



3MTM Marker Series 290

(Durable Raised Pavement Marker)

Description

Series 290 Road Studs are permanent surface mounted reflecting road studs. They have tough polycarbonate microreplicated corner cube reflector lenses with a protective abrasion resistant ceramer coating. The stud bodies are made of an engineered thermoplastic that gives maximum impact resistance and weatherability.

Complementing other road markings and traffic signing, Series 290 Road Studs stand out at night to alert motorists to road changes such as bends and exits and to improve lane line guidance. Designed for application on all asphalt type road surfaces, they are compatible with 3M recommended bitumen adhesives. Series 290 Road Studs provide highly effective, long-life visibility at night and particularly in wet weather.

Classification

Series 290 Road Studs using EN1463 part 1:1998 are classified as being **Type P3A**, i.e. Permanent, Plastic reflector with abrasion resistant layer, Non-depressible.

In terms of retroreflective performance, Series 290 Road Studs are classified as being **Class PRP1 Type 2** retroreflectors according to EN1463-1:1998.

In terms of Road Test Performance as per EN1463 part 2:2000, Series 290 Road Studs are classified as being **Class S1** (Road Presence) and **Class R1** (night-time visibility) products.

Product Features

- Durable
- Wet and dry retroreflectivity
- Impact resistance
- Abrasion resistant
- Molded-in body colors
- Rumble effect
- Lightweight
- Application finger grips
- Compatible with standard bitumen and epoxy adhesives

Photometrics

Colorimetry

The retroreflected colours of Series 290 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 290 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°	2.5
	±10°	1°	25
	±5°	0.3°	220
Amber	±15°	2°	1.25
	±10°	1°	12
	±5°	0.3°	110
Red	±15°	2°	0.5
	±10°	1°	5
	±5°	0.3°	44
Green	±15°	2°	0.5
	±10°	1°	5
	±5°	0.3°	44

Application Instructions

This section contains road surface preparation and application procedures for 3M™ Marker Series 290. 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.

Application Conditions

Applications should only take place when road temperature is 5°C or higher. Series 290 Road Studs are designed for application to properly prepared asphalt surfaces using 3M recommended bitumen adhesive.

ALL APPLICATIONS MUST BE MADE ON A CLEAN AND DRY ROAD THAT HAS BEEN SWEEPED OR BLOWN WITH HIGH PRESSURE AIR TO REMOVE DIRT AND DUST/DEBRIS.

Do not apply studs in the following situations:

1. During rainfall or immediately after rainfall.
2. On to existing road markings such as paint, thermoplastic or preformed tapes.
3. On deteriorating road surfaces.
4. Do not allow traffic to cross over studs immediately after installation. Provide adequate protection until adhesives are sufficiently set to prevent tracking or movement of the markers.
5. Do not step on studs after placement on adhesive. Simple hand pressure is all that is needed to assure adequate performance.
6. When the existing surface is dirty or wet.

Surface Types

Series 290 Road Studs are suitable for application to the following types of road surface.

- NEW ASPHALT SURFACES
- EXISTING ASPHALT SURFACES
- CONCRETE ROAD SURFACES
- SURFACE DRESSED SURFACES

On new surfaces allow adequate compaction and curing time before application of adhesive and studs. On coarse textured surfaces adhesive may need to be placed in 2 steps for proper levelling prior to stud application.

Bitumen adhesive is a single-part system designed to be melted, then applied by pouring or pumping which then sets on cooling.

Instructions for using Bitumen Adhesive

Description

3M recommended Bitumen Adhesive is a hot-applied bituminous material that, when properly applied, will bond Series 290 Road Studs to asphalt surfaces.

Application Instructions

Melting

3M recommended Bitumen Adhesive can be melted in several different types of melting units including direct fired single walled boilers, oil jacketed boilers, or electrically heated boilers. For best application results, the adhesive should be agitated frequently during melting and during application to prevent localised overheating by either recirculation pumps or by some other mechanical stirring.

During initial melting and use, the adhesive **must** be maintained at a temperature between 160°C and 180°C.

BITUMINOUS ADHESIVE MUST NOT BE OVERHEATED.

Marker Application

1. Ensure that the hot-melt bituminous adhesive is at the correct temperature, between 160°C and 180°C.
2. Apply a mass of material that is approximately three-quarters the size of the stud, to the road.
3. When the typical stud application method is used, a stud is centred 2.54cm (1 inch) to 5.08cm (2 inches) above the hot bitumen pad and dropped onto the pad. With finger pressure only, the stud is pushed down to a point where the bitumen forms a slight bead around all edges of the marker base.
4. The entire stud bottom should be supported by adhesive, and there should be adhesive surrounding the stud. Be careful not to have excessive adhesive in front of the stud.

Clean Out

If the application equipment being used is a type that requires clean-out of pumps and plumbing, follow the manufacturer's clean-out procedure instructions. If solvent is used for clean-out, ensure that solvent does not contaminate future batches of adhesive because adhesive softening and flash problems may occur.

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.

Nothing in this statement will be deemed to exclude or restrict 3M's liability for death or personal injury arising from its negligence.

All questions of liability relating to 3M products are governed by the seller's terms of sale subject where applicable to the prevailing law.

If any goods supplied or processed by or on behalf of 3M prove on inspection to be defective in material or workmanship 3M will (at its option) replace the same or refund to the Buyer the price of the goods or services.

Except as set out above, all warranties and conditions, whether expressed or implied, statutory or otherwise are excluded to the fullest extent permissible at law.

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Storage

Store away from foodstuffs and keep containers closed.

Health and Safety Information

Read all health hazard, precautionary and first-aid statements found in the Material Safety Data Sheet (MSDS) and/or product label of chemicals prior to handling or use. Also refer to the MSDS for information about the volatile organic compound (VOC) content of chemical products. Consult local regulations and authorities for possible restrictions on product VOC content and/or VOC emission.

Appropriate protection (safety goggles and gloves to prevent burns) should be worn when handling the heated bituminous adhesive. Personnel involved with the application should be familiar with the information in the MSDS for marker adhesive.

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