



## Scotchlite™ Reflective Graphic Film

Series 5100; 5100R

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### Product Bulletin

#### Product Description

These flexible, enclosed-lens and retroreflective films are designed for cut letters, decals, vehicle markings and graphics, and non-regulated signage.

These films show similar daytime and nighttime appearance, and offer excellent angularity and retain most of its retroreflectivity when wet.

Unprocessed film resists fuel vapors or occasional spills.

Transparent films are intended for use as printable basefilm and protective overlamine.

Product Line	Inkjet printing	IJ5100-10	X = color code, retro-reflective, semi-matte, permanent adhesive.
		IJ5100R-10	X = color code, retro-reflective, semi-matte, removable adhesive.
	Electrostatic printing	5100-10	X = color code, retro-reflective, semi-matte, permanent adhesive.
		5100R-10	X = color code, retro-reflective, semi-matte, removable adhesive.
	Screen printing and thermal mass transfer	5100	X = color code, retro-reflective, semi-matte, permanent adhesive.
		5100R	X = color code, retro-reflective, semi-matte, removable adhesive.

#### Product Characteristics

##### Physical & Application

These are typical values for unprocessed products.

Contact your 3M representative for a custom specification.

Material	cast vinyl	
Surface finish	semi-matte	
Thickness (film)	180 µm (0.180 mm)	
Adhesive type	pressure-sensitive	
Adhesive appearance	grey	
Liner	double-sided Polyethylene coated paper	
Adhesion	approx. 18 N/25 mm	FTM 1: 180° peel, substrate: glass; cond: 24 h 23°C/50%RH
	removable films of series	approx. 12 N/25 mm
Application method	dry only!	

Applied shrinkage	< 0.4 mm	FTM 14
Application temperature minimum (air and substrate)	+10°C +10°C +16°C	for flat surfaces for curved to corrugated surfaces with and without rivets for surfaces with deep channels
Service temperature	-34°C to +93°C	
Surface type	flat to curved, incl. rivets and deep corrugations	
Substrate type	aluminum, paint	
Graphic removal	Good to remove without or little heat. 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.	
<b>Storage</b> 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.	

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

**Durability** Unprocessed film The following durability data are given for unprocessed film only!  
 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.  
 Visit [www.3mgraphics.com](http://www.3mgraphics.com) for getting more details about 3M's comprehensive graphic solutions.

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 ±10° from vertical.

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

<b>Vertical outdoor exposure</b>	<b>Zone 1</b>	<b>Zone 2</b>	<b>Zone 3</b>
white/black	7 years	7 years	7 years
colors	7 years	7 years	7 years
<b>Interior application</b>	<b>Zone 1</b>	<b>Zone 2</b>	<b>Zone 3</b>
interior	7 years	7 years	7 years

## 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                    | <ul style="list-style-type: none"> <li>- application to competitive flexible sign substrates.</li> <li>- flexible substrates incl. 3M™ Panaflex™ Awning and Sign Facing 945GPS and 3M™ Panagraphics™ III Wide Width Flexible Substrate.</li> <li>- other than flat or simply curved surfaces.</li> <li>- painted or unpainted wallboards, gypsum boards and wallpapers.</li> <li>- stainless steel.</li> <li>- substrates other than recommended.</li> </ul> |
| Graphic removal from                   | <ul style="list-style-type: none"> <li>- signs or existing graphics that must remain intact.</li> <li>- substrates that require clean removal without risk of damage.</li> <li>- substrates with coatings (i.e.: anti-reflection, anti-scratch); coatings may be damaged during film removal.</li> </ul>   |
| Graphics subjected to Important Notice | <ul style="list-style-type: none"> <li>- regular exposure to gasoline vapors or spills at gas pumps, automobile fuel-tank ports.</li> <li>- 3M Commercial Solutions products are not tested against automotive manufacturer specifications!</li> <li>- Wet application method is not recommended for this film.</li> </ul>   |

## Special Information

The typical value of retroreflection is dependent on the film color. It is measured at a -4° entrance angle and a 0.2° observation angle and expressed in candelas per lux per square meter [cd/(lx·m²)] per **ASTM E810**.

The entrance angle is formed by a light beam striking the surface at a point and at a line that is perpendicular to the surface at the same point. Unprinted film 5100, 5100R has the following typical value of retroreflection.

film number	color name	typical coefficient
IJ5100-10; IJ5100R-10	White	100
5100; 5100R		
-10	White	100
-14	Orange	20
-64	Gold	70
-65	Rich-Gold	65
-71	Yellow	65
-72	Red	20
-74	Royal Purple	5
-75	Blue	10
-76	Light Blue	10
-77	Green	20
-78	Light Green	20
-79	Brown	5
-81	Lemon Yellow	75
-82	Ruby Red	15
-85	Black	30

## 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.

[> 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 Electronic Cutting

Based upon cutting evaluations the minimum height for text is 25 mm using upper and lowercase Helvetica Medium. The stroke width should not be lower than 1 mm.

The variable characteristics of electronically controlled cutting equipment require users to verify their specific requirements.

Sharpness of knife blade Dull blades impart a serrated look to the edge of the cut film.

Weight of knife blade The ideal weight slightly scores the liner. Too little weight does not cut completely through the film and the adhesive. Excessive weight cuts the liner and causes the blade to drag, accelerating wear and creating a serrated cut edge on the film.

Weeding The excess film should be weed (removed) as soon after cutting as practical. This is to minimize the effect of possible adhesive flow.

Temperature and relative humidity Temperature and relative humidity are minor considerations, but avoid extreme or rapid fluctuating conditions.

Roll storage Store the film in the same environment as the cutting equipment.

Further information For more details refer to our instruction bulletin 4.1 'Sheeting, Scoring, Film Cutting', please.

[>Instruction Bulletin 4.1'Sheeting, Scoring, Film cutting'<](#)

## 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 warranty. Build enough time into your process to ensure adequate drying of the graphic. Poorly dried film becomes soft and stretchy, and the adhesive becomes too aggressive. 3M recommends at least a minimum drying time of 24 hrs before further processing. Dry the graphic unrolled or at least as a loose wound roll standing upright.

## Converting Information

Formulations and processing conditions can affect ink durability. Refer to the 3M Product and Instruction Bulletins for your ink for limitations and proper usage. Graphic protection can improve the appearance, performance and durability of your graphic.

## Screen Printing

A clear coat also prevents chalking on unprinted films. Use equipment designed to handle high viscosity materials and make sure the coating is evenly applied to the specifications given in the clear's Instruction Bulletin.

Abrasion and Loss of Gloss Abrasion damage and loss of gloss are not covered by any 3M warranty. This is considered normal wear and tear.

**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'<](#)

## 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'<](#)

## 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](http://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



### Commercial Solutions

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