and 8520	8519/ 8520	4524
3M™ Piezo Ink Jet Protective Clear 8530	8530	4565
Instruction Bulletins		
Design of graphics	2.1	5501
Transferring electrostatic images	4.7	6507
Printing with piezo ink jet ink -Series 2300 -Series 3700 -Series 4000 -Series 6700	4.35 4.25 4.27 4.38	6535 6525 6527 6538
Toners, Scotchprint® series 8700/8800	4.12	6512
Warranties		
Worldwide 3M™ MCS™ Warranty Packet (includes all Commercial Graphics MCS Warranties)		9503
Worldwide 3M™ MCS™ Warranty Overview-Folder		9504
Scotchprint® Graphics Warranty (includes overview)		9505

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3M, MCS and Scotchcal are trademarks of 3M.
ORCA is a trademark of GBC/Pro-Tech Engineering Co., Inc.
UltraVu is a trademark of VUTEK, Inc.

Bulletin Change Summary

Added banner materials 8452 and 8453.



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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.

Important Notice to Purchaser

The 3M products described in this publication are covered by a 3M warranty and limitation of liability.

3M's warranty provides that if 3M finds that goods are defective in material or workmanship they will be replaced or the price refunded at 3M's option but note that 3M does not accept liability for other direct losses (except for personal injury or death) or consequential losses relating to defective products or from information supplied by 3M.

Purchasers and users of 3M products, and not 3M supplying companies, are always solely responsible for deciding on the suitability of the 3M product for their required or intended use.

Technical Assistance

For help on specific questions relating to 3M Commercial Graphics Division Products, contact your local Technical Service Representative.

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