



High Intensity Prismatic Reflective Barricade Sheeting

Series 334/336 With Pressure Sensitive Adhesive

Market Test Product Bulletin 334/336

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Replaces MT PB 334/336 dated April 2005

Description

3M™ High Intensity Prismatic Reflective Barricade Sheeting Series 334/336 are prestriped orange and white barricade sheetings intended for reflectorizing work zone traffic control barricades. Series 334/336 sheetings are designed for use on aluminum, wood substrates, and flame treated rigid plastic board panels as detailed in 3M Information Folder 1.7.

3M High Intensity Prismatic Reflective Sheeting Series 334/336 consists of impact resistant prismatic lens reflective sheetings precoated with pressure sensitive adhesive and available in the following prestriped configurations:

Table I
Barricade Sheeting Configuration

Orange/White

- 4" left stripe 334-L
- 4" right stripe 334-R
- 6" left stripe 336-L
- 6" right stripe 336-R

Note: "Left" sheetings have stripes that slope from upper left to lower right and are placed on the left to move traffic to the right. Right sheetings are the opposite.

Photometric Coefficients of Retroreflection

The values in Table II are minimum coefficients of retroreflection expressed in candelas per foot candle per square foot (candelas per lux per square meter).

Test for Coefficients of Retroreflection

Measurements are made in accordance with ASTM E810 "Standard Test Method for Coefficient of Retroreflection of Retroreflective Sheeting," except that the Table II values shall be measured only at the 90° rotation angle*. The observation angles shall be 0.2° and 0.5°, the entrance angle (B₁) shall be -4°, +30°, and +45°, and the entrance angle (B₂) = 0°. All measurements shall be made after cleaning according to 3M recommendations. *This sheeting does not have a preprinted datum mark. For testing purposes a datum arrow should be marked on the specimen per ASTM E 810. The direction of this arrow should be inclined 45° from the preprinted barricade stripes. The result is that measurements at 90° rotation are taken with the barricade stripes oriented +45° from the observation plane.

Table II
Minimum Coefficient of Retroreflection
R_A Candelas per Foot Candle per
Square Foot or Candelas per Lux per Square Meter
(90° Rotation)

-4° Entrance Angle

	Observation Angle ¹	
	0.2°	0.5°
White	360	150
Orange	145	60

30° Entrance Angle

	Observation Angle ¹	
	0.2°	0.5°
White	170	72
Orange	68	28

¹Observation Angle - The angle between the illumination axis and the observation axis.

Table III - CIE Chromaticity Coordinate Limits² for new sheeting

Color	1		2		3		4		Limit Y (%)	
	x	y	x	y	x	y	x	y	Min.	Max
White	.305	.305	.355	.355	.335	.375	.285	.325	40	-
Orange	.550	.360	.630	.370	.581	.418	.516	.394	7	27

²The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE 1931 standard colorimetric system measured with standard illuminant D64.

Color

Conformance to color requirements shall be determined by instrumental method in accordance with ASTM E-1164 on sheeting applied to aluminum test panels. The values shall be determined on a Hunter Color Flex 45/0 spectrophotometer. Computations shall be done in accordance with ASTM E-308 for the 2° observer.

Recommended Application Procedures

Series 334/336 sheetings may be applied to barricade panels using a squeeze roll applicator or by hand. The application temperature (and substrate temperature) should exceed 60°F. If hand applied, sheeting should be applied with firm pressure using a plastic squeegee or rubber roller. 3M recognizes that some customers will choose to apply Series 334/336 sheetings to plastic substrates. Without endorsement of the use of such substrates, some comments regarding their use can be made. Plastics, including fiberglass laminates, vary as to type, composition, and manufacture, so that their use as an application surface requires careful evaluation under actual use conditions. Some plastics embrittle on exposure and some plastics contain migrating constituents that may contaminate the adhesive or cause sheeting discoloration and adversely affect performance. Also, some plastics are affected by ingredients in the sheeting adhesives that migrate into the panel. Sheeting must NOT be applied to transparent or translucent materials as light transmission may adversely affect adhesion. Application of Series 334/336 sheeting to plasticized polyvinyl chloride (PVC) devices is not recommended. 3M Information Folder 1.7 may provide further insight into applications on plastic substrates. **Note:** Care must be taken to avoid stretching Series 334/336 sheetings during application.

Health and Safety Information

Read all health hazard, precautionary and first aid statements found in the Material Safety Data Sheet, and/or product label of chemicals prior to handling or use.

General Performance Considerations

The durability of 3M High Intensity Prismatic Reflective Barricade Sheeting Series 334/336 will depend upon many factors including, but not limited to, substrate selection and preparation, compliance with recommended application procedures, geographic area, exposure conditions, and maintenance. The user must determine the suitability of this material on any specific substrate (plastic, metal, or wood) for its intended use. Applications on unprimed, excessively rough or non-weather resistant surfaces, some plastics, or exposure to severe or unusual conditions can reduce the durability of such applications.

Warranty

3M warrants that 3M™ High Intensity Prismatic Reflective Barricade Sheeting Series 334/336 sold by 3M to be used as components for traffic control devices in the United States and Canada will remain effective for its intended use for three years, subject to the following provisions: If the 3M high intensity grade prismatic barricade surface is applied to barricade blank materials in accordance with all 3M application and fabrication procedures provided in 3M's product bulletins, information folders and technical memos, including the exclusive use of 3M recommended application equipment; and if the barricade panel deteriorates within three years due to natural causes to the extent that: 1) the panel is ineffective for its intended purpose when viewed from a moving vehicle under normal day and night driving conditions by drivers with normal vision, or 2) the coefficient of retroreflection is

less than 50% of the values given in Table II, 3M's sole responsibility and purchaser's and user's exclusive remedy shall be: that 3M will provide pro-rata replacement of the 3M materials:

If failure occurs within the first year from the date of fabrication, 3M will, at its expense, restore the sheeting surface to its original effectiveness. If failure occurs in the second year, two-thirds sheeting will be replaced. If failure occurs in the third year, one-third sheeting will be replaced.

Conditions

Such failure must be solely the result of design or manufacturing defects in the 3M high intensity grade prismatic reflective sheeting and not of outside causes such as: improper fabrication, handling, maintenance or installation; use of process colors, thinners, coatings, or overlay films and sheetings not made by 3M; use of application equipment not recommended by 3M; failure of sign substrate; exposure to chemicals, abrasion and other mechanical damage from fasteners used to mount the sign; sign burial; collisions, vandalism or malicious mischief.

3M reserves the right to determine the method of replacement. Replacement sheeting will carry the unexpired warranty of the sheeting it replaces. Claims made under this warranty will be honored only if the signs have been dated at the time of sheeting application, which constitutes the start of the warranty period. Claims made under this warranty will be honored only if 3M is notified of a failure within a reasonable time, reasonable information requested by 3M is provided, and 3M is permitted to verify the cause of the failure.

Limitation of Liability and Remedies

3M's liability under this warranty is limited to replacement or allowance as stated herein, and 3M assumes no liability for incidental or consequential damages such as lost profits, business or revenue in any way related to the product regardless of the legal theory on which the claim is based.

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Literature Reference

- IF 1.3 Instructions for Squeeze Roll Applicator
- IF 1.5 Hand Application Instructions
- IF 1.6 Instructions for Hand Squeeze Roll Applicator
- IF 1.7 Sign Base Materials
- IF 1.8 Color Application Instructions
- IF 1.10 Cutting, Matching, Premasking, and Prespacing Instructions
- IF 1.11 Storage Maintenance, and Removal Instructions

FOR INFORMATION OR ASSISTANCE

CALL:

1-800-553-1380

IN CANADA CALL:

1-800-265-1840

Fax-on-Demand in the U.S. and Canada:

1-800-887-3238

Internet:

www.3M.com/tss

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Traffic Safety Systems Division

3M Center, Building 0225-05-S-08
St. Paul, MN 55144-1000
1-800-553-1380
www.3M.com/tss

3M Canada Company

P.O. Box 5757
London, Ontario N6A 4T1
1-800-3MHELPS

3M México, S.A. de C.V.

Av. Santa Fe No. 55
Col. Santa Fe, Del. Alvaro Obregón
México, D.F. 01210

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