3M Process Color

Series 880I

Product Bulletin 880I **April 2011**

Replaces PB 880 dated July 2010

Description

3M™ Process Color Series 880I is designed as part of the matched component system for application by screen processing. 3M process color series 880I can be screen processed on both applied and unapplied 3M™ Engineer Grade Prismatic Reflective Sheeting Series 3430, 3M™ High Intensity Prismatic Reflective Sheeting Series 3930, 3M™ Diamond Grade™ VIP Reflective Sheeting Series 3990 and 3M™ Diamond Grade™ DG³ Reflective Sheeting Series 4000. Please reference the appropriate product bulletin. Application to other grades or types of sheetings or surfaces is not recommended.

Colors

Series 880I process color is intended for use in the production of traffic control signs. Signs made using these materials will have a similar appearance when viewed from a vehicle in daylight or at night.

The following 880I series process colors are applied by screen processing:

880I Toner	887I Brown
882I Traffic Sign Red	888I Green
883I Blue	891I Thinner
884I Yellow	893I Violet
885I Black (Opaque)	894I Lemon Yellow
886I Orange	895I Magenta

Series 880I process colors should not be blended with any other series process colors produced by 3M or any other manufacturer. 3M assumes no responsibility for premature failure of sign face legends that have been processed with non-3M process colors.

Screen Processing

1. Equipment and Set-up

Proper color and durability is achieved by using a high grade polyester, monofilament screen fabric mesh size P.E. 157. Other size screen fabric mesh sizes do not produce satisfactory color and durability and are not recommended. Screen processing should be accomplished using the off-contact screening method. Direct contact screen printing should not be used. Refer to Information Folder 1.8 for the proper techniques of off-contact screen processing. Be sure that screens, sheeting, plus screening and drying areas are dust, dirt, and lint free.

2. Coverage

Transparent process colors screened through a P.E. 157 screen fabric will cover approximately 1200 sq. ft. per gallon. Coverage will be affected by the extent of thinning, equipment used, and application procedure.

3. Mixing and Thinning

It is important that the colors and sheetings be brought to normal ambient room temperature and humidity of the screen processing area before processing. Thinning should not be necessary, except to replace solvents lost by evaporation during processing. Thin sparingly using 3M™ Thinner of the same series as the process colors. Do not use extenders, drying agents, or other materials as they will adversely affect performance life. Do not mix with any other series of process colors or clears produced by 3M or any other manufacturers. For detailed instructions, refer to Information Folder 1.8.

4. Clear Coating

3M™ Process Color Series 880I transparent or opaque colors **need not** be clear coated.

Edge Sealing

Edge sealing is not recommended.

Air Drying

Processed sheeting for air drying must be placed on open racks to allow adequate air circulation. High volume fans must be directed through the racks. Drying times will be increased by high humidity, low temperature, poor air circulation, heavy color coat, and excessive thinning. Addition of drying agents is not recommended. Sheeting processed with Series 880I colors must be air dried for a minimum of 3 hours per color.

Oven Drying

Processed sheeting for oven dried must be placed on open racks individually with sufficient open space for unobstructed air flow.

	Flow Out Time (1)	Bake Each Color (2)	Bake Final Color (2)	Oven Temp. (3)
Series 880I	10 min. (with fans)	30 min.	30 min.	105˚ ± 5˚F (41˚ ± 3˚C)

1. Before placing in the oven, rack individually to permit proper flow out of color.
2. Excessive baking can deaden adhesive.
3. Oven must provide horizontal air flow.

Conveyor Drying

Signs to be dried must be placed to allow unobstructed air flow. The conveyor speed must be able to be adjusted to meet the requirements for flow-out times and heat. Ifi mmediate packaging is planned, a cooling zone capable of cooling the sign faces to room temperature of 65˚-75˚F (18˚-24˚C) is needed. Typically, the cooling zone should be the same length as the heating zone. The temperatures stated are at the sign face and not the oven temperatures. (See Table 1).

Table 1

Series 880N		
Flow-Out Time	Between Colors	Final Color
30 seconds	2 minutes @ 185˚F (65˚C)	2 minutes @ 185˚F (65˚C)

Slipsheeting and Packaging

3M™ screen processed signs must be protected with SCW 568 Slipsheet Paper. Place the glossy side of the slipsheeting against the sign face and pad the face with closed cell packaging foam. Double faced signs must have the glossy side of the slipsheet against each face of the sign.

Unmounted screened faces must be stored flat and interleaved with SCW 568 slipsheet, glossy side against the sign face. Packages of finished sign faces must include sufficient nylon washers for mounting.

Storage

Series 880I process color should be stored at general warehouse storage (16ºC/60ºF to 27ºC/80ºF). The color has a shelf life of 12 months from customer receipt.

Troubleshooting Tips

The following troubleshooting tips are suggestions to minimize the potential for cracking of sheeting after screening with Series 880I process colors:

1. Screen applied sheets rather than unapplied sheets.
2. Use piggy-back box fans to provide air flow through entire drying rack. Have these fans running from the time the first sheet or sign is racked until 3 hours after the last sheet or sign is racked.
3. When drying unapplied sheets, use a smooth cardboard underliner on the drying rack shelves.
4. Avoid flexing sheeting when color is wet.
5. Avoid adding excessive thinner to the color.
6. Use every other shelf on drying racks.
7. Avoid use of solvents when cleaning sheeting prior to screening. If necessary, use a tack cloth to clean sheeting.

Environmental, Health and Safety Information

Read all health hazard, precautionary and first aid statements found in the Material Safety Data Sheet, and/or product label of chemicals prior to handling or use.

Consult federal, state and local air quality regulations that may regulate or restrict product use.

General Performance Considerations

3M process colors series 880I which is processed according to 3M recommendations can be expected to provide durability for traffic sign uses comparable to that of the 3M sheeting on which they are applied, with the following exceptions: Process Color 886I Orange processed on white reflective sheeting will provide 3 year durability; 894I Lemon Yellow and 895I Magenta will provide 5 year durability; 893I Violet and 887I Brown will provide 7 year durability. Durability will be substantially reduced by toning the colors.

The durability of sheeting or screen processed sheeting exposed in any position other than vertical or near vertical may be significantly reduced. The durability statements expressed herein do not apply for the use of sheeting for vehicle markings. Contact your 3M sales representative to clarify the durability of such applications. See sheeting product bulletins for specific warranty details.

Special Color Formulation Warranty Statement

3M has developed specific colors within 3M™ Process Color Series 880I that have been evaluated for their durability (in terms of retained translucency and resistance to fade) based on actual outdoor weathering. Customers who purchase specially blended colors from 3M or who blend these colors themselves can expect that the blended colors will last as long as the component colors would last individually. Many blended process colors will be durable for periods up to 10 years. However, since blended formulations often contain individual component colors that have differing expected durability, users will experience color shifts over time. More rapid color shift will occur with special colors that contain a higher percentage of shorter durability colors. In addition, toners significantly reduce durability. For these reasons, 3M cannot make a specific durability statement for any special colors.

Literature Reference

PB 3430	3M™ Engineer Grade Prismatic Reflective Sheeting Series 3430
PB 3930	3M™ High Intensity Prismatic Reflective Sheeting
PB 3990	3M™ Diamond Grade™ VIP Reflective Sheeting Series 3990
PB 4000	3M™ Diamond Grade™ DG^3 Reflective Sheeting
IF 1.4	Instructions for Operation of Interstate Squeeze Roll Applicator
IF 1.5	Hand Application Instructions for 3M™ Reflective Sheeting and
IF 1.6	Hand Squeeze Roll Applicators
IF 1.7	Sign Base Surface Preparation for 3M™ Reflective Sheeting Application
IF 1.8	Application of 3M™ Process Color 700, 800 and 990 on 3M™ Reflective Sheetings
IF 1.11	Reflective Sheeting Sign Maintenance Management

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