



## *Good Shepherd Wool Insulation*

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European Technical Approval: ETA-01/0035

EOTA: European Organisation for Technical Approval

## I LEGAL BASES AND GENERAL CONDITIONS

1. This European technical approval is issued by the Deutsches Institut für Bautechnik in accordance with:
  - Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products <sup>1</sup>, modified by the Council Directive 93/68/EEC of 22 July 1993 <sup>2</sup>;
  - *Gesetz über das Inverkehrbringen von und freien Warenverkehr mit Bauprodukten zur Umsetzung der Richtlinie 89/106/EWG des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte (Bauproduktengesetz) of 28 April 1998* <sup>3</sup>,
  - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex of Commission Decision 94/23/EC <sup>4</sup>;
2. The Deutsches Institut für Bautechnik is authorized to check whether the provisions of this European technical approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European technical approval and for their fitness for the intended use remains with the holder of the European technical approval.
3. This European technical approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European technical approval.
4. This European technical approval may be withdrawn by the Deutsches Institut für Bautechnik, in particular after information by the Commission on the basis of Article 5 (1) of Council Directive 89/106/EEC.
5. Reproduction of this European technical approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of the Deutsches Institut für Bautechnik. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European technical approval.
6. The European technical approval is issued by the approval body in its official language. This version corresponds to the version circulated within EOTA. Translations into other languages have to be designated as such.

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<sup>1</sup> Official Journal of the European Communities N° L 40, 11.02.1989, p. 12

<sup>2</sup> Official Journal of the European Communities N° L 220, 30.08.1993, p. 1

<sup>3</sup> Bundesgesetzblatt Teil I, Nr. 25, 08.05.1998, modified by the law of 15.12.2001  
Bundesgesetzblatt Teil I, Nr. 71, 21.12.2001, page 3762,

<sup>4</sup> Official Journal of the European Communities N° L 17, 20.01.1994, p.34

## II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

### 1. Definition of product and intended use

#### 1.1. Definition of product

This European technical approval applies to the thermal and/or acoustic insulating product made of unbonded sheep's wool and produced in form of mats. The insulating product consists of sheep's wool, which is mechanically hardened during manufacture. The sheep's wool is provided, within the manufacturing procedure, with an inorganic salt-based (borate) protection against fire, mould and insects.

The mats are produced in nominal thicknesses of 40 mm up to 120 mm and in nominal widths of 200 mm up to 850 mm.

The above dimensions correspond to the delivery programme of the manufacturer.

The insulating product is supplied in form of rolls. The insulating product is not faced.

#### 1.2. Intended use

The insulating product, not exposed to compression loads, can be used for the following intended uses:

##### Area of application for walls

- Insulation in cavities of external and internal walls of timber frame constructions and similar structures
- Internal insulation of walls
- Insulation in cavities of internal walls

##### Area of application for roofs and ceilings/floors

- insulation between rafters and timber beams as well as in cavities of corresponding structures
- Insulation on the uppermost storey ceilings which are not subjected to foot traffic, however, are accessible.
- Internal insulation of ceiling or roof, e.g. insulation beneath the loadbearing construction (e.g. rafters), suspended ceiling.

The product may only be used in structures where it will not be exposed to wetting or weathering.

In external walls provided to the outside with a curtain wall (ventilated façade) the product may only be used, if it is protected by a cover (e.g. made of particle boards) towards the ventilation plane. It must not be used directly behind the ventilation plane.

For use of the product for acoustic insulation (airborne sound insulation) in constructions mentioned above see sections 2.7 and 4.2.2.

Furthermore, consideration shall also be given to the relevant national provisions concerning the applicability of the insulating product.

The requirement given in this European technical approval are based on an assumed intended working life of the insulating product of 50 years. This assumption cannot be interpreted as a

manufacturer's guarantee, but are to be regarded only as a means for choosing the right product with regard to the expected economically reasonable working life of the works.

## 2. Characteristics of the product and methods of verification

### 2.1. Composition and manufacturing process

With regard to composition and manufacturing process, the insulating product shall correspond to the product subjected to the approval tests. Composition and manufacturing process are deposited with the Deutsches Institut für Bautechnik

The ETA is issued for the product on the basis of agreed data/information deposited with the Deutsches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product/production process, which could result in this deposited data/information being incorrect, shall be notified to the Deutsches Institut für Bautechnik before the changes are introduced. The Deutsches Institut für Bautechnik will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA, and if so, whether further assessment/alternations to the ETA shall be necessary.

### 2.2. Dimensions

The thickness is determined according to the standard EN 823<sup>5</sup>. The test is carried out with a load of 50 Pa.

The deviation from nominal thickness, based on the standard EN 13 162<sup>6</sup>, table 1, does not exceed: -5% or<sup>7</sup> -5 mm or +15% or<sup>8</sup> +15 mm.

The class for thickness tolerance is T2.

The length and width of the product are determined according to the standard EN 822<sup>9</sup>. The deviation from nominal length does not exceed -2%. The deviation from nominal width does not exceed  $\pm 1.5\%$ .

### 2.3. Density

The density of the product is determined according to the standard EN 1602<sup>10</sup>. The density is at least 25 kg/m<sup>3</sup> and does not exceed 70 kg/m<sup>3</sup>.

### 2.4. Water absorption

The water absorption of the product is determined according to the standard EN 1609, method A<sup>11</sup>. The mean value of water absorption at the checked density of 29 kg/m<sup>3</sup> was 1.8 kg/m<sup>2</sup>.

### 2.5. Dimensional stability under specified temperature and humidity

The dimensional stability of the product is determined according to the standard EN 1604<sup>12</sup>. The test is carried out after conditioning at a temperature of  $(70 \pm 2)^\circ\text{C}$  and  $(50 \pm 5)\%$  relative humidity

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<sup>5</sup> EN 823: 1994-07: Thermal insulating products for building applications – Determine of thickness

<sup>6</sup> EN 13 162: 2001-05: Thermal insulating products for buildings – Factory made mineral wool products - Specification

<sup>7</sup> Whichever gives the greatest numerical tolerance

<sup>8</sup> Whichever gives the smallest numerical tolerance

<sup>9</sup> EN 822: 1994-07: Thermal insulating products for building applications – Determination of length and width

<sup>10</sup> EN 1602: 1996-11: Thermal insulating products for building applications – Determination of the apparent density

<sup>11</sup> EN 1609: 1996-11: Thermal insulating products for building applications – Determination of short-term water absorption by partial immersion

for 48 h. The change of dimensions in length and width is  $\pm 1.5\%$  or less. The change of dimensions in thickness is  $\pm 2.5\%$  or less.

## 2.6. Tensile strength parallel to faces

The tensile strength is determined according to the standard EN 1608<sup>13</sup>. The tensile strength of the product is sufficient to support twice the weight of the product.

## 2.7. Airflow resistance

The airflow resistance of the product is determined according to the standard EN 29 053<sup>14</sup>, method A. The mean value of the longitudinal airflow resistance is  $3.0 \text{ kPa} \cdot \text{s/m}^2$  or more.

## 2.8. Thermal conductivity

The thermal conductivity of the product is determined, with a reference temperature of  $10^\circ\text{C}$ , according to the standard EN 12 667<sup>15</sup>. The declared value of the thermal conductivity, determined according to the standard EN ISO 10456<sup>16</sup>, for a moisture content of the product at  $23^\circ\text{C}/50\%$  relative humidity is  $\lambda = 0.039 \text{ W}/(\text{m} \cdot \text{K})$  representing at least 90% of the production with a confidence level of 90%. This declared value of the thermal conductivity applies to the density range given in section 2.3.

For conversion of humidity the following applies:

- the moisture content mass by mass at  $23^\circ\text{C}/50\%$  relative humidity:  $u = 0.096 \text{ kg/kg}$
- the moisture content mass by mass at  $23^\circ\text{C}/80\%$  relative humidity:  $u = 0.166 \text{ kg/kg}$
- the moisture content conversion coefficient mass by mass:  $f_u = 0.13$

For the admissible deviation of an individual value of the thermal conductivity from the declared value, the method described in EN 13 172<sup>17</sup>, section 7 applies.

## 2.9. Reaction to fire

The reaction to fire of the product is determined according to the standard EN ISO 11 925-2<sup>18</sup> and is classified according to the standard EN 13 501-1<sup>19</sup>. The product meets the criteria of class E according to EN 13 501-1.

## 2.10. Resistance to biological actions

### 2.10.1. Resistance to the growth of mould

The resistance to the growth of mould has been verified according to the EOTA testing procedure. The assessment of the growth of fungi according to the standard EN ISO 846<sup>20</sup>, Table 4, resulted in level 0.

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<sup>12</sup> EN 1604: 1996-11: Thermal insulating products for building applications – Determination of dimensional stability under specified temperature and humidity conditions

<sup>13</sup> EN 1608: 1996-11: Thermal insulating products for building applications – Determination of tensile strength parallel to faces

<sup>14</sup> EN 29 053: 1993-03: Acoustics – Materials for acoustical applications – Determination of airflow resistance

<sup>15</sup> EN 12 667: 2001-01: Thermal performance of building materials and products – Determination of thermal resistance by means of guarded hot plate and heat flow meter methods – Products of high and medium thermal resistance

<sup>16</sup> EN ISO 10 456: 1999-12: Building materials and products – Procedures for determining declared and design thermal values

<sup>17</sup> EN 13 172: 2001-05: Thermal insulation products – Evaluation of conformity

<sup>18</sup> EN ISO 11 925-2: 2002 – 02: Reaction to fire tests for building products – Part 2: Ignitability when subjected to direct impingement of flame

<sup>19</sup> EN 13 501-1: 2002-06: Fire classification of construction products and building elements. Part 1: Classification using test data from reaction to fire tests

<sup>20</sup> EN ISO 846: 1997-06: Plastics – Evaluation of the action of microorganisms

### **2.10.2. Resistance to the attack of vermins**

The resistance to the attack of vermins has been assessed on the basis of the short-term test according to the standard ISO 3998<sup>21</sup> and the long-term test (EOTA testing procedure).

The lethal rate and the mean loss in weight after testing according to ISO 3998 are:

- Clothes moth 15%, 18.9 mg
- Carpet beetle 10%, 7.2 mg

No new generation of insects could develop with the long-term test according to EOTA testing procedure.

The insulating product is sufficiently resistant to vermins.

### **2.11. Corrosion developing capacity on metal construction products**

No performance determined.

### **2.12. Retention of additives**

The verification of retention of additives according to the EOTA testing procedure was passed.

### **2.13. Dangerous substances**

In addition to the specific clauses relating to dangerous substances contained in this European Technical Approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

## **3. Evaluation of conformity and CE marking**

### **3.1. Attestation of conformity system**

System 3 according to the Council Directive 89/106/EEC Annex III.2.(ii), second possibility:

- a) Tasks for the manufacturer: factory production control,
- b) Tasks for the approved body: initial type-testing of the product

### **3.2. Responsibilities**

#### **3.2.1. Tasks for the manufacturer; factory production control**

The manufacturer shall have a factory production control system in his plant and shall exercise regular internal control of production.

All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures. The factory production control system ensures that the product is in conformity with this European technical support.

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<sup>21</sup> ISO 3998: 1977-07: Textiles – Determination of resistance to certain insect pests

In the framework of the factory production control the manufacturer shall carry out tests and controls in accordance with the control plan <sup>22</sup>.

Details of the extent, nature and frequency of testing and controls to be performed within the factory production control shall correspond to the control plan <sup>22</sup> which is part of the technical documentation of this European technical approval.

The results of factory production control are recorded and evaluated. The records include at least the following information:

- designation of the product and of the base materials,
- type of control or testing
- date of manufacture of the products and date of testing of the products or base materials or components,
- result of control and testing and, if appropriate, comparison with the requirements,
- signature of person responsible for factory production control.

On request the records shall be presented to the Deutsches Institut für Bautechnik.

### **3.2.2. Tasks for the approved body**

#### **3.2.2.1 Initial type-testing of the products**

For initial type-testing the results of the tests performed as part of the assessment for the European technical approval shall be used unless there are changes in the production line or plant. In such cases the necessary initial type-testing has to be agreed between the Deutsches Institut für Bautechnik and the approved bodies involved.

### **3.3 CE marking**

The CE marking shall be affixed on the products, the packaging or the attached label. The symbol "CE" shall be accompanied by the following information:

- Name, address and identifying mark of manufacturer and manufacturing plant,
- The last two digits of the year in which the CE marking was affixed,
- Number of the European technical approval,
- Identification of the product (trade name),
- Nominal dimensions of length, width and thickness,
- Class for thickness tolerances
- Range of density
- Declared value of thermal conductivity,
- Declared value of thermal resistance <sup>23</sup>
- Conversion factor for the moisture content mass by mass
- Reaction to fire (Euroclass) <sup>24</sup>
- Water absorption
- Dimensional stability under specified temperature and humidity conditions
- Airflow resistance

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<sup>22</sup> The control plan has been deposited at the Deutsches Institut für Bautechnik and is handed over only to the approved bodies involved in the conformity attestation procedure.

<sup>23</sup> The declared value of thermal resistance shall be calculated from the nominal thickness and the corresponding declared value of thermal conductivity

<sup>24</sup> European classification of reaction to fire of building materials according to the Commission Decision 2000/147/EC of 8 February 2000 implementing Article 10 of Directive 89/106/EEC on construction products

## **4. Assumptions under which the fitness of the product for the intended use was favorably assessed**

### **4.1 Manufacturing**

With regard to composition and manufacturing process, the insulating product shall correspond to the product subjected to the approval tests. Composition and manufacturing process are deposited with the Deutsches Institut für Bautechnik.

### **4.2 Installation**

The insulating product shall be installed by adequately trained personnel taking account of the installation instructions of the manufacturer.

#### **4.2.1 Parameters for the design of construction works or parts thereof**

##### **4.2.1.1 Design value of thermal conductivity**

The design value of thermal conductivity shall be defined in accordance with the relevant national provisions.

##### **4.2.1.2 Nominal thickness**

The nominal thickness of the insulating product shall be used for calculating the thermal resistance.

##### **4.2.1.3 Value of water vapour diffusion resistance**

For determination of the diffusion equivalent thickness of the air layer of the insulating product the water vapour diffusion resistance factor  $\mu = 1$  or  $2$  respectively <sup>25</sup> shall be used.

#### **4.2.2 Use of product for airborne sound insulation**

When the insulating product is used for airborne sound insulation (cavity damping), the airborne sound insulation shall be determined in accordance with the relevant technical rules in force for the construction work concerned.

## **5. Recommendations for the manufacturer**

### **5.1 Recommendations on packaging, transport and storage**

Packaging of the product has to be such that it is protected from moisture during transport and storage unless other measures are foreseen by the manufacturer for this purpose.

### **5.2 Recommendations on installation**

The product has to be protected from moisture during installation. The insulating product must be subjected to compression.

### **5.3 Accompanying information**

In the information accompanying the CE marking the manufacturer shall indicate that the product has to be protected from humidity during transport, storage and installation.

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<sup>25</sup> For the construction work in question always the less favorable value shall be used