



Advanced Engineer Grade Prismatic Reflective Sheeting

Series 7930 with Pressure Sensitive Adhesive

Product Bulletin

March 2016

Health and Safety Information

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

Description

3M™ Advanced Engineer Grade Prismatic Reflective Sheeting Series 7930 is a non-metalized micro-prismatic lens reflective sheeting designed for the production of durable traffic control signs and devices, that are exposed vertically in service.

Series 7930 sheeting can easily be identified by the visible integral marking.

Applied to properly prepared sign substrates, Series 7930 provides long-term reflectivity and durability.

The initial photometric and colorimetric properties of Series 7930 are according to EN 12899-1:2007.

| Sheeting | Color |
|----------|--------|
| 7930 | White |
| 7931 | Yellow |
| 7932 | Red |
| 7935 | Blue |
| 7937 | Green |
| 7939 | Brown |

Note: 3M™ Advanced Engineer Grade Prismatic Reflective Sheeting Series 7930 has been approved for the manufacturing of sign-faces for traffic signs with the European Technical Approval (ETA) ETA 16/0006, Version 01, Date of Issue:03032016

Properties

The initial minimum coefficient of retroreflection of Engineer Grade Prismatic, when measured according to CIE 54.2 using CIE standard illuminant A, conforms to Table 3 of EN 12899-1:2007 for Class RA1 materials (Table A).

| Geometry of measurements | | Color | | | | | |
|--------------------------|------------------------------|-------|--------|------|-------|------|-------|
| α | β_1 ($\beta_2=0$) | White | Yellow | Red | Green | Blue | Brown |
| 0,2° | +5° | 70 | 50 | 14,5 | 9 | 4 | 1 |
| | +30° | 30 | 22 | 6 | 3,5 | 1,7 | 0,3 |
| | +40° | 10 | 7 | 2 | 1,5 | 0,5 | # |
| 0,33° | +5° | 50 | 35 | 10 | 7 | 2 | 0,6 |
| | +30° | 24 | 16 | 4 | 3 | 1 | 0,2 |
| | +40° | 9 | 6 | 1,8 | 1,2 | # | # |
| 2° | +5° | 5 | 3 | 1 | 0,5 | # | # |
| | +30° | 2,5 | 1,5 | 0,5 | 0,3 | # | # |
| | +40° | 1,5 | 1,0 | 0,5 | 0,2 | # | # |

"-" Indicates "Value greater than zero but not significant or applicable"

Table A: Typical Values for Retroreflection [cd/(lx · m²)]

The above angular definitions apply for the CIE Goniometer system (co-planar geometry). The sheeting shall be mounted in 0° or 90° orientation on the goniometer.

The initial chromaticity coordinates and luminance factors.

| Color | 1 | | 2 | | 3 | | 4 | | Luminance factor |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-----------------------------|
| | x | y | x | y | x | y | x | y | β |
| White | 0,305 | 0,315 | 0,335 | 0,345 | 0,325 | 0,355 | 0,295 | 0,325 | $\geq 0,35$ |
| Yellow | 0,494 | 0,505 | 0,470 | 0,480 | 0,493 | 0,457 | 0,522 | 0,477 | $\geq 0,27$ |
| Red | 0,735 | 0,265 | 0,700 | 0,250 | 0,610 | 0,340 | 0,660 | 0,340 | $\geq 0,05$ |
| Blue | 0,130 | 0,086 | 0,160 | 0,086 | 0,160 | 0,120 | 0,130 | 0,120 | $\geq 0,01$ |
| Green | 0,110 | 0,415 | 0,150 | 0,415 | 0,150 | 0,455 | 0,110 | 0,455 | $\geq 0,04$ |
| Brown | 0,455 | 0,397 | 0,523 | 0,429 | 0,479 | 0,373 | 0,558 | 0,394 | $0,09 \geq \beta \geq 0,03$ |

Table B: Chromaticity and luminance factors

Printed Colors

For printed color areas on white sheeting, when processed according to 3M™ recommendations, the coefficients of retroreflection shall not be less than 70% of the value for the corresponding color in table A. The chromaticity coordinates and luminance factors shall conform to table B.

Surface Pattern

The Advanced Engineer Grade Prismatic sheeting is differentiated from other prismatic or encapsulated lens sheeting by the distinctive surface pattern and the visible integral marking.

Orientation

The efficiency of light return from cube corner reflectors is not equal at all rotation angles, the sheeting should be positioned in 0° or 90° application orientation on the completed sign when wide entrance angle performance is important for a given sign type or situation.

Application

Advanced Engineer Grade Prismatic sheeting should be conditioned prior to application to provide a minimum sheeting temperature of 18°C throughout the roll or sheeting stack.

The sheeting should be applied with mechanical squeeze roll applicators to properly prepared substrates. If the application is done by hand, use firm pressure with a rubber roller or equivalent to obtain maximum initial adhesion. Use multiple, heavy overlapping strokes. Re-roll all edges. For further information refer to Information Folder IF 1.4, 1.5 and 1.6.

Splices

Advanced Engineer Grade Prismatic 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. A splice gap of 1,5mm +0,5 mm is recommended. This is to prevent buckling as the sheeting expands in extreme temperature and humidity exposure.

Substrates

For traffic sign use, product application is limited to properly prepared aluminum (see Information Folder 1.7). The substrate should be conditioned prior to application to provide a minimum surface temperature of 15°C.

Extrusions are to be wrapped and flat panel signs are to be carefully trimmed, so that sheeting from adjacent panels do not touch on assembled signs. Users are urged to carefully evaluate all other substrates for adhesion and sign durability. Advanced Engineer Grade Prismatic sheeting is designed primarily for applications to flat substrates. Rivets or bolts should also support any use that requires a radius of curvature of less 130mm. Sign failures caused by the substrate or improper surface preparation are not the responsibility of 3M.

Compatible Products

Screenprint Applications

- 3M™ Process Colors 880I
- 3M™ Process Colors 880N

Digital Printing Applications

- 3M™ Piezo Inkjet Ink Series 8800UV (for Durst Rho 161TS and 162TS printer)
- 3M™ Protective Overlay Film 1140

Copy Part Applications

- 3M™ Scotchcal™ Film 3650-12 (Black)
- 3M™ Scotchcal™ ElectroCut™ Film 100-12
- 3M™ ElectroCut™ Film Series 1170
- 3M™ TFEC 260 D

All Applications

- Selected 3M application tapes

Important: Screen-printed sign faces must be sufficiently ventilated during the filling of the drying rack or immediately run through a conveyor. If the print is not ventilated properly, the solvents may damage the top film of the sheeting. Refer to Product Bulletin 880 and Information Folder 1.8 for more details. Care should be taken to avoid flexing Series 7930 sheeting before and especially after screening. Convert from series 880I to series 880N when ink

General Performance Considerations

The performance and durability of 3M™ Advanced Engineer Grade Prismatic Reflective Sheeting Series 7930 will depend upon a number of factors including (but not limited to):

- Selection, preparation and temperature of the substrate
- Application procedures
- Geographic area
- Exposure and atmospheric conditions (e.g. snow, frost)
- Correct combination of sheeting, ink and overlay film
- Ink formulation
- Ink drying/curing methods
- Cleaning and maintenance methods

Warranty

3M™ Advanced Engineer Grade Prismatic Reflective Sheeting Series 7930 sold by 3M to be used for permanent traffic control signs and devices is warranted for a period up to 7 years from date of application (concrete definition of the period is subject to the terms of sale) to be free of defects in material and workmanship, subject to the following provisions:

If Sheeting Series 7930 is processed and applied to a vertical $\pm 10^\circ$ 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.

Important Notice to Purchaser

All statements, technical information and recommendations herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed. Before using, user shall determine the suitability of the product for its intended use, and user assumes all risk and liability whatsoever in connection therewith. All questions of warranty and liability relating to this product are governed by the terms of the sale subject where applicable to the prevailing law.

No statement or recommendation not contained herein shall have any force or effect unless in an agreement signed by authorized personnel of seller and manufacturer.

Literature Reference

| | |
|---|---------|
| Instructions for Squeeze Roll Applicator | IF 1.4 |
| Hand Application Instructions | IF 1.5 |
| Instructions for Hand Squeeze Roll Applicator | IF 1.6 |
| Sign Base Materials | IF 1.7 |
| Instructions for using 3M Process Colors | IF 1.8 |
| Cutting, Matching, Premasking and Prespacing Instructions | IF 1.10 |
| Storage and Packaging | IF 1.11 |
| 3M Process Color 880I | PB 880I |
| 3M Process Color 880N | PB880N |

For Further Assistance

For help on specific questions relating to 3M™ reflective products, please contact your local 3M Technical Service person or contact:

3M Deutschland GmbH
Traffic Safety Security Laboratory
Carl-Schurz-Str. 1, D-41453 Neuss
Phone: +49 21 31/14-2541
Fax: +49 21 31/14-36 94

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