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European Technical Assessment

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General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: **Technický a skúšobný ústav stavebný, n. o.**

Trade name of the construction product

Murexin Energy Saving System EPS

Product family to which the construction product belongs

Product area code: 4
THERMAL INSULATION PRODUCTS.
COMPOSITE INSULATING KITS/SYSTEMS.
External Thermal Insulation Composite Systems (ETICS)
with renderings

Manufacturer

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This European Technical Assessment contains

34 pages including 3 Annexes which form an integral part of this assessment.

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

EAD 040083-00-0404

This version replaces

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Specific part

1 Technical description of the product

1.1 General

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

The ETICS kit comprises a prefabricated insulation product of expanded polystyrene boards to be bonded or mechanically fixed onto a wall. The methods of fixing and the relevant components are specified in the table below. The insulation product is faced with a rendering system consisting of one or more layers (site applied), one of which contains reinforcement. The rendering is applied directly to the insulating panels, without any air gap or disconnecting layer.

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

1.2 Composition of the ETICS

Table 1 – Composition of the ETICS

	Components (see Clause 2.3 for further description, characteristics and performances of the components)	Coverage (kg/m ²)	Thickness (mm)
Insulation materials with associated methods of fixing	Bonded ETICS (partially or fully bonded) with supplementary anchors. According to ETA-holder's prescription the minimal bonded surface shall be at least 40 %. National application documents shall be taken into account).		
	• Thermal insulation product: Expanded polystyrene boards (see Annex 1 for product characteristics)	/	20 to 300
	• Adhesives: - Murexin Energy Star Preparation: mixing of 6 l to 7 l water/25 kg powder Composition: mineral powder, cement base with silica sand, dispersion powder, additives	4,0 to 5,0 (powder)	/
	- Murexin Energy Forte Preparation: mixing of 6,5 l to 7 l water/25 kg powder Composition: mineral powder, cement base with silica sand, dispersion powder, additives	5,0 (powder)	/
	- Murexin Energy Fix Preparation: mixing of 6 l to 7 l water/25 kg powder Composition: mineral powder, cement base with silica sand, dispersion powder, additives	4,0 to 5,0 (powder)	/
	- Murexin Energy Diamond MAXIMO M 70 (identical to Murexin Leicht-Klebspachtel Maximo M 70) Preparation: mixing of 6 l to 7 l water/25 kg powder Composition: mineral powder, cement base with silica sand, dispersion powder, additives	4,0 to 5,0 (powder)	/
	• Supplementary anchors See list of anchors in Annex 2.		

	Mechanically fixed ETICS with anchors and supplementary adhesive. According to ETA-holder's prescription the minimal bonded surface shall be at least 40 % (see Table 17). National application documents shall be taken into account). • Thermal insulation product: Expanded polystyrene boards (see Annex 1 for product characteristics) • Supplementary adhesives: - Murexin Energy Star Preparation: mixing of 6 l to 7 l water/25 kg powder Composition: mineral powder, cement base with silica sand, dispersion powder, additives - Murexin Energy Forte Preparation: mixing of 6,5 l to 7 l water/25 kg powder Composition: mineral powder, cement base with silica sand, dispersion powder, additives - Murexin Energy Fix Preparation: mixing of 6 l to 7 l water/25 kg powder Composition: mineral powder, cement base with silica sand, dispersion powder, additives - Murexin Energy Diamond MAXIMO M 70 (identical to Murexin Leicht-Klebspachtel Maximo M 70) Preparation: mixing of 3 l to 3,5 l water / 13 kg powder Composition: mineral powder, cement base with silica sand, dispersion powder, additives • Anchors See list of anchors in Annex 2.	/	50 to 300
Base coats	• Murexin Energy Star Preparation: mixing of 6 l to 7 l water/25 kg powder Composition: mineral powder, cement base with silica sand, dispersion powder, additives	4,0 to 5,0 (powder)	3,0 to 4,0
	• Murexin Energy Forte Preparation: mixing of 6,5 l to 7 l water/25 kg powder Composition: mineral powder, cement base with silica sand, dispersion powder, additives	5,0 to 8,0 (powder)	5,0 to 8,0
	• Murexin Energy Diamond MAXIMO M 70 (identical to Murexin Leicht-Klebspachtel Maximo M 70) Preparation: mixing of 3 l to 3,5 l water / 13 kg powder Composition: mineral powder, cement base with silica sand, dispersion powder, additives	3,0 to 5,0 (powder)	3,0
Glass fibre meshes	• Standard glass fibre mesh: (see Annex 3 for product characteristics) (glass fibres mesh with mesh size between 3 mm and 5 mm) Murexin Energy Textile Murexin Energy Textile (160)	0,117 0,160	0,5

Key coat	• Murexin Energy Primer: ready to use pigmented liquid.	0,15 (l/m ²)	
Finishing coats	• Ready to use pastes – synthetic binder Murexin Energy Brilliant (particle size 1,5/2,0/3,0 mm), floated structure (particle size 2,0/3,0 mm), ribbed structure	2,5 to 4,2 2,8 to 3,9	Regulated by particle size
	• Ready to use pastes – silicone binder Murexin Energy Furioso (particle size 1,5/2,0/3,0 mm), floated structure (particle size 2,0/3,0 mm), ribbed structure	2,5 to 4,2	
	• Ready to use pastes – silicate binder Murexin Energy Crystal (particle size 1,5/2,0/3,0 mm), floated structure (particle size 2,0/3,0 mm), ribbed structure Murexin Energy Clean * (particle size 1,5/2,0/3,0 mm), floated structure	2,5 to 4,2 2,8 to 3,9 2,5 to 4,2	
	• Ready to use pastes – acrylic binder Murexin Energy Design (particle size 1,5/2,0/3,0 mm), floated structure	2,5 to 4,2	
Ancillary materials	Remain under the manufacturer's responsibility.		
* This finishing coat is not foreseen to be used with the base coat Murexin Energy Forte.			

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

2.1 Intended use

This ETICS is intended for use as external insulation of buildings' walls. The walls are made of masonry (bricks, blocks, stones ...) or concrete (cast on site or as prefabricated panels). The characteristics of the walls shall be verified prior to use of the ETICS, especially regarding conditions for reaction to fire classifications and for fixing of the ETICS either by bonding or mechanically. The ETICS is designed to give the wall to which it is applied satisfactory thermal insulation.

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

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

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

The choice of the method of fixing depends on the characteristics of the substrate, which could need preparation and shall be done in accordance with the national instructions.

The provisions made in this European Technical Assessment (ETA) are based on an assumed intended working life of at least 25 years, provided that the conditions laid down in Clauses 2.3, 2.4 and 2.5 for the packaging, transport, storage and installation as well as appropriate use, maintenance and repair are met. The indications given as to the working life cannot be interpreted as a guarantee given by the manufacturer or the Technical

Assessment Body, but should only be regarded as a means for choosing the appropriate products in relation to the expected economically reasonable working life of the works.

The ETICS belong to Category S/W2, according to EOTA Technical Report No. 034.

2.2 Manufacturing

The European Technical Assessment is issued for the ETICS in the basis of agreed data/information, deposited with the Technical Assessment Body "Building Testing and Research Institute", which identified the ETICS that has been assessed and judged. Changes to the ETICS or production process, which could result in this deposited data/information being incorrect, shall be notified to the Technical Assessment Body "Building Testing and Research Institute" before the changes are introduced. The Technical Assessment Body "Building Testing and Research Institute" will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alternations to the ETA, shall be necessary.

2.3 Design and installation

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

Design, installation and execution of ETICS are to be in conformity with national documents. Such documents and the level of their implementation in Member States' legislation are different.

2.4 Packaging, transport and storage

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

2.5 Use, maintenance and repair

The finishing coat shall normally be maintained in order to fully preserve the ETICS performance.

Maintenance includes at least:

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

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

It is important to be able to carry out maintenance as far as possible using readily available products and equipment, without spoiling appearance. Only products which are compatible with the ETICS shall be used.

The information on use, maintenance and repair is given in the manufacturer's technical documentation. It is responsibility of the manufacturer(s) to ensure that these provisions are easily accessible to the concerned people.

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

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

3.1 Safety in case of fire (BWR 2)

3.1.1 Reaction to fire (EAD 040083-00-0404 – Clause 2.2.1.1, EN 13501-1)

The reaction to fire was determined in accordance with EAD 040083-00-0404, Clause 2.2.1.1. The product as defined under Clause 1.1 reached the following classification valid for configuration stated in Table 2.

Table 2 – Reaction to fire classification of ETICS

Configuration	Max. organic content	Flame retardant content	Euroclass according to EN 13501-1
Adhesives: Murexin Energy Star Murexin Energy Forte Murexin Energy Fix Murexin Energy Diamond MAXIMO M 70 (tested)	Base coat: (3,4 ±0,6) % Finishing coat: (10,9 ±1,09) %	Base coat: 0 % Finishing coat: 0 %	B-s1, d0
EPS 70 (EPS-EN 13163-TR100) thickness from 50 mm to 200 mm tested thickness: 180 mm reaction to fire: E density: approx. 19 kg/m ³			
Base coat: Murexin Energy Star Murexin Energy Forte Murexin Energy Diamond MAXIMO M 70 (tested)			
Glass fibre meshes: Murexin Energy Textile mass per unit area from 145 g/m ² +8 % to 160 g/m ² +8% Murexin Energy Textile (160) tested mesh: R131 A101			
Key coat: Murexin Energy Primer			
Finishing coats: Murexin Energy Brilliant Murexin Energy Furioso Murexin Energy Design (tested) Murexin Energy Clean Murexin Energy Crystal			

Mounting and fixing:

The assessment of reaction to fire is based on tests with maximal insulation layer thicknesses of 180 mm, STN EN ISO 11925-2 and insulation material densities 19 kg/m³ and a base coat with maximum organic content 3,4 % render system with maximum organic content of finishing coat 10,9 % and thickness 3,0 mm (and 1,5 mm).

For the SBI this ETICS is mounted directly to a calcium silicate plasterboard substrate with a minimum density of 820 kg/m³.

The installation of the ETICS was carried out by the manufacturer (holder of assessment) following the manufacturer's specifications (instruction sheet) using a single layer of the glass fibre mesh all over the test specimen (no overlapping glass fibre mesh).

The test specimens were prefabricated and did not include any joints. The panel edges were rendered except the upper and bottom edges.

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

Please note that in some member states the classification on the basis of SBI test is not accepted. Additional tests might be required e.g. large scale tests to demonstrate compliance with a member state's fire regulation.

Further the edges of the ETICS always have to be protected against fire.

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

3.1.2 Reaction to fire of thermal insulation material (EAD 040083-00-0404 – Clause 2.2.1.2)

The reaction to fire of thermal insulations covered by ETA is Class E (a part of Declaration of performances).

3.1.2 Façade fire performance (EAD 040083-00-0404 – Clause 2.2.2, EN 13501-1)

No performance assessed.

3.2 Hygiene, health and environment (BWR 3)

3.2.1 Content, emission and/or release of dangerous substances – leachable substances (EAD 040083-00-0404 – Clause 2.2.4)

No performance assessed.

3.2.2 Water absorption (EAD 040083-00-0404 – Clause 2.2.5.1)

Table 3 – Water absorption of base coats

		Water absorption in kg/m ²	
		After 1 hour	After 24 hours
Base coat	Murexin Energy Star	0,04	0,322
	Murexin Energy Forte	0,05	0,364
	Murexin Energy Diamond MAXIMO M 70	0,04	0,11

Table 4 – Water absorption of rendering systems

Base coat Murexin Energy Star		After 1 hour	After 24 hours
Rendering systems: base coat + key coat according to Clause 1.1 + finishing coats indicated hereafter:	Murexin Energy Brilliant	0,061	0,312
	Murexin Energy Crystal	0,065	0,439
	Murexin Energy Furioso	0,050	0,308
	Murexin Energy Design	0,051	0,333
	Murexin Energy Clean	0,066	0,441

Table 5 – Water absorption of rendering systems

Base coat Murexin Energy Forte		Water absorption in kg/m²	
		After 1 hour	After 1 hour
Rendering systems: base coat + key coat according to Clause 1.1 + finishing coats indicated hereafter:	Murexin Energy Brilliant	0,052	0,348
	Murexin Energy Crystal	0,060	0,402
	Murexin Energy Furioso	0,049	0,330
	Murexin Energy Design	0,060	0,340
	Murexin Energy Clean	0,060	0,409

Table 6 – Water absorption of rendering systems

Base coat Murexin Energy Diamond MAXIMO M 70		Water absorption in kg/m²	
		After 1 hour	After 1 hour
Rendering systems: base coat + key coat according to Clause 1.1 + finishing coats indicated hereafter:	Murexin Energy Brilliant	0,08	0,36
	Murexin Energy Crystal	0,06	0,30
	Murexin Energy Furioso	0,08	0,45
	Murexin Energy Design	0,09	0,31
	Murexin Energy Clean	0,19	1,26

3.2.3 Water absorption of the thermal insulation product (EAD 040083-00-0404 – Clause 2.2.5.2)

No performance determined.

3.2.4 Water-tightness of the ETICS: Hygrothermal behaviour (EAD 040083-00-0404 – Clause 2.2.6)

Hygrothermal cycles have been performed on a rig. None of the following defects occurred during the testing:

- blistering or peeling of any finishing coat;
- failure or cracking associated with joints between insulation product boards or profiles fitted with ETICS;
- detachment of render coat;
- cracking allowing water penetration to the insulation layer (normally not bigger than 0,2 mm).

The ETICS is so assessed as resistant to hygrothermal cycles, it means ETICS passed the test without defects.

3.2.5 Water-tightness of the ETICS: Freeze-thaw behaviour (EAD 040083-00-0404 – Clause 2.2.7)

The water absorptions of all base coats used in ETICS are less than 0,5 kg/m² after 24 hours and so the corresponding configuration(s) of the ETICS are assessed as freeze/thaw resistant.

The water absorptions of rendering systems with finishing coats Murexin Energy Brilliant, Murexin Energy Furioso, Murexin Energy Clean, and Murexin Energy Design are less than 0,5 kg/m² after 24 hours and so **the corresponding configuration(s) of the ETICS are assessed as freeze/thaw resistant**.

The water absorptions of rendering systems with base coat Murexin Energy Diamond MAXIMO M 70 and finishing coat Murexin Energy Clean are more less than 0,5 kg/m² after 24 hours, therefore the ETICS has been assessed as **freeze/thaw resistant** according to simulated method (2.2.7 EAD 040083-00-0404).

3.2.6 Impact resistance (EAD 040083-00-0404 – Clause 2.2.8)

Performance is stated by level expressed by Category I or II. The resistance to hard body impacts (3 Joules and 10 Joules) for rendering systems leads to the following use categories (see Tables 7 to 9). Tests have been performed on rig and small samples.

Diameter of the impact is no performance assessed.

The presence of any micro cracks or cracks, at the impact point and at the circumference is no performance assessed.

Table 7 – Use categories for ETICS according to impact resistance

Murexin Energy Star		Single standard mesh	Double standard mesh
Rendering systems: base coat indicated above + key coats according to Clause 1.1 + finishing coats indicated hereafter:	Murexin Energy Brilliant	Category II diameter of impact: 0 mm (3J) 38mm/43mm/32mm/31mm/45mm (10J) Presence of cracks: yes (10J)	Category I diameter of impact: 0 mm (3J, 10J) Presence of cracks: no
	Murexin Energy Crystal	Category II diameter of impact: 0 mm (3J) 28mm/38mm/37mm/43mm/26mm (10J) Presence of cracks: yes (10J)	Category I diameter of impact: 0 mm (3J, 10J) Presence of cracks: no
	Murexin Energy Furioso	Category II diameter of impact: 0 mm (3J) 37mm/38mm/30mm/48mm/30mm (10J) Presence of cracks: yes (10J)	Category I diameter of impact: 0 mm (3J, 10J) Presence of cracks: no
	Murexin Energy Design	Category II diameter of impact: 0 mm (3J) 32mm/40mm/29mm/45mm/43mm (10J) Presence of cracks: yes (10J)	Category I diameter of impact: 0 mm (3J, 10J) Presence of cracks: no
	Murexin Energy Clean	Category II diameter of impact: 0 mm (3J) 45mm/33mm/45mm/40mm/31mm (10J) Presence of cracks: yes (10J)	Category I diameter of impact: 0 mm (3J, 10J) Presence of cracks: no

Table 8 – Use categories for ETICS according to impact resistance

Murexin Energy Forte		Single standard mesh	Double standard mesh
Rendering systems: base coat indicated above + key coats according to Clause 1.1 + finishing coats indicated hereafter:	Murexin Energy Brilliant	Category I diameter of impact: 0 mm (3J, 10J) Presence of cracks: no	Category I diameter of impact: 0 mm (3J, 10J) Presence of cracks: no
	Murexin Energy Crystal	Category I diameter of impact: 0 mm (3J, 10J) Presence of cracks: no	Category I diameter of impact: 0 mm (3J, 10J) Presence of cracks: no
	Murexin Energy Furioso	Category I diameter of impact: 0 mm (3J, 10J) Presence of cracks: no	Category I diameter of impact: 0 mm (3J, 10J) Presence of cracks: no
	Murexin Energy Design	Category I diameter of impact: 0 mm (3J, 10J) Presence of cracks: no	Category I diameter of impact: 0 mm (3J, 10J) Presence of cracks: no
	Murexin Energy Clean	Category I diameter of impact: 0 mm (3J, 10J) Presence of cracks: no	Category I diameter of impact: 0 mm (3J, 10J) Presence of cracks: no

Table 9 – Use categories for ETICS according to impact resistance

Murexin Energy Diamond MAXIMO M 70		Single standard mesh	Double standard mesh
Rendering systems: base coat indicated above + key coats according to Clause 1.1 + finishing coats indicated hereafter:	Murexin Energy Brilliant*	Category II diameter of impact: 24mm/29mm/27mm/30mm/21mm (3J) 39mm/51mm/39mm/34mm/30mm (10J) Presence of cracks: yes (3J, 10J)	No performance assessed
	Murexin Energy Crystal**	Category II diameter of impact: 0 mm (3J) 34mm/35mm/43mm/37mm/34mm (10J) Presence of cracks: yes (10J)	
	Murexin Energy Furioso*	Category II diameter of impact: 26mm/25mm/20mm/20mm/20mm (3J) 35mm/44mm/39mm/42mm/39mm (10J) Presence of cracks: yes (3J, 10J)	
	Murexin Energy Design*	Category II diameter of impact: 19mm/20mm/25mm/29mm/29mm (3J) 34mm/47mm/39mm/49mm/35mm (10J) Presence of cracks: yes (3J, 10J)	
	Murexin Energy Clean*	Category II diameter of impact: 44mm/48mm/51mm/51mm/44mm (3J) 51mm/40mm/46mm/53mm/44mm (10J) Presence of cracks: yes (3J, 10J)	
*Tested on the rig **Tested on small samples			

3.2.7 Water vapour permeability (EAD 040083-00-0404 – Clause 2.2.9.1)

ETICS is resistant to water vapour diffusion of the rendering system ($s_d \leq 2,0$). The mean values s_d and thicknesses of rendering systems (THR) are stated for the specified rendering systems in Tables 10 to 12.

Table 10 – Water vapour permeability of rendering systems

Murexin Energy Star (thickness 5 mm)		Equivalent air thickness (m)
Rendering systems: base coat indicated above + key coats according to Clause 1.1 + finishing coats indicated hereafter:	Murexin Energy Brilliant	0,5 (test results obtained with finishing coat Murexin Energy Brilliant, floated structure, particles size 3,0 mm), THR is 6 mm
	Murexin Energy Crystal	0,5 (test results obtained with finishing coat Murexin Energy Crystal, floated structure, particles size 3,0 mm), THR is 6 mm
	Murexin Energy Furioso	0,6 (test results obtained with finishing coat Murexin Energy Furioso, floated structure, particles size 3,0 mm), THR is 6 mm
	Murexin Energy Design	0,7 (test results obtained with finishing coat Murexin Energy Design, floated structure, particles size 3,0 mm), THR is 6 mm
	Murexin Energy Clean	0,2 (test results obtained with finishing coat Murexin Energy Clean, floated structure, particles size 3,0 mm), THR is 6 mm

Table 11 – Water vapour permeability of rendering systems

Murexin Energy Forte (thickness 5 mm)		Equivalent air thickness (m)
Rendering systems: base coat indicated above + key coats according to Clause 1.1 + finishing coats indicated hereafter:	Murexin Energy Brilliant	0,5 (test results obtained with finishing coat Murexin Energy Brilliant, floated structure, particles size 3,0 mm), THR is 8 mm
	Murexin Energy Crystal	0,6 (test results obtained with finishing coat Murexin Energy Crystal, floated structure, particles size 3,0 mm), THR is 8 mm
	Murexin Energy Furioso	0,6 (test results obtained with finishing coat Murexin Energy Furioso, floated structure, particles size 3,0 mm), THR is 8 mm
	Murexin Energy Design	0,7 (test results obtained with finishing coat Murexin Energy Design, floated structure, particles size 3,0 mm), THR is 8 mm
	Murexin Energy Clean	0,3 (test results obtained with finishing coat Murexin Energy Clean, floated structure, particles size 3,0 mm), THR is 8 mm

Table 12 – Water vapour permeability of rendering systems

Murexin Energy Diamond MAXIMO M 70 (thickness 3 mm)		Equivalent air thickness (m)
Rendering systems: base coat indicated above + key coats according to Clause 1.1 + finishing coats indicated hereafter:	Murexin Energy Brilliant	0,44 (test results obtained with finishing coat Murexin Energy Brilliant, floated structure, particles size 3,0 mm), THR is 5,02 mm
	Murexin Energy Crystal	0,38 (test results obtained with finishing coat Murexin Energy Crystal, floated structure, particles size 3,0 mm), THR is 4,71 mm
	Murexin Energy Furioso	0,39 (test results obtained with finishing coat Murexin Energy Furioso, floated structure, particles size 3,0 mm), THR is 4,86 mm
	Murexin Energy Design	0,45 (test results obtained with finishing coat Murexin Energy Design, floated structure, particles size 3,0 mm), THR is 4,82 mm
	Murexin Energy Clean	0,16 (test results obtained with finishing coat Murexin Energy Clean, floated structure, particles size 3,0 mm), THR is 5,22 mm)

3.2.8 Water vapour permeability of thermal insulation product (EAD 040083-00-0404 – Clause 2.2.9.2)

No performance assessed.

3.3 Safety and accessibility in use (BWR 4)

3.3.1 Bond strength between base coat and insulation product (EAD 040083-00-0404 – Clause 2.2.11.1)

Table 13 – Bond strength between base coat Murexin Energy Star and expanded polystyrene board (EPS – TR100)

Conditionings		
Initial state	After the hygrothermal cycles (on the rig)	After the freeze/thaw cycles (on samples)
Min. value: 99 kPa Mean value: 102 kPa (≥ 80 kPa)	Mean value: 70 kPa < 0,08 MPa (cohesive rupture)	Test not required because freeze/thaw cycles not necessary

Table 14 – Bond strength between base coat Murexin Energy Forte and expanded polystyrene board (EPS – TR150)

Conditionings		
Initial state (EN 13163-TR100)	After the hygrothermal cycles (on the rig) (EN 13163-TR150)	After the freeze/thaw cycles (on samples)
Min. value: 100 kPa Mean value: 104 kPa (≥ 80 kPa)	Mean value: 127 kPa (cohesive rupture) (≥ 80 kPa)	Test not required because freeze/thaw cycles not necessary

Table 15 – Bond strength between base coat Murexin Energy Diamond M 70 and expanded polystyrene boards (EPS – TR100)

Conditionings		
Initial state	After the hygrothermal cycles (on the rig)	After the freeze/thaw cycles (on samples)
Min. value: 11 Individual values: 124/128/132/120/120 kPa Min. value: 120 kPa Mean value: 124 kPa (≥ 80 kPa)	Individual values: 96/113/118/126/98 kPa Min. value: 96 kPa Mean value: 110 kPa (cohesive rupture) (≥ 80 kPa)	Test not required because freeze/thaw cycles not necessary

3.3.2 Bond strength between adhesive and substrate (EAD 040083-00-0404 – Clause 2.2.11.2)

Table 16 – Bond strength between adhesive and substrate/insulation product

Adhesives	Substrate and thermal insulation product	Conditionings		
		Initial state	48 h immersion in water + 2 h 23 °C/50% RH	48 h immersion in water + 7 days 23 °C/50% RH
Murexin Energy Star (the tested thickness: 3 – 5) mm)	Concrete	Min. 1274 kPa Mean 1 310 kPa (≥ 250 kPa)	Min. 555 kPa Mean 606 kPa (≥ 80 kPa)	Min. 1 401 kPa Mean 1467 kPa (≥ 250 kPa)
	Thermal insulation product EPS-TR100	Min. 99 kPa Mean 102 kPa (≥ 80 kPa)	Min. 80 kPa Mean 82 kPa (≥ 30 kPa)	Min. 105 kPa Mean 109 kPa (≥ 80 kPa)
	Thermal insulation product EPS-TR150	Min. 149 kPa Mean 151 kPa (≥ 80 kPa)	Min. 81 kPa Mean 84 kPa (≥ 30 kPa)	Min. 148 kPa Mean 150 kPa (≥ 80 kPa)
Murexin Energy Forte	Concrete	Min. 1247 kPa Mean 1300 kPa (≥ 250 kPa)	Min. 600 kPa Mean 611 kPa (≥ 80 kPa)	Min. 1429 kPa Mean: 1487 kPa (≥ 250 kPa)
	Insulation product EPS-TR100	Min. 100 kPa Mean 104 kPa (≥ 80 kPa)	Min. 81 kPa Mean 83 kPa (≥ 30 kPa)	Min. 100 kPa Mean: 103 kPa (≥ 80 kPa)
	Insulation product EPS-TR150	Min. 151 kPa Mean 155 kPa (≥ 80 kPa)	Min. 84 kPa Mean 86 kPa (≥ 30 kPa)	Min. 147 kPa Mean: 149 kPa (≥ 80 kPa)
Murexin Energy Fix	Concrete	Min. 1280 kPa Mean 1302 kPa (≥ 250 kPa)	Min. 600 kPa Mean 638 kPa (≥ 80 kPa)	Min. 1315 kPa Mean: 1444 kPa (≥ 250 kPa)
	Insulation product EPS-TR100	Min. 99 kPa Mean 102 kPa (≥ 80 kPa)	Min. 77 kPa Mean 81 kPa (≥ 30 kPa)	Min. 100 kPa Mean: 102 kPa (≥ 80 kPa)
	Insulation product EPS-TR150	Min. 150 kPa Mean 157 kPa (≥ 80 kPa)	Min. 85 kPa Mean 86 kPa (≥ 30 kPa)	Min. 149 kPa Mean: 153 kPa (≥ 80 kPa)
Murexin Energy Diamond MAXIMO M 70	Concrete	Individual values: 448/392/396/428/420 kPa Min. 392 kPa Mean: 417 kPa (≥ 250 kPa)	Individual values: 260/288/288/272/312 kPa Min. 260 kPa Mean: 284 kPa (≥ 80 kPa)	Individual values: 364/356/308/264/352 kPa Min. 308 kPa Mean: 329 kPa (≥ 250 kPa)
	Insulation product EPS-TR100	Individual values: 120/116/116/116/106 kPa Min. 106 kPa Mean: 115 kPa (≥ 80 kPa)	Individual values: 108/112/108/112/120 kPa Min. 108 kPa Mean: 112 kPa (≥ 30 kPa)	Individual values: 112/108/104/112/112 kPa Min. 104 kPa Mean: 110 kPa (≥ 80 kPa)

3.3.3 Bond strength between adhesive and thermal insulation product (EAD 040083-00-0404 – Clause 2.2.11.3)

See performance in above Table 16.

The ETICS shall be installed on the substrate with application of the adhesive on the following minimal surface (% of total) according to Table 17:

Table 17 – Minimal bonded surface of adhesives to substrate

	Tensile strength perpendicular to the face of the thermal insulation product	
	≥ 100 kPa	≥ 150 kPa
Murexin Energy Star	40 %	40 %
Murexin Energy Forte	40 %	40 %
Murexin Energy Fix	40 %	40 %
Murexin Energy Diamond MAXIMO M 70	40 %	40 %

3.3.4 Fixing strength (transverse displacement)

Test not relevant because the ETICS fulfils the following criteria (EAD 040083-00-0404 – Clause 2.2.12):

- The bonded area exceeds 40 % in case of mechanically fixed systems with supplementary adhesive.
- $E \times d = 10\,503 \text{ N/mm} < 50\,000 \text{ N/mm}$, where E is modulus of elasticity of the base coat Murexin Energy Star without glass fibre mesh and d is mean dried thickness of the base coat.
- $E \times d = 19\,395 \text{ N/mm} < 50\,000 \text{ N/mm}$, where E is modulus of elasticity of the base coat Murexin Energy Forte without glass fibre mesh and d is mean dried thickness of the base coat.
- $E \times d = 1\,148 \text{ N/mm} < 50\,000 \text{ N/mm}$, where E is modulus of elasticity of the base coat Murexin Energy Diamond MAXIMO M 70 without glass fibre mesh and d is mean dried thickness of the base coat.

3.3.5 Wind load resistance (EAD 040083-00-0404 – Clause 2.2.13.1 and 2.2.13.2)

Safety in use of mechanically fixed ETICS using anchors

The following values only apply for the combination (anchor's trade name) / (EPS panel's characteristics) mentioned in the first lines of each table.

Table 18 – Failure loads of combination of anchors described in below table and insulation product – EPS-EN 13163-TR100

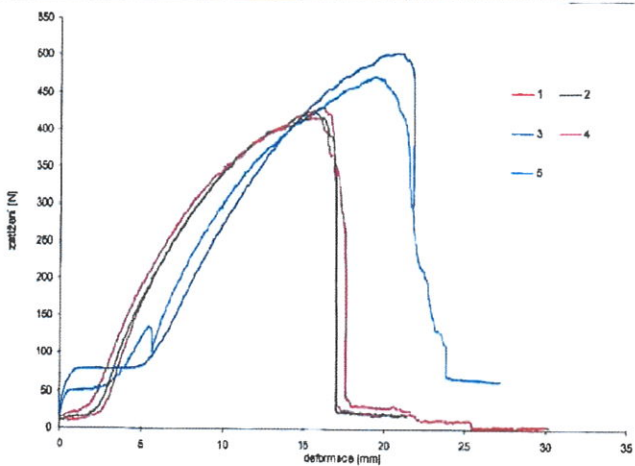
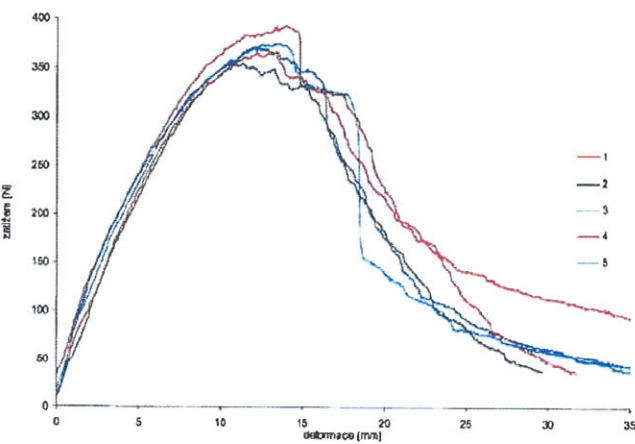
Anchors for which the following failure loads apply	Trade name	Anchors according to list in Table 28 and mentioned in Annex 2	
	Plate diameter (mm)	≥ 60	
Characteristic of the insulation product panels for which the following failure loads apply	Thickness (mm)	≥ 50	
	Tensile strength perpendicular to the face (kPa)	≥ 100	
	Tensile strength perpendicular to the face (kPa) - measured value	109,8 (average) 98,8 (minimum)	
Failure loads (N)	Anchors not placed at the panel joint (pull – through test)	R_{panel} :	Minimum: 427,2 Average: 391,8
			
	Anchors placed at the panel joint (pull – through test)	R_{joint} :	Minimum: 372,3 Average: 354,3
			

Table 19 – Failure loads of combination of anchors described in below table and insulation product – EPS-EN 13163-TR100

Note: The results only on 3 specimens are available.

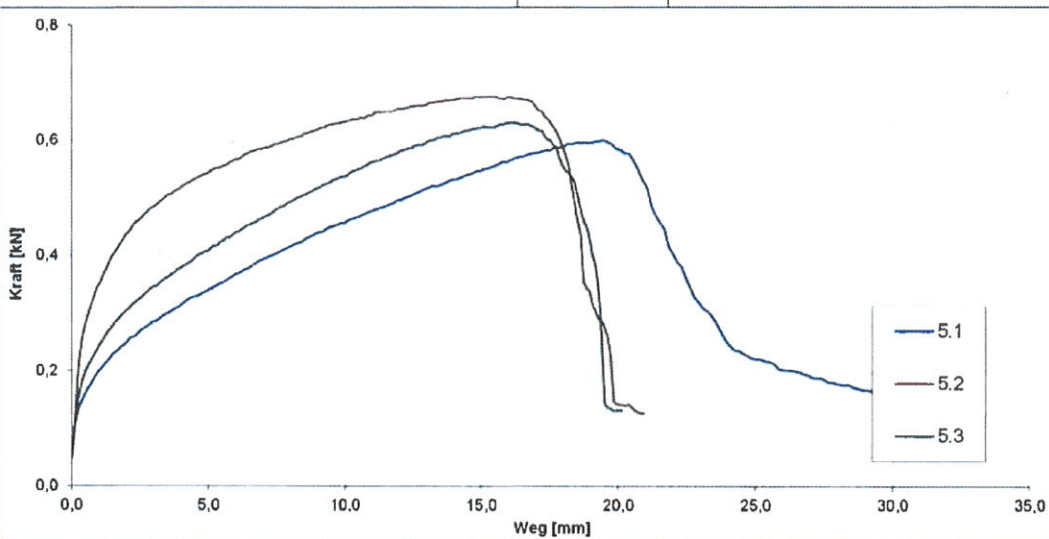
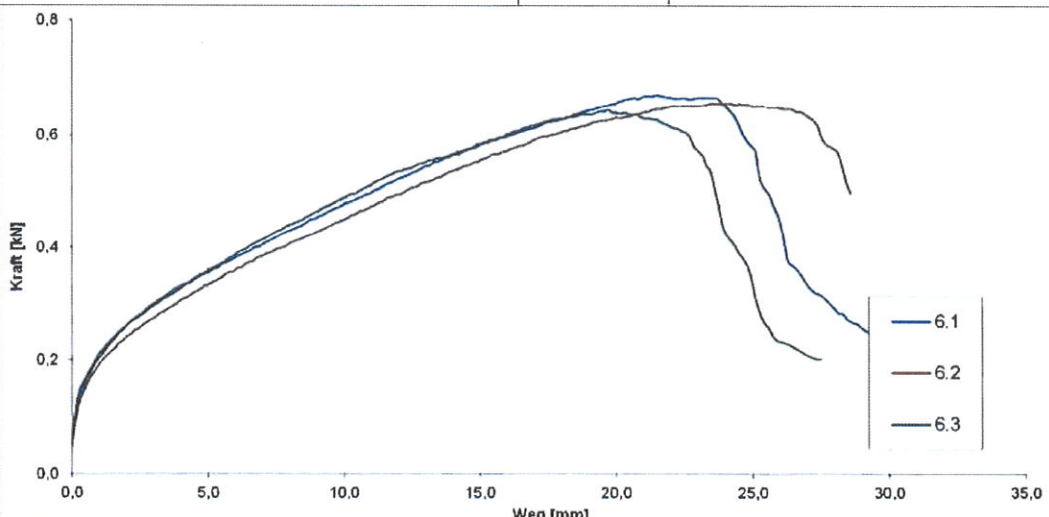
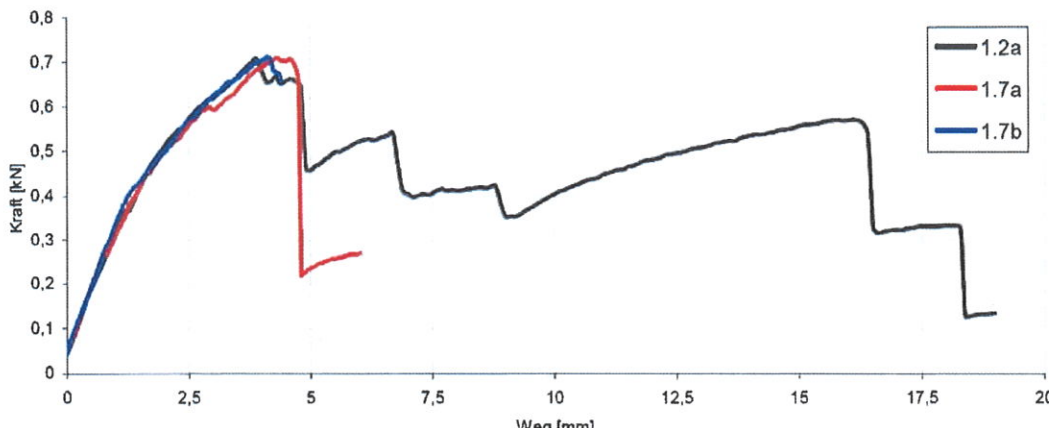
Anchors for which the following failure loads apply	Trade name	Hilti HTH (ETA 15/0464)	
	Plate diameter (mm)	≥ 60	
Characteristic of the insulation product panels for which the following failure loads apply	Thickness (mm)	≥ 50	
	Tensile strength perpendicular to the face (kPa)	≥ 100	
	Tensile strength perpendicular to the face (kPa) - measured value	108,7 (average) 92,1 (minimum)	
Failure loads (N)	Anchors not placed at the panel joint (pull – through test)	R_{panel}	Minimum: 556 Average: 517
			
	Anchors placed at the panel joint (pull – through test)	R_{joint}	Minimum: 577 Average: 561
			

Table 20 – Failure loads of combination of anchors described in below table and insulation product – EPS-EN 13163-TR100

Note: The results only on 3 specimens are available.

Anchors for which the following failure loads apply	Trade name	Baumit KlebeAnker (ETA 06/0015) Klebeanker JJ A8S (ETA 12/0064) Klebeanker X1 (ETA 19/0439)	
	Plate diameter (mm)	≥ 108	
Characteristic of the insulation product panels for which the following failure loads apply	Thickness (mm)	≥ 60	
	Tensile strength perpendicular to the face (kPa)	≥ 100	
	Tensile strength perpendicular to the face (kPa) - measured value	126 (average) 110 (minimum)	
Failure loads (N)	Anchors not placed at the panel joint (pull through test 2 anchors)	R_{panel}	Minimum: 697 Average: 699
			

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

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

n_{panel} is number (per m²) of anchors placed at the body of the thermal insulation product;
 n_{joint} is number (per m²) of anchors placed at joints;
 γ_m is national safety factor.

3.3.6 Wind load resistance – dynamic wind uplift test (EAD 040083-00-0404 – Clause 2.2.13.3)

No performance assessed.

3.3.7 Tensile test perpendicular to the faces of the thermal insulation (EAD 040083-00-0404 – Clause 2.2.21.1)

No performance assessed.

3.3.8 Shear strength and shear modulus of elasticity test of ETICS (EAD 040083-00-0404 – Clause 2.2.15)

No performance assessed.

3.3.9 Render strip tensile test (EAD 040083-00-0404 – Clause 2.2.17)

No performance assessed.

3.3.10 Bond strength after ageing (EAD 040083-00-0404 – Clause 2.2.20)

**Table 21 – Bond strength of rendering systems after ageing
(EAD 040083-00-0404 – Clause 2.2.20.2)**

Murexin Energy Star		Individual values in kPa Minimal value in kPa	Mean value in kPa
Rendering systems: base coat + key coats according to Clause 1.1 + finishing coats indicated hereafter:	Murexin Energy Brilliant	Individual values: no performance assessed Minimal value: 88	91 (≥ 80) thickness 4,5 mm
	Murexin Energy Crystal	Individual values: no performance assessed Minimal value: 82	88 (≥ 80) thickness 4,5 mm
	Murexin Energy Furioso	Individual values: no performance assessed Minimal value: 99	93 (≥ 80) thickness 4,5 mm
	Murexin Energy Design	Individual values: no performance assessed Minimal value: 88	92 (≥ 80) thickness 4,5 mm
	Murexin Energy Clean	Individual values: no performance assessed Minimal value: 87	89 (≥ 80) thickness 4,5 mm

**Table 22 – Bond strength of rendering systems after ageing
(EAD 040083-00-0404 – Clause 2.2.20.2)**

Murexin Energy Forte		Individual values in kPa Minimal value in kPa	Mean value in kPa
Rendering systems: base coat + key coats according to Clause 1.1 + finishing coats indicated hereafter:	Murexin Energy Brilliant	Individual values: no performance assessed Minimal value: 90	93 (≥ 80) thickness 6,5 mm
	Murexin Energy Crystal	Individual values: no performance assessed Minimal value: 88	91 (≥ 80) thickness 6,5 mm
	Murexin Energy Furioso	Individual values: no performance assessed Minimal value: 94	97 (≥ 80) thickness 6,5 mm
	Murexin Energy Design	Individual values: no performance assessed Minimal value: 86	90 (≥ 80) thickness 6,5 mm
	Murexin Energy Clean	Individual values: no performance assessed Minimal value: 90	93 (≥ 80) thickness of finishing coat: 2 mm

**Table 23 – Bond strength of rendering systems after ageing
(EAD 040083-00-0404 – Clause 2.2.20.1* and 2.2.20.2**)**

Murexin Energy Diamond MAXIMO M 70		Individual values in kPa Minimal value in kPa	Mean value in kPa
Rendering systems: base coat + key coats according to Clause 1.1 + finishing coats indicated hereafter:	Murexin Energy Brilliant*	Individual values: 108/115/100/134/106 Minimal value: 100	113 (≥ 80) thickness 4,19 mm
	Murexin Energy Crystal**	Individual values: 117/114/120/95/110 assessed Minimal value: 95	111 (≥ 80) thickness 4,5 mm
	Murexin Energy Furioso*	Individual values: 105/141/127/117/128 Minimal value: 105	124 (≥ 80) thickness 3,28 mm
	Murexin Energy Design*	Individual values: 127/108/98/103/107 Minimal value: 98	109 (≥ 80) thickness 3,63 mm
	Murexin Energy Clean*	Individual values: 102/146/124/122/106 Minimal value: 102	120 (≥ 80) thickness 3,25 mm
*Tested on the rig			
**Tested on small samples			

**Table 24 – Bond strength of rendering systems after ageing
(EAD 040083-00-0404 – Clause 2.2.20.2 after freeze thaw test)**

Murexin Energy Diamond MAXIMO M 70		Individual values in kPa Minimal value in kPa	Mean value in kPa
Rendering systems: base coat + key coats according to Clause 1.1 + finishing coats indicated hereafter:	Murexin Energy Diamond Maximo Energy Clean	Individual values: 113/124/118/112/112 Minimal value: 112 Mean value: 116 Cohesive value	120 (≥ 80) thickness of finishing coat: 2 mm

3.3.11 Tensile strength and elongation of the glass fibre mesh in the as-delivered state and after ageing (2.2.21.1 and 2.2.21.2 EAD 040083-00-0404)

Table 25 – Tensile strength and elongation of the glass fibre meshes

Mesh type (Trade name + ETA No.)	Characteristic	Warp direction	Weft direction
03-43 (ETA 18/0857)	Mean value of tensile strength in the as delivered state	48,7 N/mm	44,9 N/mm
	Mean value of tensile strength after ageing (≥ 20 N/mm)	26,1 N/mm	26,0 N/mm
	Mean value of elongation in the as delivered state	4,3 %	4,4 %
	Mean value of elongation after ageing	2,4 %	2,4 %
	Residual strength after ageing (≥ 50 %)	53,6 %	57,9 %
03-8 (ETA 18/0857)	Mean value of tensile strength in the as delivered state	45,2 N/mm	61,8 N/mm
	Mean value of tensile strength after ageing (≥ 20 N/mm)	23,6 N/mm	31 N/mm
	Mean value of elongation in the as delivered state	4,3 %	4,7 %
	Mean value of elongation after ageing	1,8 %	1,9 %
	Residual strength after ageing (≥ 50 %)	52,2 %	50,16 %
SSA-1363- 145 (ETA 16/0526)	Mean value of tensile strength	49 N/mm	50 N/mm
	Mean value of tensile strength after ageing (≥ 20 N/mm)	25 N/mm	29 N/mm
	Mean value of elongation in the as delivered state	3,8 %	3,7 %
	Mean value of elongation after ageing	2,1 %	2,3 %
	Residual strength after ageing (≥ 50 %)	51 N/mm	58 N/mm
R 116 A101 (ETA 13/0392)	Mean value of tensile strength in the as delivered state	46 N/mm	45 N/mm
	Mean value of tensile strength after ageing (≥ 20 N/mm)	31 N/mm	30 N/mm
	Mean value of elongation in the as delivered state	3,8 %	4,1 %
	Mean value of elongation after ageing	2,6 %	2,7 %
	Residual strength after ageing (≥ 50 %)	67,4 %	66,7 %

R 117 A101 (ETA 13/0392)	Mean value of tensile strength in the as delivered state	45 N/mm	47 N/mm
	Mean value of tensile strength after ageing (≥ 20 N/mm)	23 N/mm	28 N/mm
	Mean value of elongation in the as delivered state	3,7 %	4,2 %
	Mean value of elongation after ageing	2,1 %	2,4 %
	Residual strength after ageing (≥ 50 %)	51,1 %	59,6 %
R 131 A101 (ETA 13/0392)	Mean value of tensile strength	48 N/mm	50 N/mm
	Mean value of tensile strength after ageing (≥ 20 N/mm)	33 N/mm	38 N/mm
	Mean value of elongation in the as delivered state	3,9 %	4,0 %
	Mean value of elongation after ageing	2,9 %	3,0 %
	Residual strength after ageing (≥ 50 %)	68,8 %	76,0 %
41-112 / ES-L (ETA 17/0731)	Mean value of tensile strength	35,6 N/mm	51,5 N/mm
	Mean value of tensile strength after ageing (≥ 20 N/mm)	21,7 N/mm	37,7 N/mm
	Mean value of elongation in the as delivered state	2,57 %	3,10 %
	Mean value of elongation after ageing	1,57 %	2,45 %
	Residual strength after ageing (≥ 50 %)	61 %	73,2 %

3.4 Protection against noise (BWR 5)

3.4.1 Airborne sound insulation (EAD 040083-00-0404 – Clause 2.2.22.1)

No performance assessed.

3.4.2 Dynamic stiffness of the thermal insulation product (EAD 040083-00-0404 – Clause 2.2.22.2)

No performance assessed.

3.4.3 Air flow resistance of the thermal insulation product (EAD 040083-00-0404 – Clause 2.2.22.3)

No performance assessed.

3.5 Energy economy and heat retention (BWR 6)

3.5.1 Thermal resistance (EAD 040083-00-0404 – Clause 2.2.23)

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

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

- where $\chi_p \cdot n$ has only to be taken into account if it is greater than 0,04 W/(m²·K);
- U_c global (corrected) 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 values listed below can be taken into account if not specified in the anchor's ETA:
- = 0,002 W/K for anchors with a stainless steel screw covered by plastic anchors and for anchors with an air gap at the head of the screw ($\chi_p \cdot n$ negligible for $n < 20$);
 - = 0,004 W/K for anchors with a galvanized steel screw with the head covered by a plastic material ($\chi_p \cdot n$ negligible for $n < 10$);
 - = negligible for anchors with plastic nails (reinforced or not with glass fibres ...);
- U 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 (according to declaration in reference to EN 13163) in (m²·K)/W;
- R_{render} thermal resistance of the render (about 0,02 in (m²·K)/W or determined by test according to EN 12667 or EN 12664);
- $R_{substrate}$ thermal resistance of the substrate of the building (concrete, brick ...) in (m²·K)/W;
- R_{se} external superficial thermal resistance in (m²·K)/W;
- R_{si} internal superficial thermal resistance in (m²·K)/W.

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

3.5.2 Thermal resistance of the thermal insulation product (EAD 040083-00-0404 – Clause 2.2.23.1)

No performance assessed.

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

According to the European Commission decision 97/556/EC amended by the European Commission decision 2001/596/EC, the AVCP systems (further described in Annex V to Regulation (EU) No. 305/2011) 1 and 2+ apply.

Table 26 – Assessment and verification of constancy of performance system

Product(s)	Intended use(s)	Level(s) or class(es) (Reaction to fire)	System(s)
External thermal insulation composite systems/kits (ETICS) with rendering	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+

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

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

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

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

In order to help the Notified Body to make an evaluation of conformity, the Technical Assessment Body issuing the ETA shall supply the information detailed below. This information together with the requirements given in EC Guidance Paper B will generally form the basis on which the factory production control (FPC) is assessed by the Notified Body.

This information shall initially be prepared or collected by the Technical Assessment Body and shall be agreed with the manufacturer. The following gives guidance on the type of information required:

1) The ETA

Where confidentiality of information is required, this ETA makes reference to the manufacturer's technical documentation which contains such information.

2) Basic manufacturing process

The basic manufacturing process is described in sufficient detail to support the proposed FPC methods.

The different components of ETICS are generally manufactured using conventional techniques. Any critical process or treatment of the components which affects performance is highlighted in the manufacturer's documentation.

3) Product and materials specifications

The manufacturer's documentation includes:

- detailed drawings (possibly including manufacturing tolerances);
- incoming (raw) materials specifications and declarations;
- references to European and/or international standards;
- technical data sheets.

4) Control Plan (as a part of FPC)

The manufacturer and the "Technický a skúšobný ústav stavebný, n. o." have agreed a Control Plan which is deposited with the "Technický a skúšobný ústav stavebný, n. o." in documentation which accompanies the ETA. The Control Plan specifies the type and frequency of checks/tests conducted during production and on the final product. This includes the checks conducted during manufacture on properties that cannot be inspected at a later stage and for checks on the final product.

Products not manufactured by the ETICS manufacturer shall also be tested according to the Control Plan. It must be demonstrated to the Notified Body that the FPC system contains

elements securing that the ETICS manufacturer takes products conforming to the Control Plan from his supplier(s).

Where materials/components are not manufactured and tested by the supplier in accordance with agreed methods, then where appropriate they shall be subject to suitable checks/tests by the ETICS manufacturer before acceptance.

In cases where the provisions of the European Technical Assessment and its Control Plan are no longer fulfilled, the Notified Body shall withdraw the certificate and inform Technický a skúšobný ústav stavebný, n. o. without delay.

Technický a skúšobný ústav stavebný, n. o.
Building Testing and Research Institute
Studená 3, 821 04 Bratislava, Slovak Republic

On behalf of the Technický a skúšobný ústav stavebný, n. o.
Bratislava 22 August 2025



Prof. Ing. Zuzana Sternová, PhD.
Head of Technical Assessment Body



Annexes

Annex 1 – Thermal insulation product characteristics

Annex 2 – Description and characteristics of the anchors

Annex 3 – Description and characteristics of the reinforcement

Annex 4 – Used trade names of ETICS components

Annex 1 – Thermal insulation product characteristics

Table 27 – Characteristics of the thermal insulation product(s)

Description and characteristics		EPS panels	
		for bonded ETICS	for mechanically fixed ETICS with anchors
Reaction to fire /STN EN 13501-1/		Euroclass E (thickness from 20 to 200 mm, density from 15 to 18 kg/m ³)	
Thermal resistance ((m ² .K)/W)		Defined in the CE marking in reference to EN 13163 "Thermal insulation products for buildings – Factory made products of expanded polystyrene"	
Thickness (mm) / EN 823		EPS – EN 13163 – T2	
Length (mm) / EN 822		EPS – EN 13163 – L1 EPS – EN 13163 – L2	
Width (mm) / EN 822		EPS – EN 13163 – W2	
Squareness (mm) / EN 824		EPS – EN 13163 – S1 EPS – EN 13163 – S2	
Flatness (mm) / EN 825		EPS – EN 13163 – P3 EPS – EN 13163 – P4	
Surface condition		Cut surface (homogeneous and without "skin")	
Dimensional stability under	specified temperature and humidity / EN 1604	EPS – EN 13163 – DS(70,-)1 EPS – EN 13163 – DS(70,-)2	
	laboratory condition / EN 1603	EPS – EN 13163 – DS(N)2	
Compressive stress or compressive strength (kPa) / EN 826		EPS – EN 13163 – CS(10)70 (EPS 70) EPS – EN 13163 – CS(10)80 (EPS 80)	
Tensile strength perpendicular to the faces in dry conditions / EN 1607		≥ 100 kPa, EPS – EN 13163 – TR100 (EPS 70) ≥ 150 kPa and < 200 kPa, EPS – EN 13163 – TR150 (EPS 80)	
Short term water absorption by partial immersion / EN 1609		< 0,5 kg/m ³	
Water vapour diffusion resistance factor (μ) / EN 12086		≤ 60	
Shear strength (N/mm ²) / EN 12090		≥ 0,02 MPa	–
Shear modulus (N/mm ²) / EN 12090		≥ 1,0 MPa	–

Annex 2 – Description and characteristics of anchors

Table 28 – List of anchors used in ETICS with references to ETAs

Trade name	Description Plate stiffness/Load resistance of the anchor plate	Plate diameter (mm)	Characteristic resistance in substrate stated in
Company: Austrotherm GmbH			
Baumit KlebeAnker Baumit StarTrack Baumit Klebeanker JJ A8+	Use of category: A, B, C, E	108	ETA-06/0015
Baumit KlebeAnker Baumit StarTrack Baumit Klebeanker Duplex JJ A8S	Use of category: A, B, C, E	108	ETA-12/0064
Baumit Klebeanker X1 Baumit StarTrack X1	Plate consisting of a high-density polyethylene element which is fixed with a steel nail installed by a powder activated fastening tool Use of category: A	108	ETA-19/0439 (EAD 330965- 01-0601)
Company: Baumit Beteiligungen GmbH			
Baumit S SchraubDübel* Baumit N SchlagDübel*	Screwed-in plastic anchor with galvanized or stainless-steel screw (Baumit S) and nailed-in plastic anchor with galvanized steel overmolded with polyamide (Baumit N) 1,5 kN/mm/2,7 kN Use category (Baumit S): A, B, C, D, E Use category (Baumit N): A, B, C, D, E	60	ETA-17/0078
Company: EJOT Baubefestigungen GmbH			
Ejot H1 eco EJOT H4 Eco	Nailed-in plastic anchor with steel nail 0,6 kN/mm/1,4 kN Use of category: A, B, C	60	ETA-11/0192
EJOT H3	Nailed-in plastic anchor with polyamide nail 0,6 kN/mm/1,25 kN Use of category: A, B, C	60	ETA-14/0130
Ejotherm NT U* Ejotherm NK U*	Nailed-in plastic anchor with steel nail 0,6 kN/mm/2,43 kN Use of category: A, B, C	60	ETA-05/0009
Ejotherm NTK U	Nailed-in plastic anchor with polyamide nail and plastic head 0,5 kN/mm/1,4 kN Use of category: A, B, C	60	ETA-07/0026
Ejotherm S1	Nailed-in plastic anchor with polyamide nail 0,7 kN/mm/1,5 kN Use of category: A, B, C, D, E	60	ETA-17/0991
Company: Fischerwerke, Artur Fischer GmbH&Co.KG			
Fischer Termofix CF 8	Nailed-in plastic anchor with polyamide nail 0,5 kN/mm/1,65 kN Use of category: A, B, C, D, E	60	ETA-07/0287
fischer Termoz 8 U fischer TERMOZ 8 N fischer Termoz 8 NZ fischer Termoz 8 UZ	Nailed-in plastic anchor with steel nail 0,5 kN/mm/1,34 kN Use of category: A, B, C (for Fischer Termoz 8 N) Use of category: A, B, C, D (for Fischer Termoz 8 NZ)	60	ETA-03/0019

Trade name	Description Plate stiffness/Load resistance of the anchor plate	Plate diameter (mm)	Characteristic resistance in substrate stated in
	Screwed-in plastic anchor with steel screw and plastic head 0,5 kN/mm/2,45 kN Use of category: A, B, C, E (valid for Fischer Termoz 8 U) Use of category: A, B, C, D (valid for Fischer Termoz 8 UZ)		
fischer Termoz CN 8	Nailed-in polypropylene anchor 0,4 kN/mm/1,6 kN Use of category: A, B, C, D	60	ETA-09/0394
fischer TermoZ CS 8 TermoZ CS II 8*	Screwed-in plastic anchor with screw of galvanised steel TermoZ CS 8: 0,6 kN/mm/1,7 kN TermoZ CS II 8: 1,29 kN/mm/2,61 kN Use of category: A, B, C, D, E	60	ETA-14/0372
fischer Termoz PN8	Nailed-in plastic anchor with polyamide nail 0,4 kN/mm/1,6 kN Use of category: A, B, C	60	ETA-09/0171
Company: Hilti AG Business Unit Anchors			
Baunit SDX 8	Nailed in plastic anchor with nail made from polyamide 0,6 kN/mm/1,6 kN Use of category: A, B	60/65	ETA-14/0399
Hilti Dämmstoffelement XI-FV	Plastic part made of polyethylene 0,4 kN/mm/1,6 kN	60	ETA-03/0004
Hilti D8-FV	Screwed-in plastic anchor with screw of galvanised steel 0,63 kN/mm/3,16 kN Use of category: A, B, C, D, E Used for thickness of MW from 100 mm	60	ETA-07/0288
Hilti ETICS-ANCHOR D-FV Hilti ETICS-ANCHOR D-FV T	Screwed-in plastic anchor with steel screw 0,8 kN/mm/1,93 kN Use of category: A, B, C, D, E	60	ETA-05/0039
Hilti HTH	Used only with EPS equal or bigger than 100 mm, screwed-in anchor with polypropylene helix and special screw of galvanized steel Use category: A, B, C, D, E	75	ETA-15/0464
Hilti HTR-P HTR-M	Screwed-in plastic anchor with screw of polyamide 0,6 kN/mm/1,4 kN Use category: A, B, C, D, E	60	ETA-16/0116
Hilti WDVS-Schlagdübel SDK- FV 8	Nailed in plastic anchor with nail made from polyamide 0,5 kN/mm/1,48kN Use of category: A, B, C	60	ETA-07/0302
Company: ITW Construction Products CZ s.r.o.			
Spit PTH S*	Screwed-in plastic anchor with steel screw 0,9 kN/mm/2,6 kN Use of category: A, B, C, D, E	60	ETA-18/1102
Spit PTH SX	Screwed-in plastic anchor with steel screw 0,7 kN/mm/1,54 kN Use of category: A, B, C, D, E	60	ETA-18/1101

Trade name	Description Plate stiffness/Load resistance of the anchor plate	Plate diameter (mm)	Characteristic resistance in substrate stated in
Company: KEW Kunststoffzeugnisse GmbH			
KEW TSD 8	Nailed in anchor with galvanized steel nail 0,6 kN/mm/1,6 kN Use of category: A, B, C, D	60	ETA-04/0030
KEW InsuFix TSBD*	Nailed in anchor with galvanized steel nail 1,6 kN/mm/2,22 kN Use of category: A, B, C, D	60	ETA-08/0314
KEW InsuFix TSD-V	Nailed in anchor with galvanized steel nail 1,24 kN/mm/1,75 kN Use of category: A, B, C	60	ETA-08/0315
Company: Klimas sp. z o. o.			
Klimas Eco-Drive 8* Eco-Drive S8*	Screwed-in plastic anchor with screw of galvanized steel 0,6 kN/mm/2,8 kN Use category: A, B, C, D, E	60	ETA-13/0107
Klimas FixPlug 8 FixPlug 10	Nailed-in plastic anchor with polypropylene nail FixPlug 8: 0,6 kN/mm/1,4 kN FixPlug 10: 0,6 kN/mm/1,6 kN Use category: A, B, C, D, E	60	ETA-15/0373
Klimas LMX-8 LMX-10 LTX-8 LTX-10 LGX-8 LGX-10	LMX - Nailed-in plastic anchor with nail of galvanized steel LTX & LGX - Nailed-in plastic anchor with polypropylene nail LMX-8/LTX-8/LGX-8: 0,5 kN/mm/1,09 kN LMX-10/LTX-10/LGX-10: 0,5 kN/mm/1,02 kN Use category: A, B, C, D, E	60	ETA-16/0509
Klimas WKTherm 8*	Nailed-in plastic anchor with nail of galvanized steel 0,6 kN/mm/4,3 kN Use category: A, B, C	60	ETA-11/0232
Klimas WKTherm S-8*	Screwed-in plastic anchor with screw of galvanized steel 0,6 kN/mm/4,3 kN Use category: A, B, C, D, E	60	ETA-13/0724
Company: F. Leskovec d.o.o.			
Leskovec PSK	Nailed-in plastic anchor with nail of galvanized steel 0,7 kN/mm/1,9 kN Use category: A, B, C	60	ETA-05/0148
Leskovec PPV	Screwed-in plastic anchor with screw of galvanized steel 0,7 kN/mm/1,9 kN Use category: A, B, C, E	60	ETA-12/0331
Leskovec PSV	Screwed-in plastic anchor with screw of galvanized steel 0,6 kN/mm/1,4 kN Use category: A, B, C, D, E	60	ETA-15/0233
Company: RANIT Befestigungssysteme GmbH			
IsoFux NDS8Z*/IsoFux	Nailed-in plastic anchor with steel screw	60	ETA-07/0129

Trade name	Description Plate stiffness/Load resistance of the anchor plate	Plate diameter (mm)	Characteristic resistance in substrate stated in
NDS90Z*/ IsoFux NDM90Z*/IsoFux NDM8Z*	0,9 kN/mm/2,2 kN Use of category: A, B, C		
IsoFux Rocket*	Screwed-in plastic anchor with steel screw 1,1 kN/mm/2,5 kN Use of category: A, B, C, E	60	ETA-12/0093
Company: Rawlplug S.A.			
Koelner/Rawlplug TFIX KI-10N KI-10NS	Nailed-in plastic anchor with steel nail 0,5 kN/mm /1,23 kN Use of category: B, C, D, E (for KOELNER KI-10N) Use of category: A, B, C, D, E (for KOELNER KI-10NS)	60	ETA-07/0221
Koelner/Rawlplug KI-10 KI-10PA KI-10M	Nailed-in plastic anchor with polypropylene nail 0,5 kN/mm/2,1 kN (for KI-10, KI-10PA) 0,4 kN/mm/2,6 kN (for KI-10M) Use of category: A, B, C, D, E	60	ETA-07/0291
R-TFIX 8M	Screwed-in plastic anchor with screw of galvanized steel 1,0 kN/mm/1,53 kN A, B, C, D, E	60	ETA-17/0592
R-TFIX 8S*	Screwed-in plastic anchor with screw of galvanized steel 0,6 kN/mm/2,04 kN A, B, C, D, E	60	ETA-17/0161
Koelner/Rawlplug TFIX 8P	Nailed-in plastic anchor with nail of galvanized steel 0,3 kN/mm/1,38 kN Use of category: A, B, C, D, E	60	ETA-13/0845
Koelner/Rawlplug TFIX-8S* TFIX-8ST* TFIX-8SX*	Screwed-in anchor with screw of galvanized steel 0,6 kN/mm/2,04 kN Use of category: A, B, C, D (for KOELNER TFIX 8S) Use of category: A, B, C, D, E (for KOELNER TFIX 8ST)	60	ETA-11/0144
Company: Top Kraft Handels GmbH			
Top Kraft PPV	Screwed-in plastic anchor with screw of galvanized zinc coated steel 0,7 kN/mm/1,4 kN Use category: A, B, C, E	60	ETA-15/0244
Top Kraft PSK	Nailed-in plastic anchor with nail of galvanized steel 0,7 kN/mm/1,9 kN Use category: A, B, C	60	ETA-15/0463
Company: TOP KRAFT SK a.s SG FIX SK, a.s			
Top Kraft PSV	Screwed-in plastic anchor with screw of galvanized steel 0,8 kN/mm/1,1 kN Use category: A, B, C, D, E	60	ETA-16/0120

Annex 3 – Description and characteristics of the reinforcement**Table 29 – Description and characteristics of the reinforcement**

Murexin Energy Textile		
03/43 (ETA 18/0857)	Mesh size (average value) Mass per unit area (average value) Heat combustion (average value)	(4,6 x 3,6) mm 145 g/m ² 4,16 MJ/kg
SSA-1363-145 (ETA 16/0526)	Mesh size (average value) Mass per unit area (average value) Heat combustion (average value)	(5,7x4,2) mm 151 g/m ² 6,44 MJ/kg
R 116 A101 (ETA 13/0392)	Mesh size (average value) Mass per unit area (average value) Heat combustion (average value)	(4,8x5,8) mm 147 g/m ² 6,64 MJ/kg
R 117 A101 (ETA 13/0392)	Mesh size (average value) Mass per unit area (average value) Heat combustion (average value)	(5,1x6,1) mm 152 g/m ² 6,64 MJ/kg
41-112 / ES-L (ETA 17/0731)	Mesh size (average value) Mass per unit area (average value) Heat combustion (average value)	(4,7x5,8) mm 150 g/m ² 8 MJ/kg
Murexin Energy Textile (160)		
03/8 (ETA 18/0857)	Mesh size (average value) Mass per unit area (average value) Heat combustion (average value)	(7 x 6,5) mm 203 g/m ² max. 5,25 MJ/kg
R 131 A101 (ETA 13/0392)	Mesh size (average value) Mass per unit area (average value) Heat combustion (average value)	(4,0x4,6) mm 167 g/m ² 5,80 MJ/kg

Annex 4 – Used trade names of ETICS components

ETICS “Murexin Energy Saving System EPS”		
Adhesives or supplementary adhesives	Murexin Energy Star	
	Murexin Energy Forte	
	Murexin Energy Fix	
	Murexin Energy Diamond MAXIMO M 70	Murexin Leicht-Klebspachtel Maximo M 70
Thermal insulation product	See in Control plan of manufacturer	
Anchors or supplementary anchors	See in Annex 2 in ETA	
Base coats	Murexin Energy Star	
	Murexin Energy Forte	
	Murexin Energy Diamond MAXIMO M 70	Murexin Leicht-Klebspachtel Maximo M 70
Glass fibre meshes	Murexin Energy Textile	
	Murexin Energy Textile (160)	
Key coat	Murexin Energy Primer	
Finishing coats	Murexin Energy Brilliant	
	Murexin Energy Furioso	
	Murexin Energy Crystal	
	Murexin Energy Clean (not foreseen to be used with Murexin Energy Forte)	
	Murexin Energy Design	