

Transportation Safety Division

3M™ Vehicle Safety Markings Series 823i

Product Bulletin Series 823i
August 2018

Replaces Product Bulletin 823i Dated August 2016

1 Description

3M Vehicle Safety Markings Series 823i is an impact resistant prismatic lens reflective sheeting that is pre-coated with pressure sensitive adhesive and currently meets or exceeds the reflectivity requirements of EN 12899- 1:2007 Class RA2 and ASTM D4956 Type III (except fluorescent yellow-green). Series 823i is intended for use on clean, smooth, relatively non-porous, weather resistant surfaces prepared as described in [3M Information Folder 4.9](#).

For details of the features and benefits of 823i sheeting, please refer to the 3M Transportation Safety Division website (<http://www.3M.com/roadsafety/>).

1.1 Features

- Impact resistant, metalized flexible retroreflective sheeting.
- Excellent angularity.
- Similar daytime and nighttime appearance.
- Suited for application to flat or simply curved surfaces.
- Up to 5 years durability for non-fluorescent sheeting, 3 for fluorescent yellow-green sheeting.
- Constructed to withstand the rigors of daily use through the incorporation of an easy to clean surface and a metallic layer that resists water and dirt penetration.

1.2 Colors and Roll Dimensions

Series 823i sheeting is available in 1220 mm x 45.7 m rolls in the following colors.

Table 1. Product Codes by Color

Color	Product Code
White	823i-10
Yellow	823i-11
Red	823i-12
Blue	823i-15
Fluorescent Yellow-Green – FYG	823i-83i
Red/White Chevron	823i VWM
Red/White Chevron	823i CWM

2 Specifications

2.1 Coefficient of Retroreflection

Initial minimum coefficients of retroreflection, when measured according to CIE 54.2 using CIE standard illuminant A, conform to specifications described Table 4 of the EN 12899-1:2007 Class RA2, which are presented in Table 2.

Table 2. Minimum Coefficient of Retroreflection Requirements of EN 12899-1:2007 Class RA2 (cd/lx/m²)

Measurement Geometry	Color					
		White	Yellow	Red	Blue	Fluorescent Yellow-Green
α	β_1					
	$(\beta_2=0)$					
0.2°	+5°	250	170	45	20	170
	+30°	150	100	25	11	100
	+40°	110	70	15	8	70
0.33°	+5°	180	120	25	14	120
	+30°	100	70	14	8	70
	+40°	95	60	13	7	60
2°	+5°	5.0	3.0	1.0	0.2	3.0
	+30°	2.5	1.5	0.4	--	1.5
	+40°	1.5	1.0	0.3	--	1.0

The angular definitions used in Table 2 apply to the CIE Goniometer system (co-planar geometry). Sheeting shall be mounted for measurement on the goniometer at either a 0° or 90° orientation (0° is the direction in which the roll is unwound).

2.2 Chromaticity Coordinates and Luminance Factors

Initial chromaticities and luminance factors conform to the Class CR2 specifications of EN 12899-1:2007 for Class RA2 materials, which are shown in Table 3.

Table 3. Class CR2 Chromaticity Coordinate and Luminance Factor Specifications of EN 12899-1:2007 for Class RA2 materials

Color	Chromaticity Coordinates								Luminance Factor
	1		2		3		4		
	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	≥ 0.27
Yellow	0.494	0.505	0.470	0.480	0.513	0.437	0.545	0.454	≥ 0.16
Red	0.735	0.265	0.700	0.250	0.610	0.340	0.660	0.340	≥ 0.03
Blue	0.130	0.090	0.160	0.090	0.160	0.140	0.130	0.140	≥ 0.01
Fluorescent Yellow-Green	0.387	0.610	0.356	0.494	0.398	0.452	0.460	0.540	≥ 0.40

3 Recommended Application and Use

Series 823i is intended for use as retroreflective vehicle markings. Typical applications include their use in the manufacture of safety markings according to DIN 30710.

Series 823i features 3M Comply™ with Controltac™ Liner, which greatly improves ease of installation. For installation instructions, see [3M Information Folder 4.8](#).

4 Storage

- Cool, dry area out of direct sunlight.
- Temperature of 65-75° F (18-24° C).
- Humidity of 30-50%.
- Store rolls horizontally, in carton or in original packaging.

5 Shelf Life

Apply Series 823i sheeting within two years of date of manufacture.

6 Limitations

Flexible Prismatic Vehicle Markings Series 823i are not intended for the following uses:

- Regulatory traffic signs.
- Graphics made for automotive Original Equipment Manufacturers (OEM); please contact 3M Automotive Division for alternatives.
- Application to stainless steel substrates.

7 Compatible Products

For screen print applications, use [3M Process Color Series 990](#).

8 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.

9 Warranty Information

3M Vehicle Safety Markings Series 823i (“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.

9.1 3M Warranty

Non-fluorescent Product will remain visible for a period of up to five (5) years by resisting excessive fading, cracking, blistering, or peeling under normal use, based on European exposure; fluorescent yellow-green Product will remain visible for a period of up to three (3) years for by resisting excessive fading, cracking, blistering, or peeling under normal use, based on European exposure (3M Warranty). Warranty periods are measured from the date of initial Product installation (“Installation Date”).

9.2 Terms and Conditions

- Product must be processed and applied to a vertically-mounted ($\pm 20^\circ$) 3M recommended substrate as described in this product bulletin and in accordance with all 3M procedures provided in this product bulletin and 3M Information Folders (including but not limited to [3M Information Folder 4.8](#)), and applicable technical memos (which will be furnished to the manufacturer upon request).
- Any third-party imaging or altering of the Product not endorsed by 3M will void the 3M Warranty.
- A Product’s failure to meet the 3M Warranty must be solely the result of design or manufacturing defects in the Product and not of (a) outside causes including improper storage, fabrication, handling, maintenance, or installation; (b) use of process colors, thinners, coatings, or other chemicals not recommended by 3M; (c) use of application procedures not recommended by 3M; (d) exposure to chemicals or solvents not recommended by 3M; (e) abrasion or other physical damage; (f) snow or any other burial of the marking; (g) collisions, vandalism, or malicious mischief; (h) failure to cut markings around rivets, seams, and body panels; or (i) an act of God.
- 3M reserves the right to determine the method of replacement. Replacement product will carry the unexpired warranty of the Product it replaces.
- Claims made under this warranty will be honored only if 3M is presented with a traceable record of the Product’s Installation Date. Claims made under this warranty will be honored only if 3M is notified of a potential failure within thirty days of discovery, reasonable information requested by 3M is provided, and 3M is permitted to verify the cause of the failure.

9.3 Exclusive Limited Remedy

If the Product is proven not to have met the 3M Warranty during the warranty period, then the purchaser’s and user’s exclusive remedy, and 3M’s sole obligation, at 3M’s option, shall be that 3M will issue a refund or provide replacement of the Product.

9.4 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.

9.5 Limitation of Liability

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10 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>.

11 Literature References

- [3M IF 4.8](#) 3M™ Vehicle Safety Markings Series 823i
- [3M IF 4.9](#) 3M™ Diamond Grade™ and Flexible Prismatic Conspicuity Markings Application Instructions For Trucks, Trailers, and Specialty Vehicles
- [3M PB 990](#) 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>

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