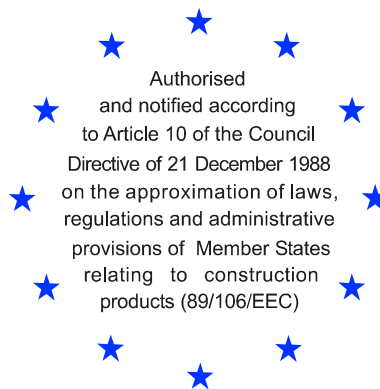


# Deutsches Institut für Bautechnik

Anstalt des öffentlichen Rechts

Kolonnenstr. 30 L  
10829 Berlin  
Germany

Tel.: +49(0)30 787 30 0  
Fax: +49(0)30 787 30 320  
E-mail: [dibt@dibt.de](mailto:dibt@dibt.de)  
Internet: [www.dibt.de](http://www.dibt.de)



# DIBt

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## European Technical Approval ETA-10/0206

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung <i>Trade name</i>	SAKRET WDV-System Mineralwolle
Zulassungsinhaber <i>Holder of approval</i>	SAKRET GmbH Osterhagener Straße 2 37431 Bad Lauterberg DEUTSCHLAND
Zulassungsgegenstand und Verwendungszweck <i>Generic type and use of construction product</i>	Außenseitiges Wärmedämm-Verbundsystem mit Putzschicht zur Wärmedämmung von Gebäuden <i>External Thermal Insulation Composite system with rendering for use as external insulation of building walls</i>
Geltungsdauer: <i>Validity:</i>	vom <i>from</i> 3 June 2010 bis <i>to</i> 2 June 2015
Herstellwerke <i>Manufacturing plants</i>	SAKRET GmbH Osterhagener Straße 2 37431 Bad Lauterberg DEUTSCHLAND

Diese Zulassung umfasst  
*This Approval contains*

18 Seiten  
*18 pages*



Europäische Organisation für Technische Zulassungen  
European Organisation for Technical Approvals

## 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>;
  - Guideline for European technical approval of "External Thermal Insulation Composite Systems with Rendering", ETAG 004, edition March 2000.
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1 Official Journal of the European Communities L 40, 11 February 1989, p. 12

2 Official Journal of the European Communities L 220, 30 August 1993, p. 1

3 Official Journal of the European Union L 284, 31 October 2003, p. 25

4 *Bundesgesetzblatt Teil I 1998*, p. 812

5 *Bundesgesetzblatt Teil I 2006*, p.2407, 2416

6 Official Journal of the European Communities L 17, 20 January 1994, p. 34

## II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

### 1 Definition of products and intended use

The External Thermal Insulation Composite System “SAKRET WDV-System Mineralwolle” called ETICS in the following text, is designed and installed in accordance with the ETA-holder's design and installation instructions, deposited with the Deutsches Institut für Bautechnik (DIBt). The ETICS comprises the following components, which are factory-produced by the ETA-holder or a supplier. It's made up on site from these. The ETA-holder is ultimately responsible for the ETICS.

#### 1.1 Definition of the construction product

	Components (see clause 2.3 for further description, characteristics and performances)	Coverage [kg/m <sup>2</sup> ]	Thickness [mm]
Insulation material with associated method of fixing	<b>Bonded ETICS:</b> <ul style="list-style-type: none"> <li>• <b>Insulation product</b> factory-prefabricated mineral wool (MW) product to EN 13162:2008                             <ul style="list-style-type: none"> <li>– MW lamella</li> </ul> </li> <li>• <b>Adhesives</b> <ul style="list-style-type: none"> <li>– <b>SAKRET Klebe und Armierungsmörtel KAM</b> (cement based powder requiring addition of about 20 – 25 % of water)</li> <li>– <b>SAKRET Klebe und Armierungsmörtel KAM-san</b> (cement based powder requiring addition of about 20 – 25 % of water)</li> <li>– <b>SAKRET Baukleber BK</b> (cement based powder requiring addition of about 20 – 25 % of water)</li> <li>– <b>SAKRET Klebe und Armierungsmörtel leicht KAM-L</b> (cement based powder requiring addition of about 25 – 30 % of water)</li> </ul> </li> </ul>	–  4.0 – 5.0 (prepared)  4.0 – 5.0 (prepared)  about 4.0 (prepared)  3.0 – 4.0 (prepared)	≤ 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 to EN 13162:2008                             <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)</li> <li>• <b>Anchors for insulation product</b> <ul style="list-style-type: none"> <li>– ejothem ST U</li> <li>– KEW TSD 8</li> <li>– WKRET-MET-LFN 8, WKRET-MET-LFM 8</li> <li>– WKRET-MET-LFN 10, WKRET-MET-LFM 10</li> <li>– TERMOZ 8 SV</li> <li>– KOELNER KI8M</li> <li>– ejothem NTK U</li> </ul> </li> </ul>	–	60 to 200

	<b>Components</b> (see clause 2.3 for further description, characteristics and performances)	<b>Coverage</b> [kg/m <sup>2</sup> ]	<b>Thickness</b> [mm]
	– IsoFux NDS8Z, IsoFux NDS90Z, IsoFux NDM8Z, IsoFux NDM90Z and anchors with ETA according to ETAG 014 <sup>7</sup> with characteristics defined in clause 2.3.2		
<b>Base coat</b>	<b>SAKRET Klebe- und Armierungsmörtel KAM</b> <b>SAKRET Klebe- und Armierungsmörtel KAM-san</b> <b>SAKRET Klebe- und Armierungsmörtel leicht KAM-l</b> Identical with the equally named adhesives given above.	6.0 – 7.0 6.0 – 7.0 about 4.5 (prepared)	3.5 – 6.0 3.5 – 6.0 3.5 – 6.0
<b>Glass fibre mesh</b>	<b>SAKRET Armierungsgewebe</b> Alkali- and slide-resistant glass fibre mesh with mass per unit area of about 160 g/m <sup>2</sup> and mesh size of about 4.0 mm x 4.0 mm.	–	–
<b>Key coat</b>	<b>SAKRET Putzgrund PG *</b> Ready to use pigmented acrylic-resin dispersion liquid To be used with all finishing coats indicated hereafter.	ca. 0,15 l/m <sup>2</sup>	–
<b>Finishing coat</b>	<b>To use with key coat "SAKRET Putzgrund PG" if applicable: *</b> <ul style="list-style-type: none"> <li>Ready to use paste – acrylic-silicate binder:                             <ul style="list-style-type: none"> <li><b>SAKRET Silikatputz SK</b> <ul style="list-style-type: none"> <li>- Rillen-Reibeputz (R) (particle size 1.5 – 2 and 3 mm)</li> <li>- Kratzputzstruktur (K) (particle size 1.5 – 2 and 3 mm)</li> </ul> </li> </ul> </li> <li>Thin layered cement based powders requiring addition of about 25 % of water:                             <ul style="list-style-type: none"> <li><b>SAKRET Modellierputz MP</b> (particle size 1 and 2 mm)</li> <li><b>SAKRET Scheibenputz SBP</b> (particle size 2 – 3 and 5 mm)</li> <li><b>SAKRET Edelleichtputz ELP</b> <ul style="list-style-type: none"> <li>- Rillenputzstruktur (R) (particle size 2 and 3 mm)</li> <li>- Scheibenputz-Struktur (K) (particle size 2 and 3 mm)</li> </ul> </li> <li><b>SAKRET Münchner Rauputz extra MRPe</b> (particle size 2 – 3 and 5 mm)</li> <li><b>SAKRET Klebe- und Armierungsmörtel KAM **</b></li> </ul> </li> </ul>	2.5 – 4.5 2.5 – 4.5  3.0 – 6.0 (prepared) 2.7 – 5.5 (prepared)  2.3 – 3.3 1.8 – 2.5 (prepared) 2.7 – 6.0 (prepared) 2.5 – 3.0	regulated by particle size       2.0
	<b>Application without key coat:</b> <ul style="list-style-type: none"> <li>Thick layered cement based powder requiring addition of about 25% of water:                             <ul style="list-style-type: none"> <li><b>SAKRET Kratzputz KP</b> (particle size 3 mm)</li> </ul> </li> </ul>	22.5 (prepared) 14.0 (prepared)	15 mm 10 mm

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ETAG 014

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

	<b>Components</b> (see clause 2.3 for further description, characteristics and performances)	<b>Coverage</b> [kg/m <sup>2</sup> ]	<b>Thickness</b> [mm]
<b>Ancillary material</b>	Description in accordance with clause 3.2.2.5 of ETAG 004 and decorative coatings compatible with the ETICS to be applied to the finishing coat. Remains the responsibility of the ETA-holder.		
* The instruction to the installer concerning the use of a key coat remains the responsibility of the ETA-holder. ** The finishing coat "SAKRET Klebe- und Armierungsmörtel KAM" has to be used with the equally named base coat exclusively			

## 1.2 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 (Class A1 or A2 - s1,d0 according to EN 13501-1:2007). 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 instructions.

The provisions made in this European technical approval (ETA) based upon the assumed intended working life of the ETICS of at least 25 years, provided that the conditions laid down in clauses 4.2, 5.1 and 5.2 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 Approval Body, but should only be regarded as a means to choosing the appropriate products in relation to the expected, economically reasonable working life of the works.

## 2 Characteristics of products and methods of verification

### 2.1 General

The assessment of the fitness for use of the ETICS for the intended use according to the Essential Requirements was carried out in compliance with ETAG 004, "Guideline for European Technical Approval of External Thermal Insulation Composite Systems with rendering", edition March 2000 (called ETAG 004 in this ETA).

Characteristics (of the components as well as of the ETICS), not mentioned in this ETA shall correspond to the respective values laid down in the technical documentation of this ETA.

## 2.2 Characteristics of the ETICS

### 2.2.1 Reaction to fire

Rendering system: Base coat with finishing coat and compatible key coat indicated hereafter	Maximum declared organic content	Class according to EN 13501-1:2007
SAKRET Silikatputz SK	Base coat ≤ 2.8 % Finishing coat ≤ 5.0 %	A2 – s2,d0
SAKRET Modellierputz MP, SAKRET Scheibenputz SBP, SAKRET Edelleichtputz ELP. SAKRET Münchner Rauputz extra MRPe, SAKRET Klebe- und Armierungsmörtel KAM, SAKRET Kratzputz KP	Base coat ≤ 2.8 % Finishing coat ≤ 2.8 %	A2 – s1,d0

#### Mounting and fixing

(for all end use applications given in clause 1.2 of the ETA)

The assessment of reaction to fire is based on tests according to EN 13823:2002 – SBI-test and EN ISO 1716:2002 with a maximum insulation layer thickness of 180 mm, a density of 95 kg/m<sup>3</sup> (testing according to EN 13823:2002 – SBI-test) resp. 150 kg/m<sup>3</sup> (testing according to EN ISO 1716:2002) as well as a rendering system with the highest organic content (silicate based finishing coat).

The manufacturer of the tested MW panels is Deutsche Rockwool Mineralwolle-GmbH, 45966 Gladbeck.

For rendering systems with cement based finishing coats the assessment of reaction to fire is based on tests with a particles size of 2 mm (lowest thickness).

For rendering systems with silicate based finishing coats the assessment of reaction to fire is based on tests with particle sizes of 1.5 mm (lowest thickness).

Testing according to EN 1716:2002 was carried out with an adhesive with the highest organic content.

For the SBI-test the ETICS was mounted directly to a calcium silicate substrate (class A2 - s1,d0) according to EN 13238:2001 with a thickness of 10 mm.

The installation of the ETICS was carried out by the approval holder following his design and installation instructions using a single mesh all over the test specimen.

The tests specimens were prefabricated and did not include any joints.

For the SBI-test the lateral edges were covered with the rendering system.

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

#### Note:

A European reference fire scenario for facades has not been laid down. In some Member States, the classification of ETICS according to EN 13501-1:2007 might not be sufficient for the use in facades. An additional assessment of ETICS according to national provisions (e.g. on the basis of a large scale test) might be necessary to comply with Member State regulations, until the existing European classification system has been completed.

## 2.2.2 Water absorption (capillarity test)

### Base coat:

Base coat	Water absorption after 1 h < 1 kg/m <sup>2</sup>	Water absorption after 24 h < 0.5 kg/m <sup>2</sup>
SAKRET Klebe- und Armierungsmörtel KAM	x	x
SAKRET Klebe- und Armierungsmörtel KAM-san	x	x
SAKRET Klebe- und Armierungsmörtel leicht KAM-I	x	x

Rendering system: Base coat with finishing coat and compatible key coat indicated hereafter	Water absorption after 24 h	
	< 0.5 kg/m <sup>2</sup>	≥ 0.5 kg/m <sup>2</sup>
SAKRET Silikatputz SK	x	
SAKRET Modellierputz MP	x	
SAKRET Scheibenputz SBP	x	
SAKRET Edelleichtputz ELP	x	
SAKRET Münchner Rauputz extra MRPe	x	
SAKRET Klebe- und Armierungsmörtel KAM	x	
SAKRET Kratzputz KP	x	

## 2.2.3 Hygrothermal behaviour

Hygrothermal cycles have been performed on rigs with the all base coats. None of the following defects occur during the testing:

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

The ETICS is so assessed resistant to hygrothermal cycles.

## 2.2.4 Freeze/thaw behaviour

The water absorption of the base coats as well as the rendering systems is less than 0.5 kg/m<sup>2</sup> after 24 hours for all configurations of the ETICS. The ETICS is so assessed as freeze/thaw resistant.

## 2.2.5 Impact resistance

The verified resistance to hard body impact and to perforation of the ETICS with different mesh configurations results in the classification into categories listed below. The resistance to perforation has not to be verified, because of a total render thickness of not less than 6 mm.

Rendering system: Base coat: "SAKRET Klebe- und Armierungsmörtel KAM" or "SAKRET Klebe- und Armierungsmörtel KAM-san" with finishing coat indicated hereafter	Single standard mesh "SAKRET Armierungsgewebe"
SAKRET Silikatputz SK (2 mm)	Category I
SAKRET Modellierputz MP (3 mm)	Category II
SAKRET Scheibenputz SBP (3 mm)	Category II

<b>Rendering system:</b> Base coat: "SAKRET Klebe- und Armierungsmörtel KAM" or "SAKRET Klebe- und Armierungsmörtel KAM-san" with finishing coat indicated hereafter	Single standard mesh "SAKRET Armierungsgewebe"
SAKRET Edelleichtputz ELP (3 mm)	Category II
SAKRET Münchner Rauputz extra MRPe (3 mm)	Category II
SAKRET Kratzputz KP (10 mm)	Category II

<b>Rendering system:</b> Base coat: "SAKRET Klebe- und Armierungsmörtel leicht KAM-l" with finishing coat indicated hereafter	Single standard mesh "SAKRET Armierungsgewebe"
SAKRET Silikatputz SK (3 mm)	Category III
SAKRET Modellierputz MP (3 mm)	Category III
SAKRET Scheibenputz SBP (3 mm)	Category III
SAKRET Edelleichtputz ELP (3 mm)	Category III
SAKRET Münchner Rauputz extra MRPe (3 mm)	Category III
SAKRET Kratzputz KP (10 mm)	Category III

The impact resistance of all other configurations of the ETICS is not determined (npd).

#### 2.2.6 Water vapour permeability

<b>Rendering system:</b> Base coat with finishing coat indicated hereafter	<b>Equivalent air thickness <math>s_d</math></b>
SAKRET Silikatputz SK	$\leq 1.0$ m (Test result obtained with a layer thickness 2 mm: 0.2 m)
SAKRET Modellierputz MP	$\leq 1.0$ m (Test result obtained with a layer thickness 1 mm: 0.1 m)
SAKRET Scheibenputz SBP	$\leq 1.0$ m (Test result obtained with a layer thickness 3 mm: 0.2 m)
SAKRET Edelleichtputz ELP	$\leq 1.0$ m (Test result obtained with a layer thickness 3 mm: 0.2 m)
SAKRET Münchner Rauputz extra MRPe	$\leq 1.0$ m (Test result obtained with a layer thickness 3 mm: 0.3 m)
SAKRET Klebe- und Armierungsmörtel KAM	$\leq 1.0$ m (Test result obtained with a layer thickness 5 mm: 0.1 m)
SAKRET Kratzputz KP	$\leq 1.0$ m (Test result obtained: 0.3 m)

#### 2.2.7 Emission of dangerous substances or radiation

The ETICS complies with the provisions of Guidance Paper H ("A harmonized approach related to dangerous substances under the construction product directives Revision August 2002").

In addition to the specific clauses relating to dangerous substances contained in this ETA, 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.



2.2.8 Safety in use

2.2.8.1 Bond strengths

Bond strength between base coat and insulation product (MW lamella and MW panel)

Base coat	Conditioning			
	Initial state		After hygrothermal cycles on the rig	After freeze/thaw test
	MW lamella	MW panel		
SAKRET Klebe- und Armierungsmörtel KAM	≥ 0.08 MPa	< 0.08 MPa but failure in the insulation product	< 0.08 MPa but failure in the insulation product	no performance determined
SAKRET Klebe- und Armierungsmörtel KAM-san	≥ 0.08 MPa			
SAKRET Klebe- und Armierungsmörtel leicht KAM-I	≥ 0.08 MPa			

Bond strength between adhesive and substrate resp. insulation product

		Conditioning		
		Initial state	2 d immersion in water + 2 h drying	2 d immersion in water + 7 d drying
SAKRET Klebe- und Armierungsmörtel KAM	Concrete	≥ 0.25 MPa	≥ 0.08 MPa	≥ 0.25 MPa
	MW lamella	≥ 0.08 MPa	≥ 0.03 MPa	≥ 0.08 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
SAKRET Klebe- und Armierungsmörtel KAM-san	Concrete	≥ 0.25 MPa	≥ 0.08 MPa	≥ 0.25 MPa
	MW lamella	≥ 0.08 MPa	≥ 0.03 MPa	≥ 0.08 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
SAKRET Baukleber BK	Concrete	≥ 0.25 MPa	≥ 0.08 MPa	≥ 0.25 MPa
	MW lamella	≥ 0.08 MPa	≥ 0.03 MPa	≥ 0.08 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
SAKRET Klebe- und Armierungsmörtel leicht KAM-I	Concrete	≥ 0.25 MPa	≥ 0.08 MPa	≥ 0.25 MPa
	MW lamella	≥ 0.08 MPa	≥ 0.03 MPa	≥ 0.08 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

Bonded surface:

For the adhesives "SAKRET Klebe- und Armierungsmörtel KAM", "SAKRET Klebe- und Armierungsmörtel KAM-san" and "SAKRET Baukleber BK" the formula given in clause 6.1.4.1.3 of ETAG 004 is fulfilled with a bonded surface of 50 % and the use as bonded ETICS is possible.

For the adhesive "SAKRET Klebe- und Armierungsmörtel leicht KAM-I" the formula given in clause 6.1.4.1.3 of ETAG 004 is fulfilled with a bonded surface of 60 % and the use as bonded ETICS is possible.

2.2.8.2 Fixing strength (displacement test)

Test not required because the ETICS fulfils the following criteria to clause 5.1.4.2 of ETAG 004:

- the bonded area exceeds 20 %
- $E \cdot d < 50\,000 \text{ N/mm}$   
 (E: modulus of elasticity of the base coat – d: mean dried thickness of the base coat)

2.2.8.3 Wind load resistance

Safety in use of mechanically fixed ETICS using profiles

The following failure loads only apply to the listed combination (MW panel's characteristics) / (way of fixing the ETICS) and the characteristics of the insulation product given in clause 2.3.1.

Failure loads – Table 1

Characteristics of the <b>MW panels</b>	Dimensions	625 mm x 800 mm
	Thickness	≥ 60 mm
	<b>Tensile strength perpendicular to the faces</b>	<b>≥ 14 kPa</b>
Failure loads [N / panel] (Static Foam Block Test)	Horizontal profiles with a vertical distance of 625 mm, fixed every 30 cm and vertical connection profiles  <b>No additional anchors in MW panel</b>	Minimal: 1200 Average: 1250

Failure loads – Table 2

Characteristics of the <b>MW panels</b>	Dimensions	625 mm x 800 mm
	Thickness	≥ 60 mm
	<b>Tensile strength perpendicular to the faces</b>	<b>≥ 14 kPa</b>
Failure loads [N] / panel (Static Foam Block Test)	Horizontal profiles with a vertical distance of 625 mm, fixed every 30 cm and vertical connection profiles  <b>Two additional anchors per MW panel,</b> plate diameter ≥ 60 mm, mounted on the MW panel surface	Minimal: 2200 Average: 2400

Safety in use of mechanically fixed ETICS using anchors

The following failure loads only apply to the listed combination (MW characteristics) / (anchor plate's characteristics) and the characteristics of the insulation product given in clause 2.3.1.

Failure loads – Table 3

Apply to all anchors listed in the Table in clause 1.1 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)	$R_{\text{panel}}$	Minimal: 650 Average: 740
	Anchors placed at the panel joints (Static Foam Block Test)	$R_{\text{joint}}$	Minimal: 590 Average: 610
	Anchors not placed at the panel joints (Pull-through test, dry conditions)	$R_{\text{panel}}$	Minimal: 640 Average: 690
	Anchors not placed at the panel joints (Pull-through test, wet conditions) - series 2 * - series 3 *	$R_{\text{panel}}$	Minimal: 360 Average: 390 Minimal: 410 Average: 450
* According to ETAG 004 clause 5.2.4.1.2 test method (2)			

Failure loads – Table 4

Apply to all anchors listed in the Table in clause 1.1 mounted on the insulation panels surface				
Characteristics of the <b>MW panels</b>	Thickness		≥ 80 mm	
	<b>Tensile strength perpendicular to the faces</b>		≥ 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)	$R_{\text{panel}}$	Minimal: 480 Average: 490	Minimal: 560 Average: 690
	Anchors placed at the panel joints (Static Foam Block Test)	$R_{\text{joint}}$	Minimal: 380 Average: 390	Minimal: 440 Average: 540
	Anchors not placed at the panel joints (Pull-through test, dry conditions)	$R_{\text{panel}}$	Minimal: 540 Average: 610	npd
	Anchors not placed at the panel joints (Pull-through test, wet conditions) - series 2 *	$R_{\text{panel}}$	Minimal: 400 Average: 460	npd
* According to ETAG 004 clause 5.2.4.1.2 test method (2)				

Failure loads – Table 5

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

The failure loads of Table 2 and 3 specified above only apply to the following anchors with deep mounting under the given conditions of installation:

Anchor	Thickness of the MW panel [d]	Conditions of installation *
ejothem STR U (ETA-04/0023)	$100 \text{ mm} > d \geq 80 \text{ mm}$	– Maximum installation depth of the anchor plate: 15 mm ( thickness of insulation cover) – Maximum depth of die: 5 mm
	$\geq 100 \text{ mm}$	– Maximum installation depth of the anchor plate: 15 mm ( thickness of insulation cover) – Maximum depth of die: 20 mm
TERMOZ 8 SV (ETA-06/0180)	$\geq 80 \text{ mm}$	– Maximum installation depth of the anchor plate: 15 mm ( thickness of insulation cover)
* According to the appropriate ETA of anchor		

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

$$R_d = \frac{R_{\text{panel}} \cdot n_{\text{panel}} + R_{\text{joint}} \cdot n_{\text{joint}}}{\gamma}$$

$n_{\text{panel}}$ : 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 joint

$\gamma$ : national safety factor

### 2.2.9 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  $R_{\text{render}}$  which is about  $0.02 \text{ (m}^2 \cdot \text{K)/W}$ .

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

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

$$U_c = U + \Delta U_{\text{anchor}} \quad \text{corrected thermal transmittance}$$

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

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 technical approval

$\chi_p = 0.004 \text{ W/K}$  for anchors with a galvanized steel screw with the head covered by a plastic material

$\chi_p = 0.002 \text{ W/K}$  for anchors with a stainless steel screw with the head covered by plastic material, and for anchors with an air gap at the head of the screw

### 2.2.10 Aspects of durability and serviceability

Bond strength after ageing:

<b>Rendering system:</b> Base coat with finishing coat indicated hereafter	SAKRET Silikatputz SK	$\geq 0.08$ MPa
	SAKRET Modellierputz MP	
	SAKRET Scheibenputz SBP	
	SAKRET Edelleichtputz ELP	
	SAKRET Münchner Rauputz extra MRPe	
	SAKRET Klebe- und Armierungsmörtel KAM	
	SAKRET Kratzputz KP	

### 2.3 Characteristics of the components

Detailed information on the chemical composition and other identifying characteristics of the components, following Annex C of ETAG 004 have been deposited with the DIBt.

Further information can be observed from the product data sheets, which are part of the technical documentation for this ETA.

#### 2.3.1 Thermal insulation product

Factory-prefabricated panels and lamella made of mineral wool (MW) to EN 13162:2008 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		
Gross heat of combustion [MJ/kg]; EN ISO 1716:2002	$PCS \leq 1.02$		
Thermal resistance [(m <sup>2</sup> · K)/W]	Defined in the CE marking in reference to EN 13162:2008		
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 - series 2 - series 3	$\geq 33$ % of average value in dry conditions $\geq 50$ % of average value in dry conditions		
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)			

### 2.3.2 Anchors

The anchors listed in the Table in clause 1.1 with reference to the respective ETA are to be used in the mechanically fixed ETICS.

Trade name	ETA-number
ejothem ST U	ETA-02/0018
KEW TSD 8	ETA-04/0030
WKRET-MET-LFN 8, WKRET-MET-LFM 8	ETA-06/0080
WKRET-MET-LFN 10, WKRET-MET-LFM 10	ETA-06/0105
TERMOZ 8 SV	ETA-06/0180
KOELNER KI8M	ETA-06/0191
ejothem NTK U	ETA-07/0026
IsoFux NDS8Z, IsoFux NDM8Z, IsoFux NDS90Z, IsoFux NDM90Z	ETA-07/0129

Additionally all anchors with ETA according to ETAG 014<sup>7</sup> with characteristics having the description below shall be used:

- 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.

### 2.3.3 Render (base coat)

The average value of crack width of the base coat "SAKRET Klebe- und Armierungsmörtel KAM-san" reinforced with the glass fibre mesh "SAKRET Armierungsgewebe" measured at a render strain value of 0.5 % is about 0.08 mm.

The average value of crack width of the base coat coat "SAKRET Klebe- und Armierungsmörtel leicht KAM-I" reinforced with the glass fibre mesh "SAKRET Armierungsgewebe" measured at a render strain value of 1 % is about 0.11 mm

### 2.3.5 Reinforcement (glass fibre mesh)

Characteristics (alkali resistance): Pass

	"SAKRET Armierungsgewebe"	
	Warp	Weft
Residual strength after ageing [N/mm]	$\geq 20$	$\geq 20$
Relative residual resistance after ageing in % of the strength in the as-delivered state	$\geq 50$	$\geq 50$

## 3 Evaluation and attestation of conformity and CE-marking

### 3.1 System of attestation of conformity

According to the decision 97/556/EC of the European Commission<sup>8</sup> amended by 2001/596/EC<sup>9</sup> system 1 or 2+ of the attestation of conformity applies depending on reaction to fire.

Considering Class A2 for reaction to fire of the ETICS, the systems of attestation of conformity are system 1 regarding reaction to fire characteristic and system 2+ regarding other characteristics than reaction to fire.

<sup>8</sup> Official Journal of the European Communities/Union L229/14 of 20.08.1997

<sup>9</sup> Official Journal of the European Communities/Union L 209/33 of 2.8.2001

These systems of attestation of conformity are defined as follows:

System 1: Certification of the conformity of the product by a notified certification body on the basis of:

- (a) Tasks for the manufacturer:
  - (1) factory production control;
  - (2) further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan;
- (b) Tasks for the notified body:
  - (3) initial type-testing of the product;
  - (4) initial inspection of factory and of factory production control;
  - (5) continuous surveillance, assessment and approval of factory production control.

System 2+: Declaration of conformity of the product by the manufacturer on the basis of:

- (a) Tasks for the manufacturer:
  - (1) initial type-testing of the product;
  - (2) factory production control;
  - (3) testing of samples taken at the factory in accordance with a prescribed test plan.
- (b) Tasks for the notified body:
  - (4) certification of factory production control on the basis of:
    - initial inspection of factory and of factory production control;
    - continuous surveillance, assessment and approval of factory production control.

## 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 ETICS and the components are in conformity with this ETA.

The manufacturer shall only use raw materials stated in the technical documentation of this ETA. The incoming raw materials are subjected to verifications by the manufacturer before acceptance.

The factory production control shall be in accordance with the "Control plan"<sup>10</sup> which is part of the technical documentation of this ETA. The "Control plan"<sup>10</sup> has been agreed between the manufacturer and the DIBt and is laid down in the context of the factory production control system operated by the manufacturer and deposited with the DIBt.

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the "Control plan"<sup>10</sup>. The records include at least the following information:

- designation of the product, the basic materials and components;
- type of control or testing;
- date of manufacture of the product and date of testing of the product or basic materials or components;

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<sup>10</sup> The "Control plan" is a confidential part of the European technical approval and only handed over to the notified body involved in the procedure of attestation of conformity. See section 3.2.2.

- result of control and testing and, if appropriate, comparison with requirements;
- signature of person responsible for factory production control.

The records shall be presented to the notified body involved in continuous surveillance. On request they shall be presented to the DIBt.

#### 3.2.1.2 Other tasks for the manufacturer

For initial type-testing of the ETICS and the components regarding other characteristics than reaction to fire the results of the tests performed as part of the assessment for the ETA shall be used unless there are changes in the production line or plant. In such cases the necessary initial type-testing has to be agreed with the DIBt.

The manufacturer shall, on the basis of a contract, involve a body which is notified for the tasks referred to in clause 3.1 in the field of ETICS in order to undertake the actions laid down in clause 3.2.2. For this purpose, the "Control plan"<sup>10</sup> referred to in clauses 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the notified bodies involved.

The manufacturer shall make a declaration of conformity, stating that the ETICS is in conformity with the provisions of ETA-10/0206 issued on 3 June 2010.

#### 3.2.2 Tasks for the notified bodies

The notified body shall perform the

- initial type-testing of the ETICS and the components regarding reaction to fire characteristic
- initial inspection of factory and of factory production control,
- continuous surveillance, assessment and approval of factory production control,

in accordance with the provisions laid down in the "Control plan"<sup>10</sup>.

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

The notified certification body involved by the manufacturer shall issue an EC certificate of conformity of the ETICS which includes the certification of factory production control stating the conformity with the provisions of this ETA.

In cases where the provisions of the ETA and its "Control plan"<sup>10</sup> are no longer fulfilled the notified certification body shall withdraw the certificate of conformity and inform the DIBt without delay.

### 3.3 Marking

#### 3.3.1 CE marking

The CE marking shall be affixed on the accompanying commercial document. The letters "CE" shall be followed by the identification number of the notified certification body and be accompanied by the following additional information:

- the name and address of the ETA-holder (legal entity responsible for the manufacture),
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate of conformity for the ETICS,
- the number of the ETA,
- the number of the ETAG,
- the ETICS trade name.



### 3.3.2 Additional marking

The respective trade name of the individual components of the ETICS shall be given on the packaging.

In addition to the trade name the following information shall be given in the accompanying commercial document and/or on the packaging of the thermal insulation product:

- minimum value of the tensile strength perpendicular to the faces of the insulation product,
- shear modulus of the insulation product.

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

### 4.1 Manufacturing

The composition and manufacturing process used for the components of the ETICS shall comply with those on which the approval tests were based. Composition and manufacturing process are deposited at the DIBt.

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. 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.

### 4.2 Installation, design and execution

#### 4.2.1 General

The wall on which the ETICS is applied shall be sufficiently stable and airtight. Its stiffness shall be large enough to ensure that the ETICS is not subjected to deformations, which could lead to damage.

The requirements given in ETAG 004, chapter 7, have to be considered.

#### 4.2.2 Installation

The ETICS is installed on site. The approval holder is obliged to instruct all those entrusted with the design and execution of the ETICS about the specific conditions of this ETA and all other details necessary for perfect execution.

Only the components whose trade name is given in clause 1.1 and which have the characteristics according to clause 2.3 may be used for the ETICS.

#### 4.2.3 Design

##### 4.2.3.1 Requirements for the substrate

As to the requirements for the substrate and its preparation, ETAG 004, clause 7.2.1 applies.

The substrate for mechanically fixed systems should have a sufficient resistance for the use of anchors according to clause 2.3.2. The conditions of the ETA for the anchor concerned apply.

##### 4.2.3.2 Resistance to wind load

Judging of sufficient resistance to wind load should be on the basis of the resistance of the fixings according to clause 2.2.8.3 and of the characteristic tension resistance of the used anchor according to clause 2.3.2. Taking into account the national safety factors the design values of resistance are determined. The smaller one of the design resistances of the ETICS ( $R_d$ ) and of the anchor ( $N_{Rd}$ ) is decisive.

The determined design wind load suction  $S_d$  (taking into account the national safety factors) is compared with the design resistance.

#### 4.2.4 Execution

The manufacturer's design and installation instructions, which are part of the technical documentation for this ETA, shall be observed with respect to the installation of the ETICS and drying times of rendering products.

## 5 Indications to the manufacturer

### 5.1 Packaging, transport and storage

Packaging of the components has to be such that they are protected against moisture during transport and storage, unless other measures are foreseen by the manufacturer for this purpose.

The components are to be protected against damage.

### 5.2 Use, maintenance, repair

To the indications on use, maintenance and repair ETAG 004, clause 7.3 applies.

Dipl.-Ing. Uwe Bender  
Deutsches Institut für Bautechnik  
Berlin, 3. Juni 2010

*beglaubigt:*  
Spannagel