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Effective November 2016

Commercial Solutions Division

Graphic Protection Options

Overlaminates and Clears

Product Bulletin

Products

This Bulletin provides an overview of all 3M graphic protection options.
All product-specific information for standard overlaminates is included in this Bulletin.
For a list of recommended base film and overlaminate solutions refer to the Graphics Solutions product catalogue brochure.

Standard Overlaminates

cast	3M™ Scotchcal™ Luster Overlaminate 3619 3M™ Scotchcal™ Matte Overlaminate 3620 3M™ Scotchcal™ Gloss Overlaminate 3640GPS 3M™ Scotchcal™ Matte Overlaminate 3642GPS 3M™ Scotchcal™ Gloss Overlaminate 3658G 3M™ Scotchcal™ Matte Overlaminate 3660M 3M™ Scotchcal™ Gloss Overlaminate 8580 3M™ Scotchcal™ Matte Overlaminate 8580M 3M™ Scotchcal™ Gloss Overlaminate 8518 3M™ Scotchcal™ Matte Overlaminate 8520 3M™ Scotchcal™ Ultra-Matte Overlaminate 8915 3M™ Scotchcal™ Graphic Film IJ70-114 3M™ Wrap Overlaminate Series 8900 (please see product-specific information for Series 8900 in separate product bulletin)
calendered (polymeric)	3M™ Scotchcal™ Gloss Overlaminate 8018G 3M™ Scotchcal™ Matte Overlaminate 8020M 3M™ Scotchcal™ Gloss Overlaminate 8038G 3M™ Scotchcal™ Matte Overlaminate 8040M
calendered (monomeric)	3M™ Scotchcal™ Gloss Overlaminate 8008G 3M™ Scotchcal™ Matte Overlaminate 8010M

	non-PVC polymer	3M™ Scotchcal™ Luster Overlaminate 8908 3M™ Scotchcal™ Matte Overlaminate 8909 3M™ Envision™ Gloss Wrap Overlaminate 8548G 3M™ Envision™ Gloss Luster Overlaminate 8549L 3M™ Envision™ Gloss Overlaminate 8048G 3M™ Envision™ Matte Overlaminate 8050M
Specialty Overlaminates	Graphic for Floors/ Pavement	3M™ Scotchcal™ Luster Overlaminate 3645 3M™ Scotchcal™ Matte Overlaminate 3647 3M™ Scotchcal™ Matte Overlaminate 3649
	Perforated Window Graphic Film	3M™ Scotchcal™ Optically Clear Overlaminate 8914i
	Window Decoration	3M™ Scotchcal™ Clear View Graphic Film 8150 3M™ Scotchcal™ Clear View Graphic Film IJ8150
	Anti-Graffiti and Anti-Scratch	3M™ Scotchgard™ Graphic and Surface Protection Film 8991 3M™ Scotchgard™ Graphic and Surface Protection Film 8993 3M™ Scotchgard™ Removable Graphic and Surface Protection Film 8991R 3M™ Scotchgard™ Graphic and Surface Protection Film 8995-124
Standard Clears	solvent-based	3M™ Screen Print Dirt Resistant Gloss Clear 1920DR 3M™ Screen Print Matte Clear 1930
	UV-based	3M™ Screen Print UV Gloss Clear 9800CL 3M™ Screen Print UV Gloss Clear 9740i
Speciality Clears	solvent-based	3M™ Screen Print Clear 1955 ABC
	water-based	3M™ Piezo Inkjet Protective Clear 8530
Guarantee and Warranty Information	A warranted or durability period may be offered based on graphic construction. Always refer to the 3M™ MCS™ Warranty or the 3M™ Performance Guarantee information available from 3M. See section Additional Information at the end of this bulletin for details.	

Product Characteristics

These are indicative values for unprocessed products.
Contact your 3M representative for a custom specification.

Product Number	Description	Material	Surface Finish	Thickness	Adhesive Type	Outdoor Durability *
IJ70-114	flexible and conformable	cast vinyl	glossy	50 µm (0.05 mm)	solvent acrylic pressure sensitive	6 years
3619	flexible, conformable, more durable	cast vinyl	glossy	50 µm (0.05 mm)	solvent acrylic pressure sensitive	7 years
3620	matte version of 3619		matte			7 years
3640GPS	high protection from UV fading, dirt, graffiti, easy to clean; thermoformable on plastic substrates	cast PVDF	glossy	50 µm (0.05 mm)	solvent acrylic pressure sensitive	12 years
3642GPS	matte version of 3640GPS		matte			
3645	for slip-, scuff- and foot traffic-resistance for floor graphics	cast vinyl	matte, structured surface	200 µm (0.2 mm)	solvent acrylic pressure sensitive	interior durability 12 months
3647	use for sidewalk signs for slip-, scuff- and foot traffic-resistance	cast vinyl	matte, structured surface	500 µm (0.5 mm)	solvent acrylic pressure sensitive	2 years
3649	for slip-, scuff- and foot traffic-resistance for floor graphics	calendered vinyl (monomeric)	matte, structured surface	120 µm (0.12 mm)	solvent acrylic pressure sensitive	interior durability 3 months
3658G	high protection from UV fading, dirt, easy to clean; thermoformable on plastic substrates	cast vinyl	glossy	50 µm (0.05 mm)	acrylic, pressure sensitive	10 years
3660M	matte version of 3658G		matte			
8008G	flexible and conformable	calendered vinyl (monomeric)	glossy	80 µm (0.08 mm)	water-based acrylic pressure sensitive	3 years
8010M	matte version of 8008G		matte			
8018G	flexible and conformable	calendered vinyl (polymeric)	glossy	75 µm (0.075 mm)	water-based acrylic pressure sensitive	5 years
8020M	matte version of 8018G		matte			
8038G	flexible and conformable	calendered vinyl (polymeric)	glossy	75 µm (0.075 mm)	solvent acrylic pressure sensitive	7 years
8040M	matte version of 8038G		matte			
8048G	flexible and conformable	non-PVC polymer	glossy	50 µm (0.05 mm)	acrylic pressure sensitive	5 years
8050M	matte version of 8048G		matte			
8150	use with film 8150 for making optical clear window decorations	cast vinyl	glossy	50 µm (0.05 mm)	solvent acrylic pressure sensitive	7 years
IJ8150	use with film IJ8150 for making optical clear window decorations					
8518	flexible and conformable	cast vinyl	glossy	50 µm (0.05 mm)	solvent acrylic pressure sensitive	8 years
8520	matte version of 8518	cast vinyl	matte	50 µm (0.05 mm)	solvent acrylic pressure sensitive	8 years
8548G	high conformability and lifting resistance	non-PVC polymer	glossy	50 µm (0.05 mm)	polymelt pressure sensitive	10 years
8549L	high conformability and lifting resistance	non-PVC polymer	glossy	50 µm (0.05 mm)	polymelt pressure sensitive	10 years
8580	high conformability and lifting resistance	cast vinyl	glossy	25 µm (0.025 mm)	solvent acrylic pressure sensitive	7 years

Product Number	Description	Material	Surface Finish	Thickness	Adhesive Type	Outdoor Durability *
8580M	matte version of 8580	cast vinyl	glossy	25 µm (0.025 mm)	solvent acrylic pressure sensitive	7 years
8908	flexible and conformable	Polyolefin	glossy	65 µm (0.065 mm)	solvent acrylic pressure sensitive	5 years
8909	matte version of 8908		matte			
8914i	optically clear for window graphics, conformable	cast vinyl	glossy	50 µm (0.05 mm)	solvent acrylic pressure sensitive	12 months
8915	flexible and conformable, reduces glare	cast vinyl	ultra-matte	50 µm (0.05 mm)	solvent acrylic pressure sensitive	8 years
Scotchgard™ 8991	substrate and surface protection from stains, abrasion, gouges, UV light, graffiti; easy to clean	extruded Polyester	high-gloss	100 µm (0.1 mm)	solvent acrylic pressure sensitive	5 years
Scotchgard™ 8991R	removable version of 8991					
Scotchgard™ 8993	substrate and surface protection from graffiti; easy to clean	extruded Polyester	high-gloss	25 µm (0.025 mm)	solvent acrylic pressure sensitive	5 years
Scotchgard™ 8995-124	substrate and surface protection from graffiti; easy to clean	extruded Polyester	matte	23 µm (0.023 mm)	solvent acrylic pressure sensitive	interior durability 5 years

Product Number	Description	Thickness	Capacity	Outdoor durability*
Clear 1920DR	solvent-based, gloss with dirt resistance; for frequently washed vehicles	minimum 6 µm (0.006 mm)	60 m²/l	7 years
Clear 1930	solvent-based, matte			3 years
Clear 1955ABC	two component solvent-bases; for petroleum enviroments	minimum 6 µm (0.006 mm)	50 - 55 m²/l	5 years
Clear 8530	water-based clear, high luster gloss for piezo inkjet printed graphics; apply with liquid laminator	8 – 20 µm (0.008 – 0.02 mm)	20 m²/l	12 months
Clear 9740i	UV-cured, gloss	6 – 12 µm (0.006 – 0.012 mm)	70 – 85 m²/l	8 years
Clear 9800CL	UV-cured, gloss; for petroleum enviroments if staining is not a concern	10 – 15 µm (0.01 – 0.015 mm)	70 – 85 m²/l	6 years

* see also section Durability

Since graphic durability is largely determined by the climate, the durability stated is based on average middle European exposure conditions. It might vary according to the geographical location of the application.
For further information refer to the section Additional Information at the end of the product bulletin.

The values above are the results of illustrative lab test measurements and shall not be considererd as a commitment from 3M.

Storage

Shelf life	2 years from the date on the original box Up to 2 years unprocessed, or process within 1 year and apply within 1 year of processing
Storage conditions	+4°C to +40°C, out of sunlight, original container in clean and dry area

The shelf life as defined above remains an indicative and maximum data, subject to many external and non-controllable factors. It may never be interpreted as warranty.

Flammability

Flammabiltiy standards are different from country to country. Ask your local 3M contact for details, please.

Further information

For more details on the used terms and test methods check our caption/reference library, please.

Durability

The durabilities mentioned in the table below are the results of illustrative lab tests. The values show the best performance expected from these products, provided that the film will be processed and applied professionally according to 3M's recommendations. The durability statements do not constitute warranties of quality, life and characteristics.

The durability of products is also influencd by:

- the type of substrate and thorough preparation of the surface (with 3M™ Surface Preparation System)
- application procedures
- environmental factors
- the method and the frequency of cleaning

Notice! The durability of a graphic construction follows from the component with the lowest statement cannot be extended by use of a longer lasting overlaminate.

3M™ MCS™ Warranty / 3M™ Performance Guarantee

In addition, 3M provides a guarantee/warranty on a finished applied graphic within the framework of 3M™ Performance Guarantee and/or 3M™ MCS™ warranty programs.

For detailed graphic construction and application options along with specific Warranty periods, please see the Warranty matrices and Warranty information on 3M Graphic Solutions/Warranties.
Visit www.3mgraphics.com for getting more details about 3M's comprehensive graphic solutions.

Usage Details

Please visit our website 3M.eu/graphicsolutions for more information on specific usage of 3M Inkjet Printing Materials for Solvent, UV and Latex Printing.

Overlaminates

All products	Except as noted otherwise: - for use on 3M graphic film surfaces only. - overlaminates have to be applied with the cold roll method. - moderate heated rollers (40°C maximum!) might be used for UV printed graphics. - for better appearance direct after lamination. - minimize web tension of overlaminate to avoid stretching of product. Note: Both heat and web tension can cause the overlaminate or graphic construction to curl!
IJ70-114	Can be used as printable base film (see product bulletin of this product series).
3645	Provides a skid resistant walking surface for floor graphics. Anti-slip properties have been tested according to DIN 51130 and are specified for slip resistance assessment group R9/V.
3647	Provides a skid resistant walking surface. Skid resistance tested by European Test Method prEN1341 and 1342: Result: SRV=49 (dry surface); SRV=40 (wet surface). Note: Values SRV>35 are safe walking surfaces.
3649	Provides a skid resistant walking surface for floor graphics. Anti-slip properties have been tested according to DIN 51130 and are specified for slip resistance assessment group R9/V.
8150 IJ8150	Can be used as printable base film (see product bulletin of this product series).
8548G 8549L	Non-PVC laminate, required for horizontal applications with 3M LX480Cv3 or 3M SV480Cv3.
8908 8909	Heat sensitive products! Cold roll (room temperature) application only.

8914i	Provides optically-clear graphic protection and prevents moisture and contaminants from collecting in the base film's perforations.
Scotchgard™ 8991 8991R	Can be used in the range of gasoline vapors and spills as long as those are not able to penetrate the edges of the film. Can be used on substrates other than graphic film! Application to aluminum, glass, PMMA, PC*, ABS, paint on flat surfaces. Service Temperature range: -54°C to +107°C. Min. application temperature: +10°C
Scotchgard™ 8993	Can be used in the range of gasoline vapors and spills as long as those are not able to penetrate the edges of the film. Can be used on substrates other than graphic film! Application to glass, metal, rigid plastics, paint on flat surfaces. Service Temperature range: -54°C to +93°C. Min. application temperature: +10°C
Scotchgard™ 8995-124	Can be used on substrates other than graphic film! Application to aluminum, glass, PMMA, PC*, ABS, paint on flat surfaces.

* Might require drying with heat before use.

Clears	All products	- For use on graphic film surfaces only - Additional important information available at named product bulletins below
	Clear 1920DR Clear 1930	3M™ Screen Printing Ink Series 1900
	Clear 1955ABC	3M™ Screen Print Clear 1955 ABC
	Clear 8530	3M™ Piezo Inkjet Protective Clear 8530
	Clear 9740i	3M™ Screen Print Gloss Clear 9740i
	Clear 9800CL	3M™ Screen Printing UV Ink Series 9800

Limitations of End Uses

3M specifically does not recommend or warrant the following uses, but please contact us to discuss your needs to recommend other products.

Overlaminates

All overlaminates	Except as noted otherwise in this section or section Usage Details: - Not for applications to substrates other than graphic films. - Not for applications to substrate surface shapes other than specified in this section or recommended in the product bulletin of the base film used for graphic construction. - Not for graphics subjected to gasoline vapors or spills at gas pumps, automobile fuel-tank ports, or top-feeding petroleum tankers. - Do not print on overlaminate. - 3M Commercial Graphics Division products are not tested against automotive manufacturer specifications! - Non vertical applications will have a significant decrease in durability!
3640GPS 3642GPS	Not for application to other 3M brand GPS films or Panagraphics III substrate or for graphics subjected to intentional or accidental abrasion. Not recommended for protection of fleet graphics.
3645	Not for exterior usage. Use with recommended base films only.
3647	No exposure to vehicle traffic and heavy equipment. Use with recommended base films only.
3649	Not for exterior usage. Use with recommended base films only.

	8150	Use with recommended base films only.
	8908 8909	No application to outdoor banner materials and reflective graphic film. No heat applied to premasked graphics. Not for use on films that must be streched during application. Excessive stretching causes the overlaminte to appear white.
	Scotchgard™ 8991 8991R	Not for use for other than flat surfaces. Not for cut film applications, flexible substrates, gypsum wallboard, poor paint adhesion, porous or unsealed surfaces. Not for vandalism or excessive product misuse that damages the substrate.
	8914i	Do not use application tape for any graphics made with this overlaminate.
	Scotchgard™ 8993	Not for use for other than flat surfaces.
Clears	All Clears	Limitations of End Uses like described in the corresponding product bulletin (see usage details).

Converting Information

Inkjet Printing

A too high total physical ink amount on the film results in media characteristic changes, inadequate drying, overlaminate lifting, and/or poor graphic performance. The maximum recommended total ink coverage for this film is 270%.

Adequately Dry Graphics

Inadequate drying can result in graphic failure including curling, increased shrinkage and adhesion failure, which are not covered under any 3M warranty.

Poorly dried film becomes soft and stretchy, and the adhesive becomes too aggressive.

Even if your printer has a dryer, it may not adequate dry latex and solvent inks in the short period of time it spends passing through the heater.

Recommendations to improve the drying of solvent inks

Dry the graphic unrolled or at least as a loose wound roll standing upright. To further increase air circulation place the spooled film roll on a grid, and place a fan beneath the grid.

If you only spool open the film, adequate drying could still take a week, depending on the environment.

Build enough time into your process to ensure adequate drying of the graphic. 3M recommends at least a minimum drying time of 24 hrs before further processing. Test: Fold a piece of film with maximum ink laydown of the graphic onto itself. Apply 140 g/cm² for 15 minutes, release and check for effects like sticking or dull spots. These are clear indications that further curing or drying is needed.

Unlike solvent inks, spooling and letting latex printed graphics sit does not help to cure the ink, but does allow the graphic manufacturer to see if any oily spots are generated which may interfere with proper adhesion of overlaminates.

To ensure proper latex ink drying, use the following recommendations:

Media Presets: HP media presets contain all the needed settings to print on a specific media.
Download and use media presets from the following page: www.hp.com/go/mediasolutionslocator.

Environmental Conditions: HP media presets have been specially designed and tested for each printer-media combination. Recommended environmental conditions: +20°C to +25°C, Humidity 40% - 60% RH

Important notice for HP 831/871 and HP 881/891

The amount of ink printed is the main key for proper overlaminate adhesion. Select a media preset using 100% or less ink density.

Post-processing of latex printed graphics immediately after printing

Latex inks should emerge from the printer fully dried. Post-air drying of a wet print will not enable drying, since latex ink drying requires that the dried ink is heated above the film formation temperature of the latex inside the printer.

For immediately post-processing of latex printed graphics follow strictly the recommendations given above (Section: Latex inks are different) and test the proper drying with the following performance tests:

Visual Test: Check the image immediately after printing. The sample should not be wet or sticky to the touch, or have an 'oily' feel when it emerges from the printer.

Rubbing Test: After the visual inspection, wipe the printed sample with a white wet paper towel. Fully-dried ink should resist wiping and should not show any stains on the white cloth. If the ink is easily removed by wet rubbing, then it is not dried.

Stacking Test: In some cases, the top surface will appear dry after printing but within a few minutes ink may migrate to the surface leaving an oily aspect. To ensure proper drying, stack at least 12 sheets liner to printed side and let sit for one hour.

After 1 hour, remove the stack and check for "oily" stains, wet surfaces or glossiness changes on high ink laydown areas on each sheet. If any of these occur, then the ink is not properly dried.

If a sample is not properly dried on the printer, reprint the image under a condition that allows complete drying. Common improvement steps are:

- Increasing the drying temperature in 5 degree steps.
- Increasing the number of passes to slow down printing.
- Reducing the amount of ink printed (media preset with lower ink densities).

Allow the converted graphic to build sufficient bond prior to application/installation

8 hours minimum for graphics laminated with heated rolls (one or two). Lamination temperature: +40°C to +60°C. Lamination speed: maximum 2 meter/minute.

Application Tape

Application tape may be used to add stiffness to a graphic for easier application, hold cut graphics together while applying, or to protect graphics from scratching and other damage during application. However, many graphics with an overlaminate do not require an application tape.

See Bulletin Application Tape Recommendations for information about selection and use of suitable application tapes, please.

Maintenance and Cleaning

Use a cleaner designed for high-quality painted surfaces. The cleaner must be wet, non-abrasive, without strong solvents, and have a pH value between 3 and 11 (neither strongly acidic nor strongly alkaline.)

Refer to Instruction Bulletin 6.5 ‘storage, handling, maintenance and removal of films and sheetings’, for general maintenance and cleaning information.

Shipping Finished Graphics

Flat, or rolled printed side out on 130 mm (5“) or larger core. These methods help to prevent the liner from wrinkling or popping off the film.

Remarks

This bulletin provides technical information only.

Important Notice

All questions of warranty and liability relating to this product are governed by the terms and conditions of the sale, subject, where applicable, to the prevailing law.
Before using, the user must determine the suitability of the product for its required or intended use, and the user assumes all risk and liability whatsoever in connection therewith.

Additional Information

Visit the web site of your local subsidiary at www.3Mgraphics.com for getting:

- more details about 3M™ MCS™ Warranty and 3M™ Performance Guarantee
- additional instruction bulletins
- a complete product overview about materials 3M is offering

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