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(English language translation; the original version is in Italian)

GENERAL PART

Trade name of the construction product	**REDART Timber Frame**
Product family to which the construction product belongs	**PAC 04: THERMAL INSULATION PRODUCTS. COMPOSITE INSULATING KITS/SYSTEMS. ETICS with renderings for the use on timber frame buildings**
Manufacturer	**P.W. FAST Sp. z o.o. ul. Foluszowa 112 65-751 Zielona Gora Poland**
Manufacturing plant	**See Annex 1**
This European Technical Assessment contains:	**61 pages including Annexes**
This European Technical Assessment is issued in accordance with Regulation (EU) n° 305/2011, on the basis of	**EAD 0400089-00-04.04 - ETICS with renderings for the use on timber frame buildings**

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SPECIFIC PARTS

1. TECHNICAL DESCRIPTION OF THE PRODUCT

The kit "REDART Timber Frame" realizes an External Thermal Insulation Composite Systems (ETICS) with renderings for the use on timber frame buildings.

The insulation products are limited to different kind of MW (hEN 13162) and, according to 1.2.1 of EAD **040089-00-04.04,** they are mounted on external boards on which they are both mechanically fixed and mechanically fixed with the use of supplementary adhesive (required bonded surface: at least 100%).

The external boards can be: wood-based panels (organic bonding), cement bonded particle boards, fibre-cement panels (cement bonded fibre boards), gypsum bonded particle boards, gypsum plaster boards, fibre-gypsum panels (gypsum bonded fibre boards) and similar products.

The mechanical fixings are anchors or a combination of adhesive and anchors.

The insulation product is faced with a rendering consisting of two layers, one of which contains the reinforcement. The rendering is applied directly to the insulating panels, without any air gap or disconnecting layer. The ETICS is totally site applied.

The ETICS include special fittings (e.g. base profiles, corner profiles, ...) to connect it to adjacent building structures (apertures, corners, parapets, etc, ...).

The ETICS comprises components which are factory-produced by the ETA Holder or by the components' suppliers. ETICS are designed and installed in accordance with the ETA Holder's design and installation instructions.

The kit comprises the components described in the following Table 1. The ETA Holder is ultimately responsible for the kit. The table lists the components without reference to the method of fixing.

Methods of fixings: the system can be mounted as:

- Bonded ETICS with mechanical fixings: the load is distributed both by the bonding layer and by the mechanical fixings. The required bonded surface is 100%; the mechanical fixings are installed after the adhesive has hardened. (National application documents shall be taken into account).

or

- Mechanically fixed: the load is distributed only by the mechanical fixings.

	Component	Trade name	Installation information	
			Coverage	Thickness
Insulation materials	Insulation product according to EN 13162: Annex No. 2 -14 Insulation product characteristics for bonded ETICS with additional mechanical fixing			
Fixings	Adhesive	REDArt Adhesive Plus (ready to use paste)	2.0 to 3.0 kg/m²	//
	Anchors: Selfdrilling screw fastener with galvanic steel anchor	ejotherm STR H	//	Ø of the collar: 60 mm Ø of the nail: 6 mm
	Anchors: Selfdrilling screw fastener with A2 stainless steel anchor	ejotherm STR H A2	//	
	Anchors: Selfdrilling screw fastener with galvanic steel anchor	Fischer termofix 6H-NT	//	
Base coats	Cement based powder requiring addition of water 0.22 l/kg	REDArt Base Coat	4.0 – 6.0 kg/m² (dry)	3.0 - 5.0 mm
	Cement based powder requiring addition of water 0.22 l/kg	REDArt Base Coat Plus	5.0 – 7.0 kg/m² (dry)	3.0 - 5.0 mm
	Cement based powder requiring addition of water 0.24 – 0.26 l/kg	ROCKWOOL REDArt Masă de șpaclu	4.0 – 6.0 kg/m² (dry)	3.0 - 6.0 mm

	Cement based powder requiring addition of water 0.22 l/kg	REDArt Base Coat Casa	5.0 – 7.0 kg/m² (dry)	3.0 - 5.0 mm
Key coats	Ready to use liquid, to be used under mineral, silicone and acrylic renderings	REDArt Mineral Primer	0.35 lt/m²	100 -120 µ
	Ready to use liquid, to be used under silicone and mineral renderings	REDArt Silicone Primer		
	Ready to use liquid, to be used under silicate renderings	REDArt Silicate Primer		
	Ready to use liquid, to be used under silicate protective coat	REDArt Silicate Paint Primer	0.08 - 0.10 (l/m²) per layer	100 -120 µ
	Ready to use liquid, to be used under silicone protective coat	REDArt Silicone Paint Primer	0.05 - 0.17 (l/m²) per layer	100 -120 µ
	Ready to use liquid, to be used under silicone renderings dilute with up to 10% of potable water	ROCKWOOL REDArt Amorsă Siliconică pentru Tencuială Decorativă	0.25 –0.30	100 -120 µ
Reinforcements	Standard mesh applied in one or two layers	AKE 145A / R 117 A101		
		AKE 160 / R 131 A101		
		117S		
		122		
		SECCO E 145		
		SECCO E 160		
		REDNET E 145		
		REDNET E 160		
		Valmieras SSA-1363-160		
		Vitrulan SD.4420G/55		

Finishing coat	Powder - mineral binder: (optionally provided with one of the protective paints including a relevant key coat)	REDArt Mineral Top Coat - spotted (particle size 2.0; 2.5; 3.0 mm) powder requiring addition of water 0.20 - 0.22 l/kg	2.2 to 3.85 kg/m²	Regulated by particle size
		REDArt Mineral Top Coat - drilled ribbed structure (particle size 2.0; 3.0 mm) powder requiring addition of water 0.20 - 0.22 l/kg	2.2 to 3.5 kg/m²	Regulated by particle size
		REDArt Mineral Smooth Top Coat powder requiring addition of water 0.22 – 0.28 l/kg	3.0 to 4.5 kg/m²	2.0 – 3.0
	Ready to use paste - silicate binder	REDArt Silicate Top Coat - spotted grain structure (particle size 1.0; 1.5; 2.0 mm)	1.7 to 3.5 kg/m²	Regulated by particle size
		REDArt Silicate Top Coat - drilled ribbed structure (particle size 2.0; 3.0 mm)	2.8 to 3.5 kg/m²	Regulated by particle size
	Ready to use paste – silicone binder	REDArt Silicone Top Coat - spotted grain structure (particle size 1.0; 1.5; 2.0 mm)	1.7 to 3.5 kg/m²	Regulated by particle size
		REDArt Silicone Top Coat - Drilled ribbed structure (particle size 2.0; 3.0 mm)	2.8 to 3.5 kg/m²	Regulated by particle size
	Ready to use paste - acrylic binder	REDArt Granite Top Coat - mosaic structure (particle size 1.5 mm)	3.5 to 5.0 kg/m²	Regulated by particle size
	Ready to use paste – acrylic-siliconic binder	ROCKWOOL REDArt Tencuială decorative : Siliconică Granulată Spotted grain structure particle size (1.0, 1.5, 2.0 mm)	1.8 - 2.7 kg/m² according to max. particle size	according to max. particle size
		ROCKWOOL REDArt Tencuială Decorativă : Siliconică Structurată Drilled ribbed structure	1.3 - 2.5 according to max. particle size	according to max. particle size
Protective coat	Silicate protective coat ready to use liquid, two layers, dilute up to 5 % of volume with REDArt Silicate Paint Primer	REDArt Silicate Paint	0.10 - 0.20 (l/m²) per layer	100 -120 µ
	Silicone protective coat ready to use liquid. one or two layers, first layer to be diluted up to 10 % of volume with water	REDArt Silicone Paint	0.12 (l/m²) per layer	100 -120 µ

Tab. 1a: Components of the kit

The possible combinations of the above listed components are the following:

- the adhesive is always the same for all combinations;
- the insulation products can all be used with all the rendering systems
- the 3 base coats REDArt Base Coat, REDArt Base Coat Plus , REDArt Base Coat casa can be used with all finishing coats but not with ROCKWOOL REDArt Tencuială decorative - Siliconică Granulată Spotted and ROCKWOOL REDArt Tencuială Decorativă: Siliconică Structurată Drilled ribbed structure
- the base ROCKWOOL REDArt Masă de șpaclu can be used only with the finishing coats ROCKWOOL REDArt Tencuială decorative - Siliconică Granulată Spotted and ROCKWOOL REDArt Tencuială Decorativă : Siliconică Structurată Drilled ribbed structure
- all reinforcements can be used in all the rendering systems
- the 10 finishing coats and the key coats can be combined as follows:

<table>
<tr><th>Key coat</th><th>Finishing coat</th><th colspan="2">Protective coat</th></tr>
<tr><td rowspan="3">REDArt Mineral Primer</td><td>REDArt Mineral Top Coat - spotted</td><td>REDArt Silicate Paint Primer *</td><td>REDArt Silicate Paint</td></tr>
<tr><td>REDArt Mineral Top Coat – drilled ribbed structure</td><td>REDArt Silicone Paint Primer *</td><td>REDArt Silicone Paint</td></tr>
<tr><td>REDArt Mineral Smooth Top Coat</td><td colspan="2">*Both Silicate and Silicone based primers and paints could be used with the 3 mineral top coats</td></tr>
<tr><td rowspan="3">REDArt Silicone Primer</td><td>REDArt Silicone Top Coat – spotted grain structure</td><td colspan="2" rowspan="7">-</td></tr>
<tr><td>REDArt Silicone Top Coat – Drilled ribbed structure</td></tr>
<tr><td>REDArt Granite Top Coat - mosaic structure</td></tr>
<tr><td rowspan="2">REDArt Silicate Primer</td><td>REDArt Silicate Top Coat – spotted grain structure</td></tr>
<tr><td>REDArt Silicate Top Coat – drilled ribbed structure</td></tr>
<tr><td rowspan="2">ROCKWOOL REDArt Amorsă Siliconică pentru Tencuială Decorativă</td><td>ROCKWOOL REDArt Tencuială decorative : Siliconică Granulată Spotted</td></tr>
<tr><td>ROCKWOOL REDArt Tencuială Decorativă : Siliconică Structurată Drilled ribbed structure</td></tr>
</table>

Tab. 1b: comination of key coat and finishing coats

2. SPECIFICATION OF THE INTENDED USE IN ACCORDANCE WITH EUROPEAN ASSESSMENT DOCUMENT N° EAD 040089-00-04.04

"REDART Timber Frame" in its alternatives is intended for use as external thermal insulation composite system with renderings to be used on timber frame buildings. The insulation products are limited to different kind of MW (hEN 13162).

The kit can be used on vertical walls. It can also be used on horizontal or inclined surfaces which are not exposed to precipitation. It is made of non load-bearing construction elements and the installed system 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 installed system is not intended to ensure the air tightness of the building structure.

The provisions made in this ETA are based on an assumed intended working life of at least 25 years, provided that the requirements of the ETA holder regarding the transport, storage and use of the product are met.

The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer or by the Technical Assessment Body, but should only be regarded as a means for choosing the appropriate products in relation to the expected economically reasonable working life of the works.

3. PERFORMANCE OF THE PRODUCT AND REFERENCES TO THE METHODS USED FOR ITS ASSESSMENT

The tests for the assessment of the performances of "REDART Timber Frame" were carried out according to the tests mentioned in the EAD; the performances are valid only if the kit's components are exactly the ones mentioned at § 1 of this ETA.

3.1 SAFETY IN CASE OF FIRE

3.1.1 Reaction to fire "REDART Timber Frame"

The reaction to fire has been determined according with § 2.2.1.1 and to Annex A of EAD; the following test were performed:

- SBI test
- Test according to EN 11925-2
- Test for determination of gross heat of combustion (calorific value), according to § 3 of EAD.

<u>"REDART Timber Frame" with REDArt Adhesive Plus and MW Frontrock Casa</u>

The system, as defined under clause 1, reached the Euroclass according Commission Delegated Regulation (EU) No 2016/364 and in particular to EN 13501-1.

REDArt Timber Frame Bonded + mechanical fixings	Organic content of the rendering system (%)	Flame retardant content of the rendering system (%)	Maximum thickness (mm)	Class
REDArt Adhesive Plus MW Frontrock Casa (60 mm) Base coat Plus (3 mm) Finishing Silicone Top Coat (2 mm)	base coat: 3% finishing coat: 5.2%	0	60	**A2 – s2, d0**

Tab. 2: Reaction to fire REDArt Timber Frame Bonded + mechanical fixings

Mounting and fixing (for all end use applications given in 2 of this ETA)

The assessment of reaction to fire is based on tests with a maximum insulation layer thickness of SBI/60 mm, EN 11925-2/60 mm and a maximum insulation material (MW) density of 85.5 kg/m^3, as well as a rendering system with a maximum organic content of 8.20% and a thickness of 5 mm. For the SBI test the system was mounted directly to a Plywood board EN 636-3 (D-s2, d0) with a minimum density of 450 kg/m^3.

The mounting of the specimen was carried out at ITC-CNR Laboratory by the Manufacturer following the specifications given in his ETA Technical Dossier and in his Recommendations, using a single layer of the glass fibre mesh all over the specimen (without overlapping the mesh). The specimen didn't include any joints; the panel edges were rendered, excluding the bottom edge and the top of the specimen

REDArt Timbe Frame with REDArt Adhesive Plus and MW Ecorock
The system, as defined under clause 1, reached the Euroclass according Commission Delegated Regulation (EU) No 2016/364 and in particular to EN 13501-1.

REDArt Timber Frame Bonded + mechanical fixings	Organic content of the rendering system (%)	Flame retardant content of the rendering system (%)	Maximum thickness (mm)	Class
REDArt Adhesive Plus MW Ecorock (180 mm) Base Coat Plus (3 mm) Finishing Silicone Top Coat (1 mm)	base coat: 3% finishing coat: 5.2%	0	180	**A2 – s2, d0**

Tab. 3: Reaction to fire REDArt Timber Frame Bonded + mechanical fixings

Mounting and fixing (for all end use applications given in 2 of this ETA)
The assessment of reaction to fire is based on tests with a maximum insulation layer thickness of SBI/180 mm, EN 11925-2/60 mm and a maximum insulation material (MW) density of 102.00 kg/m^3, as well as a rendering system with a maximum organic content of 8.20% and a thickness of 4 mm. For the SBI test the system was mounted directly to a Plywood board EN 636-3 (D-s2, d0) with a minimum density of 450 kg/m^3.
The mounting of the specimen was carried out at ITC-CNR Laboratory by the Manufacturer following the specifications given in his ETA Technical Dossier and in his Recommendations, using a single layer of the glass fibre mesh all over the specimen (without overlapping the mesh). The specimen didn't include any joints; the panel edges were rendered, excluding the bottom edge and the top of the specimen.

REDArt Timber Frame with MW Frontrock Casa (mechanically fixed)
The system, as defined under clause 1, reached the Euroclass according Commission Delegated Regulation (EU) No 2016/364 and in particular to EN 13501-1.

REDArt Timber Frame Mechanical fixed	Organic content of the rendering system (%)	Flame retardant content of the rendering system (%)	Maximum thickness (mm)	Class
MW Frontrock Casa (60 mm) Base coat Plus (3 mm) Finishing Silicone Top Coat (1 mm)	base coat: 3% finishing coat: 5.2%	0	60	**A2 – s1, d0**

Tab. 4: Reaction to fire REDArt Timber Frame Mechanical fixings

Mounting and fixing (for all end use applications given in 2 of this ETA)
The assessment of reaction to fire is based on tests with a maximum insulation layer thickness of SBI/60 mm, EN 11925-2/60 mm and a maximum insulation material (MW) density of 85.5 kg/m^3, as well as a rendering system with a maximum organic content of 8.20% and a thickness of 4 mm. For the SBI test the system was mounted directly to a Plywood board EN 636-3 (D-s2, d0) with a minimum density of 450 kg/m^3.
The mounting of the specimen was carried out at ITC-CNR Laboratory by the Manufacturer following the specifications given in his ETA Technical Dossier and in his Recommendations, using a single layer of the glass fibre mesh all over the specimen (without overlapping the mesh). The specimen

didn't include any joints; the panel edges were rendered, excluding the bottom edge and the top of the specimen.

REDArt Timber Frame Mechanical fixed	Organic content of the rendering system (%)	Flame retardant content of the rendering system (%)	Maximum thickness (mm)	Class
MW Panneau 431 (160 mm) Base Coat (5 mm) Finishing Silicone Top Coat (2 mm)	base coat: 3% finishing coat: 5.2%	0	160	**A2 – s1, d0**

Tab. 5: Reaction to fire REDART TIMBER FRAME Mechanical fixings

Mounting and fixing (for all end use applications given in 2 of this ETA)
The assessment of reaction to fire is based on tests with a maximum insulation layer thickness of SBI/160 mm, EN 11925-2/60 mm and a maximum insulation material (MW) density of 155 kg/m^3, as well as a rendering system with a maximum organic content of 8.20% and a thickness of 7 mm. For the SBI test the system was mounted directly to a Plywood board EN 636-3 (D-s2, d0) with a minimum density of 450 kg/m^3.
The mounting of the specimen was carried out at CSTB Laboratory by the Manufacturer following the specifications given in his ETA Technical Dossier and in his Recommendations, using a single layer of the glass fibre mesh all over the specimen (without overlapping the mesh). The specimen didn't include any joints; the panel edges were rendered, excluding the bottom edge and the top of the specimen.

Extended application
The test result covers arrangements with:
- base coats and finishing coats:
- with equal or less organic content,
- with thickness between those evaluated in the test if the organic content is higher than 5%.
- key coats:
- with equal or less organic content,
- adhesives:
- with equal or less organic content and equal or less thickness if the organic content is equal to
- or less than 15%,
- reinforcements:
- with an equal or less PCS_S-value per unit area
- with equal or higher weight per unit area.
- insulation:
- of the same type,
- with thickness and densities between those evaluated in the tests,
- with equal or less organic content.

3.1.2 Reaction to fire of mechanical fixings
No Performance Determined.

3.1.3 Reaction to fire of of insulation products
See Annex 2-14 of this ETA.

3.2 HYGIENE, HEALTH AND THE ENVIRONMENT

3.2.1 Water absorption (capillarity test) of the system

The water absorption has been determined in accordance with § 2.2.2.1 of EAD.

with "REDArt Base Coat"	Water absorption after 1 hour [kg/m²] (average value)	Water absorption after 24 hours [kg/m²] (average value)
REDArt Base Coat (without finishing coat)	< 1.0 kg/m²	< 0.5 kg/m²
REDArt Mineral Top Coat - spotted,mineral finishing coat max. particle size 3.0 mm with silicate protective coat REDArt Silicate Paint	< 1.0 kg/m²	< 0.5 kg/m²
REDArt Mineral Top Coat - spotted,mineral finishing coat max. particle size 3.0 mm with silicone protective coat REDArt Silicone Paint	< 1.0 kg/m²	< 0.5 kg/m²
REDArt Mineral Top Coat - drilled,mineral finishing coat max. particle size 3.0 mm with silicate protective coat REDArt Silicate Paint	< 1.0 kg/m²	< 0.5 kg/m²
REDArt Mineral Top Coat - drilled,mineral finishing coat max. particle size 3.0 mm with silicone protective coat REDArt Silicone Paint	< 1.0 kg/m²	< 0.5 kg/m²
REDArt Mineral Smooth Top Coat,mineral finishing coat with silicate protective coat REDArt Silicate Paint	< 1.0 kg/m²	< 0.5 kg/m²
REDArt Silicate Top Coat - drilled, silicate finishing coat max. particle size 3.0 mm	< 1.0 kg/m²	> 0.5 kg/m²
REDArt Silicone Top Coat, silicone finishing coat max. particle size 3.0 mm	< 1.0 kg/m²	< 0.5 kg/m²
REDArt Granite Top Coat, acrylic mosaic finishing coat max. particle size 1.5 mm	< 1.0 kg/m²	< 0.5 kg/m²

Tab. 6: Water absorption of base coat on insulation product and of rendering systems

With REDArt Base Coat Plus	Water absorption after 1 hour [kg/m²] (average value)	Water absorption after 24 hours [kg/m²] (average value)
REDArt Base Coat Plus (without finishing coat)	< 1.0 kg/m²	< 0.5 kg/m²
REDArt Mineral Top Coat - drilled, mineral finishing coat max. particle size 3.0 mm with silicate protective coat REDArt Silicate Paint	< 1.0 kg/m²	< 0.5 kg/m²
REDArt Mineral Top Coat - drilled, mineral finishing coat max. particle size 3.0 mm with silicone protective coat REDArt Silicone Paint	< 1.0 kg/m²	< 0.5 kg/m²
REDArt Mineral Smooth Top Coat, mineral finishing coat with silicate protective coat REDArt Silicate Paint	< 1.0 kg/m²	< 0.5 kg/m²
REDArt Silicate Top Coat - drilled, silicate finishing coat max. particle size 3.0 mm	< 1.0 kg/m²	< 0.5 kg/m²
REDArt Silicone Top Coat - drilled, silicone finishing coat max. particle size 3.0 mm	< 1.0 kg/m²	< 0.5 kg/m²
REDArt Granite Top Coat, acrylic mosaic finishing coat max. particle size 1.5 mm	< 1.0 kg/m²	< 0.5 kg/m²

Tab. 7: Water absorption of base coat on insulation product and of rendering systems

With ROCKWOOL REDArt Masa de spalcu	Water absorption after 1 hour [kg/m²] (average value)	Water absorption after 24 hours [kg/m²] (average value)
ROCKWOOL REDArt Masă de șpaclu (without finishing coat)	< 1.0 kg/m²	< 0.5 kg/m²
ROCKWOOL REDArt Tencuială decorativă Siliconică Granulată max. particle size 2.0 mm	< 1.0 kg/m²	< 0.5 kg/m²

Tab. 8: Water absorption of base coat on insulation product and of rendering systems

With REDArt Base Coat Casa	Water absorption after 1 hour [kg/m²] (average value)	Water absorption after 24 hours [kg/m²] (average value)
ROCKWOOL Base Coat Casa (without finishing coat)	< 1.0 kg/m²	< 0.5 kg/m²
REDArt Mineral Top Coat - spotted,mineral finishing coat max. particle size 2.5 mm with silicate protective coat REDArt Silicate Paint	< 1.0 kg/m²	< 0.5 kg/m²

REDArt Mineral Top Coat - spotted,mineral finishing coat max. particle size 2.5 mm with silicone protective coat REDArt Silicone Paint	< 1.0 kg/m^2	< 0.5 kg/m^2
REDArt Mineral Smooth Top Coat, mineral finishing coat max. particle size 3.0 mm with silicate protective coat REDArt Silicate Paint	< 1.0 kg/m^2	< 0.5 kg/m^2
REDArt Silicate Top Coat - drilled, silicate finishing coat max. particle size 3.0 mm	< 1.0 kg/m^2	< 0.5 kg/m^2
REDArt Silicone Top Coat, silicone finishing coat max. particle size 3.0 mm	< 1.0 kg/m^2	< 0.5 kg/m^2
REDArt Granite Top Coat, acrylic mosaic finishing coat max. particle size 1.5 mm	< 1.0 kg/m^2	< 0.5 kg/m^2

Tab. 9: Water absorption of base coat on insulation product and of rendering systems

3.2.2 Water tightness: Hygrothermal behaviour (heat-rain and heat-cold cycles)

In accordance with the method envisaged in § 2.2.2.2 of EAD, the kit has been applied on rig and the hygrothermal behaviour of the system has been assessed.

None of the following defects occurred:

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

Assessment: the system "REDART Timber Frame" is resistant to hygrothermal cycles.

3.2.3 Freeze/thaw resistance for the alternative Redart Base coat with REDArt Silicate Top Coat

Freeze/thaw resistance of system with finishing coats that proved to have higher value of water absorption than 0.5 kg/m^2 after 24 hours, was tested by simulation freeze/thaw resistance according to § 2.2.2.3.

None of the following defects occurred on the assessed external renderings or the base coat during and after the tests:

1) Blistering or peeling of any part of the rendering system
2) Failure or cracking associated with joints between the insulation product boards or profiles fitted with the system
3) Detachment of the external rendering
4) Cracking allowing water penetration into the insulation layer.

3.2.4 Water tightness: Moisture content and gradient

No Perfomance Determined.

3.2.5 Water penetration of ETICS

No Performance Determined.

3.2.6 Water vapour permeability (Resistance to water vapour diffusion)

The water vapour permeability has been determined in accordance with § 2.2.2.6 of EAD.

Base coat type: **REDArt Base Coat 3 mm**

Composition of the tested system:

- Base coat — REDArt Base Coat, average thickness 3 mm
- Fibre glass mesh — 1 × AKE 145A / R117 A101
- Key coat — adequate to finishing coat
- Finishing coats — defined directly in the table.

	Equivalent air thickness sd (m – average value)
REDArt Mineral Top Coat - drilled, mineral finishing coat max. particle size 3.0 mm - with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	0.16
REDArt Mineral Smooth Top Coat, mineral finishing coat max. particle size 1.0 mm, thickness 3.0 mm with protective coat REDart Silicate Paint including key coat REDArt Silicate Paint Primer	0.42
REDArt Silicate Top Coat - drilled, silicate finishing coat, max. particle size 3.0 mm	0.13
REDArt Silicone Top Coat - drilled silicone finishing coat max. particle size 3.0 m	0.19
REDArt Granite Top Coat, acrylic mosaic coat max. particle size 1.5 mm	0.37

Tab. 10: Water vapour permeability

Base coat type: **REDArt Base Coat 5 mm**

Composition of the tested system:

- Base coat — REDArt Base Coat, average thickness 5 mm
- Fibre glass mesh — 2 × AKE 145A / R117 A101
- Key coat — adequate to finishing coat
- Finishing coats — defined directly in the table.

	Equivalent air thickness sd (m – average value)
REDArt Mineral Top Coat - drilled, mineral finishing coat max. particle size 3.0 mm with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	0.25
REDArt Mineral Smooth Top Coat, mineral finishing coat, max. particle size 1.0 mm, thickness 3.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	0.51
REDArt Silicate Top Coat - drilled, silicate finishing coat - max. particle size 3.0 mm	0.34
REDArt Silicone Top Coat - drilled, silicone finishing coat max. particle size 3.0 mm	0.37
REDArt Granite Top Coat, acrylic mosaic finishing coat max. particle size 1.5 mm	0.42

Tab. 11: Water vapour permeability

Base coat type: **REDArt Base Coat Plus 3 mm**

Composition of the tested system:

- Base coat	REDArt Base Coat Plus, average thickness 3 mm
- Fibre glass mesh	1 × AKE 145A / R117 A101
- Key coat	adequate to finishing coat
- Finishing coats	defined directly in the table.

	Equivalent air thickness sd (m – average value)
REDArt Mineral Top Coat - spotted, mineral finishing coat max. particle size 3.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	0.28
REDArt Mineral Top Coat - spotted, mineral finishing coat max. particle size 3.0 mm with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	0.30
REDArt Mineral Smooth Top Coat, mineral finishing coat max. particle size 1.0 mm, thickness 3.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	0.27
REDArt Silicate Top Coat - drilled, silicate finishing coat, max. particle size 3.0 mm	0.33
REDArt Silicone Top Coat - drilled, silicone finishing coat max. particle size 3.0 mm	0.44
REDArt Granite Top Coat, acrylic mosaic coat max. particle size 1.5 mm	0.51

Tab. 12: Water vapour permeability

Base coat type: **REDArt Base Coat Plus 5 mm**

Composition of the tested system:

- Base coat	REDArt Base Coat Plus, average thickness 5 mm
- Fibre glass mesh	2 × AKE 145A / R117 A101
- Key coat	adequate to finishing coat
- Finishing coats	defined directly in the table.

	Equivalent air thickness sd (m – average value)
REDArt Mineral Top Coat - spotted, mineral finishing coat max. particle size 3.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	0.33
REDArt Mineral Top Coat - spotted, mineral finishing coat max. particle size 3.0 mm with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	0.35
REDArt Mineral Smooth Top Coat, mineral finishing coat max. particle size 1.0 mm, thickness 3.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	0.38
REDArt Silicate Top Coat - drilled, silicate finishing coat, max. particle size 3.0 mm	0.40

REDArt Silicone Top Coat - drilled, silicone finishing coat max. particle size 3.0 mm	0.48
REDArt Granite Top Coat, acrylic mosaic coat max. particle size 1.5 mm	0.61

Tab. 13: Water vapour permeability

Base coat type: **REDArt Base Coat Casa**

Composition of the tested system:

- Base coat — **REDArt Base Coat Casa**, average thickness 5 mm
- Fibre glass mesh — 2 × AKE 145 A/R 117 A101
- Key coat — adequate to finishing coat
- Finishing coats — defined directly in the table

	Equivalent air thickness sd (m – average value)
REDArt Mineral Top Coat - spotted, mineral finishing coat max. particle size 2.5 mm with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	0.24
REDArt Mineral Smooth Top Coat, mineral finishing coat max. particle size 1.0 mm, thickness 3.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	0.30
REDArt Silicate Top Coat - drilled, silicate finishing coat, max. particle size 3.0 mm	0.36
REDArt Silicone Top Coat - drilled, silicone finishing coat max. particle size 3.0 mm	0.42

Tab. 14: Water vapour permeability

Base coat type: **ROCKWOOL REDArt Masă de șpaclu 3 mm**

Composition of the tested system:

- Base coat — ROCKWOOL REDArt Masă de șpaclu, average thickness 3 mm
- Fibre glass mesh — 1 × Vitrulan SD.4420G/55
- Key coat — ROCKWOOL REDArt Amorsă Siliconică pentru Tencuială Decorativă
- Finishing coats — defined directly in the table.

	Equivalent air thickness sd (m – average value)
ROCKWOOL REDArt Tencuială decorative : Siliconică Granulată Spotted - max. particle size 2.0 mm	0.39

Tab. 15: Water vapour permeability

Base coat type: **ROCKWOOL REDArt Masă de șpaclu 6 mm**

Composition of the tested system:

- Base coat — ROCKWOOL REDArt Masă de șpaclu, average thickness 6 mm
- Fibre glass mesh — 2 × Vitrulan SD.4420G/55
- Key coat — ROCKWOOL REDArt Amorsă Siliconică pentru Tencuială Decorativă
- Finishing coats — defined directly in the table.

	Equivalent air thickness sd (m – average value)
ROCKWOOL REDArt Tencuială decorative: Siliconică Granulată Spotted - max. particle size 2.0 mm	0.50

Tab. 16: Water vapour permeability

3.2.7 Water absoption of insulation product (according to § 2.2.2.7 of EAD)

See Annex 2-14 of this ETA.

3.2.8 Water permeability of insulation product (according to § 2.2.2.8 of EAD)

See Annex 2-14 of this ETA.

3.3 SAFETY IN USE

3.3.1 Bond strength between the base coats and the insulation products in dry conditions and after ageing

The bond strength has been determined in accordance with § 2.2.3.1 of EAD. Not all the base coats were tested in all the possible combinations: the worst cases were taken into consideration as much as possible; see overview below.

Base Coat	Panel TR	Test
REDArt Base coat	TR 80	Tested
	TR 15	Tested
	TR 10	NPD
	TR 7,5	NPD
	TR 5	Tested
REDArt Base coat Plus	TR 80	Tested (only in dry conditions)
	TR 15	NPD
	TR 10	NPD
	TR 7,5	NPD
	TR 5	Tested (only after aging)
REDArt Base coat Casa	TR 80	Tested (only in dry conditions)
	TR 15	NPD
	TR 10	Tested (only after aging)
	TR 7,5	Tested (only after aging)
	TR 5	Tested
REDArt Masă de șpaclu	TR 80	NPD
	TR 15	NPD
	TR 10	Tested (only in dry conditions)
	TR 7,5	Tested (only after aging)
	TR 5	Tested (only in dry conditions)

Bond strength between:	Medium results (MPa)
base coat "REDArt Base coat" and insulation product MW Board TR15: - under dry conditions - after ageing in the rig	 Failure in insulation Failure in insulation
base coat "REDArt Base coat" and insulation product MW Lamella TR80: - under dry conditions - after ageing in the rig	 ≥ 0.08 Failure in insulation
base coat "REDArt Base coat" and insulation product MW Board TR5: - under dry conditions - after ageing in the rig	 Failure in insulation Failure in insulation
base coat "REDArt Base coat Plus" and insulation product MW Board TR5: - under dry conditions - after ageing in the rig	 NPD Failure in insulation
base coat "REDArt Base coat Plus" and insulation product MW Lamella TR80: - under dry conditions - after ageing in the rig	 ≥ 0.08 NPD
base coat "REDArt Masă de șpaclu" and insulation product Max Plus TR7,5: - under dry conditions - after ageing in the rig	 NPD Failure in insulation
base coat "REDArt Masă de șpaclu" and insulation product MAX E TR10: - under dry conditions - after ageing in the rig	 Failure in insulation NPD
base coat "REDArt Masă de șpaclu" and insulation product Frontrock Casa TR5: - under dry conditions - after ageing in the rig	 Failure in insulation NPD
base coat "REDArt Base coat Casa" and insulation product MW TR80: - under dry conditions - after ageing in the rig	 Failure in insulation NPD
base coat "REDArt Base coat Casa" and insulation product Ecorock Mono TR10: - under dry conditions - after ageing in the rig	 NPD Failure in insulation
base coat "REDArt Base coat Casa" and insulation product Frontrock Max Plus TR7,5: - under dry conditions - after ageing in the rig	 NPD Failure in insulation
base coat "REDArt Base coat Casa" and insulation product Coverrock TR5: - under dry conditions - after ageing in the rig	 Failure in insulation NPD
base coat "REDArt Base coat Casa" and insulation product Frontrock Casa TR5: - under dry conditions - after ageing in the rig	 Failure in insulation Failure in insulation

Tab. 17: Bond strength between the base coat and the insulation products

Note: The Fixing strength (transverse displacement) is not required because the ETICS fulfils one of the criteria given in § 2.2.3.5 of EAD: E x d < 50 000 N/mm (E: modulus of elasticity of the base coat without mesh; d: thickness of the base coat). See Evaluation Report related to this ETA.

3.3.2 Wind load resistance of mechanically fixed ETICS

3.3.2.1 Pull-through test of fixings (according to § 2.2.3.6.1 of EAD)

The following failure loads only apply to the listed combination (MW panel's characteristics) / (anchor plate's characteristics) and the characteristics of the insulation product given in annexes 2-14 of this ETA. For those insulation product panels whose tensile strength in wet conditions results more than 80% of that determined in dry conditions, the Pull-through test has been carried out in wet conditions according to § 2.2.3.6 /"28 days exposure" of EAD. See tables below.

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW TR15 – surface assembly			
Characteristics of the insulation product	Thickness (mm)		60 mm
	Tensile strength perpendicular to the face (kPa)		TR 15
Plate diameter (mm)			60
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.412 Average: 0.434
	Anchors not placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.346 Average: 0.365
	Anchors placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.286 Average: 0.304

Tab. 18: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW TR15 - surface assembly			
Characteristics of the insulation product	Thickness (mm)		100 mm
	Tensile strength perpendicular to the face (kPa)		TR 15
Plate diameter (mm)			60
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	Rpanel	Minimal: 0.707 Average: 0.759
	Anchors placed at the panel joints (Pull-through test) Dry condition	Rpanel	Minimal: 0.477 Average: 0.574

Tab. 19: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW Frontrock MAX E - surface assembly			
Characteristics of the insulation product	Thickness (mm)		80 mm
	Tensile strength perpendicular to the face (kPa)		TR 10
Plate diameter (mm)			60
	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.470 Average: 0.513

Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.260 Average: 0.292
	Anchors placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.349 Average: 0.402
	Anchors placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.206 Average: 0.225

Tab. 20: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW Frontrock MAX E - surface assembly			
Characteristics of the insulation product	Thickness (mm)		80 mm
	Tensile strength perpendicular to the face (kPa)		TR 10
Plate diameter (mm)			90
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.593 Average: 0.663
	Anchors not placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.290 Average: 0.314
	Anchors placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.235 Average: 0.271

Tab. 21: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW Frontrock Reno - surface assembly			
Characteristics of the insulation product	Thickness (mm)		80 mm
	Tensile strength perpendicular to the face (kPa)		TR 10
Plate diameter (mm)			60
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.312 Average: 0.341

Tab. 22: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW Ecorock MONO/RockSATE MD Plus - surface assembly			
Characteristics of the insulation product	Thickness (mm)		50 mm
	Tensile strength perpendicular to the face (kPa)		TR 10
Plate diameter (mm)			60
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.444 Average: 0.475
	Anchors placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.400 Average: 0.404

Tab. 23: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW Ecorock MONO/RockSATE MD Plus - surface assembly			
Characteristics of the insulation product	Thickness (mm)		120 mm
	Tensile strength perpendicular to the face (kPa)		TR 10
Plate diameter (mm)			60
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 1.023 Average: 1.044
	Anchors placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.500 Average: 0.679

Tab. 24: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW Frontrock MAX E (TR10) - countersunk assembly			
Characteristics of the insulation product	Thickness (mm)		100 mm
	Tensile strength perpendicular to the face (kPa)		TR 10
Plate diameter (mm)			60
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.312 Average: 0.366
	Anchors placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.331 Average: 0.377

Tab. 25: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW Frontrock MAX E (TR10) - countersunk assembly			
Characteristics of the insulation product	Thickness (mm)		100 mm
	Tensile strength perpendicular to the face (kPa)		TR 10
Special countersunk plate diameter (mm)			110
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.873 Average: 0.922
	Anchors placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.895 Average: 0.934

Tab. 26: Failure loads (kN)

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW Ecorock Mono/RockSATE MD Plus (TR10) - countersunk assembly			
Characteristics of the insulation product	Thickness (mm)		80 mm
	Tensile strength perpendicular to the face (kPa)		TR 10
Plate diameter (mm)			60
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.335 Average: 0.384

Tab. 27: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW double density panel Frontrock MAX E (TR 7.5) - surface assembly			
Characteristics of the insulation product	Thickness (mm)		60 mm
	Tensile strength perpendicular to the face (kPa)		TR 7.5
Plate diameter (mm)			60
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.372 Average: 0.402
	Anchors not placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.318 Average: 0.330
	Anchors placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.354 Average: 0.360
	Anchors placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.277 Average: 0.290

Tab. 28: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW MAX Plus/Ecorock Duo/RockSATE Duo Plus (TR 7.5) - surface assembly			
Characteristics of the insulation product	Thickness (mm)		50 mm
	Tensile strength perpendicular to the face (kPa)		TR 7.5
Plate diameter (mm)			60
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.339 Average: 0.365
	Anchors not placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.198 Average: 0.229

Tab. 29: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW Frontrock Casa (TR 5) - surface assembly			
Characteristics of the insulation product	Thickness (mm)		60 mm
	Tensile strength perpendicular to the face (kPa)		TR 5
Plate diameter (mm)			60
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.303 Average: 0.365
	Anchors not placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.172 Average: 0.187

Tab. 30: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW Frontrock Casa (TR 5) - surface assembly			
Characteristics of the insulation product		Thickness (mm)	100 mm
		Tensile strength perpendicular to the face (kPa)	TR 5
Plate diameter (mm)			60
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.354 Average: 0.395
	Anchors not placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.255 Average: 0.262

Tab. 31: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW MAX Plus/Ecorock Duo/RockSATE Duo Plus (TR 7.5) - surface assembly			
Characteristics of the insulation product		Thickness (mm)	80 mm
		Tensile strength perpendicular to the face (kPa)	TR 7.5
Plate diameter (mm)			60
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.348 Average: 0.418

Tab. 32: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW MAX Plus/Ecorock Duo/RockSATE Duo Plus (TR 7.5) - surface assembly			
Characteristics of the insulation product		Thickness (mm)	120 mm
		Tensile strength perpendicular to the face (kPa)	TR 7.5
Plate diameter (mm)			60
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.454 Average: 0.503
	Anchors not placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.368 Average: 0.406

Tab. 33: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW double density panel RockSATE Duo (TR7.5) - countersunk assembly			
Characteristics of the insulation product	Thickness (mm)		100 mm
	Tensile strength perpendicular to the face (kPa)		TR 7.5
Special countersunk plate diameter (mm)			110
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.753 Average: 1.072
	Anchors not placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.906 Average: 0.953
	Anchors placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.778 Average: 0.956
	Anchors placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.693 Average: 0.756

Tab. 34: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW double density panel Coverrock (TR5) - surface assembly			
Characteristics of the insulation product	Thickness (mm)		60 mm
	Tensile strength perpendicular to the face (kPa)		TR 5
Plate diameter (mm)			60
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.462 Average: 0.657
	Anchors not placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.355 Average: 0.405
	Anchors placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.510 Average: 0.534
	Anchors placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.236 Average: 0.267

Tab. 35: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW double density panel Coverrock (TR5) - countersunk assembly			
Characteristics of the insulation product	Thickness (mm)		80 mm
	Tensile strength perpendicular to the face (kPa)		TR 5
Special countersunk plate diameter (mm)			110
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.818 Average: 0.898
	Anchors not placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.560 Average: 0.758
	Anchors placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.667 Average: 0.792
	Anchors placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.496 Average: 0.594

Tab. 36: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW double density panel Coverrock (TR5) - countersunk assembly			
Characteristics of the insulation product	Thickness (mm)		80 mm
	Tensile strength perpendicular to the face (kPa)		TR 5
Special countersunk plate diameter (mm)			100
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.752 Average: 0.784
	Anchors not placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.472 Average: 0.534
	Anchors placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 0.484 Average: 0.554
	Anchors placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 0.313 Average: 0.339

Tab. 37: Pull-through

Apply to anchors listed in Tab. 1a of this ETA mounted on the insulation MW double density panel Frontrock MAX PLUS (TR5) – special surface assembly			
Characteristics of the insulation product	Thickness (mm)		50 mm
	Tensile strength perpendicular to the face (kPa)		TR5
Anchor applied through the mesh stripe of 200 × 200 mm Plate diameter (mm)			60
Failure loads (kN)	Anchors not placed at the panel joints (Pull-through test) Dry condition	R_{panel}	*Minimal: 1.184 Average: 1.273*
	Anchors not placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 1.039 Average: 1.110
	Anchors placed at the panel joints (Pull-through test) Dry condition	R_{panel}	Minimal: 1.158 Average: 1.194
	Anchors placed at the panel joints (Pull-through test) After thermal/humid load	R_{panel}	Minimal: 1.009 Average: 1.085

Tab. 38: Pull-through

3.3.2.2 Static foam test (according to § 2.2.3.6.2 of EAD)

The results of the pull-through resistance of anchors:

Surface assembly – MW board (TR 15)

Tested components of the system:

- Thermal insulation material — MW board (TR15) - thickness of 50 mm
- Anchors, plate diameter — Φ60 mm.

Description of the test sample	Load (kN)						
	Particularly					Mean value	Lowest value
Anchors with plate diameter Φ60 mm block 1350 × 870 mm from panels MW (TR15) of thickness 50 mm 8 pcs anchors, (EAD § 2.2.3.6, fig. 8 – 2b)	3.34	3.48	3.17	3.19	3.53	3.34	3.17

Tab. 39: Static foam test

Surface assembly – MW double density panel FASROCK MAX (TR 7,5)

Tested components of the system:

- Thermal insulation material — MW double density panel FASROCK MAX (TR7.5), 80 mm
- Anchors, plate diameter — Φ60 mm.

Description of the test sample	Load (kN)						
	Particularly						Particularly
Anchors with plate diameter Φ60 mm block 1350 × 870 mm from panels MW							

FASROCK MAX (TR 7,5) of thickness 80 mm 8 pcs anchors, (EAD § 2.2.3.6, fig. 8 – 2b)	2.98	3.45	3.29	3.06	3.17	3.19	2.98

Tab. 40: Static foam test

Surface assembly – MW Frontrock MAX E (TR 10)

Tested components of the system:

- Thermal insulation material MW Frontrock MAX E (TR 10), 80 mm
- Anchors, plate diameter Φ60 mm + additional plate (Φ90mm).

Description of the test sample	Load (kN)						
	Particularly						Particularly
Anchors with plate diameter Φ60 mm + additional plate (Φ90mm) block 1350 × 870 mm from panels MW Frontrock MAX E (TR10) of thickness 80 mm 8 pcs anchors, (EAD § 2.2.3.5, fig. 8 – 2b)	4.49	4.68	4.41	4.24	4.34	4.43	4.24

Tab. 41: Static foam test

For the Rjoint calculation following formula was used:

$$R_{joint} = \frac{(total\ load\ on\ foam\ block - 2 \times R_{panel})}{6}$$

Surface assembly – MW FRONTROCK (TR 15)

Tested components of the system:

- Thermal insulation material MW Frontrock (TR 15), 50 mm
- Anchors, plate diameter Φ60 mm

Description of the test sample	Load (kN)						
	Particularly					Mean value	Lowest value
Anchors with plate diameter Φ60 mm block 1000 × 600 mm from panels MW Frontrock (TR15) of thickness 50 mm 4 pcs anchors, in panel only, each anchor through the mesh stripe of size 200 × 200 mm (EAD § 2.2.3.5, fig. 8 – 2b)	4.65	4.81	4.57	4.46	4.62	4.62	4.46

Tab. 42: Static foam test

Surface assembly – MW Frontrock MAX E (TR 10)
Tested components of the system:
- Thermal insulation material MW Frontrock MAX E (TR 10), 80 mm
- Anchors, plate diameter Φ60 mm.

Description of the test sample	Load (kN)						
	Particularly					Mean value	Lowest value
Anchors with plate diameter Φ60 mm block 1000 × 600 mm from panels MW Frontrock MAX E (TR10) of thickness 80 mm 4 pcs anchors, in panel only, each anchor through the mesh stripe of size 200 × 200 mm (EAD § 2.2.3.5, fig. 8 – 2b)	4.48	4.61	4.38	4.53	4.42	4.48	4.38

Tab. 43: Static foam test

For the Rjoint calculation following formula was used:

$$R_{joint} = \frac{(total\ load\ on\ foam\ block - 2 \times R_{panel})}{6}$$

3.3.2.3 Tensile resistance of insulation products in dry conditions (according to § 2.2.3.7 of EAD)

See annex 2-14 of this ETA.

3.3.2.4 Tensile resistance of insulation products in wet conditions (according to § 2.2.3.8 of EAD)

See annex 2-14 of this ETA.

3.3.2.5 Shear strength and shear modulus of elasticity of insulation product (according to § 2.2.3.9 of EAD)

See annex 2-14 of this ETA.

3.3.2.6 Dimensional stability of insulation product (according to § 2.2.3.11 of EAD)

See annex 2-14 of this ETA.

3.3.2.7 Tensile strenght of rendering system (according to § 2.2.3.12 of EAD)

Base coat - REDArt Base Coat - Glass fibre mesh AKE 145 A / R 117 A101
(manufacturer: SAINT-GOBAIN ADFORS CZ s.r.o.)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	-	-
0.5 %	-	w ≤ 0.05 / 2
0.8 %	w ≤ 0.05 / 1	w ≤ 0.05 / 3
1.0 %	w ≤ 0.05 / 5	w ≤ 0.05 / 6
1.5 %	w ≤ 0.05 / 8	w ≤ 0.05 / 8
2.0 %	0.05 < w ≤ 0.10 / 10	0.05 < w ≤ 0.10 / 11

Tab. 44: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat - Glass fibre mesh AKE 170 A / R 131 A101 (manufacturer: SAINT-GOBAIN ADFORS CZ s.r.o.)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	-	-
0.5 %	-	$w \leq 0.05$ / 4
0.8 %	$w \leq 0.05$ / 3	$w \leq 0.05$ / 7
1.0 %	$w \leq 0.05$ / 5	$w \leq 0.05$ / 7
1.5 %	$w \leq 0.05$ / 7	$w \leq 0.05$ / 8
2.0 %	$w \leq 0.05$ / 10	$w \leq 0.05$ / 12

Tab. 45: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat - Glass fibre mesh 117 S (manufacturer: Technical Textiles, s.r.o.)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	-	-
0.5 %	$w \leq 0.05$ / 3	$w \leq 0.05$ / 3
0.8 %	$w \leq 0.05$ / 4	$0.05 < w \leq 0.10$ / 3
1.0 %	$w \leq 0.05$ / 5	$0.05 < w \leq 0.10$ / 5
1.5 %	$w \leq 0.05$ / 7	$0.05 < w \leq 0.10$ / 5
2.0 %	$0.05 < w \leq 0.10$ / 8	$0.10 < w \leq 0.15$ / 7

Tab. 46: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat - Glass fibre mesh 122 (manufacturer Technical Textiles, s.r.o.)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	-	-
0.5 %	$w \leq 0.05$ / 1	$w \leq 0.05$ / 2
0.8 %	$w \leq 0.05$ / 4	$w \leq 0.05$ / 2
1.0 %	$w \leq 0.05$ / 4	$w \leq 0.05$ / 4
1.5 %	$w \leq 0.05$ / 6	$0.05 < w \leq 0.10$ / 5
2.0 %	$w \leq 0.05$ / 9	$0.05 < w \leq 0.10$ / 6

Tab. 47: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat - SECCO E 145 (manufacturer: ASGLATEX Ohorn GmbH)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	$w \leq 0.05$ / 2	$w \leq 0.05$ / 2
0.5 %	$w \leq 0.05$ / 3	$w \leq 0.05$ / 6
0.8 %	$w \leq 0.05$ / 7	$0.05 < w \leq 0.10$ / 1
1.0 %	$0.05 < w \leq 0.10$ / 1	$0.05 < w \leq 0.10$ / 2
1.5 %	$0.05 < w \leq 0.10$ / 3	$0.05 < w \leq 0.10$ / 3
2.0 %	$0.05 < w \leq 0.10$ / 4	$0.10 < w \leq 0.15$ / 1

Tab. 48: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat - SECCO E 160 (manufacturer: ASGLATEX Ohorn GmbH)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	w ≤ 0.05 / 1	w ≤ 0.05 / 1
0.5 %	w ≤ 0.05 / 3	w ≤ 0.05 / 3
0.8 %	w ≤ 0.05 / 5	w ≤ 0.05 / 6
1.0 %	0.05 < w ≤ 0.10 / 2	0.05 < w ≤ 0.10 / 1
1.5 %	0.05 < w ≤ 0.10 / 3	0.05 < w ≤ 0.10 / 2
2.0 %	0.05 < w ≤ 0.10 / 4	0.05 < w ≤ 0.10 / 3

Tab. 49: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat - REDNET E 145 (manufacturer: ASGLATEX Ohorn GmbH)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	w ≤ 0.05 / 2	w ≤ 0.05 / 2
0.5 %	w ≤ 0.05 / 3	w ≤ 0.05 / 6
0.8 %	w ≤ 0.05 / 7	0.05 < w ≤ 0.10 / 1
1.0 %	0.05 < w ≤ 0.10 / 1	0.05 < w ≤ 0.10 / 2
1.5 %	0.05 < w ≤ 0.10 / 3	0.05 < w ≤ 0.10 / 3
2.0 %	0.05 < w ≤ 0.10 / 4	0.10 < w ≤ 0.15 / 1

Tab. 50: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat - REDNET E 160 (manufacturer: ASGLATEX Ohorn GmbH)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	w ≤ 0.05 / 1	w ≤ 0.05 / 1
0.5 %	w ≤ 0.05 / 3	w ≤ 0.05 / 3
0.8 %	w ≤ 0.05 / 5	w ≤ 0.05 / 6
1.0 %	0.05 < w ≤ 0.10 / 2	0.05 < w ≤ 0.10 / 1
1.5 %	0.05 < w ≤ 0.10 / 3	0.05 < w ≤ 0.10 / 2
2.0 %	0.05 < w ≤ 0.10 / 4	0.05 < w ≤ 0.10 / 3

Tab. 51: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat - Valmieras SSA-1363-160 (manufacturer: JSC Valmieras Stikla Šķiedra)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	w ≤ 0.05 / 3	w ≤ 0.05 / 2
0.5 %	w ≤ 0.05 / 4	w ≤ 0.05 / 4
0.8 %	0.05 < w ≤ 0.10 / 1	w ≤ 0.05 / 7
1.0 %	0.05 < w ≤ 0.10 / 3	0.05 < w ≤ 0.10 / 3
1.5 %	0.10 < w ≤ 0.15 / 1	0.05 < w ≤ 0.10 / 4
2.0 %	0.10 < w ≤ 0.15 / 1	0.05 < w ≤ 0.10 / 3

Tab. 52: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat Plus- AKE 145 A / R 117 A101 (SAINT-GOBAIN ADFORS CZ s.r.o.)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	w ≤ 0.05 / 3	w ≤ 0.05 / 2
0.5 %	w ≤ 0.05 / 4	w ≤ 0.05 / 3
0.8 %	w ≤ 0.05 / 5	w ≤ 0.05 / 10
1.0 %	0.05 < w ≤ 0.10 / 1	w ≤ 0.05 / 12
1.5 %	0.10 < w ≤ 0.15 / 1	0.10 < w ≤ 0.15 / 1
2.0 %	0.10 < w ≤ 0.15 / 3	0.10 < w ≤ 0.15 / 5

Tab. 53: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat Plus with Glass fibre mesh AKE 170 A / R 131 A101
(manufacturer: SAINT-GOBAIN ADFORS CZ s.r.o.)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	-	w ≤ 0.05 / 7
0.5 %	-	w ≤ 0.05 / 7
0.8 %	w ≤ 0.05 / 8	w ≤ 0.05 / 11
1.0 %	w ≤ 0.05 / 9	0.05 < w ≤ 0.10 / 3
1.5 %	w ≤ 0.05 / 20	0.05 < w ≤ 0.10 / 7
2.0 %	w ≤ 0.05 / 26	0.05 < w ≤ 0.10 / 7

Tab. 54: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat Plus with Glass fibre mesh 117 S
(manufacturer: Technical Textiles, s.r.o.)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	w ≤ 0.05 / 4	w ≤ 0.05 / 1
0.5 %	w ≤ 0.05 / 6	w ≤ 0.05 / 2
0.8 %	w ≤ 0.05 / 10	w ≤ 0.05 / 4
1.0 %	w ≤ 0.05 / 12	w ≤ 0.05 / 7
1.5 %	0.05 < w ≤ 0.10 / 2	w ≤ 0.05 / 24
2.0 %	0.05 < w ≤ 0.10 / 4	w ≤ 0.05 / 24

Tab. 55: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat Plus with Glass fibre mesh 122
(manufacturer: Technical Textiles, s.r.o.)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	w ≤ 0.05 / 6	w ≤ 0.05 / 2
0.5 %	w ≤ 0.05 / 7	w ≤ 0.05 / 6
0.8 %	w ≤ 0.05 / 12	w ≤ 0.05 / 8
1.0 %	0.05 < w ≤ 0.10 / 3	w ≤ 0.05 / 9
1.5 %	0.05 < w ≤ 0.10 / 3	0.05 < w ≤ 0.10 / 5
2.0 %	0.05 < w ≤ 0.10 / 5	0.05 < w ≤ 0.10 / 6

Tab. 56: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat Plus with Glass fibre mesh SECCO E 145
(manufacturer: ASGLATEX Ohorn GmbH)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	w ≤ 0.05 / 4	w ≤ 0.05 / 6
0.5 %	w ≤ 0.05 / 8	w ≤ 0.05 / 8
0.8 %	w ≤ 0.05 / 16	0.05 < w ≤ 0.10 / 2
1.0 %	0.05 < w ≤ 0.10 / 4	0.05 < w ≤ 0.10 / 3
1.5 %	0.10 < w ≤ 0.15 / 2	0.05 < w ≤ 0.10 / 7
2.0 %	0.10 < w ≤ 0.15 / 2	0.05 < w ≤ 0.10 / 8

Tab. 57: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat Plus with Glass fibre mesh SECCO E 160
(manufacturer: ASGLATEX Ohorn GmbH)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	-	w ≤ 0.05 / 4
0.5 %	w ≤ 0.05 / 6	w ≤ 0.05 / 8
0.8 %	w ≤ 0.05 / 13	w ≤ 0.05 / 12
1.0 %	w ≤ 0.05 / 12	w ≤ 0.05 / 14
1.5 %	0.05 < w ≤ 0.10 / 3	0.10 < w ≤ 0.15 / 3
2.0 %	0.05 < w ≤ 0.10 / 4	0.10 < w ≤ 0.15 / 4

Tab. 58: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat Plus with Glass fibre mesh REDNET E 145
(manufacturer: ASGLATEX Ohorn GmbH)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	w ≤ 0.05 / 4	w ≤ 0.05 / 6
0.5 %	w ≤ 0.05 / 8	w ≤ 0.05 / 8
0.8 %	w ≤ 0.05 / 16	0.05 < w ≤ 0.10 / 2
1.0 %	0.05 < w ≤ 0.10 / 4	0.05 < w ≤ 0.10 / 3
1.5 %	0.10 < w ≤ 0.15 / 2	0.05 < w ≤ 0.10 / 7
2.0 %	0.10 < w ≤ 0.15 / 2	0.05 < w ≤ 0.10 / 8

Tab. 59: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat Plus with Glass fibre mesh REDNET E 160
(manufacturer: ASGLATEX Ohorn GmbH)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	-	w ≤ 0.05 / 4
0.5 %	w ≤ 0.05 / 6	w ≤ 0.05 / 8
0.8 %	w ≤ 0.05 / 13	w ≤ 0.05 / 12
1.0 %	w ≤ 0.05 / 12	w ≤ 0.05 / 14
1.5 %	0.05 < w ≤ 0.10 / 3	0.10 < w ≤ 0.15 / 3
2.0 %	0.05 < w ≤ 0.10 / 4	0.10 < w ≤ 0.15 / 4

Tab. 60: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat Plus with Glass fibre mesh Valmieras SSA-1363-160
(manufacturer: JSC Valmieras Stikla Šķiedra)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	w ≤ 0.05 / 4	w ≤ 0.05 / 4
0.5 %	w ≤ 0.05 / 10	w ≤ 0.05 / 5
0.8 %	w ≤ 0.05 / 13	0.05 < w ≤ 0.10 / 2
1.0 %	w ≤ 0.05 / 15	0.05 < w ≤ 0.10 / 5
1.5 %	0.05 < w ≤ 0.10 / 2	0.10 < w ≤ 0.15 / 4
2.0 %	0.05 < w ≤ 0.10 / 4	0.10 < w ≤ 0.15 / 4

Tab. 61: Rendering system strip tensile test results (w = crack's width)

Base coat ROCKWOOL REDArt Masă de șpaclu - AKE 170 / R 131 A101
(manufacturer: SAINT-GOBAIN ADFORS CZ s.r.o.)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	w ≤ 0.05 / 9	0.05 < w ≤ 0.10 / 1
0.5 %	0.05 < w ≤ 0.10 / 4	0.05 < w ≤ 0.10 / 4
0.8 %	0.05 < w ≤ 0.10 / 9	0.10 < w ≤ 0.15 / 2
1.0 %	0.05 < w ≤ 0.10 / 8	0.10 < w ≤ 0.15 / 2
1.5 %	0.10 < w ≤ 0.15 / 7	0.10 < w ≤ 0.15 / 4
2.0 %	0.15 < w ≤ 0.20 / 4	0.10 < w ≤ 0.15 / 4

Tab. 62: Rendering system strip tensile test results (w = crack's width)

Base coat ROCKWOOL REDArt Masă de șpaclu with Glass fibre mesh Vitrulan SD.4420G/55
(manufacturer: VITRULAN Textilglas GmbH)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	0.05 < w ≤ 0.10 / 1	w ≤ 0.05 / 4
0.5 %	0.05 < w ≤ 0.10 / 3	0.05 < w ≤ 0.10 / 1
0.8 %	0.10 < w ≤ 0.15 / 1	0.05 < w ≤ 0.10 / 1
1.0 %	0.10 < w ≤ 0.15 / 2	0.05 < w ≤ 0.10 / 3
1.5 %	0.10 < w ≤ 0.15 / 3	0.10 < w ≤ 0.15 / 3
2.0 %	0.15 < w ≤ 0.20 / 1	0.10 < w ≤ 0.15 / 3

Tab. 63: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat Casa - Glass fibre mesh AKE 145 A / R 117 A101
(manufacturer: SAINT-GOBAIN ADFORS CZ s.r.o.)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	-	-
0.5 %	w ≤ 0.05 / 2	-
0.8 %	w ≤ 0.05 / 3	w ≤ 0.05 / 4
1.0 %	w ≤ 0.05 / 6	w ≤ 0.05 / 5
1.5 %	0.05 < w ≤ 0.10 / 9	w ≤ 0.05 / 7
2.0 %	w ≤ 0.10 / 10	w ≤ 0.05 / 12

Tab. 64: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat Casa - Glass fibre mesh AKE 170 A / R 131 A101
(manufacturer: SAINT-GOBAIN ADFORS CZ s.r.o.)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	-	-
0.5 %	-	w ≤ 0.05 / 3
0.8 %	w ≤ 0.05 / 2	w ≤ 0.05 / 4
1.0 %	w ≤ 0.05 / 2	w ≤ 0.05 / 6
1.5 %	w ≤ 0.05 / 4	w ≤ 0.05 / 8
2.0 %	w ≤ 0.05 / 6	w ≤ 0.05 / 10

Tab. 65: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat Casa - Glass fibre mesh 117 S
(manufacturer: Technical Textiles, s.r.o.)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	-	-
0.5 %	w ≤ 0.05 / 2	w ≤ 0.05 / 2
0.8 %	w ≤ 0.05 / 4	w ≤ 0.05 / 3
1.0 %	w ≤ 0.05 / 5	w ≤ 0.05 / 3
1.5 %	0.05 < w ≤ 0.10 / 6	w ≤ 0.05 / 5
2.0 %	0.05 < w ≤ 0.10 / 9	0.05 < w ≤ 0.10 / 9

Tab. 66: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat Casa - SECCO E 145 (manufacturer: ASGLATEX Ohorn GmbH)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	w ≤ 0.05 / 2	w ≤ 0.05 / 2
0.5 %	w ≤ 0.05 / 3	w ≤ 0.05 / 5
0.8 %	w ≤ 0.05 / 6	0.05 < w ≤ 0.10 / 1
1.0 %	w ≤ 0.05 / 10	0.05 < w ≤ 0.10 / 2
1.5 %	0.05 < w ≤ 0.10 / 2	0.05 < w ≤ 0.10 / 2
2.0 %	0.05 < w ≤ 0.10 / 3	0.10 < w ≤ 0.15 / 1

Tab. 67: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat Casa - SECCO E 160 (manufacturer: ASGLATEX Ohorn GmbH)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	w ≤ 0.05 / 2	w ≤ 0.05 / 2
0.5 %	w ≤ 0.05 / 3	w ≤ 0.05 / 4
0.8 %	w ≤ 0.05 / 6	w ≤ 0.05 / 7
1.0 %	0.05 < w ≤ 0.10 / 1	0.05 < w ≤ 0.10 / 1
1.5 %	0.05 < w ≤ 0.10 / 2	0.05 < w ≤ 0.10 / 2
2.0 %	0.05 < w ≤ 0.10 / 3	0.05 < w ≤ 0.10 / 3

Tab. 68: Rendering system strip tensile test results (w = crack's width)

Base coat - REDArt Base Coat Casa - Valmieras SSA-1363-160
(manufacturer: JSC Valmieras Stikla Šķiedra)

Rendering system strain value	Mean value of cracks in warp direction (mm) / No. of cracks	Mean value of cracks in weft direction (mm) / No. of cracks
0.3 %	w ≤ 0.05 / 1	w ≤ 0.05 / 2
0.5 %	w ≤ 0.05 / 3	w ≤ 0.05 / 3
0.8 %	w ≤ 0.05 / 5	w ≤ 0.05 / 5
1.0 %	0.05 < w ≤ 0.10 / 1	w ≤ 0.05 / 7
1.5 %	0.10 < w ≤ 0.10 / 3	0.05 < w ≤ 0.10 / 1
2.0 %	0.10 < w ≤ 0.10 / 4	0.05 < w ≤ 0.10 / 3

Tab. 69: Rendering system strip tensile test results (w = crack's width)

Based on the test results, displacement test is not required whilst the use of system is not limited by length of wall or distance between expansion joints.

3.3.2.8 Pull-out strength of mechanical fixings (anchors)

The test has been carried out, in accordance with § 2.2.3.14 of EAD, on anchors.

Monolithic wall made of:	Minimum screw-in depth of anchor ejotherm STR H and ejotherm STR H A2 (mm)	Rated value of pull-out resistance Fax,90,Rd (N)
▪ Boards made from solid softwood ▪ Solid soft wood ▪ Glued laminated timber ▪ Glued solid timber or cross laminated timber made from softwood ▪ OSB-Panels ▪ Particleboards ▪ Cement-bonded particleboards	35 o 24 (screwed through)	940

Tab.: 70: Pull-out strength of mechanical fixings

3.3.2.9 Hardened base coat: static modulus of elasticity, tensile strength and elongation at break and shrinkage behaviour for products with a thickness up to 5 mm

No Perfomance Determined.

3.3.2.10 Impact resistance

The tests have been performed on the rig on the 18 alternatives after the hygrothermal cycles, in accordance with § 2.2.3.19 of EAD. The system was made both with one single standard mesh and with double layer mesh. The resistance of the system to hard body impacts (3 Joules and 10 Joules) and to perforation (Perfotest) leads to the following use results.

Base coat type: **REDArt Base Coat**

Composition of the tested system:

- Insulation material: MW double density panel FASROCK MAX (TR7.5), thickness 120 mm
- Base coat render: REDArt Base Coat, average thickness 3 mm
- Glass fibre mesh 1 × AKE 145A / R117 A101
- Key coat adequate to finishing coat
- Finishing coat defined directly in the table

	Description
REDArt Mineral Top Coat - drilled, mineral finishing coat, max. particle size 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Mineral Top Coat - drilled, mineral finishing coat max. particle size 2.0 mm with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	Rendering not penetrated
REDArt Silicate Top Coat - spotted, silicate finishing coat max. particle size 1.0 mm	Rendering not penetrated
REDArt Silicone Top Coat - spotted, silicone finishing coat max. particle size 1.0 mm	Rendering not penetrated

Tab. 71: Impact resistance

Composition of the tested system:

- Insulation material: MW lamella (TR80), thickness 50 mm
- Base coat render: REDArt Base Coat, average thickness 3 mm
- Glass fibre mesh 1 × AKE 145A / R117 A101
- Key coat adequate to finishing coat
- Finishing coat defined directly in the table.

	Description
REDArt Mineral Top Coat - drilled, mineral finishing coat, max. particle size 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Mineral Smooth Top Coat, mineral finishing coat max. particle size 1.0 mm, total thickness 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Silicate Top Coat - spotted, silicate finishing coat max. particle size 1.0 mm	Rendering not penetrated
REDArt Silicone Top Coat - spotted, silicone finishing coat max. particle size 1.0 mm	Rendering not penetrated
REDArt Granite Top Coat, acrylic mosaic finishing coat, max. particle size 1.5 mm	Rendering not penetrated

Tab. 72: Impact resistance

Composition of the tested system:

- Insulation material: MW board (TR15), thickness 50 mm
- Base coat render: REDArt Base Coat, average thickness 3 mm
- Glass fibre mesh 1 × AKE 145A / R117 A101
- Key coat adequate to finishing coat
- Finishing coat defined directly in the table.

	Description
REDArt Mineral Top Coat - drilled, mineral finishing coat, max. particle size 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Silicate Top Coat - spotted, silicate finishing coat,max. particle size 1.0 mm	Rendering not penetrated
REDArt Silicone Top Coat - spotted, silicone finishing coat max. particle size 1.0 mm	Rendering not penetrated

Tab. 73: Impact resistance

Composition of the tested system:

- Insulation material: MW lamella (TR80), thickness 50 mm
- Base coat render: REDArt Base Coat, average thickness 5 mm
- Glass fibre mesh 2 × AKE 145A / R117 A101
- Key coat adequate to finishing coat
- Finishing coat defined directly in the table

	Description
REDArt Mineral Top Coat - drilled, mineral finishing coat, max. particle size 2.0 mm with protective coat FAST F - S including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Mineral Smooth Top Coat, mineral finishing coat, max. particle size 1.0 mm, total thickness 2.0 mm with protective coat FAST F - S including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Silicate Top Coat - spotted, silicate finishing coat max. particle size 1.0 mm	No deterioration
REDArt Silicone Top Coat - spotted, silicone finishing coat, max. particle size 1.0 mm	No deterioration
REDArt Granite Top Coat, acrylic mosaic finishing coat, max. particle size 1.5 mm	No deterioration

Tab. 74: Impact resistance

Composition of the tested system:

- Insulation material: MW board (TR15), thickness 50 mm
- Base coat render: REDArt Base Coat, average thickness 5 mm
- Glass fibre mesh 2 × AKE 145A / R117 A101
- Key coat adequate to finishing coat
- Finishing coat defined directly in the table.

	Description
REDArt Mineral Top Coat - spotted, mineral finishing coat, max. particle size 2.0 mm with protective coat FAST F - S including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Silicate Top Coat - spotted, silicate finishing coat max. particle size 2.0 mm	No deterioration
REDArt Silicone Top Coat - spotted, silicone finishing coat, max. particle size 2.0 mm	No deterioration

Tab. 75: Impact resistance

Base coat type: **REDArt Base Coat Plus**

Composition of the tested system:

- Insulation material: MW lamella (TR80), thickness 50 mm
- Base coat render: REDArt Base Coat Plus, average thickness 3 mm
- Glass fibre mesh 1 × AKE 145A / R117 A101
- Key coat adequate to finishing coat
- Finishing coat defined directly in the table.

	Description
REDArt Mineral Top Coat - drilled, mineral finishing coat, max. particle size 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	Rendering penetrated
REDArt Mineral Smooth Top Coat, mineral finishing coat max. particle size 1.0 mm, total thickness 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Silicate Top Coat - spotted, silicate finishing coat max. particle size 1.0 mm	Rendering not penetrated
REDArt Silicone Top Coat - spotted, silicone finishing coat max. particle size 1.0 mm	Rendering not penetrated
REDArt Granite Top Coat, acrylic mosaic finishing coat, max. particle size 1.5 mm	No deterioration

Tab. 76: Impact resistance

Composition of the tested system:

- Insulation material: MW lamella (TR80), thickness 50 mm
- Base coat render: REDArt Base Coat Plus, average thickness 4 mm
- Glass fibre mesh 2 × AKE 145A / R117 A101
- Key coat adequate to finishing coat
- Finishing coat defined directly in the table.

	Description
REDArt Mineral Top Coat - drilled, mineral finishing coat, max. particle size 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Mineral Smooth Top Coat, mineral finishing coat max. particle size 1.0 mm, total thickness 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Silicate Top Coat - spotted, silicate finishing coat max. particle size 1.0 mm	No deterioration
REDArt Silicone Top Coat - spotted, silicone finishing coat max. particle size 1.0 mm	No deterioration
REDArt Granite Top Coat, acrylic mosaic finishing coat, max. particle size 1.5 mm	No deterioration

Tab. 77: Impact resistance

Composition of the tested system:

- Insulation material: MW slab (TR15), thickness 50 mm
- Base coat render: REDArt Base Coat Plus, average thickness 3 mm
- Glass fibre mesh 1 × AKE 145A / R117 A101
- Key coat adequate to finishing coat
- Finishing coat defined directly in the table.

	Description
REDArt Mineral Top Coat - drilled, mineral finishing coat, max. particle size 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Silicate Top Coat - spotted, silicate finishing coat max. particle size 1.0 mm	Rendering not penetrated
REDArt Silicone Top Coat - spotted, silicone finishing coat max. particle size 1.0 mm	Rendering not penetrated

Tab. 78: Impact resistance

Composition of the tested system:

- Insulation material: MW slab (TR15), thickness 50 mm
- Base coat render: REDArt Base Coat Plus, average thickness 5 mm
- Glass fibre mesh 2 × AKE 145A / R117 A101
- Key coat adequate to finishing coat
- Finishing coat defined directly in the table.

	Description
REDArt Mineral Top Coat - drilled, mineral finishing coat, max. particle size 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Silicate Top Coat - spotted, silicate finishing coat max. particle size 1.0 mm	No deterioration
REDArt Silicone Top Coat - spotted, silicone finishing coat max. particle size 1.0 mm	No deterioration

Tab. 79: Impact resistance

Composition of the tested system:

- Insulation material: MW slab (TR5), thickness 100 mm
- Base coat render: REDArt Base Coat Plus, average thickness 3 mm
- Glass fibre mesh 1 × AKE 145A / R117 A101
- Key coat adequate to finishing coat
- Finishing coat defined directly in the table.

	Description
REDArt Mineral Top Coat - drilled, mineral finishing coat, max. particle size 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Mineral Top Coat - drilled, mineral finishing coat, max. particle size 2.0 mm with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	Rendering not penetrated
REDArt Silicate Top Coat - spotted, silicate finishing coat max. particle size 1.0 mm	No deterioration
REDArt Silicone Top Coat - spotted, silicone finishing coat max. particle size 1.0 mm	No deterioration

Tab. 80 Impact resistance

Base coat type: **BASE COAT CASA**

Composition of the tested system:

- Insulation material: MW Lamella (TR80), thickness 50 mm
- Base coat render: REDArt Base Coat Casa, average thickness 3 mm
- Glass fibre mesh 1 × AKE 145A / R117 A101
- Key coat adequate to finishing coat
- Finishing coat defined directly in the table

	Description
REDArt Mineral Top Coat Spotted, mineral finishing coat, max. particle size 1.5 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	Rendering penetrated
REDArt Mineral Top Coat Spotted, mineral finishing coat, max. particle size 1.5 mm with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	Rendering penetrated
REDArt Mineral Smooth Top Coat, mineral finishing coat max. particle size 1.0 mm, with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Mineral Smooth Top Coat, mineral finishing coat max. particle size 1.0 mm, with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	Rendering not penetrated
REDArt Granite Top Coat, acrylic mosaic finishing coat, max. particle size 1.5 mm	Rendering not penetrated
REDArt Silcate Top Coat spotted, silicate finishing coat, max particle size 1.0 mm	Rendering penetrated
REDArt Silcone Top Coat spotted, silicone finishing coat, max particle size 1.0 mm	Rendering penetrated

Tab. 81: Impact resistance

Composition of the tested system:

- Insulation material: MW Lamella (TR80), thickness 50 mm
- Base coat render: REDArt Base Coat Casa, average thickness 3 mm
- Glass fibre mesh 2 × AKE 145A / R117 A101
- Key coat adequate to finishing coat.
- Finishing coat defined directly in the table
-

	Description
REDArt Mineral Top Coat spotted, mineral finishing coat, max. particle size 1.5 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Mineral Top Coat spotted, mineral finishing coat, max. particle size 1.5 mm with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	Rendering not penetrated
REDArt Mineral Smooth Top Coat, mineral finishing coat max. particle size 1.0 mm, with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	Rendering not penetrated
REDArt Mineral Smooth Top Coat, mineral finishing coat max. particle size 1.0 mm, with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	Rendering not penetrated
REDArt Granite Top Coat, acrylic mosaic finishing coat, max. particle size 1.5 mm	No deterioration

REDArt Silcate Top Coat spotted, silicate finishing coat, max particle size 1.0 mm	Rendering not penetrated
REDArt Silcone Top Coat spotted, silicone finishing coat, max particle size 1.0 mm	Rendering not penetrated

Tab. 82: Impact resistance

Composition of the tested system:

- Insulation material: MW Frontrock Casa (TR5), thickness 100 mm
- Base coat render: REDArt Base Coat Casa, average thickness 3 mm
- Glass fibre mesh 2 × AKE 145A / R117 A101
- Key coat adequate to finishing coat
- Finishing coat defined directly in the table

	Description
REDArt Granite Top Coat, acrylic mosaic finishing coat, max. particle size 1.5 mm	Rendering not penetrated
REDArt Silcate Top Coat spotted, silicate finishing coat, max particle size 1.0 mm	Rendering penetrated
REDArt Silcone Top Coat spotted, silicone finishing coat, max particle size 1.0 mm	Rendering penetrated

Tab. 83: Impact resistance

Base coat type: **ROCKWOOL REDArt Masă de șpaclu**

Composition of the tested system:

- Insulation material: Frontrock Max E (TR10), thickness 50 mm
- Base coat render: ROCKWOOL REDArt Masă de șpaclu, average thickness 6 mm
- Glass fibre mesh 2 × Vitrulan SD.4420G/55
- Key coat REDArt Amorsă Siliconică pentru Tencuială Decorativă
- Finishing coat defined directly in the table

	Description
ROCKWOOL REDArt Tencuială decorative Siliconică Granulată spotted, max. particle size 1.0 mm	Rendering not penetrated
ROCKWOOL REDArt Tencuială Decorativă Siliconică Structrată drilled, max. particle size 1.5 mm	Rendering not penetrated

Tab. 84: Impact resistance

Composition of the system tested on the test wall Substrate:

- Insulation material: Frontrock MAX PLUS (TR7,5), thickness of 100 mm
- Base coat render: ROCKWOOL REDArt Masă de șpaclu, average thickness of 3 mm
- Glass fibre mesh 1 x Vitrulan SD.4420G/55
- Key coat ROCKWOOL REDArt Amorsă Siliconică pentru Tencuială Decorativă
- Finishing coat defined directly in the table

	Description
ROCKWOOL REDArt Tencuială Decorativă Siliconică Granulată spotted, max. particle size 1.0 mm	Rendering penetrated
ROCKWOOL REDArt Tencuială Decorativă Siliconică Structurată drilled, max. particle size 1.5 mm	Rendering penetrated

Tab. 85: Impact resistance

Composition of the system tested on the test wall Substrate:

- Insulation material: Frontrock Casa (TR5), thickness of 100 mm
- Base coat render: ROCKWOOL REDArt Masă de șpaclu, average thickness of 3 mm
- Glass fibre mesh 1 x AKE 170/ R131 A101
- Key coat ROCKWOOL REDArt Amorsă Siliconică pentru Tencuială Decorativă
- Finishing coat defined directly in the table.

	Description
ROCKWOOL REDArt Tencuială Decorativă Siliconică Granulată spotted, max. particle size 1.0 mm	Rendering not penetrated

Tab. 86: Impact resistance

Composition of the system tested on the test wall Substrate:

- Insulation material: Frontrock Casa (TR5), thickness of 100 mm
- Base coat render: ROCKWOOL REDArt Masă de șpaclu, average thickness of 3 mm
- Glass fibre mesh 2 x AKE 170/ R131 A101
- Key coat ROCKWOOL REDArt Amorsă Siliconică pentru Tencuială Decorativă
- Finishing coat defined directly in the table

	Description
ROCKWOOL REDArt Tencuială Decorativă Siliconică Granulată spotted, max. particle size 1.0 mm	Rendering not penetrated

Tab. 87: Impact resistance

3.3.2.11 Bond strength after ageing of ETICS: finishing coats tested on the rig and finishing coats not tested on the rig (according to § 2.2.3.20 and to § 2.2.3.21 of EAD)

Base coat type: **REDArt Base Coat**

Composition of the tested system:

- Insulation product MW double density panel FASROCK MAX, thickness of 120 mm
- Base coat REDArt Base Coat average thickness 3 - 4 mm
- Fibre glass mesh AKE 145A / R117 A101
- Key coat: adequate to finishing coat
- Finishing coat defined directly in the table.

Bond strength of rendering system after hygrothermal cycles (MPa)		
Finishing coat	Level	Failure type
REDArt Mineral Top Coat - drilled, mineral finishing coat max. particle size 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	≥ 0.08 or failure in insulation product	C
REDArt Mineral Top Coat - drilled, mineral finishing coat, max. particle size 2.0 mm with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	≥ 0.08 or failure in insulation product	C
REDArt Silicate Top Coat - spotted, silicate finishing coat max. particle size 1.0 mm	≥ 0.08 or failure in insulation product	C

Tab. 88: Bond strength of rendering after artificial ageing (C – cohesive failure in insulation)

Bond strength of rendering system after hygrothermal cycles (MPa)		
Finishing coat	Level	Failure type
REDArt Silicone Top Coat - spotted, silicone finishing coat max. particle size 1.0 mm	≥ 0.08 or failure in insulation product	C

Tab. 89: Bond strength of rendering after artificial ageing (C – cohesive failure in insulation)

Composition of the tested system:

- Insulation product — MW board (TR 15) thickness of 100 mm
- Base coat — REDArt Base Coat, average thickness 3 mm
- Fibre glass mesh — 1 × AKE 145A / R117 A101
- Key coat: — adequate to finishing coat
- Finishing coat — defined directly in the table.

Bond strength of rendering system after hygrothermal cycles (MPa)		
Finishing coat	Level	Failure type
REDArt Mineral Top Coat - drilled, mineral finishing coat max. particle size 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	≥ 0.08 or failure in insulation product	C
REDArt Mineral Top Coat - drilled, mineral finishing coat max. particle size 2.0 mm with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	≥ 0.08 or failure in insulation product	C
REDArt Silicate Top Coat - drilled, silicate finishing coat max. particle size 3.0 mm	≥ 0.08 or failure in insulation product	C
REDArt Silicone Top Coat, silicone finishing coat max. particle size 3.0 mm	≥ 0.08 or failure in insulation product	C

Tab. 90: Bond strength of rendering after artificial ageing (C – cohesive failure in insulation)

Composition of the tested system:

- Insulation product — MW lamella (TR80), thickness of 100 mm
- Base coat — REDArt Base Coat, average thickness 3 mm
- Fibre glass mesh — 1 × AKE 145A / R117 A101
- Key coat: — adequate to finishing coat
- Finishing coat — defined directly in the table.

Bond strength of rendering system after hygrothermal cycles (MPa)		
Finishing coat	Level	Failure type
REDArt Mineral Top Coat - drilled, mineral finishing coat max. particle size 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	≥ 0.08 or failure in insulation product	C
REDArt Mineral Top Coat - drilled, mineral finishing coat max. particle size 2.0 mm with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	≥ 0.08 or failure in insulation product	C
REDArt Silicate Top Coat - drilled, silicate finishing coat max. particle size 3.0 mm	≥ 0.08 or failure in insulation product	C
REDArt Silicone Top Coat, silicone finishing coat max. particle size 3.0 mm	≥ 0.08 or failure in insulation product	C

Tab. 91: Bond strength of rendering after artificial ageing (C – cohesive failure in insulation)

Composition of the tested system:

- Insulation product — MW board (TR15), thickness of 50 mm
- Base coat — REDArt Base Coat, average thickness 3 mm
- Fibre glass mesh — 1 × AKE 145A / R117 A101
- Key coat — adequate to finishing coat
- Finishing coat — defined directly in the table.

Bond strength of rendering after artificial ageing (MPa)		
Finishing coat	Level	Failure type
REDArt Mineral Top Coat - spotted, mineral finishing coat max. particle size 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	≥ 0.08 or failure in insulation product	C
REDArt Mineral Top Coat - spotted, mineral finishing coat max. particle size 2.0 mm with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	≥ 0.08 or failure in insulation product	C
REDArt Silicate Top Coat - spotted, silicate finishing coat max. particle size 2.0 mm	≥ 0.08 or failure in insulation product	C
REDArt Silicone Top Coat - spotted, silicone finishing coat max. particle size 3.0 mm	≥ 0.08 or failure in insulation product	C

Tab. 92: Bond strength of rendering after artificial ageing (C – cohesive failure in insulation)

Composition of the tested system:

- Insulation product — MW lamella (TR80), thickness of 50 mm
- Base coat — REDArt Base Coat, average thickness 3 mm
- Fibre glass mesh — 1 × AKE 145A / R117 A101
- Key coat: — adequate to finishing coat
- Finishing coat — defined directly in the table.

Bond strength of rendering after artificial ageing (MPa)		
Finishing coat	Level	Failure type
REDArt Mineral Top Coat - spotted, mineral finishing coat max. particle size 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	≥ 0.08 or failure in insulation product	C
REDArt Mineral Top Coat - spotted, mineral finishing coat max. particle size 2.0 mm with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	≥ 0.08 or failure in insulation product	C
REDArt Silicate Top Coat - spotted, silicate finishing coat max. particle size 2.0 mm	≥ 0.08 or failure in insulation product	C
REDArt Silicone Top Coat - spotted, silicone finishing coat max. particle size 3.0 mm	≥ 0.08 or failure in insulation product	C
REDArt Mineral Smooth Top Coat, mineral finishing coat max. particle size 1.0 mm, thickness 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	≥ 0.08 or failure in insulation product	C

Tab. 93: Bond strength of rendering after artificial ageing (C – cohesive failure in insulation)

Bond strength of rendering after artificial ageing (MPa)		
Finishing coat	Level	Failure type
REDArt Granite Top Coat, acrylic mosaic finishing coat max. particle size 1.5 mm	≥ 0.08 or failure in insulation product	C

Tab. 94: Bond strength of rendering after artificial ageing (C – cohesive failure in insulation)

Base coat type: **REDArt Base Coat Plus**

Composition of the tested system:

- Insulation product — MW double density panel Coverrock 036 (TR5), thickness of 100 mm
- Base coat — REDArt Base Coat Plus, average thickness 3-4 mm
- Fibre glass mesh — AKE 145A / R117 A101
- Key coat: — adequate to finishing coat
- Finishing coat — defined directly in the table.

Bond strength of rendering system after hygrothermal cycles (MPa)		
Finishing coat	Required value	Failure type
REDArt Mineral Top Coat - drilled, mineral finishing coat max. particle size 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	≥ 0.08 or failure in insulation product	C
REDArt Mineral Top Coat - drilled, mineral finishing coat, max. particle size 2.0 mm with protective coat REDArt Silicone Paint including key coat REDArt Silicone Paint Primer	≥ 0.08 or failure in insulation product	C
REDArt Silicate Top Coat - spotted, silicate finishing coat max. particle size 1.0 mm	≥ 0.08 or failure in insulation product	C

Tab. 95: Bond strength of rendering after artificial ageing (C – cohesive failure in insulation)

Bond strength of rendering system after hygrothermal cycles (MPa)		
Finishing coat	Level	Failure type
REDArt Silicate Top Coat - spotted, silicate finishing coat max. particle size 1.0 mm	≥ 0.08 or failure in insulation product	C
REDArt Silicone Top Coat - spotted, silicone finishing coat max. particle size 1.0 mm	≥ 0.08 or failure in insulation product	C

Tab. 96: Bond strength of rendering after artificial ageing (C – cohesive failure in insulation)

Composition of the tested system:

- Insulation product — MW double density panel Coverrock 036 (TR5), thickness of 60 mm
- Base coat — REDArt Base Coat Plus, average thickness 3-4 mm
- Fibre glass mesh — AKE 145A / R117 A101
- Key coat: — adequate to finishing coat
- Finishing coat — defined directly in the table.

Bond strength of rendering system after artificial ageing (MPa)		
Finishing coat	Level	Failure type
REDArt Mineral Smooth Top Coat, mineral finishing coat max. particle size 1.0 mm, thickness 2.0 mm with protective coat REDArt Silicate Paint including key coat REDArt Silicate Paint Primer	≥ 0.08 or failure in insulation product	C
REDArt Granite Top Coat, acrylic mosaic finishing coat max. particle size 1.5 mm	≥ 0.08 or failure in insulation product	C

Tab. 97: Bond strength of rendering after artificial ageing (C – cohesive failure in insulation)

Base coat type: **ROCKWOOL REDArt Masă de șpaclu**

Composition of the tested system:

- Insulation product — Frontrock MAX PLUS (TR7,5), thickness of 100 mm
- Base coat — ROCKWOOL REDArt Masă de șpaclu, average thickness of 3 mm
- Fibre glass mesh — Vitrulan SD.4420G/55
- Key coat: — ROCKWOOL REDArt Amorsă Siliconică pentru Tencuială Decorativă
- Finishing coat — defined directly in the table.

Bond strength of rendering system after hygrothermal cycles (MPa)		
Finishing coat	Level	Failure type
ROCKWOOL REDArt Tencuială Decorativă Siliconică Granulată spotted, max. particle size 1.0 mm	≥ 0.08 or failure in insulation product	C
ROCKWOOL REDArt Tencuială Decorativă Siliconică Structurată drilled, max. particle size 1.5 mm	≥ 0.08 or failure in insulation product	C

Tab. 98: Bond strength of rendering after artificial ageing (C – cohesive failure in insulation)

3.3.2.12 Bond strength after freeze/thaw (according 2.2.3.1 of EAD)

Finishing coat	Results	Type of failure
REDArt Silicate Top Coat - spotted, silicate finishing coat - max. particle size 1.0 mm	≥ 0.08 or failure in insulation product	C
REDArt Silicate Top Coat - spotted, silicate finishing coat, max. particle size 2.0 mm	≥ 0.08 or failure in insulation product	C
REDArt Silicate Top Coat - drilled, silicate finishing coat - max. particle size 3.0 mm	≥ 0.08 or failure in insulation product	C

Tab. 99: Bond strength of rendering after simulated freeze/thaw test (C – cohesive failure in insulation)

3.3.2.13 Protection against corrosion

Corrosion protection of metal fasteners corresponds to the requirements of the intended service class (see EN 1995-1-1 and the corresponding reference standards). For especially corrosive conditions consideration should be given to heavier hot dip coatings or stainless steel.

3.3.2.14 Tearing strength and elongation of reinforcement: glass fibre mesh

All the reinforcements of the kit are glass fibre meshes with the performances given in the following table.

Strength after ageing	Results
Residual strength after ageing	≥ 20 N/mm
Relative residual resistance (% after ageing) of strength in the as delivered state	≥ 50 % of the value at as delivered state

Tab. 100: Residual strength of all reinforcement of Table 1 after ageing

3.4 PROTECTION AGAINST NOISE

No Performande Determined.

3.5 ENERGY ECONOMY AND HEAT RETENTION

3.5.1 Thermal resistance

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

$U = U_c + \chi_p.n$

Where:

$\chi_p.n$ has only to be taken into account if it is greater than 0,04 W/(m².K);

U: global thermal transmittance of the covered wall (W/ (m².K));

n: number of anchors (through insulation product) per m²;

χ_p: local influence of thermal bridge caused by an anchor. The value listed below can be taken into account if not specified in the eventual anchor's ETA:

= 0.002 W/K for anchors with a stainless steel screw with the head covered by a plastic material and for anchors with an air gap at the head of the screw ($\chi_p.n$ negligible for n < 20);

= 0.004 W/K for anchors with a galvanized steel screw with the head covered by a plastic material ($\chi_p.n$ negligible for n < 10);

= negligible for anchors with plastic nails (reinforced or not with glass fibres …).

U_c: thermal transmittance of the current part of the covered wall (excluding thermal bridges) (W/ (m².K)) determined as follows:

$$U_c = \frac{1}{R_i + R_{render} + R_{substrate} + R_{se} + R_{si}}$$

Where:

R_i: thermal resistance of the insulation product;

R_{render}: thermal resistance of the render (about 0.02 (m².K)/W);

$R_{substrate}$: thermal resistance of the substrate of the building (concrete, brick …) ((m².K)/W);

R_{se}: external superficial thermal resistance ((m².K)/W);

R_{si}: internal superficial thermal resistance ((m².K)/W).

4. ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE (HEREINAFTER AVCP) SYSTEM APPLIED, WITH REFERENCE TO ITS LEGAL BASE

According to Decision 1997/556/EC[1] of the European Commission amended by the Decision 2001/596/EC, the AVCP (see Annex V to Regulation (EU) 305/2011) given in the following table applies.

Product	Intended use	Level or class (reaction to fire)	System
External thermal insulation composite systems/kits (ETICS) with rendering on timber frame buildings	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+
	in external wall not subject to fire regulations	any	2+

Tab. 101: AVCP system

(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).

[1] Official Journal of the European Communities L 254 of 8.10.1996

(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).

Considering the Euroclass A for the reaction to fire and that no stage in production process has been identified that corresponds to an improvement of the reaction to fire classification, the system of AVCP is System 2+ (see Annex V to Regulation (EU) 305/2011 for tasks and responsibilities).

5. TECHNICAL DETAILS NECESSARY FOR THE IMPLEMENTATION OF THE AVCP SYSTEM, AS PROVIDED FOR IN EAD 040089-00-04.04.

Technical details necessary for the implementation of the AVCP system are laid down in the Control Plan which is deposited at ITC CNR.
For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between ITC CNR and the Notified Body.

Issued in San Giuliano Milanese, Italy on 16/01/2019
by ITC – CNR

Ing. Alessio Marchetti
Acting Director of ITC-CNR

Annex 1: Manufacturing plants

1. ROCKWOOL Polska Sp. z o.o., ul. Kwiatowa 14, 66-131 Cigacice, Poland
2. ROCKWOOL France SAS, 111 Rue du Chateau des Rentiers, 75013 Paris, France
3. ROCKWOOL Hungary Kft., Alkotás u. 39/c, 1123 Budapest, Hungary
4. ROCKWOOL Peninsular S.A.U., Carrer del Bruc, 50-3°, 08010 Barcelona, Spain
5. ROCKWOOL, a.s., Cihelní 769, 735 31 Bohumín 3, Czech republic
6. Deutsche ROCKWOOL Mineralwoll GmbH & Co OHG., ROCKWOOL Straße 37-41, 45966 Gladbeck, Germany
7. AS ROCKWOOL, Gjerdrums vei 19, Pb 4215 Nydalen, 0401 Oslo, Norway
8. ROCKWOOL Italia S.p.A. a socio unico, Via Londonio, 2, 20154 Milano, Italy
9. ROCKWOOL limited, Pencoed, Bridgend, CF35 6NY, United Kingdom
10. ROCKWOOL Romania, Str. Ocna Sibiului nr. 46 - 48, 014011, sector 1, Bucharest, Romania
11. P.W. FAST Sp. z o.o., ul. Foluszowa 112, 014011, 65-751 Zielona Gora, Poland.

Annex 2: Insulation product characteristics – MW lamella (TR80)

Description and characteristics		Regulation	Declared characteristics MW lamella (TR80) (fibre orientation perpendicular)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1 or A2	Apparent density ≤ 155 kg/m³
Thermal resistance		EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162	
Thickness		EN 823	T5	-1 % or -1 mm*, +3 mm
			T4	-3 % or -3 mm*, +5 % or +5 mm**,
Length		EN 822	---	± 2 %
Width			---	± 1.5 %
Squareness		EN 824	---	≤ 5 mm/m
Flatness		EN 825	---	≤ 6 mm
Surface		ETAG 004	No additional treatment (homogenous, without coating)	
Dimensional stability under defined temperature and humidity		EN 1604	DS(70,90)	1 %
Water absorption	Short term water absorption	EN 1609	WS	≤ 1.0 kg/m²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m²
Diffusion factor (μ)(-)		EN 12086 - EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR80	≥ 80 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 50 kPa
Shear strength		EN 12090	---	≥ 20 kPa
Shear modulus of elasticity		EN 12090	---	≥ 1000 kPa

* higher value applies
** lower value applies
Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex 3: Insulation product characteristics – MW board (TR15)

Description and characteristics		Regulation	Declared characteristics MW board (TR15) (longitudinal fibre orientation)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1 or A2	Apparent density ≤ 155 kg/m³
Thermal resistance		EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162	
Thickness		EN 823	T5	-1 % or -1 mm*, +3 mm
			T4	-3 % or -3 mm*, +5 % or +5 mm**,
Length		EN 822	---	± 2 %
Width			---	± 1.5 %
Squareness		EN 824	---	≤ 5 mm/m
Flatness		EN 825	---	≤ 6 mm
Surface		ETAG 004	No additional treatment (homogenous, without coating)	
Dimensional stability under defined temperature and humidity		EN 1604	DS(70,90)	1 %
Water absorption	Short term water absorption	EN 1609	WS	≤ 1.0 kg/m²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m²
Diffusion factor (μ)(-)		EN 12086 - EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR15	≥ 15 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 6 kPa
Shear strength		EN 12090	---	---
Shear modulus of elasticity		EN 12090	---	---

* higher value applies
** lower value applies
Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex 4: Insulation product characteristics – MW board RockSATE MD (TR10)

Description and characteristics		Regulation	Declared characteristics MW board RockSATE MD (TR10) (longitudinal fibre orientation)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density ≤ 155 kg/m³
Thermal resistance		EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162	
Thickness		EN 823	T5	-1 % or -1 mm*, +3 mm
Length		EN 822	---	± 2 %
Width			---	± 1.5 %
Squareness		EN 824	---	≤ 5 mm/m
Flatness		EN 825	---	≤ 6 mm
Surface		ETAG 004	No additional treatment (homogenous, without coating)	
Dimensional stability under defined temperature and humidity		EN 1604	DS(70,90)	1 %
Water absorption	Short term water absorption	EN 1609	WS	≤ 1.0 kg/m²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m²
Diffusion factor (μ)(-)		EN 12086 - EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR10	≥ 10 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 4 kPa
Shear strength		EN 12090	---	---
Shear modulus of elasticity		EN 12090	---	---

* higher value applies

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex 5: Insulation product characteristics– MW board Panneau 431 (TR10)

Description and characteristics		Regulation	Declared characteristics MW board Panneau 431 (TR10) (longitudinal fibre orientation)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density ≤ 155 kg/m³
Thermal resistance		EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162	
Thickness		EN 823	T5	-1 % or -1 mm*, +3 mm
Length		EN 822	---	± 2 %
Width			---	± 1.5 %
Squareness		EN 824	---	≤ 5 mm/m
Flatness		EN 825	---	≤ 6 mm
Surface		ETAG 004	No additional treatment (homogenous, without coating)	
Dimensional stability under defined temperature and humidity		EN 1604	DS(70,90)	1 %
Water absorption	Short term water absorption	EN 1609	WS	≤ 1.0 kg/m²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m²
Diffusion factor (μ)(-)		EN 12086 - EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR10	≥ 10 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 4 kPa
Shear strength		EN 12090	---	---
Shear modulus of elasticity		EN 12090	---	---

* higher value applies

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex 6: Insulation product characteristics – MW boards ECOROCK MONO / RockSATE MD Plus (TR10)

Description and characteristics		Regulation	Declared characteristics MW boards ECOROCK MONO / RockSATE MD Plus (TR10) (longitudinal fibre orientation)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density ≤ 120 kg/m³
Thermal resistance		EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162	
Thickness		EN 823	T5	-1 % or -1 mm*, +3 mm
Length		EN 822	---	± 2 %
Width			---	± 1.5 %
Squareness		EN 824	---	≤ 5 mm/m
Flatness		EN 825	---	≤ 6 mm
Surface		ETAG 004	No additional treatment (homogenous, without coating)	
Dimensional stability under defined temperature and humidity		EN 1604	DS(70,90)	1 %
Water absorption	Short term water absorption	EN 1609	WS	≤ 1.0 kg/m²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m²
Diffusion factor (μ)(-)		EN 12086 - EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR10	≥ 10 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 4 kPa
Shear strength		EN 12090	---	---
Shear modulus of elasticity		EN 12090	---	---

* higher value applies

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex 7: Insulation product characteristics – MW board Frontrock Max E (TR10)

Description and characteristics		Regulation	Declared characteristics MW board Frontrock Max E (TR10) (dual density board, longitudinal fibre orientation)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density ≤ 155 kg/m³
Thermal resistance		EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162	
Thickness		EN 823	T5	-1 % or -1 mm*, +3 mm
Length		EN 822	---	± 2 %
Width			---	± 1.5 %
Squareness		EN 824	---	≤ 5 mm/m
Flatness		EN 825	---	≤ 6 mm
Surface		ETAG 004	No additional treatment (homogenous, without coating)	
Dimensional stability under defined temperature and humidity		EN 1604	DS(70,90)	1 %
Water absorption	Short term water absorption	EN 1609	WS	≤ 1.0 kg/m²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m²
Diffusion factor (μ)(-)		EN 12086 - EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR10	≥ 10 kPa
			TR7.5**	≥ 7.5 kPa**
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 4 kPa
				≥ 3 kPa**
Shear strength		EN 12090	---	---
Shear modulus of elasticity		EN 12090	---	---

* higher value applies
** valid only if insulation product´s thickness is 60 mm
Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex 8: Insulation product characteristics – MW board Frontrock Reno (TR10)

Description and characteristics		Regulation	Declared characteristics MW board External Wall DD Panel (TR10) (dual density board, longitudinal fibre orientation)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density ≤ 155 kg/m³
Thermal resistance		EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162	
Thickness		EN 823	T5	-1 % or -1 mm*, +3 mm
Length		EN 822	---	± 2 %
Width			---	± 1.5 %
Squareness		EN 824	---	≤ 5 mm/m
Flatness		EN 825	---	≤ 6 mm
Surface		ETAG 004	No additional treatment (homogenous, without coating)	
Dimensional stability under defined temperature and humidity		EN 1604	DS(70,90)	1 %
Water absorption	Short term water absorption	EN 1609	WS	≤ 1.0 kg/m²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m²
Diffusion factor (μ)(-)		EN 12086 - EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR10	≥ 10 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 4 kPa
Shear strength		EN 12090	---	---
Shear modulus of elasticity		EN 12090	---	---

* higher value applies

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex 9: Insulation product characteristics – MW board RockSATE DUO (TR7.5)

Description and characteristics		Regulation	Declared characteristics MW board RockSATE DUO (TR7.5) (dual density board, longitudinal fibre orientation)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density ≤ 155 kg/m³
Thermal resistance		EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162	
Thickness		EN 823	T5	-1 % or -1 mm*, +3 mm
Length		EN 822	---	± 2 %
Width			---	± 1.5 %
Squareness		EN 824	---	≤ 5 mm/m
Flatness		EN 825	---	≤ 6 mm
Surface		ETAG 004	No additional treatment (homogenous, without coating)	
Dimensional stability under defined temperature and humidity		EN 1604	DS(70,90)	1 %
Water absorption	Short term water absorption	EN 1609	WS	≤ 1.0 kg/m²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m²
Diffusion factor (μ)(-)		EN 12086 – EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR7.5	≥ 7.5 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 3 kPa
Shear strength		EN 12090	---	---
Shear modulus of elasticity		EN 12090	---	---

* higher value applies

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex 10: Insulation product characteristics – MW board ECOROCK (TR7.5)

Description and characteristics		Regulation	Declared characteristics MW board ECOROCK (TR7.5) (dual density board, longitudinal fibre orientation)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density ≤ 155 kg/m³
Thermal resistance		EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162	
Thickness		EN 823	T5	-1 % or -1 mm*, +3 mm
Length		EN 822	---	± 2 %
Width			---	± 1.5 %
Squareness		EN 824	---	≤ 5 mm/m
Flatness		EN 825	---	≤ 6 mm
Surface		ETAG 004	No additional treatment (homogenous, without coating)	
Dimensional stability under defined temperature and humidity		EN 1604	DS(70,90)	1 %
Water absorption	Short term water absorption	EN 1609	WS	≤ 1.0 kg/m²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m²
Diffusion factor (μ)(-)		EN 12086 – EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR7.5	≥ 7.5 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 3 kPa
Shear strength		EN 12090	---	---
Shear modulus of elasticity		EN 12090	---	---

* higher value applies

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex 11: Insulation product characteristics – MW board FASROCK MAX (TR7.5)

Description and characteristics		Regulation	Declared characteristics MW board FASROCK MAX (TR7.5) (dual density board, longitudinal fibre orientation)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density ≤ 155 kg/m³
Thermal resistance		EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162	
Thickness		EN 823	T4	-3 % or -3 mm*, +5 % or +5 mm**,
Length		EN 822	---	± 2 %
Width			---	± 1.5 %
Squareness		EN 824	---	≤ 5 mm/m
Flatness		EN 825	---	≤ 6 mm
Surface		ETAG 004	No additional treatment (homogenous, without coating)	
Dimensional stability under defined temperature and humidity		EN 1604	DS(70,90)	1 %
Water absorption	Short term water absorption	EN 1609	WS	≤ 1.0 kg/m²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m²
Diffusion factor (μ)(-)		EN 12086 - EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR7.5	≥ 7.5 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 3 kPa
Shear strength		EN 12090	---	---
Shear modulus of elasticity		EN 12090	---	---

* higher value applies
** lower value applies
Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex 12: Insulation product characteristics – MW boards Frontrock Max Plus / RockSATE DUO Plus / ECOROCK DUO (TR 7.5)

Description and characteristics		Regulation	Declared characteristics MW board Frontrock Max Plus/ RockSATE DUO Plus / ECOROCK DUO (dual density board, longitudinal fibre orientation)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density ≤ 155 kg/m³
Thermal resistance		EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162	
Thickness		EN 823	T5	-1 % or -1 mm*, +3 mm
Length		EN 822	---	± 2 %
Width			---	± 1.5 %
Squareness		EN 824	---	≤ 5 mm/m
Flatness		EN 825	---	≤ 6 mm
Surface		ETAG 004	No additional treatment (homogenous, without coating)	
Dimensional stability under defined temperature and humidity		EN 1604	DS(70,90)	1 %
Water absorption	Short term water absorption	EN 1609	WS	≤ 1.0 kg/m²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m²
Diffusion factor (μ)(-)		EN 12086 - EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR.7.5	≥ 7.5 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 3 kPa
Shear strength		EN 12090	---	---
Shear modulus of elasticity		EN 12090	---	---

* higher value applies

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex 13: Insulation product characteristics – MW boards Coverrock, Coverrock II, Coverrock 036, Coverrock Plus, Coverrock BR (TR5)

Description and characteristics	Regulation	Declared characteristics MW boards Coverrock (TR5) (dual density board, longitudinal fibre orientation)	
		Class, level according to EN 13162	Value
Reaction to fire	EN 13501 -1+A1:2009	A1	Apparent density ≤ 155 kg/m³
Thermal resistance	EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162	
Thickness	EN 823	T5	-1 % or -1 mm*, +3 mm
Length	EN 822	---	± 2 %
Width		---	± 1.5 %
Squareness	EN 824	---	≤ 5 mm/m
Flatness	EN 825	---	≤ 6 mm
Surface	ETAG 004	With or without additional treatment (one side or both sides sprayed coating)	
Dimensional stability under defined temperature and humidity	EN 1604	DS(70,-)	1 %
Water absorption – Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m²
Diffusion factor (μ)(-)	EN 12086 - EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions	EN 1607	TR5	≥ 5.0 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions	ETAG 004	---	≥ 1 kPa
Shear strength	EN 12090	---	---
Shear modulus of elasticity	EN 12090	---	---
Air flow resistance (kPa.s/m²)	EN 29053	AF_r30	≥ 30 kPa.s/m²
Dynamic stiffness	EN 29052-1	---	5 – 15 MN/m³**

* higher value applies
** specific value depends on a thickness and product type – always see the related DoP
Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex 14: Insulation product characteristics – MW boards Frontrock Casa (TR 5)

Description and characteristics		Regulation	Declared characteristics MW board Frontrock Casa (dual density board, longitudinal fibre orientation)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density ≤ 155 kg/m³
Thermal resistance		EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162	
Thickness		EN 823	T5	-1 % or -1 mm*, +3 mm
Length		EN 822	---	± 2 %
Width			---	± 1.5 %
Squareness		EN 824	---	≤ 5 mm/m
Flatness		EN 825	---	≤ 6 mm
Surface		ETAG 004	No additional treatment (homogenous, without coating)	
Dimensional stability under defined temperature and humidity		EN 1604	DS(70,90)	1 %
Water absorption	Short term water absorption	EN 1609	WS	≤ 1.0 kg/m²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m²
Diffusion factor (μ)(-)		EN 12086 - EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR.5	≥ 5 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 1 kPa
Shear strength		EN 12090	---	---
Shear modulus of elasticity		EN 12090	---	---

* higher value applies

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015