



SLOVENSKI STANDARD SIST EN 1463-2:2021

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Materiali za označevanje vozišča - Odsevniki - 2. del: Terenski preskusi

Road marking materials - Retroreflecting road studs - Part 2: Road test performance specifications

Straßenmarkierungsmaterialien - Retroreflektierende Markierungsknöpfe - Teil 2: Feldprüfungen

Produits de marquage routier - Plots rétro réfléchissants - Partie 2 : essai routier

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93.080.20 Materiali za gradnjo cest Road construction materials

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1463-2

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ICS 93.080.20

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English Version

**Road marking materials - Retroreflecting road studs - Part
2: Road test performance specifications**

Produits de marquage routier - Plots
rétro réfléchissants - Partie 2 : essai routier

Straßenmarkierungsmaterialien - Retroreflektierende
Markierungsknöpfe - Teil 2: Feldprüfungen

This European Standard was approved by CEN on 12 April 2021.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 1463-2:2021) has been prepared by Technical Committee CEN/TC 226 “Road equipment”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2021, and conflicting national standards shall be withdrawn at the latest by November 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1463-2:2000.

The main changes with respect to the previous edition are listed below:

- This document has been prepared in order to achieve consistency with EN 1824 “Road marking materials — Road trials”.
- To avoid redundancies, definitions which are stated in EN 1463-1:—¹ have been removed from Clause 3. For consistency, the Introduction has been also removed.
- Due to the fact that this document is a supporting document to harmonized EN 1463-1:—¹, the content which refers to temporary products have been removed.
- In 4.5 “Road surface conditions” (former 4.1.5), concrete road surfaces have been added as a suitable surface for carrying out the durability test.
- In 5.1 “Duration” (former 4.2.1), although it is fixed to one year, the possibility of reducing it to 11 consecutive months (including, in any case, a complete summer and winter season) is also given, as the number of available test sites in the EU is rather limited. Accordingly time needs to be planned for removal and applying a new test.
- In 5.2 “Longitudinal application patterns” (former 4.2.2), drawings have been added to avoid any misunderstanding.
- In 7.2 “Stage 1: daylight examination” (former 5.2), paragraph a) has been revised to avoid any misunderstanding.
- In 7.3 Stage 2: night-time examination (former 5.3) process step a) “clean the retroreflectors” and a note about cleaning has been added. While this just describes best practice, this information has been added to avoid any misunderstanding.
- In 7.3 Stage 2: night-time examination (former 5.3) process step d) “if the total number of test studs remaining is less than 43, the assessment shall be considered void” has been added, as a further proceeding to stage 3 makes no sense under this condition.
- In 7.6 “Stage 5: testing selected test studs” (former 5.6), 7.6.3, a Note intended to open the possibility to use portable equipment to carry out in field photometric measurements has been added.
- In Clause 8 “Individual test report” (former Clause 6) the classes S0-S3 have been removed, in accordance with the changes introduced in EN 1463-1:—¹, and minimum test report requirements have been added.

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- Added informative Annex C “Standardized documentation of weather conditions using the Köppen classification”.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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1 Scope

This document describes the test method for carrying out road trials on retroreflecting road studs. Specifications are given for test sites, for the organization of the tests, and for the presentation of the results in the form of a test report.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1463-1:—¹, *Road marking materials — Retroreflecting road studs — Part 1: Initial performance requirements*

3 Terms, definitions and types

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

test stud

retroreflecting road stud submitted for conformity testing in accordance with this document

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3.2

applicant product

set of road studs provided by the manufacturer with the same commercial reference

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4 Test sites and conditions

4.1 General

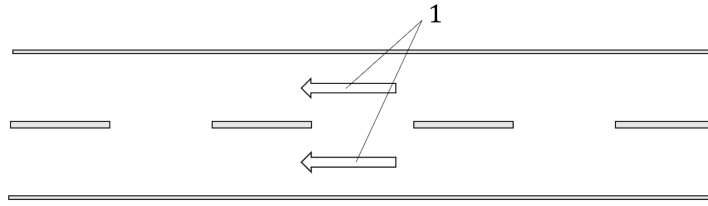
Test sites shall be arranged at suitable locations that meet at least the requirements of 4.2 to 4.5. The test results will depend on the weather, traffic and road surface conditions. These shall all be described in the corresponding individual test report (see 8.2).

4.2 Test site design characteristics and location

Studs shall be tested on a road with two lanes in one direction (Figure 1). On this test site there shall be no other than the national maximum speed limit.

¹ Under preparation. Stage at the time of publication: FprEN 1463-1:2021

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**Key**

1 is indicating the driving direction

Figure 1 — Road with two lanes in one direction

Roads used for test sites shall be straight and flat, with the lowest longitudinal and transverse gradient possible and free of singular points (such as traffic lights and intersections), substantial obstacles to daylight, source of frequent dirt (such as quarries and field exits) and movement of tracked vehicles.

Any change of site conditions during the test period shall be avoided.

The lengthwise slope and any special circumstances shall be stated in the general report for the test site.

NOTE The in use specifications for “flat” refer to a maximum slope of 4 %.

4.3 Weather conditions

At the termination of a road trial, a weather report for the duration of the road trial shall be produced. The weather report can be based on data from the nearest meteorological station and it can include data obtained on the test site itself; it should include aspects of the weather of influence to the results of the road trial.

Whether or not it is agreed between the participating parties that weather information is to be collected, the weather report shall include as a minimum an account of temperature conditions during the testing period.

NOTE Annex C is providing guidance for a simplified reporting method in accordance with the Köppen Climate Classification. The weather report can include a monthly account of mean minimum and maximum day temperatures, the cumulated precipitations in millimetres of water and the number of sand/grit scattering actions, snow ploughing actions etc.

4.4 Traffic conditions

The annual average daily traffic (AADT) of test sites shall be at least 5 000 for the total carriageway in the test direction and shall support between 10 % and 25 % heavy vehicles. A vehicle is considered a heavy vehicle if its maximum gross mass is greater than 7 500 kg.

NOTE It is recommended to select the test site in a way that traffic can be re-directed for safe installation and subsequent assessments.

Other special requirements (e.g. snow clearance, studded tyres) not included in the general minimum requirements as specified in this Clause, but considered indispensable for some countries or special applications, may be taken into account by the participating parties for the selection of the test site and recorded in the report for the test site.

4.5 Road surface conditions

Road trials shall be carried out on asphaltic or concrete road surfaces of an age of one year or more, in good condition and without damage in the form of wheel tracks, fissures, cracks or similar. The test needs to be performed at least on one road surface.

NOTE If the intended use of the road stud is for more than one type of road surface, bonding tests on the other road surfaces are recommended.

5 Organization of road trials

5.1 Duration

The duration of road trials shall be:

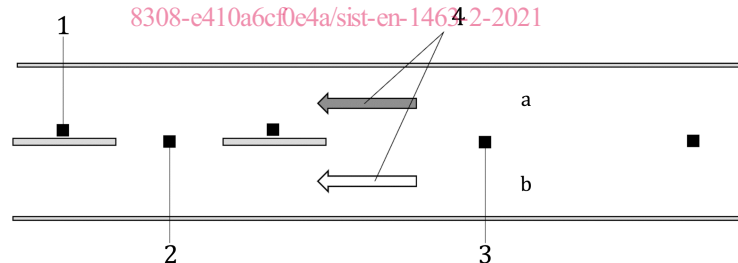
- One year, in order to try to guarantee that a full climatic cycle is covered (four seasons); otherwise, minimum 11 consecutive months which should include complete summer and winter seasons.

5.2 Longitudinal application patterns

Test studs shall be applied as indicated in Figure 2 and Figure 3:

- lane separation lines instead of road marking; or
- in the gaps between existing lane separation lines; or
- alongside and immediately adjacent to existing lane separation lines (to the right of the line for traffic driving on the right and to the left of the line for traffic driving on the left).

For all patterns, the minimum longitudinal spacing of two consecutive test studs shall be 2,5 m.

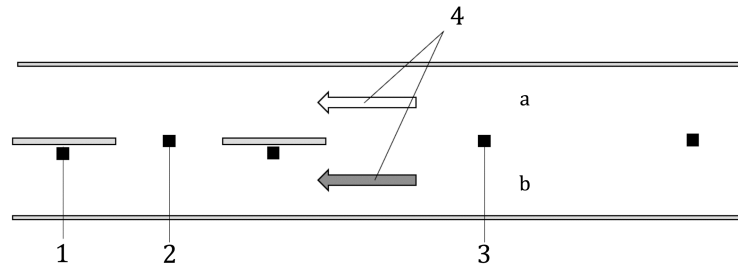


Key

- 1 is a test stud alongside and immediately adjacent to existing lane separation lines
- 2 is a test stud in the gap between existing lane separation lines
- 3 is a test stud used as lane separation line instead of road marking
- 4 indicates the driving direction
- a is lane 1
- b is lane 2

Figure 2 — Road stud application patterns for right-hand side driving

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**Key**

- 1 is a test stud alongside and immediately adjacent to existing lane separation lines
- 2 is a test stud in the gap between existing lane separation lines
- 3 is a test stud used as lane separation line instead of road marking
- 4 indicates the driving direction
- a is lane 2
- b is lane 1

Figure 3 — Road stud application patterns for left-hand side driving

6 Application of road studs

6.1 Technical specifications

Reference shall be made to the technical specifications for the stud product and the fixing system that shall be submitted by the supplier. These technical specifications shall be accompanied by a dimensioned drawing and description of the material(s) and fixing methods appropriate to the stud.

6.2 Number of studs

50 test studs shall be applied.

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Test studs of one applicant product shall not be interspaced or mixed with test studs of another applicant product.

6.3 Retroreflecting lens colour

For the road trial white, yellow or amber retroreflecting road studs shall be used. Retroreflecting road studs that are identical in every aspect concerning their construction and design, except for lens colour, and which conform to EN 1463-1:—¹, 4.1, will automatically conform if the test studs conform.

6.4 Periods of application

The periods of application of test studs shall be at a time of the year when weather conditions are suitable.

The participating parties may agree to include one or more periods for application. It is of practical advantage to keep the periods as short as possible.

6.5 Conditions suitable for application

Application of test studs shall be in accordance with the instructions of the manufacturer.

The participating parties may agree to include a specification for suitable weather conditions, for example, the road surface temperature to be at least 3 °C above the dew point of the air and the road surface temperature to be between 10 °C and 50 °C. The participating parties may agree that the application of test studs with a slow drying adhesive may be delayed if the road is to be opened to traffic within at most 2 h.

Studs may be applied when the road surface is wet if water tolerant adhesives are specified by the test stud manufacturer.

7 Measurements related to performance

7.1 General

At the end of the field trial testing period, the procedures described in 7.2 to 7.7 shall be followed.

7.2 Stage 1: daylight examination

- a) In case the test stud presents sharp edges to traffic as a result of damage, wear or separation of parts, the stud shall be considered as non-conforming.
- b) any missing test stud or reflector shall be considered as a non-conforming applicant product.
- c) record conforming and non-conforming studs on the Road Trial Assessment Form (RTAF).
- d) if the total number of conforming and remaining test studs is less than 45, the assessment shall be considered void.
- e) all non-conforming studs according to 7.2 a) should for safety reasons be removed from the road as quickly as possible before proceeding to 7.3.

NOTE An example of a RTAF is given in Annex A (informative).

7.3 Stage 2: night-time examination

After sunset position a car on the road so that it's driver is aligned with the line of studs to be tested. The headlights shall be on dipped beam.

- a) Clean the retroreflectors.

The use of abrasives, abrasive tools, chemical solvents, high pressure jets and any other surface influencing methods is not permitted.

Care should be taken during the cleaning process to ensure that the performance of the retroreflectors is not influenced. Try to remove the residual dirt with a soft paint brush under running water. Let the studs air dry. Before measurement, carefully clean them once more with a soft cotton cloth.

- b) For remaining conforming test studs after Stage 1 determine at a distance of 50 m ± 3 m, whether the stud has any retroreflection. If a test stud has no retroreflection at all it is non-conforming.
- c) Record conforming and non-conforming test studs on the RTAF.
- d) If the total number of test studs complying with b) is less than 43, the assessment shall be considered void.