# Graphic & Surface Protection Products
## Overlaminates and Clears for All Imaging Methods & Surfaces

**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.**

Note: PB = Product Bulletin, IB = Instruction Bulletin, PB-IB = Product & Instruction Bulletin

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## 1. Graphic Protection Products

### A. Standard Overlaminates

These overlaminate films are approved for most digitally imaged or unprinted film and selected screen printed films.

#### (1) High Gloss Overlaminate

- 3M™ Scotchcal™ High Gloss Overlaminate 3648

#### (2) Gloss

- 3M™ Scotchcal™ Gloss Overlaminate 3640GPS
- 3M™ Scotchcal™ Gloss Overlaminate 3658G
- 3M™ Scotchcal™ Gloss Overlaminate 8508
- 3M™ Scotchcal™ Gloss Overlaminate 8512G
- 3M™ Scotchcal™ Gloss Overlaminate 8518
- 3M™ Scotchcal™ Gloss Overlaminate 8528
- 3M™ Envision™ Gloss Wrap Overlaminate 8548G
- 3M™ Scotchcal™ Gloss Overlaminate 8580
- 3M™ Scotchcal™ Graphic Film IJ10-114
- 3M™ Scotchcal™ Optically Clear Overlaminate 8914

### (3) Luster

- 3M™ Scotchcal™ Luster Overlaminate 3619
- 3M™ Scotchcal™ Luster Overlaminate 3645
- 3M™ Scotchcal™ Luster Overlaminate 8509
- 3M™ Scotchcal™ Luster Overlaminate 8519
- 3M™ Scotchcal™ Luster Overlaminate 8524
- 3M™ Scotchcal™ Luster Overlaminate 8908
- 3M™ Envision™ Luster Wrap Overlaminate 8549L

### (4) Matte & Ultra-Matte

- 3M™ Scotchcal™ Matte Overlaminate 3620
- 3M™ Scotchcal™ Matte Overlaminate 3642GPS
- 3M™ Scotchcal™ Matte Overlaminate 3647
- 3M™ Scotchcal™ Matte Overlaminate 3660M
- 3M™ Scotchcal™ Matte Overlaminate 8510M
- 3M™ Scotchcal™ Matte Overlaminate 8520
- 3M™ Scotchcal™ Matte Overlaminate 8909
- 3M™ Scotchcal™ Ultra-Matte Overlaminate 8915

### B. Graphic and Surface Protection Films

- Scotchgard™ Graphic and Surface Protection Film 8991
- Scotchgard™ Removable Graphic and Surface Protection Film 8991R
- Scotchgard™ High Gloss Graphic and Surface Protection Film 8993

### C. Screen Print Liquid Clears

These clears are approved for most types of graphics, regardless of imaging platform, except where noted.

### (1) Gloss

- 3M™ Screen Print Dirt Resistant Gloss Clear 1920DR
- 3M™ Scotchlite™ Screen Printing Gloss Clear 4430R (for reflective graphic film only)
- 3M™ Screen Print UV Gloss Clear 9740i
- 3M™ Screen Print UV Gloss Clear 9800CL (for graphics printed with Ink Series 9800UV only)
- 3M™ Screen Print Clear VI0402

### (2) Matte

- 3M™ Screen Print Matte Clear 1930
- 3M™ Screen Print Low Gloss Clear 9730UV

### D. Digital Liquid Clears

- 3M™ Inkjet Protective Clear 8530 - High Luster

## 2. 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/MSDS, 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.

### A. Air Quality Regulations

State Volatile Organic Compound (VOC) regulations may prohibit the use of certain cleaning 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 a regulatory exemption. Check with your State environmental authorities to determine whether use of this solution may be restricted or prohibited.

## 3. Warranty Information

All 3M graphic protection products are covered by the 3M Basic Warranty.

A Warranty Period may be offered based on the graphic construction and application details. Always refer to the PB for the 3M base film or flexible substrate you are using to determine if the graphic protection product you want to use is recommended and what, if any, Warranty Period is offered. The only exception is for Scotchgard™ Graphic and Surface Protection Film 8991 and 8991R, which has Warranty Periods in its Bulletin.

### A. Limitation of Liability

Except where prohibited by law, 3M SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO PURCHASER OR USER FOR ANY DIRECT, 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 SELLER'S 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 including breach of contract, breach of warranty, negligence, strict liability, or any other legal or equitable theory.

### B. Additional Warranty Information

The 3M Graphics Warranties Brochure at 3Mgraphics.com, along with the applicable film 3M Product Bulletins, provide the details to any warranty offered for the 3M graphics products described in this bulletin.

## 4. Product Applications, Descriptions and Limitations of Use

| Product Number | Applications | | | | | | | | | | | | Description | Limitations of Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fleet/Vehicle | Vehicle Wraps | Watercraft | Transit | Labels | Thermoformable | Signage | Awning | Smooth Walls | Textured Walls and Surfaces | Windows and Glass | Floor or Sidewalk | | All Products:<br>• Not for automotive OEM graphics.<br>• Not for graphics subjected to gasoline vapors, spills, such as gas pumps, automobile fuel tank ports, or top-feeding petroleum tankers<br>• Do not print on graphic protection products<br>• Do not use overlaminate films on screen printed graphics except 3645, 3647 and 3648, which are approved for floor and sidewalk graphics. |
| **A. Standard Overlaminates** | | | | | | | | | | | | | | |
| IJ10-114 | | | | | ■ | | ■ | | | | ■ | | For economy-grade graphics; see PB IJ10/11 | |
| 3619 | | | | | | ■ | ■ | | | | | | Flexible, conformable, more durable | |
| 3620 | | | | | | ■ | ■ | | | | | | Matte version of 3619 | |
| 3640GPS | | | | | | ■ | ■ | ■ | | | | | High protection from UV fading, dirt, graffiti; easy to clean; thermoformable on plastic substrates; may use on digital films | Not for application to other 3M brand GPS films, solvent/latex printed digital films, 3M's Envision FS-1 or Panagraphics III flexible substrates or for graphics subjected to intentional or accidental abrasion |
| 3642GPS | | | | | | ■ | ■ | ■ | | | | | Matte version of 3640GPS | |
| 3645 | | | | | | | | | | | | ■ | For floor and table and some vertical graphics; Provides slip- and scuff-resistance; scrubable, waxable; see IB 5.19 | |
| 3647 | | | | | | | | | | | | ■ | For sidewalk signs; provides slip-, scuff- and foot traffic-resistance; cut radii on sharp corners to help prevent premature lifting of applied graphics; cut by hand, guillotine and cold steel rule die; clean the graphics periodically for optimum skid resistance and appearance; see IB 5.33. | No exposure to vehicle traffic, snowplows, snow shovels, heavy equipment |
| 3648 | | | | | | | | | | | | ■ | For floor graphics; provides slip- scuff- and foot traffic-resistance; scrubable, waxable; see IB 5.19 | • Indoor use only |
| 3658G | | | | | | ■ | ■ | ■ | | | | | Gloss high protection from UV fading, dirt, easy to clean; thermoformable on plastic substrates; may use on 3M translucent films 3630 & 3730 and digitally or screen printed Panagraphics III flexible substrates | |
| 3660M | | | | | | ■ | ■ | ■ | | | | | Matte version of 3658G | |
| 8508 | | | | ■ | ■ | | ■ | | ■ | | ■ | | Gloss for intermediate graphics; apply at room temperature; cut by hand, cold or hot steel rule. | • Not for use on applications that must be stretched during application<br>• Heat and tension cause curling<br>• Excessive stretching causes a white appearance |
| 8509 | | | | ■ | ■ | | ■ | | ■ | | ■ | ■ | Luster for intermediate graphics; apply at room temperature; cut by hand, cold or hot steel rule. | |

| Product Number | Applications | | | | | | | | | | | | Description | Limitations of Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fleet/Vehicle | Vehicle Wraps | Watercraft | Transit | Labels | Thermoformable | Signage | Awning | Smooth Walls | Textured Walls and Surfaces | Windows and Glass | Floor or Sidewalk | | All Products:<br>• Not for automotive OEM graphics.<br>• Not for graphics subjected to gasoline vapors, spills, such as gas pumps, automobile fuel tank ports, or top-feeding petroleum tankers<br>• Do not print on graphic protection products<br>• Do not use overlaminate films on screen printed graphics except 3645, 3647 and 3648, which are approved for floor and sidewalk graphics. |
| **A. Standard Overlaminates, *continued*** | | | | | | | | | | | | | | |
| 8510M | | | | ■ | ■ | | ■ | | ■ | | ■ | | Matte for intermediate graphics; apply at room temperature; cut by hand, cold or hot steel rule | • Not for use on applications that must be stretched during application<br>• Heat and tension cause curling<br>• Excessive stretching causes a white appearance |
| 8512G | | | | ■ | ■ | | ■ | | ■ | | ■ | | Gloss for intermediate, short-term graphics requiring abrasion resistance; apply at room temperature; cut by hand, cold or hot steel rule | |
| 8518 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | ■ | | ■ | | 8518, 8519, 8520: resists fuel vapors; highly conformable<br>8518: provides wet paint look | Using an application tape may result in loss of gloss. |
| 8519 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | ■ | | | | Luster version of 8518 | |
| 8520 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | ■ | | | | Matte version of 8518 | |
| 8524 | | | | | | | | | | ■ | | | For textured surfaces; conformable with high heat | • Use with film IJ8624 or 8624 only.<br>• See additional details in Section 7 |
| 8528 | ■ | ■ | | ■ | | | | | ■ | | ■ | | Superior UV protection; longer term vertical durability; horizontal warranty | For inkjet printed films IJ160, IJ160C, IJ170Cv3, IJ180, IJ180C, IJ180Cv3, IJ8150 |
| 8548G | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | Gloss high performance non-PVC; exceptional conformability and lifting resistance; less prone to scratching; superior UV and acid dew protection; longer term vertical durability; horizontal warranty | For inkjet printed films IJ170Cv3, IJ180, IJ180C, IJ180Cv3, IJ380Cv3, 480Cv3 |
| 8549L | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | Luster high performance non-PVC; exceptional conformability and lifting resistance; less prone to scratching; superior UV and acid dew protection; longer term vertical durability; horizontal warranty | For inkjet printed films IJ170Cv3, IJ180, IJ180C, IJ180Cv3, IJ380Cv3, 480Cv3 |
| 8580 | | ■ | | | | | | | | | | | Excellent conformability and lifting resistance; handles differently: very stretchy for conforming over complex contours; cold roll lamination methods are critical | For inkjet printed film IJ380Cv3 and used only on vehicle wraps |
| 8908 | ■ | | | ■ | | | ■ | | ■ | | ■ | | Non-vinyl: ecologically good choice. Ideal for film 3545C; specialty graphics | • No application to vinyl film applied to fleet, truck or vehicle graphics, or to reflective graphic film<br>• Use no application heat for premasked graphics |
| 8909 | ■ | | | ■ | | | ■ | | ■ | | ■ | | Matte version of 8908 | |
| 8914 | | | | | | | | | | | ■ | | Optically clear primarily for perforated window graphic film to protect and prevent moisture and contaminant collecting in film perforations, conformable | |
| 8915 | ■ | ■ | ■ | ■ | | | ■ | | ■ | | | | Ultra-matte version of 8518; reduces glare | |

| Product Number | Fleet/Vehicle | Vehicle Wraps | Watercraft | Transit | Labels | Thermoformable | Signage | Awning | Smooth Walls | Textured Walls and Surfaces | Windows and Glass | Floor or Sidewalk | Description | Limitations of Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | All Products:<br>• Not for automotive OEM graphics.<br>• Not for graphics subjected to gasoline vapors, spills, such as gas pumps, automobile fuel tank ports, or top-feeding petroleum tankers<br>• Do not print on graphic protection products |

## B. Graphic and Surface Protection Film

Note: Before applying these films to solvent printed graphics, ensure sufficient ink drying to reduce the risk of outgassing and lifting issues; see Section 6, page 7.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8991 | ■ | | | ■ | ■ | | ■ | | ■ | | ■ | | Extra thickness and special hardcoat provide superior substrate and surface protection from stains, abrasion, gouges, UV light, graffiti; easy to clean | • Not for cut film applications, flexible substrates, gypsum wallboard, poor paint adhesion, graphics printed with solvent based inks, porous or unsealed surfaces<br>• Not for vandalism or excessive product misuse that damages the substrate<br>• Not for gasoline vapors and spills that penetrate the edges of the film<br>• **8991R** is not removable from printed or unprinted graphic film<br>• See PB- IB 8991 |
| 8991R | ■ | | | ■ | ■ | | ■ | | ■ | | ■ | | Removable version of 8991; may be used on glass for general protection | |
| 8993 | ■ | | | ■ | ■ | | ■ | | ■ | | | | Graffiti-resistant; replaces overlaminates 639 and 8912 | • Not for cut film applications, flexible substrates, gypsum wallboard, poor paint adhesion, graphics printed with solvent based inks, porous or unsealed surfaces<br>• Flat surfaces only<br>• Not good for dry erase marker graffiti; not for plastics, glass, flexible substrates |

## C. Screen Print Liquid Clears

Note: May also be applied by roller coating.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Solvent-based** | | | | | | | | | | | | | | |
| 1920DR | ■ | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | ■ | | Gloss, with dirt resistance; good choice for frequently washed vehicles | • Not for thermoforming.<br>• See PB 1900 and IB 3.12. |
| 1930 | ■ | ■ | ■ | ■ | ■ | | ■ | | ■ | ■ | ■ | | Matte | See PB 1900 and IB 3.12. |
| VI0402 | ■ | | | | ■ | | | | | | | | Gloss, gasoline resistance | See PB 1900 and IB 3.12. |
| **UV-cured** | | | | | | | | | | | | | | |
| 9730UV | ■ | ■ | ■ | ■ | ■ | | ■ | | ■ | | ■ | | Matte | See PB-IB UV Clears. |
| 9740i | ■ | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | | ■ | | Gloss; suitable for petroleum environments if staining is not a concern | • Not for thermoforming.<br>• See PB-IB UV Clears. |
| 9800CL | ■ | ■ | ■ | ■ | ■ | | ■ | | ■ | | ■ | | Gloss; suitable for petroleum environments if staining is not a concern | • Use with 3M ink series 9800 only<br>• Not for graphics made of multiple layers of ink that must be stretched during installation<br>• Also see IB 3.20. |

## D. Digital Liquid Clears

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8530 | ■ | ■ | | ■ | ■ | ■ | ■ | | | | | | Water-based clear, high luster gloss for inkjet printed graphics; apply with liquid laminator; see PB 8530 | • Not for full bus wraps<br>• Not for exposure to isopropyl alcohol or harsh cleaning chemicals or solvents<br>• Not for thermoforming |

## 5. Application Surfaces, Physical and Performance Characteristics

| Number | Expected Performance Life *in years* | Application Surfaces | | | | | | | Physical Characteristics | | | | | Performance Characteristics *See Conversion Values, page 9.* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Flat | Flat with rivets | Corrugated | Simple Curves | Compound Curves | Deep Channels & Concave Surfaces | Flexible Substrates | Material | Cast or non-Cast | Mils | Gloss | Liner | Lamination Temperature A 50-100°F B 50-90°F C 60-100°F | In Use Temperature Range D -65 – +225°F E -40 – +150°F F -30 – +200°F |
| **A. Standard Overlaminates** | | | | | | | | | | | | | | | |
| IJ10-114 | 3 | ■ | | | | | | | Vinyl | Non-Cast | 3.1 | Gloss | Polycoated | A | E |
| 3619 | 6 | ■ | | | | | | ■ | Vinyl | Cast | 2 | Luster | Kraft paper | A | D |
| 3620 | 6 | ■ | | | | | | ■ | Vinyl | Cast | 2 | Matte | Kraft paper | A | D |
| 3640GPS | 9 | ■ | | | ■ | | | ■ | PVDF | n/a | 1 | Gloss | Kraft paper | C | D |
| 3642GPS | 9 | ■ | | | ■ | | | ■ | PVDF | n/a | 1 | Matte | Kraft paper | C | D |
| 3645 | 1 | ■ | | | | | | | Vinyl | Cast | 8 | Luster | Kraft paper | A | D |
| 3647 | 0.25 | ■ | | | | | | | Vinyl | Cast | 19 | Matte | Kraft paper | A | D |
| 3648 | 0.25 | ■ | | | | | | | Vinyl | Non-Cast | 4 | Gloss | Kraft paper | A | D |
| 3658G | 9 | ■ | | | ■ | | | ■ | Vinyl | Cast | 2 | Gloss | Kraft paper | A | D |
| 3660M | 9 | ■ | | | ■ | | | ■ | Vinyl | Cast | 2 | Matte | Kraft paper | A | D |
| 8508 | 4 | ■ | | | ■ | | | | Vinyl | Cast | 2.3 | Gloss | Kraft paper | A | D |
| 8509 | 4 | ■ | | | ■ | | | | Vinyl | Non-Cast | 3 | Luster | Kraft paper | A | D |
| 8510M | 4 | ■ | | | ■ | | | | Vinyl | Non-Cast | 3.5 | Matte | Kraft paper | B | E |
| 8512G | 1 | ■ | | | ■ | | | | Vinyl | Non-Cast | 12 | Gloss | Kraft paper | B | E |
| 8518 | 8 | ■ | ■ | ■ | ■ | ■ | | | Vinyl | Cast | 2 | Gloss | Polyester | A | D |
| 8519 | 8 | ■ | ■ | ■ | ■ | ■ | | ■ | Vinyl | Cast | 2 | Luster | Kraft paper | A | D |
| 8520 | 8 | ■ | ■ | ■ | ■ | ■ | | ■ | Vinyl | Cast | 2 | Matte | Kraft paper | A | D |
| 8524 | 7 | ■ | | | ■ | | | | Plastic | n/a | 2 | Luster | Kraft paper | A | D |
| 8528 | 9 | ■ | ■ | ■ | ■ | ■ | | ■ | Vinyl | Cast | 2 | Gloss | Polyester | A | D |
| 8548G | 9 | ■ | ■ | ■ | ■ | ■ | ■ | | Non-PVC | n/a | 2 | Gloss | Polyester | A | D |
| 8549L | 9 | ■ | ■ | ■ | ■ | ■ | ■ | | Non-PVC | n/a | 2 | Luster | Polyester | A | D |
| 8580 | 7 | ■ | ■ | ■ | ■ | ■ | ■ | | Vinyl | Cast | 1 | Gloss | Kraft paper | A | D |
| 8908 | 1 | ■ | ■ | | ■ | | | | Polyolefin | Non-Cast | 2.5 | Luster | Kraft paper | B | E |
| 8909 | 1 | ■ | ■ | | ■ | | | | Polyolefin | Non-Cast | 2.5 | Matte | Kraft paper | B | E |
| 8914 | 8 | ■ | | | ■ | | | | Vinyl | Cast | 2 | Gloss | Polyester | A | D |
| 8915 | 8 | ■ | ■ | ■ | ■ | ■ | | | Vinyl | Cast | 2 | Ultra Matte | Kraft paper | C | D |
| **B. Graphic and Surface Protection** | | | | | | | | | | | | | | | |
| 8991 | 3 | ■ | | | ■ | | | | Polyester | Extruded | 4 | High gloss | Polycoated | C | D |
| 8991R | 3 | ■ | | | ■ | | | | Polyester | Extruded | 4 | High gloss | Polycoated | C | D |
| 8993 | 5 | ■ | | | | | | | Polyester | Extruded | 1 | High gloss | Kraft paper | A | F |

**C. Screen Print Clear Coats**

| Number | Application Surfaces | | | | | | | Physical Characteristics | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flat | Flat with rivets | Corrugated | Simple Curves | Compound Curves | Deep Channels & Concave Surfaces | Flexible Substrates | Face Finish | Solvent or UV | Recommended Coating Thickness | Typical Coverage per U.S. gallon *See Conversion Values, page 9.* |
| 1920DR | ■ | ■ | ■ | ■ | ■ | | | Gloss | Solvent | 6 to 12 microns | 1500-2500 feet $^2$ |
| 1930 | ■ | ■ | ■ | ■ | ■ | | | Matte | Solvent | 6 to 12 microns | 1500-2500 feet $^2$ |
| VI0402 | ■ | ■ | ■ | ■ | ■ | | | Luster | Solvent | 6 to 12 microns | 1500-2500 feet $^2$ |
| 9730UV | ■ | ■ | ■ | ■ | ■ | | | Matte | UV | 6 to 12 microns | 2500-5000 feet $^2$ |
| 9740i | ■ | ■ | ■ | ■ | ■ | | | Gloss | UV | 6 to 12 microns | 2500-5000 feet $^2$ |
| 9800CL | ■ | ■ | ■ | ■ | ■ | | ■ | Gloss | UV | 6 to 12 microns | 2500-5000 feet $^2$ |

Additional Physical Characteristics, continued in Sections E, F, G.

## D. Digital Clear Coats

| Number | Application Surfaces | | | | | | | Physical Characteristics | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flat | Flat with rivets | Corrugated | Simple Curves | Compound Curves | Deep Channels & Concave Surfaces | Flexible Substrates | Face Finish | Solvent or UV | Recommended Coating Thickness | Typical Coverage per U.S. gallon *See Conversion Values, page 9.* |
| 8530 | ■ | ■ | | ■ | | | | High luster | Water base | 6 to 20 microns | 800-2500 feet [2] |

Additional Physical Characteristics, continued in Sections E, F, G.

| | Product | |
|---|---|---|
| **E. Flammability** | **All** | Flammability test data may be available for the graphic product and application you require. ASTM E84 test reports are available on the On-line Product Catalog at 3Mgraphics.com (select a product and view its Literature tab) or call 3M at 1-800-328-3908. |
| **F. Chemical Resistance** | **8991<br>8991R** | See PB-IB 8991 for complete details on the unique uses and application methods for this product. |
| | **9740i<br>9800CL<br>VI0402** | Resists gasoline spills |
| | **All Others (including clears in C and D)** | • Resists mild alkalis, mild acids and salt<br>• Excellent resistance to water<br>• Resists petroleum vapors |
| **G. Slip Resistance for Floor or Sidewalk Sign Graphics** | **3645<br>3647<br>3648<br>8509** | The UL 410 Slip Resistance of Floor Surface Materials covers the testing of floor and finishing materials to determine if their minimum average and minimum individual static coefficients of friction (COF) meet or exceed the specified requirements with respect to slip resistance only. The floor surface materials covered by this standard include floor coverings (FCM), floor treatment materials (FTM) and walkway construction materials (WCM). The average static coefficient of friction for FTM, FCM, and WCM products shall be at least 0.50 and individual static coefficients of friction shall be at least 0.45 when tested in accordance with the requirements of this standard<br>**Method:** The floor samples were tested dry only. The slip resistance characteristics of the materials were measured in accordance with the established and standardized practice of Underwriters Laboratories Inc. and in accordance with the latest Standard of Slip Resistance of Floor Surface Materials, UL 410.<br>**Results:** An average slip resistance characteristic greater than 0.50 was recorded for each of the materials tested. |
| | **3647** | Overlaminate 3647 has been tested per ASTM E303, “Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester", and meets the requirements of the skid resistance values, or British Pendulum Number (BPN), as set forth in the proposed European norms prEN1341 and prEN1342 for pedestrian surfaces. Dry Surface: BPN = 95; Wet Surface: BPN = 40. |

## 6. Important Note for all Solvent Inkjet Printed Graphics!

*Adequately Dry Graphics!*

Inadequate drying can result in graphic failure including curling, increased outgassing, increased shrinkage and adhesion failure, which are not covered under warranty.

Always build enough time into your process to ensure adequate drying of the graphic. Poorly dried film may become soft and stretchy, and the adhesive may become too aggressive. This can cause difficulty when applying an overlaminate, rolling the graphic, and applying the film. See the ink's Instruction Bulletin for more details.

## 7. Applying Overlaminate

| Product | |
|---|---|
| All | Refer to IB 4.22 for all lamination procedures. |
| Digitally Printed Graphics | Digitally printed UV-cured graphics should be applied with the hot roll method to reduce silvering. All other digitally printed graphics are normally overlaminated using the cold roll method. |
| 3640GPS<br>3642GPS<br>3658G<br>3660M | These overlaminates also can be applied with a hand or power drive roll laminator.<br>For backlit applications, these overlaminates are commonly applied using the wet (detergent and water) application method. See IB 5.7 for details. |
| 8524 | Overlaminate 8524 is designed for use only with 3M film IJ8624 or 8624.<br>When applying the overlaminate, use the minimum amount of pressure needed and unwind tension to obtain good results. This helps reduce the chance of the overlaminate tunneling as it is applied to the base film. If tunneling does occur, it will disappear when the graphic is applied with heat and pressure to a textured surface. |

## 8. Application Tape

| | |
|---|---|
| All | May be used to add stiffness for easier application, hold cut graphics together while applying, or to protect graphics from scratching and other damage during application. Many graphics with an overlaminate do not require application tape. See the Product Bulletin for the base film or flexible substrate you are using for additional recommendations.<br>When winding processed graphics, do not wind too tightly or the film may block.<br>When finishing rivets, do not apply heat to the graphic until the premasking tape is removed and then heat only enough to soften the film; too much heat will cause the overlaminate to lose gloss. Excessive heat will cause the overlaminate to curl. |
| 3645<br>3648 | Overlaminates 3645 and 3648, when used as recommended, do not require a premasking or prespacing tape for application. |
| 3647 | Overlaminate 3647 does not generally require an application tape. For die cut, prespaced graphics, 3M™ Prespacing Tape SCPS 53-X may be used. |
| 3658G<br>8518<br>8528 | Some higher gloss overlaminates are more susceptible to scratching during application. Using an application tape protects against scratching but the adhesive may dull the gloss somewhat. When the graphic is not protected by an application tape, always use edge protection on the squeegee, such as a paper liner or soft PTFE tape. |
| 8914 | Do not use application tape for any graphics made with overlaminate 8914. |
| 8908<br>8909 | Overlaminates 8908 and 8909 generally do not need an application tape, although 3M™ Premasking Tape SCPM-3 may be used. |

## 9. Maintenance and Cleaning

| | |
|---|---|
| All | Use a cleaner such as the kind used for high-quality painted surfaces. The cleaner must be wet, non-abrasive, without strong solvents or alcohol, and have a pH value between 3.0 and 11.0 (neither strongly acidic nor strongly alkaline). Also see IB 6.5. |

## 10. Shelf Life, Storage and Shipping of Films

Also see IB 6.5.

### A. Shelf Life

| Product | |
|---|---|
| 8908<br>8909<br>8512G | **Total shelf life: 2 years** from the date of manufacture on the original box. Up to 2 years unprocessed, ***OR*** process within 1 years ***and*** then apply within 1 year of processing. |
| IJ10-114 | **Total shelf life: 1 year** from the date of manufacture on the original box. |
| All Others | **Total shelf life: 3 years** from the date of manufacture on the original box.<br>If you do process the film, do so within 2 years and apply within 1 year.<br>If you do not process the film, apply it within 3 years. |

| | Product | |
|---|---|---|
| **B. Storage Temperature** | 8509<br>8518<br>8914<br>8915 | 40° to 86°F (4° to 30°C) |
| | IJ10-114 | 90°F (32°C) maximum |
| | All Others | 40° to 100°F (4° to 38°C) |
| **C. Storage Conditions** | All | • Out of sunlight<br>• Clean dry area<br>• Original container<br>• Bring the product to print room temperature before using |
| **D. Shipping Finished Graphics** | 3658G<br>3660M<br>8512G<br>8524<br>8991<br>8991R<br>8993<br>All reflective graphics | Flat and racked is preferred. If rolling, roll printed side out on a core at least 6 inches (15 cm) in diameter or larger. All graphics with reflective base films must use this large a core. This helps prevent the liner and, if used, the application tape from popping off. |
| | All Others | Flat, or rolled printed-side-out on 5 inch (13 cm) or larger core. This helps prevent the liner and, if used, the application tape from popping off. |

## 11. Conversion Values

| Temperature | Length |
|---|---|
| 50 – 100°F (10 – 38°C) | 1000 – 1200 feet$^2$ (92 – 111 m$^2$) |
| 50 – 90°F (10 – 32°C) | 800 feet$^2$ (75 m$^2$) |
| 60 – 100°F (15 – 38°C) | 2500 feet$^2$ (232 m$^2$) |
| -65 – +225°F (-54 – +107°C) | 2500 – 3000 feet$^2$ (232 – 279 m$^2$) |
| -40 – +150°F (-40 – +66°C) | 1200 – 1600 feet$^2$ (92 – 149 m$^2$) |
| -30 – +200°F (-34 – +93°C) | 750 – 800 feet$^2$ (70 – 75 m$^2$) |
| | 2500 – 3500 feet$^2$ (232 – 325 m$^2$) |

## 12. Bulletin Change Summary

For Release L: Black bars in the margin indicate a change or addition. Added new overlaminate 8549L to standard overlaminates.

For Release K: Black bars in the margin indicate a change or addition. Added new overlaminates 8512G and 8510M for intermediate applications. Added references to the new 3M™ Envision™ Flexible Substrate FS-1. The 3M Related Literature section has been replaced by direct links to the most current versions of Bulletins or warranty information you may need to successfully use this product. All links are blue underlined text.

## 13. Products Mentioned in This Bulletin

These films are referenced by their product number within this Bulletin: 3M™ Controltac™ Graphic Film IJ160-10 and IJ180; 3M™ Controltac™ Graphic Film with Comply™ Adhesive IJ160C, IJ170Cv3, IJ180C and IJ180Cv3; 3M™ Envision Wrap Film 480Cv3; 3M™ Envision™ Flexible Substrate FS-1; 3M™ Scotchcal™ Clear View Graphic Film IJ8150; 3M™ Scotchlite™ Graphic Film IJ680; 3M™ Scotchlite™ Graphic Film with Comply™ Adhesive IJ680; 3M™ Panagraphics III Wide-Width Flexible Substrate; 3M™ Screen Print UV Ink Series 9800, 3M™ Screen Print Ink Series 1900.


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