## Product Description

- Line Color and Four Color Screen Printing
- High performance, ultraviolet-curable ink system
- Includes transparent, opaque and four-color process inks
- Includes clear protective layer 3M™ Screen Print UV Gloss Clear 9800CL

## Product Features

- When protected with selected 3M liquid clear coats, this ink:
  - provides a tough, flexible graphic coating versus other UV inks.
  - is weather, chemical and abrasion-resistant.
- Superior performance on difficult application surfaces, including corrugations and rivets
- Metallic and pearlescents offered in line color inks

## Recommended Types of Graphics and End Uses

- For printing multicolor graphics on a wide variety of 3M graphic films
- For indoor and outdoor graphics
- For graphics used in a petroleum environment where staining is not a concern

(i) **IMPORTANT NOTE**

Not recommended for use on transit-mix cement trucks or other vehicles frequently washed with concentrated, strong acids or aluminum brighteners.

Not recommended for graphics made of multiple layers of inks and clear that must be stretched during installation. Please contact us to discuss other options.

(i) **IMPORTANT NOTE**

Pigments in 3M™ Four Color Screen Printing UV Ink Series 9800 may be slightly different from those in 3M™ Four Color Screen Printing Ink Series 1900. Adjustments may be needed in four color separation.

When constructed and used as described in this Bulletin, these types of graphics and end uses may be warranted by the 3M™ MCS™ Warranty. Please read the entire Bulletin for details.

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## Product Line

### Line Color Opaque Inks

| 9802 | Opaque Black | 9830 | Orange |
|------|------|------|------|
| 9803 | Mixing Black | 9837 | Red Shade Yellow |
| 9806 | Mixing White | 9843 | Medium Yellow |
| 9808 | Opaque White | 9849 | Lemon Yellow |
| 9812 | Magenta | 9861 | Light Green |
| 9813 | Red Violet | 9879 | Green Shade Blue |
| 9826 | Brick Red | 9891 | Blue Violet |
| 9827 | Red | | |

### Line Color Transparent Inks

| 9825 | Blue Shade Red | 9848 | Yellow |
|------|------|------|------|
| 9828 | Yellow Shade Red | 9864 | Blue Shade Green |
| 9831 | Orange | 9882 | Red Shade Green |
| 9840 | Medium Yellow | | |

(i) **IMPORTANT NOTE**

Custom blended colors are available. Contact a 3M Commercial Solutions sales representative or customer service representative for more information.

### Process Colors

| 9808P | Black |
|------|------|
| 9815P | Magenta |
| 9845P | Yellow |
| 9875P | Cyan |

### Clears

| 9800CL | Gloss |
|------|------|
| 9740i | Gloss |
| 9730UV | Matte |

### Other Products

| 9800B | Halftone Base |
|------|------|
| 9800HBB | Heavy Body Halftone Base |
| 9801 | Thinner |
| 9810 | Toner |

## Recommended Compatible Products

Always refer to the most current Product Bulletin at www.3Mgraphics.com/TechInfo for the 3M films you are using for complete details, including ink compatibility and specific recommendations.

### Graphic Materials

Ink series 9800 is compatible with most of 3M's Scotchcal, Controltac and Scotchlite branded graphic films that are designed for screen printing.

### Graphic Protection

- 3M™ Screen Print UV Gloss Clear 9800CL
- 3M™ Screen Print UV Gloss Clear 9740i
- 3M™ Screen Print Low Gloss Clear 9730UV

### Application Tapes

See 3M Instruction Bulletin AT-1 to determine what application tape is recommend for your film or finished graphic.

## Warranty Information

### Warranty Coverage Overview

The warranty coverage for eligible graphics is based on the user both reading and following all applicable and current 3M Graphics Product and Instruction Bulletins. The warranty period for eligible graphics is as stated in the 3M Graphics Warranties Matrices at the time that the film was purchased. Information found at 3Mgraphics.com/warranties includes:

- 3M Graphics Warranties Bulletin
  - This bulletin contains information on limitations and exceptions, and warranty period reductions for 3M Graphics Warranties.The warranty period may be reduced and stipulations may apply for certain constructions and applications, as covered in this Bulletin.
- 3M Graphics Warranties Selector
  - Use this selector to search for your warranty period by product number, ink type, and ink/printer platform.
- U.S. Desert Southwest Region Map
  - Use this map of hot, arid desert areas to determine if you are subject to reduced warranted durabilities.

The warranties set forth in this Bulletin are made in lieu of all other express or implied warranties, including any implied warranty of merchantability, fitness for a particular purpose, or arising out of a course of dealing, custom, or usage of trade.

### 3M Basic Product Warranty

3M Graphics Products are warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in its applicable 3M Graphics Product Bulletin and as further set forth in the 3M Graphics Warranties Bulletin.

### Limited Remedy

The limited remedy applicable to each warranty is addressed in the 3M Graphics Warranties Bulletin found at 3MGraphics.com/warranties.

### Limitation of Liability

Except to the extent prohibited by law, 3M SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO PURCHASER OR USER FOR ANY DIRECT (EXCEPT FOR THE LIMITED REMEDY PROVIDED HEREIN), INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, LABOR, NON-3M MATERIAL CHARGES, LOSS OF PROFITS, REVENUE, BUSINESS, OPPORTUNITY, OR GOODWILL) RESULTING FROM OR IN ANY WAY RELATED TO 3M'S GRAPHICS PRODUCTS, SERVICES, OR THIS BULLETIN. This limitation of liability applies regardless of the legal or equitable theory under which such losses or damages are sought.

### Warranty Period Matrices

See the 3M Graphics Warranties Matrices at 3MGraphics.com/warranties, for warranty period information specific to your film.

### Additional Limitations

See the 3M Graphics Warranties Bulletin at 3MGraphics.com/warranties, for terms, additional limitations of your warranty, if any, information on reduced warranties for different exposures, and limitations of liability.

### Graphics Exposed to Abrasion or Staining

Graphics are not warranted against fading, cracking, peeling, lifting or discoloration due to severe abrasion or staining from cleaning solutions, engine fuels, exhaust, or organic solvents.

### Color Matching Ink to Film

If the color of a printed ink is matched to the color of a pigmented film, the finished ink and film may not maintain the same color or gloss after being exposed outdoors.

### Processing Conditions

Processing conditions can affect the durability of the ink. Carefully follow all instructions in 3M Instruction Bulletins 3.20 and 3M Instruction Bulletin 3.21.

## 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, or by mail or in case of an emergency, call 1-800-364-3577 or 1-651-737-6501.

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

### Ventilation

Provide local and/or general exhaust ventilation in the print production areas to prevent a build up of ink vapors and to maintain levels below the limit for worker exposure. An experienced industrial ventilation engineer and/or a certified industrial hygienist can help evaluate your ventilation requirements and design based on your onsite process conditions.

Please refer to the printer manufacturer's literature for additional details and requirements.

### Air Quality Regulations

State Volatile Organic Compound (VOC) regulations may prohibit the use of certain chemicals with VOC's in graphic arts coatings and printing operations. For example, the California South Coast Air Quality Management District prohibits use of certain solvent-based solutions without a permit and other California AQMD's prohibit use of certain solutions without a permit or regulatory exemption. Check with your State environmental authorities to determine whether use of this solution may be restricted or prohibited.

### More on Environmental Health and Safety

Additional environmental, health, and safety information is available on our website at 3Mgraphics.com/sustainability.

## Graphic Performance Life

The actual performance life of a graphic is affected by all of the following. Additional performance considerations may be provided in the base film Product Bulletin.

- A protective liquid clear coat is required for graphics printed with ink series 9800.
- Formulations containing 3M screen printing ink series 9800 with Scotchlite ink series 2900 void the warranty.
- If the color of a printed ink is matched to the color of a pigmented film, the finished ink and film may not maintain the same color or gloss after being exposed outdoors.

### Scotchlite Reflective Graphic Film

Close color matching of multi-sheet graphics is difficult on retroreflective materials because production lots may vary. Adjoining panels of Scotchlite reflective graphic films must be checked for both daytime and nighttime appearance.

Follow the recommendations in 3M Instruction Bulletin 2.1 to minimize within-lot and crossweb variation. Reflective films 680-10 and 680CR-10 are available already color matched.

For these films to maintain reflectivity, only transparent inks should be used. Black and white inks are opaque. Using opaque inks like these in a formulation will reduce their transparency and prevent them from reflecting light.

## Sheet Preparation

### Liner Printing

- Polyethylene-coated paper liner; this type of liner cannot be printed.
- Kraft paper liner: this type of liner can be printed. Print the liner before screen printing the graphic. Use a fast drying lacquer or a fast drying halftone black screen printing ink for paper.

## Ink and Screen Print Clear Preparation and Coverage

### Mixing Ink Series 9800

- Line color inks and clear 9800CL are supplied press ready and do not need to be combined with other components.
- Four color inks require the addition of halftone base to obtain the desired density.

### Coverage for Line Color Inks and Clear 9800CL

- Typically, one U.S. gallon (3.8 liter) of the line color inks or clear 9800CL covers 2500 to 3500 square feet (59 to 83 square meter/liter).

### Coverage for Four Color Inks

- Typically, with a PE390 plain weave mesh, one U.S. gallon (3.8 liter) of press-ready ink covers 8000 square feet (193.6 square m/l) at 50% dot. Adjust the quantities based on your requirements.

## Screen Printing

See 3M Instruction Bulletin 3.20 and 3M Instruction Bulletin 3.21 for details.

## Roller Coating

Use of roller coating is not recommended or warranted by 3M.

## Curing Methods

Refer to the 3M Instruction Bulletins 3.20 and 3M Instruction Bulletins 3.21 for more complete information.

### Focused-lamp Cure Unit Specifications

Ink series 9800 is formulated to cure when exposed to a focused, medium-pressure, mercury-vapor lamp at a belt speed to achieve:

- 200-275 mJ/square cm and a minimum of 600 mW/square cm for line and four color inks
- 250-325 mJ/square cm and a minimum of 600 mW/square cm for clear 9800CL

(i) IMPORTANT NOTE

We recommend measuring the UVA spectrum using a Uvicure™ Plus UVA/High Power model radiometer and the UVC spectrum using a Powerpuck, which are available from: EIT Corporation, 108 Carpenter Drive, Sterling, VA 20164, Telephone: 703-478-0700

## Testing

Complete testing information is found in the 3M Instruction Bulletins listed throughout this Bulletin and in the section "Application and Installation" on page 6.

## Application and Installation

In addition to other 3M Bulletins specified in this document, the following Bulletins provide details that you may need to successfully apply a graphic.

- 3M Instruction Bulletin 4.1. Sheeting, Scoring and Film Cutting.
- 3M Instruction Bulletin 5.1. Select and Prepare Substrates for Graphic Application
- 3M Instruction Bulletin 5.36. Application Techniques for Automobiles, Vans and Buses. Complete the 3M Pre-Installation Inspection Record found in this Instruction Bulletin prior to manufacturing or applying a graphic to an automobile, van, or bus.
- 3M Instruction Bulletin 5.4. Application, Fleet Trucks.
- 3M Instruction Bulletin 5.45. Application Techniques for Railcars.
- 3M Instruction Bulletin 6.5. Storage, Handling, Maintenance, and Removal of Films and Sheetings.
- 3M Product & Instruction Bulletin UV Clears. Screen Print UV Gloss Clear 9740i, Screen Print Matte Clear 9730UV

## Special Applications

### Metallic and Pearlescent Ink for Line Colors

Producing graphics with inks that contain metallic and pearlescent flakes requires careful attention to produce consistent, high quality graphics. Even small changes in components and processing conditions affect the print quality.

Refer to the 3M Instruction Bulletin 3.20 for complete information.

Use only the recommended flakes. Other flakes may not be outdoor durable.

ⓘ **IMPORTANT NOTE**

Sparkle Silvex™ Aluminum Flakes are available from: Silberline Manufacturing Company Inc., 130 Lincoln Drive, P.O. Box B, Tamaqua, PA 18252-0420
Telephone: 800-348-4824 Fax: 570-668-0197

ⓘ **IMPORTANT NOTE**

Nazdar® Aluminum Flakes are available from: Nazdar Inks & Coatings, 8501 Hedge Lane Terrace, Shawnee, KS 66227
Telephone: 800-677-4657 Fax: 913-422-2295

ⓘ **IMPORTANT NOTE**

Pearlescent flakes are available from: EMD Chemicals, Inc., Performance Materials Division, One International Plaza,
Suite 300, Philadelphia, PA 19113
Telephone: 888-367-3275

**Warranted Metallic Flakes**

| Flake Size | Sparkle Silvex Aluminum Flakes |
|---|---|
| Small | SSP-950-20-C |
| Medium | SSP-910-20-C or SSP-404AR |

| Flake Size | Nazdar® Metallic Flakes |
|---|---|
| Fine | SIPM 573 |
| Medium | SIPM 606 |
| Coarse | SIPM 571 |

**Warranted Pearlescent Flakes**

| Flake Size | EMD Chemicals Part No. | Effect |
|---|---|---|
| Small | 9111WR Rutile fine satin | Luster |
| | 9121WR Rutile luster satin | Luster |
| Medium | 9103WR Sterline silver | Similar to small to medium aluminum flake, except they have no opacity or hiding power |

**Flake Concentrations**

| Type | Maximum Concentration by % Weight | Typical Concentration by % Weight |
|---|---|---|
| Metallic Flakes | 15 | 5 to 10 |
| Pearlescent Flakes | 15 | 10 to 15 |
| Mixtures of metallic and pearlescent flakes | 15 | 5 to 10 |

**Printing with Metallic and Pearlescent Flakes**

• Use the same screen printing and curing methods for metallic and pearlescent ink as for regular ink series 9800.

• Inks must be protected with screen print clear 9740i or 9800CL.

• Use the following mesh size recommendations. See the flake manufacturer for specific details.

**Mesh Size Recommendations**

| Type | Flake Size | Median Flake Size (microns) | Mesh Size |
|---|---|---|---|
| Sparklet Silvex Metallic Flakes | Small | 19 | 34 micron or larger 355 to 390 plain weave |
| | Medium | 22 | 34 micron or larger 305 plain weave |
| Pearlescent Flakes | Small | < 20 | 34 micron or larger 355 to 390 plain weave |
| | Medium | 10 to 40 | 34 micron or larger 305 plain weave |

**Shelf Life of Flakes**

• After adding the metallic flakes, the pot life of mixed, metallic ink is 1 to 2 days.

• Pearlescent flakes do not cause the ink to gel, however, they will settle.

ⓘ **IMPORTANT NOTE**

Metallic flakes require special handling. Exposure to air causes them to deteriorate and agglomerate. This will cause printing problems. We recommend buying only what can be used in a short period of time. See 3M Instruction Bulletin 3.20 for details.

## Shelf Life, Storage and Shipping

### Shelf Life

Use by the expiration date shown on the product packaging. A Use By Date, such as 01Dec2014, is on the ink container product label, as well as the outer shipping carton. Do not use ink that shows signs of gelling.

### Ink Storage Conditions

- Store the inks at 60 to 90 °F (15 to 32 °C).
- Away from direct sunlight, mercury vapor lamps, quartz-halogen lamps, or arc lamps.
- Original container or in other sealed, black polyethylene containers. Do not store the inks in glass or metal containers.

### Shipping Finished Graphics

Refer to the base media's 3M Product Bulletin.

### Shipping Ink

The inks are non-regulated when transported via ground. Opened ink boxes and bags may no longer provide adequate protection against leaks and spills. Exercise caution when shipping opened boxes or bags to ensure prevention of spills or leaks. In the United States, refer to the SDS for further information.

## Bulletin Change Summary

For the most current 3M Technical Information available to successfully use this product, please view this Bulletin electronically and click on the blue underlined links to view the relevant documents. This Bulletin has been substantially changed. Please read the entire Bulletin thoroughly.

### Release J NOV-2015:

- Added 9740i and 9730UV to table in "Clears" on page 2.
- Updated "Roller Coating" on page 5.

### Release I JUN-2015:

- Updated Product Bulletin to new format.

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