

High Intensity Prismatic Reflective Sheeting Series 3930 with Pressure Sensitive Adhesive

Health and Safety Information

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.

Description

3M™ High Intensity Prismatic (HIP) reflective sheeting is a non-metallised microprismatic sheeting which is designed for use on permanent, static, road traffic signs and delineators that are exposed vertically in service. The sheeting is supplied with a pressure sensitive adhesive which is protected by a plastic liner.

Applied to properly prepared sign substrates, 3M High Intensity Prismatic reflective sheeting provides long term reflectivity and durability.

3M HIP is a CE marked reflective sheeting. It has been independently assessed and following a 3rd party Factory Production Control audit has been granted a European Technical Approval (ETA 08/0101) as reflectivity class R2. This ETA complies with the requirements of BS EN 12899-1:2007, clause 4.2.

3M High Intensity Prismatic also complies with the requirements of BS 8408:2005 and is rated in accordance with this standard.

The sheeting is supplied in roll widths up to 1220mm (48 inches) in the following traffic signing colours.

Colour	Product Code
White	3930
Yellow	3931
Red	3932
Blue	3935
Interstate Green	3937

Coefficients of Retroreflection

The values in Table A are minimum coefficients of retroreflection (R_A) for new sheeting expressed in candelas per lux per square metre ($cd/lux/m^2$). Measurements are made in accordance with CIE Publication 54:1982.

Table A

MINIMUM COEFFICIENTS OF RETROREFLECTION (R_A)				
Obs. Angle	Colour	Entrance Angles		
		-5°	15°	40°
12'	White	360	220	120
	Yellow	270	145	80
	Red	65	42	16
	Interstate Green	50	40	12
	Blue	30	15	9
20'	White	180	160	95
	Yellow	122	110	65
	Red	34	32	13
	Interstate Green	32	30	11
	Blue	14	10	7
1.0°	White	20	16	5
	Yellow	12	8	3
	Red	3	2	1
	Interstate Green	2	2	0.8
	Blue	1	1	0.5
2.0°	White	5	2.5	1.5
	Yellow	3	1.5	0.2
	Red	1	0.4	0.3
	Interstate Green	0.5	0.3	0.2
	Blue	0.2	#	#

value greater than zero but not significant or applicable

Table B

Colour	1		2		3		4		Luminance Factor (Y)	
	x	y	x	y	x	y	X	y	MIN	MAX
White	0.303	0.287	0.368	0.353	0.340	0.380	0.274	0.316	27.0	
Yellow	0.498	0.412	0.557	0.442	0.479	0.520	0.438	0.472	15.0	40.0
Red	0.613	0.297	0.708	0.292	0.636	0.364	0.558	0.352	2.5	11.0
Green	0.030	0.398	0.166	0.364	0.286	0.446	0.201	0.794	3.0	9.0
Blue	0.144	0.030	0.244	0.202	0.190	0.247	0.066	0.208	1.0	10.0

Colours

The chromaticity and the luminance factor shall comply with the limits defined in Table B. Measurements shall be made in accordance with the provisions of CIE Publication no. 15 using CIE Standard Illuminant D65 and CIE 45/0 geometry.

Application

3M™ High Intensity Prismatic Reflective Sheeting Series 3930 has a pressure-sensitive adhesive that should be applied at room temperature (18 - 28°C) or higher by any of the following methods:

1. Mechanical squeeze roll powered laminator
2. Hand squeeze roll applicator
3. Hand application

Hand application is recommended for legends and copy only. Application of sheeting for backgrounds must be done with a laminator. Series 3930 sheeting should be butt joined when more than one piece of sheeting is used on one piece of substrate. The sheeting pieces should not touch each other at the join and a gap of 1 to 1.5 mm is recommended to prevent buckling as sheeting expands in extreme temperature /humidity exposure.

Substrates

For traffic sign use, properly prepared aluminium and British Steel HP200 are the only substrates on which this product is warranted by 3M. See Instruction Bulletin 1.5 for recommended substrate preparation.

Users are urged to carefully evaluate all other substrates for adhesion, flatness, resistance to warping and sign durability. Sign failures caused by the substrate or improper surface preparation are not the responsibility of 3M. Plastic substrates are not recommended where cold shock performance is essential.

3M High Intensity Prismatic reflective sheeting is designed primarily for application to flat substrates.

Process Colours

3M High Intensity Prismatic reflective sheeting may be processed into traffic signs by screen printing, before or after mounting on a sign substrate, using 3M™ Process Colour Series 880I (see Product Bulletin 880I).

Series 880I can be screen processed at 16-28°C at relative humidity of 30-60%. Use of 61T/62T screen mesh with a fill pass is recommended.

Use of other process colours is not recommended. 3M assumes no responsibility for failure of sign face legends or backgrounds that have been processed with non-3M process colours or 3M process colours other than Series 880I.

Care should be taken to avoid creasing or folding High Intensity Sheeting Series 3930 before and after screening to eliminate the possibility of cracking from improper handling techniques.

3M™ ElectroCut™ Film Series

As part of the 3M™ Matched Component System™, ElectroCut Film 1170 can be applied over 3M High Intensity Prismatic reflective sheeting using 3M TPM5 Transfer Tape. ElectroCut Film is especially suitable for small quantities of signs where screen printing may be uneconomic.

Digital Printing

Digitally printed HIP signfaces may be manufactured using the Durst Rho 161TS and 3M 8800 UV inks and 1170 clear overlay. Graphics made using this 3M system of matched and warranted components meet all the same requirements as screen printed HIP signs.

Edge Sealing

Edge sealing 3M High Intensity reflective sheeting is generally not required. Following outdoor exposure, dust particles may become trapped within the row of cut cells along the sheeting's edge. This should not adversely affect the performance of the rest of the applied copy.

Narrow width markings or letters should be a minimum of 18mm stroke width. Where possible screen printing or 3M ElectroCut™ Film is recommended.

Cutting and Matching

3M High Intensity Prismatic reflective sheeting may be hand cut or die cut one sheet at a time, and band sawed or guillotined in stacks. The sheeting can be hand cut from the face side with a sharp knife or other sharp hand tool.

Cutting equipment such as guillotines and metal shears that use pressure plates to hold the sheeting when cutting may damage the optics. To reduce pressure on and eliminate damage to the sheets the pressure plate should be padded. Stack heights may vary with condition and type of equipment used, but should not exceed 50 sheets.

NOTE: As with all reflective sheetings, when two or more pieces are used side by side on a surface they must be matched to assure uniform daytime colour and night appearance.

Prespacing

Use 3M™ Scotchcal™ Prespacing Tape Series SCPS-100 as a carrier for die cut letters, numerals or symbols for rapid, accurate application of legends.

Cleaning

Signs that require cleaning should be flushed with water, then washed with a dilute solution of mild, non-abrasive detergent and soft bristle brush or sponge. Avoid pressure that may damage the sign face. Flush with water following washing. Do not use solvents to clean signs.

Note: Signs covered with 3M Dew Resistant overlay must be flushed with clean water only. Detergents must not be used.

Storage

3M High Intensity Prismatic reflective sheeting should be stored in a cool, dry area, preferably at 18-28°C and 30-60% relative humidity and should be applied within one year of delivery.

Rolls should be stored horizontally in the shipping carton. Partially used rolls should be returned to the shipping carton or suspended horizontally from a rod or pipe through the core. Unprinted sheets should be stored flat. Unmounted-screened faces must be interleaved with SCW-82 slipsheet, glossy side against the sign face.

Indoor Storage of Finished Signs

Finished signs and applied blanks should be stored face to face, on edge on wooden battens. Signs must be protected with SCW-568 slipsheet paper or with the plastic liner. Place the glossy side of the protective layer against the sign face. Double-faced signs must have the glossy side of the slipsheet against each face of the sign.

Outdoor Storage of Finished Signs

If outdoor storage is necessary, remove all packaging and store face to face, on edge on wooden battens with a gap between the signfaces to allow air movement.

Signs kept in metal containers must be stored as above for outdoor storage.

Panels or finished signs must remain dry during shipment and storage. If packaged signs become wet, unpack immediately and store as for outside storage to allow signs to dry.

Avoid banding, crating, or stacking signs or faces. Package for shipment in accordance with commercially accepted standards to prevent movement and chafing.

Effective Life

The effective life of 3M High Intensity Prismatic reflective sheeting will depend on substrate selection and preparation, compliance with recommended application procedures, weather exposure and maintenance.

Permanent static road traffic signs incorporating 3M High Intensity Prismatic reflective sheeting applied to aluminium or British Steel HP200 substrates which have been prepared according to 3M recommended procedures, have an expected performance life of 12 years when mounted vertically.

Application to sign substrates other than aluminium or British Steel HP200 or preparation of aluminium in ways other than recommended may shorten the effective life. Application to unprimed, excessively rough or non-weather resistant surfaces will shorten the effective life. The user must determine the compatibility / suitability of any other substrates for the intended use.

Under certain conditions effective life may be shorter due to sign location, climatic conditions and method of installation.

Important Notice to Purchaser

Technical information provided by 3M is based on experience and/or tests believed to be reliable but its accuracy is not guaranteed and the results may not be relevant to every user's application. 3M does not accept responsibility or liability, direct or consequential, arising from reliance upon any information provided and the user should determine the suitability of the products for their intended use.

Nothing in this statement will be deemed to exclude or restrict 3M's liability for death or personal injury arising from its negligence.

All questions of liability relating to 3M products are governed by the seller's terms of sale subject where applicable to the prevailing law.

If any goods supplied or processed by or on behalf of 3M prove on inspection to be defective in material or workmanship 3M will (at its option) replace the same or refund to the Buyer the price of the goods or services. Except as set out above, all warranties and conditions, whether expressed or implied, statutory or otherwise are excluded to the fullest extent permissible at law.

Technical Assistance

For help on specific questions relating to 3M Traffic Safety Systems Division products, contact your local Technical Service Representative.

Traffic Safety Systems Division

3M United Kingdom PLC

3M Centre

Cain Road

Bracknell

Berks

RG12 8HT

Tel: 01344 857950

Fax: 01344 857970