

# Marker Series 590

## (Depressible Reflecting Road Stud)

### Description

Series 590 Road Studs are permanent, depressible inset reflecting road studs. They feature polycarbonate micro-replicated prismatic retro-reflective lenses with a protective and self-healing resin coating. The stud bodies are made of a specialist grade rubber compound that gives maximum impact resistance, depression durability and weatherability.

Complementing other road markings and traffic signing, Series 590 Depressible Road Studs stand out at night to alert motorists to road changes such as bends and exits and to improve lane line guidance. Series 590 Depressible Road Studs are designed to be installed into appropriate, approved in-set metal housings. Series 590 Depressible Road Studs provide highly effective, long-life visibility at night and particularly in wet weather.

### Classification

Series 590 Depressible Road Studs using EN1463-1:1998 are classified as being **Type P3B**, i.e. Permanent, Plastic reflector with abrasion resistant layer, Depressible.

In terms of retroreflective performance, Series 590 Depressible Road Studs are classified as being **Class PRP1 Type 3** retro-reflectors according to EN1463-1:1998.

In terms of Road Test Performance as per EN1463-2:2000, Series 590 Depressible Road Studs are classified as being **Class S1** (Road Presence) and **Class R2** (night-time visibility) products.

### Product Features

- Wet and dry retro-reflectivity
- Impact resistance
- Durable, depressible body
- Abrasion resistant
- Rumble effect
- Lightweight
- Easy to install
- Compatible with appropriate, approved in-set metal housings

### Photometrics

#### Colorimetry

The retroreflected colours of Series 590 Depressible Road Studs lie within the colour boxes stipulated in Table 1 when tested in accordance with CIE Publication No. 15.2 using CIE Standard Illuminant A with an entrance angle of  $\beta_V=0^\circ$ ,  $\beta_H=5^\circ$  and an observation angle of  $\alpha=0.3^\circ$ . Colour functions and calculation methods must be made in accordance with ISO/CIE 10526 and ISO/CIE 10527, 1991

**Table 1**

Colour	Point	x	y
White	1	0.390	0.410
	2	0.440	0.440
	3	0.500	0.440
	4	0.500	0.390
	5	0.420	0.370
Amber	1	0.549	0.450
	2	0.543	0.450
	3	0.590	0.395
	4	0.605	0.395
Red	1	0.665	0.335
	2	0.645	0.335
	3	0.721	0.259
	4	0.735	0.265
Green	1	0.030	0.385
	2	0.228	0.351
	3	0.321	0.493
	4	0.302	0.692

**Note:** If two points lie on the spectrum locus line, they shall not be connected by a straight line but shall, in this case, be joined by the boundary of the spectrum locus

#### Retroreflectance

When measured in accordance with CIE publication No. 54.2 using a Standard Illuminant A, Series 590 Depressible Road Studs have a minimum coefficient of luminous intensity  $R$  (CIE Publication 17.4) as given in Table 2.

**Table 2**

Colour	Entr. Angle	Obs. Angle	Min R (mcd/lx)
White	±15°	2°	1.5
	±10°	1°	10
	±5°	0.3°	150
Amber	±15°	2°	0.75
	±10°	1°	5
	±5°	0.3°	75
Red	±15°	2°	0.3
	±10°	1°	2
	±5°	0.3°	30
Green	±15°	2°	0.3
	±10°	1°	2
	±5°	0.3°	30

## Application and Removal Instructions

For situations not specifically covered in this section, it is the responsibility of the installer to contact the appropriate 3M Sales Representative or 3M Technical Service for advice.

### Installation

1. Engage the teeth within the recess of the metal base with the corresponding recesses along one side of the Series 590 stud.
2. Using hand pressure, squeeze the Series 590 stud so that it will fit into the recess.
3. Release the insert and manipulate the Series 590 stud to ensure that the teeth of the housing are engaged in the holes on both sides of the Series 590 stud.

### Removal

1. Using hand pressure or a suitable rigid implement, squeeze the sides of the Series 590, to disengage the metal teeth from the holes along one-side of the road stud.
2. Whilst continuing to squeeze the Series 590 stud, pull the stud upwards and out of the base.
3. Remove any water or debris from the metal base recess before installing any replacement Series 590 stud.

### Storage

Series 590 road studs should be stored in a cool, dry area, preferably at 18-24°C (65-75°F) and 30-50% relative humidity and should be applied within one year of purchase.

Store away from foodstuffs and keep packaging closed.

### Health and Safety Information

For further information on 3M products, you may contact our Toxicology/Product Responsibility Department on 01344 858000.

## **Important Notice to Purchaser**

*Technical information provided by 3M is based on experience and/or tests believed to be reliable but its accuracy is not guaranteed and the results may not be relevant to every user's application. 3M does not accept responsibility or liability, direct or consequential, arising from reliance upon any information provided and the user should determine the suitability of the products for their intended use.*

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