3M

Piezo Ink Jet Printing
with 3M™ Piezo Ink Jet Ink Series 1500
For VUTEk UltraVu™ 150 and 2360/3360/3300/5300 Printers

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Description

3M™ Piezo Ink Jet Ink Series 1500 makes attractive, four, six or eight Colourgraphics. These solvent-based, pigmented inks, which are weather resistant and have good Colourretention, are designed and approved for use in the VUTEk UltraVu™ 150 and 2360/3360/3300/5300 Printers.

Changing to Ink Series 1500

Ink series 1500 is not chemically compatible with other Piezo Ink Jet Ink and cannot be used with each other or mixed. When changing to ink series 1500 from any other ink series for the first time, you must contact your 3M Commercial Graphics Division sales representative or Technical Service to schedule their assistance in the changeover.

- If you are working on a large or ongoing production job that is sensitive to colour gamut, which is different with the new inks, plan to do the changeover after the job is completed.

- Schedule a 3M technical support representative to be on-site during the changeover (1-1/2 to 2 days). This is required to assist you in a smooth changeover. Contact your local sales representative to set this appointment.

Product Line

This information is subject to change. Be sure this is the most current Product Bulletin. See 3M Related Literature at the end of this bulletin.

No.	Colour	Stock No.
1581	Light Magenta	75-3470-5607-1
1582	Light Yellow	75-3470-5506-5
1585	Light Black	75-3470-5507-3
1586	Light Cyan	75-3470-5608-9
1591	Magenta	75-3470-5609-7
1592	Yellow	75-3470-5610-5
1595	Black	75-3470-5611-3
1596	Cyan	75-3470-5612-1

Compatible Products

Note: For details on using a particular film or substrate for piezo ink jet printing, please refer to that product's Product Bulletin.

100 Micron

- 3M™ Controltac™ *Plus* Graphic Film IJ160-10
- 3M™ Controltac™ *Plus* Graphic Film with Comply™ Performance IJ160C-10
- 3M™ Controltac™ *Plus* Graphic Film Series IJ162
- 3M™ Scotchcal™ Perforated Window Graphic Film 3M™ Scotchcal™ Perforated Window Marking Film IJ8173
- 3M™ Scotchcal™ ElectroCut™ Graphic Film IJ20-10
- 3M™ Scotchcal ™ Graphic Film IJ20-20
- 3M™ Scotchcal ™ Graphic Film IJ20-114
- 3M™ Scotchcal™ Graphic Film Series IJ40-10
- 3M™ Scotchcal™ Graphic Film Series IJ40-20
- 3M™ Scotchcal™ Graphic Film Series IJ40-114
- 3M™ Scotchcal™ Opaque Graphic Film 8645 ES

50 Micron

- 3M™ Controltac™ *Plus* Graphic Film IJ180-10
- 3M™ Controltac™ *Plus* Graphic Film with Comply™ Performance IJ180C-10
- 3M™ Scotchcal™ Graphic Film Series 3650B, 3669
- 3M™ Scotchcal™ Translucent Graphic Film IJ3630-20

Reflective Films

- 3M™ Scotchlite™ *Plus* Flexible Reflective Graphic Film IJ680-10
- 3M™ Scotchlite™ Removable Graphic Film with Comply™ Performance Film IJ680CR-10

Banner Material

- 3M™ Single-Sided Banner Material 8451
- 3M™ Mesh Banner Material 8453
- 3M™ Panagraphics™ II Intermediate Flexible Substrate

Application Tapes

- 3M™ Prespacing Tape SCPS-2, SCPS-55
- 3M™ Premasking Tape SCPM-3

Overlaminates and Clear Coats

- 3M™ Screen Print Gloss Clear 1920DR
- 3M™ Screen Print Gloss Clear 9720UV
- 3M™ Scotchcal™ Luster Overlaminate 3645
- 3M™ Scotchcal™ Luster Overlaminate 8519
- 3M™ Scotchcal™ Matte Overlaminate 8520
- 3M™ Scotchcal™ Optically Clear Overlaminate 8914i
- 8936/3M™ Piezo Ink Jet Ink Series 3700
- 8934/3M™ Controltac™ Plus Graphic Film with Comply™ Performance 3545C
- 3M™ Scotchcal™ High Gloss Graffiti-Resistant Overlaminate 8912 ES

Health and Safety

Ventilation

Provide local and/or general exhaust ventilation in the printing drying areas to prevent a build up of solvent vapors and to maintain levels of solvents below the limit for worker exposure. 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. VUTEk, the printer's manufacturer, also provides ventilation information. Please refer to their literature too.

Guidelines for Successful Printing with Solvent-Based Piezo Ink Jet Inks

The Role of the Printer Operator

An operator who understands pre-press operations and the relationship between media characteristics, printer setup, total ink coverage and drying time can produce graphics that achieve the performance expectations of the media and the customer. The operator should work with the graphic designer and/or colour conversion operator so there is a common understanding of print and media parameters.

A wide variety of printing media (substrates) can be used with piezo ink jet printing. Although 3M media have been extensively tested in laboratory conditions, the knowledge and skill of the operator is the most important factor in producing high quality graphics.

About Solvent-Based Piezo Inks Used in This Printer

The inks used in this printer contain a high percentage of solvent. If the solvent is not evaporated quickly through heat and air, it may significantly affect post-printing operations and how the media handles when applying it.

Solvent's Affect on Media and the Printed Image

When the media is not sufficiently dried immediately after processing, it may result in edge curling, shrinkage, adhesive problems and/or stretching, which contribute to handling and performance problems. Also, the graphic may be hard to overlaminate and it could be damaged due to smearing or blocking during handling. The more solvent you can eliminate, the better the media performance.

How to Manage the Total Physical Amount of Ink on Media

Testing shows that properly managing the total physical amount of ink laid down in any area on the graphic results in better image quality, less ink usage, quicker drying times and greater throughput. It also helps ensure good media performance.

To help you achieve these goals, we have established maximum Total Ink Coverage for each 3M media. Total ink coverage is the total percentage of all inks (CMYK) used in the darkest shadow regions of the graphic. For example, CMYK values of 60%, 60%, 60% and 100% produces a total ink coverage of 280%.

Note: Some software or colour printing reference books may refer to total ink coverage as: total area coverage; total dot area; max CMYK; maximum ink amount; total ink limit; total printing dot.

There is a common misconception that because the ratio of ink solids to solvent is very low, the only way to achieve satisfactory density is to use high ink coverage. Testing shows that in many cases you can achieve very good density with lower total ink coverage with little or no loss of quality. The rest of this section discusses options for managing the total ink coverage.

Setting Total Ink Coverage During Colour Separation

The best results can be achieved when total ink coverage is taken into consideration by the graphic designer and limited during pre-press operations.

The graphic designer and/or colour separator should always discuss printing parameters with the piezo press operator so that the total ink coverage can be set during separation. The typical methods of colour separation are Photoshop®, ICC-based colour management, third party colour separation packages and direct conversion to CMYK at the time of scanning.

Part of establishing the total ink coverage is determining maximum black. We recommend limiting black ink to the minimum level necessary to achieve a maximum density. For example, if you review a series of black patches in 1% increments from 90% to 100%, a visible difference in density usually stops being noticeable between 94% and 100% of total black. When doing colour separations, we recommend setting the UCR/GCR between 260% and 280%.

Correcting Total Ink Coverage During Printing

If the total ink coverage on a colour-separated image is too high for the media and your RIP software supports ink limiting, you may be able to use this function to reduce the total physical amount of ink on the media.

For example, in 3M's **Scotchprint® Graphic Maker Software**, the ink limiting feature manipulates the print data to reduce the amount of ink used while maintaining colour balance for the best possible image quality. It does this by limiting the amount of cyan, magenta and yellow that can be used together without restricting the 100% solid colours (cyan, magenta, yellow and black). Ink limiting for TOTAL CMY can be set for none, 100%, 150%, 200% or 250%. For most images, the recommended default is 150%.

If you are not using Graphic Maker software, consult your RIP software manual for limiting options.

If you do not have print time ink limit functions

You may have to reseparate your image for correct total ink coverage. This is not the optimal method as loss of colour fidelity and image quality problems can occur.

Keys to Successful Printing and Application

There are many keys to successful printing and application. The two most important keys for successfully printed media are total ink coverage and drying. The two most important keys for successfully using the inks are colour management and using software profiles. However, because of the variety of media used and the different operating conditions of each shop, follow all keys to achieve overall success.

1. **Discuss the project with the graphic designer and/or colour separator.**

   Make sure the designer and/or colour separator know the parameters and printing recommendations for both the media and press being used for each graphic.

2. **Discuss the project with the media applicator.**

   Work with the media applicator so you are both aware of any special handling or application techniques that may be needed for the selected media construction. Any combination of high total ink coverages, hot application temperatures, and irregular application surfaces may make applying the media more difficult

   Be aware that all 100 Micron films with an overlaminate may tent over rivets; this is true for all printing technologies.

3. **Select the right media for your type of graphic and application needs.**

   - Each media has specific intended uses and applications, which are described in the media's Product Bulletin.

   - Do not use rolls of media that are damaged; it can result in printer failure.

   - Condition the media for 24 hours in the same environment as the printer.

4. **Understand the unique processing characteristics needed for each media.**

   - *Specific Media Processing Recommendations* on page 5 are guidelines we have developed that help provide the best graphic results with the media you are using.

   - *An overlaminate or clear coat* is required for graphics subjected to abrasion such as road debris and automatic/power washing, harsh cleaners, or chemicals.

   - *Clear and translucent films for backlit signs require special consideration.* Clear films tend to be more sensitive to shrinkage due to high total ink coverage. Film that is not sufficiently dried prior to creating an overlap may shrink and result in a light leak. Rather than increasing the total ink coverage to increase the density of the backlit image, we recommend printing two layers of film

at lower ink levels. Refer to the appropriate instruction bulletin for the technique.

5. **Achieving maximum image quality requires good colour management and correct settings**

   a. **The operator must have excellent pre-press skills.**

      Good colour management practices are essential. For good colour output, colour separations must take into consideration the printer, the halftoning method and the ink series being used. You can use whatever method you are accustomed to that provides the desired printing results, which may include Photoshop®, high end scanners or ICC profiles.

   b. **Always use the correct software profiles.**

      Each printer/ink combination has a unique printer profile that helps ensure successful printing.

      ICC Profiles for the VUTEk printers are available at www.scotchprint.com. See *Information on the Web* on page 1.

   c. Use the printer settings discussed in **Specific Media Processing Conditions** on page 5.

6. **Limit the total ink coverage.**

   Refer to the "How to Manage the Total Physical Amount of Ink on Media" on page 3.

   Too much ink on the media results in media characteristic changes including shrinkage, loss of changeability, loss of positionability (Controltac *Plus* graphic films) and air release features (Controltac *Plus* graphic film with Comply performance), as well as inadequate drying, overlaminate lifting, difficult application and/or poor graphic performance.

7. **Don't take shortcuts when drying graphics.**

   Graphics that seem dry to the touch may still be saturated with solvent. This causes the graphic to become soft and stretchy and can affect the adhesion.

   If the graphics don't seem to be drying sufficiently in the printer, we recommend increasing drying time or drying temperature in the printer, or using an auxiliary dryer to complete the drying (2 hours @ 150°F should be sufficient), or air drying. Air drying may be significantly less effective than oven drying.

   Remember, reducing total ink coverage reduces solvents and therefore reduces drying time.

To check dryness, use the Dryness Test on page 8.

These are problems that may occur due to insufficient drying.

- If the media you are using is a Controltac *Plus* graphic film, the positionability feature will be significantly reduced if the film is not sufficiently dried.

- You may notice some problems, such as blocking or embossing, when the graphic is unrolled prior to application.

- An overlaminate may be difficult to apply.

Too high a drying temperature can distort the printing media, resulting in:

- Transport problems in the printer.

- Wrinkling when the printed graphic is overlaminated or premasked.

8. **Prepare test graphics.**

The default settings in the printer for drying temperature and time, and the preselected settings in the software for total ink coverage and linearization, may not be the optimum for the graphic that you are printing.

You'll save time and money if you print test graphics for each media type you use. Print the graphics at different printer settings, total ink coverage and drying times. We recommend starting your tests with the total ink coverage at 240% to 280%. Refer to **Specific Media Processing Recommendations**, below, for guidelines.

If the graphic is wound on a spindle or core during printing, check to see that the graphic does not emboss or block.

9. **Follow all operation and maintenance procedures recommended in the printer user's guide.**

Specific Media Processing Recommendations

The most commonly recommended printer setting is "Ultra Standard" because of its image quality. It has the added bonus of providing the longest dwell time in the dryer with the smallest amount of laydown per head pass.

Run the pre-heat temp very low (75° to 120°F / 24° to 49°C) so you get sufficient dot gain. Run the post-heat (dryer) at 130° to 160°F (55° to 71°C) to dry out as much solvent as possible and facilitate drying. The more solvent you can eliminate, the better the media performance.

Media	Total Ink Coverage (Maximum)	Lifting on Corrugations/ Tenting on Rivets	Other Considerations
IJ160-10	270%	Yes, fleet graphics	
IJ160C-10	270%		
IJ162	270%		Pay close attention to Key 7, page 4, and Key 4, page 4.
IJ180-10	270%		Pay close attention to Key 7, page 4.
IJ180C-10	270%		Pay close attention to Key 7, page 4.
IJ680-10	270%		
IJ680CR-10	270%		
IJ40-10/20/114	270%		
IJ20-10/20/114	270%		
IJ3630-20	270%		Pay close attention to Key 4, page 4.
3650B	270%		
6339	270%		Pay close attention to Key 4, page 4.

Continued on the next page

Note: For the full product names of the 3M products listed on this page, please see page 2.

Specific Media Processing Recommendations, *continued*

Media	Total Ink Coverage (Maximum)	Lifting on Corrugations/ Tenting on Rivets	Other Considerations
IJ8173	260%		Due to the perforations in this film, it is harder to match the colour density of a solid film. Pay close attention to Key 7, page 4.
			Higher total ink coverage increases drying issues; the film may lift from liner, stick to liner when rolled up, wrinkle when being overlaminated.
			Undried solvent can cause film to lift from substrate after application.
			If the printer carriage is striking the media due to edge curling, raise the printer carriage height.
			Pay close attention to the shipping recommendations in Product Bulletin IJ8171
8451 8453	300%		Banner material is susceptible to blocking or embossing when rolled, especially if the graphic is not totally dried.
Panagraphics II	Ink coverage is determined by whether the substrate will be used for a banner or backlit graphic. Backlit images require greater density, which may be achieved by using the printer's double strike input mode. When using this mode, you have exceeded the maximum total ink coverage when you can no longer obtain colour consistency throughout the graphic and/or the graphic cannot be adequately dried after printing.		

Using Overlaminates, Clear Coats and Application Tapes

Note: See the table on page 6 for an overview of film and overlaminate/clear coat recommendations as of the date of publication. Please refer to the film Product Bulletins for complete details.

When to Use an Overlaminate or Clear Coat

Refer to Instruction Bulletin 4.22, *Cold Roll Lamination,* for applying overlaminates.

Refer to Instruction Bulletin 3.11 for printing details on using clear coat 1920DR.

Refer to Instruction Bulletin 3.18 for printing details on using clear coat 2920DR.

Therefore, to protect the ink and graphics and receive the Warranted Durability, an overlaminate or clear coat is required when the graphic is used in such environments.

Graphics That Specifically Require An Overlaminate Or Clear Coat

- Graphics on the exterior of vehicles and railroad rolling stock
- Any graphics exposed to the abrasive or harsh environments mentioned above
- All graphics for floors

Graphics That Do Not Require Protection To Be Warranted

If the graphics are not exposed to the environments listed above, an overlaminate or clear coat is not required to receive the Warranted Durability. However, for graphics applied in high contact areas such as bus shelters, hallways, etc., using an overlaminate or clear coat will provide additional protection.

When to Use an Application Tape

The type of 3M application tape to use depends on the type of graphic produced.

- Use premasking tape if there is very little exposed liner.
- Use prespacing tape if graphics have large amounts of exposed liner or are kiss cut.

Refer to the table above for the appropriate application tape. Refer to the most current Instruction Bulletin 4.3 for more complete information on applying the recommended application tape.

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

Recommended Overlaminates, Clear Coats and Application Tapes

	Ink 1500	Films with Comply	Overlaminate or Clear Coat [1,2]							
			8519 8520	3645	8914i	1920	8936/ 8937	9720UV[1]	8912	8934/ 8935
Film										
IJ160-10	?		?			?		?		
IJ160C-10	?	?[2]	?[2]			?[2]		?[2]		
IJ162	?		?	?		?				
IJ180-10	?		?			?		?	?	
IJ180C-10	?	?[2]	?[2]			?[2]		?[2]	?	
IJ3630-20	?		?			?		?		
3650B 3650 3669	?		?			?		?		
IJ8173	?				?					
IJ20-10 IJ20-80 IJ20-114	?					?	?	?		
IJ40-10 IJ40-20 IJ40-114	?					?		?		?
IJ680-10	?		?[II]			?		?[II]		
IJ680CR-10	?	?[2]	?[2,II]			?		?[2]		
8645	?					?	?	?		
8451	?		?			?		?	?	
8453	?	Does not use an overlaminate								
Panagraphics II	?		?					?		
Application Tape										
Premasking Tape	SCPS-100	SCPS-55	SCPS-100	None	Do not use an application tape	SCPS-100	SCPS-100	SCPS-100	SCPS-100	
Prespacing Tape	SCPS-2	SCPS-55	SCPS-2	None		SCPS-2	SCPS2	SCPS-2	None	

[1] Clears 1920DR, 9720UV and 2920DR must be screen printed to be warranted.
[2] Films with Comply performance use only premasking tape SCPM-55.
[3] Do not use matte overlaminates on graphics made with reflective film.
[4] See **When to Use an Application Tape**, page 7.

Recommended Printers Settings

These settings provide a good starting point. Follow VUTEk UltraVu User's Guide for printer adjustments to achieve optimum output.

2360/3360 Printers with IR Heaters

	Starting Point	Typical Range
Pre-heat	30°C (90°F)	24-45°C (75-110°F)
Post-heat	40°C (110°F)	30-55°C (90-130°F)
IR heater	55°C (130°F)	50-65°C (120-150°F)

2360/3360 Printers without IR Heaters

	Starting Point	Typical Range
Pre-heat	40°C (110°F)	30-50°C (85-120°F)
Post-heat	60°C (140°F)	55-65°C (130-150°F)

Adjust the vacuum for optimum test 1 jetting. The setting is typically -0.24 to -0.29 psi for ink series 1500.

Weep cycles will help maintain open jets when not printing. The recommended settings are:

Weep interval	4 sec
Weep count	20
Spittoon count	1

Dryness Test

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

The conveyor times given in the previous section vary with the equipment being used, the amount of thinning, oven temperature, humidity conditions, etc. Insufficient drying can result in blocking or severe surface impression. Therefore, it is important to check for sufficient dryness when the printing starts. We recommend using the following procedures to determine if adequate drying has occurred.

1. This test is used to set the dryer conditions and approximate degree of dryness.

   a. Touch a printed sheet face to face.

   b. Place the touched area close to your ear and separate it.

   c. If the graphic is adequately dried, there is either a slight or no discernible sound when the surfaces separate. If the graphic is not sufficiently dry, a crackling sound is heard. The louder the sound, the greater the amount of additional drying needed.

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

   a. Place several printed sheets face-to-face under a 30 cm (12 inch) stack of film or under a weight of 135 gm/cm^2 (2 pounds/square inch).

   b. After 10 minutes, remove the sheets and check for blocking or surface impressions.

   c. If blocking or severe surface impressions are noted, increase the drying time. If you are jet drying, either increase the temperature or decrease the belt speed.

Graphic Maintenance and Cleaning

To clean a finished graphics, use a cleaner such as the kind used for high-quality painted surfaces. The cleaner must be wet, non-abrasive, without strong solvents and have a pH value between 3 and 11 (neither strongly acidic nor strongly alkaline.)

Printer Cleaning and Routine Printer Maintenance

Printer cleanliness is very important in the production of high quality, full Colour graphics. You must follow the routine maintenance schedule in the VUTEk UltraVu User's Guide, including the periodic changing of in-line filters.

We recommend that each customer assign a master operator that will have maintenance responsibilities. This person will be trained by a technician during printer installation and must use the recommended methods and safety measures.

You will need thinner CGS-15 for performing normal printer maintenance.

Shelf Life and Storage

Ink

- Store ink in the original packaging.
- Store the inks at 0° to 32° (C 32° to 90°F).
- Use the inks within one year of purchase.
- Ink series 1500 may be regulated for shipping. In the United States, the inks are not regulated for ground shipping. They are, however, regulated for air shipment and should not be shipped by air without proper documentation. Opened ink bottles (foil seal broken) no longer meet UN packaging guidelines and cannot be shipped by air without special UN-approved overpacking containers.

Finished Graphics

- Be sure the ink is dry before packaging the finished graphic.
- Ship the finished graphic lying flat or rolled. To roll, wrap the graphic, film-side out, onto a core that is 130 mm (5 inches) or larger in diameter. These methods help to prevent the liner from wrinkling or popping off.
- Put a slip sheet, such as 3M™ Release Liner SCW-33, on the face of the printed side of these types of graphics: a graphic that is premounted on panels, panels that have graphics on both sides, or a liner that is printed by a customer.
- Store the graphics in a clean, dry area.
- Store the graphics out of the direct sunlight and at a temperature less than 38°C (100°F).

Waste Disposal

Waste from the printer includes ink waste, printer blotting cloth, and plastic bottles. Please handle all waste in a responsible manner.

Warranty and Disclaimers

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.

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Visit our password-protected website (www.scotchprint.com, then Login) for exclusive product information, services and product promotions.

To register, login as above and click "Register" on the right side of the screen. Certain restrictions apply.

3M Related Literature

Before starting any job, be sure you have the most recent product and instruction bulletins.

Listed below is related 3M technical literature that may be of interest.

Subject	Bulletin No.
Product Bulletins	
3M™ Controltac™ *Plus* Film IJ160-10	IJ160-10
3M™ Controltac™ *Plus* Graphic Film with Comply™ Performance with Comply™ Performance IJ160C-10	IJ160C-10
3M™ Controltac™ *Plus* Film Series IJ162-10	IJ162-10
3M™ Controltac™ *Plus* Graphic Film IJ180-10	IJ180-10
3M™ Controltac™ *Plus* Graphic Film with Comply™ Performance IJ180C-10	IJ180C-10
3M™ Scotchlite™ *Plus* Flexible Reflective Graphic Film IJ680-10	IJ680-10
3M™ Scotchlite™ Removable Graphic Film with Comply™ Performance IJ680CR-10	IJ680CR-10
3M™ Scotchcal™ Graphic Film 3650b and 3669	3650
3M™ Scotchcal™ Translucent Film IJ3630-20	IJ3630-20
3M™ Scotchcal™ Perforated Window Graphic Film IJ 8173	IJ8173
3M™ Single-Sided Banner Material 8451	8451
3M™ Scotchcal™ Graphic Film IJ40-10	40
3M™ Scotchcal™ Graphic Film IJ40-10	40
3M™ Scotchcal™ Graphic Film IJ40-114	40
3M™ Scotchcal ™ Graphic Film IJ20-10	20
3M™ Scotchcal ™ Graphic Film IJ20-20	20
3M™ Scotchcal ™ Graphic Film IJ20-114	20
3M™ Scotchcal™ Opaque Graphic Film 8645 ES	8645
3M™ Mesh Banner Material 8453	8453
3M™ Panagraphics™ II Intermediate Flexible Substrate	Panagraphics
3M™ Scotchcal™ Luster Overlaminate 3645	3645
3M™ Scotchcal™ Luster Overlaminate 8934 ES	8934/8935
3M™ Scotchcal™ Matte Overlaminate 8935 ES	8934/8935
3M™ Scotchcal™ Luster Overlaminate 8936 ES	8936

Subject	Bulletin No.
3M™ Scotchcal™ Matte Overlaminate 8937 ES	8937
3M™ Scotchcal™ High Gloss Graffiti-Resistant Overlaminate 8912 ES	8912
3M™ Scotchcal™ Overlaminate 8519 and 8520	8519/8520
3M™ Scotchcal™ Optically Clear Overlaminate 8914i	8914I
3M™ Screen Printing Ink Series 1900	1900
3M™ Screen Printing Ink Series 9700UV	9700
Instruction Bulletins	
Design of graphics	2.1
Screen printing with line ink series 1900	3.11
Screen printing with line ink series 2900	3.18
Screen printing with ink series 9700 UV	3.4
Making digitally imaged, single and double-sided promotional banners	4.15
Cold roll lamination	4.22
Making backlit signs with piezo printed films	4.26
Application, substrate selection, preparation and substrate-specific application techniques	5.1
Application, special applications and vehicles	5.4
Application, general procedures for interior and exterior dry applications	5.5
Scoring and cutting	4.1
Using 3M application tapes; premasking and prespacing for films	4.3
Storage, handling, maintenance, removal	6.5

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UltraVu is a trademark of VUTEk Inc.

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.

Commercial Graphics Department
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