

Making a difference with vehicle visibility: ensuring nighttime road safety in India



Road traffic injuries are currently the eighth leading cause of death across all age groups worldwide.¹ According to the World Health Organization, they are also the leading cause of death for children and young adults aged five to 29 years.

In India alone, over 150,000 people are killed in road traffic accidents annually.² Many of these road traffic accidents and fatalities occur in low-light conditions. According to a 2017 report in India, the country's highest number of total road accidents (18.4 percent) had been recorded between 6:00 PM and 9:00 PM.³

Enhancing vehicle visibility through retroreflective conspicuity tapes

A contributing factor to road traffic collisions is the poor visibility of heavy vehicles, especially in dark conditions. As vivid, contrasting colours can enable drivers to identify and locate a hazard amidst the visual roadway clutter, using retroreflective tape is key in enhancing vehicle conspicuity.⁴

In fact, the U.S. National Highway Traffic Safety Administration (NHTSA) estimates that approximately 2,660 lives have been saved from 1960 to 2012 because of retroreflective conspicuity tape on heavy trucks and trailers.⁵

Although retroreflective tape is applied on trucks and trailers, it also benefits occupants of passenger vehicles. During darkness, the tape can reduce side and rear collisions into heavy trailers by 41 percent.⁶

When all heavy trailers have retroreflective tape, an estimated 191 to 350 lives can be saved every year, according to the NHTSA. Retroreflective tape can also prevent approximately 3,100 to 5,000 injuries and roughly 7,800 crashes annually (relative to a hypothetical fleet of trailers without the tape).

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Compliance with regulations and guidelines

The U.S. National Highway Traffic Safety Administration (NHTSA) requires retroreflective conspicuity tape to be fixed on the sides and rear of trailers that are over two metres wide or weigh over 4,535 kg. Many countries are now implementing similar measures.

In India, the government has made it mandatory to apply retroreflective tapes on all commercial vehicles, regardless of manufacture year.⁷ This includes three and four-wheelers, as well as light, medium and heavy vehicles. India's AIS-090 (Automotive Industry Standard) regulation requires conspicuity markings on at least 80 percent of the overall length and width of the vehicle, as close as practicable to the edges.⁸ In unique cases, this can be reduced to 60 percent for challenging applications.

In 2013, the National Ambulance Code AIS-125 was also introduced in a bid to improve the safety of road ambulances in India. The AIS-125 lists several requirements, including a twolined red Battenburg pattern on the side of the ambulance.⁹



Conspicuity tapes applied as a complete contour line marking (box) on the rear of a trailer.

1 Global status report on road safety, World Health Organization, 2018

2 The Economic Times, India, 2018

3 Road accidents in India, Government of India, 2017

4 Emergency Vehicle Visibility and Conspicuity Study, U.S. FEMA, 2009

5 U.S. NHTSA, 2015

6 U.S. NHTSA Technical Report, 2001

7 The Times of India, 2019

8 Automotive Industry Standards Committee, India, 2005

9 Automotive Industry Standards Committee, India, 2013

10 Human Factors: The Journal of the Human Factors and Ergonomics Society, 2018

Safeguard lives – and your bottom line

As numerous studies and field tests suggest, retroreflective tape on vehicles can prevent roadway accidents, injuries and fatalities. By using retroreflective tape for your vehicles, you are doing your part to safeguard the lives of your employees and civilians. These accident prevention measures also mean that you are reducing your legal and financial liability.

If you operate a business that primarily involves vehicles or trailers, you know how important it is to keep those vehicles on the road. Any accidents can lead to unnecessary downtime, which translates to reduced efficiency and lost revenue.

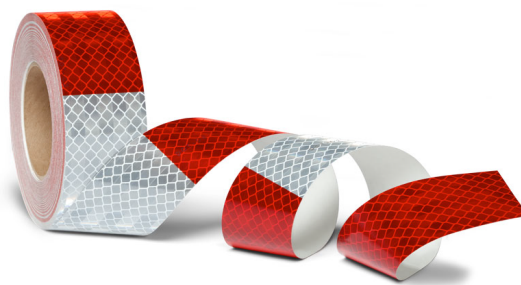
Vehicle retroreflective tapes are a cost-effective solution to help protect the lives around you, your assets, and your bottom line.



Retroreflective tapes increase the visibility of school buses on the road.

Using quality vehicle retroreflective tape

The 3M™ range of highly retroreflective microprismatic tapes is designed to enhance the visibility of the sides and rears of vehicles. These tapes deliver bright, vivid retroreflectivity at wide angles – almost 90 degrees from perpendicular – to ensure that your vehicles remain highly visible during daytime, night-time and poor weather conditions. Our tapes also exceed NHTSA, ECE-104, and AIS-090 requirements and are DOT approved, ensuring compliance with industry standards.



Use the table below to compare the different product specifications.

Features	3M™ Diamond Grade™ Conspicuity Markings Series 983	3M™ Diamond Grade™ Conspicuity Markings Series 943	3M™ Vehicle Safety Markings Series 823i	Globetrotter
Typical Use	For application on rigid-sided vehicles	For application on rigid-sided vehicles	For application on simple curved surfaces, vehicle profiles, reflective wraps etc.	For application on simple curved surfaces, vehicle profiles, reflective wraps etc.
Suitable application surfaces and substrates	Aluminium, stainless steel, automotive paint	Aluminium, stainless steel, automotive paint	Aluminium, stainless steel, automotive paint	Aluminium, stainless steel, automotive paint
Maximum Warranty	8 Years	5 Years	3 Years	2 Years
Standard Colour Range	White, yellow & red	White, yellow & red	White, red, yellow, blue, florescent yellow green, red white chevron	White, yellow, orange, white-orange strips
Adhesive	Clear, pressure sensitive	Clear, pressure sensitive	Clear, pressure sensitive	Clear, pressure sensitive
Product Construction	Prismatic construction	Prismatic construction	Prismatic construction	Prismatic construction
Roll Size	2" X 50 meters	2" X 50 meters	Varied Size	Varied Size
ECE-104 and AIS-090 Compliant	Yes (104 R – 00821)	Yes (104R – 003994)	No	No
Application temperature range of air and substrate	Min 10° C	10°C to 38°C	+15° C to +38° C	Min +18° C

Common conspicuity applications: Emergency Vehicles

Emergency vehicles, such as ambulances, fire trucks and police vehicles, often operate in fast-paced, lifethreatening situations. As emergency vehicles are driven at faster speeds, the accident fatality rates for emergency medical service personnel, firefighters and law enforcement officers are 2.5 to 4.8 times higher than the average of other occupations.¹⁰

In addition, emergency vehicles are sometimes required to stop by the roadside during crises. In low-light conditions, it is even more crucial that these vehicles can be seen by other drivers from a distance to prevent road collisions.

To this end, 3M worked with two of India's major ambulance manufacturers to design and apply retroreflective sheeting to make their ambulances more visible at night.



An example of how 3M Conspicuity tapes can be applied on ambulances in India.

Application examples of 823i vehicle wrap, Globetrotter, and 983 non-logged roll



Globetrotter – India Applications



DG3 – UK Applications



823i – European Applications



Wider 983 Conspicuity – US Applications



Interested in knowing more about retroreflective tape applications and regulations?

3M offers local technical and regulatory support, helping you to comply with national regulations and guidelines. Contact us for product specifications and recommendations, where to buy information, and more.

CONTACT OUR EXPERTS

To learn more about road safety and 3M product ranges visit:
www.3mindia.in/3M/en_IN/road-safety-in

For more information on Conspicuity markings, application guidelines, and where to buy 3M retroreflective tape, visit:
www.3mindia.in/3M/en_IN/road-safety-in/support/contact-us/