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European Technical Assessment

**ETA 17/0276 – version 01
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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

Product family to which the construction product belongs

Product area code: 4
External Thermal Insulation Composite Systems with rendering for the use as external insulation to walls of buildings

Manufacturer

MurexinGmbH
Franz von Furtenbach Straße 1
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<http://www.murexin.at>

Manufacturing plant

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This European Technical Assessment contains

51 pages including 4 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

ETAG 004, edition June 2013, used as European Assessment Document (EAD).

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 and mineral wool 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 ETICS (connections, apertures, corners, parapets, sills ...). Assessment and performance of these components is not addressed in this ETA, however the ETICS manufacturer is responsible for adequate compatibility and performance within the ETICS when the components are delivered as part of the kit.

1.2 Composition of the ETICS

Table 1 – Composition of the ETICS

| | Components (see Annex 1 for further description, characteristics and performances of the components) | Coverage kg/m ² | Thickness mm |
|--|--|--------------------------------------|--------------------------|
| Insulation materials with associated methods of fixing | <p>Bonded ETICS (partially or fully bonded) with supplementary anchors. According to ETA-holder's prescription the minimal bonded surface shall be at least 20 % (see Table 24 to 30). National application documents shall be taken into account.</p> <ul style="list-style-type: none"> • Insulation products: Expanded polystyrene boards Murexin Energy Panel EPS-F (100) Murexin Energy Panel EPS-F (120) Murexin Energy Panel EPS-F (150) Murexin Energy Panel EPS-F plus (100) Murexin Energy Panel EPS-F plus (120) Murexin Energy Panel EPS-F plus (150) <p>* Thermal insulation of thickness 301 mm until 420 mm is used only with anchors – types ejothem STR U/ ejothem STR U 2G</p> <ul style="list-style-type: none"> • Adhesives (type of cement – see page 6): <ul style="list-style-type: none"> - Murexin Energy Top Preparation: mixing of 6,5 l water/25 kg powder Composition: mineral powder, grey cement of types 1,2,3,4 base with silica sand and lime stone, dispersion powder, additives - Murexin Energy Fix Preparation: mixing of 7 l to 8 l water/25 kg powder Composition: mineral powder, grey cement of types 1,2,3,4 base with silica sand and lime stone, dispersion powder, additives • Supplementary anchors See Annex 2 for list of anchors and their product characteristics. | / | 20 to 300 301 to 420* |
| | <p>Bonded ETICS (fully bonded) with supplementary anchors. According to ETA-holder's prescription the bonded surface shall be 100 %. National application documents shall be taken into account.</p> <ul style="list-style-type: none"> • Insulation products: Mineral wool lamellas Murexin Energy Panel MWL • Adhesives (type of cement –see page 6): <ul style="list-style-type: none"> - Murexin Energy Top Preparation: mixing of 6,5 l water/25 kg powder Composition: mineral powder, grey cement of types 1,2,3,4 base with silica sand and lime stone, dispersion powder, additives - Murexin Energy Fix Preparation: mixing of 7 l to 8 l water/25 kg powder Composition: mineral powder, grey cement of types 1,2,3,4 base with silica sand and lime stone, dispersion powder, additives • Supplementary anchors See Annex 2 for list of anchors and their product characteristics. | 5 (powder) 4 to 5 (powder) | 50 to 300 |

| | | | |
|------------------|---|-----------------------------------|---|
| | <p>Mechanically fixed ETICS with anchors and supplementary adhesive (see Clause 3.4.5) for possible associations EPS/anchors, MW/anchors). According to ETA-holder's prescription the minimal bonded surface shall be at least 20 % with EPS and 40 % with MW (see Table 24 to 30). National application documents shall be taken into account.</p> <ul style="list-style-type: none"> • Insulation products – Type 1 Expanded polystyrene boards Murexin Energy Panel EPS-F (100) Murexin Energy Panel EPS-F (120) Murexin Energy Panel EPS-F (150) Murexin Energy Panel EPS-F plus (100) Murexin Energy Panel EPS-F plus (120) Murexin Energy Panel EPS-F plus (150) * Thermal insulation of thickness 301 mm until 420 mm is used only with anchors – types ejothem STR U/ ejothem STR U 2G • Insulation products – Type 2 Mineral wool slabs Murexin Energy Panel MW • Supplementary adhesives (type of cement – see page 6) <ul style="list-style-type: none"> - Murexin Energy Top Preparation: mixing of 6,5 l water/25 kg powder Composition: mineral powder, grey cement of types 1,2,3,4 base with silica sand and lime stone, dispersion powder, additives - Murexin Energy Fix Preparation: mixing of 7 l to 8 l water/25 kg powder Composition: mineral powder, grey cement of types 1,2,3,4 base with silica sand and lime stone, dispersion powder, additives • Anchors See Annex 2 for list of anchors and their product characteristics. | | 50 to 300 301 to 420* |
| Base coat | <ul style="list-style-type: none"> • Murexin Energy Top Preparation: mixing of 6,5 l water/25 kg powder Composition: mineral powder, grey cement of types 1,2,3,4 base with silica sand and lime stone, dispersion powder, additives | 4,0 (EPS) 5,0 (MW) (powder) | 3,0 to 4,0 (EPS) 4,0 to 5,0 (MW) |
| Glass fibre mesh | <ul style="list-style-type: none"> • Standard glass fibre mesh: (glass fibres mesh with mesh size approx. 4 mm and 4 mm, mass per unit area: min. 145 g/m²): Murexin Energy Textile | / | / |
| Key coat | <ul style="list-style-type: none"> • Murexin Energy Primer ready to use pigmented liquid | 0,20 to 0,25 | |
| Finishing coats | <ul style="list-style-type: none"> • Ready to use pastes – silicate binder Murexin Energy Crystal (particles size 1,5/2,0/3,0 mm), floated structure (particles size 2,0/3,0 mm), ribbed structure | 2,5 to 4,2 | |
| | <ul style="list-style-type: none"> • Ready to use pastes – silicate binder Murexin Energy Clean (particles size 1,5/2,0/3,0 mm), floated structure | 2,5 to 4,2 | |
| | <ul style="list-style-type: none"> • Ready to use pastes – silicone binder Murexin Energy FuriOSO (particles size 1,5/2,0/3,0 mm), floated structure (particles size 2,0/3,0 mm), ribbed structure | 2,5 to 4,2 | |

| | | | |
|---------------------------|---|------------|------------|
| | <ul style="list-style-type: none"> Ready to use pastes – acrylic binder Murexin Energy Brilliant (particles size 1,5/2,0/3,0 mm), floated structure (particles size 2,0/3,0 mm), ribbed structure | 2,5 to 4,1 | |
| | <ul style="list-style-type: none"> Ready to use pastes – acrylic binder Murexin Energy Design (particles size 1,5/2,0/3,0 mm), floated structure (particles size 2,0/3,0 mm), ribbed structure | 2,5 to 4,1 | |
| | <ul style="list-style-type: none"> Ready to use pastes – silicone and acrylic binder Murexin Energy Art (particles size 1,0 (Fine)/1,5 (Vario)/3,0 (Trend)/ 4,0 mm (Max)), modelling and floated structure | 2,9 to 6,2 | |
| | <ul style="list-style-type: none"> Ready to use pastes – acrylic binder Murexin Energy Creative (particles size 2,0 mm), floated structure | 5,5 | |
| | <ul style="list-style-type: none"> Ready to use pastes – silicone and acrylic binder Murexin Energy Fine (particles size 1,0 mm), floated structure | 2,0 | |
| | <ul style="list-style-type: none"> Ready to use pastes – silicone and acrylic binder Murexin Energy Art Fine (particles size 0,5 mm), floated structure | 1,4 | 0,5 to 1,0 |
| | * To be used optionally with all types of finishing coats mentioned above. | | |
| Decorative coats/paints** | <ul style="list-style-type: none"> Ready to use paint – silicate binder Murexin Clean Color | 0,5 | |
| | <ul style="list-style-type: none"> Ready to use paint – silicone binder Murexin Furioso Color | 0,5 | |
| | <ul style="list-style-type: none"> Ready to use paint – silicate binder Murexin Crystal Color | 0,5 | |
| | <ul style="list-style-type: none"> Ready to use paint – acrylic binder Murexin Design Color | 0,5 | |
| | <ul style="list-style-type: none"> Ready to use paint – acrylic binder Murexin Brilliant Color | 0,5 | |
| | <ul style="list-style-type: none"> Ready to use paint – acrylic binder Murexin Art Metallic | 0,5 | |
| | <ul style="list-style-type: none"> Ready to use paint – silicate binder Murexin Art Lasur | 0,5 | |
| | <ul style="list-style-type: none"> Ready to use paint – silicate binder Murexin Art Finish | 0,5 | |
| | <ul style="list-style-type: none"> Ready to use paint – silicate binder Murexin Art Glitter | 0,5 | |
| | ** To be used optionally alone with all types of finishing coats mentioned above or with decorative plasters applying on finishing coats. | | |
| Ancillary materials | Descriptions in accordance with 3.2.2.5 of the ETAG 004. Remain under the ETA-holder responsibilities. | | |

Cement types:

| | |
|---------------|------------------------|
| Cement Type 1 | CEM II/A-S 42,5R grey |
| Cement Type 2 | CEM I 42,5R grey |
| Cement Type 3 | CEM II/A-LL 42,5R grey |
| Cement Type 4 | CEM I 52,5N grey |

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 (see 7.2.1 of the ETAG 004) 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 *SW2*, according to EOTA Technical Report No. 034.

2.2 Manufacturing

The European Technical Assessment is issued for the ETICS on 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 Technický a skúšobný ústav stavebný, n. o. (TSÚS) before the changes are introduced. The Technical Assessment Body Technický a skúšobný ústav stavebný, n. o. 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. Therefore, the assessment and declaration of performance are done taking into account general assumptions introduced in 7.1 and 7.2 of ETAG 004 used as EAD, which summarized how information introduced in the ETA and related documents is intended to be used in the construction process and gives advice to all parties interested when normative documents are missing.

2.4 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 to 3.

3.1 Mechanical resistance and stability (BWR 1)

Not relevant.

3.2 Safety in case of fire (BWR 2)

3.2.1 Reaction to fire (ETAG 004 – Clause 5.1.2.1, EN 13501-1)

The reaction to fire was determined according to ETAG 004, Clause 5.1.2.1. The product as defined under Clause 1.1 reached the following classification stated in Tables 2 to 6.

Table 2 – Classification of reaction to fire for ETICS

| Configuration 1 | Max. organic content | Flame retardant content | Euroclass according to EN 13501-1 |
|--|---|---|-----------------------------------|
| Adhesives: Murexin Energy Top | Base cat: 13,7 % ± 0,6 abs Finishing coat: (10,9 ± 10) % rel. Decorative coat (plaster): (9,1 ± 10) % rel. Decorative coat (Paint): (20,9 ± 10) % rel. | EPS: no information Base coat: Murexin EnergyTop: 0 % Finishing coat: 0 % | B-s2, d0 |
| EPS-EN 13163 in line with Table 1 of ETA thickness: 50 mm to 420 mm Color: white or grey reaction to fire: E | | | |
| Base coat: Murexin Energy Top | | | |
| Glass fibre mesh: Murexin EnergyTextile mass per unit area: from 145 g/m ² ± 8 % to 160 g/m ² ± 8% | | | |
| Key coat: Murexin Energy Primer | | | |
| Finishing coats: Murexin Energy Crystal Murexin Energy Clean Murexin Energy Furioso Murexin Energy Brilliant Murexin Energy Design Murexin Energy Art Murexin EnergyCreative Murexin Energy Fine | | | |
| Decorative coat/plaster: Murexin Energy Art Fine | | | |
| Decorative coats/paints: Murexin Clean Color Murexin Furioso Color Murexin Crystal Color Murexin Design Color Murexin Brilliant Color Murexin Art Metallic Murexin Art Lasur Murexin Art Finish Murexin Art Glitter | | | |

Table 3 – Classification of reaction to fire for ETICS

| Configuration 2 | Max. organic content | Flame retardant content | Euroclass according to EN 13501-1 |
|--|--|---|--|
| Adhesives: Murexin Energy Top Murexin Energy Fix | Base coat: 13,7 % ± 0,6 abs Finishing coat: (10,9 ± 10) % rel. Decorative coat (plaster): (9,1 ± 10) % rel. Decorative coat (Paint): (20,9 ± 10) % rel. | EPS: no information Base coat: Murexin EnergyTop: 0 % Finishing coat: 0 % | B-s1, d0 |
| EPS-EN 13163 in line with Table 1 of ETA thickness: 50 mm to 420 mm Color: white or grey reaction to fire: E | | | |
| Base coat: Murexin Energy Top | | | |
| Glass fibre mesh: Murexin Energy Textile mass per unit area: from 145 g/m ² ± 8 % to 160 g/m ² ± 8% | | | |
| Key coat: Murexin Energy Primer | | | |
| Finishing coat: Murexin Energy Art (4,0 mm grain size) | | | |
| Decorative coat/plaster: Murexin Energy Art Fine | | | |
| Decorative coats/paints: Murexin Clean Color Murexin Furioso Color Murexin Crystal Color Murexin Design Color Murexin Brilliant Color Murexin Art Metallic Murexin Art Lasur Murexin Art Finish Murexin Art Glitter | | | |

Table 4 – Classification of reaction to fire for ETICS

| Configuration 3 | Max. organic content | Flame retardant content | Euroclass according to EN 13501-1 |
|---|---|---|--|
| Adhesives: Murexin Energy Top Murexin Energy Fix | Base coat: 13,7 % ± 0,6 abs Finishing coat: (10,9 ± 10) % rel. | EPS: no information Base coat Murexin Energy Top: 0 % Finishing coat: 0 % | B-s1, d0 |
| EPS-EN 13163 in line with Table 1 of ETA thickness: 50 mm to 420 mm Color: white or grey reaction to fire: E | | | |
| Base coat: Murexin Energy Top | | | |
| Glass fibre mesh: Murexin Energy Textile mass per unit area: min. 145 g/m ² | | | |
| Key coat: Murexin Energy Primer | | | |
| Finishing coats: Murexin Energy Crystal Murexin Energy Clean Murexin Energy Furioso Murexin Energy Brilliant Murexin Energy Design Murexin Energy Art Murexin Energy Creative Murexin Energy Fine | | | |

Table 5 – Reaction to fire classification of ETICS

| Configuration 4 | Max. ash content and heat combustion | Flame retardant content | Euroclass according to EN 13501-1 |
|--|---|---------------------------------------|-----------------------------------|
| Adhesives: Murexin Energy Top Murexin Energy Fix | | | |
| MW-EN 13162-TR7,5 MW-EN 13162-TR10 MW-EN 13162-TR15 (tested) thickness: from 60 mm to 300 mm (tested thickness: 180 mm) reaction to fire: A1, μ : MU1 measured density: 130 kg/m ³ to 135 kg/m ³ | Adhesive: (96,8 to 98) %/ (0,833 ± 0,127) MJ/kg | | |
| MW-EN 13162-TR80 (tested) MW-EN 13162-TR100 thickness: from 60 mm to 300 mm (tested thickness: 180 mm) reaction to fire: A1, μ : MU1 measured density: 67 kg/m ³ to 89 kg/m ³ | Base coat: (96,8 to 98) %/ (0,833 ± 0,127) MJ/kg | | |
| Base coat: Murexin Energy Top | Key coat: (87,1 to 90,1) %/ (2,671 ± 0,088) MJ/kg | | |
| Glass fibre mesh: Murexin Energy Textile mass per unit area: from 145 g/m ² + 8 % to 160 g/m ² + 8 % | Finishing coat: (88,0 to 90,2) %/ (2,305 ± 0,262) MJ/kg | Base coat: 0 % Finishing coat: 0 % | A2-s1, d0 |
| Key coat: Murexin Energy Primer | | | |
| Finishing coats: Murexin Energy Brillant Murexin Energy Furioso Murexin Energy Art Murexin Energy Design Murexin Energy Clean Murexin EnergyCrystal Murexin Energy Fine Murexin Energy Creative | Decorative coats/plasters: (90,3 to 92,1) %/ (2,211 ± 0,098) MJ/kg | | |
| Decorative coat/plaster: Murexin Energy Art Fine | Decorative coats/paints: min. 84,8 %/ (4,274 ± 0,014) MJ/kg | | |
| Decorative coats/paints: Murexin Clean Color Murexin Furioso Color Murexin Crystal Color Murexin Design Color Murexin Brilliant Color | | | |

Table 6 – Reaction to fire classification of ETICS

| Configuration 5 | Max. ash content and heat combustion | Flame retardant content | Euroclass according to EN 13501-1 |
|---|---|---------------------------------------|-----------------------------------|
| Adhesives: Murexin Energy Top Murexin Energy Fix | | | |
| MW-EN 13162-TR7,5 MW-EN 13162-TR10 MW-EN 13162-TR15 thickness: from 60 mm to 300 mm reaction to fire: A1, μ : MU1 measured density: 130 kg/m ³ to 135 kg/m ³ | Adhesive: (96,8 to 98) %/ (0,833 ± 0,127) MJ/kg | | |
| MW-EN 13162-TR80 MW-EN 13162-TR100 thickness: from 60 mm to 300 mm reaction to fire: A1, μ : MU1 measured density: 67 kg/m ³ to 89 kg/m ³ | Base coat: (96,8 to 98) %/ (0,833 ± 0,127) MJ/kg | | |
| Base coat: Murexin Energy Top | Key coat: (87,1 to 90,1) %/ (2,671 ± 0,088) MJ/kg | | |
| Glass fibre mesh: Murexin Energy Textile mass per unit area: from 145 g/m ² + 8 % to 160 g/m ² + 8 % | Finishing coat: (88,0 to 90,2) %/ (2,305 ± 0,262) MJ/kg | Base coat: 0 % Finishing coat: 0 % | No performance assessed |
| Key coat: Murexin Energy Primer | | | |
| Finishing coats: Murexin Energy Brilliant Murexin Energy Furioso Murexin Energy Art Murexin Energy Design Murexin Energy Clean Murexin Energy Crystal Murexin Energy Fine Murexin Energy Creative | Decorative coats/plasters: (90,3 to 92,1) %/ (2,211 ± 0,098) MJ/kg | | |
| Decorative coat/plaster: Murexin Energy Art Fine | Decorative coats/paints: min. 0 % (Glitter)/ (29,348±0,122) MJ/kg | | |
| Decorative coats/paints: Murexin Art Metallic Murexin Art Lasur Murexin Art Finish Murexin Art Glitter | | | |

Mounting and fixing:

The assessment of reaction to fire for configuration 1 is based on tests with maximal insulation layer thickness of SBI/200 mm, STN EN ISO 11925-2 and insulation material density 15,7 kg/m³ and a render system with maximum organic content (13,7 % ± 0,6 abs) for base coat and (10,9 ± 10) % rel. for finishing coat and (9,1 ± 10) % rel. for decorative coat (plaster) and (20,9 ± 10) % rel. for decorative coat (paint) and thicknesses of grain sizes of finishing coats 1,0 mm and 4,0 mm.

The assessment of reaction to fire for configuration 2 is based on tests with maximal insulation layer thickness of SBI/200 mm, STN EN ISO 11925-2 and insulation material density 15,7 kg/m³ and a render system with maximum organic content (13,7 % ± 0,6 abs) for base coat and (10,9 ± 10) % rel. for finishing coat Murexin Energy Art Max and (9,1 ± 10) % rel. for decorative coat (plaster) and (20,9 ± 10) % rel. for decorative coat (paint) and thicknesses of grain sizes of finishing coat Murexin Energy Art Max 4,0 mm.

The assessment of reaction to fire for configuration 3 is based on tests with maximal insulation layer thickness of SBI/200 mm, STN EN ISO 11925-2 and insulation material density 15 kg/m^3 and a render system with maximum organic content ($13,7 \% \pm 0,6 \text{ abs}$) for base coat and ($10,9 \pm 10$) % rel. for finishing coat and thickness 3,0 mm.

The assessment of reaction to fire for configuration 4 is based on tests with maximal insulation layer thickness of 180 mm and insulation material densities 130 kg/m^3 to 135 kg/m^3 , with maximum organic content/heat combustion of finishing coat (9,8-12) %/($2,305 \pm 0,262$) % and thicknesses 1,0 mm and 4,0 mm, with maximum heat combustion value of decorative paint/paint ($4,274 \pm 0,014$) MJ/kg, optionally with maximum heat combustion value of decorative paint/plaster ($2,211 \pm 0,098$) MJ/kg.

For the SBI configuration this ETICS is mounted directly to a calcium silicate plasterboard substrate of reaction to fire classification A2-s1, d0 with a minimum density of $800 \text{ kg/m}^3 \pm 10 \text{ kg/m}^3$.

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

3.3 Hygiene, health and environment (BWR 3)

3.3.1 Water absorption (ETAG 004 – Clause 5.1.3.1)

Table 7 – Water absorption of base coat (on EPS boards)

| | | Water absorption after 24 hours | |
|-----------|---------------------------|---------------------------------|-------------------------|
| | | < 0,5 kg/m ² | ≥ 0,5 kg/m ² |
| Base coat | Murexin Energy Top (3 mm) | x | |

Table 8 – Water absorption of rendering coats

| Base coat | | Water absorption after 24 hours | |
|---|--------------------------|---------------------------------|-------------------------|
| Murexin Energy Top (thickness 3 mm) | | < 0,5 kg/m ² | ≥ 0,5 kg/m ² |
| Rendering systems: base coat + key coat according to Clause 1.1 + finishing coats indicated hereafter: | Murexin Energy Crystal | x | |
| | Murexin Energy Clean | x | |
| | Murexin Energy Furioso | x | |
| | Murexin Energy Brilliant | x | |
| | Murexin Energy Design | x | |
| | Murexin Energy Art | x | |
| | Murexin Energy Creative | x | |
| | Murexin Energy Fine | x | |

Table 9 – Water absorption of base coat (on MW boards)

| | | Water absorption after 24 hours | |
|-----------|--------------------|---------------------------------|-------------------------|
| | | < 0,5 kg/m ² | ≥ 0,5 kg/m ² |
| Base coat | Murexin Energy Top | x | |

Table 10 – Water absorption of rendering coats (on MW boards)

| Base coat Murexin Energy Top | | Water absorption after 24 hours | |
|---|--------------------------|---------------------------------|-------------------------|
| | | < 0,5 kg/m ² | ≥ 0,5 kg/m ² |
| Rendering systems: base coat + key coat according to Clause 1.1 + finishing coats indicated hereafter: | Murexin Energy Crystal | x | |
| | Murexin Energy Clean | x | |
| | Murexin Energy Furioso | x | |
| | Murexin Energy Brilliant | x | |
| | Murexin Energy Design | x | |
| | Murexin Energy Art | x | |
| | Murexin Energy Creative | x | |
| | Murexin Energy Fine | x | |

Table 11 – Water absorption of base coat (on MW lamella)

| | | Water absorption after 24 hours | |
|-----------|--------------------|---------------------------------|-------------------------|
| | | < 0,5 kg/m ² | ≥ 0,5 kg/m ² |
| Base coat | Murexin Energy Top | x | |

Table 12 – Water absorption of rendering coats (on MW lamellas)

| Base coat Murexin Energy Top | | Water absorption after 24 hours | |
|---|--------------------------|---------------------------------|-------------------------|
| | | < 0,5 kg/m ² | ≥ 0,5 kg/m ² |
| Rendering systems: base coat + key coat according to Clause 1.1 + finishing coats indicated hereafter: | Murexin Energy Crystal | x | |
| | Murexin Energy Clean | x | |
| | Murexin Energy Furioso | x | |
| | Murexin Energy Brilliant | x | |
| | Murexin Energy Design | x | |
| | Murexin Energy Art | x | |
| | Murexin Energy Creative | x | |
| | Murexin Energy Fine | x | |

3.3.2 Watertightness (ETAG 004 – Clause 5.1.3.2)

3.3.2.1 Hydrothermal behaviour (ETAG 004 – Clause 5.1.3.2.1)

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 resistant to hygrothermal cycles, it means ETICS passed the test without defects.

3.3.2.2 Freeze-thaw behaviour (ETAG 004 – Clause 5.1.3.2.2)

- The water absorptions of base coat and all rendering systems 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.**

3.3.3 Impact resistance (ETAG 004 – Clause 5.1.3.3)

The resistance to hard body impacts (3 Joules and 10 Joules) leads to the following use categories.

Table 13 – Use categories for ETICS according to impact resistance

| Murexin Energy Top + EPS board (EN 13163-TR100) | | Single standard mesh | Double standard mesh |
|---|--------------------------|----------------------|----------------------|
| Rendering systems: base coat + key coat according to clause 1.1 + finishing coats indicated hereafter: | Murexin Energy Crystal | Category | Category I |
| | Murexin Energy Clean | | |
| | Murexin Energy Furioso | | |
| | Murexin Energy Brilliant | | |
| | Murexin Energy Design | | |
| | Murexin Energy Art | | |
| | Murexin Energy Creative | Category II | |
| | Murexin Energy Fine | Category III | Category II |

Table 14 – Use categories for ETICS according to impact resistance

| Murexin Energy Top + MW board (EN 13162-TR7,5) | | Single standard mesh |
|---|--------------------------|----------------------|
| Rendering systems: base coat + key coat according to clause 1.1 + finishing coats indicated hereafter: | Murexin Energy Crystal | Category II |
| | Murexin Energy Clean | |
| | Murexin Energy Furioso | |
| | Murexin Energy Brilliant | |
| | Murexin Energy Design | |
| | Murexin Energy Art | Category III |
| | Murexin Energy Creative | Category II |
| | Murexin Energy Fine | Category III |

Table 15 – Use categories for ETICS according to impact resistance

| Murexin Energy Top + MW lamella (EN 13162-TR80) | | Single standard mesh |
|---|--------------------------|--|
| Rendering systems: base coat + key coat according to clause 1.1 + finishing coats indicated hereafter: | Murexin Energy Crystal | Category II (at thickness of rendering systems 6 mm) |
| | Murexin Energy Clean | |
| | Murexin Energy Furioso | |
| | Murexin Energy Brilliant | |
| | Murexin Energy Design | |
| | Murexin Energy Art | Category III |
| | Murexin Energy Creative | Category II |
| | Murexin Energy Fine | Category III |

3.3.4 Water vapour permeability (ETAG 004 – Clause 5.1.3.4)

Tested combinations in tables 16, 17, 18 and 19 are representative for all possible configurations of rendering systems including decorative coat. Hence, no possible configuration exceeds 2 m of air equivalent thickness and therefore fulfills the requirement of ETAG 004.

Table 16 – Water vapour permeability of rendering systems

| Murexin Energy Top (applied on EPS) (thickness 3 mm) | Equivalent air thickness (m) | |
|---|---|--|
| Rendering systems: base coat + key coat Murexin Energy Primer + finishing coats indicated hereafter: | Murexin Energy Crystal | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Crystal, floated structure, particles size 3,0 mm: 0,538), THR is 6,1 mm |
| | Murexin Energy Clean | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Clean, floated structure, particles size 3,0 mm: 0,232), THR is 6 mm |
| | Murexin Energy Furioso | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Furioso, floated structure, particles size 3,0 mm: 0,580), THR is 6 mm |
| | Murexin Energy Brilliant | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Brilliant, floated structure, particles size 3,0 mm: 0,466), THR is 6,1 mm |
| | Murexin Energy Design | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Design, floated structure, particles size 3,0 mm: 0,664), THR is 6 mm |
| | Murexin Energy Art | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Art Max, floated structure, particles size 4,0 mm: 0,384), THR is 6,9 mm |
| | Murexin Energy Creative | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Creative 2, floated structure, particles size 2,0 mm: 0,44), THR is 5,1 mm |
| | Murexin Energy Fine | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Fine, floated structure, particles size 1,0 mm: 0,342), THR is 4,2 mm |

**Table 17 – Water vapour permeability of rendering systems
(including decorative coats/paints)**

| Murexin Energy Top (applied on EPS) | Equivalent air thickness (m) | |
|---|--|--|
| Rendering systems: base coat + key coat Murexin Energy Primer + finishing coats indicated hereafter: | Murexin Energy Crystal Murexin Crystal Color | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Crystal, floated structure, particles size 3,0 mm, decorative paint Murexin Crystal Color: 0,601), THR is 6,4 mm |
| | Murexin Energy Clean Murexin Clean Color | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Clean, floated structure, particles size 3,0 mm, Murexin Clean Color: 0,248), THR is 6,4 mm |
| | Murexin Energy Furioso Murexin Furioso Color | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Furioso, floated structure, particles size 3,0 mm, Murexin Energy Furioso: 0,640), THR is 6,4 mm |
| | Murexin Energy Furioso Murexin Energy Fine | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Furioso, floated structure, particles size 1,5 mm, Murexin Energy Fine: 0,738), THR is 4,7 mm |
| | Murexin Energy Brilliant Murexin Brilliant Color | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Brilliant, floated structure, particles size 3,0 mm, Murexin Brilliant Color: 0,525), THR is 6,4 mm |
| | Murexin Energy Design Murexin Design Color | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Design, floated structure, particles size 3,0 mm, Murexin Design Color: 0,738), THR is 6,4 mm |
| | Murexin Energy Design Murexin Art Metallic | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Design, floated structure, particles size 3,0 mm, Murexin Art Metallic: 1,056), THR is 6,3 mm |
| | Murexin Energy Design Murexin Art Finish | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Design, floated structure, particles size 3,0 mm, Murexin Art Finish: 0,672), THR is 6,3 mm |
| | Murexin Energy Art Structo Murexin Furioso Color | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Art Structo, floated structure, particles size 4,0 mm, Murexin Furioso Color: 0,445), THR is 7,4 mm |
| | Murexin Energy Creative Murexin Art Glitter | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Creative, floated structure, particles size 2,0 mm, Murexin Art Glitter: 0,832), THR is 6 mm |
| | Murexin Energy Model Murexin Energy Art Fine | $\leq 2,0$ (test results obtained with finishing coat Murexin Energy Model, floated structure, particles size 1,5 mm, Murexin Energy Art Fine: 0,588), THR is 4,7 mm |

Table 18 – Water vapour permeability of rendering systems

| Murexin Energy Top (applied on MW) | | Equivalent air thickness (m) |
|--|--------------------------|--|
| Rendering systems: base coat + key coat Murexin Energy Primer + finishing coats indicated hereafter: | Murexin Energy Crystal | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Crystal, floated structure, particles size 3,0 mm: 0,613), THR is 7,7 mm |
| | Murexin Energy Clean | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Clean, floated structure, particles size 3,0 mm: 0,307), THR is 7,7 mm |
| | Murexin Energy Furioso | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Furioso, floated structure, particles size 3,0 mm: 0,655), THR is 7,7 mm |
| | Murexin Energy Brilliant | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Brilliant, floated structure, particles size 3,0 mm: 0,541), THR is 7,7 mm |
| | Murexin Energy Design | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Design, floated structure, particles size 3,0 mm: 0,739), THR is 7,7 mm |
| | Murexin Energy Art | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Art Max, floated structure, particles size 4,0 mm: 0,459), THR is 8,7 mm |
| | Murexin Energy Creative | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Creative, floated structure, particles size 2,0 mm: 0,515), THR is 7,4 mm |
| | Murexin Energy Fine | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Fine, floated structure, particles size 1,0 mm: 0,417), THR is 5,7 mm |

**Table 19 – Water vapour permeability of rendering systems
(including decorative coats/paints)**

| Murexin Energy Top (applied on MW) (thickness 4,5 mm) | Equivalent air thickness (m) | |
|---|--|--|
| Rendering systems: base coat + key coat Murexin Energy Primer + finishing coats indicated hereafter: | Murexin Energy Crystal Murexin Crystal Color | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Crystal, floated structure, particles size 3,0 mm, decorative paint Murexin Crystal Color: 0,676), THR is 7,7 mm |
| | Murexin Energy Clean Murexin Clean Color | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Clean, floated structure, particles size 3,0 mm, Murexin Clean Color: 0,323), THR is 7,7 mm |
| | Murexin Energy Furioso Murexin Furioso Color | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Furioso, floated structure, particles size 3,0 mm, Murexin Furioso Color: 0,716), THR is 7,7 mm |
| | Murexin Energy Furioso Murexin Energy Fine | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Furioso, floated structure, particles size 1,5 mm, Murexin Energy Fine: 0,813), THR is 6,9 mm |
| | Murexin Energy Brilliant Murexin Brilliant Color | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Brilliant, floated structure, particles size 3,0 mm, Murexin Brilliant Color: 0,600), THR is 7,8 mm |
| | Murexin Energy Design Murexin Design Color | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Design, floated structure, particles size 3,0 mm, Murexin Design Color: 0,813), THR is 7,7 mm |
| | Murexin Energy Design Murexin Art Metallic | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Design, floated structure, particles size 3,0 mm, Murexin Art Metallic: 1,131), THR is 7,7 mm |
| | Murexin Energy Design Murexin Art Finish | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Design, floated structure, particles size 3,0 mm, Murexin Art Finish: 0,747), THR is 7,7 mm |
| | Murexin Energy Art Structo Murexin Furioso Color | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Art Structo, floated structure, particles size 4,0 mm, Murexin Furioso Color: 0,520), THR is 8,7 mm |
| | Murexin Energy Creative Murexin Art Glitter | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Creative, floated structure, particles size 2,0 mm, Murexin Art Glitter: 0,907), THR is 6,7 mm |
| | Murexin Energy Model Murexin Energy Art Fine | $\leq 1,0$ (test results obtained with finishing coat Murexin Energy Model, floated structure, particles size 1,5 mm, Murexin Energy Art Fine: 0,673), THR is 6,1 mm |

NOTE THR means total thickness of rendering system (base coat+mesh+key coat+finishing coat+(decorative coats)).

3.3.5 Release of dangerous substances (ETAG 004 – Clause 5.1.3.5, EOTA TR 034)

In addition to the specific clauses relating to dangerous substances contained in this European Technical Assessment, there may be other requirements applicable to the kit falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet provisions of the EU Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

A written declaration was submitted by the ETA-holder-ETICS manufacturer.

3.4 Safety and accessibility in use (BWR 4)

3.4.1 Bond strength between base coat and insulation product (ETAG 004 – Clause 5.1.4.1.1)

- Base coat Murexin Energy Top onto EPS (EN 13163 – TR100, EN 13163 – TR150)

Table 20 – Bond strength of base coat onto insulation product

| Conditionings | | |
|---|--|---|
| Initial state | After the hygrothermal cycles (on the rig) | After the freeze/thaw cycles (on samples) |
| ≥ 0,08 MPa* | ≥ 0,08 MPa* | Not performed |
| * Failure occurred in insulation product. | | |

- Base coat Murexin Energy Top onto MW (EN 13162 – TR7,5, EN 13162 – TR15)

Table 21 – Bond strength of base coat onto insulation product

| Conditionings | | |
|---|--|---|
| Initial state | After the hygrothermal cycles (on the rig) | After the freeze/thaw cycles (on samples) |
| < 0,08 MPa* | < 0,08 MPa* | Not performed |
| * Failure occurred in insulation product. | | |

- Base coat Murexin Energy Top onto MW lamellas (EN 13162 – TR80)

Table 22 – Bond strength of base coat onto insulation product

| Conditionings | | |
|---|--|---|
| Initial state | After the hygrothermal cycles (on the rig) | After the freeze/thaw cycles (on samples) |
| ≥ 0,08 MPa* | Not performed | Not performed |
| * Failure occurred in insulation product. | | |

3.4.2 Bond strength between adhesive and substrate/insulation product (ETAG 004 – Clauses 5.1.4.1.2 and 5.1.4.1.3)

Table 23 – Bond strength of adhesive onto substrate and EPS (EN 13163 – TR100 or TR120 or TR150) and MW (EN 13162-TR80)

| | | 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 Top | Concrete | ≥ 0,25 MPa | ≥ 0,08 MPa | ≥ 0,25 MPa |
| | Insulation product EPS –TR100 | ≥ 0,08 MPa (min. 0,10 MPa) | ≥ 0,03 MPa (min. 0,08 MPa) | ≥ 0,08 MPa (min. 0,10 MPa) |
| | Insulation product EPS –TR150 | ≥ 0,08 MPa (min. 0,15 MPa) | ≥ 0,03 MPa (min. 0,08 MPa) | ≥ 0,08 MPa (min. 0,16 MPa) |
| | Insulation product MW – TR80 | ≥ 0,08 MPa (min. 0,083 MPa) | ≥ 0,03 MPa (min. 0,078 MPa) | < 0,08 MPa* (min. 0,079 MPa) |
| Murexin Energy Fix | Concrete | ≥ 0,25 MPa | ≥ 0,08 MPa | ≥ 0,25 MPa |
| | Insulation product EPS –TR100 | ≥ 0,08 MPa (min. 0,10 MPa) | ≥ 0,03 MPa (min. 0,08 MPa) | ≥ 0,08 MPa (min. 0,10 MPa) |
| | Insulation product EPS –TR150 | ≥ 0,08 MPa (min. 0,15 MPa) | ≥ 0,03 MPa (min. 0,08 MPa) | ≥ 0,08 MPa (min. 0,15 MPa) |
| | Insulation product MW – TR80 | ≥ 0,08 MPa (min. 0,081 MPa) | ≥ 0,03 MPa (min. 0,075 MPa) | ≥ 0,08 MPa (min. 0,077 MPa*) |

* Failure occurred in the insulation product.

The minimum bonded surface S, which shall exceed 20 %, is calculated as follows:

$$S (\%) = [0,03 \times 100]/B$$

where:

B is minimum failure resistance of the adhesive to the insulation product in dry conditions for all failure modes expressed in MPa;

0,03 MPa corresponds to the minimum requirements.

The ETICS shall be installed on the substrate with application of the adhesive on the following minimal surface (% of total) according to Tables 24 to 30.

Table 24 – Minimum admissible bonded surface area for bonded ETICS

| Tensile strength perpendicular to the faces of the insulation product (Murexin Energy Panel EPS-F (100) and Murexin Energy Panel EPS-F plus (100)) | Minimum admissible bonded surface area of all adhesive defined in ETICS composition |
|--|---|
| ≥ 100 kPa (EPS-EN 13163-TR100) | 40 % |

Table 25 – Minimum admissible bonded surface area for mechanically fixed ETICS with supplementary adhesive

| Tensile strength perpendicular to the faces of the insulation product (Murexin Energy Panel EPS-F (100) and Murexin Energy Panel EPS-F plus (100)) | Minimum admissible bonded surface area of all adhesive defined in ETICS composition |
|---|--|
| ≥ 100 kPa (EPS-EN 13163-TR100) | 40 % |

Table 26 – Minimum admissible bonded surface area for bonded ETICS

| Tensile strength perpendicular to the faces of the insulation products (Murexin Energy Panel EPS-F (120) and Murexin Energy Panel EPS-F plus (120)) | Minimum admissible bonded surface area of all adhesive defined in ETICS composition |
|--|--|
| ≥ 120 kPa (EPS-EN 13163-TR120) | 25 % |

Table 27 – Minimum admissible bonded surface area for mechanically fixed ETICS with supplementary adhesive

| Tensile strength perpendicular to the faces of the insulation products (Murexin Energy Panel EPS-F (120) and Murexin Energy Panel EPS-F plus (120)) | Minimum admissible bonded surface area of all adhesive defined in ETICS composition |
|--|--|
| ≥ 120 kPa (EPS-EN 13163-TR120) | 40 % |

Table 28 – Minimum admissible bonded surface area for bonded ETICS

| Tensile strength perpendicular to the faces of the insulation product (Murexin Energy Panel EPS-F (150) and Murexin Energy Panel EPS-F plus (150)) | Minimum admissible bonded surface area of all adhesive defined in ETICS composition |
|---|--|
| ≥ 150 kPa (EPS-EN 13163-TR150) | 20 % |

Table 29 – Minimum admissible bonded surface area for mechanically fixed ETICS with supplementary adhesive

| Tensile strength perpendicular to the faces of the insulation product (Murexin Energy Panel EPS-F (150) and Murexin Energy Panel EPS-F plus (150)) | Minimum admissible bonded surface area of all adhesive defined in ETICS composition |
|---|--|
| ≥ 150 kPa (EPS-EN 13163-TR150) | 40 % |

Table 30 – Bonded surface area for bonded ETICS

| Tensile strength perpendicular to the faces of the insulation product (mineral wool lamella) | Bonded surface area for bonded ETICS |
|---|---|
| ≥ 80 kPa (MW-EN 13162-TR80) | 100 % |

3.4.3 Bond strength after ageing (ETAG 004 – Clauses 5.1.7.1 and 5.1.7.2)

**Table 31 – Bond strength of rendering systems after ageing (with EPS)
(ETAG 004 – Clause 5.1.7.1)**

| Murexin Energy Top | | After hydrothermal cycles | After freeze/thaw cycles |
|--|----------------------------------|---------------------------|--|
| Rendering systems: base coat + key coats according to Clause 1.1 + finishing coats indicated hereafter: | Murexin Energy Clean (3,0 mm) | ≥ 0,08 MPa | Test not performed because freeze/thaw cycles not necessary |

**Table 32 – Bond strength of rendering systems after ageing
(ETAG 004 – Clause 5.1.7.2)**

| Murexin Energy Top | | After 7 days immersion in water + 7 days 23 °C/50% RH (on samples) | After freeze/thaw cycles |
|--|--------------------------|--|--|
| Rendering systems: base coat + key coats according to Clause 1.1 + finishing coats indicated hereafter: | Murexin Energy Crystal | ≥ 0,08 MPa | Test not performed because freeze/thaw cycles not necessary |
| | Murexin Energy Clean | | |
| | Murexin Energy Furioso | | |
| | Murexin Energy Brilliant | | |
| | Murexin Energy Design | | |
| | Murexin Energy Design | | |
| | Murexin Energy Creative | | |
| | Murexin Energy Fine | | |

**Table 33 – Bond strength of rendering systems after ageing (with MW board-TR7,5)
(ETAG 004 – Clause 5.1.7.2)**

| Murexin Energy Top | | After 7 days immersion in water + 7 days 23 °C/50% RH (on samples) | After freeze/thaw cycles |
|--|--------------------------|--|---|
| Rendering systems: base coat + finishing coats indicated hereafter: | Murexin Energy Crystal | < 0,08 MPa But failure occurs in thermal insulation | Test not performed because freeze/thaw cycles not necessary |
| | Murexin Energy Clean | | |
| | Murexin Energy Furioso | | |
| | Murexin Energy Brilliant | | |
| | Murexin Energy Design | | |
| | Murexin Energy Art | | |
| | Murexin Energy Creative | | |
| | Murexin Energy Fine | | |

3.4.4 Fixing strength (ETAG 004 – Clause 5.1.4.2)

Test not required because the ETICS fulfills the following criteria:

- The bonded area exceeds 20 % in case of mechanically fixed systems with supplementary adhesive.

3.4.5 Wind load resistance (ETAG 004 – Clause 5.1.4.3)

Safety in use of mechanically fixed ETICS using anchors

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

Table 34 – 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 | Hilti insulation anchor SD-FV 8 Hilti ETICS-ANCHOR D-FV Hilti ETICS-ANCHOR D-FV T Hilti Dämmstoffelement XI-FV Hilti SX-FV Koelner TFIX-8M Koelner TFIX 8S Koelner TFIX 8ST IsoFux NDS8Z IsoFux NDS90Z IsoFux NDM90Z IsoFux NDM8Z IsoFux Rocket | |
| | Plate diameter (mm) | ≥ 60 | |
| Characteristic of the insulation product panels for which the following failure loads apply | Thickness (mm) | ≥ 60 | |
| | Tensile strength perpendicular to the face (kPa) | ≥ 100 | |
| Failure loads (N) | Anchors not placed at the panel joint (pull – through test) | R_{panel} : | Minimum: 450 Average: 510 |
| | Anchors placed at the panel joint (static foam block test) | R_{joint} : | Minimum: 337,5 Average: 383 |

Table 35 – 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 | Hilti D8-FV | |
| | Plate diameter (mm) | ≥ 60 | |
| Characteristic of the insulation product panels for which the following failure loads apply | Thickness (mm) | ≥ 100 | |
| | Tensile strength perpendicular to the face (kPa) | ≥ 100 | |
| Failure loads (N) | Anchors not placed at the panel joint (pull – through test) | R_{panel} : | Minimum: 510 Average: 540 |
| | Anchors placed at the panel joint (static foam block test) | R_{joint} : | Minimum: 430 Average: 470 |

Table 36 – 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 | fischer TERMOZ 8U fischer TERMOZ 8 N fischer Termoz CN 8 fischer Termoz 8 NZ fischer Termoz 8 SV fischer Termoz 8 UZ fischer Termoz PN 8 KEW InsuFix TSD-V KEW InsuFix TSBD 8 KEW TSD 8 |
| | Plate diameter (mm) | ≥ 60 |
| Characteristic of the insulation product panels for which the following failure loads apply | Thickness (mm) | ≥ 60 |
| | Tensile strength perpendicular to the face (kPa) | ≥ 100 |
| Failure loads (N) | Anchors not placed at the panel joint (pull – through test) | R_{panel} : Minimum: 560 Average: 571 |
| | Anchors placed at the panel joint (static foam block test) | R_{joint} : Minimum: 493 Average: 503 |

Table 37 – 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 | Bravoll PTH-KZ 60/8-La Bravoll PTH-KZL 60/8-La Bravoll PTH 60/8-La Bravoll PTH-L 60/8-La Bravoll PTH-S 60/8 Bravoll PTH-SX Bravoll PTX Bravoll PTH-EX ejotherm STR U ejotherm STR U 2G ejotherm NT U ejotherm NK U Hilti SX-FV Koelner TFIX 8S Koelner TFIX 8ST KEW TSD-V |
| | 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 |
| Failure loads (N) | Anchors not placed at the panel joint (pull – through test) | R_{panel} : Minimum: 502 Average: 514 |
| | Anchors placed at the panel joint (static foam block test) | R_{joint} : Minimum: 322 Average: 359 |

Table 38 – 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 | | SPIT ISO ejot H1 eco ejot H3 ejotherm NTK U fischer TERMOZ 8 N fischer Termoz 8 NZ fischer TERMOZ KS 8 fischer Termoz CN 8 hilti fixing element XI-FV KOELNER KI-10N KOELNER KI-10NS KI-10, KI-10PA KI-10M KOELNER TFIX-8M KOELNER TFIX-8P |
| | Plate diameter (mm) | | ≥ 50 |
| Characteristic of the insulation product panels for which the following failure loads apply | Thickness (mm) | | ≥ 50 |
| | Tensile strength perpendicular to the face (kPa) | | ≥ 100 |
| Failure loads (N) | Anchors not placed at the panel joint (pull – through test) | R_{panel} : | Minimum: 407 Average: 421 |
| | Anchors placed at the panel joint (pull – through test) | R_{joint} : | Minimum: 363 Average: 373 |

Table 39 – 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 | | Hilti HTH |
| Characteristic of the insulation product panels for which the following failure loads apply | Thickness (mm) | | ≥ 100 |
| | Tensile strength perpendicular to the face (kPa) | | ≥ 100 |
| Failure loads (N) | Anchors not placed at the panel joint (pull – through test) | R_{panel} : | Minimum: 644,41 Average: 682,90 |
| | Anchors placed at the panel joint (pull – through test) | R_{joint} : | Minimum: 544,99 Average: 604,04 |

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

Table 40 – Failure loads of combination of anchors described in below table and insulation product – MW-EN 13162-TR7,5 (single density product))

| | | | | |
|--|---|--|------------------------------|------------|
| Anchors for which the following failure loads apply | | Trade name | Anchors according to Annex 2 | |
| | | Plate diameter (mm) | ≥ 60 | |
| Characteristic of the insulation product panels for which the following failure loads apply | | Thickness (mm) | ≥ 60 | |
| | | Tensile strength perpendicular to the face (kPa) | ≥ 7,5 | |
| Failure loads (N) | Anchors not placed at the panel joint (pull – through test) | R_{panel} : | Minimum: | 300 |
| | | | Average: | 320 |
| Failure loads (N) | Anchors placed at the panel joint (pull – through test) | R_{joint} : | Minimum: | 250 |
| | | | Average: | 280 |

Table 41 – Failure loads of combination of anchors described in below table and insulation product – MW-EN 13162-TR7,5 (single density product)

| | | | | |
|--|---|--|------------------------------|------------|
| Anchors for which the following failure loads apply | | Trade name | Anchors according to Annex 2 | |
| | | Plate diameter (mm) | ≥ 60 | |
| Characteristic of the insulation product panels for which the following failure loads apply | | Thickness (mm) | ≥ 140 | |
| | | Tensile strength perpendicular to the face (kPa) | ≥ 7,5 | |
| Failure loads (N) | Anchors not placed at the panel joint (pull – through test) | R_{panel} : | Minimum: | 470 |
| | | | Average: | 520 |
| Failure loads (N) | Anchors placed at the panel joint (pull – through test) | R_{joint} : | Minimum: | 390 |
| | | | Average: | 410 |

Table 42 – Failure loads of combination of anchors described in below table and insulation product – MW-EN 13162-TR7,5 (dual density product)

| | | | | |
|--|---|--|---|------------|
| Anchors for which the following failure loads apply | | Trade name | Anchors according to Annex 2 marked with* | |
| | | Plate diameter (mm) | ≥ 60 | |
| Characteristic of the insulation product panels for which the following failure loads apply | | Thickness (mm) | ≥ 60 | |
| | | Tensile strength perpendicular to the face (kPa) | ≥ 7,5 | |
| Failure loads (N) | Anchors not placed at the panel joint (pull – through test) | R_{panel} : | Minimum: | 380 |
| | | | Average: | 430 |
| Failure loads (N) | Anchors placed at the panel joint (pull – through test) | R_{joint} : | Minimum: | 290 |
| | | | Average: | 360 |

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

$$R_d = [R_{\text{panel}} \times n_{\text{panel}} + R_{\text{joint}} \times n_{\text{joint}}] / \gamma$$

where

n_{panel} is number (per m^2) of anchors not placed at the panel joint;
 n_{joint} is number (per m^2) of anchors placed at the panel joint;
 γ is national safety factor.

3.4.6 Render strip tensile test (ETAG 004 – Clause 5.5.4.1)

The mean value of the crack width of the base coat with the glass fibre mesh Murexin Energy Textile (4 mm × 4 mm) have not been tested (No performance assessed).

3.5 Protection against noise (BWR 5)

3.5.1 Airborne sound insulation (ETAG 004 – Clause 5.1.5.1)

No performance assessed.

3.6 Energy economy and heat retention (BWR 6)

3.6.1 Thermal resistance (ETAG 004 – Clause 5.1.6.1)

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 $\text{W}/(\text{m}^2 \cdot \text{K})$;
 U_c global (corrected) thermal transmittance of the covered wall ($\text{W}/(\text{m}^2 \cdot \text{K})$);
 n number of anchors (through insulation product) per m^2 ;
 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) ($\text{W}/(\text{m}^2 \cdot \text{K})$) determined as follows:

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

where R_i thermal resistance of the insulation product (according to declaration in reference to EN 13163) in $(\text{m}^2 \cdot \text{K})/\text{W}$;
 R_{render} thermal resistance of the render (about 0,02 in $(\text{m}^2 \cdot \text{K})/\text{W}$ or determined by test according to EN 12667 or EN 12664);
 $R_{\text{substrate}}$ thermal resistance of the substrate of the building (concrete, brick ...) in $(\text{m}^2 \cdot \text{K})/\text{W}$;
 R_{se} external superficial thermal resistance in $(\text{m}^2 \cdot \text{K})/\text{W}$;
 R_{si} internal superficial thermal resistance in $(\text{m}^2 \cdot \text{K})/\text{W}$.

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 conductivity of anchors shall be given when anchors are used in the ETICS.

3.7 Sustainable use of natural resources (BWR 7)

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 43 – 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 are 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, 26 September 2017



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

Annexes

- Annex 1 Insulation product characteristics
- Annex 2 Description and characteristics of the anchors
- Annex 3 Description and characteristics of the reinforcement
- Annex 4 Overview of trade names used for components Murexin Energy Saving System

Annex 1

Insulation product characteristics

Table 44 – Characteristics of the insulation product(s)

| Description and characteristics | EPS panel “Murexin Energy Panel EPS-F (100)” <i>white color</i> | |
|---|---|--|
| | for bonded ETICS | for mechanically fixed ETICS with anchors |
| Reaction to fire / STN EN 13501-1 | Euroclass E (thickness from 20 to 420 mm, density from 13,5 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" $\lambda_{ins}: < 0,038 \text{ W/(m}\cdot\text{K)}$ (declared value) | |
| 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 |
| Bending strength according to EN 12089 | EPS - EN 13163 – BS115 | |
| Compressive stress or compressive strength (kPa) / EN 826 | EPS - EN 13163 – CS(10)70 | |
| Tensile strength perpendicular to the faces in dry conditions / EN 1607 | ≥ 100 kPa and < 150 kPa, EPS - EN 13163 – TR100 | |
| Short term water absorption by partial immersion / EN 1609 | < 0,5 kg/m ² | |
| Water vapour diffusion resistance factor (μ) / EN 12086 | ≥ 20 ≤ 60 | |
| Shear strength (N/mm ²) / EN 12090 | ≥ 0,02 MPa | – |
| Shear modulus (N/mm ²) / EN 12090 | ≥ 1,0 MPa | – |

Table 45 – Characteristics of the insulation product(s)

| Description and characteristics | | EPS panel “Murexin Energy Panel EPS-F plus (100)” <i>grey color</i> | |
|---|--|---|---|
| | | for bonded ETICS | for mechanically fixed ETICS with anchors |
| Reaction to fire / STN EN 13501-1 | | Euroclass E (thickness from 20 to 420 mm, density from 13,5 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" $\lambda_{ins}: < 0,031 \text{ W/(m}\cdot\text{K)}$ (declared value) | |
| 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 | |
| Bending strength according to EN 12089 | | EPS - EN 13163 – BS115 | |
| Compressive stress or compressive strength (kPa) / EN 826 | | EPS - EN 13163 – CS(10)70 | |
| Tensile strength perpendicular to the faces in dry conditions / EN 1607 | | $\geq 100 \text{ kPa}$ and $< 150 \text{ kPa}$, EPS - EN 13163 – TR100 | |
| Short term water absorption by partial immersion / EN 1609 | | $< 0,5 \text{ kg/m}^2$ | |
| Water vapour diffusion resistance factor (μ) / EN 12086 | | ≥ 20 ≤ 60 | |
| Shear strength (N/mm ²) / EN 12090 | | $\geq 0,02 \text{ MPa}$ | – |
| Shear modulus (N/mm ²) / EN 12090 | | $\geq 1,0 \text{ MPa}$ | – |

Table 46 – Characteristics of the insulation product(s)

| Description and characteristics | | EPS panel “Murexin Energy Panel EPS-F (120)” <i>white color</i> | |
|---|--|---|---|
| | | for bonded ETICS | for mechanically fixed ETICS with anchors |
| Reaction to fire / STN EN 13501-1 | | Euroclass E (thickness from 20 to 420 mm, density from 13,5 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" $\lambda_{ins}: < 0,038 \text{ W/(m}\cdot\text{K)}$ (declared value) | |
| Thickness (mm) / EN 823 | | EPS - EN 13163 – T1 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 | |
| Bending strength according to EN 12089 | | EPS - EN 13163 – BS115 | |
| Compressive stress or compressive strength (kPa) / EN 826 | | EPS - EN 13163 – CS(10)70 | |
| Tensile strength perpendicular to the faces in dry conditions / EN 1607 | | $\geq 120 \text{ kPa}$ and $< 150 \text{ kPa}$, EPS - EN 13163 – TR120 | |
| Short term water absorption by partial immersion / EN 1609 | | $< 0,5 \text{ kg/m}^2$ | |
| Water vapour diffusion resistance factor (μ) / EN 12086 | | ≥ 20 ≤ 60 | |
| Shear strength (N/mm ²) / EN 12090 | | $\geq 0,02 \text{ MPa}$ | – |
| Shear modulus (N/mm ²) / EN 12090 | | $\geq 1,0 \text{ MPa}$ | – |

Table 47 – Characteristics of the insulation product(s)

| Description and characteristics | | EPS panel “Murexin Energy Panel EPS-F plus (120)” <i>grey color</i> | |
|---|--|---|---|
| | | for bonded ETICS | for mechanically fixed ETICS with anchors |
| Reaction to fire / STN EN 13501-1 | | Euroclass E (thickness from 20 to 420 mm, density from 13,5 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" $\lambda_{ins}: < 0,031 \text{ W/(m}\cdot\text{K)}$ (declared value) | |
| Thickness (mm) / EN 823 | | EPS - EN 13163 – T1 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 | |
| Bending strength according to EN 12089 | | EPS - EN 13163 – BS115 | |
| Compressive stress or compressive strength (kPa) / EN 826 | | EPS - EN 13163 – CS(10)70 | |
| Tensile strength perpendicular to the faces in dry conditions / EN 1607 | | $\geq 120 \text{ kPa}$ and $< 150 \text{ kPa}$, EPS - EN 13163 – TR120 | |
| Short term water absorption by partial immersion / EN 1609 | | $< 0,5 \text{ kg/m}^2$ | |
| Water vapour diffusion resistance factor (μ) / EN 12086 | | ≥ 20 ≤ 60 | |
| Shear strength (N/mm ²) / EN 12090 | | $\geq 0,02 \text{ MPa}$ | – |
| Shear modulus (N/mm ²) / EN 12090 | | $\geq 1,0 \text{ MPa}$ | – |

Table 48 – Characteristics of the insulation product(s)

| Description and characteristics | | EPS panel “Murexin Energy Panel EPS-F (150)” <i>white color</i> | |
|---|--|---|---|
| | | for bonded ETICS | for mechanically fixed ETICS with anchors |
| Reaction to fire / STN EN 13501-1 | | Euroclass E (thickness from 20 to 420 mm, density from 13,5 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" $\lambda_{ins}: < 0,038 \text{ W/(m}\cdot\text{K)}$ (declared value) | |
| 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 | |
| Bending strength according to EN 12089 | | EPS - EN 13163 – BS115 | |
| Compressive stress or compressive strength (kPa) / EN 826 | | EPS - EN 13163 – CS(10)70 | |
| Tensile strength perpendicular to the faces in dry conditions / EN 1607 | | $\geq 150 \text{ kPa}$ and $< 200 \text{ kPa}$, EPS - EN 13163 – TR150 | |
| Short term water absorption by partial immersion / EN 1609 | | $< 0,5 \text{ kg/m}^2$ | |
| Water vapour diffusion resistance factor (μ) / EN 12086 | | ≥ 20 ≤ 60 | |
| Shear strength (N/mm ²) / EN 12090 | | $\geq 0,02 \text{ MPa}$ | – |
| Shear modulus (N/mm ²) / EN 12090 | | $\geq 1,0 \text{ MPa}$ | – |

Table 49 – Characteristics of the insulation product(s)

| Description and characteristics | | EPS panel “Murexin Energy Panel EPS-F plus (150)” <i>grey color</i> | |
|---|--|---|---|
| | | for bonded ETICS | for mechanically fixed ETICS with anchors |
| Reaction to fire / STN EN 13501-1 | | Euroclass E (thickness from 20 to 420 mm, density from 13,5 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" $\lambda_{ins}: < 0,031 \text{ W/(m}\cdot\text{K)}$ (declared value) | |
| 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 | |
| Bending strength according to EN 12089 | | EPS - EN 13163 – BS115 | |
| Compressive stress or compressive strength (kPa) / EN 826 | | EPS - EN 13163 – CS(10)70 | |
| Tensile strength perpendicular to the faces in dry conditions / EN 1607 | | $\geq 150 \text{ kPa}$ and $< 200 \text{ kPa}$, EPS - EN 13163 – TR150 | |
| Short term water absorption by partial immersion / EN 1609 | | $< 0,5 \text{ kg/m}^2$ | |
| Water vapour diffusion resistance factor (μ) / EN 12086 | | ≥ 20 ≤ 60 | |
| Shear strength (N/mm ²) / EN 12090 | | $\geq 0,02 \text{ MPa}$ | – |
| Shear modulus (N/mm ²) / EN 12090 | | $\geq 1,0 \text{ MPa}$ | – |

Table 50 – Characteristics of the insulation product(s)

| Description and characteristics | | MW board “Murexin Energy Panel MW” (single density product) |
|---|--|--|
| | | for mechanically fixed ETICS with anchors |
| Reaction to fire / STN EN 13501-1 | | Euroclass A1 (thickness from 50 to 300 mm, density from 90 to 116,5 kg/m ³) |
| Thermal resistance ((m ² .K)/W) | | Defined in the CE marking in reference to EN 13162 $\lambda_{ins}: < 0,036 \text{ W/(m}\cdot\text{K)}$ (declared value) |
| Thickness (mm) / EN 823 | | MW - EN 13162 – T5 |
| Length (mm) / EN 822 | | MW - EN 13162 – $\pm 2 \%$ |
| Width (mm) / EN 822 | | MW - EN 13162 – $\pm 1,5 \%$ |
| Squareness (mm) / EN 824 | | MW - EN 13162 – $\leq 5 \text{ mm/m}$ |
| Flatness (mm) / EN 825 | | MW - EN 13162 – $\leq 6 \text{ mm}$ |
| Surface condition | | Cut surface (homogeneous and with or without "skin") |
| Dimensional stability under | specified temperature and humidity / EN 1604 | No performance assessed |
| | laboratory condition / EN 1603 | MW - EN 13162 – DS(TH) |
| Compressive stress or compressive strength (kPa) / EN 826 | | MW - EN 13162 – CS(10)25 |
| Tensile strength perpendicular to the faces in dry conditions / EN 1607 | | $\geq 7,5 \text{ kPa}$, MW - EN 13162 – TR7,5 $\geq 10 \text{ kPa}$, MW - EN 13162 – TR10 |
| Short term water absorption by partial immersion / EN 1609 | | MW - EN 13162 – WS, WL(P) |
| Water vapour diffusion resistance factor (μ) / EN 12086 | | MW - EN 13162 – MU1 |
| Shear strength (N/mm ²) / EN 12090 | | – |
| Shear modulus (N/mm ²) / EN 12090 | | – |

Table 51 – Characteristics of the insulation product(s)

| Description and characteristics | | MW board “Murexin Energy Panel MW” (dual density product) |
|---|--|--|
| | | for mechanically fixed ETICS with anchors |
| Reaction to fire / STN EN 13501-1 | | Euroclass A1 (thickness from 50 to 300 mm, density from 90 to 116,5 kg/m ³) |
| Thermal resistance ((m ² .K)/W) | | Defined in the CE marking in reference to EN 13162 $\lambda_{ins}: < 0,036 \text{ W/(m}\cdot\text{K)}$ (declared value) |
| Thickness (mm) / EN 823 | | MW - EN 13162 – T5 |
| Length (mm) / EN 822 | | MW - EN 13162 – $\pm 2 \%$ |
| Width (mm) / EN 822 | | MW - EN 13162 – $\pm 1,5 \%$ |
| Squareness (mm) / EN 824 | | MW - EN 13162 – $\leq 5 \text{ mm/m}$ |
| Flatness (mm) / EN 825 | | MW - EN 13162 – $\leq 6 \text{ mm}$ |
| Surface condition | | Cut surface (homogeneous and with or without "skin") |
| Dimensional stability under | specified temperature and humidity / EN 1604 | No performance assessed |
| | laboratory condition / EN 1603 | MW - EN 13162 – DS(TH) |
| Compressive stress or compressive strength (kPa) / EN 826 | | MW - EN 13162 – CS(10)20 |
| Tensile strength perpendicular to the faces in dry conditions / EN 1607 | | $\geq 7,5 \text{ kPa}$, MW - EN 13162 – TR7,5 $\geq 10 \text{ kPa}$, MW - EN 13162 – TR10 |
| Short term water absorption by partial immersion / EN 1609 | | MW - EN 13162 – WS, WL(P) |
| Water vapour diffusion resistance factor (μ) / EN 12086 | | MW - EN 13162 – MU1 |
| Shear strength (N/mm ²) / EN 12090 | | – |
| Shear modulus (N/mm ²) / EN 12090 | | – |

Table 52 – Characteristics of the insulation product(s)

| Description and characteristics | | MW board “Murexin Energy Panel MWL” |
|---|--|--|
| | | for fully bonded ETICS with supplementary anchors |
| Reaction to fire / STN EN 13501-1 | | Euroclass A1 (thickness from 60 to 300 mm, density from 78 to 116,5 kg/m ³) |
| Thermal resistance ((m ² .K)/W) | | Defined in the CE marking in reference to EN 13162 $\lambda_{ins}: < 0,042 \text{ W/(m}\cdot\text{K)}$ (declared value) |
| Thickness (mm) / EN 823 | | MW - EN 13162 – T5 |
| Length (mm) / EN 822 | | MW - EN 13162 – $\pm 2 \%$ |
| Width (mm) / EN 822 | | MW - EN 13162 – $\pm 1,5 \%$ |
| Squareness (mm) / EN 824 | | MW - EN 13162 – $\leq 5 \text{ mm/m}$ |
| Flatness (mm) / EN 825 | | MW - EN 13162 – $\leq 6 \text{ mm}$ |
| Surface condition | | Cut surface (homogeneous and without "skin") |
| Dimensional stability under | specified temperature and humidity / EN 1604 | MW - EN 13162 – DS(T+)- |
| | laboratory condition / EN 1603 | MW - EN 13162 – DS(TH) |
| Compressive stress or compressive strength (kPa) / EN 826 | | MW - EN 13162 – CS(10)40 |
| Tensile strength perpendicular to the faces in dry conditions / EN 1607 | | MW - EN 13162 – TR80 |
| Short term water absorption by partial immersion / EN 1609 | | MW – EN 13162 – WS, WL(P) |
| Water vapour diffusion resistance factor (μ) / EN 12086 | | MW – EN 13162 – MU1 |
| Shear strength (N/mm ²) / EN 12090 | | min. 0,02 N/mm ² |
| Shear modulus (N/mm ²) / EN 12090 | | min. 1,0 N/mm ² |

Annex 2

Description and characteristics of anchors

Table 53 – References to ETAs for anchors used in ETICS “Murexin Energy Saving System” with EPS

| Trade name | Description Plate stiffness/Load resistance of the anchor plate | Plate diameter mm | Characteristic resistance in substrate stated in |
|---|--|-------------------|--|
| Bravoll PTH-KZ 60/8 / Bravoll PTH 60/8 | Nailed-in plastic anchor with (polyamide – PTH) (steel – PTH-KZ) nail and plastic head 0,4 kN/mm/1,8 kN Use of category (Bravoll PTH 60/8): A, B Use of category (Bravoll PTH-KZ 60/8): A, B, C, D | 60 | ETA-05/0055 |
| Bravoll PTH-S 60/8 | Screwed-in plastic anchor with steel screw 0,9 kN/mm/2,6 kN Use of category: A, B, C, D, E | 60 | ETA-08/0267 |
| Bravoll PTH-SX | Screwed-in plastic anchor with plastic screw 0,5 kN/mm/1,8 kN Use of category: A, B, C, D, E | 60 | ETA-10/0028 |
| Bravoll PTH-X/Bravoll PTH-EX | Nailed-in plastic anchor with polyamide (PTH X) or steel screw (PTH-EX) 0,6 kN/mm/1,5 kN Use of category: A, B, C, D | 60 | ETA-13/0951 |
| Ejotherm STR U/Ejotherm STR U 2G | Screwed-in plastic anchor with steel screw and plastic head 0,6 kN/mm/2,08 kN Use of category: A, B, C, D, E | 60 | ETA-04/0023 |
| 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 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 |
| Ejot H1 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 |
| Ejot H4 eco | Nailed-in plastic anchor with polyamide nail 0,6 kN/mm/1,4 kN Use of category: A, B, C, D, E | 60 | ETA-11/0192 |
| 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) 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) | 60 | ETA-03/0019 |
| 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 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 |
| 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 |

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|--|--|-------------|----|-------------|
| Hilti Dämmstoffelement XI-FV | Plastic part made of polyethylene 0,4 kN/mm/1,6 kN | 60 | | ETA-03/0004 |
| Hilti insulation anchor SD-FV 8/ Hilti HDT-FV90 | Nailed-in plastic anchor with polyamide nail 0,3 kN/mm/1,55 kN Use of category: A, B, C | 60 | | ETA-03/0028 |
| 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 WDVS-Schlagdübel SDK-FV 8 | Nailed in plastic anchor with nail made from polyamide 0,5 kN/mm/1,48 kN Use of category: A, B, C | 60 | | ETA-07/0302 |
| IsoFux NDS8Z/IsoFux NDS90Z/ IsoFux NDM90Z/IsoFux NDM8Z | Nailed-in plastic anchor with steel screw 0,9 kN/mm/2,2 kN Use of category: A, B, C | 60 | | ETA-07/0129 |
| 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 |
| 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 |
| SPIT ISO | Naled in plastic anchor with plastic nail 0,3 kN/mm/1,0 kN Use of category: A, B, C | 50 to 60 | 90 | ETA-04/0076 |
| 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 |
| 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 |
| Koelner 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 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 |
| Koelner TFIX-8M | nailed-in anchor with nail of galvanized steel 1,0 kN/mm/1,75 kN Use of category: A, B, C | 60 | | ETA-07/0336 |
| Koelner TFIX 8P | Nailed-in plastic anchor with nail of galvanised steel 0,3 kN/mm/1,38 kN Use of category: A, B, C, D, E | 60 | | ETA-13/0845 |
| Koelner TFIX-8S/Koelner TFIX-8ST | Screwed-in anchor with screw of galvanised 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 |
| 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 | 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 |
| 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 |
| 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 |
| 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 |

Table 54 – References to ETAs for anchors used in ETICS “Murexin Energy Saving System” with MW

| Trade name | Description Plate stiffness/Load resistance of the anchor plate | Plate diameter mm | Characteristic resistance in substrate stated in |
|---|--|-------------------|--|
| Bravoll PTH-KZ 60/8/Bravoll PTH 60/8* | Nailed-in plastic anchor with (polyamide – PTH) (steel – PTH-KZ) nail and plastic head 0,4 kN/mm/1,8 kN Use of category (Bravoll PTH 60/8): A, B Use of category (Bravoll PTH-KZ 60/8): A, B, C, D | 60 | ETA-05/0055 |
| Bravoll PTH-S 60/8 | Screwed-in plastic anchor with steel screw 0,9 kN/mm/2,6 kN Use of category: A, B, C, D, E | 60 | ETA-08/0267 |
| Bravoll PTH-SX | Screwed-in plastic anchor with plastic screw 0,5 kN/mm/1,8 kN Use of category: A, B, C, D, E | 60 | ETA-10/0028 |
| Bravoll PTH-X/Bravoll PTH-EX | Nailed-in plastic anchor with polyamide (PTH X) or steel screw (PTH-EX) 0,6 kN/mm/1,5 kN Use of category: A, B, C, D | 60 | ETA-13/0951 |
| Ejotherm STR U*/Ejotherm STR U 2G* | Screwed-in plastic anchor with steel screw and plastic head 0,6 kN/mm/2,08 kN Use of category: A, B, C, D, E | 60 | ETA-04/0023 |
| 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 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 |
| Ejot H1 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 |
| Ejot H4 eco | Nailed-in plastic anchor with polyamide nail 0,6 kN/mm/1,4 kN Use of category: A, B, C, D, E | 60 | ETA-11/0192 |
| 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) 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) | 60 | ETA-03/0019 |
| 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 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 |
| 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 Dämmstoffelement XI-FV | plastic part made of polyethylene 0,4 kN/mm/1,6 kN | 60 | ETA-03/0004 |
| Hilti insulation anchor SD-FV 8/ Hilti HDT-FV90* | Nailed-in plastic anchor with polyamide nail 0,3 kN/mm/1,55 kN Use of category: A, B, C | 60 | ETA-03/0028 |

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| 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 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 |
| IsoFux NDS8Z*/IsoFux NDS90Z/ IsoFux NDM90Z/IsoFux NDM8Z | Nailed-in plastic anchor with steel screw 0,9 kN/mm/2,2 kN Use of category: A, B, C | 60 | ETA-07/0129 |
| 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 |
| 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 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 |
| 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 |
| Koelner 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 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 |
| Koelner TFIX-8M | nailed-in anchor with nail of galvanized steel 1,0 kN/mm/1,75 kN Use of category: A, B, C | 60 | ETA-07/0336 |
| Koelner TFIX 8P | Nailed-in plastic anchor with nail of galvanised steel 0,3 kN/mm/1,38 kN Use of category: A, B, C, D, E | 60 | ETA-13/0845 |
| Koelner TFIX-8S*/Koelner TFIX-8ST* | Screwed-in anchor with screw of galvanised 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 |
| Hilti HTR-P | 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 |
| 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 |
| 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 |
| 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 |

In ETICS “Murexin Energy Saving System” can be used also other types of anchors as stated in Tables 62 and 63, after adding them to the control plan of manufacturer of ETICS on previous agreement between Technický a skúšobný ústav stavebný, n. o. (TSÚS) and Murexin GmbH. These additional anchors will be added to listed anchors in Tables 53 and 54 of ETA in the next coming version.

Annex 3

Description and characteristics of the reinforcement

Table 55 – Description and characteristics of the reinforcement

| Mesh trade name | Description | Alkalis resistance (5.6.7.1 of ETAG 004) | | | |
|------------------------|---|--|------|--|------|
| | | Residual strength after ageing (N/mm) | | Relative residual resistance: % (after ageing) of the strength in the as delivered state | |
| | | Warp | Weft | Warp | Weft |
| Murexin Energy Textile | Standard mesh: Mesh size: 4 mm × 4,5 mm Mass per unit area: min. 145 g/m ² | ≥ 20 | | ≥ 50 | |

Annex 4

Overview of trade names used for components

| | |
|--------------------------------|---------------------------------------|
| Adhesive | Murexin Energy Top |
| | Murexin Energy Fix |
| Insulation board | Murexin Energy Panel EPS-F (100) |
| | Murexin Energy Panel EPS-F plus (100) |
| | Murexin Energy Panel EPS-F (120) |
| | Murexin Energy Panel EPS-F plus (120) |
| | Murexin Energy Panel EPS-F (150) |
| | Murexin Energy Panel EPS-F plus (150) |
| | Murexin Energy Panel MW |
| | Murexin Energy Panel MWL |
| Base coat | Murexin Energy Top |
| Glass fibre mesh | Murexin Energy Textile |
| Key coat | Murexin Energy Primer |
| Finishing coats | Murexin Energy Crystal |
| | Murexin Energy Clean |
| | Murexin Energy Furioso |
| | Murexin Energy Brilliant |
| | Murexin Energy Design |
| | Murexin Energy Art |
| | Murexin Energy Creative |
| | Murexin Energy Fine |
| Decorative coat/plaster | Murexin Energy Art Fine |
| Decorative coat/paint | Murexin Clean Color |
| | Murexin Furioso Color |
| | Murexin Crystal Color |
| | Murexin Brilliant Color |
| | Murexin Design Color |
| | Murexin Art Metallic |
| | Murexin Art Lasur |
| | Murexin Art Finish |
| Murexin Art Glitter | |

Combination of finishing coats and decorative coats

| | Murexin Clean Color | Murexin Furioso Color | Murexin Crystal Color | Murexin Brilliant Color | Murexin Design Color |
|-----------------------------|------------------------|--------------------------|--------------------------|----------------------------|-------------------------|
| Murexin Energy Clean | x | | | | |
| Murexin Energy Design | x | x | | x | x |
| Murexin Energy Furioso | x | x | | x | x |
| Murexin Energy Crystal | x | x | x | | x |
| Murexin Energy Brilliant | x | x | x | x | x |
| Murexin Energy Art | x | x | | x | x |
| Murexin Energy Fine | x | x | | x | x |

Combination of finishing coats and decorative coats

| | Murexin Art Metallic | Murexin Art Lasur | Murexin Art Glitter | Murexin Art Finish | Murexin Energy Art Fine |
|-----------------------------|-------------------------|----------------------|------------------------|-----------------------|----------------------------|
| Murexin Energy Clean | x | x | x | x | x |
| Murexin Energy Design | x | x | x | x | x |
| Murexin Energy Furioso | x | x | x | x | x |
| Murexin Energy Crystal | x | x | x | x | x |
| Murexin Energy Brilliant | x | x | x | x | x |
| Murexin Energy Art | x | x | x | x | x |
| Murexin Energy Fine | x | x | x | x | x |
| Murexin Energy Creative | | | | x | |