Deutsches Institut für Bautechnik

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European Technical Assessment Body for construction products

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European Technical Assessment ETA-07/0145 of 16 April 2026

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General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	Grigotherm Wärmedämm-Verbundsystem MW
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	Fornaci Calce Grigolin GmbH Edelputzwerk Siemensstraße 26 76275 Ettlingen GERMANY
Manufacturing plant	Fornaci Calce Grigolin GmbH Edelputzwerk Siemensstraße 26 76275 Ettlingen
This European Technical Assessment contains	25 pages including 7 annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Article 95(4) of Regulation (EU) No 2024/3110, on the basis of	EAD 040083-01-0404
This version replaces	ETA-07/0145 issued on 9 May 2018

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Specific Part

1 Technical description of the product

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 the ETICS.

The ETICS kit comprises a prefabricated insulation product of mineral wool (MW) to be bonded and if necessary additional mechanically fixed onto a wall. The methods of fixing and the relevant components are specified in annex 1.

The insulation product is faced with a rendering system consisting of one base and finishing coat (site applied), the base coat contains reinforcement. The rendering system 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.

2 Specification of the intended use in accordance with the applicable European assessment Document

The performances in Section 3 can only be assumed if the ETICS is used in accordance with the specifications and under the boundary conditions specified in Annexes 2 to 7.

The verifications and assessment methods on which this ETA is based lead to the assumption of a working life of the ETICS "Grigotherm Wärmedämm-Verbundsystem MW" at least 50 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.

For use, maintenance and 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 localized damaged areas due to accidents,
- the aspect maintenance with products compatible with the ETICS (possibly after washing or ad hoc preparation).

Necessary repairs are to be carried out 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 known to the concerned people.

3 Essential characteristics of the product

3.1 Safety in case of fire (BWR 2)

Essential characteristic	Assessment method[1]	Performance
Reaction to fire of ETICS	2.2.1.1	see Annex 2.1
Reaction to fire of the thermal insulation product	2.2.1.2	see Annex 2.2
Reaction to fire performance of the PU-foam adhesives	2.2.1.3	not relevant
Façade fire performance	2.2.2	no performance assessed
Propensity to undergo continuous smouldering	2.2.3	see Annex 2.3

3.2 Hygiene, health and the environment (BWR 3)

Essential characteristic	Assessment method[1]	Performance
Content, emission and/or release of dangerous substances. Leachable substances	2.2.4.1	no performance assessed
Water absorption of the base coat and the rendering system	2.2.5.1	see Annex 3.1
Water absorption of the thermal insulation product	2.2.5.2	no performance assessed
Watertightness. Hygrothermal behaviour	2.2.6	see Annex 3.2
Watertightness. Freeze – thaw resistance	2.2.7	see Annex 3.3
Impact resistance	2.2.8	see Annex 3.4
Water vapour permeability of the rendering system (equivalent air thickness)	2.2.9.1	see Annex 3.5
Water vapour permeability of the thermal insulation product (Water-vapour resistance factor)	2.2.9.2	no performance assessed

[1] Clause in EAD 040083-01-0404, unless another EAD is specified

3.3 Safety and accessibility in use (BWR 4)

Essential characteristic	Assessment method[1]	Performance
Bond strength between the base coat and the thermal insulation product	2.2.10.1	see Annex 4.1
Bond strength between the adhesive and the substrate	2.2.10.2	see Annex 4.2
Bond strength between the adhesive and the thermal insulation product	2.2.10.3	see Annex 4.3
Bond strength of the PU-foam adhesives	2.2.10.4	not relevant
Fixing strength transverse displacement test with tension load	2.2.11.1	no performance assessed
Fixing strength transverse displacement test without tension load	2.2.11.2	no performance assessed
Wind load resistance. Pull-through resistance	2.2.12.1	no performance assessed
Wind load resistance. Static foam block resistance	2.2.12.2	no performance assessed
Wind load resistance. Dynamic wind uplift resistance	2.2.12.3	no performance assessed
Tensile strength perpendicular to the faces of the thermal insulation product in dry conditions	2.2.13.1	see Annex 4.4
Tensile strength perpendicular to the faces of the thermal insulation product in wet conditions	2.2.13.2	no performance assessed
Shear strength and shear modulus of elasticity of the thermal insulation product	2.2.14	no performance assessed
Pull-through resistance of mechanical fixing devices from profiles	2.2.15	not relevant
Render strip tensile strength	2.2.16	no performance assessed
Shear strength and shear modulus of the PU-foam adhesives	2.2.17	not relevant
Post expansion behaviour of the PU-foam adhesives	2.2.18	not relevant

3.4 Protection against noise (BWR 5)

Essential characteristic	Assessment method[1]	Performance
Airborne sound insulation	2.2.19	no performance assessed
Dynamic stiffness of the thermal insulation product	2.2.19.1	see Annex 5.1
Air flow resistance of the thermal insulation product	2.2.19.2	see Annex 5.2

3.5 Energy economy and heat retention (BWR 6)

Essential characteristic	Assessment method[1]	Performance
Thermal resistance of ETICS without influence of mechanical fixing devices	2.2.20.1	see Annex 6.1
Thermal conductivity and thermal resistance of the thermal insulation product	2.2.20.2	see Annex 6.2
Thermal transmittance of fixing devices	2.2.20.3	see Annex 6.3

3.6 Aspects of durability

Essential characteristic	Assessment method[1]	Performance
Bond strength after ageing of finishing layers tested on the rig	2.2.21.1	see Annex 7.1
Bond strength after ageing of finishing layers not tested on the rig	2.2.21.2	see Annex 7.2
Tensile strength and elongation of the glass fibre mesh at initial state and after ageing in alkali conditions	EAD 040016-01-0404, Clause 2.2.7	see Annex 7.3

4 Assessment and verification of constancy of performance

In accordance with EAD 040083-01-0404 the applicable European legal act is Commission Decision 97/556/EC, as amended by Decision 2001/596/EC.

Product	Intended use	Levels or classes (Reaction to fire[2])	Systems
"Grigotherm Wärmedämm-Verbundsystem MW"	ETICS in external wall subject to fire regulations	A1 (1), A2 (1), B (1), C (1)	1
		A1 (2), A2 (2), B (2), C (2), D, E, (A1 to E) (3), F	2+
	ETICS in external wall not subject to fire regulations	any	2+

(1) 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)
(2) Products/materials not covered by footnote (1)
(3) 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)

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

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 19 April 2026 by Deutsches Institut für Bautechnik

Anja Rogsch
Head of Section

beglaubigt:
Klette

[2] Including propensity to undergo continuous smouldering, where relevant

Deutsches Institut für Bautechnik DIBt

Annex 1 – Composition of the ETICS

Components National application documents shall be taken into account	**Coverage [kg/m²]**	**Thickness [mm]**
Insulation material with associated method of fixing		
Bonded ETICS		
• **Insulation product**		
Factory-prefabricated mineral wool (MW)		
• **MW lamella**		**60 to 400**
Grigolin Putzträgerlamelle Speedrock II	–	60 to 400
Grigolin Putzträgerlamelle WVL 2	–	60 to 200
Grigolin Putzträgerlamelle FKL C2	–	60 to 400
Grigolin Putzträgerlamelle FAL 1cc	–	60 to 200
• **Adhesives**		
• **Grigolin Elastischer Klebe- und Armierungsmörtel AC 07 ISOLFLEX** Cement based powder requiring addition of about 25 % of water	6.0	–
• **Grigolin Elastischer Klebe- und Armierungsmörtel AC 08 ISOLFLEX** Cement based powder requiring addition of about 25 % of water	6,0	–
• **Grigolin AC 20 UNILIGHT** Cement based powder requiring addition of about 25 % of water	4,0	–
• **Grigolin Basiflex** Cement based powder requiring addition of about 25 % of water	9,0	–
• **Grigolin AC 16 UNIRAS** Cement based powder requiring addition of about 28 % of water	9,0	–
Mechanically fixed ETICS with anchors and supplementary adhesive		
• Insulation product		
Factory-prefabricated mineral wool (MW)		
• **MW board**		**60 to 300**
Grigolin MiWo beidseitig beschichtet	–	80 to 300
Grigolin Putzträgerplatte FKD-LIGHT C2	–	60 to 300
Grigolin Putzträgerplatte FAS 10cc	–	60 to 300
Grigolin Putzträgerplatte FAS 2cc	–	100 to 200
Grigolin Putzträgerplatte Sillatherm Light 035	–	120 to 200
Grigolin Putzträgerplatte WVP 1-035 Plus	–	80 to 240
Grigolin Putzträgerplatte WVP 1-035 (60-400)	–	60 to 240
• **MW lamella**		**60 to 200**
Grigolin Putzträgerlamelle Speedrock II	–	60 to 200
Grigolin Putzträgerlamelle WVL 2	–	60 to 200
Grigolin Putzträgerlamelle FKL C2	–	60 to 200
Grigolin Putzträgerlamelle FAL 1cc	–	60 to 200

Components National application documents shall be taken into account	**Coverage [kg/m²]**	**Thickness [mm]**
Mechanically fixed ETICS with anchors and supplementary adhesive		
• **Supplementary adhesive** As with bonded ETICS • **Anchors for insulation product** Anchor with ETA in accordance with EAD 330196-01-0604[1]		
Base coat		
• **Grigolin Elastischer Klebe- und Armierungsmörtel AC 07 ISOLFLEX**	3.5 to 4.3	2.7 to 3.3
• **Grigolin Elastischer Klebe- und Armierungsmörtel AC 08 ISOLFLEX**	3.5 to 4.3	2.7 to 3.3
• **Grigolin AC 20 UNILIGHT**	4.0 to 4.5	4.5 to 5.5
• **Grigolin AC 16 UNIRAS**	3.5 to 5.5	3.0 to 5.0
Identical with the equally named adhesives given above.		
Glass fibre mesh		
• **Grigolin-Gewebe**	0.160	–
Alkali- and slide-resistant glass fibre mesh with mesh size of about 4.0 mm x 4.0 mm.		
Key coat		
• **UNI-KO GM-Grundierung**	about 0.2	–
Ready-to-use pigmented acrylic-resin dispersion liquid.		
For the compatibility with the finishing coats see below.		
Finishing coat		
To use with key coat if applicable:[a)]		
• Thick-layered cement based powder requiring addition of about 30 % of water:		
MARMORINO Edelstruktur- und Modellierputz GR 100 Particle size 1.0 mm	about 1.4	Regulated by particle size
MARMORINO Edelstruktur- und Modellierputz GR 200 Particle size 1.5 mm	about 2.5	
MARMORINO 2 mm Particle size 2.0 mm	about 3.0	
MARMORINO Edelstruktur- und Modellierputz GR 300 Particle size 2.5 mm	about 3.4	
• Ready-to-use pastes – silicate/acrylic-resin binder:		
SIL4 INTO Grigolin Silikatputz K Particle size 1.5 – 2.0 – 2.5 and 3.0 mm	1.6 to 4.0	
Ancillary materials		
Remains the responsibility of the manufacturer.		

a) The instruction to the installer concerning the use of a key coat remains the responsibility of the manufacturer.

1 EAD 330196-01-0604 Plastic anchors made of virgin or non-virgin material for fixing of external thermal insulation composite systems with rendering (and previous versions)

Annex 2 – Safety in case of fire (BWR 2)

2.1 Reaction to fire of ETICS

Configurations	Organic content	Flame retardant content	Euroclass according to EN 13501-1
MW lamella / MW board	-	no flame retardant	A1
Anchors	-	-	-
Base coat	max. 4.0 %	no flame retardant	-
Rendering system Base coat with finishing coat and compatible key coat specified below			
MARMORINO Edelstruktur- und Modellierputz GR 100, GR 200, GR 300 and MARMORINO 2 mm	max. 1.2 %	no flame retardant	A2 – s1,d0
SIL4 INTO Grigolin Silikatputz K	max. 6.9 %	no flame retardant	

2.2 Reaction to fire of the thermal insulation product

The reaction to fire class of thermal insulation product is A1 in accordance with the Commission Delegated Regulation (EU) No 2016/364 in connection with EN 13501-1.

2.3 Propensity to undergo continuous smouldering

The ETICS does not show propensity to undergo continuous smouldering.

Annex 3 – Hygiene, health and environment (BWR 3)

3.1 Water absorption of the base coat and the rendering system

	Mean value water absorption	
	$W_{p,1h}$ [kg/m²]	$W_{p,24h}$ [kg/m²]
Base coat		
Grigolin Elastischer Klebe- und Armierungsmörtel AC 07 ISOLFLEX	< 0.1	0.3
Grigolin Elastischer Klebe- und Armierungsmörtel AC 08 ISOLFLEX	< 0.1	0.1
Grigolin AC 20 UNILI GHT	0.3	1.4[a)]
Grigolin AC 16 UNIRAS	< 0.1	0.3
Rendering system Base coat "Grigolin Elastischer Klebe- und Armierungsmörtel AC 07 ISOLFLEX" or "Grigolin Elastischer Klebe- und Armierungsmörtel AC 08 ISOLFLEX" with finishing coat specified below		
MARMORINO Edelstruktur- und Modellierputz GR 100	no performance assessed	
MARMORINO Edelstruktur- und Modellierputz GR 200		
MARMORINO Edelstruktur- und Modellierputz GR 300		
MARMORINO 2 mm		
SIL4 INTO Grigolin Silikatputz K	0.1	0.5[b)]
Rendering system Base coat "Grigolin AC 20 UNILIGHT" with finishing coat specified below		
MARMORINO Edelstruktur- und Modellierputz GR 100	0.2	1.2[b)]
MARMORINO Edelstruktur- und Modellierputz GR 200		
MARMORINO Edelstruktur- und Modellierputz GR 300		
MARMORINO 2 mm		
SIL4 INTO Grigolin Silikatputz K	< 0.1	0.2
Rendering system Base coat "Grigolin AC 16 UNIRAS" with finishing coat specified below		
MARMORINO Edelstruktur- und Modellierputz GR 100	< 0.1	0.2
MARMORINO Edelstruktur- und Modellierputz GR 200		
MARMORINO Edelstruktur- und Modellierputz GR 300		
MARMORINO 2 mm		
SIL4 INTO Grigolin Silikatputz K	< 0.1	0.1

$W_{p,1h}$ water absorption after 1 hour

$W_{p,24h}$ water absorption after 24 hours

a) Water absorption of base coat after 24 hours is ≥ 0.5 kg/m². Examination of hygrothermal behaviour (Annex 3.2) and freeze-thaw behaviour of base coat and base coat with finishing coat (Annex 3.3) required.

b) Water absorption of rendering system after 24 hours is ≥ 0.5 kg/m². Examination of hygrothermal behaviour (Annex 3.2) and freeze-thaw behaviour of base coat with finishing coat (Annex 3.3) required.

3.2 Watertightness. Hygrothermal behaviour

The hygrothermal behaviour was tested under “HWC” conditions (Heating – Wetting – Cooling test conditioning/cycles). ETICS is hygrothermal cycles (HWC) resistant.

3.3 Watertightness. Freeze – thaw resistance

	Freeze-thaw resistant	
	Yes	**No**
Base coat		
Grigolin Elastischer Klebe- und Armierungsmörtel AC 07 ISOLFLEX	X	
Grigolin Elastischer Klebe- und Armierungsmörtel AC 08 ISOLFLEX	X	
Grigolin AC 20 UNILIGHT	X [a)]	
Grigolin AC 16 UNIRAS	X	
Rendering system Base coat "Grigolin Elastischer Klebe- und Armierungsmörtel AC 07 ISOLFLEX" or "Grigolin Elastischer Klebe- und Armierungsmörtel AC 08 ISOLFLEX" with finishing coat specified below		
MARMORINO Edelstruktur- und Modellierputz GR 100	no performance assessed	
MARMORINO Edelstruktur- und Modellierputz GR 200		
MARMORINO Edelstruktur- und Modellierputz GR 300		
MARMORINO 2 mm		
SIL4 INTO Grigolin Silikatputz K		X
Rendering system Base coat "Grigolin AC 20 UNILIGHT" with finishing coat specified below		
MARMORINO Edelstruktur- und Modellierputz GR 100	X [a)]	
MARMORINO Edelstruktur- und Modellierputz GR 200		
MARMORINO Edelstruktur- und Modellierputz GR 300		
MARMORINO 2 mm		
SIL4 INTO Grigolin Silikatputz K	X	
Rendering system Base coat "Grigolin AC 16 UNIRAS" with finishing coat specified below		
MARMORINO Edelstruktur- und Modellierputz GR 100	X	
MARMORINO Edelstruktur- und Modellierputz GR 200		
MARMORINO Edelstruktur- und Modellierputz GR 300		
MARMORINO 2 mm		
SIL4 INTO Grigolin Silikatputz K	X	

[a)] ETICS is freeze-thaw resistant because no defects are observed after freeze-thaw cycles.

3.4 Impact resistance

	Level of damage with single-layered "Grigolin-Gewebe"
Rendering system Base coat "Grigolin Elastischer Klebe- und Armierungsmörtel AC 07 ISOLFLEX" and "Grigolin Elastischer Klebe- und Armierungsmörtel AC 08 ISOLFLEX" with finishing coat specified below	
MARMORINO Edelstruktur- und Modellierputz GR 100	no performance assessed
MARMORINO Edelstruktur- und Modellierputz GR 200	
MARMORINO Edelstruktur- und Modellierputz GR 300	
MARMORINO 2 mm	
SIL4 INTO Grigolin Silikatputz K	$A_{3,w}$
Rendering system Base coat "Grigolin AC 20 UNILIGHT" with finishing coat specified below	
MARMORINO Edelstruktur- und Modellierputz GR 100	$A_{3,w}$
MARMORINO Edelstruktur- und Modellierputz GR 200	
MARMORINO Edelstruktur- und Modellierputz GR 300	
MARMORINO 2 mm	
SIL4 INTO Grigolin Silikatputz K	$A_{3,w}$
Rendering system Base coat "Grigolin AC 16 UNIRAS" with finishing coat specified below	
MARMORINO Edelstruktur- und Modellierputz GR 100	$A_{3,w}$, $B_{10,w}$
MARMORINO Edelstruktur- und Modellierputz GR 200	
MARMORINO Edelstruktur- und Modellierputz GR 300	
MARMORINO 2 mm	
SIL4 INTO Grigolin Silikatputz K	$A_{3,w}$, $A_{10,w}$

Explanation of the given results:

Level of damage:

- A — no cracks (not even hairline cracks) and no defects observed on the test surface for all five impact points
- B — no cracks wider than 0,1 mm and no defects observed on the test surface for five impacts out of five impact points
- C — no cracks wider than 0,2 mm and no defects observed on the test surface for five impacts out of five impact points
- D — cracks wider than 0,2 mm

1st Subscript: The number represents the impact energy level of the test in Joules.

2nd Subscript: Preconditioning before the test:

- HWC — test was performed on the rig subjected to hygrothermal cycles (heating-wetting-cooling)
- HWCFT — test was performed on the rig subjected to hygrothermal cycles (heating-wetting-cooling-freezing and thawing)
- w — specimen was conditioned by immersion in water and then dried

Example:

$C_{3,HWC}$ means that the level of damage C was identified, energy level of the test was 3 J and the test specimen was preconditioned by HWC cycles on the rig

3.5 Water vapour permeability of the rendering system (equivalent air thickness)

Rendering system Base coat "Grigolin AC 16 UNIRAS" with finishing coat specified below	**Equivalent air thickness s_d [m]** Test results obtained with layer thickness of base coat of 4 mm
MARMORINO Edelstruktur- und Modellierputz GR 100 with "UNI-KO GM-Grundierung"	≤ 1.0 m (Test result obtained with layer thickness t = 2.5 mm: 0.07 m)
MARMORINO Edelstruktur- und Modellierputz GR 200 with "UNI-KO GM-Grundierung"	
MARMORINO Edelstruktur- und Modellierputz GR 300 with "UNI-KO GM-Grundierung"	
MARMORINO 2 mm with "UNI-KO GM-Grundierung"	
SIL4 INTO Grigolin Silikatputz K with "UNI-KO GM-Grundierung"	≤ 1.0 m (Test result obtained with layer thickness t = 3 mm: 0.20 m)

The results were obtained using test method EN ISO 7783, method B of clause 6.2.3.

No performance assessed for all other combinations.

Annex 4 – Safety and accessibility in use (BWR 4)

4.0 Description of failure mode

Failure mode	Description
A_{A-S}	Failure between substrate and adhesive
C_A	Failure in adhesive
A_{I-A}	Failure between adhesive and thermal insulation product
C_I	Failure in the thermal insulation product
A_{B-I}	Failure between thermal insulation product and base coat
C_B	Failure in base coat

4.1 Bond strength between the base coat and the thermal insulation product

Thermal insulation product: MW-Lamella		$F_{B-I,dry}$ [kPa][a)]	C_I	A_{B-I}	C_B	$F_{B-I,HWC}$ [kPa][a)]	C_I	A_{B-I}	C_B	$F_{B-I,F-T}$ [kPa]	C_I
Grigolin Elastischer Klebe- und Armierungsmörtel AC 07 ISOLFLEX	$F_{B-I,min,condition}$	80	100	0	0	13	100	0	0	Test not required because freeze/thaw cycles not necessary	
	$F_{B-I,mean,condition}$	80				14					
Grigolin Elastischer Klebe- und Armierungsmörtel AC 08 ISOLFLEX	$F_{B-I,min,condition}$	80	100	0	0	13	100	0	0		
	$F_{B-I,mean,condition}$	80				14					
Grigolin AC 16 UNIRAS	$F_{B-I,min,condition}$	80	100	0	0	5	100	0	0		
	$F_{B-I,mean,condition}$	80				6					
Grigolin AC 20 UNILIGHT	$F_{B-I,min,condition}$	80	90	10	0	64	90	10	0	11	100
	$F_{B-I,mean,condition}$	80				74				14	100

$F_{B-I,dry}$	Initial state without conditioning (drying for at least 28 days)
$F_{B-I,HWC}$	Tested on the rig after HWC (heating-wetting-cooling)
$F_{B-I,F-T}$	The bond strength between the base coat and the thermal insulation product after freeze-thaw cycles
$F_{B-I,min,condition}$	Minimum value of bond strength between base coat and thermal insulation product
$F_{B-I,mean,condition}$	Mean value of bond strength between base coat and thermal insulation product
a)	Minimum 80 kPa for each individual results with adhesive failure (A) or cohesive failure (C) in the base coat. One single value lower than 80 kPa but higher than 60 kPa is accepted.
C_I, A_{B-I}, C_B	Failure mode (percentage of adhesive or cohesive rupture) [%]

4.2 Bond strength between the adhesive and the substrate

Substrate: Concrete		$F_{A\text{-}S,dry}$			$F_{A\text{-}S,2d,2h}$			$F_{A\text{-}S,2d,7d}$		
		[kPa][a)]	$A_{A\text{-}S}$	C_A	[kPa][b)]	$A_{A\text{-}S}$	C_A	[kPa][a)]	$A_{A\text{-}S}$	C_A
Grigolin Elastischer Klebe- und Armierungs-mörtel AC 07 ISOLFLEX (t = 3 - 5 mm)	$F_{A\text{-}S,min,condition}$	396	0	100	561	0	100	1560	0	100
	$F_{A\text{-}S,mean,condition}$	500			660			1860		
Grigolin Elastischer Klebe- und Armierungs-mörtel AC 08 ISOLFLEX (t = 3 - 5 mm)	$F_{A\text{-}S,min,condition}$	299	0	100	512	0	100	1235	0	100
	$F_{A\text{-}S,mean,condition}$	356			578			1321		
Grigolin AC 20 UNILIGHT (t = 3 - 5 mm)	$F_{A\text{-}S,min,condition}$	413	0	100	238	0	100	508	0	100
	$F_{A\text{-}S,mean,condition}$	460			280			560		
Grigolin Basiflex (t = 3 - 5 mm)	$F_{A\text{-}S,min,condition}$	998	0	100	426	30	70	1599	0	100
	$F_{A\text{-}S,mean,condition}$	1202			547			1748		
Grigolin AC 16 UNIRAS (t = 4 mm)	$F_{A\text{-}S,min,condition}$	493	0	100	496	10	90	1485	0	100
	$F_{A\text{-}S,mean,condition}$	549			576			1601		

$F_{A\text{-}S,dry}$	Initial state without conditioning (drying for at least 28 days)
$F_{A\text{-}S,2d,2h}$	Tested after immersion of the adhesive in water for 2 days and 2 hours drying
$F_{A\text{-}S,2d,7d}$	Tested after immersion of the adhesive in water for 2 days and 7 days drying
$A_{A\text{-}S}$, C_A	Failure mode (percentage of adhesive or cohesive rupture) [%]
a)	One single value lower than 250 kPa but higher than 200 kPa is accepted.
b)	One single value lower than 80 kPa but higher than 60 kPa is accepted.
$F_{A\text{-}S,min,condition}$	Minimum value of bond strength between the adhesive and the substrate
$F_{A\text{-}S,mean,condition}$	Mean value of bond strength between the adhesive and the substrate

4.3 Bond strength between the adhesive and the thermal insulation product (MW lamella)

Thermal insulation product: MW-Lamella		$F_{A\text{-}I,dry}$			$F_{A\text{-}I,2d,2h}$			$F_{A\text{-}I,2d,7d}$		
		[kPa]	$A_{I\text{-}A}$ a)	C_I b)	[kPa]	$A_{I\text{-}A}$ c)	C_I d)	[kPa]	$A_{I\text{-}A}$ a)	C_I d)
Grigolin Elastischer Klebe- und Armierungsmörtel AC 07 ISOLFLEX (t = 3 - 5 mm)	$F_{A\text{-}I,min,condition}$	80	0	100	69	0	100	80	0	100
	$F_{A\text{-}I,mean,condition}$	80			73			80		
Grigolin Elastischer Klebe- und Armierungsmörtel AC 08 ISOLFLEX (t = 3 - 5 mm)	$F_{A\text{-}I,min,condition}$	80	0	100	69	0	100	80	0	100
	$F_{A\text{-}I,mean,condition}$	80			73			80		
Grigolin AC 20 UNILIGHT (t = 3 - 5 mm)	$F_{A\text{-}I,min,condition}$	80	10	90	64	5	95	77	5	95
	$F_{A\text{-}I,mean,condition}$	80			66			80		
Grigolin Basiflex	$F_{A\text{-}I,min,condition}$	no performance assessed								
	$F_{A\text{-}I,mean,condition}$									
Grigolin AC 16 UNIRAS (t = 4 mm)	$F_{A\text{-}I,min,condition}$	80	0	100	75	0	100	80	0	100
	$F_{A\text{-}I,mean,condition}$	80			80			80		

$F_{A\text{-}I,dry}$	Initial state without conditioning (drying for at least 28 days)
$F_{A\text{-}I,2d,2h}$	Tested after immersion of the adhesive in water for 2 days and 2 hours drying
$F_{A\text{-}I,2d,7d}$	Tested after immersion of the adhesive in water for 2 days and 7 days drying
$A_{I\text{-}A}$, C_I	Failure mode (percentage of adhesive or cohesive rupture) [%]
a)	The minimum failure resistance value is 80 kPa. One single value lower than 80 kPa but higher than 60 kPa is accepted
b)	The minimum failure resistance value is 30 kPa with respect to the minimum accepted bonded surface, as described below
c)	The minimum failure resistance value is 30 kPa
d)	No limit value
$F_{A\text{-}I,min,condition}$	Minimum value of bond strength between the adhesive and the thermal insulation product
$F_{A\text{-}I,mean,condition}$	Mean value of bond strength between the adhesive and the thermal insulation product

Minimum bonded area for bonded ETICS

The minimum bonded area B_S is 40%, as the minimum given in EAD 040083-01-0404, Clause 1.1 for bonded ETICS.

4.4 Tensile strength perpendicular to the faces of the thermal insulation product in dry conditions

	$\sigma_{mt,mean,dry}$ [kPa]
MW board	
Grigolin MiWo beidseitig beschichtet	≥ 10
Grigolin Putzträgerplatte FKD-LIGHT C2	≥ 7.5
Grigolin Putzträgerplatte FAS 10cc	≥ 10
Grigolin Putzträgerplatte FAS 2cc	≥ 9
Grigolin Putzträgerplatte Sillatherm Light 035	≥ 7.5
Grigolin Putzträgerplatte WVP 1-035 Plus	≥ 3.5
Grigolin Putzträgerplatte WVP 1-035 (60-400)	≥ 3.5
MW lamella	
Grigolin Putzträgerlamelle Speedrock II	≥ 80
Grigolin Putzträgerlamelle WVL 2	≥ 80
Grigolin Putzträgerlamelle FKL C2	≥ 80
Grigolin Putzträgerlamelle FAL 1cc	≥ 80
$\sigma_{mt,mean,dry}$	The mean value of tensile test strength perpendicular to the faces of each thermal insulation type in dry condition

Annex 5 – Protection against noise (BWR 5)

5.1 Dynamic stiffness of the thermal insulation product

MW board

Thickness of the thermal insulation product [mm]	Grigolin MiWo beidseitig beschichtet	Grigolin Putzträgerplatte…					
		FKD-LIGHT C2	FAS 10cc	FAS 2cc	Sillatherm Light 035	WVP 1-035 Plus	WVP 1-035 (60-400)
	Dynamic stiffness s´ [MN/m³]						
60		10	11				12
70		10	11				12
80	11	8	8			9	9
90	11	8	8			9	9
100	11	8	6	15		7	7
110	11	8	6	15		7	7
120	9	6	6	15	6	6	6
130	9	6	5	15	6	6	6
140	9	5	5	10	5	5	5
150	9	5	5	10	5	5	5
160	9	5	4	10	5	5	5
170	9	5	4	10	5	5	5
180	9	4	4	15	4	4	4
190	9	4	4	15	4	4	4
200	6	3	4	15	4	4	4
210	6	3	4			4	4
220	6	3	4			4	4
230	6	3	4			4	4
240	6	3	4			4	4
250	6	3	4				
260	6	3	4				
270	6	3	4				
280	6	3	4				
290	6	3	4				
300	6	3	4				

MW lamella

Thickness of the thermal insulation product [mm]	Grigolin Putzträgerlamelle Speedrock II	Grigolin Putzträgerlamelle WVL 2	Grigolin Putzträgerlamelle FKL C2	Grigolin Putzträgerlamelle FAL 1cc
	Dynamic stiffness s' [MN/m³]			
60	100	140	no performance assessed	no performance assessed
70	100	140		
80	100	105		
90	100	105		
100	100	85		
110	80	85		
120	80	70		80
130	80	70		80
140	80	60		80
150	80	60		80
160	80	60		80
170	60	60		80
180	60	60		60
190	60	60		60
200	60	60		60
210	40			
220	40			
230	40			
240	40			
250 - 400	no performance assessed			

5.2 Air flow resistance of the thermal insulation product

Tradename of the thermal insulation product	Air flow resistance R [kPa · s/m³]
MW board	
Grigolin MiWo beidseitig beschichtet	≥ 40
Grigolin Putzträgerplatte FKD-LIGHT C2	≥ 30
Grigolin Putzträgerplatte FAS 10cc	≥ 40
Grigolin Putzträgerplatte FAS 2cc	≥ 40
Grigolin Putzträgerplatte Sillatherm Light 035	≥ 35
Grigolin Putzträgerplatte WVP 1-035 Plus	≥ 30
Grigolin Putzträgerplatte WVP 1-035 (60-400)	≥ 20
MW lamella	
Grigolin Putzträgerlamelle Speedrock II	≥ 15
Grigolin Putzträgerlamelle WVL 2	≥ 10
Grigolin Putzträgerlamelle FKL C2	no performance assessed
Grigolin Putzträgerlamelle FAL 1cc	≥ 15

Annex 6 – Energy economy and heat retention (BWR 6)

6.1 Thermal resistance of ETICS without influence of mechanical fixing devices

The thermal resistance of the ETICS (R_{ETICS}) is calculated in accordance with EN ISO 6946, cl. 6.7.1.2 without thermal bridges or internal and external surface resistances (R_{si} and R_{se}). It is considering the thermal insulation product ($R_{insulation}$) and the rendering system (R_{render}) as homogenous layers.

$$R_{ETICS} = R_{insulation} + R_{render}\ [(m^2 \cdot K)/W]$$

with: $R_{insulation}$ insulation thickness / thermal conductivity coefficient declared or measured $[(m^2 \cdot K)/W]$

R_{render} 0.02 $(m^2 \cdot K)/W$, in accordance with EN ISO 10456, cl. 8

6.2 Thermal conductivity and thermal resistance of the thermal insulation product

Tradename of the thermal insulation product	**Thickness $t_{insulation}$** [mm]	**Thermal conductivity λ_D** [W/(m·K)]	**Thermal resistance $R_{insulation}$** [(m²·K)/W]
MW board			
Grigolin MiWo beidseitig beschichtet	80 – 300	0.034	$t_{insulation} / \lambda_D$
Grigolin Putzträgerplatte FKD-LIGHT C2	60 – 300	0.034	
Grigolin Putzträgerplatte FAS 10cc	60 – 300	0.034	
Grigolin Putzträgerplatte FAS 2cc	100 – 200	0.034	
Grigolin Putzträgerplatte Sillatherm Light 035	120 – 200	0.034	
Grigolin Putzträgerplatte WVP 1-035 Plus	80 – 240	0.034	
Grigolin Putzträgerplatte WVP 1-035 (60-400)	60 – 240	0.034	
MW lamella			
Grigolin Putzträgerlamelle Speedrock II	60 – 400	0.040	$t_{insulation} / \lambda_D$
Grigolin Putzträgerlamelle WVL 2	60 – 200	0.040	
Grigolin Putzträgerlamelle FKL C2	60 – 400	0.040	
Grigolin Putzträgerlamelle FAL 1cc	60 – 200	0.039	

6.3 Thermal transmittance of fixing devices

The thermal bridges caused by mechanical fixing (anchors, profiles) increases the thermal transmittance U. This influence had to take into account according to EN ISO 6946

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

with U_c corrected thermal transmittance [W/(m² ·K)]

U thermal transmittance of the whole external wall, including ETICS, without thermal bridges

$$U = 1 / (R_{si} + R_{substrate} + R_{ETICS} + R_{se})$$

with:
- R_{si} internal surface thermal resistance [W/(m² ·K)]
- $R_{substrate}$ thermal resistance of the substrate wall [W/(m² ·K)]
- R_{ETICS} thermal resistance of the entire ETICS [W/(m² ·K)]
- R_{se} external surface thermal resistance [W/(m² ·K)]

n number of anchors per m²

χ_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:

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

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

$\chi_p = 0.008$ W/K for all other anchors (worst-case)

Annex 7 – Aspects of durability

7.1 Bond strength after ageing of finishing layers tested on the rig

Test conditioning applied is HWC (heating and wetting (HW) + heating and cooling (HC)).

	$F_{render,min,aged}$ [kPa] a)	$F_{render,mean,aged}$ [kPa] a)	Failure mode C_B	A_{B-I}	C_I
Rendering system Base coat "Grigolin AC 20 UNILIGHT" with finishing coat specified below					
MARMORINO Edelstruktur- und Modellierputz GR 100 with "UNI-KO GM-Grundierung"	67 b)	72	0	5	95
MARMORINO Edelstruktur- und Modellierputz GR 200 with "UNI-KO GM-Grundierung"	67 b)	72	0	5	95
MARMORINO Edelstruktur- und Modellierputz GR 300 with "UNI-KO GM-Grundierung"	67 b)	72	0	5	95
MARMORINO 2 mm with "UNI-KO GM-Grundierung"	67 b)	72	0	5	95
SIL4 INTO Grigolin Silikatputz K with "UNI-KO GM-Grundierung"	66 b)	73	0	20	80

$F_{render,min,aged}$	minimum values of bond strength after ageing
$F_{render,mean,aged}$	mean values of bond strength after ageing
C_B, A_{B-I}, C_I	Failure mode (percentage of adhesive or cohesive rupture (see Annex 4) [%]
a)	Minimum 80 kPa for each individual results with adhesive failure (A) or cohesive failure (C). One single value lower than 80 kPa but higher than 60 kPa is accepted.
b)	The failure resistance is lower than 80 kPa but the failure occurs in the thermal insulation product (cohesive failure).

No performance assessed for all other combinations.

7.2 Bond strength after ageing of finishing layers not tested on the rig

	$F_{render,min,aged}$ [kPa] a)	$F_{render,mean,aged}$ [kPa] a)	Failure mode C_B	A_{B-I}	C_I
Rendering system Base coat "Grigolin Elastischer Klebe- und Armierungsmörtel AC 07 ISOLFLEX" or "Grigolin Elastischer Klebe- und Armierungsmörtel AC 08 ISOLFLEX" with finishing coat specified below					
MARMORINO Edelstruktur- und Modellierputz GR 100	80	81	0	0	100
MARMORINO Edelstruktur- und Modellierputz GR 200	80	81	0	0	100
MARMORINO Edelstruktur- und Modellierputz GR 300	80	81	0	0	100
MARMORINO 2 mm	80	81	0	0	100
SIL4 INTO Grigolin Silikatputz K	15 b)	16 b)	0	0	100
Rendering system Base coat "Grigolin AC 16 UNIRAS" with finishing coat specified below					
MARMORINO Edelstruktur- und Modellierputz GR 100	80	84	0	0	100
MARMORINO Edelstruktur- und Modellierputz GR 200	80	84	0	0	100
MARMORINO Edelstruktur- und Modellierputz GR 300	80	84	0	0	100
MARMORINO 2 mm	80	84	0	0	100
SIL4 INTO Grigolin Silikatputz K with "UNI-KO GM-Grundierung"	86	90	0	0	100

$F_{render,min,aged}$	minimum values of bond strength after ageing
$F_{render,mean,aged}$	mean values of bond strength after ageing
C_B, A_{B-I}, C_I	Failure mode (percentage of adhesive or cohesive rupture (see Annex 4) [%]
a)	Minimum 80 kPa for each individual results with adhesive failure (A) or cohesive failure (C). One single value lower than 80 kPa but higher than 60 kPa is accepted.
b)	The failure resistance is lower than 80 kPa but the failure occurs in the thermal insulation product (cohesive failure).

No performance assessed for all other combinations.

7.3 Tensile strength and elongation of the glass fibre mesh at initial state and after ageing in alkali conditions

"Grigolin-Gewebe"	**Mean value warp**	**Mean value weft**
In as-delivered state		
Tensile strength $R_{50,m,min}$ [N/50 mm]	≥ 2400	≥ 2500
Tensile strength $T_{max,in}$ [kN/m]	≥ 48	≥ 50
Elongation $\varepsilon_{m,in}$ [%]	≥ 3.9	≥ 4.0
After ageing in alkali conditions		
Residual tensile strength $R_{50,m,min}$ [N/50 mm]	≥ 1650	≥ 1900
Residual tensile strength $T_{max,m,alk}$ [kN/m]	≥ 33	≥ 38
Elongation $\varepsilon_{m,alk}$ [%]	≥ 2.9	≥ 3.0