3M

Printing, Lamination and Application of 3M™ Scotchgard™ Protector Graphic Film 8050

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Description

This bulletin gives specific instructions for the printing, lamination and use of 3M™ Scotchgard™ Protector Graphic Film 8050 Kit.

This Scotchgard Protector Graphic Film 8050 Kit comprises a dimensionally stable and custom printable polyester film, a screen printable primer and a high shear acrylic transfer adhesive. The kit is intended for use within applications requiring a high durability, such as public transport vehicles and is designed for use on flat and simple curved interior surfaces.

Compatible Products

- 3M™ Screen Printing Ink Series 9800UV
- 3M™ Piezo Ink Jet Series 4600
- 3M™ SCPM 44X Application Tape
- 3M™ SCPM-19 Application Tape
- 3M™ Adhesion Promoter 86A

For details and compatibility please refer to the corresponding Product & Instruction Bulletins or Data Sheets.

Health and Safety

Caution
When handling any chemical products such as printing inks, read the manufacturer's container labels and the Materials Safety Data Sheets (MSDS) for important health, safety and environmental information. To obtain MSDS for 3M products; Web site: www.3m.com/uk/msds Telephone enquiries: 01344 858000

Ventilation

Provide local and/or general exhaust ventilation in the print drying areas to prevent a build up of solvent vapours
An experienced industrial ventilation engineer and/or a certified industrial hygienist can help evaluate your ventilation requirements and design based on your site process conditions.

Note: Additional environmental health and safety information is available in EHS Bulletin 6000, which is available on our web site at www.3m.com/uk/graphicsolutions

General Handling

Care should be taken when using Scotchgard Protector Graphic Film 8050 to avoid the possibility of cuts from the edge of the film. It is recommended that protective gloves be worn when handling.

The film surface must be kept free from dust or any other contamination prior to printing and laminating to ensure a clean and suitable bond is achieved.

Particular care should be taken as a static charge can be generated when handling and processing the film. This charge should be minimised where possible and the effects of static attraction should be taken into account in the processing. It is also recommended that the working area be dust free.

The handling of Scotchgard Protector Graphic Film 8050 at various stages during the conversion and application processes may be improved by the use of SCPM 44X application tape, on small format

graphics and SCPM19 on large format graphics. If this is done, it is important to minimise any subsequent change in the moisture content of tape to maintain film stability.

Due to the nature of the film surface, take care that stacked sheets do not slip and rolls 'telescope' when being handled.

Cutting & Sheeting

A sharp blade is required for cutting the film. The blade may also require changing/sharpening more regularly to avoid ragged edges or incomplete cutting.

3M™ Scotchgard™ Protector Graphic Film 8050 can be guillotine cut as detailed in Instruction Bulletin 4.1 Sheeting, Scoring and Cutting of Film.

Screen Printing

Ensure that the correct surface (i.e. the print receptor surface) is printed.

Also note that as the printing will be on the underside (second surface) of the film when it is finished, details may need to be printed in 'reverse' and the sequence of colour lay down should be considered.

The procedure for screen printing is detailed in the Instruction Bulletins 3.11 & 3.12 for the 1900 ink system.

The drying of the film during conversion is critical to its performance and reference should be made to the Drying Conditions section in this Bulletin.

Care should be taken to ensure that the vacuum pressure of the print table is adjusted correctly to avoid a dimpled appearance of the print.

The primer is intended for printing directly onto the dried graphic screen print ink. The primer enables high adhesion to the transfer adhesive, assuring clean removal, as well as an opacity that enables the hiding of substrates with high luminance or colour contrast, thus the application of the primer is essential.

Digital Printing

Ensure that the correct surface (i.e. the print receptor surface) is printed.

Also note that as the printing will be on the underside (second surface) of the film when it is finished, details may need to be printed in 'reverse'.

Digital printing on Scitex equipment with 4600 Inks is as detailed in the Instruction Bulletin 4.43.

The drying of the film during conversion is critical to its performance and reference should be made to the Drying Conditions section in this Bulletin.

It should be noted that automatic tracking on some digital printing equipment may require special adjustment to take account that the Scotchgard™ Protector Graphic Film 8050 is transparent.

The primer is intended for printing directly onto the dried graphic digital print ink. The primer enables high adhesion to the transfer adhesive, assuring clean removal, as well as an opacity that enables the hiding of substrates with high luminance or colour contrast, thus the application of the primer is essential.

Printing of Primer

These are the recommendations for the printing of the Scotchgard ™ Protector Graphic Film 8050 Primer coat, which enables a high level of adhesion of the transfer adhesive, assuring clean removal of the film at the end of life, as well as promoting the hiding of substrates with high luminance or colour contrast.

Background

Certain substrates, for example the internal surfaces of rail rolling stock, may exhibit significant variations in colour or luminance. The presence of graffiti or ghost images of graffiti is a good example.

If applying the film directly onto such surfaces, it may be necessary to flood coat the Primer on the film so that such variations in substrate luminance do not show-through the applied film.

Surface Variation

The variation in substrate contrast is the result of a number of factors including,

- Ghost images of coloured ink on a generally light substrate

- Ghost images of black ink onto a generally light substrate

- Show-through of substrate metal, due to over-abrasion of the substrate coating

Where it is anticipated that substrates will exhibit colour or luminance contrast, it is recommended that the guidelines below are followed.

Solution

The recommended solution will depend upon two key factors,

- The nature of the substrate

- The colour and complexity of the graphic image

After the image coat is printed and dried. This is then overprinted with the primer flood coat.

It is recommended that for homogeneous image coats, a 62T mesh screen be used where possible

It is further recommended that for the primer flood coat a 62T mesh screen be always used.

The primer can be thinned as normal for ink series 1900 with CGS50 up to 15% as required.

The table below provides more detail on the recommended primer flood coat.

Image Coat Finish	Recommended Print Solution
Homogeneous Light Image Coat (e.g. white, ivory, etc)	Image coat – 62T mesh Primer coat - 62T mesh Primer coat to be a blend of 99.5% 8057 Primer and 0.5% 1905 black ink*
Homogeneous Dark Image Coat (e.g. dark blue, dark green, etc)	Image coat – 62T mesh Primer coat - 62T mesh Primer coat to be 100% 8057 Primer
Complex Image Coat (i.e. 4 colour half tone printed graphic)**	Image coat – Digital print or screen printed 120T mesh Primer coat - 62T mesh Primer coat to be 100% 8057 Primer

*Note: The addition of 0.5% back ink to the primer mix has no impact on the priming performance of the primer layer.

** Note: Where the complex image has significant areas of homogeneous colour, defer to the recommendation for homogeneous colour

The above recommendations are guidelines only. It remains the responsibility of the converter to confirm suitability of the printing of the film.

Impact on the Colour of the Image Coat

Where 3M™ Screen Printing Ink 1905 black ink is blended with the 8057 Primer, the luminance of the image cost may be impacted. In such cases, it may be necessary to print a lighter image coat to compensate.

Drying Conditions

The drying of the film during conversion is critical to its performance and it is important that reference should be made to the Drying Conditions section as well as the specified drying details in the relevant Instruction Bulletin for the ink system being used.

Depending on dryer being used, it may be found necessary to place a slip sheet under printed sheet to avoid dryer belt pattern becoming imprinted on the graphic.

Graphics that seem dry to the touch may still be saturated with solvent. If this is not dried quickly through heat and air circulation this may significantly impact post printing operations, affect adhesive performance and application, and impact functional performance in the field leading to ply failure. It is important to note that high levels of retained solvent may contribute to a decrease in the film's fire performance compromising the safety of the application.

If there is any question as to sufficient dryness, a suitable dryness test should be performed.

Dryness Test

This test is used to determine if adequate drying has taken place.

1. Take several printed sheets and place them under a 30cm (12 inch) stack of film or under a weight of 135 g/cm^2.

Note: Sheets must not be stacked face to face.

2. After 10 minutes, remove the sheets and check for blocking (sticking together) or surface impression.

3. If blocking or severe surface impression is noted, additional drying is required. If conveyor drying, either the temperature should be increased or the belt speed decreased.

Ink Adhesion

The adhesion of the ink to the film during conversion is critical to the performance of the film and it is important that this is checked at the beginning of each run.

Tape Snap Adhesion Test

1. Using a sharp razor blade, knife or other suitable instrument, scribe a crosshatch pattern through the ink layers. Do not cut through the film substrate.

2. Using a PA-1 plastic applicator (available from 3M Commercial Graphics Division), firmly apply a strip of Scotch Tape #610 over the scribed area.

3. Remove the tape by pulling it back upon itself using a rapid, firm pull.

4. No separation of ink layers should occur.

Lamination

The pressure sensitive acrylic transfer adhesive which is part of the Scotchgard™ Protector Graphic Film 8050 Kit, should be laminated onto the printed surface of the 3M™ Scotchgard™ Protector Graphic Film 8050.

The adhesive lamination of Scotchgard protector graphic film 8050 is compatible with most roll laminators. No heat is required.

Lamination of the adhesive onto the film 8050 should be generally carried out a minimum of 24 hours after printing to ensure sufficient drying of the print.

Refer to Instruction Bulletin 4.22.1 Lamination Techniques for Convertors of Laminating Adhesives for details on equipment and how to laminate the adhesive.

Shelf Life, Shipping and Storage

The shelf life of the film is 2 years. Film should be converted and applied a maximum of 2 years from the date of receipt. Converted film should be applied within 1 year of conversion.

The shelf life of the adhesive is 2 years from date of despatch by 3M, when stored in the original carton at 21°C and 50% Relative Humidity.

Converted film should be stored flat, in a clean area, protected from moisture and direct sunlight, with ambient temperatures below 38°C. Wrap stacks of cut sheets with polyethylene film and seal with tape to prevent moisture absorption by the liner, which will cause the sheets to curl or ripple.

Processed film, if rolled during shipping, must be rolled film side out onto a core of no less than 150mm (6 inches) diameter. This method prevents the graphics and premask from wrinkling and popping off the liner.

Application

3M™ Scotchgard™ Protector Graphic Film 8050 is designed for application on flat and simple curved interior surfaces.

The preparation of the substrate and the application of the Scotchgard™ Protector Graphic Film 8050 should be carried out with reference to Instruction Bulletin 5.1 Surface Preparation, to Instruction Bulletin 5.1.1 Surface Preparation, Graphic Removal and Application of Replacement Graphics on Rail Transport Vehicles and to Instruction Bulletin 5.5 Application, General Procedures for Interior and Exterior Dry Applications.

Adhesion Promotion of Edges

For applications where there is a high risk of the edges of graphic being lifted, it may be advantageous to deploy an adhesion promoting primer such as 3M™ Adhesion Promoter 86A on the substrate under the selected edges of the graphic.

This should be carried out prior to application, by wiping an area approximately 10-15mm wide around the required perimeter of the application area that will be covered by the edge of the graphic, with a lint free cloth wetted with 3M™ Adhesion Promoter 86A. Use the minimum amount of the adhesion promoter that will coat the desired surface. Allow to dry for 10 minutes or until the coated surface is not glossy then squeegee the film down. For best results apply the film within 2 hours to the promoted surface. For more information refer to Adhesion Promoter 86A Product Data Sheet.

Joining Panels

Panels of the 3M™ Scotchgard™ Protector Graphic Film 8050 can be joined by using overlaps but may it may be aesthetically better to 'butt joint' where this is possible.

Where overlap joints are used it is recommended to apply 3M™ Adhesion Promoter 86A on the top surface of the underneath film along it's edge to the width of the overlapping graphic piece (5-10mm) to ensure a good adhesive bond.

This should be carried out by wiping this area with a lint free cloth wetted with 3M™ Adhesion Promoter 86A using the minimum amount that will coat the desired surface. Allow to dry for 10 minutes or until the coated surface is not glossy then squeegee the film overlap down. For best results apply the film within 2 hours to the promoted surface. For more information refer to Adhesion Promoter 86A Product Data Sheet.

Graphic Repair

Applications that are subject to excessive vandalism or product abuse such as cutting or gouging resulting in damage to the graphics can be repaired, however it should be noted that 'repaired' graphics are not warranted.

It is suggested that, where possible, a complete graphic panel is removed and replaced rather than a small area repaired. See Graphic Removal below.

If repairs are required they should be carried out as detailed in Instruction Bulletin 5.1.1 Surface Preparation, Graphic Removal and Application of Replacement Graphics on Rail Transport Vehicles and in Instruction Bulletin 6.5 Storage, Handling, Maintenance and Removal of Films and Sheetings

Graphic Removal

While the Scotchgard™ Protector Graphic Film 8050 is designed for use within applications requiring a high durability it may be anticipated that, where applications that are subject to excessive vandalism or product abuse resulting in damage to the graphics, they can be removed and replaced.

The removal of graphics should be carried out as detailed in Instruction Bulletin 5.1.1 Surface Preparation, Graphic Removal and Application of Replacement Graphics on Rail Transport Vehicles and in Instruction Bulletin 6.5 Storage, Handling, Maintenance and Removal of Films and Sheetings

Subsequent re-application of new graphics should be carried out as detailed in previous section on Application.

Waste Disposal

For guidelines on disposal of material components please refer to the relevant individual component Material Safety Data Sheets (MSDS).

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.

Related 3M Literature

Related 3M Technical Literature which should also be referenced is detailed below:

Subject	Bulletin No.
Product Bulletins	
3M™ Scotchgard™ Protector Graphic Film 8050	8050
Instruction Bulletins	
Sheeting, Scoring and Cutting of Film	4.1
Premasking and Prespacing	4.3
Lamination Techniques for Convertors of Laminating Adhesives	4.22.1
Surface Preparation	5.1
Application, General Procedures for Interior and Exterior Dry Applications	5.5
Storage, Handling, Maintenance and Removal of Films and Sheetings	6.5
Surface Preparation, Graphic Removal and Application of Replacement Graphics on Rail Transport Vehicles	5.1.1 (Railways)
Screen printing using 1900 Series Ink	3.11, 3.12
Screen printing using 9800 UV Ink	3.4, 3.13
Printing with Piezo Ink Jet Ink Series 4600	4.43
Product Data Sheets	
3M™ Adhesion Promoter 86A	

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

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