

Guidance for retroreflective marking on Light Commercial Vehicles (LCVs)



February 2025



1. Introduction

Approximately 30% of collisions involving vans or other Light Commercial Vehicles¹ (LCVs) occur during lighting-up hours or at times of reduced visibility. Vehicles used for roadside operations especially those that are at times stationary during their work activity are at a higher risk. Such operations include but not limited to, road maintenance, emergency services, utility providers, breakdown recovery vehicles, and delivery vehicles.

To increase the visibility of LCVs used in roadside operations, vehicle owners may consider fitting retroreflective chevron markings to their vehicle. Retroreflective materials reflect light directly back to the source, therefore increasing the visibility of a vehicle fitted with markings to approaching motorists.

In Ireland the fitment of retroreflective markings is mandatory for [Heavy Commercial Vehicles](#)² (HCVs) however, their fitment is optional for LCVs.

This document provides some guidance for owners of LCVs that would like to fit retro-reflective chevron markings to their vehicle.

Vehicles that are used for Temporary Traffic Management (TTM) operations must comply with the requirements outlined in the [TTM Guidance Manuals](#) on the Department of Transport traffic signs website.

2. Recommendations

To increase the visibility of light commercial vehicles used for roadside operations vehicle owners may fit rear retroreflective markings. When fitting rear retroreflective markings the following is recommended.

Design

Rear retroreflective markings should comprise of alternate strips of retroreflective material and non-retroreflective material in a chevron pattern.

The alternating stripes should be:

- at least 150mm wide
- and
- angled upwards between 45° and 60°.



¹ Commercial vehicles with a gross vehicle weight of less than or equal to 3,500kg. Gross vehicle weight is defined as the maximum weight of the vehicle including the driver, passengers, fuel, and load.

² Commercial vehicles with a gross vehicle weight greater than 3,500kg. Gross vehicle weight is defined as the maximum weight of the vehicle including the driver, passengers, fuel, and load.

Colour

The stripes should be red and yellow in colour, with the colour alternating between each stripe.

- The red stripes should be a retroreflective material which is designed to maximise night-time visibility,
- The yellow stripes should be a fluorescent non-reflective material which will provide good daytime visibility and contrast to the red.

As an alternative it is possible to have complete coverage of red retroreflective material in place of chevrons on the rear, but the red/yellow combination is generally considered to provide greater visibility in all light conditions.

Material

Reflective materials are separated into different classes based on their reflective properties and intended use.

To ensure that rear chevron markings perform as intended, it is crucial that the correct materials are used.

- The red stripes should consist of a high grade retro reflective material.
- The alternate stripes should be a fluorescent yellow **non-reflective** material.

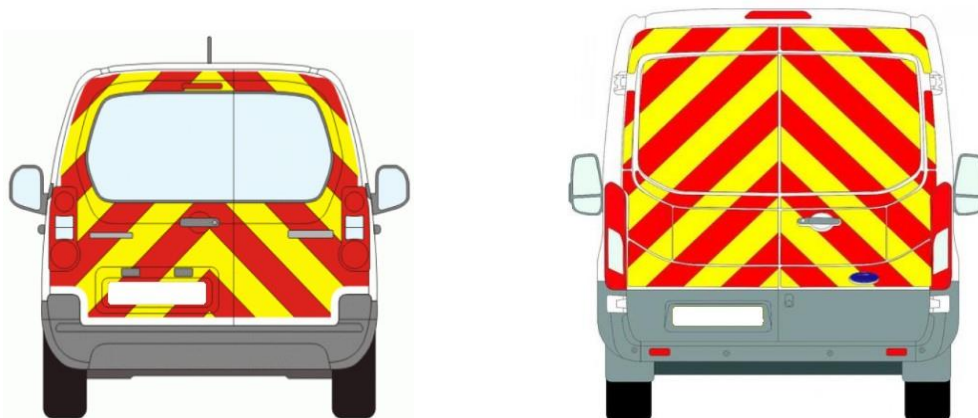
Note: only red reflective markings are permitted to the rear of vehicles in Ireland.

Fitment

It is recommended that chevron markings are only fitted to the rear and cover as much of the back of the vehicle as possible, they must not be fitted to the side or front of the vehicle.

When fitted to the rear of the vehicle they must not obscure any windows, lights, reflectors, sensors, or registration plates.

On large vans with no rear windows, it is possible to cover most of the rear of the vehicle in reflective material, whereas, on some smaller vehicles, the markings will cover a smaller area to provide better rear visibility for the driver by keeping the rear window clear.



Where rear facing chevron markings are obscured by a device mounted on the vehicle, additional chevron markings may be applied to any face of the device which is directed to the rear of the vehicle and oncoming road users.

Rear facing door edging / lockers / guardrail strips may be fitted with red retroreflective material.

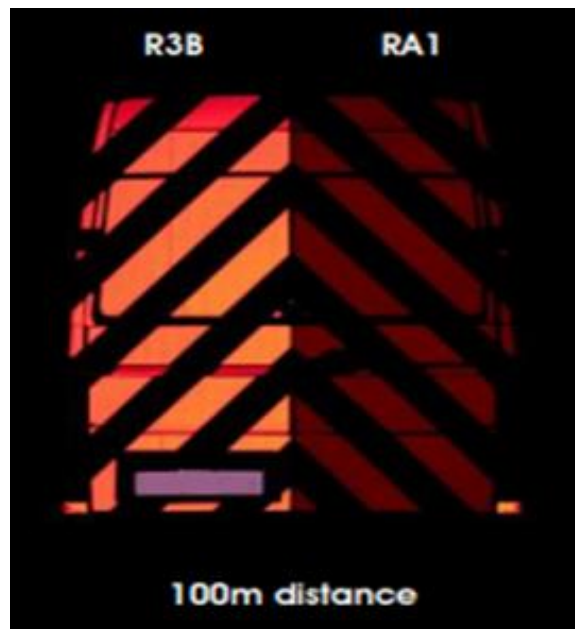
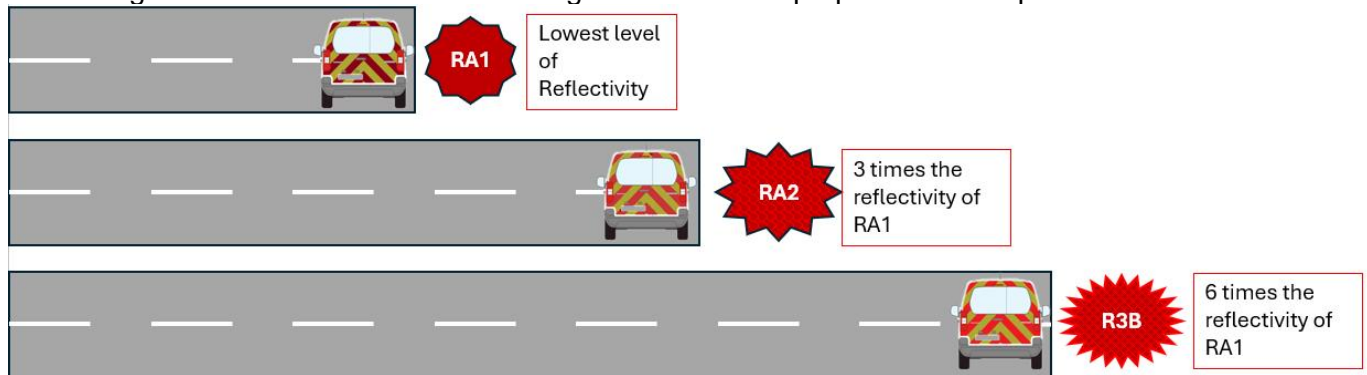
3. Material properties

To ensure maximum visibility during lighting up hours, it is recommended that materials with high retroreflective properties are used for the red stripes in the rear chevron markings. The information below provides an overview of the different types of material available.

European Standard EN 12899-3:2007.

EN 12899-3:2007 'Permanent vertical signage for road traffic' outlines requirements for new retroreflectors as a separate product, it covers the minimum performance requirements and durability requirements. Within the standard there are three levels of retro-reflective materials as seen below.

- **RA1** – this is the lowest level of reflective material which would typically be used for items such as numberplates
- **RA2** – this mid-level reflective material uses micro-prismatic technology which would typically be used for items such as traffic signage
- **R3B** – this is the highest-level reflective material which uses glass-bead technology and is designed for use in locations where high retroreflective properties are required.



**Reflectivity comparison of RA1 and R3B
Visibility from 100 metres**

UN Regulation ECE 104

UN Regulation ECE 104 outlines the technical requirements for the approval of retro reflective marking tapes for vehicles of EU categories M, N, and O, (passenger, goods, and trailers) in Europe.

Within the Regulation there are three classes of materials.

- Class E – this material has the lowest reflective properties and may be used for distinctive markings/graphics for an extended area.
- Class D – this material had mid-level reflective properties and may be used for distinctive markings/graphics intended for a limited area.
- Class C – this is the highest-class reflective material in ECE104 and can be used for contour markings or where high retroreflective properties are required.

The image below provides an example of the different classes of ECE104 material.



Class C markings approved under ECE104 must carry the “E-mark” to show that the tape has met the minimum requirements of the Regulation. Class C material fitted to a vehicle must be red to the rear, yellow or white to the side, and white to the front.

4. Maintenance

The effectiveness of retroreflective materials tends to deteriorate over time, so regular maintenance is important. It is recommended that vehicle owners maintain retro-reflective markings by undertaking the following.

- Keep the markings clean and free from dirt.
- Treat retroreflective materials with the same care used with high gloss automotive finishes, avoiding scrubbing or the use of brushes with stiff bristles.
- Avoid using harsh chemical cleaning agents, or excessively high pressure / temperature jet washers.
- Always follow manufacturers recommendations where possible.
- Replace any markings that become damaged or where the reflectivity has deteriorated

Correct maintenance of the retroreflective materials can result in greater visibility and prolong their service life.

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