



SLOVENSKI STANDARD SIST EN 12637-1:2004

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Products and systems for the protection and repair of concrete structures - Test methods
- Compatibility of injection products - Part 1: Compatibility with concrete

Produkte und Systeme für den Schutz und die Instandsetzung von Betontragwerken -
Prüfverfahren - Verträglichkeit von Rissfüllstoffen - Teil 1: Verträglichkeit mit Beton

Produits et systemes pour la protection et la réparation des structures en béton -
Méthodes d'essai - Compatibilité des produits d'injection - Partie 1: Compatibilité avec le
béton

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ICS:

91.080.40 Betonske konstrukcije Concrete structures

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EUROPEAN STANDARD
NORME EUROPÉENNE
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EN 12637-1

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Products and systems for the protection and repair of concrete structures - Test methods - Compatibility of injection products - Part 1: Compatibility with concrete

Produits et systèmes pour la protection et la réparation des structures en béton - Méthodes d'essai - Compatibilité des produits d'injection - Partie 1: Compatibilité avec le béton

Produkte und Systeme für den Schutz und die Instandsetzung von Betontragwerken - Prüfverfahren - Verträglichkeit von Rissfüllstoffen - Teil 1: Verträglichkeit mit Beton

This European Standard was approved by CEN on 27 February 2004.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This document (EN 12637-1:2004) has been prepared by Technical Committee CEN /TC 104, "Concrete and related products", the secretariat of which is held by DIN.

It has been drafted by Sub-Committee 8 "Products and systems for the protection and repair of concrete structures" (Secretariat 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 February 2005, and conflicting national standards shall be withdrawn at the latest by February 2005.

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

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EN 12637-1:2004 (E)**1 Scope**

This document describes the method for determining the compatibility with concrete of polyurethane injection products, or other elastic injection products likely to be sensitive to the effects of the alkalis in concrete. This document describes the reference procedure.

In the case of polyurethane products, this method is only suitable for final injection products (i.e. not water-stopping foams).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5893, *Rubber and plastics test equipment - Tensile, flexural and compression types (constant rate of traverse) - Specifications*

3 Test principle

This test investigates the effect of water contamination upon a polyurethane injection product, as might occur when the product is injected into water filled cracks in concrete. It then assesses the likelihood of change in flexibility of the cured product as a result of long term contact with concrete. This is simulated by storing specimens in a solution of caustic potash. These are then compared with control specimens of cured water contaminated product which have been stored in air and similar specimens stored in water. A further set of control specimens is prepared without water contamination and the cured products stored in air only. The specimens are cut from material polymerised for seven days in shell moulds preventing an increase in volume.

4 General requirements**4.1 Apparatus**

- compression testing machine complying with ISO 5893;
- mould for casting the product (see Figure 1);
- sharp knife;
- vessel to store specimens in caustic potash;
- x, y recorder.

4.2 Materials

- 0,1 Molar solution of caustic potash (KOH);
- the injection product.

5 Test procedure

5.1 Description and design of the mould

The mould comprises two 10 mm thick, 270 mm diameter mild steel plates, each having a 5 mm deep groove in one face to receive a 200 mm \varnothing , 35 mm high, 5 mm thick steel cylinder. The whole assembly is securely clamped by 12 equally spaced mild steel bolts passing through the plates, outside the cylinder, as illustrated in Figure 1.

The upper plate has a 50 mm diameter threaded feed hole, fitted with a threaded steel plug. There is also a vent fitted with a valve in the upper plate near the perimeter of the chamber formed by the plates and the cylinder. Sheets of waxed paper or silicone release paper should be cut to fit the mould to prevent the injection product sticking to the steel surfaces. The test should be conducted at $(21 \pm 2) ^\circ\text{C}$ and $(60 \pm 10) \%$ relative humidity.

5.2 Mixing of components

5.2.1 Products as supplied

One-component products require no mixing.

Two-component products shall be thoroughly blended, using the complete contents of the package, and then thoroughly mixed for two minutes using a slow speed (200 rpm) electric drill fitted with a suitable paddle. To complete the mixing process, the product shall be poured from one vessel to another and mixed again.

5.2.2 Products contaminated with water

In the case of single-component products, sufficient product to fill the mould shall be taken and 5 % water added. It shall be mixed thoroughly for one minute, unless the rate of reaction proves too rapid to allow it to then be poured into the mould, in which case the supplier's advice on mixing shall be followed. Any such change in mixing procedure shall be recorded in the test report. [SIST EN 12637-1:2004](https://standards.iteh.ai/catalog/standards/sist/b477801a-d600-4673-ba3a-2684885611217-7894)

Two component products shall be mixed as described in 5.2.1 above, but only for one minute. Then, after pouring into a second vessel, 5 % water (upon weight of product) shall be added and thorough mixing continued for a further minute.

5.3 Casting the specimens

The products, when mixed, shall be poured immediately into two moulds via the central hole and sealed immediately with the threaded plug and the vent valve closed.

After 7 days the moulds shall be dismantled and the polyurethane discs taken out. The disc shall be cut with a sharp knife into the specimens, $(50 \times 50 \times 25)$ mm (Figure 1).

12 specimens are necessary.

5.4 Storage of the specimens

Three specimens shall be stored in each of the conditions shown in Table 1 for the number of days stated.

Table 1 — Storage of the specimen

| Condition | Product as supplied | Product contaminated with water |
|---------------------|---------------------|---------------------------------|
| Air | 14 days | 14 days |
| Demineralised water | | 14 days |
| 0,1 molar KOH | | 14 days |

EN 12637-1:2004 (E)**6 Mechanical properties : evaluation after storage**

At the end of the specified storage period, the specimens shall be wiped dry and placed centrally between the platens of the compression test machine. The machine shall be operated at a strain rate of 2,0 mm/min and the specimens shall be subjected to the loading/unloading cycle shown at Figure 2. The stresses required to produce the specified rate of deformation shall be recorded, together with the strains, on an x, y plotter.

7 Interpretation of results

The elasticity of the specimen shall be determined by the stress/strain plot of the third and final compressive load cycle (from $t = 4,125$ min to $t = 5,375$ min). To evaluate the lost work the area between the loading and unloading curves is to be determined in Nmm (area 1 in Figure 3). Additionally the area beneath the stress/strain curve is to be determined as deformation work (area 2 in Figure 3).

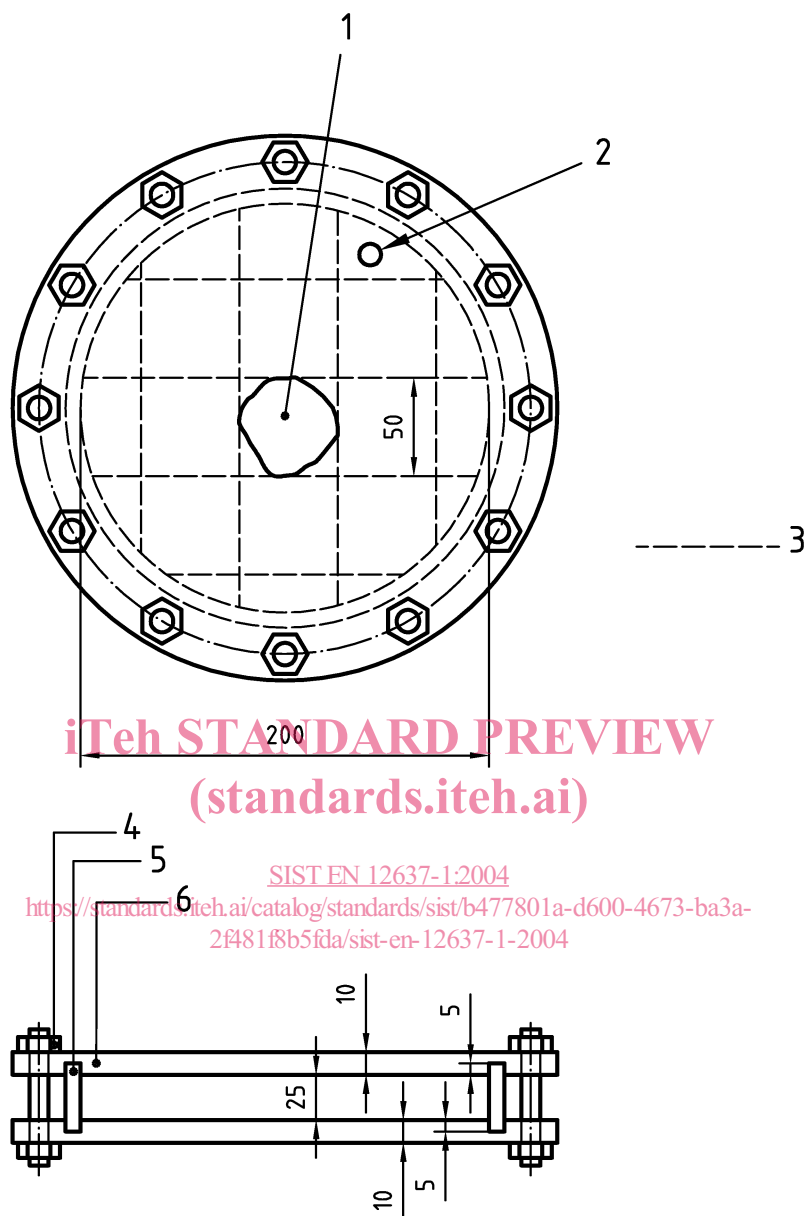
8 Test report

The test report shall contain the following informations :

- a) a reference to this document;
- 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;
- e) name and identification marks or batch (number of the product);
- f) date of supply of the product;
- g) date of preparation of the test specimens and any deviation from the prescribed method of preparation; procedure of mixing of the product and mixing with water (ratio of the components and/or catalyst, description of mixing equipment, duration of mixing);
- h) conditions of storage of prepared specimens prior to test;
- i) date of test and details of the test equipment used, including the make, type and capacity and the calibrations details or the identification number of the apparatus;
- j) the test results;

The lost work and the deformation work in elastic modulus of the specimens, both modified and unmodified, relative to the unmodified product stored in air (control);
- k) precision data;
- l) date of test report and signature.

Dimensions in millimetres

**Key**

- 1 Filling aperture (Filling hole)
- 2 Valved vent
- 3 Cutting line
- 4 M 12 (12 pieces)
- 5 Steel cylinder \varnothing 200 mm
- 6 Steel plate \varnothing 270 mm

Figure 1 — Mould for casting specimen