

Transportation Safety Division

3M™ Diamond Grade™ Series 983 Rail Car Conspicuity Markings

Application Instructions For Rail Cars

Information Folder 4.18
April 2018

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1 Description

3M Diamond Grade Conspicuity Markings are precoated with an aggressive pressure sensitive adhesive for application to most clean, dry, wax-free, non-corroded, weather resistant surfaces. The adhesive is protected with a clear plastic, easy release liner. 3M conspicuity markings are intended to be applied to the sides of rail cars to enhance visibility and recognition by motorists.

3M conspicuity markings can be applied to flat surfaces (with and without rivets) and non-compound curved surfaces with radii greater than 5 inches. For application to corrugated rail cars, apply the markings to the top of the corrugation and form it down and around the curved surface to the bottom of the marking.

Rail car markings can be applied to rusted, severely pitted, loose, or chalking paint surfaces **only** if recommended surface preparation procedures are followed. These procedures are outlined on the next page. Application is not recommended on irregularly shaped frameworks, bolts, rivets larger than ½ inch high, support plates, or within ¼ inch of door hinges, exterior posts, weld joints, or the end of the surface. 3M conspicuity markings are available in kiss-cut rolls.

Note: Carefully review the following information before proceeding with application.

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/>).

2 Storage

Diamond Grade conspicuity markings can be stored for a period of two years in a cool, dry area at temperatures of 65-75°F (16-24°C) and must be applied within the two years of date of manufacture. Rolls should be stored horizontally or in their shipping cartons. Partially used rolls should be returned to the shipping cartons or suspended horizontally from rods or pipes through their cores.

3 Application Instructions

3.1 Required Tools

- 1 3M Blue Squeegee PA-1-B or 3M Gold Squeegee PA-1-G.
- 2 Monkey Strip, applied to the edge of the squeegee; available from distributors listed on www.monkeystrips.com.
- 3 Utility knife and scissors; available locally at hardware or industrial supply stores.
- 4 Osborne Arch Punch No. 149 or Osborne Belt Punch No. 245 of proper size; available at hardware or industrial supply stores.



- 5 Industrial heat gun, such as Dayton Industrial Heat Gun 500-750°F (260-399°C) or equivalent; available at industrial supply stores.
- 6 3M Scotch-Brite™ Heavy Duty Cleaning Pad (green or brown); available locally at paint or industrial supply stores.
- 7 Lint free paper towels.
- 8 Recommended cleaning solvent (see “Surface Preparation” below).

4 Temperature and Environment

For optimum adhesion and durability, Diamond Grade Series 983 conspicuity markings should be applied when air and application surface temperatures are within the following limits:

- Minimum - 35°F (7°C)
- Maximum - 100°F (38°C)

Diamond Grade Series 983 conspicuity markings may also be applied when air and application surface temperatures are beyond these limits with the following precautions:

- Above 100°F (38°C) care must be taken to avoid pre-adhesion.
- Below 35°F (7°C) the substrate surface may be heated to a temperature within the application range using portable heaters, heat lamps, hot water, or steam. If hot water or steam is used, the surface must be thoroughly **dry** before application. In addition, when outside temperatures are below the minimum application temperature, the applied markings must also be heated using an industrial heat gun and immediately resqueegeed. The heat gun should be held 8-12 inches from the marking to avoid burning, melting, or distorting the marking.

Note: to ensure markings are not distorted, applied heat should be regulated so that marking surfaces are comfortable to the touch.

5 Surface Preparation

All surfaces must be cleaned prior to application.

- 1 Wash surfaces with detergent and water to remove dirt and road film.
- 2 Solvent wipe using lint-free paper towel saturated with non-oily, quick-drying solvent, such as isopropyl alcohol, acetone, or 3M Prep Solvent 70.
- 3 Immediately dry surfaces with clean, dry, lint-free paper towel before solvent evaporates completely, paying close attention to rivets, seams, and door hinge areas.

Note: An application surface that has been washed, dried, and solvent wiped can still have poor adhesion in the areas around rivets and seams due to liquid retention caused by capillary action.

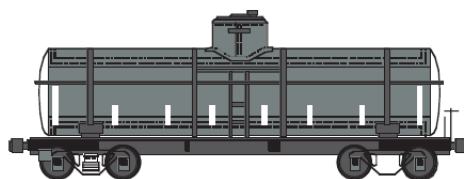
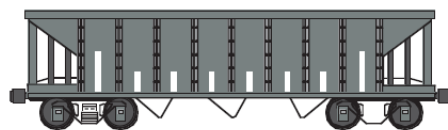
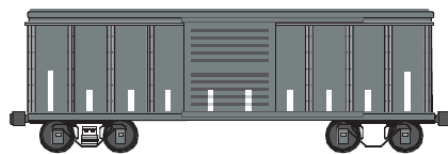
5.1 Cleaning Procedures for Rusted/Corroded Surfaces or Loose/ Chalking Paint:

- 1 Remove contaminants, such as rust and chalking paint, using a 3M Scotch-Brite™ Surface Conditioning Disc or 3M Scotch-Brite Heavy Duty Cleaning Pad 7440.
- 2 Areas that have been abraded down to bare metal should be painted or primed with a rust preventative fast-dry paint or primer. Check the paint for adhesion by applying masking tape, then snapping it off. If any paint is removed by the tape, paint is not fully cured. Paint must be completely cured prior to applying conspicuity markings.

Application to rusted, severely pitted, loose, or chalking paint surfaces is not recommended. For stainless steel applications, initial adhesion is improved by wiping and drying with white distilled vinegar after solvent cleaning has been completed.

6 Application Procedure

- 1 Marking must be cut $\frac{1}{8}$ inch away from exterior posts, large bolts, and rivets. Apply markings no closer than $\frac{1}{8}$ inch from door hinges, door hardware, ends of the rail car, and weld joints to avoid wrinkling or lifting.
- 2 Peel off the 4 x 18 inch kiss-cut piece of marking from the roll liner, position and align the marking on the car, and tack it down lightly to hold it in position.
- 3 Using a PA-1 applicator, press marking to application surface using firm, vertically overlapping strokes. Be sure all edges are well adhered.
- 4 Apply the remaining markings using the above procedures.



- 5 Apply marking over rivets using firm pressure, leaving a bridge which will adhere when the marking is cut in these areas.
- 6 Cut markings around rivets using an Osborne cutting tool of the proper size to fit over rivets. Place tool over top of rivet and marking and tap lightly using a small hammer. Squeegee the marking around the rivet with firm pressure. The cut film on the rivet head can be left on the rivet but will eventually come off. Avoid applying markings over closely spaced rivets where possible.
- 7 **Markings should not be overlapped to make seams or joints.** Rather, markings should be butted together.

7 Edge Sealing

Edge sealing is not required on 3M Diamond Grade Conspicuity Markings.

8 Cleaning

Markings applied to rail cars can be hand washed with a sponge, cloth, or soft brush using warm water and detergent. Rinse thoroughly. When using hand spray wash wands, hold the nozzle at least 12 inches from the surface and at an angle less than 45° from perpendicular to markings to avoid damaging them. To avoid immediate damage, acid brighteners and cleaning solutions should not be allowed to soak on markings.

9 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.

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>.

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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