



Engineer Grade Prismatic Reflective Sheeting

Series 3430 with Pressure Sensitive Adhesive

Meets ASTM Type I

Product Bulletin 3430 International

January 2009

Description

3M™ Engineer Grade Prismatic Reflective Sheeting Series 3430 meets ASTM D4956 Type I and is a non-metalized micro-prismatic lens retroreflective sheeting designed for production of reflective commercial signs and non-critical traffic control signs that are exposed vertically in service. Series 3430 sheeting can easily be identified by the visible integral “EGP” marking. When applied to properly prepared sign substrates, 3430 sheeting provides long-term reflectivity and durability. Series 3430 sheeting is available in the following colors.

<u>Color</u>	<u>Product Code</u>
White	3430
Yellow	3431
Red	3432
Blue	3435
Green	3437
Brown	3439

Sign Fabrication Methods

Application

Series 3430 sheeting comes with pressure sensitive adhesive and should be applied to the sign substrate at room temperature 65°F (18°C) or higher by any of the following methods:

Mechanical squeeze roll applicator - Reference 3M Information Folder 1.4 (Room temperature application)

Application to extruded guide sign panels that require edge wrapping requires heat directed at the next-to-last edge roller. Cracking or edge lifting may occur if the sheeting is not sufficiently heated during the edge wrapping process.

Hand squeeze roll applicator - Reference 3M Information Folder 1.6

Hand Application

Hand application is recommended for legend and copy only. Application of sheeting for complete signs or backgrounds must be performed with a roll laminator, either mechanical or hand. See 3M Information Folder 1.5 for more details.

Hand applications may result in visual irregularities that may be aesthetically objectionable to some customers. Such irregularities are more noticeable on darker colors. To obtain a close-up uniform appearance, a roll laminator must be used.

All direct applied copy and border MUST be cut at all metal joints and squeegeed at the joint.

Splices

Series 3430 sheeting should be butt spliced when more than one piece of sheeting is used on one piece of substrate. The sheeting pieces should not touch each other at the splice, where a gap of up to 1/16 inch is acceptable. This is to prevent buckling as the sheeting expands in extreme temperature/humidity exposure. If the visual appearance of the splice is important or a slight gap is undesirable, the following procedures must be followed:

1. Overlap the sheeting at least one inch, with or without the liner attached.
2. Using a straight edge and a sharp utility knife, cut through both layers of reflective sheeting.
3. Peel back and remove cut remnants. If liner was left on, remove and roll down remaining sheeting.
4. Seal edge with thinned 3M™ Process Color 880I Clear using a fine artist paintbrush.

Double Faced Signs - Series 3430 sheeting can be damaged by direct exposure to steel laminating rolls. When fabricating double-faced sided signs, a piece of cardboard must be placed between the sheeting and steel laminating roll. The Highway Handyman 12" HSRA is equipped with rubber top and bottom rolls that will prevent any damage the sheeting.

Substrates

For traffic sign use properly prepared sheet or extruded aluminum is recommended. While most clean, smooth, relatively non-porous, flat, rigid, weather resistant surfaces can be prepared for application of retroreflective sheeting, the user must evaluate any substrate other than aluminum for adhesion and sign durability. 3M is not liable for sign failures caused by the substrate (deformation, outgassing, cracking, warping, etc. leading to cosmetic or functional failure of the sign sheeting) or improper surface preparation. (See 3M Information Folder 1.7). Extrusions can be wrapped or trimmed, and flat panel signs are to be carefully trimmed so that sheeting from adjacent panels are not in contact with each other. Series 3430 sheeting is designed primarily for application to flat substrates. Any use that requires a radius of curvature of less than five inches should also be supported by rivets or bolts. Plastic substrates are not recommended where cold shock performance is essential.

Screen Processing

Series 3430 sheeting may be screen processed into traffic signs before or after mounting on a sign substrate, using 3M Process Colors Series 880I (see Product Bulletin 880I) or Series 880N (see Product Bulletin 880N). Series 880I or 880N process colors can be screened at 60-100°F (16-38°C) at relative humidity of 20-50%. A PE 157 screen mesh with a fill pass is recommended. See Information Folder 1.8 for details. Use of other process colors series is not recommended. 3M assumes no responsibility for failure of sign face legends or backgrounds that have been processed with non-3M process colors or 3M process colors other than those listed above.

For white sheeting screen printed with 3M transparent inks or covered with 3M™ Electrocut™ Film Series 1170, the R_A for the colored areas should be no less than 70% of the minimum R_A as specified in Table A for the corresponding integral colored sheeting.

Care should be taken to avoid flexing Series 3430 sheeting before and especially after screening to eliminate the possibility of cracking from improper handling techniques.

Cutting and Matching

The sheeting may be hand cut or die cut one sheet at a time, and band sawed or guillotined in stacks. Series 3430 sheeting can be hand cut from either side with a razor blade or other sharp hand tool. Like all reflective sheetings, when two or more pieces are used side by side on a sign, they must be matched to assure uniform daytime and nighttime appearance.

Cutting equipment such as guillotines and metal shears, that have pressure plates on the sheeting when cutting, may damage the optics. Padding the pressure plate and easing it down onto the sheets will significantly reduce damage.

Maximum stack height for cutting Series 3430 sheeting is 1-1/2 inches or 50 sheets. Details on cutting can be found in 3M Information Folder 1.10. **Note:** If direct copy is cut with a friction fed plotter, a minimum 550 gm downforce is required. When used as background, sheeting should be oriented identically across all panels or pieces of the sign for uniform appearance of sign background (the seal pattern or tiles in the same direction).

Edge sealing Series 3430 sheeting is generally not required. Following extended exposure, airborne dust particles may become trapped within the row of cut cells along the sheeting edge. This should have no adverse effect on sign performance. If the user chooses to edge seal, series 880I process color should be used.

Cleaning

Signs that require cleaning should be flushed with water, then washed with a detergent solution and bristle brush or sponge. Avoid pressure that may damage the sign face. Flush with water following washing. Do not use solvents to clean signs. See 3M Information Folder 1.10.

Storage and Packaging

Series 3430 sheeting should be stored in a cool, dry area, preferably at 65-75°F (18-24°C) and 30-50% relative humidity and should be applied within one year of purchase. 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. Unprocessed sheets should be stored flat. Finished signs and applied blanks should be stored on edge. Screen processed signs must be protected with the adhesive liner or SCW 568 slipsheet paper. Place the glossy side of the slipsheeting against the sign face and pad the face with closed cell packaging foam. Double-faced signs must have the glossy side of the slipsheet against each face of the sign.

Unmounted screened faces must be stored flat and interleaved with SCW 568 slipsheet, glossy side facing the sign face. Packages of finished sign faces must be supplemented with nylon washers for mounting. Avoid banding, crating, or stacking signs. Package for shipment in accordance with commercially accepted standards to prevent movement and chafing. Store sign packages indoors on edge.

Panels or finished signs must remain dry during shipment and storage. If packaged signs become wet, unpack immediately and allow signs to dry. See Information Folder 1.11 for instructions on packing for storage and shipment.

Installation

Nylon washers are recommended between the heads of all twist fasteners (such as screw heads, bolts, or nuts) and the sheeting to protect the sheeting from the twisting action of the bolt heads.

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™ Engineer Grade Prismatic Reflective Sheeting Series 3430 will depend upon substrate selection and preparation, compliance with recommended application procedures, geographic area, exposure conditions, and maintenance.

Engineer grade prismatic reflective sheeting can be expected to provide satisfactory performance for 5-7 years when processed with 3M matched component inks and films, depending upon climatic conditions of the installation.

Maximum durability of Series 3430 sheeting can be expected in applications subject to vertical exposure on stationary objects when processed and applied to properly prepared aluminum according to 3M recommendations provided in 3M Information Folder 1.7 on Sign Substrate Surface Preparation.

The user must determine the suitability of any nonmetallic sign backing for its intended use.

Applications to unprimed, excessively rough or non-weather-resistant surfaces, or exposure to severe or unusual conditions can shorten the performance of such applications. Signs in mountainous areas that are covered by snow for prolonged periods may also have reduced durability.

3M process colors, when used according to 3M recommendations, are generally expected to provide performance comparable to colored reflective sheeting.

Dilution of color and atmospheric conditions in certain geographic areas may result in reduced durability.

3M™ ElectroCut™ Film Series 1170 can be expected to perform satisfactorily for the life of the sign when direct applied to series 3430 sheeting.

Minimum coefficient of retroreflection, chromaticity limits, and daytime luminance factor (Y%) for the Engineer Grade Prismatic Sheeting Series 3450 are given in Table A and Table B, respectively.

**Table A - Minimum Coefficient of Retroreflection
Candelas/Foot Candle/Square Foot
Candelas/Lux/Square Meter**

Obs. ¹ Angle	Ent. Angle ²	White	Yellow	Red	Green	Blue	Brown
0.2	-4	70	50	14.5	9.0	4.0	2.0
0.2	+30	30	22	6.0	3.5	1.7	1.0
0.5	-4	30	25	7.5	4.5	2.0	1.0
0.5	+30	15	13	3.0	2.2	0.8	0.5

Reflectivity conforms to ASTM D 4956.
¹Observation Angle - The angle between the illumination axis and the observation axis.
²Entrance Angle - The angle from the illumination axis to the retroreflector axis. The retroreflector axis is an axis perpendicular to the retroreflective surface.

Table B - CIE Chromaticity Coordinate Limits

Color	x	y	Reflectance Limit (Y)							
			x	y	x	y	x	y	Min	Max
White	.303	.300	.368	.366	.340	.393	.274	.329	27.0	
Yellow	.498	.412	.557	.442	.479	.520	.438	.472	15.0	45.0
Red	.648	.351	.735	.265	.629	.281	.565	.346	2.5	12.0
Blue	.140	.035	.244	.210	.190	.255	.065	.216	1.0	10.0
Green	.026	.399	.166	.364	.286	.446	.207	.771	3.5	9.0
Brown	.430	.340	.610	.390	.550	.450	.430	.390	4.0	9.0

Warranty

3M warrants for a period up to 7 years from date of application (concrete definition of the period is subject to the terms of sale) that 3M™ Engineer Grade Prismatic Reflective Sheeting Series 3430 sold by 3M to be used for traffic control signs and delineators is free of defects in material and workmanship, subject to the following provisions: Sheeting Series 3430 must be processed and applied to a vertical ±10° surface in accordance with all 3M application and fabrication procedures provided in 3M's product and information folders, technical memos (which will be furnished to the agency upon request), including the exclusive use of 3M matched component systems, process colors, overlay films and recommended application equipment.

Conditions

Such failure must be solely the result of design or manufacturing defects in the 3M engineer 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 1.4 Instructions for Squeeze Roll Applicator PB880I 3M™ Process Color Series 880I PB880N 3M™ Process Color Series 880N
 - 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
- “Standard Highway Signs, As Specified in the Manual on Uniform Traffic Control Devices”, U.S. Department of Transportation, Federal Highway Administration, 1979.

FOR INFORMATION OR ASSISTANCE

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