

Transportation Safety Division

Digital Imaging with HP Latex 360/365 Printers on 3M™ Reflective Sheeting Series 4000 and 3930

Information Folder 1.18
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1 Description

3M Diamond Grade™ DG³ Reflective Sheeting Series 4000 and 3M High Intensity Prismatic Reflective Sheeting Series 3930 are compatible with the HP Latex 360/365 printers in combination with HP 831/HP 871 Latex inks. This compatibility is backed with a [3M MCS™ Warranty](#) and [3M MCS Warranty for Traffic](#) when the printing guidelines in this document are followed and 3M ElectroCut™ Film 1170C Clear is applied over the finished graphics. See the “Limited Warranty” section of this document for more information on the MCS Warranties.

Traffic GREEN, Traffic BLUE, Traffic BROWN, Traffic RED, Traffic PURPLE, and Traffic BLACK can be printed on an HP 360/365 printer with HP 831/HP 871 Latex inks. When printed and laminated with 1170 Clear Overlamine following the guidelines below, these colors are backed by the [3M MCS Warranty for Traffic](#).

Non-regulated colors, also known as process colors or process color graphics, may also be printed on 3M High Intensity Prismatic Sheeting 3930 or 3M Diamond Grade DG³ Prismatic 4000. When printed and laminated with 1170 Clear Overlamine following the guidelines below, these colors are backed by the [3M MCS Warranty](#).

Table 1. Summary of Color and Retroreflectivity Specifications

Sheeting/ Overlay	Printed Colors	Characteristic	Specification
3M 3930 (White) / 1170C	Traffic BLUE	Daytime color	ASTM D4956 Table 11
	Traffic GREEN	Nighttime Color	ASTM D4956 Table 13
	Traffic BROWN	Luminance Factor	ASTM D4956 Table 2
	Traffic RED	Coefficients of Retroreflection (R _A)	70% of ASTM D4956 Table 5 (Type IV)
	Traffic PURPLE		
3M 4090 (White) / 1170C	Traffic BLUE	Daytime color	ASTM D4956 Table 11
	Traffic GREEN	Nighttime Color	ASTM D4956 Table 13
	Traffic BROWN	Luminance Factor	ASTM D4956 Table 2
	Traffic RED	Coefficients of Retroreflection (R _A)	70% of ASTM D4956 Table 10 (Type XI)
	Traffic PURPLE		
3M Series 3930 / 1170C 3M Series 4000 / 1170C 3M 3931 (Yellow) / 1170C 3M 3934 (Orange) / 1170C	Traffic BLACK	Opaque	
3M Series 3930 / 1170C 3M Series 4000 / 1170C	Process Colors	Non-regulated applications only.	

Note: For information on digital imaging with HP Latex 360/365 Printers on 3M reflective sheeting for rigid temporary traffic control signing applications, see [3M Information Folder 3.5](#).

2 Printing Guidelines

There are several steps to producing a regulated traffic sign on your HP Latex printer. Please follow them carefully as the most successful and durable signs are achieved when all of the following criteria are met.

2.1 Preparing to Print Traffic Colors

The Authorized 3M Traffic Edition of Flexi Production Manager and FlexiSIGN allows you to print the six traffic colors.

Note: 3M Traffic Preset must be used in the production manager for signs to be produced to meet the color and retroreflection specifications described above and to be covered by the 3M MCS Warranty for Traffic.

2.2 Selecting, Preparing, and Using 3M Retroreflective Sheeting

Do not use damaged rolls of sheeting, which can result in head strikes and printer damage. Condition the sheeting, ink, and overlaminate for 24 hours in the same environment as the printer before using.

2.3 Operation and Maintenance Procedures

Printer cleanliness is very important in the production of high quality signs and graphics. Follow all operation and maintenance procedures recommended by the printer manufacturer.

2.4 Printing Traffic Colors

In FlexiSign, make sure you have selected the correct traffic color swatches for areas of the sign to be printed with Traffic GREEN, Traffic BLUE, Traffic BROWN, Traffic RED, Traffic PURPLE, and Traffic BLACK.

The settings in the preset must be used to ensure proper traffic color output and **should not be altered for any reason:**

Table 2. 3M Traffic Colors Substrate Settings

Substrate Group	Substrate Name	Number of Passes	Ink Amount %	Optimizer Level %	Curing Temp °C	Curing Temp °F	Inter-Swath Delay Offset Milliseconds	Vacuum Setting
Self-Adhesive Vinyl	3M 3930_4000 Traffic Colors	12	150	4	107	225	200	80

2.5 Application of Overlamine

The printed image must be cured and dry before overlaminating with 3M ElectroCut™ Film 1170C Clear.

Lamination should be performed using a laminator that meets the following criteria:

1. Roll to roll, manual squeeze roll, or flat-bed laminator.
2. Between 48" and 65" wide.
3. Equipped with a pneumatically controlled nip (preferred but not required).
4. Equipped with rubber covered nip rolls capable of a minimum nip pressure of 7 pounds per lineal inch.
5. Equipped with rolls with Shore A durometer of 60 or higher (preferred but not required).

Follow the laminator manufacturer's instructions.

Note: If you see trapped air between ink and overlamine, consider increasing pressure and/or lowering lamination speed.

2.6 Environmental Specifications

Table 3. Use the Printer in a Climate-Controlled Room with the Following Conditions

Relative humidity range for best print quality	40–60% with 3M Series 4000/3930
Temperature range for best print quality	68–77°F with 3M Series 4000/3930

3 Durability

The durability of 3M reflective sheeting will depend upon substrate selection and preparation, compliance with recommended application procedures, geographic area, exposure conditions, and maintenance practices. Maximum durability can be expected in applications subject to vertical exposure on stationary objects, when processed and applied to aluminum prepared according to the 3M recommendations provided in [3M Information Folder 1.7](#). The user must determine the suitability of any nonmetallic sign backing for its intended use. Applications to unprimed, excessively rough, or non-weather-resistant surfaces and exposure to severe or unusual conditions can shorten the performance lifetimes of such applications. Signs in mountainous areas that are covered by snow for prolonged periods may also have reduced durabilities. Atmospheric conditions in certain geographic areas may result in reduced durability.

4 Storage

Completed signs must be protected with SCW 568 slipsheet paper and stored on edge. Placing the glossy side of the slipsheeting against the sign face, pad the face with closed cell packaging foam. Double-faced signs must have the glossy side of a piece of slipsheeting against each face of the sign. Unmounted processed faces must be stored flat and interleaved with SCW 568 slipsheeting, glossy sides against sign faces. Maximum stack height is five inches.

Avoid banding, crating, or stacking signs. Package for shipment in accordance with commercially accepted standards to prevent movement and chafing. Store sign packages indoors on edges.

For processing, storage, packaging, and cleaning information, please refer to [3M Information Folder 1.11](#).

5 Environmental, Health, and Safety

CAUTION: When handling any chemical products, read the manufacturers' container labels and the Safety Data Sheets (SDS) for important health, safety, and environmental information. To obtain SDS sheets for 3M products, go to 3M.com/SDS, contact 3M by mail, or in case of an urgent need, call 1-800-364-3577. HP SDS sheets can be found at the [HP website](#).

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

6 Disclaimer

With the exception of 3M branded products, 3M does not represent that any printer or printer accessory recommended in 3M literature will meet customer requirements, any federal, state, or local regulations, or any applicable safety standards. Such determination is the responsibility of the printer owner. For a buyer's convenience, 3M may provide engineering or technical information, recommendations, certifications, and other information or materials relating to other company's products ("Other Information"), but 3M does not warrant Other Information, including but not limited to, its accuracy or completeness.

7 Warranty Information

7.1 Limited Warranty

For warranty information, please refer to the [3M Digitally-Imaged Sign Warranty Bulletin](#), [3M MCS™ Warranty Matrix for HP Latex 360/365/370/375 Printers](#), and the [3M MCS Warranty for Traffic Matrix for HP Latex 360/365 Printers](#).

7.2 Limitations of Liability

EXCEPT WHERE PROHIBITED BY LAW, 3M WILL NOT BE LIABLE FOR ANY LOSS OR DAMAGE ARISING FROM THE 3M PRODUCT, WHETHER DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL, REGARDLESS OF THE LEGAL THEORY ASSERTED, INCLUDING WARRANTY, CONTRACT, NEGLIGENCE, OR STRICT LIABILITY.

8 Literature Reference

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

3M PB 3930	3M™ High Intensity Prismatic Digital Sheeting Series 3930
3M PB 4000	3M™ Diamond Grade™ DG ³ Reflective Sheeting Series 4000
3M PB 1170	3M™ ElectroCut™ Film Series 1170
3M IF 1.7	3M™ Reflective Sheeting Sign Base Surface Preparation
3M IF 1.11	3M™ Reflective Sheeting Sign Maintenance Management
3M IF 3.5	Imaging for Rigid Temporary Traffic Control Signing Applications

ASTM Test Methods are available from ASTM International, West Conshohoken, PA.

For Information or Assistance

Call: 1-800-553-1380

In Canada Call:

1-800-265-1840

Internet:

<http://www.3M.com/digital4traffic>

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