SLOVENSKI STANDARD
SIST EN 13596:2005

01-februar-2005

Hidroizolacijski trakovi - Hidroizolacija betonskih premostitvenih objektov in drugih betonskih povoznih povrġin - Doloļ anje oprijemne trdnosti

Flexible sheets for waterproofing - Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles - Determination of bond strength

Abdichtungsbahnen - Abdichtungssysteme auf Beton für Brücken und andere Verkehrsflächen - Bestimmung der Abreißfestigkeit

Feuilles souples d'étanchéité - Étanchéité des ponts et autres surfaces en béton circulables par les véhicules - Détermination de l'adhérence

Ta slovenski standard je istoveten z: **EN 13596:2004**

ICS:

91.100.50	Veziva. Tesnilni materiali	Binders. Sealing materials
93.080.20	Materiali za gradnjo cest	Road construction materials

SIST EN 13596:2005 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 13596

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ICS 91.100.50; 93.080.20

English version

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This European Standard was approved by CEN on 8 August 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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Contents

Foreword

This document (EN 13596:2004) has been prepared by Technical Committee CEN /TC 254 "Flexible sheets for waterproofing", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by April 2005, and conflicting national standards shall be withdrawn at the latest by July 2006.

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.

Introduction

The purpose of the test is to determine the adhesive properties of the waterproofing system.

Bond strength between the waterproofing sheet system and concrete substrate or asphalt layer can be determined.

1 Scope

This document is one of a series of standards applicable to flexible sheets for waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles.

This document specifies a test method for the evaluation of the tensile bond strength properties of the waterproofing sheet system applied to a concrete surface and with an asphalt layer.

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.

EN 13416, *Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Rules for sampling*

EN 13375:2004, *Flexible sheets for waterproofing – Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles – Specimen preparation.*

prEN 14695:2003, *Flexible sheets for waterproofing – Reinforced bitumen sheets for waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles – Definitions and characteristics.*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13375:2004, prEN 14695:2003 and the following apply.

bond strength
tensile stress at maximum force when testing the adhesion between different layers in a waterproofing system

4 Test methods

4.1 Principle

The bond strength shall be measured using a tensile test equipment. The tensile force shall be applied perpendicular to the test specimen, and the force required at failure shall be registered.

4.2 Apparatus and materials

a) Tensile test machine, with force increasing rate control and automatic load recording, fitted with suitable clamps and base to ensure that the tensile force can be applied without momentum perpendicular to the test specimen.

b) Circular steel plates, with a diameter of 50 mm, or square steel plates with test area (50 × 50) mm², and a tolerance of 0,5 mm. The steel plate shall be attached by suitable means (e.g. screwed) to the tensile test machine. Minimum thickness of steel plate shall be 10 mm from bottom of steel plate to bottom of screw hole.

c) Suitable adhesive (e.g. two part epoxy resin), for bonding the steel plates to the waterproofing sheet or the asphalt layer of the test specimen.

d) Oven, capable of maintaining a temperature of (23 ± 2) °C.

e) Device for measuring surface temperature, with an accuracy of at least ± 0,5 °C.

4.3 Preparation of test specimens

Samples and test pieces shall be taken in accordance with EN 13416.

Compound specimen and test specimen preparations are described and specifications for base specimens and asphalt layer mixes are given in EN 13375.

Type 1 (waterproofing sheet and concrete):

Base specimen with the applied flexible sheet waterproofing shall be used if bond strength between waterproofing sheet and concrete substrate is to be measured. If the flexible sheet system consists of more than one sheet layer, only the bottom sheet layer shall be applied and tested. (Illustrated in Figure 1.)

Type 2 (waterproofing sheet and asphalt layer):

Flexible sheet sample applied with an asphalt layer shall be used if bond strength between waterproofing sheet and asphalt layer is to be measured. If the flexible sheet system consists of more than one sheet layer, only the top sheet layer shall be applied with an asphalt layer and tested. After preparation the compound specimen shall be turned up side down (with the waterproofing facing upwards).

Type 3 (concrete, waterproofing system and asphalt layer):

Base specimen with the applied flexible sheet waterproofing system and asphalt layer shall be used if bond strength of the complete waterproofing system and including the asphalt layer (the weakest link of the system) is to be measured.

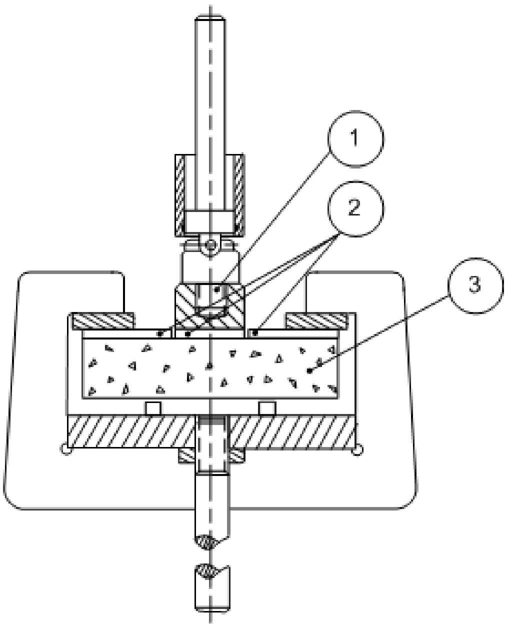
For type 3 only sawn test specimens 50 mm × 50 mm shall be used.

After preparation of test specimen(s) according to EN 13375 and cooling to room temperature, steel plates (4.2 b) shall be bonded to the upper surface of the test specimen (waterproofing sheet for type 1 and 2 or asphalt layer for type 3) with a suitable adhesive (4.2 c).

For type 1 and 2 the test areas shall then be isolated by cutting the sheet along the sides of the steel plate down to the concrete (type 1) or to the asphalt layer (type 2). Test specimen areas may be cut before bonding the steel plates.

At least three test areas shall be prepared and any preparation shall not affect the structure of the material.

NOTE Enough test specimens should be prepared to ensure a minimum acceptable number of tests with an acceptable type of failure. If necessary the test area surface is prepared, before bonding the steel plates to the surface, by for instance using a metal brush.



Key

1 Steel plate
2 Waterproofing sheet
3 Concrete

Figure 1 — Example of equipment and specimen for determining bond strength (between waterproofing sheet and concrete substrate)

4.4 Procedure

Prior to testing the test specimen shall be conditioned at test temperature for at least 24 hours.

The test specimen is placed in the tensile test machine and the steel plate attached to the machine. During testing the steel plate is pulled with an increasing stress rate to assure an increase in tensile force of (0,15 ± 0,01) N/s mm^2 applied perpendicular to the test specimen. The tensile bond failure load shall be recorded together with the mode of failure.

The following general modes of failure may occur for a system of flexible bitumen sheet and primer:

— in the concrete;

— between concrete and primer;

— in the primer layer;

— between primer and weldable or pour-and roll bitumen;

— in the weldable or pour-and roll bitumen;

— against or within the reinforcement;

— between sheet and granules;

— adhesive failure.

With an applied flexible sheet waterproofing system and asphalt layer failure may occur also:

— between asphalt layer and sheet;