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Transportation Safety Division

3M™ Advanced Flexible Engineer Grade Reflective Sheeting Series 7300

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Initial Issue

1 Description

3M Advanced Flexible Engineer Grade Reflective Sheeting is a non-metallized, corrosion free, microprismatic reflective sheeting. Series 7300 sheeting, as manufactured by 3M ("Sheeting"), meets the requirements of ASTM D4956 Type I. It has been specially designed to have high scratch resistance and is flexible and durable. The adhesive on Series 7300 Sheeting has been optimized for application to a variety of traffic control devices, including plywood, metal, and both flat and curved reboundable plastic substrates. Series 7300 Sheeting incorporates a microseal technology that gives the Sheeting a more uniform appearance and a whiter base color compared to beaded sheetings. The microseal technology also makes the Sheeting plotter and die-cuttable, and eliminates the need for edge sealing. Series 7300 Sheeting features microprismatic optics that return light to drivers under a diverse set of nighttime viewing geometries that are encountered by the driving public. When applied to properly prepared substrates, the Sheeting provides long-term reflectivity and durability.

Series 7300 Sheeting is available in the following colors.

Table 1. Product Codes by Color

Color	Product Code
White	7310
Yellow	7311
Orange	7314
White/Orange 4" Stripe Barricade L/R	7334L/7334R
White/Orange 6" Stripe Barricade L/R	7336L/7336R

2 Specifications

2.1 Coefficient of Retroreflection and Chromaticity

Minimum coefficient of retroreflection (R_A), color specification limits, and daytime luminance factor (Y%) data for Series 7300 are given in Table 2 and Table 3, respectively.

Table 2. Minimum Coefficient of Retroreflection, R_A, cd/fc/ft^2 (cd/lx/m^2). Measurements taken according to ASTM D4956.

Observation Angle[1] (°)	Entrance Angle[2] (°)	White	Yellow	Orange
0.2	-4	70	50	25
0.2	+30	30	22	7
0.5	-4	30	25	13
0.5	+30	15	13	4

1. Observation Angle - The angle between the illumination axis and the observation axis.
2. Entrance Angle - The angle from the illumination axis to the retroreflector axis. The retroreflector axis is an axis perpendicular to the retroreflective surface.

Table 3. Color Specification Limits (Daytime)

									Daytime Luminance Factor (Y%)	
Color	x	y	x	y	x	y	x	y	Min.	Max
White	.303	.300	.368	.366	.340	.393	.274	.329	27	
Yellow	.498	.412	.557	.442	.479	.520	.438	.472	15	45
Orange	.558	.352	.636	.364	.570	.429	.506	.404	14	30

3 Adhesive

Series 7300 Sheeting incorporates a pressure sensitive adhesive that has been specially designed for low energy surfaces, including moderately rough or porous wood, plastic, and a variety of metal surfaces. This high performance adhesive system has been designed to retain its elasticity over a wide temperature range. This assures durable adhesion to a variety of substrates, even upon cold impact.

4 Substrates

The most reliable and durable traffic devices and signs are made from properly prepared substrates. It is up to the individual customer to determine if a substrate is appropriate for a specific purpose. Users are urged to carefully evaluate all other substrates for adhesion and device durability. Refer to 3M Information Folder 1.7 for surface preparation recommendations. Substrates with low surface energies may require additional preparation steps, such as flame treatment, mechanical abrasion, or use of adhesion promoters, prior to Sheeting application. Sheeting failures caused by substrate failures or improper surface preparations are not the responsibility of 3M. User is responsible for determining whether the 3M product is suitable for a particular purpose and application.

5 Application

5.1 Pressure Sensitive Adhesive

Series 7300 Sheeting incorporates a pressure sensitive adhesive and should be applied to substrates at room temperature, 60°F (16°C), or higher using any of the methods described below. If Sheeting temperature is below 60°F (16°C), allow it to remain at 60-75°F (16-24°C) for at least 24 hours before application.

5.2 Application Equipment

1. 48" Interstate Squeeze Roll Applicator (see 3M Information Folder 1.4)
2. Hand Squeeze Roll Applicator (HSRA) (see 3M Information Folder 1.6)

Note: When using a HSRA with an air cylinder kit, apply the minimum tension needed to properly position the Sheeting on the substrate. A nip roller pressure of 80 psi is recommended.

5.3 Hand Application

To maximize initial adhesion, use firm pressure with a 2" (5 cm) rubber roller or plastic squeegee. Multiple, heavy overlapping strokes should be used. Squeegee all edges. Do not stretch Sheeting during application. Maintain minimum distance between liner removal and adhesive contact point. See 3M Information Folder 1.5 for detailed hand application instructions.

5.4 Other Application Methods

Customized application equipment exists for a wide range of flat and curved substrate surfaces. Series 7300 Sheeting has been found to be compatible with a variety of customized application equipment. Please contact 3M Technical Service for more information.

6 Imaging by Screen Processing

Series 7300 Sheeting may be screen processed using 3M Process Colors Series 880 or 990. Process at a temperature of 60-100°F (16-38°C) and a relative humidity of 20-50%. If other series process colors are used, it is the user's responsibility to determine their suitabilities and durabilities. 3M assumes no responsibility for premature failures of sign face legends that have been processed with non-3M process colors. Since 3M has no control over colors made by other manufacturers the user should check with the process color manufacturer for processing recommendations and assurance of performance prior to any extensive use. To screen process traffic signs, a P.E. 157 screen mesh screened with a fill pass is recommended. Clear coating is neither required nor recommended. Consult 3M Information Folder 1.8 for details.

7 Imaging by Digital Processing

Series 7300 Sheeting is compatible with a variety of digital printing systems. Please contact 3M Technical Service for more information.

8 Cutting Methods

Users are encouraged to evaluate cutting procedures for their own equipment and shop conditions. Series 7300 Sheeting may be hand cut, die cut, plotter cut, or guillotined multiple sheets at a time. Compared to beaded sheeting, extended blade life can be expected when cutting Series 7300 Sheeting. Sheeting may be cut into any desired shape, including cone sleeves. Sealing of the cut edges of Series 7300 Sheeting is not required. Details regarding cutting methods can be found in 3M Information Folder 1.10.

9 Cleaning

Devices and signs that require cleaning should be flushed with water then washed with a detergent solution and soft bristle brush or sponge. Avoid pressure that may damage the device or sign face. Flush with water following washing.

10 Storage and Packaging

Series 7300 Sheeting should be stored in a cool, dry area, preferably at a temperature of 60-75°F (16-24°C) and a relative humidity of 30-50%, and be applied within two years of date of manufacture. Rolls should be stored horizontally in their shipping cartons. Partially used rolls should be returned to their shipping cartons or suspended horizontally from rods or pipes through their cores. Unprocessed sheets should be stored flat. Refer to 3M Information Folder 1.11 for instructions on packing for storage and shipment.

11 Health and Safety Information

Read all health hazard, precautionary, and first aid statements found in the Safety Data Sheets (SDS) and Article Information Sheets for important health, safety, and environmental information. To obtain SDSs and Article Information Sheets for 3M products, go to 3M.com/SDS, contact 3M by mail, or for urgent requests call 1-800-364-3577.

12 Durability and Performance

The durabilities of Series 7300 Sheeting applications will depend upon substrate selection and preparation, compliance with recommended application procedures, geographic area, exposure conditions, and maintenance practices. Maximum durabilities can be expected in applications subject to vertical exposures on stationary objects when processed and applied to properly prepared substrates according to 3M recommendations available in 3M Information Folder 1.7. The user must determine the suitability of any substrate for its intended use. Exposure to severe or unusual conditions and applications to unprimed, excessively rough, or non-weather-resistant surfaces can reduce durabilities.

Purchaser should perform appropriate tests to determine if Sheeting meets their performance requirements when applied to reboundable plastic substrates. Tests should incorporate plastic manufacturer's recommendations for impacting reboundable plastic traffic control devices.

13 Other Product Information

Always confirm that you have the most current version of the applicable product bulletin, information folder, or other product information from 3M's Website at http://www.3M.com/roadsafety.

14 Literature References

3M IF 1.4	Instructions for Interstate Squeeze Roll Applicator
3M IF 1.5	Hand Application Instructions
3M IF 1.6	Hand Squeeze Roll Applicator
3M IF 1.7	Sign Base Surface Preparation
3M IF 1.8	Process Color Instructions
3M IF 1.10	Cutting, Premasking, and Prespacing
3M IF 1.11	Reflective Sheeting Sign Maintenance Management
3M IF 3.3	Application Procedures for CW80, 3300, 3910 or 7300 Series Sheeting
3M PB 880I	3M™ Process Color Series 880I
3M PB 880N	3M™ Process Color Series 880N
3M PB 990	3M™ Process Color Series 990

ASTM Test Methods are available from ASTM International, West Conshohocken, PA.

For Information or Assistance
Call: 1-800-553-1380
In Canada Call:
1-800-3M HELPS (1-800-364-3577)

Internet:

http://www.3M.com/roadsafety

3M assumes no responsibility for any injury, loss or damage arising out of the use of a product that is not of our manufacture. Where reference is made in literature to a commercially available product, made by another manufacturer, it shall be the user's responsibility to ascertain the precautionary measures for its use outlined by the manufacturer.

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