

Transportation Safety Division

3M™ Diamond Grade™ Flexible Roll-Up Sheeting Series RS60/64I

Product Bulletin Series RS60/64I
May 2018

Replaces PB RS60/64I Dated February 2016

1 Description

3M Diamond Grade Flexible Roll-Up Sheeting Series RS60 is a wide angle microprismatic reflective sheeting designed for use in the production of roll-up traffic control signs used in construction work zones. Series RS60 sheeting meets or exceeds ASTM 4956 Type VI requirements. This sheeting is designed to provide higher nighttime brightness than sheetings that use glass bead lenses. Additionally, RS64I fluorescent orange sheeting offers higher daytime and low-light (dusk and dawn) visibility than non-fluorescent colored sheeting. Series RS60/64I sheeting is backed with a durable, flexible, gray-colored, fiber reinforced vinyl.

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

Series RS60/64I sheeting is available in the following colors.

Table 1. Product Codes by Color

Color	Product Code
White	RS60
Fluorescent Orange – FO	RS64I

2 Photometrics

2.1 Daytime Color (x , y , Y_T , Y_F)

The chromaticity coordinates, fluorescent daytime luminance factors (Y_F), and total daytime luminance factors (Y_T) of Series RS60/64I retroreflective sheeting conform to the ASTM 4956 standards presented in Table 2.

Table 2. ASTM 4956 CIE Daytime Chromaticity Coordinate Limits^a and Luminance Factor Minima standards for new sheeting

Color	1		2		3		4		Y_T	Y_F
	x	y	x	y	x	y	x	y		
White	0.303	0.300	0.368	0.366	0.340	0.393	0.274	0.329	40	N/A
Fluorescent Orange	0.583	0.416	0.535	0.400	0.595	0.351	0.645	0.355	30	15

a. The instrumentally determined color values of retroreflective sheeting can vary significantly depending on the make and model of colorimetric spectrophotometer as well as the color and retroreflective optics of the sheeting (David M. Burns and Timothy J. Donahue, Measurement Issues in the Color Specification of Fluorescent Retroreflective Materials for High Visibility Traffic Signing and Personal Safety Applications, Proceedings of SPIE: Fourth Oxford Conference on Spectroscopy, 4826, pp. 39-49, 2003). For the purposes of this document, the HunterLab ColorFlex 45/0 spectrophotometer shall be the referee instrument.

2.2 Test for Coefficients of Retroreflection

Conformance to coefficient of retroreflection requirements shall be determined by instrumental methods, in accordance with ASTM E-810 "Test Method for Coefficient of Retroreflection of Retroreflective Sheeting." Per ASTM E-810, values obtained at 0° and 90° rotations were averaged to determine the R_A values presented in Table 3.

Table 3. Minimum Coefficient of Retroreflection, R_A , for New Sheeting (cd/lux/m²)

Observation Angle ^b	White			Fluorescent Orange		
	Entrance Angle ^a					
	-4°	30°	45°	-4°	30°	45°
0.2°	500	200	125	200	80	30
0.5°	225	85	75	90	35	10
1.0°	20	15	15	10	8	5

a. Entrance (Incidence) Angle - The angle between the illumination axis and the retroreflector axis. The retroreflector axis is an axis perpendicular to the retroreflective surface.

b. Observation (Divergence) Angle - The angle between the illumination axis and the observation axis.

3 Application

Series RS60/64I sheeting has been designed so that corner pockets or snaps can be sewn or riveted into it. Cross brace supports can then be used in conjunction with portable sign stands. Cross braces should not bow more than 1/2 inch when inserted. All corner pockets should be fabric, plastic, or rubber. Plastic or rubber molded pockets should have rounded edges. Washers should be rubber or plastic. Metal washers should be backed with rubber or plastic washers.

3.1 Process Colors

Off-contact screen process methods are preferred when screening 3M Diamond Grade Flexible Roll-Up Sheeting Series RS60/64I.

The screening table must be perfectly flat. When screening sheets, hold them in place using a vacuum table or, if a vacuum table is not available, place them on a non-porous table surface using a thin, uniform layer of low tack pressure sensitive adhesive. The screen mesh size should be in the P.E. 157 - P.E. 230 range and made from a

monofilament fabric. Stenciling process colors or screening them with screen fabrics or mesh sizes not recommended above may produce unsatisfactory colors or durabilities and are not recommended.

3M Process Color Series 1805 (black) is the recommended ink for Diamond Grade Roll-Up Sign Sheeting Series RS60/64I. To thin Series 1805 process colors, use only CGS 50 or CGS 80 thinner. Signs printed with Series 1805 colors must be allowed to dry for 24 hours (on drying rack) before being rolled.

3M Process Color Series 990 is recommended for Diamond Grade White Sheeting Series RS60 when colored printing is required. If storing stacked printed sheets, Series 990 inks must be used with 4430R overprint clear ink to protect the colors. Series 990 colors must be allowed to dry for a minimum of three hours before 4430R is applied.

3.2 Storage

Diamond Grade Flexible Roll-Up Sheeting should be stored in a cool dry area, preferably at a temperature of 65 to 75°F (18 to 24°C) and a relative humidity of 30 to 50%, and used within one year of date of receipt.

Unprocessed sheets should be stored flat. See [Information folder 1.11](#) for details regarding storage and packaging. For material that has been stored for more than 90 days, it is good practice to wipe the surface down with a standard alcohol wipe prior to use.

Finished roll-up signs should be stored dry and rolled up properly, per OEM specifications.

4 Durability

The durability of Series RS60/64I roll-up sheeting will depend upon preparation, compliance with recommended application procedures, geographic area, exposure conditions, and maintenance practices.

5 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, contact 3M by mail, or for urgent requests call 1-800-364-3577.

6 Warranty Information

6.1 3M Warranty

3M warrants to the sign manufacturer (“Sign Manufacturer”) that 3M Diamond Grade Flexible Roll-Up Sheeting Series RS60/64I, sold by 3M and to be used as components for roll-up traffic control signs (“Sign”) used in work zones, will be free of defects in material and workmanship and will remain visible by resisting excessive fading, cracking, peeling, lifting, or discoloration for a period of three years measured from the date of original purchase (“3M Warranty”).

6.2 3M Warranty Terms and Conditions

Failure to meet the 3M Warranty must be solely the result of design or manufacturing defects in the Series RS60/64I roll-up sign sheeting and not outside causes such as: improper fabrication, handling, maintenance, or installation; process colors, thinner, coatings, or overlay films and sheetings not made by 3M; use of equipment not recommended by 3M; failure of Sign hardware; exposure to chemicals, abrasion, and other mechanical damage from fasteners used to mount the Sign; 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.

Series RS60/64I Flexible Roll-Up Sheeting must be processed in accordance with all 3M application and fabrication procedures provided in 3M's product bulletins, information folders, and technical memos (which will be furnished to the agency upon request) and use, processing, and storage requirements as described herein, including the exclusive use of 3M matched component systems, process colors, and recommended application equipment.

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.

6.3 Exclusive Limited Remedy

If, during the warranty period, the sheeting is proven to not meet the 3M Warranty, then the Sign Manufacturer's exclusive remedy, and 3M's sole obligation, at 3M's option, shall be that 3M, at its expense, will provide pro-rata replacement of the 3M materials.

6.4 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.

6.5 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.

7 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>.

8 Literature References

3M IF 1.10	Cutting, Matching, Premasking & Prespacing Instructions
3M IF 1.11	Storage Maintenance and Removal Instructions
3M PB 1805	3M™ Process Colors
3M PB 990	3M™ Process Colors

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>

3M, 3M Science, Applied to Life., and Diamond Grade are trademarks of 3M. Used under license in Canada. Colorflex is a registered trademark of Hunter Associates Laboratory, Inc.

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.



Transportation Safety Division

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

Phone 1-800-553-1380

Web 3M.com/roadsafety

Please recycle. Printed in USA © 3M 2018.
All rights reserved. Electronic Only