



TECHNICAL REPORT

**Determination of the  
resistance to  
static indentation**

TR 007  
Edition May 2004

EUROPEAN ORGANISATION FOR TECHNICAL APPROVALS

# Technical Report 007 revised

## Determination of the resistance to static indentation

Edition May 2004

### 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 of the determination of the resistance to static indentation of an installed product of liquid applied roof waterproofing kits.

### 2 Principle

The resistance to static indentation of the product installed on a given substrate is determined by applying a given static load by means of a steel indenter to the exposed side of the product for a period of 24 hours and investigating whether the test specimen is perforated or not by the determination of the watertightness.

### 3 Apparatus

#### 3.1 A device, including weights if any

To apply the constant loads, according to Table 1, on a steel indenter.

Level of resistance	Loads (N)	User load category
L1	70 ± 1	P1
L2	150 ± 1	P2
L3	200 ± 1	P3
L4	250 ± 1	P4

Table 1 – Loads

#### 3.2 Indentor

A 10 mm diameter steel rod, having a hemispherical end with a measuring gauge of at least 100 mm long.

#### 3.3 Frame

To clamp the test specimen, internal dimensions with a minimum of (200 x 200) mm.

#### 3.4 Flat rigid base

Base of sufficient size.

### 3.5 Devices for testing watertightness

In case of fully bonded product:

- a. electrical spark tester;
- b. cylinder, diameter  $(50 \pm 2)$  mm, to apply a head of (coloured) water with a minimum length of 100 mm.

## 4 Test specimen

### 4.1 Dimensions

The test specimen is the installed product including its substrate. The dimensions of the test specimen shall be based on the frame used, but shall have a testing area of at least  $(200 \pm 1)$  mm x  $(200 \pm 1)$  mm. The substrate shall have a thickness of  $(100 \pm 2)$  mm.

### 4.2 Number of test specimens

The number of test specimens is three.

*NOTE – Depending on the type of substrate used and its dimensions it is allowed to use the substrate more than once. However, if the substrate is damaged as a result of the test, the use of the same substrate is only allowed when the new position of indentation is not within 100 mm of any previous one or the internal sides of the frame. In that case the same piece of substrate can be used for three tests.*

### 4.3 Preparation of test specimens

In the case of a product being defined as loose laid or partially bonded, the test specimens shall be cut from a free film sample (e.g. obtained by the use of siliconized paper etc.).

In all other cases the test specimens shall be the product, bonded to the most and least compressible substrate specified by the applicant for that product, except where that substrate is concrete, a steel plate (at least 6 mm thick) shall be used as a substrate.

*NOTE 1 – If the liquid applied roof waterproofing kit incorporates a supporting layer and/or an internal layer the test specimen shall not include lap joints.*

*NOTE 2 – Only in the case of fully bonded product where the least compressible substrate specified is concrete, a steel plate is used as a substrate in order to allow subsequent verification of watertightness by electrical means e.g. by an electrical spark tester.*

### 4.4 Curing and conditioning

The installed product shall be conditioned at a temperature of  $(23 \pm 2)$  °C and a relative humidity of

$(50 \pm 5)$  % for a period of at least the period prescribed by the applicant.

The cured test specimens shall be conditioned at  $(23 \pm 2)$  °C for a period of at least 16 hours.

## 5 Procedure

### 5.1 Test conditions

The test shall be carried out at a temperature of  $(23 \pm 2)$  °C and a relative humidity of  $(50 \pm 5)$  %, unless otherwise specified.

### 5.2 Test procedure

**5.2.1** Clamp the test specimen in the framework in such a way, that the installed product is fully restrained and supported at the edges.

**5.2.2** Position the loading device in the centre of the test specimen when using dimensions of 200 mm x 200 mm, or at a distance of at least 100 mm from the internal sides of the frame work when using a larger test specimen.

**5.2.3** Place the indenter on the exposed side of the test specimen and connect it to the loading device.

**5.2.4** Apply the load to the steel rod (see Table 1) corresponding to the product user load category, related to its intended use as specified by the applicant.

**5.2.5** Remove the test specimen; examine the installed product visually for perforation and (in case of doubt) determine the watertightness of the installed product at the place of indentation by using one of the following procedures:

- a. free films

the verification method as specified in EOTA Technical Report 003 (but with a head of water of 100 mm);

- b. bonded to substrates

by the application of a 100 mm column of (coloured) water for a period of 24 hours. After this period the installed product shall be carefully removed from the substrate and the substrate shall be examined for

evidence of water penetration (e.g. by use of an UV lamp);

c. bonded to steel

by the application of a small amount of salt water to the indentation and the use of an electrical method (e.g. spark tester). The steel plate is then acting as the earth. Care must be taken to ensure that the voltage applied across the test specimen is not too high to cause damage.

*NOTE – When the installed product contains conductive material(s) the electrical spark tester cannot be used.*

**5.2.6** Perform the test on the remaining test specimens.

## **6 Expression of results**

Determine whether the test specimen has been perforated by visual examination and by testing the watertightness. The installed product is considered "watertight" when all three test specimens pass the test.

## **7 Test report**

The test report shall give the following information:

- a. reference to this Technical Report;
- b. the name of the testing laboratory;
- c. date of testing;
- d. a description of the installed product, including dimensions, curing and conditioning;
- e. a description of the substrate;
- f. the watertightness of the three test specimens at the place of indentation and the method of determination, if relevant;
- g. all operating details not specified in this Technical Report, as well as incidents likely to have influenced the results.

## **Annex A Bibliography**

- Directive Générale UEAtc pour l'Agrément des revêtements d'étanchéité des toitures - July 1982.