



Screen Printing using Transparent Line Inks: 3M™ Scotchlite™ Screen Printing Ink Series 1900

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.

Description

3M™ Scotchlite™ Transparent Screen Printing Inks Series 1900 is used on 3M™ Scotchlite™ Plus Curtain Sided Vehicle Sheeting Series 780 Film in the fabrication of attractive graphics, emblems, and logos. These inks have good weather resistance and excellent colour retention.

These inks may be dried in a conveyor dryer or oven dried.

Stock Preparation

Conditioning of Stock

For best results, sheets should be allowed to stabilise under shop humidity and temperature conditions before a run is started. Any significant variation between storage and shop area conditions or in shop conditions between start and finish of a printing run may cause sheets to curl or the printing to go out of register.

Stacking of cut sheets should be avoided even when shop humidity is controlled because stack pressure causes uneven humidity absorption or loss with resultant waving or curling of the sheets' edges. Racking of the sheets individually, liner side up, overnight in the shop will tend to stabilise them. It is important during this conditioning that the sheets be supported and kept flat over their entire length and width. Do not rack sheets face to face.

Proper stock conditioning is especially important where hairline registry or multiple coloured markings are to be produced.

Sheet Cutting

If possible, all sheets which are to be screen printed should be cut from the roll in the same direction.

Generally, a good rule to follow is to cut sheets with the longest dimension parallel to the printing on the liner.

Series 1900 Transparent Line Inks

- 1910 Gloss toner/reducer
- 1920DR Clear
- 1973 Orange
- 1974 Green
- 1975 Red
- 1976 Blue
- 1977 Magenta
- 1981 Black
- 1982 Yellow
- 1983 Brown
- 1985 Maroon
- 1986 Cyan
- 1987 Blue-violet
- 1989 Lemon Yellow

Clears, Thinners, Sheeting, Premask/Prespace

Overprint Clear Thinners	1920DR CGS-30 Thinner for Inks & Clear CGS-50 Slow Thinner for Inks & Clear CGS-80 Very Slow Thinner for Inks & Clear
Sheeting	3M™ Scotchlite™ Plus Curtain Sided Vehicle Sheeting Series 780
Premask Prespace	SCPM-19

NOTE: The higher the CGS number, the slower the evaporation rate.

Mixing Line Inks

It is recommended that inks be mixed on a high speed power mixer. They should be thinned as necessary and then mixed for another five minutes before using.

Storage

Ink, toners, and clears should be stored between 21°C (70°F) and 32°C (90°F) and used within one year from the date of purchase.

Coverage

The coverage of thinned inks will vary with the screen mesh used; however, coverage of 22 - 30m² per litre (900-1200 ft²/gallon) can be expected. Coverage of overprint clear will be approximately 60m² per litre (2400 ft²/gallon) when printed through a 90t/cm (230 tpi) screen.

Toning of Inks

Colours may be toned using toner 1910. Toner 1910 should not exceed 50% by weight of the total mixture. The use of overprint clear 1920DR as a toner is not recommended.

Blending of Inks

Blending Scotchlite™ Transparent Inks with Scotchcal 1900 series inks is not recommended.

Metallic Pastes

The Series 1900 Metallic Pastes are not intended for use on reflective sheeting.

Screen Printing

Screen Fabric

90t/cm (230 tpi) Direct, indirect or capillary stencil systems recommended for solvent based inks.

A screen mesh finer than 90t/cm (230 tpi) will render less colour saturation than a coarser mesh and may result in a significant reduction of durability.

Screen Frame

Use a metal frame which is large enough to provide a 15 to 25cm (6 to 10 inch) well between the frame and the open design area. The screen fabric must be tightly and uniformly stretched and fastened onto the frame.

Stencil

Any type of stencil film or photostencil material may be used which resists ketones and strong lacquer solvents.

Squeegee

Use a sharp, medium to hard urethane or RKS type squeegee. It should be long enough to completely cover the width of the area being printed with a 5cm (2 inch) or greater overlap on each end.

Screen Printing Method

To get a uniform impression, the "off-contact" method of screen printing is recommended.

Position the reflective sheeting under the stencil and hold in place by vacuum. Do not use aerosol adhesives or non-wetting of the ink may result.

Prior to screen printing, remove any dust or foreign matter from the fabric and stencil screen and from

each piece of film with a "Tack Rag" (varnish impregnated cloth).

Screen Wash-up

Use a commercially available lacquer thinner. A suitable substitute may be formulated by blending xylo, ketones (MEK, MIBK or a mixture) and VM&P Naphta.



CAUTION: When using solvents, follow all manufacturer's instructions and review and follow all health and safety information. Refer to container labels and MSDS's for health, safety and handling instructions.

Screen Opener

Should the screen become clogged or dried with ink, the screen can be reopened by washing using 3MTM Scotchcal™ Thinner CGS-80. Do not use any spray/ aerosol "screen openers".

Ink Drying Conditions

Dryness Test

The conveyor times given below will 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 printing starts. It is recommended that the following procedure be followed to determine if adequate drying has occurred.

- a) Take several printed sheets and place them face-to-face, under a 30cm (12 inch) stack of film or under a weight of 135 g/sq cm (2 lb/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, additional drying is required. If jet drying, either the temperature should be increased or the belt speed decreased.

Suggested Drying Conditions

Conveyor Drying: Dry ink series 1900 for a minimum of 30-40 seconds at 60-70 degrees C (140-160 degrees F). Use temperature strips and check the conveyor from side to side.

Markings should be checked for dryness following the procedure outlined above.

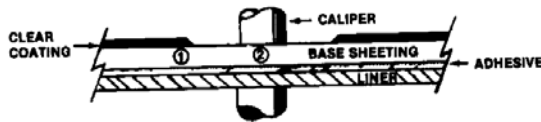
Overprint Clear Preparation

Thickness

In order to obtain the stated durability, the overprint clear thickness after drying must be a minimum of 0.006mm (0.00024 inches) on the printed areas.

Test for thickness as follows using a Micrometric gauge.

1. Apply pressure-sensitive masking tape down the entire length of the film in the centre. Apply over-print clear, remove tape and dry thoroughly.
2. Measure thickness of overprint clear by reading calliper at point (1) adjacent to taped area and then at taped area, point (2) on base material.



3. The difference between these two readings will be the dry thickness of the overprint clear coating.

Application of Overprint Clear

To obtain the overprint clear thickness required above, the following procedure must be followed:

Screen Printing

Screen print the thinned overprint clear through a 80t/cm (200 tpi) mesh or coarser using a flood or fill pass, followed by an impression pass.

Screen Printing	1920DR
Clear Gloss	
Thinner	CGS-30, CGS-50 (add about 1 part to 5 parts Clear by volume)
Viscosity	500-800 Centipoise (about 30 seconds in a #5 Zahn Cup).

Overprint Clear Drying Conditions

Conveyor Drying: Dry overprint clear for a minimum of 30-40 seconds at 60-70 degrees C (140-160 degrees F). Use temperature strips and check the conveyor from side to side.

The same variables that affect drying of the ink also apply to the overprint clear. Insufficient drying will result in blocking or severe surface impressions. Check for sufficient dryness of the clear using the tests for dryness outlined under Ink Drying Conditions Dryness Test.

If markings are to be premasked, several sheets should be premasked and tested using the procedure described under Ink Drying Conditions Dryness Test.

Premasking/Prespacing

After markings are thoroughly dry they should be pre-masked with 3MTM Scotchlite™ Premask Tape SCPM-19. Refer to Instruction Bulletin 4.3 (Commercial Graphics) for detailed information.

Packaging

The inks and the overprint clear must be completely dry before packaging. It is not necessary to slip-sheet printed markings for packaging unless the protective liner has been imprinted. When slip sheeting is necessary, use 3MTM Release Liner SCW33.

Storage of Printed Film

Fabricated markings must be stored flat or on a core with a diameter of at least 8cm (3 inches), wound film-side out and in a clean area free from excessive moisture and direct sunlight, with ambient temperatures of 38 °C (100 °F) or less. Markings may be stored up to one year prior to use.

If hairline registry is required in one direction, and where sheet size permits, sheets should be cut so that the critical dimension is parallel to the liner printing.

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Important Notice to Purchaser

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