

A Guide to IS EN 1463 European Standard for Road Studs

Retro-reflecting road studs are "*horizontal guiding devices that reflect incident light by means of retro-reflectors in order to warn, guide or inform road users*". They may be constructed in one or more integral parts and may be bonded to, anchored within or embedded within the road surface".

Part 1 of IS EN 1463 specifies the initial performance requirements of both permanent and temporary road studs when new. This includes the levels of reflectivity, physical dimensions and type (depressible/non-depressible etc) and a description of the methods employed to perform the measurements.

While part 2 of IS EN 1463 describes a test method for carrying out road trials on retro-reflecting road studs for use in both permanent and temporary applications. This includes specifications for test sites (ADT, road layout etc) and application patterns. It also provides the classifications which are used to describe the performance of a road stud at the completion of the trial.

Road Stud Classifications PART 1

Classification by Design

- Type A = non depressible road stud
- Type B = depressible road stud

Classification by Use

- Type P = Permanent road stud
- Type T = Temporary road stud

Classification by Reflector

- Type 1 = Glass
- Type 2 = Plastic
- Type 3 = Plastic with abrasion resistant layer

Installation Systems

- Bonded road stud - fixed to road using an adhesive applied to the road surface at the time of installation.
- Self-adhesive road stud - pre-coated with adhesive.
- Anchored road stud - fixed to the road surface using an anchor or spigot.
- Embedded road stud - fixed into a prepared cavity of an appropriate dimension cut into the road surface - for example the traditional "CATS-EYE".

Table 1 - Performance Requirements – Dimensions

Class	Height of Stud over road surface
H0	No requirement
H1	Up to 18 mm
H2	18 to 20 mm
H3	20 to 25 mm

Class	Max Length & Width of Road Studs	
	HD0	No requirement
HD1	250 mm	190 mm
HD2	320 mm	230 mm

Table 2 - Performance Requirements - Night- time Visibility - White Road Studs

Class PRP1, min. R values for type 1, 2 & 3 Road Studs as new				
Entrance angle β_H $\beta_v = 0^\circ$	Observation angle α	Min. R (mcd/lux)		
		Type		
		1	2	3
15°	2°	2	2.5	1.5
10°	1°	10	25	10
5°	0.3°	20	220	150

The Night-time visibility requirements for each Colour of retro-reflector is based on the relevant number in the above table multiplied by the relevant colour factor.

Table 3 - Colour Factors for Retro-reflectors

Colour	Colour Factor
White	1.0
Yellow	0.6
Amber	0.5
Red	0.2
Green	0.2

Road Stud Trials PART 2

Road trials should be carried out on a Dual-carriageway (AADT > 5,000 and % HGV 10-25%) for added safety and protection when the test studs are being installed, inspected and removed. Test period for permanent studs = 1 (one) year. Test period for temporary studs = 4 (four) months. Fifty Road Studs per test per colour.

When the test period is complete, a night-time drive through is carried out to assess how many of the studs remain in place.

- Where 100% of the studs remain in place, the stud receives an **S1** classification.

A number of studs are then selected and removed from the road pavement and returned to a laboratory for reflectivity testing.

- Where the reflectivity R of the studs are found to exceed the relevant value in Table 2 above Performance Requirements, the stud receives an **R1** classification.

S1 -100% Retention of studs at end of road trial
R1 - 100% Retention of reflectivity after road trial