



SLOVENSKI STANDARD

SIST ENV 13459-2:2002

01-september-2002

Materiali za označevanje vozišča - Kontrola kakovosti - 2. del: Smernice za pripravo planov kakovosti za uporabo materialov

Road marking materials - Quality control - Part 2: Guidelines for preparing quality plans for materials application

Straßenmarkierungsmaterialien - Qualitätskontrolle - Teil 2: Anleitung für die Aufstellung von Qualitätsplänen für die Applikation

Produits de marquage routier - Contrôle de la qualité - Partie 2: Guide de préparation de plans qualité pour l'application des produits

<https://standards.iteh.ai/catalog/standards/sist/0423154b-5ac1-4930-90f9-d899c16146f5/sist-env-13459-2-2002>

Ta slovenski standard je istoveten z: **ENV 13459-2:1999**

ICS:

93.080.20 Materiali za gradnjo cest Road construction materials

SIST ENV 13459-2:2002 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST ENV 13459-2:2002](https://standards.iteh.ai/catalog/standards/sist/0423154b-5ac1-4930-90f9-d899c16146f5/sist-env-13459-2-2002)

<https://standards.iteh.ai/catalog/standards/sist/0423154b-5ac1-4930-90f9-d899c16146f5/sist-env-13459-2-2002>

EUROPEAN PRESTANDARD
PRÉNORME EUROPÉENNE
EUROPÄISCHE VORNORM

ENV 13459-2

September 1999

ICS 93.080.20

English version

Road marking materials - Quality control - Part 2: Guidelines for preparing quality plans for materials application

Produits de marquage routier - Contrôle de la qualité -
Partie 2: Guide de préparation de plans qualité pour
l'application des produits

Straßenmarkierungsmaterialien - Qualitätskontrolle - Teil 2:
Anleitung für die Aufstellung von Qualitätsplänen für die
Applikation

This European Prestandard (ENV) was approved by CEN on 19 August 1999 as a prospective standard for provisional application.

The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

[SIST ENV 13459-2:2002](https://standards.iteh.ai/catalog/standards/sist/0423154b-5ac1-4930-90f9-d899c16146f5/sist-env-13459-2-2002)

<https://standards.iteh.ai/catalog/standards/sist/0423154b-5ac1-4930-90f9-d899c16146f5/sist-env-13459-2-2002>



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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Contents

Foreword.....	3
Introduction	4
1. Scope.....	4
2. Normative references	4
3. Definitions	4
4. Guidelines for the quality plan	5
Annex A (informative) Process control for application of paint.....	9
Annex B (informative) Process control for application of thermoplastics.....	10
Annex C (informative) Process control for application of cold plastics	11
Annex D (informative) Process control for application of preformed road markings.....	12
Annex E (informative) Process control for application of retroreflecting road studs	13
Annex F (informative) Example of a machine data sheet.....	14
Annex G (informative) Determination of the mass of the dry paint and the mass of the drop-on materials	16
Annex H (informative) Bibliography	18

Foreword

This European Prestandard has been prepared by Technical Committee CEN/TC 226 "Road equipment", the secretariat of which is held by AFNOR.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this European Prestandard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This European Prestandard consists of the following Parts under the general title: Road marking materials – Quality control:

- Part 1: Sampling from storage and testing
- Part 2: Guidelines for preparing quality plans for materials application
- Part 3: Performance in use

Road studs are included in Part 1 and 2 but not in Part 3.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST ENV 13459-2:2002](https://standards.iteh.ai/catalog/standards/sist/0423154b-5ac1-4930-90f9-d899c16146f5/sist-env-13459-2-2002)

<https://standards.iteh.ai/catalog/standards/sist/0423154b-5ac1-4930-90f9-d899c16146f5/sist-env-13459-2-2002>

Introduction

Performance of road markings depends not only on the quality of the road marking materials used (properly achieved by relevant European Standards : e.g. prEN 1871, EN 1790), but also on the quality of the application process. Achieving an appropriate quality for the application process requires the preparation of a quality plan. The quality plan is intended to assure the quality by setting out the specific quality practices, resources and sequence of activities during application of road marking materials and activities related to the application.

1. Scope

This European Prestandard provides guidance for the preparation of quality plans for application of road marking materials.

The selection of appropriate elements contained in this European Prestandard and the extent to which these elements are adopted and applied depends upon factors such as the size of the organisation, the nature of the material, the application process etc.

2. Normative references

[SIST ENV 13459-2:2002](https://standards.iteh.ai/catalog/standards/sist/0423154b-5ac1-4930-90f9-d899c16146f5/sist-env-13459-2-2002)

[https://standards.iteh.ai/catalog/standards/sist/0423154b-5ac1-4930-90f9-](https://standards.iteh.ai/catalog/standards/sist/0423154b-5ac1-4930-90f9-d899c16146f5/sist-env-13459-2-2002)

[d899c16146f5/sist-env-13459-2-2002](https://standards.iteh.ai/catalog/standards/sist/0423154b-5ac1-4930-90f9-d899c16146f5/sist-env-13459-2-2002)

This European Prestandard 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 any of these publications apply to this European Prestandard 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.
EN ISO 8402	Quality management and quality assurance - Vocabulary (ISO 8402:1994)

3. Definitions

For the purposes of this standard the definitions given in EN ISO 8402 apply.

4. Guidelines for the quality plan

4.1 General

For the application process and related activities it is recommended that documented quality plans are prepared and maintained. If the use of quality plans is required, the plan shall be consistent with the organization's quality system and shall ensure that specified requirements are met.

4.2 Quality objectives

The quality plan shall define the quality objectives to be attained during (e.g. dosages and dimensions) and after the application process (e.g. road marking performance).

4.3 Organization and personnel

The quality plan shall define at least the specific allocation of responsibilities, authorities and resources during the different phases of the application process and for activities related to the application.

4.4 Planning

The quality plan shall include a project plan in which the various stages from preparation up to application and inspection are related to time and to each other. Steps which are vital for the realization of the planning shall be identified.

4.5 Process Control

4.5.1 General

The quality plan shall define instructions and relevant information (4.5.2), activities before (4.5.3) and during application (4.5.4) to ensure that the application can be carried out under controlled conditions.

4.5.2 Instructions and relevant information for application process

Instructions and relevant information for the application process can include the following :

- identification of which application method to be used ;
- identification of which machinery to be used ;
- documented work instructions defining how to perform the application, where the absence of such instructions would adversely affect quality ;
- a marking plan, showing the lay-out, position and geometry of the road markings;

- patterns and dimensions of longitudinal and transverse markings, symbols and letters (including geometry) ;
- dimensions of existing markings ;
- the road classification and information about traffic intensity ;
- location of the work ;
- the texture of the substrate, i.e. smooth, rough or very rough ;
- relevant information about the pavement and / or the existing marking ;
- the class(es) of performance specified for each road marking according to EN 1436 ;
- type of road marking products to be applied, including the drop-on materials.

4.5.3 Activities before application

Activities before application can include the following :

a) control of processes and equipment, as appropriate

- annex A gives an example of process control for application of paint.
- annex B gives an example of process control for application of thermoplastics.
- annex C gives an example of process control for application of cold plastics.
- annex D gives an example of process control for application of preformed road markings.
- annex E gives an example of process control for application of retroreflecting road studs.
- annex F gives an example for presentation of the characteristics of a marking machine.

b) ensure that suitable conditions for application exists, which can include the following :

- the road side is secured during the application
- the substrate is free from contaminants which influence the quality of the marking(s) to be applied
- the substrate is dry (unless the instructions for the product to be applied state otherwise)
- the substrate does not visibly contain deicing salt
- the substrate is free from defects in order to be able to apply the marking material using suitable equipment

- the temperature of the substrate is within the range suitable for application
- the wind speed is (for spraying products) within the range suitable for application

4.5.4 Activities during application

Activities during application can include monitoring and control of suitable process characteristics.

Examples of process control for different materials are given in the annexes referenced in 4.5.3.

4.6 Identification and traceability

The quality plan shall include, or give references to, procedures for identification and traceability.

4.7 Inspection and control

The quality plan shall include an inspection and/or control programme for the application of road marking materials.

For each inspection to be performed the following information should be given in the quality plan :

[SIST ENV 13459-2:2002](https://standards.iteh.ai/catalog/standards/sist/0423154b-5ac1-4930-90f9-120101010101/sist-13459-2-2002)

[https://standards.iteh.ai/catalog/standards/sist/0423154b-5ac1-4930-90f9-](https://standards.iteh.ai/catalog/standards/sist/0423154b-5ac1-4930-90f9-120101010101/sist-13459-2-2002)

- who is responsible and assigned to carry out the inspection or control ;
- the method to be applied ;
- the frequency and, if possible, the time and place ;
- the applicable standard and the specified performance ;
- possible application of a statistical technique to verify whether the measured results comply with the specified performance ;
- possible reference to procedures to be applied in case of non conformity.

4.8 Corrective and preventive action

The quality plan shall include, or give references to, procedures for corrective and preventive action.

4.9 Quality records

The quality plan shall define all relevant data that have to be recorded. All quality records shall be legible and identifiable to the part of the work involved. They shall be stored for at least the duration of the warranty-period and maintained in such a way that they are readily retrievable.

Relevant data within the application process and activities related to the application can for example include the following :

- identification of the road marking materials used ;
- pattern dimensions ;
- visual appearance of the finished marking ;
- final layer thickness and/or quantities of applied materials ;
- width of the marking in dry condition ;
- location and position ;
- maximum height above the surrounding road surface of retroreflecting road studs ;
- maximum height above the surrounding road surface of a road marking with improved night time visibility during rain/wetness (profiled road markings) ;
- relative air humidity ;
- air and substrate temperature ;
- wind speed ;
- quantity of the thinner (for paint) ;
- drying time ;
- any relevant comments including any deviation from the quality plan.

NOTE : The use of standard forms is recommended for registration of inspection and control data, especially where routine work is involved.

4.10 Changes

The quality plan shall include, or give references to, procedures to be applied when modifications of the quality plan are needed as the project proceeds.

Annex A (informative)

Process control for application of paint

Before application, ensure that:

- a) the manufacturer's instructions concerning the dosage of the components, if applicable, are followed;
- b) the product to be applied is homogeneous;
- c) the consistency of the paint is suitable;
- d) the drop-on materials, if applied, have no agglomerations that hinder their regular flow through the dispenser (if necessary, sieve them);
- e) the flow is correctly adjusted.

During and after application:

- f) ensure that the paint distribution is even, and also, if applied, that the distribution of drop-on materials is regular and that the embedding of the majority of the glass beads is in accordance with their class of refractive index as given in EN 1423.

NOTE : The embedding depends on the refractive index of the glass beads. The embedding of glass beads with a refractive index of $\geq 1,5$ should be slightly more than or equal to the radius of the glass beads. Glass beads with a refractive index $\geq 1,7$ and $\leq 1,9$ should have an embedding of 50 % of the radius of the glass beads.

- g) determine:
 - 1) the thickness of the wet layer;
 - 2) the mass of :
 - the paint ;
 - the drop-on materials, if applied.

The method for measuring 1 is given in prEN 13197.

The method for measuring 2 is given in EN 1824 but an alternative method for 2 is given in Annex G.

NOTE 1: Item g) is not appropriate for hand application.

NOTE 2: When an automatic dosage system is used, other alternative measuring methods for 2, different from those specified in this standard, are allowed.