



**SLOVENSKI STANDARD**  
**SIST EN 1824:2020**

**01-december-2020**

**Nadomešča:**  
**SIST EN 1824:2011**

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**Materiali za označevanje vozišča - Terenski preskusi**

Road marking materials - Road trials

Straßenmarkierungsmaterialien - Feldprüfungen

Produits de marquage routier - Essais routiers

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**SIST EN 1824:2020**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

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English Version

## Road marking materials - Road trials

Produits de marquage routier - Essais routiers

Straßenmarkierungsmaterialien - Feldprüfungen

This European Standard was approved by CEN on 3 August 2020.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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## European foreword

This document (EN 1824:2020) 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of an identical text or by endorsement, at the latest by May 2021, and conflicting national standards shall be withdrawn at the latest by May 2021.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 1824:2011.

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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**EN 1824:2020 (E)****1 Scope**

This document specifies the requirements for conducting road trials for road marking intended for use in both permanent and temporary road marking. Details are given for test sites, for the application of road marking materials on the test sites, for the parameters to be measured and the frequency of the measurements 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 1436, *Road marking materials - Road marking performance for road users and test methods*

EN 13036-1, *Road and airfield surface characteristics - Test methods - Part 1: Measurement of pavement surface macrotexture depth using a volumetric patch technique*

**3 Terms and definitions**

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

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

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

**3.1**  
**roll-over class**  
number of wheel passages over a point of a road surface within a specified period of time

**3.2**  
**useful rate of application**  
quantity, expressed in  $\text{g} \times \text{m}^{-2}$ , of base material and/or drop-on and/or other materials which have adhered to the road surface, when lines are done

**3.3**  
**rate of consumption during application**  
quantity, expressed in  $\text{g} \times \text{m}^{-2}$ , of drop-on or injection materials at the exit of the guns of the application equipment

**3.4**  
**percentage of heavy vehicles**  
ratio between the number of heavy vehicles and the number of all vehicles circulating on the test site

**3.5**  
**road marking assembly**  
assembly composed of base road marking material together with the precise application instructions and designs including the identification of the manufacturer, dosages, types and proportions of additional materials (drop-on or other) needed to build up the applied road marking, every change to which is a new assembly



## 4 Test sites and conditions

### 4.1 General

Test sites shall be arranged at suitable locations in accordance with 4.2 to 4.5. The test results may depend on test field location, climate, road surface and traffic which shall be described according to 4.2 to 4.6.

### 4.2 Test sites characteristics and location

The test site shall be located in an area which belongs to one of the climatic classes defined in 4.3.

The test site shall consist of a field, where the road markings are to be applied. The roads used for test sites should be straight and flat and without junctions, substantial obstacles to daylight, sources of frequent dirt (quarries, field exits, etc.) or tracked vehicles.

**NOTE** It is useful to have additional areas at the roadsides and/or at both ends in order to allow safe working conditions and convenient operation of application with road marking equipment.

The percentage of heavy vehicles on the test site shall be 5 % to 25 % of all vehicles.

The location of the test site shall be indicated in the test report.

### 4.3 Climatic conditions and classes

Climatic classes (see Table 1) are defined according to the Köppen classification and the use of winter maintenance.

Köppen classification shall be determined according to Annex A.

Winter maintenance is defined by the number of times that snowplough have operated on the test field during the road trials. Winter maintenance is applicable if this number is equal to or greater than 20 and shall be considered only for the Köppen zone Cfb.

**Table 1 — Test Field climatic classes**

Climatic Class	Climatic zone according to Köppen
C1	Dfc
	E
C2	Cfb without Winter maintenance
C3	Cfb with Winter maintenance
	Dfb
	Dsb
C4	Csa
	Bsh
	Cfa
	Csb

### 4.4 Road surface conditions and classes

Road trials shall be carried out on asphaltic road surfaces of an age of 1 year or more, which are in good condition and not in need of repair for the duration of the road trials and are not damaged by the presence of wheel tracks, fissures, cracks or similar.

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NOTE 1 Road trials on cement concrete surfaces do not give repeatable results because of on-going chemical reactions.

At the commencement of a road trial, a road surface report of the road trial shall be available. The test surface report shall include a general description of the road surface and an account of the texture depth (MTD: mean texture depth), determined in accordance with EN 13036-1.

The MTD shall be measured at several locations on the test field. The number of measurements depends on the test field length. Measurements shall be carried out, at least, at three transversal locations and repeated every 30 m on the test field. The transversal measurements locations are in the centre of the carriageway, near the right and left edge line.

The average mean texture depth is derived from these measurements. The standard deviation shall be within the limits specified in EN 13036-1.

NOTE 2 The depth of pavement surface macrotexture can be determined by measuring the profile of a surface and calculating the texture depth from this profile in accordance with EN ISO 13473-1. (MPD: mean profile depth, resp. ETD: estimated texture depth). Depending to the averaged measured texture depth, the test field roughness is described in term of roughness class according to Table 2.

**Table 2 — Test field roughness classes**

<b>Roughness class</b>	<b>Average depth of pavement surface macrotexture (MTD, ETD)</b>
RG1	$\leq 0,60$ mm
RG2	$> 0,60$ mm and $\leq 0,90$ mm
RG3	$> 0,90$ mm and $\leq 1,20$ mm
RG4	$> 1,20$ mm

NOTE 3 The texture depth has an influence on the result of road trials, at least for materials applied in thin layers.

#### 4.5 Roll-over classes

The volume of traffic shall be such as to ensure that one or more measurement areas with the desired roll-over class can be selected (see 7.3).

At the termination of a road trial, a traffic report for the duration of the road trial should be made available. The traffic report shall include the roll-over classes according to Table 3, determined on the measurement area(s) in accordance with Annex B.

Table 3 — Roll-over classes

Roll-over class	Number of wheel passages
T0	≤ 50 000
T1	Between 50 000 and 60 000
T2	100 000 (±20 000)
P0	≤ 50 000
P1	Between 50 000 and 60 000
P2	100 000 (±20 000)
P3	200 000 (±40 000)
P4	500 000 (±100 000)
P5	1 000 000 (±200 000)
P5.5	1 500 000 (±150 000)
P6	2 000 000 (±200 000)
P7	4 000 000 (±400 000)

NOTE The roll-over classes T0, T1 and T2 are for materials intended for temporary road markings, while the roll-over classes P0 to P7 are for materials intended for permanent road markings.

The traffic report should further include the percentage of heavy vehicles together with an indication of the counting method used.

A vehicle is considered a heavy vehicle if its maximum gross mass is above 7 500 kg.

#### 4.6 Studded tyres

From general experience, the use of studded tyres can be relevant to the erosion of road markings. For road trial sites where studded tyres are used, this shall be indicated on the test report. When available, the percentage of vehicles with studded tyres shall be indicated in the report.

A test period during which studded tyres are used shall end with the summer period in order to allow for the recovery of the road marking performance.

## 5 Organization of road trials

### 5.1 Duration

A road trial shall include at least one full climatic cycle of one year for materials intended for permanent road marking and up to 6 months for materials intended for temporary road marking. In order to be able to organize road trials on a yearly basis on the same road site, the minimum duration may be reduced to 10 months (provided that the winter period is included in these 10 months). The test reports shall always precise the duration of the road trials.

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## 5.2 Transverse and longitudinal application patterns

## 5.2.1 General

Road markings shall be applied in patterns of lines either transverse or longitudinal to the road.

When a long (more than 40 cm) measurement area is necessary, the transverse pattern cannot be used.

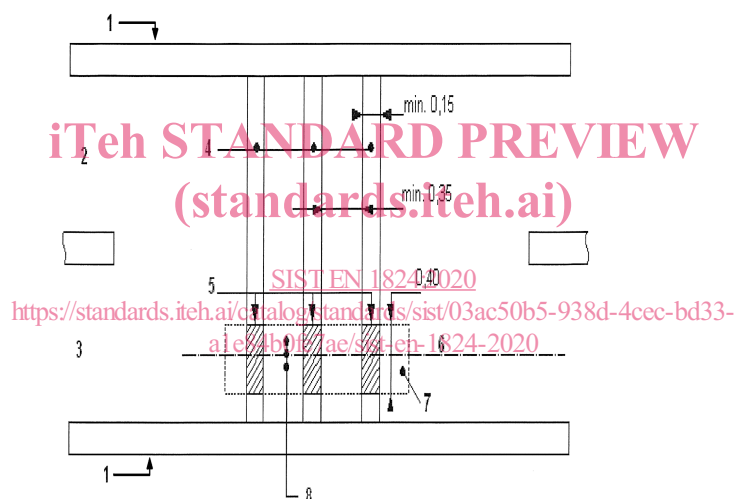
When both the transverse and longitudinal patterns are used on the same test site, they shall be used on separate parts of that test site.

## 5.2.2 Transverse pattern

At least three lines shall be applied for each road marking. The distance between two adjacent lines should be at least 0,35 m and the width at least 0,15 m as shown in Figure 1. The application can be done across one or two lanes.

NOTE Lines of the same material need not be adjacent.

Dimensions in metres



## Key

1	edge line	5	measurement area
2	Lane 2	6	axis of measurement column
3	Lane 1	7	measurement column
4	road marking in test	8	measurement points for determination of the number of wheel passages

Figure 1 — Example of a transverse pattern showing a measurement column

## 5.2.3 Longitudinal pattern

Lines are applied in transverse rows and longitudinal columns. For each of the road marking there shall be one line in each column containing measurement areas (see 7.3.2.3).

The lines should be at least 0,13 m wide and at least 1 m long as shown in Figure 2. Unmarked space between the lines is a minimum of 0,5 m in the longitudinal direction.