

# Products and systems for the protection and repair of concrete structures — Test methods —

## Part 1: Determination of linear shrinkage for polymers and surface protection systems (SPS)

The European Standard EN 12617-1:2003 has the status of a  
British Standard

ICS 91.080.40

## National foreword

This British Standard is the official English language version of EN 12617-1:2003.

The UK participation in its preparation was entrusted by Technical Committee B/517, Concrete, to Subcommittee B/517/8, Protection and repair of concrete structures, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/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.

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### Summary of pages

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## Products and systems for the protection and repair of concrete structures - Test methods - Part 1: Determination of linear shrinkage for polymers and surface protection systems (SPS)

Produits et systèmes pour la protection et la réparation des structures en béton - Méthodes d'essai - Partie 1: Détermination du retrait linéaire des polymères et des systèmes de protection de surface

Produkte und Systeme für den Schutz und die Instandsetzung von Betontragwerken - Prüfverfahren - Teil 1: Bestimmung des linearen Schrumpfes von Polymeren und Oberflächenschutzsystemen (OS)

This European Standard was approved by CEN on 3 March 2003.

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## Foreword

This document (EN 12617-1:2003) has been prepared by Technical Committee CEN/TC 104 "Concrete and related products", 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of an identical text or by endorsement, at the latest by October 2003, and conflicting national standards shall be withdrawn at the latest by October 2003.

The European Standard is one of a series dealing with products and systems for the protection and repair of concrete structures:

EN 12617-1, *Products and systems for the protection and repair of concrete structures - Test methods - Part 1: Determination of linear shrinkage for polymers and surface protection systems (SPS).*

EN 12617-2, *Products and systems for the protection and repair of concrete structures - Test methods - Determination of shrinkage of polymer for injection products - Part 2: Shrinkage of crack injection product formulated with polymer binder: volumetric shrinkage.*

EN 12617-3, *Products and systems for the protection and repair of concrete structures - Test methods - Part 3: Determination of early age linear shrinkage for structural bonding agents.*

EN 12617-4, *Products and systems for the protection and repair of concrete structures - Test methods - Part 4: Determination of shrinkage and expansion.*

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

## 1 Scope

This European Standard specifies a method for determining the linear shrinkage of solvent free multicomponent cold curing reactive resins for the protection and repair of concrete structures.

NOTE The method is not suitable for rubber, elastic and very fast curing products. Rubber and elastic products show relaxation effects and can dissipate stress to the ground. For testing very fast curing products the pot life should be long enough for mixing and preparing the test specimens.

## 2 Normative references

This European Standard incorporates by dated or undated references, 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 Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 1504-1, *Products and systems for the protection and repair of concrete structures – Definitions, requirements, quality control and evaluation of conformity – Part 1: Definitions.*

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

EN ISO 1513, *Paints and varnishes – Examination and preparation of samples for testing (ISO 1513:1992).*

## 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions contained in EN 1504-1 and the following apply.

### 3.1 shrinkage

contraction in length or volume during curing of the material

### 3.2 shrinkage value

ratio of the gap width in mm after curing to the original length of 1 m

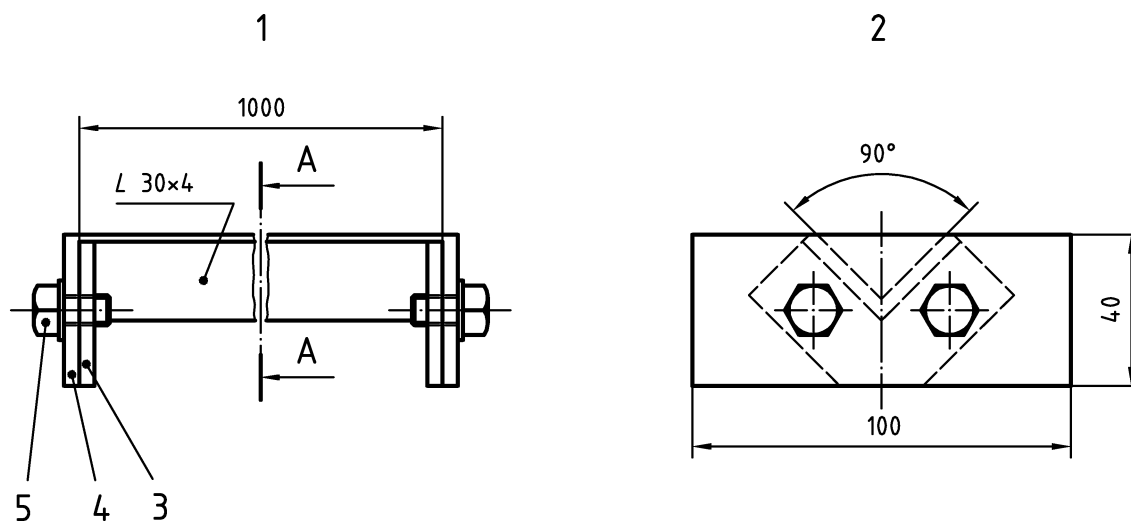
## 4 Apparatus

4.1 Two trough sections, of length 1 000 mm ± 1 mm, made of 30 mm x 4 mm steel angle with ends fitted with flat ground flanges closed with matching bolted metal plates which also serve as supports, all shown in Figures 1 and 2.

4.2 Instrument to measure length to an accuracy of 0,05 mm (e.g. slide gauge).

4.3 Drying cabinet maintained at (70 ± 2) °C.

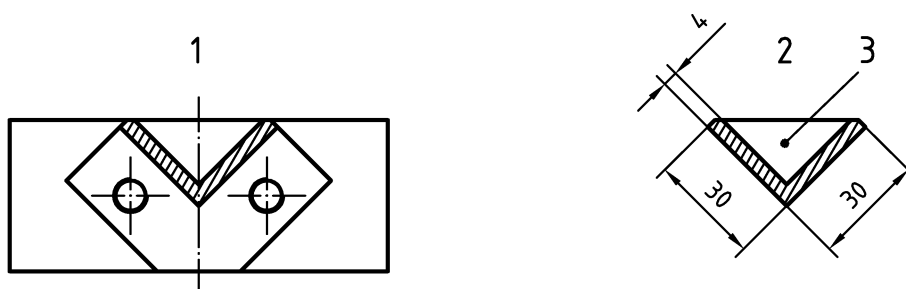
Dimensions in millimetres

**Key**

- 1 Side view
- 2 Face view
- 3 Welded-on flange
- 4 Face covering
- 5 M8 x 12 – 8,8

**Figure 1 — Dimensions of the trough**

Dimensions in millimetres

**Key**

- 1 Section A – A
- 2 Profile
- 3 Material under test

**Figure 2 — Dimensions of the trough and position of the material under test****5 Sampling**

A representative and homogenous sample of the material to be tested shall be taken in accordance with EN ISO 15528. The sample shall be examined and prepared as described in EN ISO 1513.

## 6 Procedure

Determine the shrinkage value using duplicate 1 000 mm troughs.

Coat the inside surfaces of the two troughs with a release agent. Mix the components of the material under test according to the manufacturer's instructions. Pour the mixture into the troughs and trowel off flush. Avoid the formation of air bubbles.

Store the two troughs in a climate of  $(21 \pm 2) ^\circ\text{C}$  /  $(60 \pm 10) \% \text{ r. h.}$  for 7 days. Then determine the shrinkage by aligning the cured material at one end of the trough and measuring the resulting gap at the other end of the trough within an accuracy of 0,1 mm (shrinkage value  $s_1$ ).

Thereafter store the cured material, either in the trough for one day in a drying cabinet at  $(70 \pm 2) ^\circ\text{C}$ , followed by storage for a further day at a temperature of  $(21 \pm 2) ^\circ\text{C}$ . Repeat the shrinkage measurements (shrinkage values  $s_2$ ).

Observe the samples for visual defects (cracks etc.).

## 7 Precision

Precision data are currently not available.

## 8 Test report

The test report shall at least include the following information:

- a) a reference to the test method standard;
- b) name and address of the test laboratory;
- c) identification number and date of the test report;
- d) name and address of the manufacturer or supplier of the product(s);
- e) name and identification marks or batch number of the product(s);
- f) date of supply of the product;
- g) date of preparation of the test specimens and any deviation from the prescribed method of preparation;
- h) conditions of storage of prepared specimens prior to test;
- i) date of test and details of the test equipment used;
- j) the test results ; single shrinkage values ( $s_1$  and  $s_2$ ) and mean shrinkage values to an accuracy of 0,1 mm/m;
- k) precision data;
- l) any deviation of this standard;
- m) date of test report and signature.





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