SLOVENSKI STANDARD
oSIST prEN 12802:2009

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Materiali za oznaḷ evanje voziḡḷ a - Laboratorijske metode za identifikacijo

Road marking materials - Laboratory methods for identification

Straßenmarkierungsmaterialien - Laborverfahren für die Identifikation

Produits de marquage routier - Méthodes de laboratoire pour identification

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Road marking materials - Laboratory methods for identification

Produits de marquage routier - Méthodes de laboratoire pour identification

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Contents

Foreword

This document (prEN 12802:2008) has been prepared by Technical Committee CEN/TC 226 “Road equipment”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12802:2000.

1 Scope

This European Standard describes 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

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ENV 13459-1, *Road marking materials – Quality control – Part 1: Sampling from storage and testing*

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*

ISO 2555, *Plastics. Resins in the liquid state or as emulsions or dispersions. Determination of apparent viscosity by the Brookfield Test method*

ISO 2811-1, *Paints and varnishes – Determination of density – Part 1: Pyknometer method*

ISO 2811-2, *Paints and varnishes – Determination of density – Part 2: Immersed body (plummet) method*

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*

ISO 11890-2, *Paints and varnishes. Determination of volatile organic compound (VOC) content. Gas chromatographic method*

ISO 15528, *Paints, varnishes and raw materials for paints and varnishes. Sampling*

3 Terms and definitions

For the purpose of this European Standard the following terms and definitions apply.

3.1
paints
a liquid product containing suspended solids. It can be supplied in single or multicomponent systems. When applied it produces a cohesive film by the process of solvent evaporation, or solvent evaporation and a chemical process.

3.1.1
solvent paints
solvent paints are liquid products containing solids and liquid additives suspended in an organic solvent. They can be supplied in single or multi-component systems. The solids comprise are inorganic and/or organic fillers, pigments and additives

3.1.1.1
high Solid paints (HS)
high Solid paints are liquid products containing solids and liquid additives suspended in a solution of the binder in an organic solvent. The content of solvents is limited to 25% weight by weight.

3.1.1.2
single-Component-High Solid paints (SCHS)
the cohesive film of a single-component High Solid is formed only by evaporation of the solvent and physical curing.

3.1.1.3
multi-Component-High Solid paints (MCHS)
multi-component-High Solid paints consist of two or more components. The cohesive film is formed after mixing all components by the evaporation of the solvent and a chemical reaction. The Application is possible within the pot-life-time.

3.1.2
waterborne Paints
a liquid product containing suspended solids in an aqueous liquid. It can be supplied in single or multicomponent systems. When applied it produces a cohesive film by the process of aqueous liquid evaporation and /or chemical process

3.1.2.1
dispersions
dispersions are liquid or viscous products containing solids and liquid additives dispersed in an aqueous liquid. The aqueous liquid consists of the binder polymers and mainly of water. The solids comprise inorganic and/or organic fillers, pigments and additives. The content of volatile organic solvents is limited to 2 % weight by weight, the total amount of volatile organic compounds (VOC) is limited to 3 % weight by weight.

3.1.2.2
dispersion paints
the volatile component is mainly water. The content of organic solvents is limited to 2 % weight by weight, the total amount of volatile organic compounds (VOC) is limited to 3 % weight by weight.
The solid content is lower than 80 % weight by weight. The cohesive film of a dispersion paint is produced by the process of water evaporation.

3.1.2.3
high solid dispersions
the volatile component of a high solid dispersion is mainly water with a content lower than 20 % weight by weight, the content of solids is equal to or higher than 80 % weight by weight. The content of organic solvents is limited to 2 % weight by weight, the total amount of volatile organic compounds (VOC) is limited to 3 % weight by weight. The cohesive film of a High-Solid dispersion is produced by the process of water evaporation and a chemical cross-linking reaction.

3.2
cold plastics
cold plastics are viscous products supplied in two or multi-component forms (at least one main component and a hardener system). They are free from solvents. The cohesive film is formed after mixing of all components only by a chemical reaction. Following the reaction the liquid becomes a solid.

3.2.1
cold-setting reactive materials (cold plastics)
cold plastics consist of a minimum of two components. One component contains a hardener and another component the accelerator. Depending on the system the components are mixed in various ratios. The application is only possible within the pot-life-time.

3.2.2 energy Induced Curing Materials (EICM)
energy induced curing materials produce a cohesive film under the influence of energy
(e.c. heat, UV-radiation).

3.3
thermoplastics
a solvent-free marking substance supplied in block, granular or powder forms. It is heated to a molten state and then applied. It forms a cohesive film by cooling.

NOTE Additional materials to those described in 3.1 to 3.3 can include, if recommended by the manufacturer, primers which are liquid products which may contain solids and liquid additives suspended in an organic solvent or in water. The solids comprise inorganic and/or organic fillers, pigments and additives. The content of volatile organic solvents is not limited.
Primers are used to precoat road surfaces before the road marking system is applied. They improve the adhesion of the road marking and protect against disintegration, discolouring etc. caused by incompatible compounds in the road surface.

4 Sampling

Samples representative of each component of the material shall be taken from storage in accordance with ENV 13459-1. 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 ENV 13459-1 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 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 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 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 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 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 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 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 Clause 4 of EN 1424.

5.6.2 Refractive index

The refractive index class of the glass beads shall be determined using the method laid down in Clause 4 of EN 1424

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

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 sulfide, using the method laid down in Clause 4 of EN 1423

5.6.4 Defective beads

The percentage of defective glass beads shall be determined using the method laid down in Clause 4 of EN 1424

5.6.5 Surface Treatment

The surface treatment of the glass beads shall be determined using the method laid down in Clause 4 of 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 Clause 4 of 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 Clause 4 of EN 1423.

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

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 sulfide, using the method laid down in Clause 4 of EN 1423

5.7.1.4 Defective beads

The percentage of defective glass beads shall be determined using the method laid down in Clause 4 of EN 1423.

5.7.1.5 Surface Treatment

The surface treatment of the glass beads shall be determined using the methods laid down in Clause 4 of 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 Clause 5 of EN 1423.

5.7.2.2 Granulometry

The granulometry of the antiskid aggregates shall be determined using the method laid down in Clause 5 of 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 Clause 5 of 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 Clause 4 of EN 1423 and the antiskid aggregates shall conform to Clause 5 of EN 1423. The tests on the glass beads and the antiskid aggregates to be incorporated in mixtures shall be conducted separately before mixing.