

Application, Maintenance & Removal Instructions for 3M™ Scotchlite™ Diamond Grade™ LDP Reflective Sheeting

Introduction

Scotchlite Diamond Grade LDP sheeting is coated with an aggressive pressure sensitive adhesive for application to most flat rigid surfaces (with and without rivets). The adhesive is protected with an easy release translucent plastic liner.

Applications are not recommended to rusted or corroded metal, loose or chalking paint, irregular shaped framework, bolts, rivets larger than 12mm high, support plates, within 3mm of door hinges, exterior posts, weld joints and ends of vehicle.

Important: The following information should be carefully reviewed before proceeding with individual instructions.

Preparation

Tools

- 3M™ Applicator PA-1 (blue or gold); available from Commercial Graphics Division or Traffic Control Materials Division.
- 3M™ Low Friction Sleeve SA-1 (used on the plastic applicator to minimize surface scratching); available from Commercial Graphics Division or Traffic Control Materials Division.
- Utility Knife; available locally at hardware or industrial supply stores.
- Industrial heat gun with a temperature range of approximately 250-400°C; available at industrial supply stores.
- Clean cloth or lint-free paper towels and recommended cleaning solvent.

Application Temperature

For optimum adhesion and durability, Diamond Grade LDP sheeting should be applied when air and application surface temperatures are within the following limits:

Product	Minimum	Maximum
LDP Sheeting	10°C	38°C

Check the proper temperature using an Infrared-Thermometer like 3M™ Scotchtrak™ IR-500. The marking may also be applied when air and application surface temperatures are beyond these limits with the following precautions:

- Above 38°C
 - If applied at temperatures above 38°C care must be taken to avoid pre-adhesion.
- Below 10°C
 - If the substrate is below 10°C, the substrate surface may be mechanically heated to this temperature by using a portable heater, 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 marking must also be heated using an industrial heat gun. The heat gun should be held 20 - 30 cm from the marking to avoid burning, melting or distorting the marking.

! CAUTION: To ensure marking is not distorted, applied heat should be regulated so that the marking surface is comfortable to the touch. Following this heat treatment, the marking must be re-squeegeed and left inside for 12 hours minimum to assure adequate adhesion in cold temperatures.

Surface Preparation

All surfaces must be considered contaminated and must be cleaned prior to application. Wash surface with detergent and water to remove dirt and road film. Solvent wipe using a clean cloth or paper towel saturated with Isopropyl alcohol. Immediately dry surface before solvent dries, paying close attention to rivets, seams and door hinge areas.

Note: An application surface that has been washed, dried, solvent wiped and dried can still have poor adhesion in the area around rivets and seams due to liquid retention caused by capillary action. This problem can be overcome by allowing a cleaned vehicle to stand overnight prior to application of markings, or by the use of a heat gun to dry out retained solvent.

Application to rusted, severely pitted, loose or chalking painted surfaces is not recommended. These surfaces must be clean of rust and painted using recommended standard practices before applying conspicuity marking.

Application

If possible marking should be applied in an essentially continuous stripe or panel. Cut the sheeting around rivet heads and other irregularities as recommended in this bulletin. Apply marking no closer than 3mm to door hinges, door hardware, ends of the trailer, weld joints and the lower panel of tank trailer expansion joints.

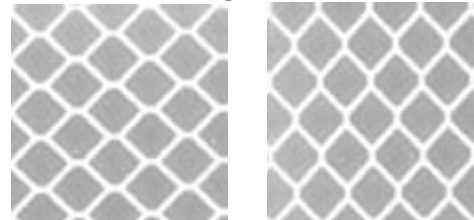
1. Remove a small section of the liner from back of marking, position and align the marking on the vehicle and tack down lightly to hold in position.
2. Firmly hold 50-70cm (arm length) in position against the surface with one hand and slowly remove the liner from the back with your other hand by pulling down on the liner. Do not lose alignment. Removing liner from the marking before aligning will cause pre-adhesion and misalignment.
3. Using a PA-1 applicator with a low friction sleeve, press the marking to the surface using firm, overlapping strokes. Be sure all edges are adhered.

4. Apply the remainder of vehicles using the above procedures. It is recommended to use a 3M designed product dispenser.
5. Apply marking over rivets and body panel seams using firm pressure leaving a bridge which will adhere when the marking is cut in these areas.
6. Cut marking between all body panels and door openings using a sharp utility knife and squeegee the marking to the surface. Cut marking no closer than 3mm to exterior posts, weld joints, door hinges, door hardware and ends of the trailer and the lower panel of tank trailer expansion joints to avoid lifting and wrinkling.

Note: Do not apply the marking beyond panel edges where moisture and dirt can get to the adhesive. Marking should not be overlapped but should be butted together to make seams and join pieces. Remove the liner approx. 100mm length pre-mark squeegee.

Application Orientation

Figure 1



Application Orientation
= HORIZONTAL

Application Orientation
= VERTICAL

Diamond Grade LDP Sheeting is designed to reflect effectively regardless of its orientation on the substrate or ultimate orientation after installation.

However, because the efficiency of light return from cube corner reflectors is not equal at all rotation angles, optimum entrance angle performance can be achieved when the sheeting is oriented in a particular way.

When extra wide entrance angle performance is important for a given situation, you may elect to apply the material with a specific orientation.

Optimum wide-angle entrance performance is achieved by orientating Diamond Grade LDP sheeting horizontally. The sharp ends of the cell pattern point horizontally.

However, unless the location and/or position calls for extra-wide entrance angularity performance, Diamond Grade LDP Series sheetings can be manufactured and installed using the orientation that most efficiently utilises the reflective sheeting.

NOTE: In cases where panels, strips and text are placed on the same surface, it is recommended they be placed in the same orientation.

Cleaning

Diamond Grade conspicuity sheeting Diamond Grade LDP sheeting may be hand washed with a sponge or soft cloth using cold or warm water and soap or detergent, followed by a clean water rinse. When using pressure washing equipment, limit nozzle pressure to 80 bar (1000psi). Nozzle should be held at least 1 metre away from the vehicle using a wide fan pattern, and at an angle no more than 15 degrees from square on to the vehicle surface.

Caution: ! Any dirt collecting at the outer edges of the Diamond Grade LDP sheeting will not affect the products' overall performance. Do not attempt to remove this dirt with aggressive use of the pressure washing equipment as it may result in the edge lifting and/or top film layer delamination. Acid brightening and cleaning solutions can have an adverse affect on Diamond Grade LDP sheeting over time by lowering the surface gloss and retroreflection. These solutions should not be allowed to soak on the sheeting to avoid immediate damage

Removal

Equipment and Materials Required

- Heat Gun with variable temperature control.
- 3M Gold Applicator or similar
- Solvent e.g. Autosmart "PREPTONE", 3M Industrial Cleaner (Citrus based) or similar



Caution: Manufacturers' guidelines should be followed closely when working with solvent products .

Removal of Diamond Grade Sheeting

Using gentle heat from the heat gun, warm the area of the sheeting to be removed, avoiding use of excessive heat as this can cause the sheeting to melt. Heat small areas at a time, e.g. 50cm by 50cm and then gently peel the DG away from the bodywork. Use of the applicator behind the sheeting can help removal, taking care where possible to avoid causing delamination of the sheeting, as small pieces left on the bodywork can be more difficult to remove.

Repeat this process around the vehicle until all the sheeting panels have been removed.

Any small pieces of sheeting can be removed by using a non-abrasive grinding wheel, e.g. 3M Scotchbrite™ Molding Adhesive and Stripe Removal Disc.

Adhesive Removal

After removal of the sheeting it is likely that a layer of adhesive will remain on the bodywork. In order to remove this layer a solvent needs to be used to soften the adhesive to aid removal.

The procedure suggested is as follows:-

Spray a panel with solvent so that the adhesive is saturated and allow 5-10 * minutes for the adhesive to absorb the solvent. Repeat this step as necessary until the solvent has thoroughly penetrated the adhesive. Using the plastic applicator, remove the softened adhesive and discard carefully.

The process of solvent application and adhesive removal should be repeated until the adhesive is completely removed.

The time allowed for the adhesive to be absorbed may vary depending on ambient conditions, but do not allow the adhesive to become dry as this makes the removal process more difficult.

Final Finish

Rinse the vehicle body work with clean water, dry and apply a finishing compound to restore the paint work to the required finish.



IMPORTANT: FOLLOW MANUFACTURERS' USE AND SAFETY GUIDELINES AS DIRECTED WHEN HANDLING AND WORKING WITH SOLVENTS

Health & Safety

Refer to the package label and the Material Safety Data Sheet for health, safety, and handling information on the products referenced in this bulletin. For 3M products, if necessary, you may contact our Toxicology/Product Responsibility Department on 01344 858000.

Important Notice to Purchaser

The 3M products described in this publication are covered by a 3M warranty and limitation of liability. 3M's warranty provides that if 3M finds that goods are defective in material or workmanship they will be replaced or the price refunded at 3M's option but note that 3M does not accept liability for other direct losses (except for personal injury or death) or consequential losses relating to defective products or from information supplied by 3M. Purchasers and users of 3M products, and not 3M supplying companies, are always solely responsible for deciding on the suitability of the 3M product for their required or intended use.

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