

Traffic Safety and Security Division

3M™ Advanced Engineer Grade Prismatic Sheeting

Series 7930 with Pressure Sensitive Adhesive

Product Bulletin 7930 – US
February 2016

Description

3M™ Advanced Engineer Grade Prismatic Sheeting Series 7930 meets the ASTM D4956 Type I standard, and is a non-metalized microprismatic reflective sheeting designed for production of retroreflective commercial signs, non-critical traffic control signs that are exposed vertically in service, as well as pressure sensitive stickers. Micro seal technology gives Series 7930 a more uniform visual appearance compared to its conventional prismatic counterparts and a whiter base color compared to beaded sheeting. Series 7930 can be readily identified by the integral product number watermark. When applied to properly prepared sign substrates, Series 7930 sheeting provides long-term reflectivity and durability.

Table 1. Series 7930 sheeting is available in the following colors.

Color	Product Code
White	7930
Yellow	7931
Red	7932
Orange	7934
Blue	7935
Green	7937
Brown	7939

Sign Fabrication Methods

Application

Series 7930 sheeting incorporates a pressure sensitive adhesive and should be applied to the sign substrate at room temperature 65°F (18°C) or higher by any of the methods below. If the sheeting temperature is less than 65°F (18°C), allow it to remain at 65°F – 75°F (18°C – 24°C) for at least 24 hours before application. Mechanical squeeze roll applicator – Reference Information Folder 1.4.

Hand squeeze roll applicator — Reference Information Folder 1.6.

Hand application is recommended for copy only. See Information Folder 1.5. 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 panel seams and squeegeed at the joint. Squeegee used on Series 7930 must be covered with a low-friction sleeve. Change sleeve often.

Splices

Series 7930 sheeting must 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 in order to prevent buckling as the sheeting may expand with extreme temperature/humidity exposure.

Double Faced Signs

The sheeting on the bottom side of a double faced sign can be damaged if rolled through a squeeze roll applicator with an unprotected steel bottom roller. The use of a semi-soft flat sheet between the steel roller and the applied sign face will provide protection from damage. A material such as a rubber mat, tag board or cardboard is recommended.

Substrates

For traffic sign use, substrates found to be most reliable and durable are properly prepared aluminum sheets and extruded aluminum street name blades. It is up to the individual customer to determine if a substrate is appropriate for its specific purpose. Users are urged to carefully evaluate all other substrates for adhesion and sign durability. Other substrates that may be satisfactory for proper application of sheeting will have the following characteristics:

- Clean
- Smooth
- Flat
- Rigid
- Dimensionally stable
- Weather resistant
- Non-porous
- High surface energy (passes water break test)

Refer to Information Folder 1.7 for surface preparation recommendations. Substrates with low surface energy may require additional preparation such as flame treatment, mechanical abrasion or use of adhesion promoters prior to sheeting application.

Series 7930 is designed primarily for applications to flat substrates but also may be suitable for simple curves, such as a pipe. 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 required. Sign failures caused by the substrate or improper surface preparation are not the responsibility of 3M. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's application.

Imaging

For imaged areas on white sheeting when processed according to 3M recommendations, the coefficients of retroreflection should not be less than 70% of the value for the corresponding color in Table 2. The color chromaticity and luminance shall conform to Table 3.

Screen Processing

Series 7930 may be screen processed into traffic signs before or after mounting on a sign substrate, using 3M™ Process Colors Series 880N or Series 880I. Series 880N and Series 880I 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. Refer to Information Folder 1.8 for details. Clear coating is not required or recommended. Use of other process colors series is not recommended. Care should be taken to avoid flexing Series 7930 sheeting faces after screening to minimize the possibility of cracking from improper handling techniques.

Digital Printing

Series 7930 is compatible with the 3M 8800 series UV inkjet inks printed by Durst Rho 161TS & Rho 162TS printers. Series 7930 is also compatible with the 3M 8900 series UV inkjet inks printed by an EFI H1625-RS printer. Conformance to ASTM D4956 requirements for Type I sheeting has been established when 3M printing requirements are followed. A 3M clear overlamine film must be used to finish the sign face. Regional requirements might vary. Please contact your 3M Technical Service for further information on compatible overlay films. Series 7930 is compatible with select latex and solvent ink jet inks and printers. Please contact 3M Technical Service for more information on compatible systems and inks. Series 7930 is not recommended for thermal transfer printing.

Cutting and Matching

Series 7930 may be cut into letters and shapes for direct applied copy. Sealing cut edges of Series 7930 sheeting is not required.

Plotter Cutting

Users are encouraged to evaluate cutting procedures for their own equipment and shop conditions, using typical beaded Engineer Grade settings. A slight increase in down force and knife depth may be needed.

Premasking/Prespacing

1. Premasked Markings: Use Application Tape SCPM-3.
2. Prespaced Markings: Use Prespacing Tape SCPS-2 or Application Tape SCPM-3.

Other Cutting Methods

Series 7930 may be hand cut or die cut one sheet at a time, and band sawed or guillotined in stacks. Cutting equipment such as guillotines and metal shears, which have pressure plates on the sheeting when cutting, may damage the sheeting. Padding the pressure plate and easing it down onto the sheets being cut will minimize the chance of damage. Maximum stack height for cutting Series 7930 sheeting is 50 sheets. Details on cutting can be found in Information Folder 1.10.

Background Matching

To optimize uniform appearance across all viewing conditions, background sheeting should be oriented in the same direction on the sign.

Fabrication Lines

The manufacture of prismatic sheeting results in lines being present in the product. Series 7930 fabrication lines may be noticeable very near to the sign, but do not affect the functional performance of the sign. See Figure 1 for an illustration of the fabrication lines.

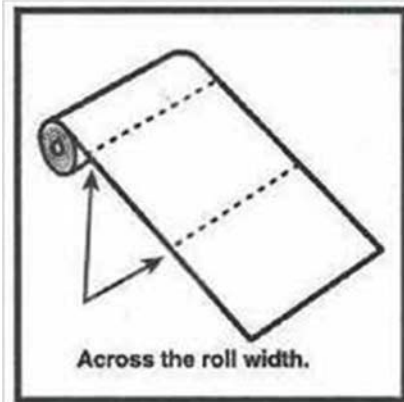


Figure 1 - Fabrication Lines

Cleaning

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 sign face. Flush with water following washing. Do not use solvents to clean signs. See 3M Information Folder 1.10.

Storage and Packaging

Series 7930 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. Processed sign faces must be protected with SCW 568 slipsheet paper. Place the glossy side of the slipsheet against the sign face. Double faced signs must have the glossy side of the slipsheet against each face of the sign.

Unmounted sign faces must be stored flat and interleaved with SCW 568 slipsheet, glossy side against the sign face.

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 edges.

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

Installation

Nylon washers are required when twist style fasteners are used to mount the sign.

Health and Safety Information

Read all health hazard, precautionary and first aid statements found in the Safety Data Sheets, Article Information Sheets, and/or product label of chemicals prior to handling or use. To obtain SDS sheets for 3M products, go to 3M.com/SDS, or by mail, or in case of an emergency, call 1-800-364-3577.

General Performance Considerations

Minimum coefficient of retroreflection, chromaticity limits, and daytime luminance factor (Y%) for Series 7930 are given in Table 2 and Table 3, respectively.

Durability Considerations

When 3M's system of matched component materials (Table 4) are used, depending upon the substrate selection and preparation, compliance with recommended application procedures, geographic area, exposure conditions, and maintenance, Series 7930 can be expected to provide satisfactory performance for up to seven years.

Applications other than vertical exposure on stationary objects may reduce durability. Periodic sign inspection and regular sign replacement are strongly recommended.

Exposure Considerations

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. Atmospheric conditions in certain geographic areas may result in reduced durability.

Custom Process Colors Considerations

Custom colors may have reduced durability.

Coefficient of Retroreflection and Chromaticity

Minimum coefficient of retroreflection, chromaticity limits, and daytime luminance factor (Y%) for Series 7930 are given in Table 2 and Table 3, respectively.

Table 2. Minimum Coefficient of Retroreflection

Candelas/Foot Candle/Square Foot Candelas/Lux/Square Meter

Obs. Angle ¹	Ent Angle ²	White	Yellow	Red	Orange	Green	Blue	Brown
0.2	-4	70	50	14.0	25	9.0	4.0	1.0
0.2	+30	30	22	6.0	7.0	3.5	1.7	0.3
0.5	-4	30	25	7.5	13	4.5	2.0	0.3
0.5	+30	15	13	3.0	4.0	2.2	0.8	0.2

Reflectivity conforms to ASTM D4956-13.

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. CIE Chromaticity Coordinate Limits

Color									Reflectance Limit (Y) Color	
	x	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	15.0
Orange	.558	.352	.636	.364	.570	.429	.506	.404	10.0	30.0
Blue	.140	.035	.244	.210	.190	.255	.065	.216	1.0	10.0
Green	.026	.399	.166	.364	.286	.446	.207	.771	3.0	12.0
Brown	.430	.340	.610	.390	.550	.450	.430	.390	1.0	9.0

Table 4. System of Matched Component Materials

Matched Components	
Process Color	Series 880N or Series 880I
UV Inkjet Inks	8800UV, 8900UV
Slipsheet	SCW 568
Prespacing Tape	SCPS-2
Premasking Tape	SCPM-3
Transfer Tape	TPM-5

Additional General Performance Considerations for Orange

Advanced Engineer Grade Prismatic Sheeting Orange 7934 can be expected to provide satisfactory performance for up to three years when processed with 3M's system of matched components listed in Table 4, depending upon climatic conditions of the installation. The user must determine the suitability of any sign substrate for its intended use. Applications to unprimed, excessively rough or non-weather-resistant surfaces, or exposure to severe or unusual conditions can shorten the durability of such applications.

3M Basic Product Warranty

3M™ Advanced Engineer Grade Prismatic Sheeting Series 7930 ("Product") is warranted ("Basic Warranty") to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this product bulletin. If the Product is proven not to have met the Basic Warranty on its shipment date, then a buyer's exclusive remedy, and 3M's sole obligation, at 3M's option, will be refund or replacement of the Product.

Limitation of Liability and Remedies

3M WILL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO A BUYER FOR DIRECT (other than the applicable Limited Remedy stated above), SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS) IN ANY WAY RELATED TO A PRODUCT OR THIS PRODUCT BULLETIN, REGARDLESS OF THE LEGAL OR EQUITABLE THEORY ON WHICH SUCH DAMAGES ARE SOUGHT.

Literature Reference

Product Bulletin 880I	3M™ Process Color Series 880I
Product Bulletin 880N	3M™ Process Color Series 880N
Information Folder 1.4	Instructions for Squeeze Roll Applicator
Information Folder 1.5	Hand Application Instructions
Information Folder 1.6	Instructions for Hand Squeeze Roll Applicator
Information Folder 1.7	Sign Base Surface Preparation
Information Folder 1.8	Process Color Instructions
Information Folder 1.10	Cutting, Matching, Premasking, and Prespacing Instructions
Information Folder 1.11	Sign Maintenance Management

For Information or Assistance

Call: 1-800-553-1380

In Canada Call:

1-800-265-1840

Internet:

www.3M.com/roadwaysafety

3M is a trademark of 3M. Used under license in Canada.

EFI is a trademark of Electronics for Imaging, Inc.

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.

Important Notice

All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed, and the following is made in lieu of all warranties, or conditions express or implied. Seller's and manufacturer's only obligation shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct, special or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his/her intended use, and user assumes all risk and liability whatsoever in connection therewith. Statements or recommendations not contained herein shall have no force or effect unless in an agreement signed by officers of seller and manufacturer.



Traffic Safety and Security Division

3M Center, Building 0225-04-N-14
St. Paul, MN 55144-1000 USA

Phone 1-800-553-1380
Web 3M.com/roadwaysafety

Please recycle. Printed in USA © 3M 2016.
All rights reserved. Electronic Only