

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

ETA-06/0152  
of 13 January 2016

English translation prepared by DIBt - Original version in German language

### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

"RELIUS WDV-System V 710-V 810"

Product family  
to which the construction product belongs

Product area code: 4  
External Thermal Insulation Composite System with  
rendering on mineral wool for the use as external  
insulation of building walls

Manufacturer

RELIUS Farbenwerke GmbH  
Heimertinger Straße 10  
87700 Memmingen  
DEUTSCHLAND

Manufacturing plant

RELIUS Farbenwerke GmbH  
Heimertinger Straße 10  
87700 Memmingen  
DEUTSCHLAND

This European Technical Assessment  
contains

16 pages including 3 annexes which form an integral part  
of this assessment

Annex 4 Control Plan contains confidential information  
and is not included in the European Technical  
Assessment when that assessment is publicly available

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

Guideline for European technical approval of "External  
Thermal Insulation Composite Systems with Rendering",  
ETAG 004, edition 2000, amended 2013,  
used as European Assessment Document (EAD)  
according to Article 66 Paragraph 3 of Regulation (EU)  
No 305/2011.

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## SPECIFIC PART

### 1 Technical description of the product

#### 1.1 Definition of the kit

This product is an ETICS (External Thermal Insulation Composite System) with rendering - a kit comprising components which are factory-produced by the manufacturer or component suppliers. It's made up on site from these. The ETICS manufacturer is ultimately responsible for all components of the ETICS specified in this ETA.

The ETICS kit comprises a prefabricated insulation product of mineral wool (MW) to be bonded and if it necessary additional mechanically fixed 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 reinforcement. The rendering is applied directly to the insulating panels, without any air gap or disconnecting layer.

The ETICS may include special fittings (e.g. base profiles, corner profiles ...) for connection to adjacent building elements (apertures, corners, parapets...). Assessment and performance of these components is not addressed in this ETA, however the ETICS manufacturer is responsible for adequate compatibility and performance within the ETICS when the components are delivered as a part of the kit.

#### 1.2 Composition of the ETICS

	<b>Components</b> National application documents shall be taken into account	<b>Coverage</b> [kg/m <sup>2</sup> ]	<b>Thickness</b> [mm]
<b>Insulation material with associated method of fixing</b>	<b>Bonded ETICS:</b> <ul style="list-style-type: none"> <li>• Insulation product (see annex 1 for product characteristics) factory-prefabricated mineral wool (MW) product <ul style="list-style-type: none"> <li>- MW lamella</li> </ul> </li> <li>• <b>Adhesives</b> (coated lamella: minimum bonded surface 50 %; uncoated lamella: minimum bonded surface 100 %) <ul style="list-style-type: none"> <li>- <b>RELIUS WDV S Kleber PHS</b> (cement based powder requiring addition of about 25 % of water)</li> <li>- <b>RELIUS K.A.m</b> (cement based powder requiring addition of about 25 % of water)</li> </ul> </li> </ul>	-	≤ 200
	<b>Mechanically fixed ETICS with anchors and supplementary adhesive:</b> <ul style="list-style-type: none"> <li>• <b>Insulation product</b> factory-prefabricated mineral wool (MW) product (see annex 1 for product characteristics) <ul style="list-style-type: none"> <li>- MW panel</li> <li>- MW lamella</li> </ul> </li> <li>• <b>Supplementary adhesive</b> (equal to bonded ETICS, minimum bonded surface 40 %)</li> </ul>	ca. 4.0 (powder)	60 to 200

	<b>Components</b> National application documents shall be taken into account	<b>Coverage</b> [kg/m <sup>2</sup> ]	<b>Thickness</b> [mm]
<b>Insulation material with associated method of fixing</b>	<ul style="list-style-type: none"> <li>• <b>Anchors for insulation product</b> (see annex 2 for product characteristics) all anchors with ETA according to ETAG 014<sup>1</sup> with characteristics defined in annex 2</li> </ul>		
<b>Base coat</b>	<b>RELIUS K.A.m</b> Identical with the equally named adhesive given above.	3.5 to 12.0 (powder)	On average: 3.0 to 10.0 (dry)
<b>Glass fibre mesh</b>	<b>RELIUS Gittergewebe</b> Alkali- and slide-resistant glass fibre mesh with mass per unit area of about ca. 165 g/m <sup>2</sup> and mesh size of about ca. 4.0 mm x 4.0 mm. (see annex 3 for product characteristics)	–	–
<b>Key coat</b>	<b>RELIUS Universal Putzgrund**</b> Ready to use pigmented acrylic-resin dispersion liquids. For the compatibility with the finishing coats see below.	0.2 to 0.3 l/m <sup>2</sup>	–
<b>Finishing coat</b>	<b>To use without key coat**</b> <ul style="list-style-type: none"> <li>• Cement based powder requiring addition of about 27 % of water</li> </ul> <b>RELIUS Mineralputz</b> Struktur Edelputz KM <sup>*</sup> (particle size 2 – 3 and 4 mm) Struktur Rillenputz RM <sup>*</sup> (particle size 2 – 3 and 4 mm) Struktur Waschputz (particle size 0.5 and 1.5 mm)	3.0 to 4.5 3.0 to 4.5 4.0 to 11.0 (powder)	} regulated by particle size 3.0 to 8.0
	<b>To use with key coat "RELIUS Universal Putzgrund" if applicable:**</b> <ul style="list-style-type: none"> <li>• Ready to use pastes – potassium <b>RELIUS Silatputz</b> Struktur Edelputz K<sup>*</sup> (particle size 1.5 – 2 and 3 mm) Struktur Rillenputz R<sup>*</sup> (particle size 1.5 – 2 and 3 mm)</li> <li>• Ready to use pastes – silicate/acrylic-resin <b>RELIUS Silcosanputz</b> Struktur Edelputz K<sup>*</sup> (particle size 1.5 and 2 mm) Struktur Rillenputz R<sup>*</sup> (particle size 1.5 and 2 mm)</li> <li>• Thin layered cement based powder requiring addition of about 27 % of water:</li> <li>• <b>RELIUS Mineral Strukturputz</b> Struktur Edelputz KM<sup>*</sup> (particle size 2 – 3 and 4 mm) Struktur Rillenputz RM<sup>*</sup> (particle size 3 and 4 mm)</li> </ul>	2.8 to 5.0  2.0 to 3.0  3.5 to 4.5 (powder)	
<b>Ancillary material</b>	Remain under the manufacturer's responsibility		
* K / KM / R / RM indicates different structures of the finishing coats.			
** The instruction to the installer concerning the use of a key coat remains the responsibility of the ETA-holder.			

<sup>1</sup> ETAG 014

Plastic anchors for fixing of external thermal insulation composite systems with rendering

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

### **2.1 Intended use**

This ETICS is intended to be used as external insulation to the walls of buildings made of masonry (bricks, blocks, stones ...) or concrete (cast on site or as prefabricated panels) with and without rendering. The characteristics of the walls shall be verified prior to use of the ETICS, especially regarding conditions for reaction to fire classification and for fixing of the ETICS either by bonding or mechanically. It shall be designed to give the wall to which it is applied satisfactory thermal insulation.

The ETICS is non load-bearing construction element. 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 can be used on new or existing (retrofit) vertical walls.

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

The choice of the method of fixing depends on the characteristics of the substrate, which could need preparation (see clause 7.2.1 of ETAG 004) and on the national instruction.

The verifications and assessment methods on which this European Technical Assessment (hereinafter called ETA) is based lead to the assumption of a working life of the ETICS "RELIUS WDV-System V 710-V 810" of at least 25 years. The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer, but are to be regarded only as a means for choosing the right products in relation to the assumed economically reasonable working life of the works

### **2.2 Manufacturing**

The ETA is issued for the ETICS on the basis of agreed data/information, deposited with the DIBt, which identifies the ETICS that has been assessed and judged. Changes to the ETICS or the components or their production process, which could result in this deposited data/information being incorrect, should be notified to the DIBt before the changes are introduced. The DIBt 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.

### **2.3 Design and installation**

The installation instructions including special installation techniques and provisions for the qualification of the personnel are given in the manufacturer's technical documentation.

Design, installation and execution of ETICS are to be in conformity with national documents. Such documents and the level of their implementation in Member States' legislation are different. Therefore, the assessment and declaration of performance are done taking into account general assumptions introduced in the chapters 7.1 and 7.2 of ETAG 004 used as EAD, which summarize how information introduced in the ETA and related documents is intended to be used in the construction process and gives advice to all parties interested when normative documents are missing.

### **2.4 Packing, transport and storage**

The information on packaging, transport and storage is given in the manufacturer's technical documentation. It is the responsibility of the manufacturer to ensure that this information is made known to the concerned people.

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## 2.5 Use, maintenance, repair

The finishing coat shall normally be maintained in order to fully preserve the ETICS performance. Maintenance includes at least:

- visual inspection of the ETICS,
- the repairing of localised damaged areas due to accidents,
- the aspect maintenance with products adapted and compatible with the ETICS (possibly after washing or ad hoc preparation).

Only products which are compatible with the ETICS shall be used.

Necessary repairs should be performed as soon as the need has been identified.

The information on use, maintenance and repair is given in the manufacturer's technical documentation. It is the responsibility of the manufacturer to ensure that this information is made know to the concerned people.

## 3 Characteristics of products and methods of verification

### 3.0 General

The performances of the kit as described in this chapter are valid provided that the components of the kit comply with Annexes 1 to 3.

### 3.1 Mechanical resistance and stability (BWR 1)

not relevant

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

#### Reaction to fire (ETAG 004 - clause 5.1.2)

NPD (no performance determined)

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

#### 3.3.1 Water absorption (capillarity test) (ETAG 004 - clause 5.1.3.1)

- **Base coat:**
  - 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 system:**

		Water absorption after 24 hours	
		< 0.5 kg/m <sup>2</sup>	≥ 0.5 kg/m <sup>2</sup>
<b>Rendering system:</b> Base coat with finishing coat and compatible key coat indicated hereafter:	RELIUS Universal Putzgrund and RELIUS Silatputz	x	
	RELIUS Mineralputz		x
	RELIUS Universal Putzgrund and RELIUS Mineral Strukturputz	x	
	RELIUS Universal Putzgrund and RELIUS Silcosanputz	x	

#### 3.3.2 Hygrothermal behaviour (ETAG 004 - clause 5.1.3.2)

Pass (without defects)

#### Freeze/thaw behaviour

The ETICS with finishing coat "RELIUS Mineralputz" has been assessed as freeze/thaw resistant according to the simulated method.

English translation prepared by DIBt

### 3.3.3 Impact resistance (ETAG 004 - clause 5.1.3.3)

<b>Rendering system:</b> Base coat with finishing coat and compatible key coat indicated hereafter:	Single standard mesh: "RELIUS Gittergewebe"
RELIUS Universal Putzgrund and RELIUS Silatputz	Category I
RELIUS Universal Putzgrund and RELIUS Silcosanputz	Category I
RELIUS Universal Putzgrund and RELIUS Mineral Strukturputz	Category II
RELIUS Mineralputz	Category II

### 3.3.4 Water vapour permeability (ETAG 004 - clause 5.1.3.4)

<b>Rendering system:</b> Base coat with finishing coat and compatible key coat indicated hereafter:	<b>Equivalent air thickness <math>s_d</math></b>
RELIUS Universal Putzgrund + RELIUS Silcosanputz	$\leq 1.0$ m (0.3 m; corresponds to the structure KC, particle size 3 mm)
RELIUS Universal Putzgrund and RELIUS Silatputz	$\leq 1.0$ m (0.2 m; corresponds to the structure KC, particle size 3 mm)
RELIUS Universal Putzgrund + RELIUS Mineral Strukturputz	$\leq 1.0$ m (0.2 m; corresponds to the structure KC, particle size 4 mm)
RELIUS Mineralputz	$\leq 1.0$ m (0.1 m; corresponds to the structure KC, thickness 4 mm)

### 3.3.5 Release of dangerous substances (ETAG 004 - clause 5.1.3.5, EOTA TR034)

Essential characteristic	Performance
Release of dangerous substances:	no performance assessed

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

### 3.4.1 Bond strength between base coat and insulation product (MW panel) (ETAG 004 - clause 5.1.4.1.1)

Conditioning		
Initial state	After hygrothermal cycles	After freeze/thaw test
< 0.08 MPa but failure in the MW panel	< 0.08 MPa but failure in the MW panel	Test not required because freeze/thaw cycles not necessary

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**3.4.2 Bond strength between base coat and insulation product (MW lamella) (ETAG 004 - clause 5.1.4.1.1)**

Conditioning		
Initial state	After hygrothermal cycles	After freeze/thaw test
≥ 0.08 MPa	< 0.08 MPa but failure in the MW lamella	Test not required because freeze/thaw cycles not necessary

**3.4.3 Bond strength between adhesive and substrate resp. insulation product (MW panel resp. lamella) (ETAG 004 - clause 5.1.4.1.2 and 5.1.4.1.3)**

Adhesive	Substrate resp. insulation product	Conditioning		
		Initial state	2 d immersion in water and 2 h drying	2 d immersion in water and 7 d drying
RELIUS WDVS Kleber PHS	Concrete	≥ 0.25 MPa	≥ 0.08 MPa	≥ 0.25 MPa
	MW panel	< 0.08 MPa but failure in the insulation product	< 0.03 MPa but failure in the insulation product	< 0.08 MPa but failure in the insulation product
	MW lamella	< 0.08 MPa but failure in the insulation product	≥ 0.03 MPa	< 0.08 MPa but failure in the insulation product
RELIUS K.A.m	Concrete	≥ 0.25 MPa	≥ 0.08 MPa	≥ 0.25 MPa
	MW panel	< 0.08 MPa but failure in the insulation product	< 0.03 MPa but failure in the insulation product	< 0.08 MPa but failure in the insulation product
	MW lamella	≥ 0,08 MPa	≥ 0,03 MPa	≥ 0,08 MPa

Bonded surface:

With a bonded surface of 50 % the formula given in clause 6.1.4.1.3 of ETAG 004 is fulfilled and the use as bonded ETICS is possible.

**3.4.4 Bond strength after ageing (ETAG 004 - clause 5.1.7.1)**

<b>Rendering system:</b> Base coat with finishing coat and compatible key coat indicated hereafter	RELIUS Universal Putzgrund and RELIUS Silatputz	< 0.08 MPa but failure in the insulation product
	RELIUS Universal Putzgrund and RELIUS Silcosanputz	
	RELIUS Universal Putzgrund and RELIUS Mineral Strukturputz	
	RELIUS Mineralputz	

**3.4.5 Fixing strength (displacement test) (ETAG 004 - clause 5.1.4.2)**

Test not required, therefore no limitation of ETICS length required.



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### 3.4.6 Wind load resistance (ETAG 004 - clause 5.1.4.3)

The following failure loads only apply to the listed combination and the characteristics of the insulation product given in annex 1.

Safety in use of mechanically fixed ETICS using anchors

Failure loads - Table 1

Apply to all anchors listed in the clause 1.2 mounted on the insulation panels surface			
Characteristics of the <b>MW panels</b>	Thickness		≥ 60 mm
	<b>Tensile strength perpendicular to the faces</b>		≥ 14 kPa
Plate diameter of anchor			≥ Ø 60 mm
Failure loads [N]	Anchors not placed at the panel joints (Static Foam Block Test)	$R_{panel}$	Minimal: 650 Average: 740
	Anchors placed at the panel joints (Static Foam Block Test)	$R_{joint}$	Minimal: 590 Average: 610
	Anchors not placed at the panel joints (Pull-through test, dry conditions)	$R_{panel}$	Minimal: 640 Average: 690
	Anchors not placed at the panel joints (Pull-through test, wet conditions) - series 2* - series 3*	$R_{panel}$	Minimal: 360 Average: 390 Minimal: 410 Average: 450
* according to ETAG 004 clause 5.2.4.1.2 test method (2)			

Failure loads - Table 2

apply to anchor ejothem STR U with deep mounting				
Characteristics of the <b>MW panels</b>	Thickness		≥ 80 mm	≥ 100 mm
	Depth of die**		≤ 5 mm	≤ 20 mm
	<b>Tensile strength perpendicular to the faces</b>		≥ 14.0 kPa	
Plate diameter of anchor			≥ Ø 60 mm	
Failure loads [N]	Anchors not placed at the panel joints (Static Foam Block Test)	$R_{panel}$	Minimal: 430 Average: 480	
	Anchors placed at the panel joints (Pull-through test, dry conditions)	$R_{joint}$	Minimal: 410 Average: 430	
	Anchors not placed at the panel joints (Pull-through test, wet conditions) - series 2* - series 3*	$R_{joint}$	Minimal: 230 Average: 240 Minimal: 260 Average: 280	
* according to ETAG 004 clause 5.2.4.1.2 test method (2)				
** for the definition of "die" see Annex 2 of ETA-04/0023, validity from 16.06.2013				

Failure loads - Table 3

apply to all anchors listed in the clause 1.2 mounted on the insulation panels surface				
Characteristics of the MW panels		Thickness	≥ 80 mm	
		Tensile strength perpendicular to the faces	≥ 5,0 kPa	
Plate diameter of anchor			≥ Ø 90 mm	≥ Ø 140 mm
Failure loads [N]	Anchors not placed at the panel joints (Static Foam Block Test)	$R_{panel}$	Minimal: 480 Average: 490	Minimal: 560 Average: 690
	Anchors placed at the panel joints (Static Foam Block Test)	$R_{joint}$	Minimal: 380 Average: 390	Minimal: 440 Average: 540
	Anchors not placed at the panel joints (Pull-through test, dry conditions)	$R_{panel}$	Minimal: 540 Average: 610	npd
	Anchors not placed at the panel joints (Pull-through test, wet conditions) - series 2*	$R_{panel}$	Minimal: 400 Average: 460	npd
* according to ETAG 004 clause 5.2.4.1.2 test method (2)				

Failure loads - Table 4

Apply to all anchors listed in the clause 1.1 mounted on the insulation panels surface				
Characteristics of the MW lamella		Thickness	≥ 60 mm	
		Tensile strength perpendicular to the faces	≥ 80 kPa	
Plate diameter of anchor			≥ Ø 140 mm	
Failure loads [N]	Anchors placed at the panel joints (Pull-through test, dry conditions)	$R_{joint}$	Minimal: 620 Average: 660	
	Anchors placed at the panel joints (Pull-through test, wet conditions)	$R_{joint}$	Minimal: 510 Average: 570	
	Anchors placed at the panel joints (Static Foam Block Test)	$R_{joint}$	Minimal: 710	

The failure loads in the Table 2 apply to the following anchors with deep mounting but only on the following conditions of installation:

Dübel	Thickness of the MW panel [d]	Conditions of installation*
ejotherm STR U (ETA-04/0023)	100 mm > d ≥ 80 mm	<ul style="list-style-type: none"> <li>Maximum installation depth of the anchor plate: 15 mm (≙ thickness of insulation cover)</li> <li>Maximum depth of die: 5 mm</li> </ul>
	≥ 100 mm	<ul style="list-style-type: none"> <li>Maximum installation depth of the anchor plate: 15 mm (≙ thickness of insulation cover)</li> <li>Maximum depth of die: 20 mm</li> </ul>
* according to the appropriate ETA of anchor		

### 3.4.7 Render strip tensile test (ETAG 004 – clause 5.5.4.1)

The average value of crack width of the base coat reinforced with the glass fibre mesh "RELIUS Gittergewebe" measured at a render strain value of 1 % is about 0.15 mm.

### 3.5 Protection against noise (BWR 5)

NPD (no performance determined)

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

#### 3.6.1 Thermal resistance

The nominal value of the additional thermal resistance  $R$  provided by the ETICS to the substrate wall is calculated in accordance with EN ISO 6946:2007 from the nominal value of the insulation product's thermal resistance  $R_D$  given accompanied to the CE marking and from the thermal resistance of the rendering system  $R_{render}$  which is about  $0.02 \text{ (m}^2 \cdot \text{K)/W}$ .

$$R = R_D + R_{render}$$

The thermal bridges caused by anchors increase the thermal transmittance  $U$ . This influence had to take into account according to EN ISO 6946:2007.

$$U_c = U + \Delta U_{Dübel} \quad \text{corrected thermal transmittance [W/(m}^2 \cdot \text{K)]}$$

$$\Delta U_{Dübel} = \chi_p \cdot n \quad \text{correction term for anchors}$$

where:  $n$  number of anchors per  $\text{m}^2$

$\chi_p$  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:

$\chi_p = 0,004 \text{ W/K}$  for anchors with stainless steel screw covered by plastic anchors with an air gap at the head of the screw

$\chi_p = 0,002 \text{ W/K}$  for anchors with a galvanized steel screw with the head covered by a plastic material, and for anchors with an air gap at the head of the screw

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

For the sustainable use of natural resources no performance was investigated for this product.

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

According to the European Commission decision 97/556/EC amended by the European Commission decision 2001/596/EC, the assessment and verification of constancy of performance system (AVCP) applies suitable following table (see Annex V to Regulation (EU) No 305/2011).

Product	Intended use	Levels or classes (Reaction to fire)	Systems
"RELIUS WDV-System V 710-V 810"	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 (1) <sup>(3)</sup> Products/materials that do not require to be tested for reaction to fire (e.g. products/materials of Classes A1 according to Commission Decision 96/603/EC)			

Considering the Class F for reaction to fire of the ETICS, the system of attestation of conformity is system 2+.

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**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 deposited at Deutsches Institut für Bautechnik.

Issued in Berlin on 13 January 2016 by Deutsches Institut für Bautechnik

Uwe Bender  
Head of Department

*beglaubigt:*  
Windhorst

**European Technical Assessment**  
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**Annexes:**

- Annex 1: Thermal insulation product characteristic
- Annex 2: Anchors
- Annex 3: Reinforcement

**Annex 1: Thermal insulation product characteristic**

Factory-prefabricated panels and lamella made of mineral wool (MW) to EN 13162:2015 with the following designation code and the other properties having the description in the Table below shall be used, provided that the manufacturer and the trade name of the MW are deposited with the DIBt.

MW – EN 13162 – T5 – DS(T+) – WS – WL(P) – MU1

Description and characteristics	MW panel	MW panel	MW lamella
Reaction to fire; EN 13501-1:2007	Class A1		
Thermal resistance [(m <sup>2</sup> · K)/W]	Defined in the CE marking in reference to EN 13162:2015		
Tensile strength perpendicular to the faces [kPa]; EN 1607:1997			
- in dry conditions*	$\sigma_{mt} \geq 14$	$\sigma_{mt} \geq 5$	$\sigma_{mt} \geq 80$
- in wet conditions** Average value	$\geq 33\%$ of average value in dry conditions $\geq 50\%$ of average value in dry conditions		
- series 2			
- series 3			
Compressive strength* [kPa]; EN 826:1996	$\sigma_m \geq 40$	$\sigma_m \geq 4$	$\sigma_m \geq 40$
Apparent density [kg/m <sup>3</sup> ]; EN 1602:1996	$120 \leq \rho_a \leq 150$	$100 \leq \rho_a \leq 150$	$80 \leq \rho_a \leq 150$
Shear strength* [kPa]; EN 12090:1997	$20 \leq f_{tk} \leq 100$	$6 \leq f_{tk} \leq 100$	$20 \leq f_{tk} \leq 100$
Shear modulus [MPa]; EN 12090:1997	$1.0 \leq G_m \leq 2.0$	$0.3 \leq G_m \leq 2.0$	$1.0 \leq G_m \leq 2.0$
* Minimal value of all single values			
** According to ETAG 004 clause 5.2.4.1.2 test method (2)			

## Annex 2: Anchors

All anchors with ETA according to ETAG 014<sup>1</sup> with characteristics having the description below shall be used in the mechanically fixed ETICS:

- plate diameter of anchor  $\geq 60$  mm resp.  $\geq 90$  mm or  $\geq 140$  mm
- plate stiffness  $\geq 0.3$  kN/mm
- load resistance of the anchor plate  $\geq 1.0$  kN

These characteristics and the characteristic tension resistance of the anchors shall be taken from the corresponding ETA.

**Annex 4: Reinforcement (glass fibre mesh)**

Characteristics (alkali resistance): Pass

	Description	Residual strength after ageing  [N/mm]	Relative residual strength after ageing, of the strength in the as-delivered state  [%]
RELIUS Gittergewebe	Alkali- and slide-resistant glass fibre mesh with mass per unit area of about 165 g/m <sup>2</sup> and mesh size of about 4.0 mm x 4.0 mm	≥ 20	≥ 50