

Transportation Safety Division

3M™ Diamond Grade™ Conspicuity Markings Series 983 for Trucks and Trailers

Product Bulletin Series 983 for Trucks and Trailers
August 2023

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1 Description

3M™ Diamond Grade™ DG³ Conspicuity Markings Series 983 for Trucks and Trailers are highly retroreflective microprismatic markings designed to enhance the visibilities of the sides and rears of trucks and trailers. These reflective markings consist of prismatic lenses that are formed in a transparent, synthetic resin, and sealed and backed with a pressure sensitive adhesive and clear polymeric liner. Diamond Grade Conspicuity Markings are highly durable, providing up to ten years of field performance. 3M's Series 983 markings have excellent angularity, which provides enhanced visibility for drivers. Combined daytime brightness and retroreflection provides 24-hour visibility and detection.

Series 983 for Trucks and Trailers markings with DOT-C2 certification marks meet or exceed all FMVSS 108 or 571.108 Standard No. 108, S8.2.1 Retroreflective sheeting requirements when applied according to the FMVSS 108 or 571.108 Standard No. 108 S8.2.1.5 and S8.2.1.6 specifications.

For details of the features and benefits of Series 983 sheeting, please refer to the 3M Transportation Safety Division website (<http://www.3M.com/roadsafety/>).

Conspicuity Markings Series 983 for Trucks and Trailers is available in the following colors.

Table 1. Product codes by color.

Color	Product Code
White	983-10
Red 11-inch/White 7-inch (alternating pattern)	983-32
Red 6-inch/White 6-inch (alternating pattern)	983-326
Red	983-72

1.1 Easy to Apply

- o Aggressive pressure sensitive adhesive
- o Compressible, easy-to-remove liner
- o Available in rolls, packaged pieces, or kiss-cut pieces on a roll. Please refer to the 3M Transportation Safety Division Pricing Catalog for the standard product offering.

1.2 Durable

- o Pre-sealed edges
- o Non-metallic construction
- o 10-year warranty

2 Typical Physical Properties

Table 2 presents typical physical property data for Series 983 for Trucks and Trailers. The information presented in Table 2 should be considered typical only, and not be used for specification purposes.

Table 2. Typical physical properties.

Property	FMVSS 108 Requirement	Series 983 for Trucks and Trailers Typical Values
Thickness (Caliper)	N/A	0.014–0.018 inch
Whiteness Daytime Luminance Limit YT ASTM E1164	> 15 White > 2.5 Red	45 White 5 Red
Gloss ASTM D523 at 85°	N/A	100
Shrinkage ASTM D4956	< 1/8 inch change on 9x9 inch panel	No substantial change
Flexibility - wrap around 0.125 inch mandrel at 32 °F (0 °C)	No cracking	No cracking
High pressure wash test - 45° angle, 1200 psi, 8 inch away	N/A	Passes
Adhesion - 90° Hanging Weight ASTM D4956	< 2 inch (51 mm) movement	0.2 inch (4 mm)
Minimum Application Temp.	N/A	50 °F (10 °C)
Instron Peel Adhesion 12 inch/minute, 90° pullback	N/A	Degreased aluminum 5.3 lb/in (.95 kg/cm) Prepainted panel 3.0 lb/in (0.55 kg/cm) Stainless steel 6.0 lb/in (1.1 kg/cm) FRP 2.5 lb/in (0.52 kg/cm) Tedlar® 3.0 lb/in (0.54 kg/cm) Aluminum Rail 3.5 lb/in (0.56 kg/cm)
Chemical Resistance SAE J1967	N/A	Not affected by toluene, #2 diesel fuel, gasoline (leaded) kerosene, TSP detergent, xylene, dilute metal brighteners
Corrosion Resistance ASTM B117 Salt Spray	N/A	No effect - 1000 Hours
Room Temperature Impact Resistance 100 in-lb, 5/8 inch tip	No damage outside impact	No damage outside impact
Cold Temperature Impact Resistance 60 in-lb at -20 °F	N/A	No damage outside impact

2 Coefficient of Retroreflection, R_A

Series 983 for Trucks and Trailers markings with DOT-C2 certification marks meet and/or exceed the photometry requirements of Table XVI-c when tested according to the procedure of S14.2.3 for the color and grade as specified in the 571.108 Standard No. 108, S8.2.1.7 Photometry requirement for Conspicuity Retroreflective Sheeting.

3 Typical Physical Characteristics

Table 4 describes the typical physical characteristics of Series 983 for Trucks and Trailers. The information in Table 4 should be considered typical only, and not be used for specification purposes.

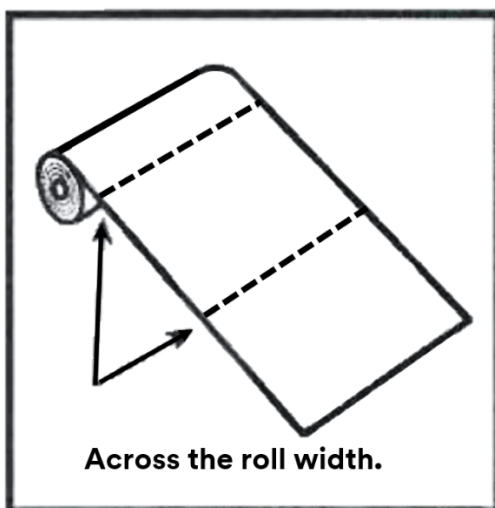
Table 4. Typical physical characteristics.

Property	Description
Adhesive color and type	Clear, pressure sensitive
Liner	Translucent polymeric
Application surfaces	Painted or unpainted flat metal without rivets
Heat resistance	Maintains 70% of original coefficient of retroreflection at ($\alpha=0.2$, $\beta=-4$) after 24 hr. exposure to 170 °F (77 °C) air
Recommended minimum application temperature (ambient and substrate)	50 °F (10 °C)
Performance range	-30–200 °F (-34–94 °C)

Fabrication Lines

The manufacture of prismatic sheeting results in lines being present in the product. In Diamond Grade™ DG³ Conspicuity Markings these lines are slightly thicker than the seal pattern legs. Fabrication lines are noticeable in shop light but are not observable on the road either in daylight or at night under typical use conditions (Figure 2).

Figure 2 - Fabrication Lines



4 Maintenance

a. Cleaning

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

- i. Clean with sponge, cloth, or soft brush using water and detergent
- ii. Automatic truck/car wash or standard high-pressure hand spray under following conditions:
 1. Maximum pressure: 1200 PSI/80 bar
 2. Maximum water/wash solution temperature: 140 °F (60 °C)
 3. Minimum of 12 inches (30 cm) between cleaning jet(s) and marking
 4. Cleaning wand or jets at angle of no more than 45 degrees from perpendicular to the marking surface
 5. Use spray tip #1505 (15 degree spray angle, 05 capacity size)
- iii. When using metal brighteners, follow manufacturer's recommendations for dilution. Thoroughly rinse brightener from markings after soaking vehicle

b. Storage

Series 983 for Trucks and Trailers 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.

c. Shelf Life

Apply Series 983 for Trucks and Trailers within three years of date of manufacture.

5 Durability

Series 983 for Trucks and Trailers will provide maximum durability when:

- All 3M recommended procedures are followed and
- Markings are applied to vertical surfaces (within $\pm 20^\circ$ of vertical orientation).

Series 983 marking durability depends on use. Failure to follow 3M-required techniques may reduce durability. Below are some conditions and processing examples that may lead to reduced durability:

- Failure to cut markings around rivets, seams, and body panels
- Improper use of high-pressure cleaning
- Contact with non-recommended chemicals or solvents
- Improper application or surface preparation
- Horizontal exposure
- Open cells along the edges of a marking may collect dirt, but will not reduce marking performance
- Damage due to external conditions may reduce adhesion and reflectivity near the damaged area

6 Health and Safety Information

Read all health hazard, precautionary, and first aid statements found in the Safety Data Sheet (SDS), Article Information Sheet, and/or product labels of chemicals prior to handling or use. Consult local regulations and authorities for possible restrictions. Visit us at www.3M.com/us and select SDS search to obtain current Safety Data Sheets.