



## European Technical Approval ETA-11/0431

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung <i>Trade name</i>	OpenWall 042 OpenWall 045 OpenWall 047
Zulassungsinhaber <i>Holder of approval</i>	Alsecco (UK) Ltd. Whitebridge Way STONE, STAFFORDSHIRE ST15 8GH GROSSBRITANNIEN
Zulassungsgegenstand und Verwendungszweck <i>Generic type and use of construction product</i>	Mineralische Wärmedämmplatte  <i>Thermal insulating board made of mineral material</i>
Geltungsdauer: <i>Validity:</i>	vom <i>from</i> 20 September 2011 bis <i>to</i> 8 May 2015
Herstellwerke <i>Manufacturing plants</i>	WERK 1, Deutschland WERK 2, Deutschland WERK 3, Deutschland WERK 4, Bulgarien WERK 5, Österreich  PLANT 1, Germany PLANT 2, Germany PLANT 3, Germany PLANT 4, Bulgaria PLANT 5, Austria

Diese Zulassung umfasst  
*This Approval contains*

10 Seiten  
*10 pages*

## I LEGAL BASES AND GENERAL CONDITIONS

- 1 This European technical approval is issued by 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 Council Directive 93/68/EEC<sup>2</sup> and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council<sup>3</sup>;
  - Gesetz über das In-Verkehr-Bringen von und den 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 und anderer Rechtsakte der Europäischen Gemeinschaften (Bauproduktengesetz - BauPG) vom 28. April 1998<sup>4</sup>, as amended by law of 31 October 2006<sup>5</sup>;
  - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC<sup>6</sup>
- 2 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.
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- 6 The European technical approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

<sup>1</sup> Official Journal of the European Communities L 40, 11 February 1989, p. 12  
<sup>2</sup> Official Journal of the European Communities L 220, 30 August 1993, p. 1  
<sup>3</sup> Official Journal of the European Union L 284, 31 October 2003, p. 25  
<sup>4</sup> *Bundesgesetzblatt Teil I 1998*, p. 812  
<sup>5</sup> *Bundesgesetzblatt Teil I 2006*, p. 2407, 2416  
<sup>6</sup> Official Journal of the European Communities L 17, 20 January 1994, p. 34

## II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

### 1 Definition of the product and intended use

#### 1.1 Definition of the construction product

This European technical approval applies to the thermal insulating boards made of mineral material with the designations "OpenWall 042", "OpenWall 045" and "OpenWall 047".

The thermal insulating boards are manufactured of quartz powder, calcium hydrate, cement and aggregates by adding of aluminium as a pore forming agent and are high-pressure steam cured (autoclaved).

The thermal insulating boards are produced of different compositions and densities. Depending on composition and density the boards have a compressive strength of at least 200 kPa in conjunction with a declared value of thermal conductivity of  $\lambda = 0.040 \text{ W/(m}\cdot\text{K)}$ , a compressive strength of at least 300 kPa in conjunction with a declared value of thermal conductivity of  $\lambda = 0.043 \text{ W/(m}\cdot\text{K)}$  or a compressive strength of at least 350 kPa in conjunction with a declared value of thermal conductivity of  $\lambda = 0.045 \text{ W/(m}\cdot\text{K)}$ .

The surface of the thermal insulating boards can also be provided in the factory with a priming coat on both sides.

The boards are made with the following dimensions:

Nominal thicknesses: 40 mm to 300 mm

Nominal lengths: 350 mm to 1000 mm

Nominal widths: 200 mm to 750 mm

The thermal insulating boards can show a gradient of up to 9° in longitudinal direction.

The information concerning the dimensions corresponds to the manufacturer's delivery program.

#### 1.2 Intended use

The thermal insulating boards can be used for the following intended uses:

Area of application for walls

- External insulation of walls
- Internal insulation of walls (including added facing shells without substructure)
- Insulation of cavity walls (two-leaf walls), core insulation
- Cavity insulation in walls, insulation of timber frame and wood panel construction

Area of application for pitched roofs/flat roofs

- External insulation of the roof below the roofing and below waterproofing
- Insulation between rafters

Area of application for floors/ceilings

- Internal insulation of ceilings (e.g. ceiling insulation in cellars and underground parking garages)
- Internal insulation of floors or bedplates (on the top) below screeds

The thermal insulating boards shall only be installed in structures where they are protected from precipitation and weathering as well as from contact with water.

This European technical approval does not cover the use of the thermal insulating boards in thermal insulation systems. In this regard separate European technical approvals are necessary for certain intended uses (e.g. in the case of a use in external thermal insulation composite systems).

As to the application of the insulation product, the respective national regulations shall be additionally observed.

The provisions made in this European technical approval are based on an assumed working life of the thermal insulating boards of 50 years, provided that the conditions laid down in sections 4.2, 5.1 and 5.2 for the packaging, transport, storage, installation and use are met. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

## 2 Characteristics of the product and methods of verification

### 2.1 Composition and production methods

With regard to composition and production method the thermal insulating boards shall correspond to those which were the basis for the approval tests. The composition (separated for the products with different values concerning compressive strength and thermal conductivity) and the production method are deposited with Deutsches Institut für Bautechnik. See also clause 4.1.

### 2.2 Dimensions

The thickness is determined according to the standard EN 823:1994-07. The test is performed with a load of 250 Pa. No test result (individual value) deviates from the nominal thickness by more than  $\pm 2$  mm.

Length and width of the thermal insulating boards are determined according to the standard EN 822:1994-07. The deviations (individual values) in the direction of length and width do not amount to more than  $\pm 2$  mm.

The squareness is determined according to the standard EN 824:1994-07. The deviation from the squareness in the direction of length and width for each individual value does not amount to more than 4 mm/m.

The flatness is determined according to the standard EN 825:1994-07. The deviation from the flatness does not exceed the value of 2 mm.

### 2.3 Density

The density of the thermal insulating boards is determined according to the standard EN 1602:1906-11. Each individual value of the density (dry<sup>7</sup>) shall be within the following areas:

OpenWall 042:

at least 85 kg/m<sup>3</sup> and not exceeding 95 kg/m<sup>3</sup>

OpenWall 045 and OpenWall 047:

at least 100 kg/m<sup>3</sup> and not exceeding 115 kg/m<sup>3</sup>

### 2.4 Water vapour diffusion

The water vapour diffusion resistance coefficient, determined according to the standard EN 12086:1997-06, climatic condition A, amounts to  $\mu = 2$  for the product "OpenWall 042" and  $\mu = 3$  for the products "OpenWall 045" and "OpenWall 047". Before testing, the samples shall be stored to constant mass at 23 °C/50 % relative humidity.

<sup>7</sup>

Drying temperature 105 °C to constant mass

## 2.5 Water absorption

- 2.5.1 The short term water absorption by partial immersion is determined according to the standard EN 1609:1996 + A1:2006, method B. No value amounts to more than 2.0 kg/m<sup>2</sup>. Before testing, the samples shall be dried to constant mass at 40 °C.
- 2.5.2 The determination of the long term water absorption by partial immersion is performed according to the standard EN 12087:1997 + A1:2006, method 1B. No value amounts to more than 3.0 kg/m<sup>2</sup>. Before testing, the samples shall be dried to constant mass at 40 °C.

## 2.6 Thermal conductivity

The thermal conductivity of the thermal insulating boards at dry state<sup>8</sup> is determined with a reference temperature of 10 °C according to EN 12667:2001-01. The effect of humidity on thermal conductivity is determined by measuring the thermal conductivity after storing the insulating boards at 23 °C and 50 % relative humidity and at 23 °C and 80 % relative humidity.

The declared values of thermal conductivity, determined according to the standard EN ISO 10456:2007-12 for a moisture content of the insulating boards at 23 °C/50 % relative humidity, amount to:

OpenWall 042:	$\lambda = 0.040 \text{ W/(m}\cdot\text{K)}$
OpenWall 045:	$\lambda = 0.043 \text{ W/(m}\cdot\text{K)}$
OpenWall 047:	$\lambda = 0.045 \text{ W/(m}\cdot\text{K)}$

The declared values are based on a limit value, which must not be exceeded during production (category 2). The limit value of the thermal conductivity at dry state amounts to:

OpenWall 042:	$\lambda_{10,\text{dry}} = 0.0392 \text{ W/(m}\cdot\text{K)}$
OpenWall 045:	$\lambda_{10,\text{dry}} = 0.0420 \text{ W/(m}\cdot\text{K)}$
OpenWall 047:	$\lambda_{10,\text{dry}} = 0.0438 \text{ W/(m}\cdot\text{K)}$

The declared values of the thermal conductivity apply to the density range given in section 2.3.

For conversion of humidity the following applies:

- the moisture content mass by mass at 23 °C/50 % relative humidity:  $u = 0.028 \text{ kg/kg}$
- the moisture content mass by mass at 23 °C/80 % relative humidity:  $u = 0.032 \text{ kg/kg}$
- the moisture conversion coefficient mass by mass (23/50 → 23/80):  $f_u = 1.98$
- the moisture conversion coefficient mass by mass (dry → 23/50):  $f_u = 0.42$
- the moisture conversion coefficient mass by mass (dry → 23/80):  $f_u = 0.96$

## 2.7 Compressive strength

The compressive strength of the thermal insulating boards is determined according to the standard EN 826:1996-05.

The mean value of the compressive strength amounts to at least:

OpenWall 042:	200 kPa
OpenWall 045:	300 kPa
OpenWall 047:	350 kPa

Individual values may fall below these values up to 10 %.

Before testing, the samples shall be dried to constant mass at 40 °C.

<sup>8</sup> Drying temperature for determination of  $\lambda_{10,\text{dry}}$ : 70 °C to constant mass

## 2.8 Dimensional stability

2.8.1 The dimensional stability of the thermal insulating boards at specified temperature is determined according to the standard EN 1604:1996 + A1:2006. The test is performed after a 48 h storage at  $(70 \pm 2)$  °C.

The dimensional changes in the direction of lengths, widths and thicknesses amount to a maximum of  $\pm 0.5$  %.

2.8.2 The determination of the dimensional stability under specified temperature and humidity conditions is performed according to the standard EN 1604 after a 48 h storage at  $(23 \pm 2)$  °C and  $(90 \pm 5)$  % relative humidity.

The dimensional changes in the direction of lengths, widths and thicknesses amount to a maximum of  $\pm 0.5$  %.

## 2.9 Tensile strength perpendicular to faces

The tensile strength perpendicular to faces of the boards is determined according to the standard EN 1607:1996-11.

The minimum value of the tensile strength (individual value) for the products "OpenWall 045" and "OpenWall 047" amounts to 80 kPa.

Before testing, the samples shall be dried to constant mass at 40 °C.

No performance was determined for the product "OpenWall 042".

## 2.10 Bending strength

The bending strength of the thermal insulating boards is determined according to the standard EN 12089:1997-06, method B.

The minimum value of the bending strength (individual value) for the products "OpenWall 045" and "OpenWall 047" amounts to 80 kPa.

Before testing, the samples shall be dried to constant mass at 40 °C.

No performance was determined for the product "OpenWall 042".

## 2.11 Behaviour under point load

The deformation under a point load of 1000 N, determined according to the standard EN 12430:1998 + A1:2006, for the products "OpenWall 045" and "OpenWall 047" amounts to a maximum of 1.0 mm.

Before testing, the samples shall be dried to constant mass at 40 °C.

No performance was determined for the product "OpenWall 042".

## 2.12 Reaction to fire

The reaction to fire is tested by using the test methods relevant for the corresponding reaction to fire class and is classified according to the standard EN 13501-1:2007 + A1:2009-09. The thermal insulating boards meet the criteria of class A1 according to EN 13501-1.

## 2.13 Emission of dangerous substances or radiation

Note: 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 Construction Products Directive, these requirements need also to be complied with, when and where they apply.

## 2.14 Summary of the product types and properties

Product properties according to clause		OpenWall		
		042	045	047
Density [kg/m <sup>3</sup> ]	2.3	85 - 95	100 - 115	
Water vapour diffusion resistance coefficient $\mu$	2.4	2	3	
Water absorption [kg/m <sup>2</sup> ]	2.5.1	$\leq 2.0$		
	2.5.2	$\leq 3.0$		
Declared value of thermal conductivity [W/(m·K)]	2.6	0.040	0.043	0.045
Dimensional stability [%]	2.8.1	$\leq 0.5$		
	2.8.2	$\leq 0.5$		
Compressive strength (mean value) [kPa]	2.7	$\geq 200$	$\geq 300$	$\geq 350$
Tensile strength [kPa]	2.9	-	$\geq 80$	
Bending strength [kPa]	2.10	-	$\geq 80$	
Behaviour under point load [mm]	2.11	-	$\leq 1.0$	
Reaction to fire	2.12	A1		

## 3 Evaluation and attestation of conformity and CE marking

### 3.1 System of attestation of conformity

According to the Decision 1999/91/EC of the European Commission<sup>9</sup> amended by the Decision 2001/596/EC<sup>10</sup> system 3 of the attestation of conformity applies.

This system of attestation of conformity is defined as follows:

System 3: Declaration of conformity of the product by the manufacturer on the basis of:

- (a) Tasks for the manufacturer:
  - (1) factory production control;
- (b) Tasks for the approved body:
  - (2) initial type-testing of the product.

Note: Approved bodies are also referred to as "notified bodies".

### 3.2 Responsibilities

#### 3.2.1 Tasks for the manufacturer

##### 3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European technical approval.

The manufacturer may only use initial materials stated in the technical documentation of this European technical approval.

<sup>9</sup> Official Journal of the European Communities L 29/44 of 03.02.1999  
<sup>10</sup> Official Journal of the European Communities L 209/33 of 02.08.2001



The factory production control shall be in accordance with the control plan which is part of the technical documentation of this European technical approval. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited with Deutsches Institut für Bautechnik.<sup>11</sup>

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

#### 3.2.1.2 Other tasks for the manufacturer

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 for the construction product in order to undertake the actions laid down in section 3.2.2. For this purpose, the control plan referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body involved.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of this European technical approval.

#### 3.2.2 Tasks for the approved bodies

The approved body shall perform the

- initial type-testing of the product,

in accordance with the provisions laid down in the control plan.

The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

For initial type-testing the results of the test carried out as part of the assessment for the European technical approval shall be used, provided that nothing changes in the production or at the factory. Otherwise the necessary initial type-testing shall be agreed on between Deutsches Institut für Bautechnik and the approved body involved.

For the indication of the declared value of the thermal conductivity according to category 2 the values determined within the framework of approval testing are to be examined by means of renewed measurements of the thermal conductivity by an approved body for the extension of the period of validity of the European technical approval.

#### 3.3 CE marking

The CE marking shall be affixed on the product, on a label attached to the product, on the packaging or on the accompanying commercial documents, e.g. the EC declaration of conformity. The letters "CE" shall be accompanied by the following additional information depending on product type:

- the name and address of the producer (legal entity responsible for the manufacture),
- the last two digits of the year in which the CE marking was affixed,
- the number of the European technical approval,
- nominal dimensions of length, width and thickness,
- density range,
- water absorption (short term and long term)\*,
- water vapour diffusion resistance coefficient\*,
- compressive strength\*,
- tensile strength perpendicular to faces\*,
- dimensional stability under specified temperatures\*,
- dimensional stability under specified temperature and humidity conditions\*,

<sup>11</sup>

The control plan is a confidential part of the documentation of this European technical approval and only handed over to the approved body involved in the procedure of attestation of conformity. See section 3.2.2.



- bending strength\*,
- deformation under point load\*,
- declared value of thermal conductivity,
- conversion factor for thermal conductivity for the moisture content mass by mass at 23 °C/80 % relative humidity,
- reaction to fire: class according to EN 13501-1,
- indication of dangerous substances ,
- indication of biocidal products (Directive 98/8/EEC).

\* These characteristics can be indicated alternatively on the basis of the following designation code.

Short-term water absorption	WS2.0
Long-term water absorption	WL(P)3.0
Water vapour diffusion resistance	MU2 or MU3
Compressive strength	CS(Y)200 or CS(Y)300 or CS(Y)350
Tensile strength perpendicular to faces	TR80 or NPD
Dimensional stability under specified temperatures	DS(70,-)
Dimensional stability under specified temperature and humidity conditions	DS(23,90)
Bending strength	BS80 or NPD
Deformation under point load	PL(P)1 or NPD

**4 Assumptions under which the fitness of the product for the intended use was favourably assessed**

**4.1 Manufacturing**

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

**4.2 Installation**

The installation instructions given by the manufacturer shall be taken into account for installation of the thermal insulation boards. Where the thermal insulating boards are fixed by using adhesives and/or anchors, only such adhesions or anchors shall be used, which are suited for this purpose. The assessment of these fixing means is not part of this European technical approval. The product shall be protected from moisture during installation. The conditions according to clause 1.2 shall be observed.

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

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

The design value of thermal conductivity shall be laid down according to relevant national provisions.

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

When calculating the thermal resistance, the nominal thickness of the insulating material shall be applied.

##### **4.2.1.3 Water vapour diffusion resistance coefficient**

For the determination of the diffusion-equivalent air layer thickness of the insulating material the water vapour diffusion resistance factor  $\mu$  according to clause 2.4 shall be applied for calculating.

### **5 Indications to the manufacturer**

#### **5.1 Packaging, transport and storage**

Packaging of the product shall be performed such that the insulating material is protected from moisture during transport and storage, unless other measures are foreseen by the manufacturer for this purpose.

#### **5.2 Use, maintenance, repair**

In the information accompanying the CE marking the manufacturer shall specify that the product is to be protected from moisture during transport, storage and installation.

Uwe Bender  
Head of Department

*beglaubigt:*  
Iffländer