



## European Technical Approval ETA-11/0455

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung  
*Trade name*

thermotec BEPS-WD 100R, thermotec BEPS-WD 130R, thermotec  
BEPS-WD 70N

Zulassungsinhaber  
*Holder of approval*

Mixit Dämmstoffe GmbH  
Galgenau 19  
4212 Neumarkt i. M.  
ÖSTERREICH

Zulassungsgegenstand  
und Verwendungszweck  
*Generic type and use  
of construction product*

Wärmedämmstoff aus Polystyrolschaum-Granulat und Compound  
*Thermal insulation material made of polystyrene foam granulate and  
compound*

Geltungsdauer:  
*Validity:* vom  
*from*  
bis  
*to*

24 November 2011  
24 November 2016

Herstellwerk  
*Manufacturing plant*

Werk 1 - Uplengen-Remels  
DEUTSCHLAND  
Werk 2 - Möllenhagen  
DEUTSCHLAND  
Werk 3 - Backnang  
DEUTSCHLAND  
Werk 4 - Neumarkt i. M.  
ÖSTERREICH

Diese Zulassung umfasst  
*This Approval contains*

8 Seiten  
*8 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 products and intended use

#### 1.1 Definition of the construction products

This European technical approval applies to the thermal insulation materials made of polystyrene foam granulate and a mixture of binding agent (compound) with the designations "thermotec BEPS-WD 70N", "thermotec BEPS-WD 100R" and "thermotec BEPS-WD 130R".

New expanded polystyrene is used for manufacturing the thermal insulation material "thermotec BEPS-WD 70N", kibbled packaging material of expanded polystyrene is used for manufacturing the thermal insulation materials "thermotec BEPS-WD 100R" and "thermotec BEPS-WD 130R".

The particle size of the polystyrene foam granulate amounts to approx. 4 mm for "thermotec BEPS-WD 70N" and not more than 7 mm for "thermotec BEPS-WD 100R" and "thermotec BEPS-WD 130R".

The thermal insulation materials are produced in the plant as dry mixture (from polystyrene foam granulate and mixture of binding agent) and filled in bags (approx. 100 litre or approx. 200 litre capacity) or delivered in a mobile mixer. The dry mixture is placed in the construction work on site under addition of water with an earth-moist consistency.

#### 1.2 Intended use

The thermal insulation materials serve for the production of insulation layers for floors and roofs by processing at the place of use.

The nominal thickness of the insulation layer produced using the thermal insulation materials shall be at least 40 mm and shall not exceed 120 mm at built-in state.

The thermal insulation materials may only be installed in structures where they are protected from wetting, weathering and moisture.

With regard to the application of the thermal insulation materials, the respective national regulations shall be observed in addition.

The provisions made in this European technical approval are based on an assumed working life of the thermal insulation products of 50 years, provided that the conditions laid down in sections 4.2, 5.1 and 5.2 for 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 products and methods of verification

Unless otherwise described, the characteristics of product stated in the following apply to the final product. For this purpose the tests are performed on adequate samples which have been produced from the dry mixture under addition of water.

## 2.1 Composition and production methods

With regard to composition and production method the thermal insulation materials (dry mixture) shall correspond to those which were the basis for the approval tests. Composition and production methods are deposited with Deutsches Institut für Bautechnik. See also clause 4.1.

## 2.2 Compressive stress at 10 % deformation

The compressive stress at 10 % deformation, determined according to EN 826:1996-05, is at least 70 kPa for "thermotec BEPS-WD 70N" and "thermotec BEPS-WD 130R" and at least 50 kPa for "thermotec BEPS-WD 100R".

## 2.3 Particle size and particle size distribution

The particle size distribution of the polystyrene foam granulate is determined according to EN 933-1:1997+A1:2005 and shall correspond to the distribution determined within the approval tests.

## 2.4 Bulk density of the dry mixture

The bulk density of the dry mixture, determined according to EN 1097-3:1998-04 using a measuring vessel with a volume of 5 liter, meets the following areas:

"thermotec BEPS-WD 70N": at least 65 kg/m<sup>3</sup> and not more than 80 kg/m<sup>3</sup>

"thermotec BEPS-WD 100R": at least 70 kg/m<sup>3</sup> and not more than 90 kg/m<sup>3</sup>

"thermotec BEPS-WD 130R": at least 100 kg/m<sup>3</sup> and not more than 120 kg/m<sup>3</sup>

## 2.5 Density

### 2.5.1 Density of the thermal insulation material

The density of the thermal insulation material (individual value), determined according to EN 1602:1996-11 meets the following areas:

"thermotec BEPS-WD 70N": at least 80 kg/m<sup>3</sup> and not more than 95 kg/m<sup>3</sup>

"thermotec BEPS-WD 100R": at least 100 kg/m<sup>3</sup> and not more than 120 kg/m<sup>3</sup>

"thermotec BEPS-WD 130R": at least 130 kg/m<sup>3</sup> and not more than 160 kg/m<sup>3</sup>

### 2.5.2 Density of the fresh mortar

The density of the fresh mortar determined according to EN 1015-6:1998+A1:2006 using a measuring vessel with a volume of 10 liter meets the following areas:

"thermotec BEPS-WD 70N": at least 85 kg/m<sup>3</sup> and not more than 100 kg/m<sup>3</sup>

"thermotec BEPS-WD 100R": at least 120 kg/m<sup>3</sup> and not more than 145 kg/m<sup>3</sup>

"thermotec BEPS-WD 130R": at least 150 kg/m<sup>3</sup> and not more than 180 kg/m<sup>3</sup>

## 2.6 Thermal conductivity

The thermal conductivity of the insulation material is determined at a reference temperature of 10° C according to EN 12667:2001-01. The declared value of thermal conductivity, determined according to the standard EN ISO 10456:2007+AC:2009 for a moisture content of the insulation material at 23 °C/50 % relative air humidity, amounts to:

for "thermotec BEPS-WD 70N":  $\lambda_D = 0.043 \text{ W/(m} \cdot \text{K)}$

for "thermotec BEPS-WD 100R":  $\lambda_D = 0.047 \text{ W/(m} \cdot \text{K)}$

for "thermotec BEPS-WD 130R":  $\lambda_D = 0.050 \text{ W/(m} \cdot \text{K)}$

The declared value of thermal conductivity is based on a limit value, which must not be exceeded during production (category 2) and applies to the density range given in clause 2.5.1. The limit value of thermal conductivity under dry conditions amounts to:

for "thermotec BEPS-WD 70N":  $\lambda_{10,dry} = 0.0425 \text{ W/(m} \cdot \text{K)}$

for "thermotec BEPS-WD 100R":  $\lambda_{10,dry} = 0.0465 \text{ W/(m} \cdot \text{K)}$

for "thermotec BEPS-WD 130R":  $\lambda_{10,dry} = 0.0495 \text{ W/(m} \cdot \text{K)}$

Concerning conversion for the humidity the values given in Table 1 apply.

Table 1

	"thermotec BEPS-WD 70N"	"thermotec BEPS-WD 100R" and "thermotec BEPS-WD 130R"
mass-related moisture content at 23°C/50 % relative air humidity $u_{(23/50)}$ [kg/kg]	0.02	0.03
mass-related moisture content at 23°C/80 % relative air humidity $u_{(23/80)}$ [kg/kg]	0.05	0.06
mass-related moisture conversion coefficient $f_{u1 (dry - 23/50)}$	0.50	0.33
mass-related moisture conversion coefficient $f_{u2 (23/50 - 23/80)}$	1.63	1.94
moisture conversion factor $Fm_{(dry - 23/50)}$	1.01	1.01
moisture conversion factor $Fm_{(23/50 - 23/80)}$	1.05	1.06

## 2.7 Deformation under specified load and temperature

The deformation of the thermal insulation materials under specified load and temperature is determined according to EN 1605:1996 +A1:2006 (test condition 1: 20 kPa, 80 °C, 48 h). The change of relative deformation amounts to 5 % at the most.

## 2.8 Reaction to fire

The reaction to fire of the thermal insulation material is tested according to the standard EN ISO 11925-2:2010-11 and classified according to the standard EN 13501-1:2007+A1:2009. The thermal insulation materials meet the requirements of class E according to EN 13501-1.

## 2.9 Moisture absorption

The moisture absorption (desorption) of the thermal insulation material "thermotec BEPS-WD 70N", tested according to the standard EN ISO 12571:2000-03, does not exceed 3.5 % by mass at 23 °C/50 % relative air humidity and 5 % by mass at 23 °C/80 % relative air humidity.

The moisture absorption (desorption) of the thermal insulation materials "thermotec BEPS-WD 100R" and "thermotec BEPS-WD 130R", tested according to the standard EN ISO 12571:2000-03, does not exceed 4 % by mass at 23 °C/50 % relative air humidity and 6 % by mass at 23 °C/80 % relative air humidity.

## 2.10 Water vapour diffusion

The water vapour diffusion resistance coefficient of the thermal insulation materials, determined according to the standard EN 12086:1997-06, climatic condition A, amounts to  $\mu = 5$  for "thermotec BEPS-WD 70N" and "thermotec BEPS-WD 100R" and  $\mu = 6$  for "thermotec BEPS-WD 130R". Before testing, the samples shall be stored at 23 °C/50 % relative humidity until mass is constant.

## 2.11 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.

## 3 Evaluation and attestation of conformity and CE marking

### 3.1 System of attestation of conformity

According to the communication of the European Commission<sup>7</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.

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>8</sup>

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

<sup>7</sup> Letter of the European Commission of 23 June 2006 to EOTA

<sup>8</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.

#### 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.

#### 3.3 CE marking

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

- 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,
- identification of the product (trade name),
- installation thickness: 40 mm to 120 mm,
- filling weight,
- declared value of thermal conductivity,
- reaction to fire: class E according to EN 13501-1.

#### 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.

The manufacturer shall ensure that the polystyrene foam granulate is only made from initial materials which do not contain impurities.

## 4.2 Installation

### 4.2.1 Installation conditions

The thermal insulation materials may only be installed in structures where they are protected from wetting, weathering and moisture.

When installed the installation instructions, to be given by the manufacturer, shall be taken into account.

When processing thermal insulation material delivered in bags the whole volume of the package delivered and marked according to clause 3.3 shall be mixed with the batching water on site (no partial quantities shall be processed).

The density of the fresh mortar according to clause 2.5.2 shall be observed during installation. The executing company has to check the density.

The amounts of water to be added are:

for "thermotec BEPS-WD 70N": 2.2 to 2.8 litre per 100 litre dry mixture

for "thermotec BEPS-WD 100R": 4.5 to 5.0 litre per 100 litre dry mixture

for "thermotec BEPS-WD 130R": 5.0 to 5.5 litre per 100 litre dry mixture

For the subsequent works after installing the insulation layer the time limits to be given by the manufacturer shall be observed.

The conditions according to clause 1.2 shall be taken into account.

### 4.2.2 Installation thickness and nominal thickness

The nominal thickness of the insulation layer produced using the thermal insulation material shall be at least 40 mm and shall not exceed 120 mm at built-in state.

The installation thickness shall correspond at each point to at least the nominal thickness but shall not exceed 120 mm.

The executing company shall check the installation thickness.

### 4.2.3 Parameters for the design of construction works or parts of construction works

#### 4.2.3.1 Thermal conductivity and thermal resistance

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

#### 4.2.3.2 Water vapour diffusion resistance coefficient

For the determination of the diffusion-equivalent air layer thickness of the thermal insulation layer the water vapour diffusion resistance coefficient  $\mu = 5$  for "thermotec BEPS-WD 70N" and "thermotec BEPS-WD 100R" and  $\mu = 6$  for "thermotec BEPS-WD 130R" shall be applied for calculating.

## 5 Indications to the manufacturer

### 5.1 Packaging, transport and storage

Packaging, transport and storage shall be performed such that the construction product is protected from moisture.

### 5.2 Use, maintenance, repair

In the information accompanying the CE marking the manufacturer shall specify that the product shall be installed following the installation instructions given by the manufacturer and that it shall be protected from moisture during transport and storage.