

Transportation Safety Division

Reflective Gate Arm Markings

GA1616

Product Bulletin GA1616
May 2019

Replaces Product Bulletin GA1616 Dated July 2011

1 Description

3M™ Reflective Gate Arm Markings GA1616 (“Markings”) are highly retroreflective, flexible, microprismatic markings designed to mark gate arms for enhanced visibility and detection. The reflective marking consists of prismatic lenses that are formed in a transparent, synthetic resin, reflectorized and backed with a pressure sensitive adhesive and paper liner.

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

2 Properties

2.1 Product Features

- o Flexible
- o Accommodates low temperature application (minimum 35 °F)
- o Warranted performance for 5 years
- o Available in 2”, 4”, and 6” width rolls

2.2 Easy to apply

- o Aggressive pressure sensitive adhesive
- o Easy to remove liner

2.3 Product Performance

This product meets all of the physical property requirements specified in ASTM D4956, including the following:

- o Flexibility
- o Shrinkage
- o Liner removal
- o Impact resistance
- o Colorfastness

3 Specifications

3.1 Coefficient of Retroreflection

The minimum coefficient of retroreflection values of Markings when new are given in Table 1 in terms of candelas per lux per square meter. Measurements are made for samples applied to an aluminum panel in accordance with ASTM E810 “Standard Test Method for Coefficient of Retroreflective Sheeting” and represent averages of values obtained at 0° and 90° orientations.

Table 1. Minimum coefficient of retroreflection (R_A) for new markings (cd/lux/m²).

	Observation Angle ^a					
	0.2°	0.2°	0.2°	0.5°	0.5°	0.5°
Entrance Angel ^b	-4°	30°	45°	-4°	30°	45°
White	250	250	60	65	65	15
Red	60	60	15	15	15	4

- a. Observation Angle – the angle formed by the light beam striking the reflective surface and the light beam returning to the observer
- b. Entrance Angle – the angle formed by a light beam striking a surface at a point and a line perpendicular to the surface at the same point.

4 Maintenance

Routine cleaning is recommended for maximum performance. The following cleaning methods are recommended:

- Clean with sponge, cloth, or soft brush using water and detergent.
- Clean with automatic truck/car wash or standard high-pressure hand spray under following conditions:
 - Maximum pressure: 1200 PSI/80 bar
 - Maximum water/wash solution temperature: 140 °F (60 °C)
 - Minimum of 12 inches (30 cm) between cleaning jet(s) and marking
 - Cleaning wand or jets at angle of no more than 45 degrees from perpendicular to the marking surface
 - Use spray tip #1505 (15 degree spray angle, 05 capacity size).

When using a metal brightener, follow manufacturer's recommendations for dilution. Thoroughly rinse brightener from markings after soaking vehicle.

4.1 Storage

Markings should be stored in a cool, dry area, out of direct sunlight, at a temperature of 65-75 °F (18-24 °C) and a relative humidity of 30-50%. Rolls should be stored horizontally in their shipping cartons or original packaging. Apply within one year of date of receipt.

Apply Tape within one year of receipt of material.

5 Health and Safety Information

Read all health hazard, precautionary, and first aid statements found in the Safety Data Sheets (SDS), Article Information Sheets, and products labels of any materials for important health, safety, and environmental information prior to handling or use. 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 Basic Product Warranty

Markings are 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 Markings 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 replacement of the Markings only.

6.2 Additional Warranty

3M warrants ("3M Warranty") that Markings sold by 3M to be used for conspicuity markings on trucks, trailers, and other equipment ("Equipment") in the United States and Canada will remain visible by resisting excessive fading, cracking, peeling, and lifting for five (5) years ("Warranty Period"), as measured from the date of initial application onto the Equipment ("Installation Date").

6.3 Terms and Conditions

- o Markings must be processed and applied to a vertically-mounted ($\pm 10^\circ$) 3M recommended substrate as described in this product bulletin and in accordance with all 3M application, fabrication, and cleaning procedures provided in 3M's product bulletins, information folders (including but not limited to [3M Information Folder 4.9](#)), and applicable technical memos (which will be furnished to the manufacturer upon request).
- o Any third-party imaging or altering of the Markings not endorsed by 3M will void the 3M Warranty.
- o Markings' failure to meet the 3M Warranty must be solely the result of design or manufacturing defects in the Markings 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 and other physical damage; (f) snow or any other burial of the marking; (g) collisions, vandalism, or malicious mischief; or (h) an act of God.
- o 3M reserves the right to determine the method of replacement. Replacement markings will carry the unexpired warranty of the Markings they replace.
- o Claims made under this warranty will be honored only if (a) 3M is presented with a traceable record of the Markings' Installation Date, (b) 3M is notified in writing of the claim within thirty days of discovery, (c) 3M is provided with the information reasonably required to validate the claim, and (d) 3M is permitted to verify the cause of the failure.

6.4 Exclusive Limited Remedy

If Markings are 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 provide replacement of the Markings.

6.5 Disclaimer

THE 3M WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, 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.

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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 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 3M.com/roadsafety.

8 Literature References

[3M IF 4.9](#) 3M™ Diamond Grade™ and Flexible Prismatic Conspicuity Markings Application Instructions For Trucks, Trailers and Specialty Vehicles

ASTM Test Methods are available from ASTM International, West Conshohocken, PA.

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