3M™ Reflective Sheeting Series 3210

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.

Description

3M Reflective Sheeting Series 3210 is a durable flexible retroreflective sheeting consisting of spherical lens elements enclosed within a transparent resin having a smooth flat outer surface. This sheeting retains its high reflectivity when totally wet by rain.

Series 3210 a high tack pressure sensitive adhesive. The adhesive is protected by a removable liner.

Photometric Requirements

The values in Table 1 are minimum coefficients of retroreflection and are expressed in candelas per lux per square metre (cd./lux/m^2) Measurements are made in accordance with CIE publication 54.

TABLE 1: COEFFICIENT OF RETROREFLECTION

Entrance Angle	Observation Angle	White*	Yellow*
5°	12'	70	50
	20'	50	35
	1.0°	5	3
15°	12'	55	35
	20'	45	20
	1.0°	3	2
40°	12'	10	7
	20'	9	5
	1.0°	1.5	0.5

(cd./lux/m^2)*

The sheeting shall maintain 90% of the values in Table 1 with water falling on the sheeting.

Colour Requirements

The chromaticity co-ordinates and luminance factors shall comply with the limits of Table 2. Measurements shall be made in accordance with the provisions of CIE Publication no. 15 using CIE Standard Illuminant D65 and CIE 45/0 geometry.

TABLE 2: CHROMATICITY COORDINATES

Colour	1		2		3		4		Min Lum. Factor
	x	y	x	y	x	y	x	y	
White (090)	0.355	0.355	0.305	0.305	0.285	0.325	0.335	0.375	0.35
Yellow (091)	0.545	0.454	0.487	0.423	0.427	0.483	0.465	0.534	0.27

Application

Series 3210 sheeting has a high-tack pressure sensitive adhesive especially designed for application to plastic and rough substrates, as well as recommended metal substrates. It can also be applied at lower temperatures (5°C and above). Application by hand or by mechanical or hand squeeze roll applicator is recommended.

These sheetings are most easily handled and applied when air and substrate surface temperatures are between 8°C and 28°C. To avoid cracking, hand application should be done carefully with a plastic applicator or a 5cm rubber hand roller.

To minimise the possibility of wrinkling, air entrapment or cracking when applying large emblems, premasking or prespacing with 3M application tape is recommended for ease of handling.

These reflective sheetings are suitable for use on flat surfaces. Although flexible, they may not conform to embossed or compound curved surfaces. Trial application should be made to determine the suitability of the material for this purpose.

Fabrication

Colour Processing

For screen-printing, the 3M™ Process Colour 990 is recommended. Surface contamination prior to screen-printing may result in spots where colour does not cover properly. If this occurs, the condition may be minimised or eliminated by wiping each sheet with a clean rag dampened with VM & P Naptha, Xylol, or 3M™ Thinner 911 / Thinner T11A before screen printing.

Sheeting which is to be printed with more than one colour should be maintained at constant temperature and humidity during conditioning and processing. Processing should be conducted as continuously as possible to ensure good registration of the colours.

Cutting

The sheeting may be hand cut, band sawn, guillotined or die-cut.

Storage

For best results, 3M™ Reflective Sheeting Series 3210 should be stored in a cool, dry area, preferably at 18°C to 28°C and 30% to 60% relative humidity, and should be applied within one year of date 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. Cut sheets should be stored flat.

Applied sheeting must be protected. The adhesive liner can be used for this. Place the plastic coated side of the liner against the sign face. Double-sided signs must be slip sheeted on both sides.

Avoid banding, crating, or stacking that puts panels, copy and finished signs under pressure. Package in accordance with commercially accepted standards to prevent movement and chafing, which may cause damage to the sheeting during shipment.

Maintenance

Clean the sheeting surface by rinsing and/or washing with a mild, non-abrasive detergent and water, using a soft brush or cloth. A solvent such as paraffin will remove tar, oil or road film.

Effective Performance Life

3M Reflective Sheeting Series 3210, are designed for relatively short life traffic control devices and emblems. It is not recommended for the manufacture of permanent road traffic signs, but it is suitable for the manufacture of temporary signs used at roadworks and construction sites.

When applied in accordance with these procedures a satisfactory performance of up to 3 years can be expected when exposed under normal vertical conditions in most climates and environments.

The sheeting is considered as performing effectively for the number of years stated above, if the sheeting has not deteriorated due to natural causes to the extent that (1) the device or emblem is ineffective for its intended purpose when viewed from a vehicle, or (2) if, after removal of surface dirt, according to the - recommendations of the reflective sheeting manufacturer, the average night time reflective - brightness is less than one half of the brightness values specified in Table 1.

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.

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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, contact your local Technical Service Representative.

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