



National Standards Authority of Ireland

IRISH STANDARD

**I.S. EN 13494:2002**

ICS 91.100.60

**THERMAL INSULATION PRODUCTS FOR  
BUILDING APPLICATIONS - DETERMINATION  
OF THE TENSILE BOND STRENGTH OF THE  
ADHESIVE AND OF THE BASE COAT TO THE  
THERMAL INSULATION MATERIAL**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
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**EN 13494**

October 2002

ICS 91.100.60

English version

**Thermal insulation products for building applications -  
Determination of the tensile bond strength of the adhesive and  
of the base coat to the thermal insulation material**

Produits isolants thermiques destinés aux applications du  
bâtiment - Détermination de l'adhérence par traction de la  
colle et de la couche de base sur le matériau d'isolation  
thermique

Wärmedämmstoffe für das Bauwesen - Bestimmung der  
Haftzugfestigkeit zwischen Klebmasse/Klebemörtel und  
Wärmedämmstoff sowie zwischen Unterputz und  
Wärmedämmstoff

This European Standard was approved by CEN on 12 August 2002.

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 Management Centre 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 Management Centre has the same status as the official versions.

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



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## **Foreword**

This document (EN 13494:2002) has been prepared by Technical Committee CEN /TC 88, "Thermal insulating materials and 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of an identical text or by endorsement, at the latest by April 2003, and conflicting national standards shall be withdrawn at the latest by April 2003.

This European Standard is one of a series of standards which specify test methods for determining dimensions and properties of thermal insulating materials and products. It supports a series of product standards for thermal insulating materials and products which derive from the Council Directive of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products (Directive 89/106/EEC) through the consideration of the essential requirements.

This European Standard has been drafted for applications in buildings but may also be used in other areas where it is relevant.

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

## EN 13494:2002 (E)

### 1 Scope

This European Standard specifies equipment and procedures for determining the tensile bond strength of the adhesive and of the base coat to the thermal insulation material.

### 2 Normative references

This European Standard incorporates, by dated or undated reference, 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 823, *Thermal insulating products for building applications — Determination of thickness*.

EN 1015-1, *Methods of test for mortar for masonry — Part 1: Determination of particle size distribution (by sieve analysis)*.

EN 1602, *Thermal insulating products for building applications — Determination of the apparent density*.

EN 1607, *Thermal insulating products for building applications — Determination of tensile strength perpendicular to faces*.

prEN ISO 3251, *Paints and varnishes and plastics — Determination of non-volatile matter content (ISO/DIS 3251:2000)*.

prEN ISO 9229:1997, *Thermal insulation — Definitions of terms (ISO 9229:1997)*.

prEN 13499:1999, *Thermal insulation products for buildings — External Thermal Insulation Composite Systems (ETICS) based on expanded polystyrene — Specification*.

EN ISO 3451-1, *Plastics — Determination of ash — Part 1: General methods (ISO 3451-1:1997)*.

### 3 Terms and definitions, symbols and units

#### 3.1 Terms and definitions

For the purposes of this European Standard the terms and definitions given in prEN ISO 9229:1997 and prEN 13499:1999 apply.

#### 3.2 Symbols and units

Symbols used in this standard:

$\sigma$  is the tensile bond strength, kPa;

$F$  is the tensile load at failure, kN;

$A$  is the cross-sectional area of the plate, m<sup>2</sup>.

## 4 Principle

The tensile bond strength of the adhesive and of the base coat to the thermal insulation material are determined by a direct load perpendicular to the surface of the adhesive or the base coat. The tensile load is applied by means of a rigid plate glued to the test area of the adhesive or base coat.

## 5 Apparatus

### 5.1 Glue

The glue shall be suitable for rough surfaces (render surface) and for timber (e.g. solvent free epoxy adhesive or polyurethane adhesive). The glue shall not damage the thermal insulation material, the base coat or the adhesive and not influence the results.

### 5.2 Rigid plates

The rigid plates (e.g. plywood of thickness 20 mm or steel plates of thickness 5 mm) shall have dimensions of  $(200 \pm 2) \text{ mm} \times (200 \pm 2) \text{ mm}$ . The mechanical stability of the rigid plates shall not influence the test results. They shall have a central fitting for the connection to the testing machine providing a self aligning attachment to avoid uneven distribution of tensile stress during the test. On the side to which the glue is to be applied, the plates shall be flat with a tolerance of  $\pm 0,5 \text{ mm}$  per 100 mm length.

### 5.3 Saw

Mechanical driven saw (e.g. circular saw or band saw) with guides for a rectangular cut. The saw shall be suitable for sawing test specimens from hardened adhesive or base coat with the reinforcement.

### 5.4 Tensile testing machine

The tensile testing machine, appropriate for the range of force and displacement involved, capable of having a constant crosshead speed adjusted to  $(10 \pm 1) \text{ mm/min}$  and suitable for testing specimens with the dimensions of  $200 \text{ mm} \times 200 \text{ mm}$ . It shall be capable of measuring the force with an error limit of at least 1 % (see EN 1607).

## 6 Test specimens

### 6.1 Preparation of the samples

The adhesive, or base coat with the reinforcement, is applied in accordance with the manufacturers instructions on to the surface of thermal insulation material having minimum dimensions of  $500 \text{ mm} \times 1000 \text{ mm} \times 60 \text{ mm}$ . The samples shall not include mechanical fixings.

### 6.2 Conditioning of the samples

The conditioning of the samples shall be carried out as specified in the relevant ETICS product standard.

NOTE In the absence of a product standard for ETICS or any other European technical specification, the conditioning procedure may be agreed between parties.

### 6.3 Preparation and number of test specimens

Cut three square shaped test specimens of dimensions  $200 \text{ mm} \times 200 \text{ mm}$  out of the samples. A minimum distance of 100 mm to the edges of the samples shall be maintained.

The thickness of the adhesive or of the base coat shall be measured visually and rounded to the nearest mm.

Apply a thin layer of glue to both surfaces of the test specimen in such a way that the glue forms a complete layer between the rigid plates and the test specimen. With slight pressure glue the rigid plate on to the test specimen

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