



TECHNICAL REPORT

**Determination  
of crack-bridging  
capability**

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## Foreword

*EOTA Technical Reports are developed as supporting reference documents to European Technical Approval Guidelines and can also be applicable to a Common Understanding of Assessment Procedures, an EOTA Comprehension Document or an European Technical Approval, as far as reference is made therein.*

*EOTA Technical Reports go into detail in some aspects and express the common understanding of existing knowledge and experience of the EOTA bodies at a particular point in time.*

*Where knowledge and experience is developing, especially through approval work, such reports can be amended and supplemented.*

*When this happens, the effect of the changes upon the European Technical Approval Guidelines will be laid down in the relevant comprehension documents, unless the European Technical Approval Guideline is revised.*

*This EOTA Technical Report has been prepared by the EOTA Working Group 04.02/01 – “Liquid applied roof waterproofing Kits” and endorsed by EOTA.*

## 1 Scope

This EOTA Technical Report specifies the method for the determination of the capability of installed products of liquid applied roof waterproofing kits, to bridge cracks in the concrete substrate, both directly after curing and after accelerated ageing by heat.

## 2 Principle

The verification is performed by inducing a defined crack in the concrete substrate as part of the test specimen and determine the resistance to cracking of the installed product fully bonded, at low temperature during a defined period of time.

## 3 Apparatus

**3.1** A tensile testing machine of suitable capacity with a minimum of 10 kN and displacement involved and adjustable to a constant crosshead speed of 0,5 mm/min.

**3.2** Recording equipment for measuring time, speed, tension and displacement to an accuracy of 0,1 mm.

**3.3** Cold box or refrigerator, designed to reach a temperature of - 30°C and adjustable to  $\pm 2^\circ\text{C}$ .

**3.4** Cold chamber designed to reach a temperature of - 30°C and adjustable to  $\pm 2^\circ\text{C}$  and suitable to be mounted to the tensile testing machine.

**3.5.1** Scales with a measuring range of at least 600 g at an accuracy of 0,1 g.

## 4 Test specimen

### 4.1 Dimensions

The test specimen is the installed product of the liquid applied roof waterproofing kit, including its specified substrate, to which it shall be applied as prescribed by the manufacturer.

The test specimen shall have a width of  $(50 \pm 1)$  mm and a length of  $(290 \pm 2)$  mm.

### 4.2 Number

The number of test specimens is six.

### 4.3 Specified substrate

The substrate of the test specimen consists of two concrete blocks of dimensions  $(50 \times 150 \times 30)$  mm, sawn (for example from a concrete paving slab) as two halves from one block of dimensions  $(50 \times 300 \times 30)$  mm, and placed end-to-end with the sawn edges touching.

Both pieces fixed together by rigid adhesive tape at bottom and along both sides.

The surface of the concrete substrate should be smooth, dry and clean and free from screed marks and exposed aggregate.

### 4.4 Preparation

Before the product is applied the concrete blocks shall be stored at a relative humidity of  $(90 \pm 5)$  % and at a temperature of  $(23 \pm 2)$  °C until moisture equilibrium is reached, which is to be determined by weighing.

The product shall be applied as prescribed by the manufacturer and shall be fully bonded to the surface of the two pieces of the specified substrate.

*NOTE – The installed product of the test specimen shall not have a protective finish.*

### 4.5 Curing and conditioning

The installed product shall be cured at a temperature of  $(23 \pm 2)$  °C and at a relative humidity of  $(50 \pm 5)$  % for at least the period as prescribed by the manufacturer.

After curing, three of the six specimens shall be artificially aged by heat by storing them at  $(70 \pm 2)$  °C for a period of 91 days.

Prior to testing the test specimen shall be gradually brought to ambient temperature and afterwards be conditioned at  $(-30 \pm 2)$  °C for at least 12 hours.

## 5 Procedure

### 5.1 Test conditions

The test shall be carried out at a temperature of  $(-30 \pm 2)$  °C.

### 5.2 Test procedure

**5.2.1** The test specimen is fixed longitudinally to the jaws of the tensile testing machine and the adhesive tapes are carefully removed.

**5.2.2** Adjust the tensile testing machine in order to subject the specimen to static tension at a rate of 0,5 mm/min. until a gap of 1,5 mm is developed between the two halves of the concrete block.

**5.2.3** At that moment, bring the tensile testing machine to a stand-still and maintain this situation for a period of 5 minutes.

The test specimen must be able to bridge this gap for the duration of this period without sustaining damage.

**5.2.4** Following the test, the temperature of the test specimen will be allowed to rise to ambient temperature, after which the crack-bridging capability is examined visually.

**5.2.5** In case of no clearly visible damage, the watertightness of the installed product shall be determined by sealing a pipe of a matching outer diameter to the test specimen over the crack area.

The pipe shall be of sufficient height to impose a head of water of 100 mm during 24 hours.

**5.2.6** Spread a moisture indicator (e.g. a mixture of powdered sugar and methylene blue) on an even board and cover it with a filter paper.

Place the prepared test specimen on the filter paper and carry out the watertightness test.

**5.2.7** Perform the test(s) on the remaining test specimens.

## **6 Expression of results**

Any ruptures in the membrane as well as any adhesion failures will be recorded.

Record as final result whether the test specimen remains watertight or not.

The installed product is considered to be proven when both series of three test specimens pass the watertightness test.

## **7 Test report**

The test report shall include the following information:

- a. reference to this Technical Report;
- b. the name of the testing laboratory;
- c. date of testing;
- d. description of the installed product and its substrate, including dimensions, curing, conditioning;
- e. the test conditions;
- f. a description of the failure mode in the test specimen, if any;
- g. all operating details not specified in this Technical Report, as well as incidents likely to have influenced the results.

## **Annex A**

### **Bibliography**

- VTT 2654: 1992 "Waterproofing bitumen sheet membrane systems for bridge deck – Cracking capability in cold".
- L.C.P.C. Laboratoire de France – Determination de la résistance à la fissuration provoquée.