SLOVENSKI STANDARD
SIST EN 1790:1999

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Materiali za označevanje vozišča – Predoblikovane oznake

Road marking materials - Preformed road markings

Straßenmarkierungsmaterialien - Vorgefertigte Markierungen

Produits de marquage routier - Marquages routiers préformés

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93.080.20 Materiali za gradnjo cest Road construction materials

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English version

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

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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by December 1998, and conflicting national standards shall be withdrawn at the latest by December 1998.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

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Introduction

A particular category of road marking materials, used for horizontal signalization, are preformed, i.e. manufactured products in sheet form, ready for use on the road. They can be applied by means of adhesives, pressure or heat, with or without use of a primer. Preformed road marking materials can be linear, in pieces of a certain length or in rolls. They can also be cut out in the form of symbols or signs or parts of them, making it possible to assemble them on the road to achieve the desired shape.

Most preformed road markings are white or yellow, but in special cases other colours are used.

Preformed road marking materials can be designed for use as permanent or temporary road markings. When they are used for temporary road markings, and have to be removed afterwards, the specific property of "removability" can be required.

1 Scope

This standard specifies the laboratory requirements for the specific characteristics of, and the corresponding test methods for, new preformed road marking materials intended for permanent and temporary use.

Most preformed road marking materials, hereafter referred to as 'preformed materials', do not change significantly their properties during application. For those materials the performance requirements for road users, in accordance with EN 1436, can be determined in the laboratory, before application on the road.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate place in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any 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.

EN 1436	Road marking materials - Road marking performance for road users
prEN 1871	Road marking materials - Physical properties
EN 1824	Road marking materials - Road trials

3 Definitions

For the purposes of this standard the following definitions apply:

3.1 preformed road marking : A factory produced road marking material, in sheet or roll form, capable of being applied to the substrate with adhesive, pressure, heat or a combination of them.

3.2 tape : A preformed road marking, capable of adapting itself to the texture of the substrate, which may be precoated with pressure-sensitive adhesive, capable of being stuck to the substrate without heating the material. Photometric, colorimetric and skid resistance characteristics are not significantly modified during application.

3.3 preformed cold plastic road marking : A preformed road marking made of cold plastic marking material as defined in prEN 1871, applied to the substrate with the use of an adhesive. Photometric, colorimetric and skid resistance characteristics are not significantly modified during application.

3.4 preformed thermoplastic road marking : A preformed road marking made of thermoplastic marking material as defined in prEN 1871, applied to the substrate by heating the material at melting temperature. Preformed thermoplastic road markings may require the application of drop-on materials during application on site.

3.5 priming coat or primer : A substance used to improve the adhesion between the preformed road marking material and the substrate.

3.6 adhesive : A substance used to bond the preformed road marking to the substrate.

3.7 removable preformed road marking : A preformed road marking capable of being removed, intact or in large pieces, when required, without damage to the road surface.

4 Requirements

4.1 General

The requirements defined in 4.2 to 4.7 are valid for testing in the laboratory of all types of white and yellow preformed materials, unless stated otherwise in the text. The minimum requirements on colour, luminance and retroreflection are applicable only to white and yellow.

For preformed thermoplastic and preformed cold plastic materials, the requirements given in prEN 1871 for those types of products shall also apply.

4.2 Reflection in daylight or road lighting

With the exception of some preformed thermoplastic materials (see note) the performance of preformed materials in daylight or road lighting conditions shall be in accordance with EN 1436.

NOTE: This measurement is not relevant for preformed thermoplastic materials to which drop-on materials are added during application.

4.3 Reflection in car headlight illumination

With the exception of some preformed thermoplastic materials (see note 2 to table 1), the performance shall be as given in table 1.

Table 1 : Classes of coefficient of retroreflected luminance R_L in dry conditions

Type and colour	Class (as defined in EN 1436)	Minimum R_L $mcd \cdot m^{-2} \cdot lx^{-1}$
Permanent		
White and yellow	R0	No performance determined
White	R5	300
Yellow	R4	200
Temporary		
White and yellow	R0	No performance determined
White and yellow	R5	300

NOTE 1: The class R0 is intended for conditions where visibility of the road marking is achieved without retroreflection in car headlight illumination.

NOTE 2: This measurement is not relevant for preformed thermoplastic materials to which drop-on materials are added during application.

4.4 Luminance factor and colour

4.4.1 Measured on samples in the laboratory, in accordance with EN 1436, the requirements for preformed materials shall be as given in table 2.

Table 2 : Classes of luminance factor β in dry conditions

Type and colour	Class (as defined in EN 1436)	Minimum luminance factor β
Permanent		
White and yellow	B0	No performance determined
White	B5	0,60
Yellow	B3	0,40
Temporary		
White and yellow	B0	No performance determined
White	B6	0,70
Yellow	B3	0,40
NOTE: The class B0 is intended for conditions where verification of the visibility of the road marking is achieved by measurement of luminance coefficient under diffuse illumination, Qd.		

4.4.2 The chromaticity regions for preformed materials shall be in accordance with EN 1436, with the use of class Y2 for yellow.

4.5 Skid resistance

With the exception of preformed thermoplastic materials (see note), the skid resistance of preformed materials shall be in accordance with EN 1436.

NOTE: This measurement is not relevant for preformed thermoplastic materials because the application can change the performance of the preformed material.

4.6 Removability

Removable preformed road markings shall be entirely removable without damage to the road surface. The material shall come away from the road surface without leaving permanent coloured traces. No deformation or cracking of the road surface shall be present.

NOTE : The removal procedure should take place with minimal disturbance to traffic.

4.7 UV resistance for preformed road markings applied without heat

UV resistance shall be checked in accordance with prEN 1871. The luminance factor β shall be determined before and after the UV ageing.

The preformed materials shall be classified in accordance with table 3, where $\Delta\beta$ is the difference between the luminance factor before and after testing.

Table 3 : Classes of UV resistance

Colour	Class	$\Delta\beta$
White and yellow	UV0	No performance determined
White and yellow	UV2	$\leq$ 0,10