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## European Technical Assessment

**ETA 16/0803  
of 05/01/2017**

### General Part

#### **Technical Assessment Body issuing the ETA:**

Centre of Building Construction Engineering, Joint Stock Company

#### **Trade name of the construction product**

Thermal and acoustic insulation based on natural fibers - KOBE ECO HEMP FLEX

#### **Product family to which the construction product belongs**

Product area code: 04  
Thermal insulation products; Composite insulating kits/systems

#### **Manufacturer**

KOBE-cz s.r.o.  
Znojemská 1002  
691 23 Pohořelice  
Czech Republic  
www.kobe-cz.eu

#### **Manufacturing plant(s)**

KOBE-cz s.r.o.  
U Sladovny 430  
671 25 Hodonice  
Czech Republic

#### **This European Technical Assessment contains**

9 pages

#### **This European Technical Assessment is issued in accordance with regulation (EU) No. 305/2011, on the basis of**

European Assessment Document (EAD)  
040005-00-1201 - Factory-made thermal and/or acoustic insulation products made of vegetable or animal fibres, June 2015

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## 1 Technical description of the product

### 1.1 Definition of the construction product

Thermal and acoustic insulation based on natural fibers - KOBE ECO HEMP FLEX with density of  $35 \pm 5 \text{ kg/m}^3$  is made of natural hemp fibers which are blended with bicomponent connective fibers. The products are manufactured in the form of boards or rolls of the following sizes:

#### **KOBE ECO HEMP FLEX**

Thickness:	5 - 240 mm
Length:	500 - 10 000 mm
Width:	350 - 2 600 mm
Density:	$35 \pm 5 \text{ kg/m}^3$

Standard dimensions of the product

Boards:	1 200 x 580 mm
	1 200 x 600 mm
	1 200 x 625 mm
	or according to the customer's requirement
Rolls:	2 - 20 m
	or according to the customer's requirement

Composition of product KOBE ECO HEMP FLEX is 82-85 % hemp fiber, 10-15 % bicomponent fiber BICO, 3-5 % soda ash fire protection. The resulting reaction to fire classification is listed in chapter 3.2.1. The product is treated with the spray as protection against mould.

### 1.2 Manufacturing

The European Technical Assessment is issued on the basis of approved tests, calculations and assessments, archived at the Centre of Civil Engineering, Inc. Prague. These documents unequivocally identify authenticated product. Changes in production process or material that could affect the properties of the product must be reported to the Centre of Civil Engineering, Inc. Prague before the changes are introduced. The Civil Engineering Centre, Inc. Prague will decide whether the announced changes will or will not affect the properties of the product specified in the ETA, and whether it will require further evaluation for the proposed changes.

## **2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)**

### **2.1 Intended use**

The product is determined for use in buildings as insulation of walls, ceilings, floors, roofs, between rafters and wooden beams.

Assessment of this insulation product applies only to product with use in construction sites that is not exposed to rainfall, moisture or weathering, and in structural members without contact with water or soil, or in buildings where there is no exceedance of critical moisture content.

Products must be installed in accordance with the manufacturer's instructions.

The application of this insulation product must comply with national regulations.

### **2.2 General assumptions**

Release of dangerous substances for the given product was not determined. If necessary, the additional assessment will be carried out according to the national and European regulations.

Developing the capacities of corrosion of the given product was not determined. In case of contact with the metal parts of the structure, necessary measures to prevent corrosion will be carried out.

Improvement of the impact transmission loss was not determined. In case of use of the product together with this requirement, the calculations according to the relevant national, technical regulations will be carried out.

The manufacturer shall ensure suitable packaging, storage, transportation, maintenance, replacement and repair to the given product. The manufacturer has the responsibility to take appropriate action to the given product as regards the information about the storage, maintenance, replacement and repair of the product, which he considers necessary and that he provided to their clients.

### 3 Performance of the product and referenced to the methods used for its assessment

#### 3.1 General

Verification and evaluation of the suitability of the product „Thermal and acoustic insulation based on natural fibers - KOBE ECO HEMP FLEX“ for the intended use was made according to the essential requirements in accordance with EAD 040005-00-1201 „Factory-made thermal and/or acoustic insulation products made of vegetable or animal fibres“, June 2015.

Tale 1 - Essential characteristics and performance

<b>Product-type:</b> Thermal and acoustic insulating products		<b>Intended use:</b> Buildings
<b>Basic Requirement for construction work</b>	<b>Essential characteristics</b>	<b>Performance</b>
<b>BWR 2</b> Safety in case of fire	Reaction to fire	Clause 3.2.1
<b>BWR 3</b> Hygiene, health and the environmental	Biological resistance (Growth of mould fungus)	Clause 3.3.1
<b>BWR 4</b> Safety and accessibility in use	Corrosion developing capacity	No performance assessed
<b>BWR 5</b> Protection against noise	Specific airflow resistivity	Clause 3.5.1
	Dynamic stiffness	No performance assessed
	Impact sound reduction	No performance assessed
	Compressibility	No performance assessed
	Sound absorption	Clause 3.5.5
<b>BWR 6</b> Energy economy and heat retention	Thermal conductivity	Clause 3.6.1
	Water vapour diffusion resistance *)	Clause 3.6.2
	Water absorption	Clause 3.6.3
	Geometry *)	Clause 3.6.4
	Density *)	Clause 3.6.5
	Flatness after one-sided wetting	No performance assessed
	Compressive stress or strength *)	No performance assessed
	Dimensional stability under specified temperature and humidity *)	Clause 3.6.8
	Deformation under specified compressive load and temperature conditions *)	Clause 3.6.9
	Tensile strength parallel *)	Clause 3.6.10
	Tensile strength perpendicular to faces *)	Clause 3.6.11
	Tensile strength perpendicular to faces in wet conditions	Clause 3.6.12
	Compressive creep *)	No performance assessed
	Behaviour under point load *)	No performance assessed
Shear strength and shear modulus of elasticity	No performance assessed	

Note: \*) This characteristics also relates to BWR 5.

### 3.2 Safety in case of fire (BWR 2)

#### 3.2.1 Reaction to fire

Class of reaction to fire of the product is classified according to EN 13501-1+A1.

Product	Class according to EN 13501-1+A1
Thermal and acoustic insulation based on natural fibers - KOBE ECO HEMP FLEX	D-s1, d0
<b>Area of application</b> The classification is valid for the following parameters of product: - Thickness $\geq$ 50 mm This classification is valid for the following conditions of end use of the product: - Use in conjunction with material based on timber or any materials with class A1 or A2-s1, d0.	

### 3.3 Hygiene, health and the environment (BWR 3)

#### 3.3.1 Biological resistance (Growth of mould fungus)

Biological resistance against the fungal growth was verified according to the testing method ÖNORM B 6010 „Insulation materials for thermal and/or sound insulation in the buildings – Test methods“, EAD 040005-00-1201, annex B and standard norm EN ISO 846.

No intensity of fungal growth occurs on the given product.

Resistance to insect attack was not verified. The product does not content any animal fibers.

### 3.4 Safety and accessibility in use (BWR 4)

#### 3.4.1 Corrosion developing capacity

No performance assessed.

### 3.5 Protection against noise (BWR 5)

#### 3.5.1 Specify airflow resistivity

Resistance against airflow is determined according to EN 29053, method A. The resistivity of the air (art. 2.3 EN 29053) is  $\leq 1$  kPa.s/m<sup>2</sup> (The value is equal to 0,32 kPa.s/m<sup>2</sup>).

#### 3.5.2 Dynamic stiffness

No performance assessed.

#### 3.5.3 Impact sound reduction

No performance assessed.

#### 3.5.4 Compressibility

No performance assessed.

### 3.5.5 Sound absorption

Measurement of the sound absorption coefficient according to EN ISO 354 and EN ISO 11654. Thickness of the product 100 mm.

Sound absorption coefficient  $\alpha_s$  and practice sound absorption coefficient  $\alpha_p$ :

frequency	$\alpha_s$ [-]	$\alpha_p$ [-]
125 Hz	0,40	0,35
250 Hz	0,65	0,60
500 Hz	0,82	0,80
1000 Hz	0,81	0,85
2000 Hz	0,89	0,90
4000 Hz	1,03	1,00

Weighted sound absorption coefficient  $\alpha_w = 0,85$  (H). Class sound absorption B.

## 3.6 Energy economy and heat retention (BWR 6)

### 3.6.1 Thermal conductivity

Thermal conductivity is determined according to EN 12667. Declared thermal conductivity values are determined according to EN ISO 10456.

Mean value of thermal conductivity coefficient  $\lambda_{10,dry}$

$$\lambda_{10,dry,mean} = 0,0417 \text{ W/(m.K)}$$

Average value of thermal conductivity coefficient  $\lambda_{23,50}$  a  $\lambda_{23,80}$

$$\lambda_{23,50} = 0,0427 \text{ W/(m.K)}$$

$$\lambda_{23,80} = 0,0503 \text{ W/(m.K)}$$

Determination of thermal conductivity coefficient  $\lambda_{10,dry,90/90}$

$$\lambda_{10,dry,90/90} = 0,0432 \text{ W/(m.K)}$$

Declared values of thermal conductivity coefficient  $\lambda_D$

*Category 1* (comes from  $\lambda_{10,dry,90/90}$ )

$$\lambda_{10,dry,90/90} = 0,0432 \text{ W/(m.K)}$$

$$\lambda_{D,(23,50)} = 0,0442 = 0,045 \text{ W/(m.K)}$$

*Category 2* (comes from  $\lambda_{10,dry,limit}$ )

$$\lambda_{10,dry,limit} = 0,0427 \text{ W/(m.K)} - \text{maximum value from } \lambda_{10,dry}$$

$$\lambda_{D,(23,50)} = 0,0437 = 0,044 \text{ W/(m.K)}$$

Average value of moisture content

$$u_{23,50} = 0,055 \text{ kg/kg}$$

$$u_{23,80} = 0,141 \text{ kg/kg}$$

Determination of transitive coefficient

$$f_{u,1} = 0,4238$$

$$f_{u,2} = 1,8906$$

### 3.6.2 Water vapour diffusion resistance

Water vapour diffusion resistance according to EN 12086 of the product is  $\mu = 2,3$ .

### 3.6.3 Water absorption

Water absorption of the product is determined according to EN 1609, method A. Short-term water absorption by partial immersion  $W_p$  is determined  $\leq 2 \text{ kg/m}^2$  (Average value is equal to  $1,51 \text{ kg/m}^2$ ).

### 3.6.4 Geometry

Determination of the thickness is according to EN 823. According to EN 13171+A1 is for tolerant thickness reached level with labeling T3.

Determination of the length of the product is according to EN 822. Deviation from the nominal values does not exceed  $\pm 2\%$ , according to EN 13171+A1.

Determination of the width of the product is according to EN 822. Deviation from the nominal values does not exceed  $\pm 1,5\%$ , according to EN 13171+A1.

### 3.6.5 Density

Density is determined according to EN 1602. The mean is equal to  $32,0 \pm 0,4 \text{ kg/m}^3$ .

### 3.6.6 Flatness after one-sided wetting

No performance assessed.

### 3.6.7 Compressive stress

No performance assessed.

### 3.6.8 Dimensional stability under specified temperature and humidity

Dimensional stability under specified temperature and humidity conditions is determined according to EN 1604.

Exposure: 48 hours at the temperature of  $(70 \pm 2)^{\circ}\text{C}$  and relative humidity of  $(90 \pm 5)\%$ .

Reached class according to EN 13171+A1 for the length is DS(70,90)1.

Reached class according to EN 13171+A1 for the width is DS(70,90)1.

Reached class according to EN 13171+A1 for the thickness is DS(70,90)3.

### 3.6.9 Deformation under specified compressive load and temperature conditions

Determination of deformation after loading with pressure and temperature is according to EN 1605.

Set parameter:                    relative deformation after the level A  $\varepsilon$  [%]  
    Total relative deformation after the level B  $\varepsilon_2$  [%].

Average value for  $\varepsilon = 68,5\%$  and for  $\varepsilon_2 = 69,0\%$ .

### 3.6.10 Tensile strength parallel

Determination of the tensile strength in the plane of the board  $\sigma_t$  is according to EN 1608. The product has at the thickness of 50 mm average value of 10,1 kPa and at the thickness of 200 mm value of 10,2 kPa. For the purpose of manipulation, according to EN 1608 the product must have tensile strength in the panel of the board 10 kPa.

### 3.6.11 Tensile strength perpendicular to faces

Determination of the tensile strength perpendicular to the surface  $\sigma_{mt}$  according to EN 1607.

Reached level of tensile strength perpendicular to the surface according to EN 13171+A1 is CL1 at request of  $\geq 1,0 \text{ kPa}$  (average value 2,3 kPa).

3.6.12 Tensile strength perpendicular to faces in wet conditions

Tensile strength perpendicular to faces in wet conditions, also in the chapter 3.6.11.

At the temperature of  $(70 \pm 2)^\circ\text{C}$  and relative humidity of  $(95 \pm 5)\%$ :

Series 1: for 7 days followed by a drying period at the temperature of  $(23 \pm 2)^\circ\text{C}$  and relative humidity of  $(50 \pm 5)\%$  until constant weight is achieved.

Series 2: for 28 days followed by a drying period at the temperature of  $(23 \pm 2)^\circ\text{C}$  and relative humidity of  $(50 \pm 5)\%$  until constant weight is achieved.

Average value for the set 1 is equal to 1,8 kPa and for the set 2 is equal to 1,5 kPa.

3.6.13 Compressive creep

No performance assessed.

3.6.14 Behaviour under point load

No performance assessed.

3.6.15 Shear strength and shear modulus of elasticity

No performance assessed.



**4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base**

In accordance with Decision 1999/91/EC<sup>1</sup> European committee amended by Commission Decision 2001/596/EC<sup>2</sup> from 08. 01. 2001 the system is used for assessment and verification of constancy (see Annex V of Regulation (EU) no. 305/2011 and Commission Regulation delegated Regulation (EU) no. 568/2014) set forth below.

With regard to the result of reaction to fire classification in chapter 3.2.1 the system 3 is mentioned.

System 3:

- a) The manufacturer shall carry out factory production control,
- b) The notified laboratory shall assess the performance on the basis of testing (based on sampling carried out by the manufacturer), calculation, tabulated values or descriptive documentation of the construction products.

**5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD**

The manufacturer must establish and maintain a factory production control system which ensures that the product is in conformity with the European Technical Assessment.

All documents, procedures and records are systematically documented and kept in written form.

The procedures to be implemented within the production control system are set out in the Control Plan for manufacturers, stored in the Civil Engineering Centre Inc. Prague and transmitted to the manufacturer of the given product.

For any discrepancies and deficiencies in the test results, the manufacturer shall provide corrective measures to eliminate them.

The product that is not in accordance with the requirements specified in this European technical assessment must not be CE marked. If all the criteria of assessment are fulfilled, the manufacturer must issue a declaration of performance.

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By

On behalf Centre of Building Construction Engineering, Joint Stock Company  
(CSI a.s. Prague)

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<sup>1</sup> Official Journal of the European Union (OJEU) L 29, of 03.02.1999, p.44-48

<sup>2</sup> Official Journal of the European Union (OJEU) L 209, of 02.08.2001, p.33-42