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## European Technical Assessment

**ETA-06/0281  
of 08/08/2016**

### General Part

<b>Technical Assessment Body issuing the European Technical Assessment</b>	Instytut Techniki Budowlanej
<b>Trade name of the construction product</b>	AVAL ROKER
<b>Product family to which the construction product belongs</b>	External Thermal Insulation Composite System with rendering (ETICS)
<b>Manufacturer</b>	ATLAS spółka z o.o. ul. Świętej Teresy 105 PL 91-222 Łódź, Poland
<b>Manufacturing plant</b>	ATLAS spółka z o.o. ul. Świętej Teresy 105 PL 91-222 Łódź, Poland
<b>This European Technical Assessment contains</b>	15 pages including 2 Annexes which form an integral part of this Assessment
<b>This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of</b>	Guideline for European Technical Approval ETAG 004, Edition 2013 "External Thermal Insulation Composite Systems with rendering", used as European Assessment Document (EAD)
<b>This version replaces</b>	ETA-06/0281 issued on 27/07/2011

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## Specific Part

### 1 Technical description of the product

External Thermal Insulation Composite System AVAL ROKER called ETICS in the following text is a kit designed and installed in accordance with the manufacturer design and installation instructions deposited with the Instytut Techniki Budowlanej.

The ETICS comprises the following components, which are factory-produced by the manufacturer or component suppliers. ETICS is made up on site from these components. The ETICS manufacturer is ultimately responsible for ETICS.

The ETICS comprises a prefabricated insulation product made of mineral wool (MW) to be bonded onto a wall. The methods of fixing and the relevant components are specified in the table below. The insulation product is faced with a rendering system consisting of one or more layers (site applied), one of which contains reinforcing mesh. The rendering is applied directly to the insulation panels, without any air gap or disconnecting layer.

The ETICS also includes ancillary materials which are defined in clause 3.2.2.5 of ETAG 004. They shall be used in accordance with the manufacturer's instruction.

**Table 1**

	<b>Components</b>	<b>Coverage (kg/m<sup>2</sup>)</b>	<b>Thickness (mm)</b>
<b>Insulation material with associated methods of fixing</b>	<b>Bonded ETICS:</b> fully bonded or fully bonded with supplementary mechanical fixings (bonded surface shall be 100%). National application documents shall be taken into account.		
	<ul style="list-style-type: none"> <li>• <b>Insulation product:</b> Mineral wool (MW) lamella according to EN 13162; see Annex 1 for product characteristics</li> </ul>	-	≤ 250
	<ul style="list-style-type: none"> <li>• <b>Adhesive:</b> <b>AVAL KT 190</b> cement based powder requiring addition of 0,20 to 0,25 l/kg of water composition: sand, cement, mineral fillers, synthetic resin, additives</li> </ul>	4,5 to 5,5 <sup>1</sup> (powder)	-
	<b>Mechanically fixed ETICS with supplementary adhesive:</b> according to manufacturer's recommendation the minimal bonded surface shall be 40% of the surface. National application documents shall be taken into account.		
	<ul style="list-style-type: none"> <li>• <b>Insulation product:</b> Mineral wool (MW) panels according to EN 13162; see Annex 1 for product characteristics</li> </ul>	-	50 to 250
	<ul style="list-style-type: none"> <li>• <b>Anchors:</b> see Annex 2 for product characteristics</li> </ul>	-	-
	<ul style="list-style-type: none"> <li>• <b>Supplementary adhesive:</b> see bonded ETICS</li> </ul>	-	-
<b>Base coat</b>	<ul style="list-style-type: none"> <li>• <b>AVAL KT 190</b> cement based powder requiring addition of 0,20 to 0,25 l/kg of water</li> </ul>	5,5 to 6,5 (powder)	4,0 to 5,0
<b>Glass fibre meshes</b>	<ul style="list-style-type: none"> <li>• <b>Standard and reinforced glass fibre meshes</b> see Annex 2 for product characteristics</li> </ul>	-	-

<sup>1</sup> refers to fully bonded system



Table 1

	Components	Coverage (kg/m <sup>2</sup> )	Thickness (mm)
Key coats	<ul style="list-style-type: none"> <li>• <b>AVAL KT 16</b> composition: water, styroacrylat binder, mineral fillers, additives ready to use liquid to be used with AVAL KT 137 and AVAL KT 35</li> </ul>	0,25 to 0,35	-
	<ul style="list-style-type: none"> <li>• <b>AVAL KT 15</b> composition: water, styroacrylat binder, silicone resin, additives ready to use liquid to be used with AVAL KT 72 and AVAL KT 73</li> </ul>	0,25 to 0,35	-
	<ul style="list-style-type: none"> <li>• <b>AVAL KT 76</b> composition: water, styroacrylat binder, silicone resin, mineral fillers, additives ready to use liquid to be used with AVAL KT 74, AVAL KT 75, AVAL SILICONE, AVAL SILICONE-SILICATE</li> </ul>	0,25 to 0,35	-
Finishing coats	<ul style="list-style-type: none"> <li>• <b>Mineral finishing coats</b> composition: sand, cement, mineral fillers, additives</li> </ul>		
	<b>AVAL KT 137</b> powder requiring addition of 0,18 to 0,26 l/kg of water; particle size 1,5; 2,0; 2,5; 3,0 mm; grained structure	2,5 to 4,5	regulated by particle size
	<b>AVAL KT 35</b> powder requiring addition of 0,18 to 0,26 l/kg of water; particle size 2,0; 3,0 mm; ribbed structure	2,5 to 4,5	
	<ul style="list-style-type: none"> <li>• <b>Silicone finishing coats</b> composition: water, silicone resin, sand, mineral fillers, additives ready to use paste</li> </ul>		
	<b>AVAL KT 74</b> particle size 1,5; 2,0 mm; grained structure	2,5 to 3,5	regulated by particle size
	<b>AVAL KT 75</b> particle size 2,0 mm; ribbed structure	2,5 to 3,5	
	<b>AVAL SILICONE</b> particle size 1,5; 2,0 mm; grained structure	2,5 to 3,5	
	<ul style="list-style-type: none"> <li>• <b>Silicate finishing coats</b> composition: water, acryl-copolymer binder, sand, mineral fillers, additives ready to use paste</li> </ul>		
	<b>AVAL KT 72</b> particle size 1,5; 2,0 mm; grained structure	2,5 to 3,5	regulated by particle size
	<b>AVAL KT 73</b> particle size 2,0 mm; ribbed structure	2,5 to 3,5	
<ul style="list-style-type: none"> <li>• <b>Silicone-silicate finishing coats</b> composition: water, silicate binder, silicone binder, sand, mineral fillers, additives ready to use paste</li> </ul>			
<b>AVAL SILICONE-SILICATE</b> particle size 1,5 mm; 2,0 mm; grained structure	2,5 to 3,5	regulated by particle size	
Primers	<ul style="list-style-type: none"> <li>• <b>AVAL KT 52</b> composition: water, styroacrylat binder, mineral fillers, silicone emulsion, additives ready to use liquid to be used with AVAL KT 54</li> </ul>	0,05 to 0,20	-
	<ul style="list-style-type: none"> <li>• <b>AVAL KT 47</b> composition: water, styroacrylat binder, mineral fillers, silicone emulsion, additives ready to use liquid to be used with AVAL KT 48, AVAL KT 46, AVAL SALTA N</li> </ul>	0,05 to 0,20	-

Table 1

	Components	Coverage (kg/m <sup>2</sup> )	Thickness (mm)
<b>Decorative coats</b> (paints)	<ul style="list-style-type: none"> <li>• <b>AVAL KT 54</b> to be used optionally with all finishing coats composition: silicate binder, pigments, additives ready to use liquid</li> </ul>	0,200 to 0,280*	-
	<ul style="list-style-type: none"> <li>• <b>AVAL KT 48</b> to be used optionally with all finishing coats composition: silicone resin, pigments, additives ready to use liquid</li> </ul>	0,125 to 0,250*	-
	<ul style="list-style-type: none"> <li>• <b>AVAL KT 46</b> to be used optionally with all finishing coats composition: silicone resin, pigments, additives ready to use liquid</li> </ul>	0,125 to 0,250*	-
	<ul style="list-style-type: none"> <li>• <b>AVAL SALTA N</b> to be used optionally with AVAL SILICONE, AVAL SILICONE-SILICATE, AVAL KT 137 and AVAL KT 35 composition: silicone resin, pigments, additives ready to use liquid</li> </ul>	0,125 to 0,250*	-
		0,125 to 0,250*	-
<b>Ancillary materials</b>	Remain under ETICS manufacturer responsibility. Anchors as supplementary mechanical fixings covered by ETA issued according to ETAG 014.		
* decorative coats coverage in dm <sup>3</sup> /m <sup>2</sup>			

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

This ETICS is intended to be used as external thermal insulation of buildings' walls made of masonry (bricks, blocks, stones, etc.) or concrete (cast on site or as prefabricated panels) with or without rendering.

The ETICS can be used on new or existing (retrofit) vertical walls. It can also be used on horizontal or inclined surfaces which are not exposed to precipitation.

The ETICS is made of non load-bearing construction elements. It does not contribute directly to the stability of the wall on which it is installed, but it can contribute to durability by providing enhanced protection from the effects of weathering.

The ETICS is not intended to ensure the airtightness of the building structure.

The provisions made in this European Technical Assessment are based on an assumed working life of the ETICS of at least 25 years, provided that the conditions for the packaging, transport, storage, installation as well as appropriate use, maintenance and repair are met. The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer or the Technical Assessment Body, but should only be regarded as a means for choosing the appropriate products in relation to the expected economically reasonable working life of the works.

Design, installation, maintenance and repair shall take into account principles given in clause 7 of ETAG 004 and shall be done in accordance with national provisions.

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

Performances of the ETICS related to the Basic Requirements were determined in compliance with the ETAG 004.



Performances of the ETICS as described in this clause are valid provided that the components of the kit comply with Annexes 1 + 2.

### 3.1 Safety in the case of fire (BWR 2)

#### 3.1.1 Reaction to fire (ETAG 004, clause 5.1.2.1)

Table 2

Configuration	Maximum declared organic content	Declared flame retardant content	Reaction to fire class according to EN 13501-1
ETICS AVAL ROKER with MW boards (reaction to fire class A1) and rendering system: <ul style="list-style-type: none"> <li>• Adhesive: AVAL KT 190</li> <li>• Meshes: ATLAS 150, ATLAS 165, R 117 A 101 / AKE 145 / VERTEX 145, SSA 1363-150 SM0.5</li> <li>• Base coat: AVAL KT 190</li> <li>• Finishing coats: AVAL SILICONE, AVAL SILICONE-SILICATE (with relevant key coats)</li> <li>• Decorative coats: AVAL KT 54, AVAL KT 48, AVAL KT 46, AVAL SALTA N (with primers AVAL KT 47, AVAL KT 52)</li> </ul>	$\leq 4,05\%$  $\leq 10,57\%$  $\leq 22,7\%$	0% (no flame retardant)	<b>A2 – s2, d0</b>
ETICS AVAL ROKER with MW boards (reaction to fire class A1) and rendering system: <ul style="list-style-type: none"> <li>• Adhesive: AVAL KT 190</li> <li>• Meshes: R 117 A 101 / AKE 145 / VERTEX 145, SSA 1363 SM(100)</li> <li>• Base coat: AVAL KT 190</li> <li>• Finishing coats: AVAL KT 173, AVAL KT 35, AVAL KT 72, AVAL KT 73 (with relevant key coats)</li> <li>• Decorative coats: AVAL KT 54, AVAL KT 48, AVAL KT 46 (with relevant primers)</li> </ul>	$\leq 4,05\%$  $\leq 4,9\%$  $\leq 18,6\%$	0%	<b>A2 – s2, d0</b>
ETICS AVAL ROKER with MW boards (reaction to fire class A1) and rendering system: <ul style="list-style-type: none"> <li>• Adhesive: AVAL KT 190</li> <li>• Meshes: R 117 A 101 / AKE 145 / VERTEX 145, SSA 1363 SM(100)</li> <li>• Base coat: AVAL KT 190</li> <li>• Finishing coat: AVAL KT 74, AVAL KT 75 (with relevant key coats)</li> <li>• Decorative coats: AVAL KT 48, AVAL KT 46 (with relevant primers)</li> </ul>	$\leq 4,05\%$  $\leq 8,4\%$  $\leq 18,6\%$	0%	<b>B – s1, d0</b>

*Note:* European reference fire scenario has not been laid down for facades. In some Member States the classification according to EN 13501-1 might not be sufficient for the use in facades. An additional tests might be required to comply with national provisions (e.g. large scale tests).

#### Mounting and fixing

The assessment of reaction to fire is based on: SBI tests according to EN 13823, tests according to EN ISO 11925-2 and EN ISO 1716 with maximum insulation material (MW) density of 135,0 kg/m<sup>3</sup> as well as finishing coats with maximum organic content.

For the SBI test according to EN 13823, the ETICS is mounted directly to a substrate (Class A2-s1, d0) with a thickness of 12 mm.

For the test according to EN ISO 11925-2 no substrate is used.

The installation of the ETICS was carried out by the manufacturer following the manufacturer's specifications (instruction of installation) using a single layer of the glass fibre mesh and double mesh layer all over the test specimens. The test specimens were prefabricated and did not include any joints.

Anchors were not included in the tested ETICS as they have no influence on the test results.

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

#### 3.2.1 Water absorption (ETAG 004, clause 5.1.3.1)

- Base coat AVAL KT 190:
  - water absorption after 1 hour < 1,0 kg/m<sup>2</sup>,
  - water absorption after 24 hours < 0,5 kg/m<sup>2</sup>,
- Rendering systems – according to Table 3.

**Table 3**

		Water absorption after 24 h	
		< 0,5 kg/m <sup>2</sup>	≥ 0,5 kg/m <sup>2</sup>
<b>Rendering system:</b> base coat AVAL KT 190 (with the relevant key-coat) + finishing coat indicated hereafter:	AVAL KT 137, AVAL KT 35	X	-
	AVAL KT 72, AVAL KT 73	X	-
	AVAL KT 74, AVAL KT 75	X	-
	AVAL SILICONE	X	-
	AVAL SILICONE-SILICATE	X	-

#### 3.2.2 Watertightness (ETAG 004, clause 5.1.3.2)

Passed without defects. None of the following defects occurred during testing:

- blistering or peeling of any finishing,
- failure or cracking associated with joints between insulation product boards or profiles fitted with ETICS,
- detachment of the render,
- cracking allowing water penetration to the insulation layer.

The ETICS is so assessed as resistant to hygrothermal cycles.

The water absorption of base coat and the rendering system is less than 0,5 kg/m<sup>2</sup> after 24 hours for all configurations of the ETICS, so the ETICS is assessed as freeze/thaw resistant.

#### 3.2.3 Impact resistance (ETAG 004, clause 5.1.3.3)



Table 4

Impact resistance (3J, 10J) – MW panels		
Rendering system		Single mesh layer
<b>Rendering system:</b> base coat AVAL KT 190 (with the relevant key-coat) + finishing coat indicated hereafter:	AVAL KT 137, AVAL KT 35	Category III
	AVAL KT 72, AVAL KT 73	Category I
	AVAL KT 74, AVAL KT 75	Category II
	AVAL SILICONE	Category III
	AVAL SILICONE-SILICATE	Category I

Table 5

Impact resistance (3J, 10J) – MW lamella		
Rendering system		Single mesh layer
<b>Rendering system:</b> base coat AVAL KT 190 (with the relevant key-coat) + finishing coat indicated hereafter:	AVAL KT 137, AVAL KT 35	Category III
	AVAL KT 72, AVAL KT 73	Category I
	AVAL KT 74, AVAL KT 75	Category II
	AVAL SILICONE	Category I
	AVAL SILICONE-SILICATE	Category I

3.2.4 Water vapour permeability (ETAG 004, clause 5.1.3.4)

Table 6

		Equivalent air thickness $s_d$
<b>Rendering system:</b> base coat AVAL KT 190 + finishing coat:	AVAL KT 137 AVAL KT 35	$\leq 1,0$ m AVAL KT 16 + AVAL KT 137 3,0 mm: 0,21 m AVAL KT 16 + AVAL KT 35 3,0 mm + AVAL KT 46: 0,12 m AVAL KT 16 + AVAL KT 137 3,0 mm + AVAL SALTA N: 0,24 m
	AVAL KT 72 AVAL KT 73	$\leq 1,0$ m AVAL KT 15 + AVAL KT 72 2,0 mm: 0,20 m AVAL KT 15 + AVAL KT 72 2,0 mm + AVAL SALTA N: 0,35 m



Table 6

		Equivalent air thickness $s_d$
<b>Rendering system:</b> base coat AVAL KT 190 + finishing coat:	AVAL KT 74 AVAL KT 75	$\leq 1,0$ m AVAL KT 76 + AVAL KT 74 2,0 mm: 0,75 m AVAL KT 76 + AVAL KT 74 2,0 mm + AVAL SALTA N: 0,95 m
	AVAL SILICONE	$\leq 1,0$ m AVAL KT 76 + AVAL SILICONE 2,0 mm: 0,51 m AVAL KT 76 + AVAL SILICONE 2,0 mm + AVAL SALTA N: 0,59 m AVAL KT 76 + AVAL SILICONE 2,0 mm + AVAL KT 54: 0,39 m AVAL KT 76 + AVAL SILICONE 2,0 mm + AVAL KT 48: 0,44 m AVAL KT 76 + AVAL SILICONE 2,0 mm + AVAL KT 46: 0,52 m
	AVAL SILICONE-SILICATE	$\leq 1,0$ m AVAL KT 76 + AVAL SILICONE-SILICATE 2,0 mm: 0,52 m AVAL KT 76 + AVAL SILICONE-SILICATE 2,0 mm + AVAL SALTA N: 0,62 m AVAL KT 76 + AVAL SILICONE-SILICATE 2,0 mm + AVAL KT 54: 0,59 m AVAL KT 76 + AVAL SILICONE-SILICATE 2,0 mm + AVAL KT 48: 0,66 m AVAL KT 76 + AVAL SILICONE-SILICATE 2,0 mm + AVAL KT 46: 0,57 m

### 3.2.5 Release of dangerous substances (ETAG 004 - clause 5.1.3.5, EOTA TR 034)

The written declaration on dangerous substances was submitted by the manufacturer to the Technical Assessment Body.

In addition to the specific clauses relating to dangerous substances contained in this ETA, there may be other requirements applicable to the ETICS falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Regulation (EU) No 305/2011, these requirements need also to be complied with, when and where they apply.

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

### 3.3.1 Bond strength between base coat and insulation product (ETAG 004, clause 5.1.4.1.1)

Table 7

Bond strength between base coat and insulation product (MW panels)			
Base coat	Initial state	After hygrothermal cycles (on the rig)	After freeze/thaw cycles
AVAL KT 190	< 0,08 MPa failure into MW	< 0,08 MPa failure into MW	test not required because freeze/thaw cycles not necessary

### 3.3.2 Bond strength between adhesive / substrate and adhesive / insulation product (ETAG 004, clause 5.1.4.1.2 and 5.1.4.1.3)

Table 8

Bond strength between: adhesive – substrate (concrete) and adhesive – insulation product (MW panels and MW lamella)				
Adhesive		Under dry conditions	48 h immersion in water + 2 h drying at (23±2)°C and (50±5)% RH	48 h immersion in water + 7 days drying at (23±2)°C and (50±5)% RH
AVAL KT 190	Concrete	≥ 0,25 MPa	≥ 0,08 MPa	≥ 0,25 MPa
	MW panels	< 0,08 MPa	< 0,03 MPa	< 0,08 MPa
		failure into MW		
MW lamella	≥ 0,08 MPa	≥ 0,03 MPa	≥ 0,08 MPa	

The ETICS shall be installed on the substrate with application of the adhesive on the following minimal surface:

Table 9

	Tensile strength perpendicular to the faces of MW			
	≥ 10 kPa	≥ 15 kPa	≥ 80 kPa	≥ 100 kPa
AVAL KT 190	40%	40%	100%	100%

### 3.3.3 Bond strength after ageing (ETAG 004, clause 5.1.7)

Table 10

		After hygrothermal cycles
<b>with MW panels</b>		
<b>Rendering system:</b> base coat AVAL KT 190 (with relevant key coat) + finishing coat indicated hereafter:	AVAL KT 137, AVAL KT 35	< 0,08 MPa failure into MW
	AVAL KT 72, AVAL KT 73	< 0,08 MPa failure into MW
	AVAL KT 74, AVAL KT 75	< 0,08 MPa failure into MW
<b>with MW lamella</b>		
<b>Rendering system:</b> base coat AVAL KT 190 (with relevant key coat) + finishing coat indicated hereafter:	AVAL KT 137, AVAL KT 35	≥ 0,08 MPa
	AVAL KT 72, AVAL KT 73	≥ 0,08 MPa
	AVAL KT 74, AVAL KT 75	≥ 0,08 MPa
	AVAL SILICONE	≥ 0,08 MPa
	AVAL SILICONE-SILICATE	≥ 0,08 MPa



**3.3.4 Fixing strength (ETAG 004, clause 5.1.4.2)**

Test not required because the ETICS fulfils the criteria  $E \cdot d \leq 50.000 \text{ N/mm}$ .

**3.3.5 Wind load resistance (ETAG 004, clause 5.1.4.3)**

The wind load resistance of the ETICS  $R_d$  is calculated as follow:

$$R_d = (R_{\text{panel}} \times n_{\text{panel}} + R_{\text{joint}} \times n_{\text{joint}}) / \gamma$$

where:

- $n_{\text{panel}}$ : number (per  $\text{m}^2$ ) of anchors not placed at the panel joints
- $n_{\text{joint}}$ : number (per  $\text{m}^2$ ) of anchors placed at the panel joints
- $\gamma$ : national safety factor

**Table 11**

Anchors for which the following failure loads apply	Anchors according to Annex 2			
	Plate diameter of the anchor	$\geq 60 \text{ mm}$		
Characteristics of MW panels for which the following failure loads apply	Thickness	$\geq 50 \text{ mm}$		
	Tensile strength perpendicular to the faces	$\geq 10 \text{ kPa}$		
Failure load, kN	Anchors not placed at the panel joints (pull-through test), dry conditions	$R_{\text{panel}}$	Minimum value: Average value:	<b>0,66</b> <b>0,68</b>
	Anchors not placed at the panel joints (pull-through test), wet conditions	$R_{\text{panel}}$	Minimum value: Average value:	<b>0,40</b> <b>0,42</b>
	Anchors placed at the panel joints (static foam block test)	$R_{\text{joint}}$	Minimum value: Average value:	<b>0,44</b> <b>0,48</b>

The above given loads apply for anchors according to Annex 2 and all other anchors if they meet the following criteria:

- covered by ETA according to ETAG 014,
- plate diameter  $\geq 60 \text{ mm}$ ,
- plate stiffness of anchor  $\geq 0,4 \text{ kN/mm}$ ,
- load resistance of anchor plate  $\geq 1,64 \text{ kN}$ ,
- anchors mounted on the insulation panel surface.

**3.3.6 Render strip tensile test (ETAG 004, clause 5.5.4)**

No performance assessed.

**3.4 Protection against noise (BWR 5)**

**3.4.1 Airborne sound insulation (ETAG 004, clause 5.1.5)**

No performance assessed.

**3.5 Energy economy and heat retention (BWR 6)**

**3.5.1 Thermal resistance and thermal transmittance (ETAG 004, clause 5.1.6)**

The thermal transmittance of the wall covered by the ETICS is calculated in accordance with the standard EN ISO 6946:

$$U_c = U + \chi_p \cdot n$$

where:  $\chi_p \cdot n$  has only to be taken into account if it is greater than  $0,04 \text{ W}/(\text{m}^2 \cdot \text{K})$

- U<sub>c</sub>: corrected thermal transmittance of the covered wall (W/(m<sup>2</sup>·K))
- n: number of anchors (through insulation product) per m<sup>2</sup>
- χ<sub>p</sub>: local influence of thermal bridge caused by an anchor. The values listed below can be taken into account if not specified in the anchor's ETA:
  - = 0,002 W/K for anchors with a plastic screw, stainless steel screw with a head covered by plastic material and for anchors with an air gap at the head of the screw (χ<sub>p</sub> · n negligible for n < 20)
  - = 0,004 W/K for anchors with a galvanized steel screw with the head covered by a plastic material (χ<sub>p</sub> · n negligible for n < 10)
  - = 0,008 W/K for all other anchors (worst case)
- U: thermal transmittance of the current part of the covered wall (excluding thermal bridges) (W/(m<sup>2</sup>·K)) determined as follows:

$$U = 1 : [R_i + R_{render} + R_{substrate} + R_{se} + R_{si}]$$

- where: R<sub>i</sub>: thermal resistance of the insulation product (according to declaration in reference to EN 13162) in (m<sup>2</sup>·K)/W
- R<sub>render</sub>: thermal resistance of the render (about 0,02 in (m<sup>2</sup>·K)/W or determined by test according to EN 12667 or EN 12664)
- R<sub>substrate</sub>: thermal resistance of the substrate (e.g. concrete, brick) in (m<sup>2</sup>·K)/W
- R<sub>se</sub>: external superficial thermal resistance in (m<sup>2</sup>·K)/W
- R<sub>si</sub>: internal superficial thermal resistance in (m<sup>2</sup>·K)/W

The value of thermal resistance of insulation product shall be given in the manufacturer's documentation along with the possible range of thicknesses. In addition, the point thermal conductivity of anchors shall be given when anchors are used in the ETICS.

### 3.6 Sustainable use of natural resources (BWR 7)

No performance assessed.

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

According to Decision 97/556/EC of the European Commission amended by the Decision 2001/596/EC, the systems of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table apply.

**Table 12**

Product	Intended use	Level or class (Reaction to fire)	System
External thermal insulation composite systems/kits (ETICS) with rendering	in external wall subject to fire regulations	A1 <sup>(1)</sup> , A2 <sup>(1)</sup> , B <sup>(1)</sup> , C <sup>(1)</sup>	1
		A1 <sup>(2)</sup> , A2 <sup>(2)</sup> , B <sup>(2)</sup> , C <sup>(2)</sup> , D, E, (A1 to E) <sup>(3)</sup> , F	2+
	in external wall not subject to fire regulations	any	2+

<sup>(1)</sup> Products/materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material)

<sup>(2)</sup> Products/materials not covered by footnote <sup>(1)</sup>

<sup>(3)</sup> Products/materials that do not require to be tested for reaction to fire (e.g. products/materials of Class A1 according to Commission Decision 96/603/EC)

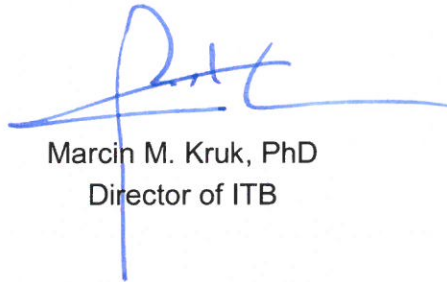


**5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document (EAD)**

Technical details necessary for the implementation of the AVCP system are laid down in the control plan which is deposited at Instytut Techniki Budowlanej.

For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

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Marcin M. Kruk, PhD  
Director of ITB

<b>Factory-prefabricated mineral wool (MW) panels and lamella according to EN 13162</b>		
<b>Description and characteristics</b>	<b>MW lamella</b>	<b>MW panels</b>
<b>Reaction to fire</b> EN 13501-1	Class A1	
<b>Thermal resistance (m<sup>2</sup>·K)/W</b>	Defined in the CE marking in reference to EN 13162	
<b>Thickness</b> EN 823	MW-EN 13162 – T5	
<b>Dimensional stability under specified temperature and humidity</b> EN 1604	MW-EN 13162 – DS(TH)	
<b>Short-term water absorption (partial immersion)</b> EN 1609	MW-EN 13162 – WS	
<b>Long-term water absorption (partial immersion)</b> EN 12087	MW-EN 13162 – WL(P)	
<b>Water vapour diffusion resistance factor (μ)</b> EN 12086	1	
<b>Tensile strength perpendicular to the faces in dry conditions</b> EN 1607	MW-EN 13162 – TR80 MW-EN 13162 – TR100	MW-EN 13162 – TR10 MW-EN 13162 – TR15
<b>Tensile strength perpendicular to the faces in wet conditions (kPa)</b> ETAG 004, clause 5.2.4.1.2	≥ 40 (TR80) ≥ 50 (TR100)	≥ 5,0 (TR10) ≥ 7,5 (TR15)
<b>Shear strength (MPa)</b> EN 12090	≥ 0,02	-
<b>Shear modulus (MPa)</b> EN 12090	≥ 1,0	-

<b>AVAL ROKER</b>	<b>Annex 1</b> of European Technical Assessment ETA-06/0281
Thermal insulation products characteristic	



**Anchors**

Anchor trade name	Plate diameter (mm)	Description of the anchor and characteristics resistance in the substrate
WKEȦ-MET ŁMXφ10 and ŁTXφ10	≥ 60	ETA-08/0172
KOELNER TFIX-8M	≥ 60	ETA-07/0336
KOELNER TFIX-8S and TFIX-8ST	≥ 60	ETA-11/0144
KOELNER KI-10, KI-10PA and KI-10M	≥ 60	ETA-07/0291
KOELNER KI-10 N and KI-10NS	≥ 60	ETA-07/0221
ejothem STR U and SDK-U	≥ 60	ETA-04/0023
ejothem NT U and NK U	≥ 60	ETA-05/0009
ejothem SDM-T plus U, SDF-K plus and SDF-S plus	≥ 60	ETA-04/0064
Hilti SD-FV	≥ 60	ETA-03/0028
Fisher TERMOZ 8N and 8NZ	≥ 60	ETA-03/0019
Fisher TERMOZ PN8	≥ 60	ETA-09/0171
BRAVOLL PTH-S 60/8-La	≥ 60	ETA-08/0267
BRAVOLL PTH-SL 60/8-La	≥ 60	ETA-08/0267

Additionally, every anchor meeting the following criteria can be used:

- ETA according to ETAG 014,
- plate diameter ≥ 60 mm,
- plate stiffness ≥ 0,4 kN/mm,
- load resistance of the plate ≥ 1,64 kN.

**Glass fibre meshes**

Standard mesh trade name	Description	Alkalis resistance	
		Residual resistance after ageing, N/mm	Relative residual resistance, (after ageing) of the strength in the as delivered state, %
R 117 A 101 / AKE 145 / VERTEX 145	mass per unit area: 145 g/m <sup>2</sup> mesh size: 4,0 x 4,5 mm	≥ 20	≥ 50
SSA 1363 SM(100)	mass per unit area: 145 g/m <sup>2</sup> mesh size: 3,5 x 3,5 mm	≥ 20	≥ 50
SSA 1363-150 SM0.5	mass per unit area: 150 g/m <sup>2</sup> mesh size: 3,6 x 4,3 mm	≥ 20	≥ 50
ATLAS 150	mass per unit area: 150 g/m <sup>2</sup> mesh size: 4,5 x 5,0 mm	≥ 20	≥ 50
ATLAS 165	mass per unit area: 160 g/m <sup>2</sup> mesh size: 3,7 x 3,9 mm	≥ 20	≥ 50

**AVAL ROKER**

Anchors characteristic.  
Glass fibre meshes characteristic

**Annex 2**

of European  
Technical Assessment  
ETA-06/0281

