

Commercial Solutions Division

3M™ Scotchcal™ Graphic Film

Series IJ40

3M™ Controltac™ Print Film

Series 40C

Product Description

3M™ Scotchcal™ Graphic Film Series IJ40 and 3M™ Controltac™ Print Film Series 40C offer great versatility for indoor and outdoor signs and fleet graphics for solvent, eco-solvent, UV, latex inkjet printing and screen printing.

Removable versions 3M™ Scotchcal™ Graphic Film Series IJ40-10R and 3M™ Controltac™ Print Film 40C-10R are tested and approved for use in conjunction with the recommended overlamine as base film to produce graphics for floors.

This film uses 3M™ Controltac™ and 3M™ Comply™ technology.

3M™ Controltac™ minimizes the initial contact area of the adhesive and allows the applicator to reposition the film during application.

This allows easier installation of large format graphics in a wide temperature range.

Product variants with Comply™ adhesive also have air release channels for fast and easy, bubble-free graphic installations.

Product Line	Screen and inkjet printing		
	IJ40-10		white, opaque, glossy, permanent adhesive (grey).
	IJ40-10T		white, opaque, glossy, permanent adhesive (clear).
	IJ40-10R		white, opaque, glossy, removable adhesive (grey).
	IJ40-20		white, opaque, matte, permanent adhesive (grey).
	IJ40-20R		white, opaque, matte, removable adhesive (grey).
	40C-10		white, opaque, glossy, permanent adhesive (grey) with Controltac™ and Comply™.
	40C-10R		white, opaque, glossy, removable adhesive (grey) with Controltac™ and Comply™.
	40C-20		white, opaque, matte, permanent adhesive (grey) with Controltac™ and Comply™.
	40C-20R		white, opaque, matte, removable adhesive (grey) with Controltac™ and Comply™.
	IJ40-114		transparent, glossy, permanent adhesive.
	IJ40-114R		transparent, glossy, removable adhesive.
	IJ40-124		transparent, matte, permanent adhesive.
	IJ40-124R		transparent, matte, removable adhesive.

Product Characteristics

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

Physical & Application		
Material		calendered vinyl (polymeric)
Surface finish		glossy and matte (see product line)
Thickness (film)		75 µm (0.075 mm)
Adhesive type		acrylic adhesive, pressure-sensitive
		In addition: product variants with Comply™ adhesive have air release channels

Adhesive appearance	grey, except for transparent versions; some white films with clear adhesive available (indicated with letter 'T')	
	versions with Comply:	grey
Liner	back-sided Polyethylene coated paper	
	versions with Comply:	double-sided Polyethylene coated paper
Adhesion	16 N/25 mm	FTM 1: 180° peel, substrate: glass; cond: 24 h 23°C/50%RH
	removable films of series	6 N/25 mm
Application method	wet or dry	
	versions with Comply:	dry only!
Applied shrinkage	< 0.4 mm	FTM 14
Application temperature (minimum air and substrate)	+10°C	for flat surfaces
	+10°C	for curved to corrugated surfaces, with and without rivets
	use for floors:	+16°C
Service temperature (after application)	-50°C to +90°C	(not for extended periods of time at the extremes)
Surface type	flat to simple curved	
Substrate type	aluminum, glass, PMMA, PC*, ABS, paint	
	use for floors:	ceramic, finished wood, marble, sealed concrete, terrazzo, waxed vinyl
	*Might require drying with heat before use	
Graphic removal	Removable without heat and/or chemicals from supported substrates. Statement given for removable versions only! No liability is given for ease or speed of removal of any graphic. Pay attention to adequate air and substrate temperature.	

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

Storage	Shelf life	Use within two years from the date of manufacture on the sealed original box. Use within one year after opening the box.
	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 Flammability standards are different from country to country. Ask your local 3M contact for details, 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 influenced 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

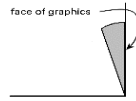
Unprocessed film The following durability data are given for unprocessed film only!

Climatic zones Graphic durability is largely determined by the climate and the angle of exposure. Find below a table showing the durability of a product according to the angle of exposure and the geographical location of the application.

- Zone 1 Northern Europe, Italy (north of Rome), Russia
- Zone 2 Mediterranean area without North Africa, South Africa
- Zone 3 Gulf area, Africa

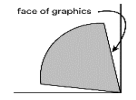
Exposure types

Vertical:



The face of the graphic is $\pm 10^\circ$ from vertical.

Non-vertical:



The face of the graphic is greater than 10° from vertical and greater than 5° from horizontal.

Interior: Interior means an application inside a building without direct exposure to sunlight.

Vertical outdoor exposure	Zone 1	Zone 2	Zone 3
white	7 years	6 years	4 years
transparent	5 years	4 years	3 years
Non-vertical outdoor exposure	Zone 1	Zone 2	Zone 3
white	3.5 years	3 years	2 years
transparent	2.5 years	2 years	1.5 years
Interior application	Zone 1	Zone 2	Zone 3
interior	7 years	7 years	7 years

Notice! Use for floors: durability (interior) - 12 months

3M™ Performance Guarantee and MCS™ Warranty

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.

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.

Graphics applied to

- flexible substrates incl. 3M™ Panagraphics™ III Wide Width Flexible Substrate.
- low surface energy substrates or substrates with low surface energy coating.
- other than flat or simply curved surfaces.
- painted or unpainted rough wallboards, gypsum boards and wallpapers.
- stainless steel.
- surfaces that are not clean and smooth.
- surfaces with poor paint to substrate adhesion.
- loose, broken or unsound flooring material.

Graphic removal from Graphics subjected to

- signs or existing graphics that must remain intact.
- gasoline vapors or spills.

Important Notice

- 3M Commercial Solutions products are not tested against automotive manufacturer specifications!
- Due to increasing winding-tension towards the roll core, surface impressions might occur with rolls of a length of more than 200 m.

Graphics Manufacturing

Graphic protection can improve the appearance, performance and durability of printed graphics. Any printed graphic exposed to abrasive conditions (including vehicles), harsh cleaners or chemicals must include graphic protection in order to be warranted.

When to use an overprint clear or overlaminate	See instruction bulletin GPO 'graphic protection options' for further information about selection and use of protective overlaminates and printable clears.
Graphic for Floors	To create a graphic for floors this film has to be protected with the recommended overlaminate. No printable clear available! > Product Bulletin Graphic Protection Options <
Shipping finished graphics	Flat, or rolled film side out on 130 mm (5 inch) or larger core. These methods help to prevent the liner from wrinkling or application tape, if used, from popping off.

Converting Information

Inkjet Printing

Adequately Dry Graphics

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%.

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 adequately 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.

Notice: Latex inks are different

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

Give laminated samples time before applying them. The adhesion bond between the laminate and the printed base film will increase with time. 24 hours minimum for room temperature laminated graphics.
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

See product bulletin ATR 'application tape recommendations' for information about selection and use of suitable application tapes for this product, please.

[> Product Bulletin Application Tape Recommendations <](#)

Refer to Instruction Bulletin 5.1 'select and prepare substrates for graphic application', for general application information.

[> Instruction Bulletin 5.1 'select and prepare substrates for graphic application' <](#)

Important Notice
Controltac™ Films

Films require high squeegee pressure to avoid air entrapment between film and substrate. Therefore the use of 3M™ PA-1 Gold Squeegee with thin and soft sleeve is recommended. Wetting of sleeves helps to avoid scratches on film surface during application. Please refer to the product's instruction bulletin for detailed information.

Graphics for Floors **Application Tapes** Graphic for floors do not require a premask or prespacing tape for application.

Avoid Lifting Cut radiuses on any sharp corners of the graphic after lamination. Do not apply finished graphic to the edge of tiles. Keep always a distance of a few centimeter to the joints (not edge of graphic to edge of tile).

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.

[> Instruction Bulletin 6.5 'Storage, Handling, Maintenance and Removal of Films and Sheetings' <](#)

Important Safety Remark

Application to glass

The application of colored or printed film onto glass with sunlight exposure can lead to glass breakage through thermal expansion of the glass. The local conditions must be examined for the danger of glass break by uneven heat absorption through sun exposure. Type of glass (insulation glass, float glass, LSG, toughened safety glass, semi-tempered glass, etc.), glass dimension, joint condition, flexibility of the sealant, quality of the edge finishing, geographical orientation and partial shadow during sun exposure are the determining factors. Light color designs and application on the outside of the window are to be preferred. A free non-applied framework of 4 mm around the entire window front can help to dissipate the absorbed warmth. According to common knowledge a thermal crack can occur at temperature differences of approx. 130°C (toughened safety glass), approx. 40°C (float glass) or approx. 110°C (semi-tempered glass). Coldest place is usually under the framework in the embedded joined window part, the warmest place is typically on the darkest place in the format. Because of the many above mentioned factors, glass breakage cannot be fully predicted, therefore 3M does not accept liability for glass breakage when using this film for window graphics.

Remarks

Important notice

This bulletin provides technical information only.

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.

As outdoor graphics age, natural weathering occurs causing a gradual reduction in gloss, slight color changes, some lifting of the graphic at the edges or around rivets, and ultimately a minor amount of cracking.

These changes are not evidence of product failure and are not covered by a 3M warranty.

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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