

# Surface dressing — Test methods —

## Part 1: Rate of spread and accuracy of spread of binder and chippings

The European Standard EN 12272-1:2002 has the status of a  
British Standard

ICS 93.080.20

# National foreword

This British Standard is the official English language version of EN 12272-1:2002.

The UK participation in its preparation was entrusted by Technical Committee B/510, Road materials, to Subcommittee B/510/2, Surface dressing, sprays and slurry surfacing, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

## Cross-references

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This British Standard, having been prepared under the direction of the Building and Civil Engineering Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 27 March 2002

## Summary of pages

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English version

## Surface dressing - Test methods - Part 1: Rate of spread and accuracy of spread of binder and chippings

Enduits superficiels d'usure - Méthodes d'essai - Partie 1:  
Taux d'épandage et régularité transversale du liant et des  
gravillons

Oberflächenbehandlung - Prüfverfahren - Teil 1: Dosierung  
und Querverteilung von Bindemitteln und Splitt

This European Standard was approved by CEN on 9 November 2001.

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## Foreword

This document EN 12272-1:2002 has been prepared by Technical Committee CEN/TC 227 "Road materials", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by August 2002, and conflicting national standards shall be withdrawn at the latest by June 2004.

In this standard the annexes A and C are normative and the annexes B and D informative.

This European Standard is one of a series of standards as listed below:

EN 12272-1, *Surface dressing – Test methods – Part 1: Rate of spread and accuracy of spread of binder and chippings.*

prEN 12272-2, *Surface dressing – Test methods – Part 2: Visual assessment of defects.*

prEN 12272-3, *Surface dressing – Test methods – Part 3: Determination of binder aggregate adhesivity by the vialit plate shock test method; German version prEN 12272-3:1997.*

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

## 1 Scope

This European Standard specifies test methods for determining the rates of spread and accuracy of spread of binder and chippings of a surface dressing on a section of road at a given time. It is also applicable to surface dressings on airfields and other trafficked areas.

The test methods are used on site to check the ability of binder sprayers and chipping spreaders to meet the intended rates of spread and tolerances and coefficients of variation.

The test methods for measuring the rates of spread and accuracy of spread of binders and chippings are not applicable to combined chipping-binder spreaders.

## 2 Normative references

Not applicable.

## 3 Terms and definitions

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

### 3.1 surface dressing

surface treatment consisting of the successive laying of at least one layer of binder and at least one layer of chippings

### 3.2 chippings

coarse aggregate within a narrow grading range, practically free of fines

NOTE Chippings can have specified values for strength, soundness, shape, polishing resistance, resistance to abrasion, purity, durability and affinity to bituminous binder.

### 3.3 rate of spread of binder

average mass of binder in kilograms per square metre ( $\text{kg/m}^2$ ), applied to the road surface when measured in accordance with this European Standard

### 3.4 rate of spread of chippings

average bulk volume in litres per square metre ( $\text{l/m}^2$ ) or, mass in kilograms per square metre ( $\text{kg/m}^2$ ) applied to the road surface, when measured in accordance with this European Standard

### 3.5 proportional range

difference between the maximum and minimum individual values of rates of spread of binder or chippings determined divided by the mean value, using the test methods in this European Standard

### 3.6 accuracy of spread of binder

Coefficient of variation of the mass of binder applied to the road surface when measured in accordance with this European Standard. The value and graph indicate the ability of the sprayer to apply binder evenly across the road

### 3.7 accuracy of spread of chippings

Coefficient of variation of the mass of chippings applied to the road surface when measured in accordance with this European Standard. The value and graph indicate the ability of the chipping spreader to apply the chippings evenly across the road

## 4 Determination of the rate of spread of binder

### 4.1 Principle

Samples of the binder sprayed by the binder sprayer are collected to determine the average rate of spread. At least five trays, boards or tiles are used, each with a minimum area of  $0,1 \text{ m}^2$  and having a minimum combined area of  $0,5 \text{ m}^2$ , spaced evenly across the full width of the road to be sprayed. Alternatively, a continuous strip of tiles or boards abutting each other is arranged across this entire width.

### 4.2 Apparatus

#### 4.2.1 Trays

Rectangular trays of metal or other material sufficiently robust to resist deformation in use. (Steel plate 2 mm thick is suitable).

NOTE The trays can contain an absorbent material to inhibit binder flow.

The internal dimensions of each tray in millimetres (mm) shall be the following:

- Side length  $(250 \pm 2) \text{ mm}$  to  $(500 \pm 2) \text{ mm}$ ;
- Height  $(5 \pm 2) \text{ mm}$  to  $(10 \pm 2) \text{ mm}$ .

A set of trays used for a test shall not vary in side dimensions by more than 10 mm from each other.

#### 4.2.2 Tiles or absorbent fibre boards

Rectangular carpet tiles or absorbent fibre boards, sufficiently absorbent to hold at least 1,5 times the specified rate of binder without loss of binder, e.g. flowing off whilst spraying or transferring to bags or penetration through the tile or board.

The dimensions of the tiles or boards (exposed area to collect binder) in millimetres (mm) shall be the following:

- Side length  $(250 + 2) \text{ mm}$  to  $(500 + 2) \text{ mm}$ ;
- Thickness maximum 25 mm.

The tiles or boards may be larger than the maximum dimension but shall be masked by tape to give the maximum dimension.

A set of trays used for a test shall not vary in side dimensions by more than 10 mm from each other.

#### 4.2.3 Ruler

Ruler, with a minimum length of 500 mm to measure the dimension of the trays, boards or tiles to the nearest 1 mm.

#### 4.2.4 Portable balance

Portable balance, readable to 0,1 g and of sufficient capacity to weigh one tray with 1,5 x the maximum rate of spread of binder.

#### 4.2.5 Plastic bags

Plastic bags, lightweight and capable of containing the binder and tray or board or tile for weighing without any loss by leakage or evaporation.

#### 4.2.6 Tape

Adhesive tape, used to hold the trays, boards or tiles to the road and to mask them to the required dimensions. When removed, the tape shall not damage the masked parts of absorbent boards or carpet tiles so as to ensure there is no loss in mass of the underlying material.

### 4.3 Procedure

#### 4.3.1 Preparation of the trays, carpet tiles or absorbent fibre board

Mark the trays or carpet tiles or absorbent fibre boards with an indelible identification. Insert an absorbent material as a liner into each tray. Weigh the trays, the carpet tiles or absorbent fibre boards together with a plastic bag, to the nearest 1 g and record these masses as the mass of each sampling device before spraying.

#### 4.3.2 Location and placement of the tray, carpet tiles or absorbent fibre board

The test site shall be at least 30 m from the start of the spraying operation.

Space the trays, carpet tiles or absorbent fibre boards across the width of road which is to be sprayed with binder, and at least 200 mm from the edge as shown in Figure 1. If adhesive tape is used to secure the carpet tiles or absorbent fibre board to the road during spraying, measure the length and width of each of the areas exposed to the binder spray to the nearest 5 mm for the calculation of the exposed area.

NOTE 1 When the rates of transverse distribution are intentionally different in the same transverse profile then the trays, boards or carpet tiles related to the same measurement should be placed in areas where the intended rate of spread is the same.

NOTE 2 Care should be taken to ensure that when spray curtains are being used, to avoid touching the trays, boards or tiles.

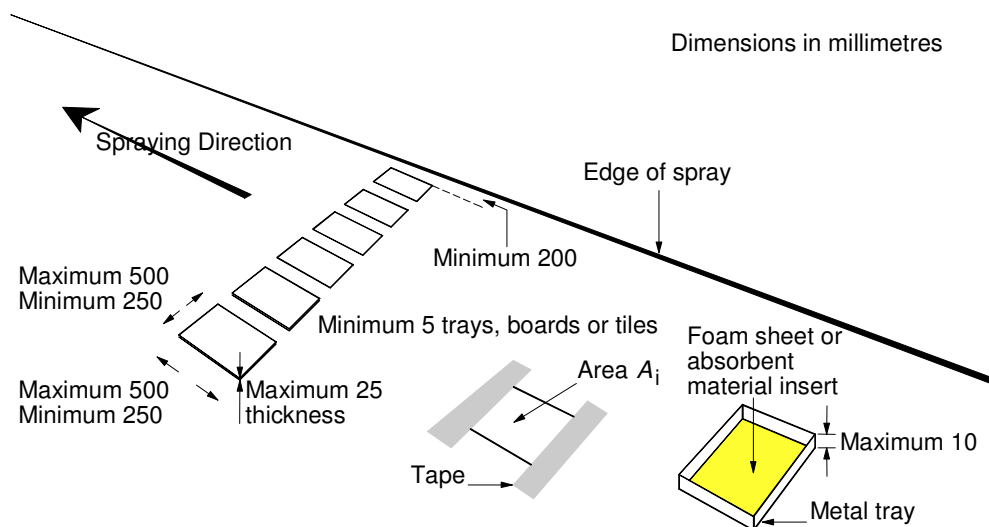


Figure 1 — Trays or carpet tiles or absorbent fibre boards, diagrammatic

#### 4.3.3 Removal and weighing of the trays, carpet tiles or absorbent fibre boards

Within 3 min of the binder being sprayed onto the road, but before any chippings are applied, remove the trays, carpet tiles or absorbent fibre board from the road surface. Care shall be taken not to lose or gain any binder. Then insert each sampling device into its own plastic bag before weighing it to the nearest 1 g. Record the mass of each sampling device after spraying.

#### 4.4 Expression of results

Calculate the binder mass:

$$M_i = M_{2i} - M_{1i} \quad (1)$$

where

$M_i$  is the binder mass retained on the sampling device, expressed in kilograms (kg);

$M_{2i}$  is the mass of the sampling device after spraying, expressed in kilograms (kg);

$M_{1i}$  is the mass of the sampling device before spraying, expressed in kilograms (kg);

Calculate the rate of spread:

$$d_i = \frac{M_i}{A_i} \quad (2)$$

where

$d_i$  is the rate of spread of binder, expressed in kilograms per square metre ( $\text{kg/m}^2$ ), for each sampling device;

$M_i$  is the binder mass retained on the sampling device, expressed in kilograms (kg);

$A_i$  is the area of sampling device exposed to the binder spray, expressed in square metres ( $\text{m}^2$ ).

Calculate the mean rate of spread of the binder:

$$D = \frac{(d_1 + d_2 + d_3 + d_4 + d_5 + \dots d_N)}{N} \quad (3)$$

where

$D$  is the mean rate of spread of binder, expressed in kilogram per square metre ( $\text{kg/m}^2$ ), reported to the nearest  $0,05 \text{ kg/m}^2$  ;

$d_1$  to  $d_N$  are the rates of spread of binder on each sampling device;

$N$  is the number of sampling devices used in the test.

Calculate the proportional range:

$$P_R = \frac{(d_{\max} - d_{\min})}{D} \quad (4)$$

where

$P_R$  is the proportional range;

$d_{\max}$  is the highest rate of spread of binder found on an individual sampling device;

$d_{\min}$  is the lowest rate of spread of binder found on an individual sampling device.

Repeat the test if the proportional range is greater than 0,20.

NOTE If this recurs it indicates that a measurement of the transverse distribution can be necessary (see clause 6).

## 4.5 Test report

The test report shall contain:

- a) a statement that the test has been performed in accordance with this European Standard;
- b) identification of sprayer and spraybar used;
- c) spraybar height;
- d) spraybar width used;
- e) location of site test;
- f) date of test;
- g) climatic conditions likely to affect the test result (e.g. windy, etc.);
- h) binder temperature recorded from the tank;
- i) binder type;
- j) specified rate of spread and tolerance;
- k) results as calculated in 4.4;
- l) any remarks;
- m) name and signature of the person responsible for conducting the test.