



# Diamond Grade™ Conspicuity Markings

Series 983



## Powerful protection against collisions

Six times brighter than conventional markings

Highly durable and non-corroding

Superior reflectivity, even at angles up to 90°

DOT certified and guaranteed to meet and exceed NHTSA requirements

Seven year warranty



Studies show that heavy trucks with reflective markings experience 20% fewer nighttime collisions.

Studies show that conspicuity markings reduce the probability of serious accidents. Drivers rely on what they can see. And vehicles with reflective markings provide better visual information for faster, more accurate decision-making by drivers. This need for better visual information is particularly important when you consider the following factors:

- Roadways vary
- Automobiles often have dirty, misaligned headlights
- Drivers lose visual acuity and the ability to react quickly as they grow older

3M responds to the need for improved safety with a state-of-the-art product... 3M™ Diamond Grade™ Conspicuity Marking Series 983. Series 983 markings offer all the characteristics of superior reflective marking:

• **Brightness**

Six times brighter than conventional markings. And it maintains its superior conspicuity with a bright white appearance during the day and high reflectivity at night.

• **Angularity**

Reflects at angles approaching 90°.



Marked vehicles are clearly visible even when backing up, crossing traffic or making turns.

• **Outlines**

Help identify vehicle size and type

• **Durability**

Resists weather, dirt and aging

• **Warranty** 7 year

Diamond Grade™ marking series 983 has an acrylic and polycarbonate construction that is highly durable and non-corroding.

**Designed to stand up to the rigors of the road.**

Diamond Grade™ marking series 983 is DOT certified and guaranteed to meet or exceed all NHTSA requirements. It also carries a seven-year warranty with performance backed by 60 years of experience in reflective technology.

**Talk to your 3M representative today.**

As the leader in reflective technology, 3M can meet your specific conspicuity needs. To learn more about 3M™ Diamond Grade™ Conspicuity Markings contact your local 3M representative or visit our website at [www.3M.com/tss](http://www.3M.com/tss)

- The acrylic and polycarbonate construction makes 3M's conspicuity markings highly durable and non-corroding.
- Series 983 markings maintain superior conspicuity with a bright white appearance during the day and high reflectivity at night.
- Convenient peel off liner for easy application.



**Traffic Safety Systems Division**  
 3M Center, Building 225-5S-08  
 P.O. Box 33225  
 St. Paul, MN 55133-3225  
[www.3M.com/tss](http://www.3M.com/tss)

**3M Canada Company**  
 P.O. Box 5757  
 London, Ontario N6A 4T1  
 1.800.3MHELPS

**3M Mexico, S.A. de C.V.**  
 Av. Santa Fe No. 55  
 Col. Santa Fe, Del. Alvaro  
 Obregon  
 Mexico, D.F. 01210



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# 3M

## ...the line to improved safety

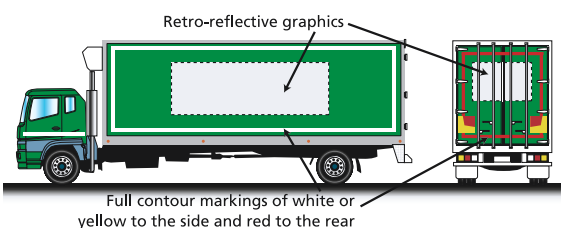
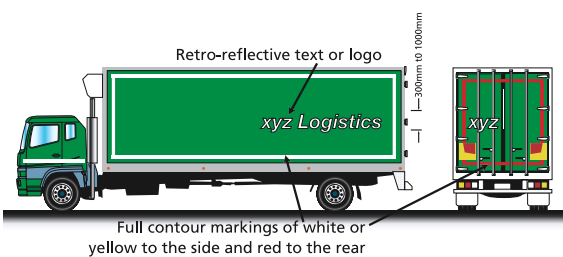
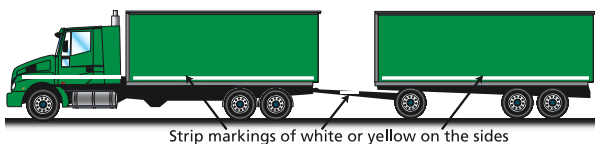


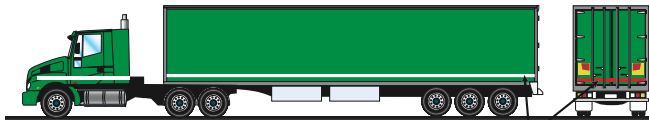
Every year many accidents occur because some drivers don't see other vehicles, or may see them too late to avoid a collision. Many of these accidents involve smaller vehicles colliding with trucks, trailers and other heavy vehicles, in many cases resulting in the death or severe injury of the occupant of the smaller vehicle.

Research that has been conducted in Europe and the USA details significant reductions in truck accident rates achieved through the application of retro-reflective striping and contour markings.

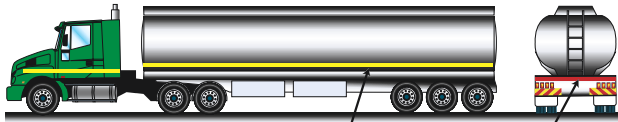
A study conducted in three parts by the Laboratory of Lighting Technology, Darmstadt University of Technology in Germany over a ten year period and involving a total of nearly 8,000 trucks, showed that each truck with contour markings was involved in only 0.5 car/truck accidents per year on average. Unmarked trucks were involved in as many as 15 such accidents per year.

The Vector Study (1985), conducted in the USA, involved 4,000 trucks over a two-year period and showed a 21.2% reduction in night-time accidents and a 16.3% reduction in day time accidents. A subsequent report from NHTSA, following the introduction in 1997 of contour markings on all trucks in the USA, entitled "The Effectiveness of Retro-reflective Tape on Heavy Trailers", dated March 2001, reported a reduction in side and rear impacts into marked trailers ranging between 29% and 41% in dark conditions. Furthermore, the report stated a reduction in fatality and injury accidents of 44% in dark conditions.





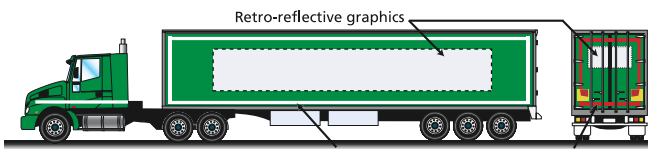
Strip markings of white or yellow on the sides and red across the rear



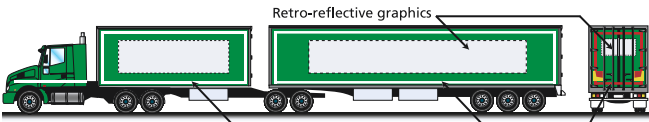
Strip markings of white or yellow on the sides and red across the rear



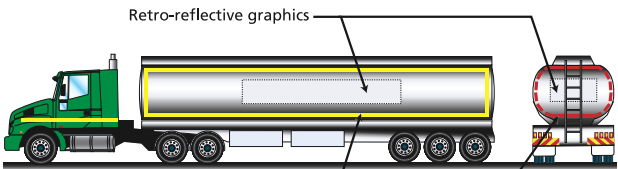
Strip markings of white or yellow on the sides and red across the rear



Full contour markings of white or yellow to the side and red to the rear



Full contour markings of white or yellow to the side and red to the rear



Full contour markings of white or yellow to the side and red to the rear

Following on from this research, the Australian Trucking Association has developed the Australian Heavy Vehicle Visibility Code of Practice. This code clearly describes the methods by which retro-reflective conspicuity tape can be applied to vehicles to increase their visibility. Additionally, the code details the use of white or yellow tape on the sides of vehicles, and the use of red tape on the rear of vehicles. The tape can be applied in either full contour form or strip form to delineate the vehicle's length and size. Additionally the code recommends how the use of retro-reflective graphics and corporate logos can complement safety.

**3M™ Scotchlite™ Diamond Grade™ Conspicuity Sheeting Series 983** and **3M™ Scotchlite™ Diamond Grade™ Segmented Conspicuity Tape Series 987** are highly reflective tapes that can be used to improve the visibility and early recognition of rigid and curtain sided heavy vehicles. The retro-reflective sheeting, in either strip or full contour form, identifies the shape and size of heavy vehicles to other traffic, making day, dusk and night-time driving safer for all.

For your copy of the **ATA Code of Practice** please contact the ATA on **02 6253 6900**.



For further product information, including details on where to purchase and how to apply

**3M™ Scotchlite™ Diamond Grade™ Conspicuity Tapes** please contact 3M on **1800 227 106**.



3M Traffic Control Materials Division

**Freecall: 1800 227 106**

[www.3M.com.au/reflective](http://www.3M.com.au/reflective)

email: [reflective@mmm.com](mailto:reflective@mmm.com)

# Rail Car Visibility for Enhanced Safety



- FRA 224 compliant—vivid yellows and bright whites
- Durable—resists weather, dirt and aging
- Aggressive adhesive
- Superior customer and technical support
- Industry-leading warranties
- Non-corroding
- Available in two product constructions
  - Series 983 FRA—strong and durable for smooth surfaces, available in fluorescent yellow for 24 hour visibility
  - Series 973 FRA—new flexible prismatic for smooth surfaces, and around rivets and corners

## Make rail cars more visible

3M™ Diamond Grade™ Rail Car Markings make rail cars more visible and help to improve safety for motorists.

Diamond Grade markings are now available in two constructions. Whether you need a strong, rigid product for smooth surfaces or one with a little more flexibility for application over or around rivets, 3M has a solution. Both constructions are bright and durable, and are backed by 3M's superior technical service and customer service, along with an industry-leading warranties. They are easy to apply and come with aggressive, pressure sensitive adhesive that stands up to the demanding rail car environment.

3M™ Diamond Grade™ Rail Car Markings Series 983 are made with a superior polycarbonate construction for maximum durability and carry a 10-year warranty. In addition to standard yellow and white, Series 983 markings are also available in fluorescent yellow. Studies have shown fluorescent materials provide enhanced safety during the hours of dawn and dusk when driver headlights may not be on, and especially during inclement weather including rain, fog or cloudy conditions.

3M™ Diamond Grade™ Rail Car Markings Series 983	
983-21 FRA	Fluorescent Yellow
983-71 FRA	Standard Yellow
983-10 FRA	White

New 3M™ Diamond Grade™ Flexible Prismatic Rail Car Markings Series 973 are more conformable and come with a 7-year warranty. Designed for application to smooth surfaces, and around rivets and corners, Series 973 markings have pre-sealed edges and an easy pull-off liner.

3M™ Diamond Grade™ Flexible Prismatic Rail Car Markings Series 973	
973-71 FRA	Standard Yellow
973-10 FRA	White

Diamond Grade markings are available in a variety of sizes, rolls (continuous or kiss-cut).

Series 983 and 973 Standard Sizes	
Rolls	4 inches x 50 yards
Kiss Cuts	4 x 9-inch, 4 x 18-inch and 4 x 36-inch
Strips (983 only)	4 x 18-inch, 100 strips per package

3M™ Diamond Grade™ Reflectors Series 989 <i>Meets and exceeds SAE requirements</i>		
REF-72	Red	2 x 3.5-inch rectangular, 500/roll
REF-74	Amber	2 x 3.5-inch rectangular, 500/roll
REFR-3 REFR-4	Red	3- and 4-inch round, 50/package
REFA-3 REFA-4	Amber	3- and 4-inch round, 50/package

For additional sizes, contact your 3M distributor or 3M sales representative, or call 1-800-553-1380.

For more information about 3M's bright and visible rail car markings, or 3M's full line of traffic safety products and services, contact your 3M representative or visit [www.3M.com/tss](http://www.3M.com/tss).



### Traffic Safety Systems Division

3M Center, Building 0225-05-S-08  
St. Paul, MN 55144-1000  
1-800-553-1380  
[www.3M.com/tss](http://www.3M.com/tss)

### 3M Canada Company

P.O. Box 5757  
London, Ontario N6A 4T1  
1-800-3MHELPS

### 3M Mexico, S.A. de C.V.

Av. Santa Fe No. 55  
Col. Santa Fe, Del. Alvaro  
Obregon  
Mexico, D.F. 01210

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# High Risk Rural Roads Program

**3M products and expertise help agencies develop low-cost solutions and on-target funding requests for improving safety on rural roads.**



3M Traffic Safety Solutions



## Why Rural Roads Now?

Congress put funding in the current federal highway bill (“SAFETEA-LU” or Safe, Accountable, Flexible Efficient Transportation Equity Act: A Legacy for Users) because of serious national concern for safety on rural roads. The High Risk Rural Roads Program (HRRRP) provides \$360 million with the goal to cut traffic deaths and injuries on public roads by 20 percent by 2008.

Federal funding is earmarked for low-cost solutions that improve rural driving safety. The funding is available now through 2009 to help states correct or improve hazardous road locations or features in a rural setting.

## Concerns Stimulate Action

Rural roads are the most dangerous roads in America.

- About 60 percent of fatalities nationwide are on rural roads.<sup>1</sup>
- For every ten vehicle miles traveled, fatalities are 2.75 times higher on rural roads than on other roads.<sup>2</sup>
- In 2003 alone, 25,136 people died as a result of run-off-road crashes.<sup>1</sup>
- The cost of each death is more than \$1.1 million and each disabling injury is nearly \$50,000-that's the cost for each individual, not each crash.<sup>3</sup>
- Drivers are three times as likely to be involved in an accident during rainy or wet pavement conditions.<sup>4</sup>

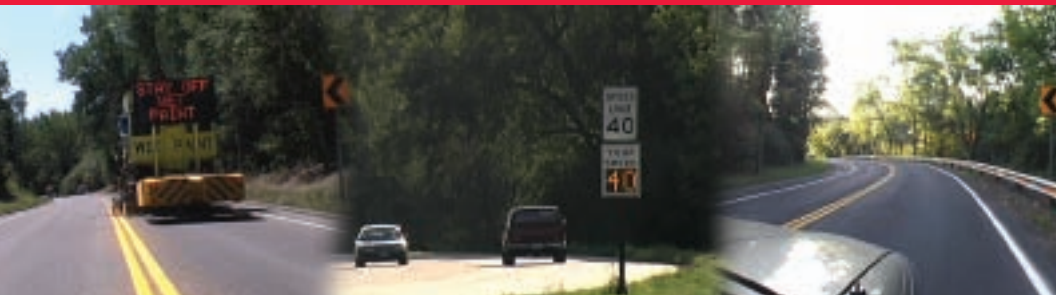
Low-cost engineering improvements such as attention-getting signage, highly visible road markings, traffic calming devices and other positive guidance measures help reduce risk and costly crashes. HRRRP helps communities make rural roads safer and support solutions with federal funds.

<sup>1</sup> Federal Highway Administration (FHWA)

<sup>2</sup> merginet.com

<sup>3</sup> National Safety Council (NSC)

<sup>4</sup> Development of Human Factors Guidelines, FHWA-RD-99-130, December 1999





# 3M HRRRP Solutions

There are many options to make high risk rural roads safer; 3M provides a family of solutions to support HRRRP efforts.



## Higher Visibility Increases Driver Awareness

Attention-getting signage and highly visible road markings provide measurably improved communication. Preparing drivers for road transitions and giving them advance warning to points of conflict, such as STOP-controlled intersections, increases driving safety and reduces driving risk. There are many excellent countermeasures to help reduce risk.

- Maintain high standards of retroreflectivity to attract attention
- Replace faded signs and markings to maintain visibility
- Enhance signage, markings and sightline visibility to keep drivers informed and aware
- Highlight road edge transitions with retroreflective, all-weather striping materials
- Install linear delineation systems on guard rails for guidance through roadway geometry changes



## Brighter Signs Improve Safety

Traffic signing delivers from \$10<sup>4</sup> to \$24<sup>6</sup> for every dollar spent—a highly cost-effective traffic safety improvement. Studies show that brighter signs help reduce crashes by as much as 25 to 48 percent.<sup>5</sup> 3M™ Diamond Grade™ DG<sup>3</sup> Reflective Sheeting helps improve safety at STOP-controlled intersections and fluorescent yellow sheeting enhances the visibility of advance warning signs.

- Delivers increased luminance during the day, dawn and dusk for better positive guidance
- Generates twice the retroreflective efficiency of other sheetings at night through full cube technology<sup>7</sup>
- Delivers optimal performance where and when drivers need it most



## Better Markings Provide Positive Guidance

Pavement markings made from high performance, all-weather materials provide guidance for drivers and raise awareness in transitions and danger spots such as hidden intersections, curves and railroad crossings.

3M™ Stamark™ High Performance Wet Reflective Tape and 3M™ All Weather Paint offer durability and all weather performance.

The solution:

- Provides high visibility-day or night, wet or dry
- Alerts drivers to changing road geometries or approaching conditions
- Increases motorist guidance with stop bars, crosswalks, symbols and legends



## Driver Feedback Signs Reduce Traffic Speeds

The FHWA Manual on Uniform Traffic Control Devices states that “Changeable message signs displaying actual speeds... enhance driver compliance with speed limits.” Each one-mile-per-hour decrease in traffic speed typically reduces accidents by five percent.<sup>5</sup>

3M™ Driver Feedback Signs provide real-time feedback to slow speeding drivers as they approach transitions from rural to populated areas. The proven technology:

- Makes roadways safer by reducing driving speeds
- Commands attention with high-visibility fluorescent yellow-green pixels
- Logs speed data to substantiate speed reductions

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<sup>5</sup> Ripley, 20004 ITE Annual Meeting Proceedings

<sup>6</sup> <http://www.98.net/roadsafety/statistics.html>

<sup>7</sup> 3M measurement to recognized scientific standards

<sup>8</sup> Litman, T., Traffic Calming Benefits, Costs and Equity Impacts, Victoria Transport Policy Institute, 1999

## A History of Leadership

3M has been discovering and advancing technologies that help make the driving environment safer for more than 65 years. 3M is the recognized leader in innovative products for positive guidance, traffic management and public safety.



**Contact a 3M representative for more information about 3M products, services and expert advice for High Risk Rural Roads.**



**Traffic Safety Systems Division**

3M Center, Building 225-05-S-08

St. Paul, MN 55144-1000

USA

1-800-553-1380

[www.3M.com/tss](http://www.3M.com/tss)

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