

Transportation Safety Division

3M™ Engineer Grade Prismatic Reflective Sheeting Series 3430 with Pressure Sensitive Adhesive

Product Bulletin Series 3430

October 2020

1 Description

3M™ Engineer Grade Prismatic Reflective Sheeting Series 3430 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 3430 comprises solventless adhesive¹, coated without the use of organic solvents.

Series 3430 sheeting can easily be identified by the visible integral 'EGP' marking.

Applied to properly prepared sign substrates, Series 3430 provides long-term reflectivity and durability.

Sheeting	Color
3430	White
3431	Yellow
3432	Red
3435	Blue
3437	Green
3439	Brown



3M™ Engineer Grade Prismatic Reflective Sheeting Series 3430 is approved for the manufacturing of signfaces for traffic signs with a European Technical Assessment (ETA).

All provisions concerning the assessment and verification of constancy of performance described in the ETA 10/0118 and 12/0550 were applied and the product fulfills all the prescribed requirements (see the Declaration of Performance at the end of this document for more details).

¹ Due to the use of ancillary organic materials in the manufacturing of the adhesive, traces of organic solvent can be found in the product

2 Photometric 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 and ETA 10/0118 and 12/0550 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: Minimum Coefficient of Retroreflection [$cd / (lx * m^2)$]

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 (as shown below in figure 1).

The initial chromaticity coordinates and luminance factors conform to Class CR2 of EN 12899-1:2007 and ETA 10/0118 and 12/0550 (Table B).

Color	1		2		3		4		Luminance factor
	x	y	x	y	x	y	x	y	
White	0,305	0,315	0,335	0,345	0,325	0,355	0,295	0,325	$\geq 0,40$
Yellow	0,494	0,505	0,470	0,480	0,513	0,437	0,545	0,454	$\geq 0,24$
Red	0,735	0,265	0,700	0,250	0,610	0,340	0,660	0,340	$\geq 0,03$
Blue	0,130	0,090	0,160	0,090	0,160	0,140	0,130	0,140	$\geq 0,01$
Green	0,110	0,415	0,170	0,415	0,170	0,500	0,110	0,500	$\geq 0,03$
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

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.

This complies with requirements in EN 12899-1 and ETA 10/0118 and ETA 12/0550.

3 Surface Pattern



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

Figure 1 – Sheeting is positioned at 90° orientation

4 Orientation

Engineer Grade Prismatic is designed to be an effective sheeting regardless of its orientation on the substrate or ultimate orientation after installation.

However, because 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.

5 Application

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.

6 Splices

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 up to 1.5 mm is acceptable. This is to prevent buckling as the sheeting expands in extreme temperature and humidity exposure.

7 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. 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 than 130 mm.

Sign failures caused by the substrate or improper surface preparation are not the responsibility of 3M.

8 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™ Opaque Graphic Film 100-12

(other colors of Scotchcal™ Opaque Graphic Film Series 100 are compatible, regional warranties apply)

- 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 3430 sheeting before and especially after screening. Convert from series 880I to series 880N when ink triggered cracking first appears in your shop.

9 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.

10 General Performance Considerations

The performance and durability of 3M™ Engineer Grade Prismatic Reflective Sheeting Series 3430 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

10.1 Warranty

3M Engineer Grade Prismatic Reflective Sheeting Series 3430 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 3430 is 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.

10.2 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.

10.3 Disclaimer

THE 3M WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE, OR ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING OR OF PERFORMANCE, CUSTOM OR USAGE OF TRADE.

10.4 Limitation of Liability

Except for the limited remedy stated above, and except where prohibited by law, 3M will not be liable for any loss or damage arising from the Signs or any 3M product, whether direct, indirect, special, incidental or consequential damages (including but not limited to lost profits, business or revenue in any way), regardless of the legal theory asserted including warranty, contract, negligence or strict liability.

10.5 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.mmm.com/roadsafety>.

10.6 Literature References

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 Series 880I	PB 880I
3M Process Color Series 880N	PB 880N

For Further Assistance

For help on specific questions relating to 3M™ reflective products, please contact your local 3M Application Engineer or contact:



3M Deutschland GmbH
Transportation Safety Laboratory
Carl-Schurz-Straße 1
41453 Neuss
Tel: 02131/14 3394
Fax: 02131/14 3694
E-Mail: Verkehrssicherheit@mmm.com
www.3M.de/verkehrssicherheit

All rights reserved

Technical Information PB EGP Series 3430 – CE /
10.2020

© 3M 2020. All rights reserved.

Declaration of Performance/ Leistungserklärung

3M Engineer Grade Prismatic 3430

Construction Product Code / Bezeichnung des Bauproduktes

Microprismatic Retroreflective Sheeting

1. 3M Engineer Grade Prismatic Reflective Sheeting Series 3430
2. 3M Engineer Grade Prismatic Reflective Sheeting Series 3430 + 3M Electrocut Film Series 1170
3. 3M Engineer Grade Prismatic Reflective Sheeting Series 3430 printed with 3M Process Color Series 880I or N
4. 3M Engineer Grade Prismatic Reflective Sheeting Series 3430 + 3M Piezo Inkjet Ink Series 8800UV + 3M Protective Overlay Film 1140

Intended Use / Verwendungszweck

The construction product is used to manufacture sign faces for permanent traffic signs. The intended use includes, for example:

- Retro-reflective signs, retro-reflective and transilluminated signs (see also EN 12899-1)
- Variable message signs (see also EN 12966-1)

Das Bauprodukt wird für die Herstellung von Signalbildern von ortsfesten, vertikalen Verkehrszeichen verwendet. Der Verwendungszweck schließt z.B. ein:

- Retroreflektierende Verkehrszeichen, retroreflektierende und innenbeleuchtete Verkehrszeichen (siehe EN 12899-1)
- Wechselverkehrszeichen (siehe EN 12966-1)

Manufacturer / Hersteller



3M Deutschland GmbH
Carl-Schurz-Str.1
D – 41453 Neuss

Assessment and Verification of Constancy of Performance / Bewertung und Überprüfung der Leistungsbeständigkeit

System 1

StrAus-Zert, notified body 0913, Fleyer Str. 204, D-58097 Hagen performs the continuous surveillance, assessment and evaluation of the factory production control under system 1 and issued the certificate of constancy of performance 0913-CPR-2016 / 02.

/

StrAus-Zert, notifizierte Stelle Nr. 0913, Fleyer Str. 204, D-58097 Hagen führt die laufende Überwachung, Beurteilung und Anerkennung der werkseigenen Produktionskontrolle nach System 1 durch und hat das Zertifikat der Leistungsbeständigkeit 0913-CPR-2016 / 02 ausgestellt.

UBAtc, Rue du Lombard 42, B-1000 Brussels, performed the initial type testing and initial inspection of the factory and the FPC under system 1 and issued ETA 10/0118 and ETA 12/0550

/
UBAtc, Rue du Lombard 42, B-1000 Brussels, führte die Erstprüfung und Erstinspektion des Werks und der werkseigenen Produktionskontrolle nach System 1 durch und hat ETA 10/0118 und ETA 12/0550 ausgestellt.

Declared Performance / erklärte Leistung

Safety in Use / Nutzungssicherheit

Essential Characteristics / Wesentliche Merkmale	Performance / Leistung	Technical Specification / Technische Spezifikation
Visibility Characteristics		
Daylight Chromaticity and Luminance Factor	Table 1.2 (see Amendment)	EAD 120001-01-0106 (sept 2016) ETA 10/0118 (version 2 issued feb 10 th 2016) and ETA 12/0550
Coefficient of Retro-reflection	Class RA1 of EN 12899-1	
Rotational Symmetry	Ratio > 1 : 2.5	
Durability		
Impact Resistance	No apparent cracking or delamination	EAD 120001-01-0106 (sept 2016) ETA 10/0118 (version 2 issued feb 10 th 2016) and ETA 12/0550
Visibility after weathering		
Daylight Chromaticity and Luminance Factor	Table 1.3 (see Amendment)	
Coefficient of Retroreflection	Values > 80% of Class RA1	

The performance of the construction product identified above is in conformity with the declared performance. This declaration of performance is issued under the sole responsibility of the manufacturer /

Die Leistung des oben genannten Bauproduktes entspricht der erklärten Leistung.
Verantwortlich für die Erstellung dieser Leistungserklärung ist allein der Hersteller.

Neuss, August 2018
3M Deutschland GmbH



ppa

Dr. Chris Howitt
Technical Director
3M EMEA Area

Amendment to the Declaration of Performance**'3M Engineer Grade Prismatic 3430'**

This declaration covers the product 'Microprismatic retroreflective sheeting'.

Sign plates or complete assemblies of fixed vertical road traffic signs according to EN 12899-1:2007 can be manufactured with the following products and product combinations, according to ETA 10/0118 and ETA 12/0550 and the respective Evaluation Reports.

Components	Trade name	Colours/code	Characteristics
Micro-prismatic retro-reflective sheeting	3M™ Engineer Grade Prismatic Reflective Sheeting Series 3430	White 3430 Red 3432 Yellow 3431 Green 3437 Blue 3435	Thickness: 0,32 - 0,49 mm Rolls in various length and widths
Coloured overlay film	ELECTROCUT FILM series 1170	Yellow 1171 Red 1172 Blue 1175 Green 1177 Brown 1179 Green 2 (Dark Green) 1176	Thickness: 0,549 mm Rolls in various length and widths
Process colour	3M™ Process Colour Series 880 I or N	Yellow 884 I or N Red 882 I or N Blue 883 I or N Green 888 I or N French Red 889 I or N	20-25 mg/l
Process colour for digital printing	3M™ Piezo Inkjet Ink Series 8800 UV	Yellow Red Blue Green Orange Brown	18 - 20 ml/m ²
Overlay film	3M™ Protective Overlay Film 1140	Clear	Combined Thickness: 0.549 mm Rolls in various length and width

Colours		Chromaticity Coordinates				Luminance Factor β
		1	2	3	4	
White Tolerance Sphere	x	0.305	0.335	0.325	0.295	≥ 0.40
	y	0.315	0.345	0.355	0.325	
Yellow Tolerance Sphere	x	0.494	0.470	0.513	0.545	≥ 0.24
	y	0.505	0.480	0.437	0.454	
Red Tolerance Sphere	x	0.735	0.700	0.610	0.660	≥ 0.03
	y	0.265	0.250	0.340	0.340	
Orange Tolerance Sphere	x	0.631	0.560	0.506	0.570	≥ 0.14
	y	0.369	0.360	0.404	0.429	
Blue Tolerance Sphere	x	0.130	0.160	0.160	0.130	≥ 0.01
	y	0.090	0.090	0.140	0.140	
Green Tolerance Sphere	x	0.110	0.170	0.170	0.110	≥ 0.03
	y	0.415	0.415	0.500	0.500	
Brown Tolerance Sphere	x	0.455	0.523	0.479	0.558	0.03-0.09
	y	0.397	0.429	0.373	0.394	

Table 1.2: Manufacturer's specification for initial daylight chromaticity and luminance factor

Colours		Chromaticity Coordinates				Luminance Factor β
		1	2	3	4	
White Tolerance Sphere	x	0.355	0.305	0.285	0.335	≥ 0.40
	y	0.355	0.305	0.325	0.375	
Yellow Tolerance Sphere	x	0.545	0.487	0.427	0.465	≥ 0.24
	y	0.454	0.423	0.483	0.534	
Red Tolerance Sphere	x	0.735	0.674	0.569	0.655	≥ 0.03
	y	0.265	0.236	0.341	0.345	
Orange Tolerance Sphere	x	0.631	0.560	0.506	0.570	≥ 0.14
	y	0.369	0.360	0.404	0.429	
Blue Tolerance Sphere	x	0.078	0.150	0.210	0.137	≥ 0.01
	y	0.171	0.220	0.160	0.038	
Green Tolerance Sphere	x	0.007	0.248	0.177	0.026	≥ 0.03
	y	0.703	0.409	0.362	0.399	
Brown Tolerance Sphere	x	0.455	0.523	0.479	0.558	0.03-0.09
	y	0.397	0.429	0.373	0.394	

Table 1.3: Manufacturer's specification for daylight chromaticity and luminance factor 'in-use'