



Process Color

Series 880N

Product Bulletin 880N

January 2013

Replaces PB 880N dated July 2010

Description

3M™ Process Color Series 880N is designed as part of the matched component system for application by screen processing. 3M process color series 880N 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 4400. Please reference the appropriate product bulletin. Application to other grades or types of sheetings or surfaces is not recommended.

Colors

Signs made using these materials will have a similar appearance when viewed from a vehicle in daylight or at night. The following 880N series process colors are applied by screen processing:

880N Toner
882N Traffic Sign Red Process Color
883N Blue Process Color
884N Yellow Process Color
885N Black Process Color
886N Orange Process Color
887N Brown Process Color
888N Green Process Color
892 F low Additive
711N Thinner

Series 880N 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 screen fabric mesh sizes do not produce satisfactory color or 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. **Do not reclaim any unused ink that remains in the screen. Dispose of appropriately.**

3. Mixing

Process colors must be mixed prior to use. Shake for at least one minute by paint shaker or three minutes by hand. For best results, after shaking, mix mechanically for at least five minutes at 1000 - 2000 RPM with the equivalent of a 3 blade, 2 inch (5.1 cm) diameter propeller powered by an air-driven motor. Let stand for one hour. Cover as soon as possible after mixing and during use.

4. Thinning and Flow Additive

Series 880N process colors are formulated to be at screening viscosity directly out of the can. If a lower viscosity process color is needed for screening, there are two choices for thinners. 3M™ 711N thinner is a general purpose thinner that will work in most applications. 3M™ CGS-80 thinner/retarder is a more specialized thinner that will slightly increase drying times and should be used if drying in the screen is a problem.

Thinners should be added sparingly and only to a point that results in a good quality screened image. Over-thinning may result in screening errors such as non-wets, or “fish” eyes. A good general rule is to add thinner until the color lifted with the stationary propeller “piles” just slightly, on the surface as it flows back into the container

892 Flow Additive can be used to improve flow characteristics. Refer to Information Folder 1.8.

NOTE: If at all possible, the mixing and thinning should be done the night before and then just before screening, hand mix with a spatula.

CAUTION: Do not retard drying (use CGS-80) on unmounted sheeting in cold weather (< 30°F) or dry humidity (< 30 % RH), as cracking may occur. Use 3M™ 711N thinner ONLY in these conditions.

5. Clear Coating

Series 880N transparent or opaque colors need not be clear coated.

Edge Sealing

Edge sealing is not recommended.

Air Drying

Air drying is best done at temperatures of 60-100°F (15-38°C) and relative humidity of 20-50%. Drying rates may be slowed by high humidity, low temperature, poor air circulation, a too heavy coat of color, or excessive thinning. [Exhaust ventilation must also be provided in the screening or drying room to prevent a build up of solvent vapors which may affect drying or create a health or re hazard.] Addition of drying agents is not recommended since they adversely affect color adhesion and durability.

NOTE: If screen printed materials are not sufficiently dried, blocking, sticking or severe surface impressions of the screened images may occur when stored or packaged for shipment. If adequate drying is in question, the following steps are recommended to determine if the image has been sufficiently dried.

1. Press a dried screen printed area face to another dried screen printed face with moderate hand pressure.
2. Place the touched area close to your ear and separate by pulling apart. If the process color is dry, there will be a slightly discernible or no sound heard. If the color is not adequately dried a crackling sound will be heard. The louder the sound the more additional drying will be required.

It is imperative that the newly processed sheets be placed on racks with adequate air flow (approximately 125 lin. ft./min. minimum) through the racks while they are being filled, so as to rapidly remove any exhaust solvents. Follow these procedures:

1. Signs should be racked with unobstructed space for air flow between layers.
2. Fans should be placed 4-6 ft. in front of and air directed through all parts of the racks with horizontal air flow between the layers. Two fans per rack are required for most commercial racks.
3. Racks should not be placed in a corner or near a wall where the air flow or exhaust is restricted.

Minimum Dry Times

Between Colors 2 hrs.

Before Packaging 3 hrs.

Oven Drying

Processed sheeting must be racked individually with sufficient unobstructed air flow space between layers and at the end of rack. Ovens must be designed to provide adequate horizontal air flow through the oven (125 lin. ft./min. minimum). The freshly screened processed sign must be allowed to flow-out (air dry with fans) before it is placed in the oven. (See Table 1).

Table 1

Diamond Grade™ and 3M™ High Intensity Grade Sheeting				
	Flow-Out Times (1)	Bake Each Color (2)	Bake Final Color (2)	Oven Temp
880N Series	10 min.	30 min.	30 min.	105°+ 5°F (41° + 3°C)
1. Before placing in oven, rack individually to permit flow-out of color.				
2. Excessive baking can deaden adhesive.				
3. Oven must be provided with horizontal air flow of adequate volume.				

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. If immediate 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 2).

Table 2

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

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 at and interleaved with SCW 568 slipsheet, glossy side against the sign face. Packages of finished sign faces must include sufficient nylon washers for mounting. Avoid banding, crating, or stacking signs. Package for shipment in accordance with commercially accepted standards to prevent movement and Store sign packages indoors on edge.

Panels or finished signs must remain dry during shipment and storage. If packaged signs become wet, unpack immediately and allow signs to dry. See Information Folder 1.11 for instructions on packing for storage and shipment.

Storage

3M™ Process Color Series 880N should be stored at general warehouse storage (16°C/60°F to 27°C/80°F). The color has a shelf life of 12 months from customer receipt.

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 color series 880N which is processed according to 3M recommendations can be expected to provide durability for traffic sign uses comparable to that of 3M sheeting on which they are applied.

Application to other grades or types of sheeting or surfaces is not recommended. Please reference the appropriate product bulletin.

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.

3M Literature Reference

PB 3430	3M™ Engineer Grade Prismatic Reflective Sheeting Series 3430
PB 3930	3M™ High Intensity Prismatic Reflective Sheeting Series 3930
PB 4000	3M™ Diamond Grade™ DG ³ Reflective Sheeting Series 4000
PB 3990	3M™ Diamond Grade™ VIP Reflective Sheeting Series 3990
IF 1.4	Instructions for Operation of Interstate Squeeze Roll Applicator
IF 1.5	Hand Application Instructions for 3M™ Reflective Sheeting and Scotchcal™ Films with Pressure-Sensitive Adhesive
IF 1.7	Sign Base Surface Preparation for 3M™ Reflective Sheeting Application
IF 1.8	Application of 3M™ Process Color 700, 880 and 990 on 3M™ Reflective Sheatings
IF 1.11	Sign Maintenance Management for 3M™ Reflective Sheeting

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