



Diamond Grade™ and Flexible Prismatic Conspicuity Markings

Application Instructions For Trucks, Trailers and Specialty Vehicles

Information Folder 4.9

October 2014

Description

3M™ Diamond Grade™ Conspicuity Markings Series 983, 3M™ Diamond Grade™ Flexible Prismatic Conspicuity Markings Series 973 and 3M™ Flexible Prismatic Conspicuity Markings Series 963 utilize a pressure sensitive adhesive for application to many clean, dry, weather-resistant surfaces.

The adhesive is protected by an easy-release liner. 3M conspicuity markings are intended to be applied to the side and rear perimeter of vehicles in a continuous stripe to enhance visibility and recognition by motorists. See examples later in this Information Folder.

Markings can be applied to flat surfaces (drilled or punched to accommodate rivets) and non-compound curved surfaces with a radius greater than five inches. For application to corrugated vehicles, apply the marking to the bottom and top rails or between corrugations if adequate flat surface is available.

Application is not recommended to rusted or corroded metal, loose or chalking paint, irregular shaped framework, bolts, rivets support plates, corrugations, within 1/8 inch of door hinges, exterior posts, weld joints, the end of the vehicle surface, or within three inches of mandated lights, reflectors, or turn signals.

Storage

3M conspicuity markings can be stored for a period of two years in a cool, dry area at temperatures between 65-75°F (18-24°C) and must be applied within the one-year time frame. Rolls should be stored horizontally or in their shipping carton. Partially used rolls should be returned to the shipping carton or suspended from a rod or pipe through the core.

Application Preparation Instructions

Tools

1. Plastic Applicator, PA-1 (blue or gold); available from 3M.
2. Low friction sleeve, SA-1 (used on the plastic applicator to minimize surface scratching); available from 3M.
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. 3M™ Scotch-Brite™ Heavy Duty Cleaning Pad (green or brown); available locally at paint or industrial supply stores.
6. Lint free paper towels.
7. Recommended cleaning solvent.

Application Temperature

For optimum adhesion and durability, 3M conspicuity markings should be applied when air and application surface temperatures are within the following limits:

<u>Minimum</u>	<u>Maximum</u>
50°F (10°C)	100°F (38°C)

The 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 50°F (10°C) the substrate surface may be mechanically heated to a temperature within the application range by using a portable heater or heat lamps. When air temperature is below the minimum application temperature, the markings should be stored in a hotbox to keep them above 50°F (10°C) until application.

Surface Preparation

All surfaces must be cleaned prior to application.

1. Wash surface with detergent and water to remove dirt and road film.
2. Solvent wipe using a lint-free paper towel saturated with a non-oily, quick-drying solvent, such as isopropyl alcohol, acetone, or 3M™ Prep Solvent 70.
3. Immediately dry the surface with a clean, dry lint-free paper towel before the 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 area around rivets and seams due to liquid retention caused by capillary action.

Application Procedure These procedures should be followed to apply the markings to the cleaned surface within the proper application temperature range.

1. Markings must be cut to allow a three inch distance from required lights or reflectors, and 1/8 inch away from exterior posts, tie down posts and large bolts or rivets if applied on the frame rail.

On corrugated trailers, apply marking on the frame rail if a flat surface is not available and cut around the rivets as recommended below.

Apply markings no closer than 1/8 inch to door hinges, door hardware, ends of the trailer and weld joints to avoid wrinkling or lifting (Figure 1). Cut marking 1/8 inch back on lower panel of expansion joints on tank trailers.

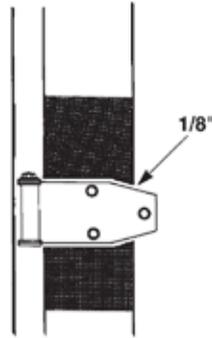


Figure 1

2. Remove the liner from back of marking, position and align the marking on the vehicle and tack down lightly to hold in position. For Flexible Prismatic Series 963 and 973, care should be taken to avoid stretching the marking.
3. Using a PA-1 applicator, press the marking to the surface using firm, vertical, overlapping strokes. Be sure **all** edges are adhered by resqueegeeing the edges.
4. Apply the remaining markings using the above procedures.
5. Apply markings over rivets using firm pressure leaving a bridge over the rivet head. Cut markings around rivets using an Osborne punch of proper size to fit over the rivet. Place the tool over the top of the rivet and tap lightly using a small hammer while slightly turning the cutting tool. Remove the cut film on the rivet head. Squeeze the marking around the rivet with firm pressure. Avoid applying markings over closely spaced rivets where possible. Apply the marking above the bottom row of closely spaced rivets on side panels.

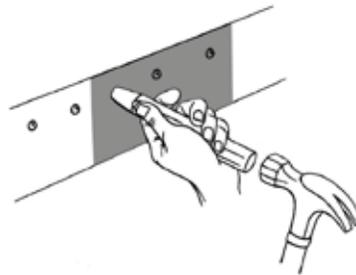


Figure 2

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- Application Procedure (continued)**
6. Cut marking at all panel seams and door openings using a sharp utility knife and squeegee the marking to the surface. Cut markings no closer than 1/8 inch to exterior post weld joints, door hinges, door hardware, lower panel of expansion joints on tank trailers, and ends of trailer to avoid lifting and wrinkling.
 7. **Markings should not be overlapped to make seams or joints.** Markings should be butted together.
 8. Do not apply the marking beyond panel edges where moisture and dirt can contaminate the adhesive.
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Cleaning

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

- Wash with sponge, cloth or soft brush using water and detergent.
 - Standard high-pressure hand spray:
 - Maximum** pressure — 1200 PSI/80 bar.
 - Maximum** water/wash solution temperature — 140°F/60°C.
 - Minimum** of 12 inches/30cm distance between cleaning spray tips and markings.
 - Cleaning wand or spray tips to be at no greater angle than 45 degrees from perpendicular to the markings surface. Use Spray Tip — #1505 (15 degree spray angle, 05 capacity size).
 - When using metal brighteners, follow manufacturer's recommendations for dilution. Thoroughly rinse from marking after soaking rail car or other vehicle.
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Removal Instructions

Required Tools:

1. Single edged razor blades
2. Handled tool to hold razor blades
3. Safety glasses
4. Solvent resistant protective gloves
5. Absorbent paper towels

Recommended Solvents:

1. Isopropyl alcohol (rubbing alcohol)
2. Suggested adhesive removal products:
 - a. 3M Citrus Cleaner
 - b. Brake cleaning fluid
 - c. Paint remover in aerosol can — use ONLY on bare metals (non-painted)
 - d. You may try other products to de-tackify the adhesive. Be cautious as you do not want the finish to be harmed.

NOTE: always follow manufacturer's instructions and safety recommendations

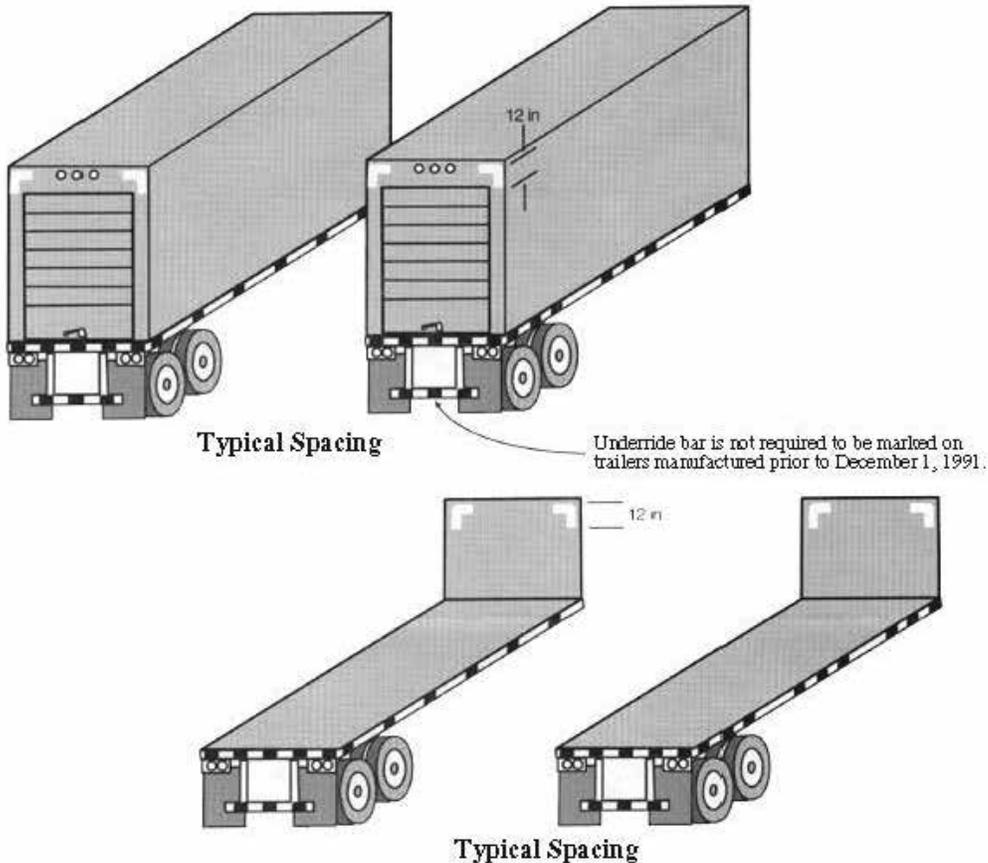
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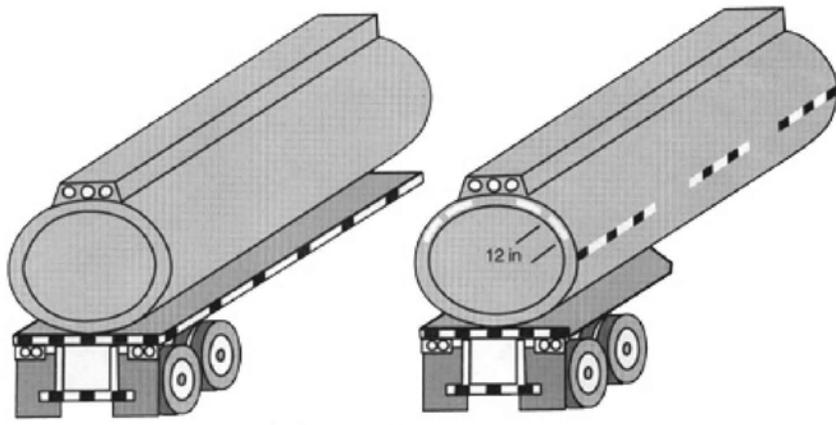
1. Use handled tool containing a new single edged razor blade to lift an edge of the marking.
2. While keeping the edge of the razor close to the surface of the substrate, begin to work the razor from side-to-side in small strokes in the direction of removal.
3. Pull the loose marking with minimal tension at approximately 45 degrees away from the substrate while working the razor back and forth.
4. If markings break away from the substrate, keep repeating steps one through three above. Note: Ease of marking removal will depend on initial adhesion and time on substrate.
5. It is very important to change razor blades frequently. A sharp blade will give best results.

Removing Adhesive

1. Spray one of the suggested adhesive removal products onto the adhesive residue.
2. Let the remover soak on the adhesive for three to five minutes.
3. Use a sharp razor blade in handled tool to scrape off adhesive.
4. Wipe residue off onto paper towel.
5. It may be necessary to repeat steps one through four several times to remove all adhesive.
6. Always use a sharp razor blade for best results.
7. All adhesive residue must be removed before re-application of markings.
8. Substrate needs to be cleaned with alcohol using one towel to clean and one to wipe away residue before reapplication of markings.

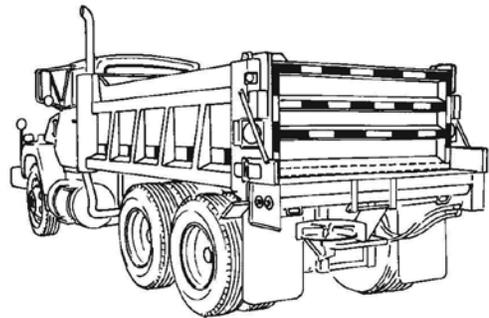
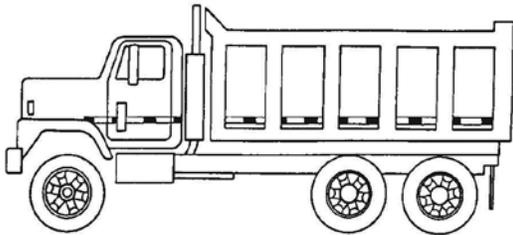
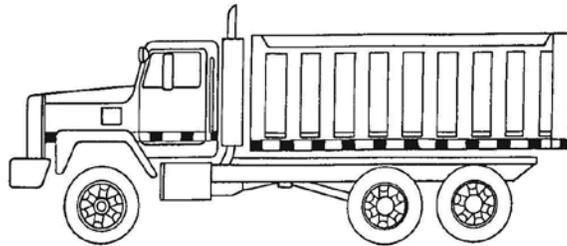
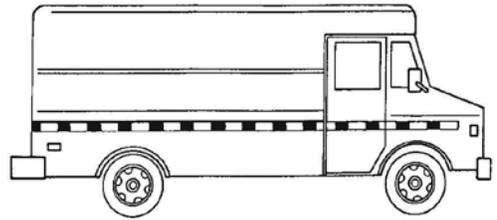
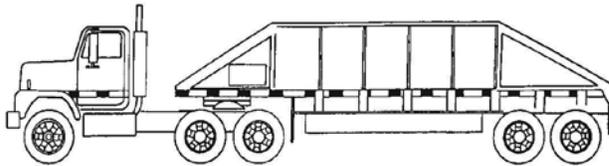
Truck and Trailer Application Guidelines for Conspicuity Markings Series 983/973/963





Typical Spacing

Suggested Applications



**Health and Safety
Information**

Read all health hazard, precautionary, and first aid statements found in the Material Safety Data Sheet (MSDS) and/or product label of chemicals prior to handling or use. Also refer to MSDS for information about the volatile organic compound (VOC) content of chemical products or cleaning solvents. Consult local regulatory authorities for possible restrictions on product VOC content and/or VOC emissions. For 3M products you may contact 3M Helps at 1-888-364-3577.

**FOR INFORMATION OR ASSISTANCE
CALL: 1-800-553-1380****IN CANADA CALL:
1-800-265-1840****Internet:
www.3M.com/roadwaysafety**

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