3M™ Process Colour Series 880I

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.

Product Description

3M Process Colour Series 880I is designed as part of the 3M™ MCS™ (Matched Component System) for screen printing onto both applied and unapplied 3M™ High Intensity Grade Sheeting Series 3860, 3870 and 5870 or 3M™ Diamond Grade™ Sheeting Series 3970 and 3990. Please reference the appropriate Product Bulletin. Application to other grades or types of sheetings or surfaces is not recommended.

Colours

Series 880I is transparent screen printing colours which are used in the production of signs and graphics made with 3M High Intensity or Diamond Grade sheetings. Signs made using these materials will have a similar appearance when viewed from a vehicle in daylight or at night. Series 880I inks are available in the following colours:

880I	Toner	885I	Black (Opaque)
882I	Traffic Sign Red	888I	Interstate Green
883I	Blue	889I	Thinner
884I	Yellow		

Series 880I process colours should not be blended with any other series process colours produced by 3M or any other manufacturer. 3M assume no responsibility for premature failure of printed areas that have been processes with non-3M inks.

Storage of Inks

Series 880I should be stored in the recommended ambient conditions, 18°C to 28°C and 30% to 60% relative humidity, for 24 hours before use. This is particularly important for newly delivered stocks, which may have been maintained at lower temperatures during transit.

Screen Processing

Equipment and Set-up

High grade polyester, monofilament screen fabric mesh size 61T or 62T is recommended to produce the correct colour and durability printing for traffic signs use.

The use of screen mesh fabric sizes other than those recommended will affect colour and durability. Off-contact screening method should be used. Be sure that print screens, sheetings and screening and drying areas are dust, dirt and lint free.

Screen Frame

Use a rigid metal (aluminium or steel) frame large enough to provide a 15-25cm well between the frame and the open design area. The screen fabric must be tightly and uniformly stretched and fastened on to the frame.

Squeegee

Use a sharp rubber or plastic blade of 65 shore hardness of rectangular shape without nicks or grooves, which is resistant to all thinners and solvents used. The length must overlay the print size by at least 5cm on both sides.

Stencil

Use only water soluble stencil films or direct emulsion stencil materials that are resistant to all solvents and thinners used.

Ink Preparation

It is important that the inks and sheetings be at the recommended ambient room temperature and humidity prior to printing.

All Series 880I colours are ready to screen direct from the container. Thinning is not recommended except to replace solvent lost during screening. If necessary, use 891I thinner not exceeding 10% by volume.

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 colours or clears produced by 3M or any other manufacturer.

Clear Coating

3M™ Process Colour Series 880I transparent or opaque colours **need not** be clear coated for static vertically mounted traffic signs.

NOTE: For vehicle applications, screen processed sheeting must be clear coated using 880I toner.

Coverage

Transparent process colours screened through a 61T/62T screen fabric will cover approximately 1200 Sq. ft per gallon. Coverage will be affected by the extent of thinning, equipment used, and application procedure.

Drying Colours

Air Drying

1. Signs must be racked with at least 5cm of unobstructed space for air flow between layers
2. Adequate air velocity (minimum 0.5m/s through the rack) *must* be provided by using high volume fans placed 4-6ft in front of and directed through all parts of the racks with horizontal air flow between layers. Two or three fans per rack are normally required depending on rack and fan size.
3. Racks should not be placed in a corner or near a wall where the air flow or exhaust is restricted.
4. Adequate air extraction of solvents is essential to prevent a build up of solvent vapours which may effect drying or create a health or fire hazard

Air Drying Times

First and consecutive colours	3 hours
Final colour or clear coat	5 hours

NOTE:- High humidity, low temperature, poor air circulation, too heavy coat of ink or excessive thinning may increase air drying times.

Conveyor Oven Drying (Tunnel Drying)

Series 880I inks may be dried using conveyor oven drying. A minimum tunnel drying length of 10 metres (including cooling section) is essential. Printed faces must not be stacked until completely cool.

Conveyor Drying Times

Flow out time	1 minute
Conveyor speed	3 metres / minute
Residual time	3 minutes at 55^0C

Note: Drying parameters may vary according to equipment

Batch Ovens

Flow out time	10 minutes (with fans)
Bake each colour	30 minutes
Bake final colour	30 minutes
Oven temperature	$41^o \pm 3^o$C

1. Excessive baking can deaden adhesive
2. Oven must provide horizontal air flow

Slipsheeting and Packaging

Mounted screen printed signs must be protected with SCW-568 or SCW-82 slipsheet and foam padding. Place the glossy side of the slipsheet against the sign face and pad the sign with closed cell packaging foam. Double-faced signs must have the glossy side of the slipsheet against each side of the sign.

Unmounted screen printed faces of High Intensity Grade sheeting series 3860 and 870 and Diamond Grade sheeting series 3970 and 3990 should be protected by slipsheeting with SCW-568 or SCW-82 glossy side against the sign face and stored horizontally.

General Performance Considerations

3M Series 880I inks which are processed according to 3M recommendations can be expected to provide durability for traffic sign uses comparable to that of the High Intensity Grade or Diamond grade sheeting on which they are printed.

Toning the colours will substantially reduce their durability.

The durability of printed and unprinted sheeting exposed in any position other than vertical may be significantly reduced. The durability statements expressed herein do not apply for the use of High Intensity or Diamond Grade sheeting for vehicle applications. Contact your 3M sales representative to clarify the durability of such applications. See sheeting product bulletins for specific warranty details.

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TROUBLE SHOOTING

Condition	Possible Cause	Corrective Steps
1. Incomplete coverage of colours (spots where colour does not flow out properly, non-wets and fish eyes)	1. Need addition of thinner	1. Thin as directed in text and mix
	2. Contamination	1. Be sure that all equipment, sheeting, inks and printing areas are free of contaminants. 2. Avoid masking out open screen area with pressure sensitive tape. Squeegee action will often pull bits of tape adhesive or release coating into image area causing spotting. 3. If shop is using any of the temporary films with soft, oozy adhesive, check cutting, jogging and printing areas closely for evidence of adhesive transfer. This type of adhesive transfers very easily to cutting and screening equipment and is a common cause of spotting. 4. Avoid use of silicone release agents, silicone hand creams, silicone lubricants, etc in shop. 5. Keep printing and stock conditioning area separate from any equipment using large amount of lubricant (eg. Vacuum applicators, which use oil). 6. Use new wiping rags where possible. If reuse is desirable have them laundered separately from other rags and clothing. Relaundered rags used by other industries may often retain some silicone or oil contaminants. .1 Ensure that colour and thinner are thoroughly mixed and strained. Mix with a high speed mixer. .2 Avoid touching sheets in the area to be printed. Handle sheets only in waste edge area. It may be helpful to wear clean cotton gloves during sheeting, cutting or handling operations. .3 Tack rag each sheet lightly just before screening. .4 If non-wetting still appears, it can be reduced or eliminated by wiping each sheet with clean rags dampened with appropriate Thinner or VM&P Naphtha. Dry the sheet by wiping with a clean rag before printing. .5 If signs are screened after application, this can cause severe non-wetting. .6 Use colour at higher viscosity .7 Warm sheeting above dew point to avoid condensation.
Note: The source of colour spotting (non-wetting) is difficult to pinpoint in any given instance, since there are many potential causes. Essentially this problem occurs due to some contaminant – finger oils, lubricants, airborne oil or soap particles, protective hand cream, silicones, and residue from incompletely cleaned wiping rags, etc on the sheeting surface or in the colour. The colour pulls away from such contaminated areas, leaving open spots. In general, transparent colours are more subject to this condition than opaques. The listed recommendations should help minimise occurrence of this condition		
.	3. Highly toned and/or certain dark colour formulations may be more susceptible to non-wetting.	1. If corrective steps above do not eliminate problem, contact 3M Technical Service.
2. Ink drying in screen	1. Colour too thick	1. Remove ink and add fresh colour as necessary 2. Sparingly add 889I Thinner
3. Colour bubbling	1. Colour too thick 2. Squeegee pass is too fast	1. As 1 and 2 above 3. Make a slow uniform impression pass

Important Notice To Purchaser

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Except as set out above, all warranties and conditions, whether expressed or implied, statutory or otherwise are excluded to the fullest extent permissible at law.

Technical Assistance

For help on specific questions relating to 3M Traffic Safety Systems Division Products, contact your local Technical Service Representative.

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