



# 3M™ Controltac™ Graphic Film Series VHRIJ160-10

## Product Description

Part of the 3M Rail Graphic range, 3M™ Controltac™ Graphic Marking Film VHRIJ160-10 is a removable film for promotional graphics on flat and simple curved surfaces with or without rivets.

### Key Features

- Positionable and repositionable pressure activated adhesive ideal for applying large graphics
- Piezo, screen and electrostatic printable films
- Wide application temperature range
- Pigmented adhesive for hiding power
- Removable adhesive, allowing graphics to be removed for up to 3 years
- Conformance to BS6853:1999 fire regulations
- Conformance to GM/RT 2120 Issue 2 (April 2004)

## Applications and Uses

Film series VHRIJ160-10 is intended for making removable, durable graphics. When used with the listed compatible products, these products are covered by the 3M™ MCS™ Rail Warranty.

## Limitations of End Uses

Specifically, we do not warrant this film for the following:

- Graphics regularly subjected to petroleum vapours or spills
- Graphics applied to stainless steel substrates
- Graphics applied to corrugated surfaces and three-dimensional surfaces
- Non rail rolling stock applications
- Application to substrates that do not have a clean, smooth surface or have poor paint to substrate adhesion

## Product Line

Product No.	Colour	Stock Availability
VHR160-10	White	Stock item

Please contact the 3M sales office for lead times on non-stock items. Refer to the 3M Commercial Graphics Price List for stock availability and lead times for stock items.

## Compatible Products

- 3M™ Piezo Ink Jet Ink Series 1500
- VUTEk UltraVu™ Printers UV150, 2360/3360 3000/3300, 5000/5300
- 3M™ Piezo Ink Jet Ink Series 4600 Scitex Pressjet-W™ Digital Printer
- 3M™ Screen Printing Ink Series 1900 (line and 4 colour half tone)
- 3M™ Screen Printing Ink Series 9700UV (Line and four colour half tone)
- 3M™ Overprint Clear & Edge Sealer 1955ABC
- 3M™ Edge Sealer 3950

## Main Characteristics

Property	Description
Film Type	Calendared, opaque, white, matte vinyl
Thickness	0.10mm (100 micron) without adhesive 0.13mm (130 micron) with adhesive
Adhesive type	Pressure activated, positionable, grey pigmented, removable
Liner	Premium Performance Liner 150g/m <sup>2</sup>
Suitable application surface	Flat with and without rivets
Suitable application substrates	ABS resins, aluminum, chrome, glass fiberglass-reinforced plastic, paint (check adhesion to powder or water-base paints)
Application temperature range (substrate, air and graphic)	Flat surfaces with and without rivets: 4° to 38°C*

\* For applications nearing the minimum temperature range, please contact your local technical service representative to confirm suitability of application.

## Chemical and Physical Properties

Values given are typical and are not for use in specifications. If a custom specification is desired, a request should be submitted through your sales representative.

### Physical Properties

Property	Metric Units
Tensile Strength (ISO 1184-1983)	22 N/25mm
Applied Shrinkage	0.08mm (80 micron)
Temperature Range post application	-34°C - +93°C
Reverse Impact Resistance	No cracking 45kg @ 23°C Cracking 45kg @ -17°C

### Adhesion (FTM1)

Substrate	Metric Units (N/25mm)
ABS	20
Anodised Aluminium	25
Chrome	20
Etched Aluminium	25

## Flammability

3M™ Controltac™ Graphic Film VHRIJ160-10 conforms to:-

- BS6853:1999 fire regulations, category 1a, 1b and II
- GM/RT 2120 Issue 2 (April 2004)

## Warranty

Only a 3M™ MCS™ Qualified Manufacturer or a Scotchprint® Graphics Authorised Manufacturer can produce 3M™ MCS™ Rail Warranted Graphics. The warranty period is based on field experience and exposure tests. When the graphics are processed and used according to the 3M recommendations, they should have the performance life shown in the table below. The actual performance depends on the:

- Correct combination of film and ink
- Ink formulation
- Drying methods
- Selection and preparation of the substrate
- Application methods
- Exposure conditions
- Cleaning methods

## Warranted Durability for Rail Rolling Stock in the UK

The following tables show the warranties, in years, for exposure where the face of the graphic is vertical at  $90^\circ \pm 10^\circ$ .

### Graphic Orientation



### Vertical Exposure

Face of graphic is  $\pm 10^\circ$  from vertical

Colour	Ink Series	Protective Clear Coat	Exterior	Interior
VHRIJ160-10	Unprinted	1920DR, 9720, 1955ABC	3	3
VHRIJ160-10	<b>Screen Printing</b>			
	1900/9700 Line/Halftone	1920DR, 9720, 1955ABC	3	3
VHRIJ160-10	<b>Digital Printing</b>			
	1500/4600	1920DR, 9720, 1955ABC	3	3

A clear coat protective layer will provide less abrasion resistance than a laminate. Therefore some degradation of a printed image may occur if the graphics are subjected to abrasive washing conditions.

Refer to the 3M™ MCS™ Warranty Document for details.

Note: For the full product names of the 3M products listed on this page, please see page 1.

## Drying



### Caution

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 overlamine, rolling the graphic, and applying the film. See the ink's Instruction Bulletin for more details.

## Cutting

The following are common cutting methods for VHRIJ160-10. See Instruction Bulletin 4.1 for details:

- Bandsawing
- Hot Kiss Cutting
- Drum-type electronic cutting
- Flat-bed electronic cutting
- Cold and hot steel-rule die cutting
- Guillotine
- Hand cut

## Application Tapes

The type of application tape to use depends on the type of graphic produced and the ink or overprint clear that was applied last. See Instruction Bulletin 4.3 for details.

- Use a prespacing tape if the graphic has large amounts of the liner exposed.
- Use a premasking tape if very little of the liner is exposed.

Overprint Clear	Prespacing Tape	Premasking Tape
Unprinted	SCPS-100	SCPM-19
1920DR	SCPS-100	SCPM-19
1955abc	SCPS-2	SCPS-100
9720UV	SCPM-44X	SCPM-44X

## Application

Refer to the Instruction Bulletin 5.4 and 5.5 for application details.

The following application details are for VHRIJ160-10.

### Temperature

The application temperature range:

- Flat surfaces with and without rivets is 4° to 38°C\*

\* For applications nearing the minimum temperature range, please contact local technical service representative to confirm suitability of application.

### Positioning

This film has a positionable adhesive. Application pressure bonds the adhesive to the substrate and destroys the positionability feature. The film loses its positionability feature at application temperatures above 38°C.

Do not use detergent and water or a commercial application liquid to position the graphic onto rail rolling stock.

## 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).

## Removal

Film VHRIJ160-10 may be removed from some substrates for up to one year without heat or chemicals and leave little or no adhesive residue. This should be determined by testing. However it is recommended that heat is used for all removals. See Removal Factors and Removal Methods in Instruction Bulletin 6.5.

### Removability Exceptions

1. Aged paint and metals must be tested to ensure removability. Surface oxidation or chalking may result in adhesive residue upon removal.
2. Paint and/or filler that is not firmly bonded to the substrate may be damaged when removing the film.
3. Paint that is not properly cured may prevent the film from being removed.

## Shelf Life

The shelf life of the film is 2 years and should be applied within 2 years of the receipt of film if unprocessed. Processed film should be applied within 1 year of processing and within 2 years of receipt of the film.

## Related 3M Literature

Listed below is related 3M Technical Literature which may be of interest:

Subject	Bulletin No.
<b>Product Bulletins</b>	
3M™ Piezo Ink Jet Ink Series 1500	1500
3M™ Piezo Ink Jet Ink Series 4600	4600
3M™ Screen Printing Ink Series 1900	1900
3M™ Screen Printing Ink Series 9700UV	9700
3M™ Overprint Clear & Edge Sealer 1955ABC	1955
3M™ Edge Sealer 3950	3950

Subject	Bulletin No.
<b>Instruction Bulletins</b>	
Design of graphics	2.1
3M™ Piezo Ink Jet Ink Series 1500	4.45
3M™ Piezo Ink Jet Ink Series 4600	4.43
Screen printing with ink series 1900	3.12
Screen printing with 3M™ Overprint Clear & Edge Sealer 1955ABC	3.12.2
Screen printing with ink series 9700 UV	3.4
Cold roll lamination	4.22
Scoring and cutting	4.1
Using 3M application tapes; premasking and prespacing for films	4.3
Application, substrate selection, preparation and substrate-specific application techniques for rail applications	5.1.1
Application, special applications and vehicles	5.4
Application, general procedures for interior and exterior dry applications	5.5
Storage, handling, maintenance, removal	6.5

## Glossary of Terms

### Matched Component System or MCS

The system pursuant to which Finished Graphics are produced by a Graphic Manufacturer using only 3M Products and components and manufactured in accordance with 3M's Product or Instruction Bulletins, 3M Specification Document and using 3M Approved Technologies.

### 3M™ Controltac™ Plus

A film with 3M™ Controltac™ positionable adhesive system has millions of precision-placed microscopic glass spheres embedded within its adhesive layer. These spheres help to prevent the adhesive from fully contacting the application surface until pressure is applied. This enables the graphic to be positioned, then re-positioned as many times as necessary, until it is in exactly the right place before final application.

## Health & Safety

Refer to the package label and the Material Safety Data Sheet for health, safety, and handling information on the products referenced in this bulletin. For 3M products, if necessary, you may contact our Toxicology/Product Responsibility Department on 01344 858000.

## Important Notice to Purchaser

The 3M products described in this publication are covered by a 3M warranty and limitation of liability.

3M's warranty provides that if 3M finds that goods are defective in material or workmanship they will be replaced or the price refunded at 3M's option but note that 3M does not accept liability for other direct losses (except for personal injury or death) or consequential losses relating to defective products or from information supplied by 3M.

Purchasers and users of 3M products, and not 3M supplying companies, are always solely responsible for deciding on the suitability of the 3M product for their required or intended use.

## Technical Assistance

For help on specific questions relating to 3M Commercial Graphics Division Products, contact your local Technical Service Representative.

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3M Centre, Cain Road, Bracknell  
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[www.3m.com/uk/graphicsolutions](http://www.3m.com/uk/graphicsolutions)

## Sales Assistance

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