SLOVENSKI STANDARD
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Materiali za označevanje vozišča - Laboratorijske metode za identifikacijo

Road marking materials - Laboratory methods and identification

Straßenmarkierungsmaterialien - Laborverfahren für die Identifikation

Produits de marquage routier - Méthodes de laboratoire pour identification

Ta slovenski standard je istoveten z: EN 12802:2011

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Road marking materials - Laboratory methods for identification

Produits de marquage routier - Méthodes de laboratoire pour identification

Straßenmarkierungsmaterialien - Laborverfahren für die Identifikation

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

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Contents

Foreword

This document (EN 12802:2011) 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of an identical text or by endorsement, at the latest by December 2011, and conflicting national standards shall be withdrawn at the latest by December 2011.

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

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The Annexes A to H of this European Standard are normative.

This European Standard is one of a package of inter-related European Standards with a common date of withdrawal (dow) fixed on December 2011 *(including the request of an extension fo the co-existence period)*:

— EN 1790, *Road marking materials — Preformed road markings*,

— EN 1824, *Road marking materials — Road trials*,

— EN 1871, *Road marking materials — Paint, thermoplastic and cold plastic materials — Specifications*,

— EN 12802, *Road marking materials — Laboratory methods for identification*,

— EN 13197, *Road marking materials — Wear simulator Turntable,*

— EN 13212, *Road marking materials — Requirements for factory production control*,

— EN 13459, *Road marking materials — Sampling and testing*.

1 Scope

This document specifies laboratory methods for the identification of road marking materials used in horizontal signalization. It is not necessary, unless required, to perform all of the tests described.

2 Normative references

The following referenced documents are indispensable for the application 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 1423, *Road marking materials — Drop on materials — Glass beads, antiskid aggregates and mixtures of the two*

EN 1424, *Road marking materials — Premix glass beads*

EN 1790, *Road marking materials — Preformed road markings*

EN 13459, *Road marking materials — Sampling and testing*

EN ISO 11890-2, *Paints and varnishes — Determination of volatile organic compound (VOC) content — Part 2: Gas-chromatographic method (ISO 11890-2:2006)*

EN ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling (ISO 15528:2000)*

ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*

3 Terms and definitions

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

3.1
paints
liquid product containing binders, pigments, extenders, solvents and additives

NOTE It can be supplied in single or multi-component systems. When applied it produces a cohesive film by the process of solvent evaporation, or solvent evaporation and a chemical reaction.

3.2
cold plastics
viscous products supplied in two or multi-component forms (at least one main component and a hardener system) and free from solvents

NOTE The cohesive film is formed after mixing of all components only by a chemical reaction. Following the reaction, the liquid becomes a solid.

3.3
thermoplastics
solvent-free marking substance supplied in block, granular or powder forms

NOTE It is heated to a molten state and then applied. It forms a cohesive film by cooling.

4 Sampling

Samples representative of each component of the material shall be taken from storage, or prior to application, in accordance with EN 13459. Smaller representative samples, of sufficient quantity to carry out all the tests required, shall be taken from the larger samples. For paints and cold plastics approximately 1 l of the basic component shall be taken.

In the case of thermoplastic in powder form, sufficient quantity shall be taken in accordance with EN 13459 so that it can be melted in a metal container and mixed to a homogeneous mass. After cooling and casting into solid sheets or blocks, representative samples of approximately 1 kg of homogeneous solid material shall be taken for testing.

5 Test methods

5.1 General

The standard test methods are listed in 5.2 to 5.4.

Alternative quantitative analytical test methods may be used providing that:

— the resulting values are comparable to those obtained using the standard methods; and,

— the repeatability of the alternative methods, determined in accordance with ISO 5725-2, can be shown to be not less than that of the methods given in this standard.

5.2 Paint

5.2.1 Density

The density of the paint shall be determined using, either the method laid down in EN ISO 2811-1, or an alternative method complying with 5.1.

5.2.2 Solids content

The solids content of the paint, expressed as a percentage, shall be determined using, either the method described in Annex A, or an alternative method complying with 5.1.

5.2.3 Organic content and identification

The type of organic materials, and the content expressed as a percentage, of the paint shall be determined using, either the method described in Annex B, or an alternative method complying with 5.1.

5.2.4 Inorganic content and identification

The type of inorganic materials, and the content expressed as a percentage, of the paint shall be determined using, either the method described in Annex C, or an alternative method complying with 5.1.

5.2.5 Titanium dioxide content

The titanium dioxide content of the inorganic compound of the paint, expressed as a percentage, shall be determined, either by the method described in Annex D, or an alternative method complying with 5.1.

5.2.6 Glass bead content

The glass bead content of the paint, expressed as a percentage, shall be determined, either as described in Annex E, or an alternative method complying with 5.1.

5.2.7 Solvent content and identification

The type of solvent, and the content expressed as a percentage, of the paint shall be determined using, either the method described in Annex F, or an alternative method complying with 5.1.

5.2.8 Viscosity

The viscosity of the paint shall be determined using, either the method described in Annex G, or an alternative method complying with 5.1.

5.2.9 Ash content

The ash content of the paint shall be determined using, either the method described in Annex H, or an alternative method complying with 5.1.

5.3 Thermoplastics

5.3.1 Density

The density of the thermoplastics shall be determined using, either the method laid down in EN ISO 2811-2, or an alternative method complying with 5.1.

5.3.2 Organic content and identification

The type of organic materials, and the content expressed as a percentage, of the thermoplastics shall be determined using, either the method described in Annex B, or an alternative method complying with 5.1.

5.3.3 Inorganic content and identification

The type of inorganic materials, and the content expressed as a percentage, of the thermoplastics shall be determined using, either the method described in Annex C, or an alternative method complying with 5.1.

5.3.4 Titanium dioxide content

The titanium dioxide content of the inorganic compound of the thermoplastics, expressed as a percentage, shall be determined, either by the method described in Annex D, or an alternative method complying with 5.1.

5.3.5 Glass bead content

The glass bead content of the thermoplastics, expressed as a percentage, shall be determined, either as described in Annex E, or an alternative method complying with 5.1.

5.3.6 Ash content

The ash content of the thermoplastics shall be determined using, either the method described in Annex H, or an alternative method complying with 5.1.

5.4 Cold plastics

5.4.1 Density

The density of the cold plastics shall be determined using, either the method laid down in EN ISO 2811-2, or an alternative method complying with 5.1.

5.4.2 Organic content and identification

The type of organic materials, and the content expressed as a percentage, of the cold plastics shall be determined using, either the method described in Annex B, or an alternative method complying with 5.1.

5.4.3 Inorganic content and identification

The type of inorganic materials, and the content expressed as a percentage, of the cold plastics shall be determined using, either the method described in Annex C, or an alternative method complying with 5.1.

5.4.4 Titanium dioxide content

The titanium dioxide content of the inorganic compound of the cold plastics, expressed as a percentage, shall be determined, either by the method described in Annex D, or an alternative method complying with 5.1.

5.4.5 Glass bead content

The glass bead content of the cold plastics, expressed as a percentage, shall be determined, either as described in Annex E, or an alternative method complying with 5.1.

5.4.6 Solvent content and identification

The type of solvent, and the content expressed as a percentage, of the cold plastics shall be determined using, either the method described in Annex F, or an alternative method complying with 5.1.

5.4.7 Viscosity

The viscosity of the cold plastics shall be determined using, either the method laid down in EN ISO 2555 with a Type A viscosimeter, or an alternative method complying with 5.1.

5.4.8 Ash content

The ash content of the cold plastics shall be determined using, either the method described in Annex H, or an alternative method complying with 5.1.

5.5 Preformed road markings

The identification methods for preformed road markings are laid down in EN 1790.

5.6 Premix glass beads

5.6.1 Granulometry

The granulometry of the glass beads shall be determined using the method laid down in EN 1424.

5.6.2 Refractive index

The refractive index class of the glass beads shall be determined using the method laid down in EN 1424.

5.6.3 Resistance to water, hydrochloric acid, calcium chloride and sodium sulphide

The glass beads shall not develop any surface haze or dulling when in contact with any of the following: water, hydrochloric acid, calcium chloride and sodium sulphide, using the method laid down in EN 1423.

5.6.4 Defective beads

The percentage of defective glass beads shall be determined using the method laid down in EN 1424.

5.6.5 Surface Treatment

The surface treatment of the glass beads shall be determined using the method laid down in EN 1424.

5.7 Drop on materials

5.7.1 Drop on glass beads

5.7.1.1 Granulometry

The granulometry of the glass beads shall be determined using the method laid down in EN 1423.

5.7.1.2 Refractive index

The refractive index class of the glass beads shall be determined using the method laid down in EN 1423.

5.7.1.3 Resistance to water, hydrochloric acid, calcium chloride and sodium sulphide

The glass beads shall not develop any surface haze or dulling when in contact with any of the following: water, hydrochloric acid, calcium chloride and sodium sulphide, using the method laid down in EN 1423.

5.7.1.4 Defective beads

The percentage of defective glass beads shall be determined using the method laid down in EN 1423.

5.7.1.5 Surface Treatment

The surface treatment of the glass beads shall be determined using the methods laid down in EN 1423.

5.7.2 Drop on antiskid aggregates

5.7.2.1 Friability index

The friability index of the antiskid aggregates shall be determined using the method laid down in EN 1423.

5.7.2.2 Granulometry

The granulometry of the antiskid aggregates shall be determined using the method laid down in EN 1423.

5.7.2.3 Colour co-ordinates and luminance factor

If the antiskid aggregate is not transparent, the chromaticity co-ordinates and the luminance factor shall be determined using the method laid down in EN 1423.

5.7.3 Mixture of glass beads and antiskid aggregates

In a mixture of glass beads and antiskid aggregates the glass beads shall conform to EN 1423 and the antiskid aggregates shall conform to EN 1423. The tests on the glass beads and the antiskid aggregates to be incorporated in mixtures shall be conducted separately before mixing.

5.8 Tolerances

Tolerances are as shown in Table 1.

For the initial testing of a material, tolerances apply to the manufacturers declared values for the properties tested and the initial test results shall be within the tolerances in Table 1.

When the values fall inside the tolerances then the values initially declared by the manufacturer are considered to be verified.

When values fall outside of the tolerances there are four possibilities:

— the manufacturer can decide that the test be terminated;

— by agreement between the participants the test can be repeated with the same samples;

— by agreement between the participants the test can be repeated with new samples;

— by agreement between the participants the manufacturer can submit revised declared values;

For re-identification of a material, it may not be necessary to test all of the values. Reference values for the properties tested shall be the values declared by the manufacturer.

Table 1 — Tolerances

Parameter	Maximum relative deviation	Maximum absolute deviation
Solids content	-	± 2
Density	-	Paint: ± 0,04 g/cm³ Cold plastic: ± 0,06 g/cm³ Thermoplastic: ± 0,1 g/cm³
Organic constituents	10 %	± 2
Calcium Carbonate		± 3
Inorganic constituents	-	± 3
Titanium dioxide	For TiO_2 concentrations ≥ 10 % Tolerance = 10 %	For TiO_2 concentrations ≤ 10 % Tolerance = ± 1
Glass beads*	20 %	± 5
Solvent content		± 3
Viscosity	Cold plastic: 20 %	Paint: ± 10 units
Ash Content	-	± 3
* Experimental values which are only applicable if the glass bead content is ≥ 10%. It is not possible to set tolerances if the percentage of glass beads is less than 10 %.		

NOTE When assessing the identity of two infrared spectra it has to be checked if all absorptions-/transmission peaks are present or there are additional occurrences which are significantly different from the baseline to stand out. The relative height levels between the peaks must not change significantly.

6 Test Report

At the end of the tests, the test report shall be made available. The test report shall include at least: a reference to this standard and to the test method (Annex A to Annex H); the critical testing conditions; and the expression of the results (as specified in the corresponding test method) and the related uncertainty (if applicable).

Annex A
(normative)

Paint – Test method for the determination of the solids content

A.1 Principle

The volatile constituents of the paint are evaporated at 105 °C. The residual solids are weighed and the solids content calculated.

A.2 Apparatus

a) Cooling equipment, refrigerator or water bath with thermostat at approximately + 10 °C;

b) porcelain dishes with a diameter of approximately 40 mm an a high of 20 mm to 30 mm;

c) analytical balance, with an accuracy of 0,001 g, with zero point correction;

d) warming cupboard, with forced fresh air ventilation and flame-proof interior capable of being heated to 105 °C ± 2 °C;

e) desiccator, with drying agent, e.g. silica gel.

A.3 Reagents

Thinner consisting of a suitable solvent / thinner as recommended by the manufacturer.

A.4 Procedure

A.4.1 Carry out two determinations.

A.4.2 Mark porcelain plates with numbers. Record the mass of the empty plates (*L)* to the nearest 0,001 g. Place approximately 2 g of the paint, pre-cooled to 10 °C and homogenized, in the plate with a spoon. Weigh to the nearest 0,001 g (mass M_1).

A.4.3 Place the plates containing the sample in a warming cupboard at a temperature of 105 °C ± 2 °C and store there for at least 3 h or until constant mass is reached. Constant mass is reached when, after the sample has been in the warming cupboard for a further 1,5 h, the mass loss is less than 0,2 % of the initial mass. Cool the plate to room temperature in the desiccator, and weigh to the nearest 0,001 g.