Deutsches Institut für Bautechnik

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Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

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European Technical Assessment ETA-06/0045 of 29 October 2025

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	StoTherm Vario 3
Product family to which the construction product belongs	Product area code: 4 External Thermal Insulation Composite System with rendering on expanded polystyrene for use on building walls
Manufacturer	Sto SE & Co. KGaA Ehrenbachstraße 1 79780 Stühlingen DEUTSCHLAND
Manufacturing plant	Sto SE & Co. KGaA Ehrenbachstraße 1 79780 Stühlingen DEUTSCHLAND
This European Technical Assessment contains	23 pages including 6 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	040083-00-0404
This version replaces	ETA-06/0045 issued on 19 June 2018

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Specific Part

1 Technical description of the product

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

The ETICS kit comprises a prefabricated insulation product of expanded polystyrene (EPS) to be bonded and if it necessary additional mechanically fixed onto a wall. The methods of fixing and the relevant components are specified in annex 1. The insulation product is faced with a rendering system consisting of one base coat and finishing coat (site applied), in which the base coat 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 ...) for connection to adjacent building elements (apertures, corners, parapets ...). Assessment and performance of these components are not addressed in this ETA, however the ETICS manufacturer is responsible for adequate compatibility and performance within the ETICS when the components are delivered as a part of the kit.

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

The performances in Section 3 can only be assumed if the ETICS is used in accordance with the specifications and under the boundary conditions specified in Annexes 2 to 5.

The verifications and assessment methods on which this ETA is based lead to the assumption of a working life of the "StoTherm Vario 3" of at least 25 years. The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer, but are to be regarded only as a means for choosing the right products in relation to the assumed economically reasonable working life of the works.

For use, maintenance and repair, the finishing coat shall be maintained in order to fully preserve the ETICS performance. Maintenance includes at least:

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

Necessary repairs are to be carried out as soon as the need has been identified.

The information on use, maintenance and repair is given in the manufacturer’s technical documentation.

It is the responsibility of the manufacturer to ensure that this information is made known to the concerned people.

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

3.1 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire of the ETICS	(see annex 2) Euroclass according to EN 13501-1
Reaction to fire of the EPS insulation product – Apparent density according to EN 1602	(see annex 2) Euroclass E according EN 13501-1 $\rho_a \leq 30$ kg/m³
Facade fire performance	no performance assessed

3.2 Hygiene, health and environment (BWR 3)

Essential characteristic	Performance	
Release of dangerous substances	no performance assessed	
Water absorption Base coat after 1 hour after 24 hours **Rendering system** after 1 hour after 24 hours EPS- insulation product after 24 h	(see annex 3.1) Average [kg/m²] Average [kg/m²] Average [kg/m²] Average [kg/m²] maximum value 0.5 kg/m²	
Water-tightness of the ETICS: Hygrothermal behaviour on the test wall	Pass without defects	
Water-tightness of the ETICS: Freeze/thaw behaviour	The water absorption of the base coats as well as the rendering systems with all finishing coats except "StoSil K/R/MP" and "StoMiral EKP" is less than 0.5 kg/m² after 24 hours. The ETICS with the finishing coat "StoSil K/R/MP" has been assessed as freeze/thaw resistant according to the simulated method. The ETICS with the finishing coat "StoMiral EKP" has no performance assessed.	
Impact resistance	(see annex 3.2) Category	
Water vapour permeability - Rendering system	(see annex 3.3) s_d value [m]	
- EPS insulation product	μ = 20 – 70	Thickness of the insulation product 400 mm

3.3 Safety and accessibility in use (BWR 4)

Essential characteristic	Performance
Bond strength between base coat and EPS insulation product	(see annex 4.1) - Minimal value/average [kPa] - Minimal value/average [kPa]
between adhesive and substrate	(see annex 4.2) - Thickness [mm] of the used adhesives - Minimal value/average [kPa]; rupture type: Initial state (dry conditions) - Minimal value/ average [kPa]; rupture type: after 2 d immersion in water, 2 h drying - Minimal value/ average [kPa]; rupture type: after 2 d immersion in water, 7 d drying
between adhesive and EPS insulation	(see annex 4.3) - Thickness [mm] of the used adhesives - Minimal value/average [kPa]; rupture type: Initial state (dry conditions) - Minimal value/average [kPa]; rupture type: after 2 d immersion in water, 2 h drying - Minimal value/average [kPa]; rupture type: after 2 d immersion in water, 7 d drying
Fixing strength (displacement test)	Test not required therefore no limitation of ETICS length required.
Wind load resistance of ETICS pull-through test of fixing static foam block test	(see annex 4.4) - R_{panel} [kN/fixing], - R_{joint} [kN/fixing], - Plate diameter of anchor ≥ 60 mm resp. ≥ 90 mm - plate stiffness ≥ 0.3 kN/mm² - load resistance of the anchor plate ≥ 1.0 kN
Tensile strength perpendicular to the faces in dry conditions standard EPS elastified EPS	 σ_{mt} ≥ 80 kPa (bonded ETICS) σ_{mt} ≥ 100 kPa (bonded ETICS with anchors) σ_{mt} ≥ 150 kPa (bonded ETICS with profiles) σ_{mt} ≥ 80 kPa (bonded ETICS, bonded ETICS with anchors)

Essential characteristic	Performance
Shear strength of the ETICS	≥ 20 kPa
Shear modulus of the ETICS standard EPS elastified EPS	 ≥ 1.0 MPa ≥ 0.3 MPa
Pull-through resistance of the fixing of profiles	≥ 0.5 kN
Render strip tensile test	(siehe Anhang 4.5) crack width w_{rk} [mm]
Bond strength after ageing finishing coat tested on the rig finishing coat not tested on the rig	(see annex 4.6) Minimal value/average [kPa] Minimal value/average [kPa]
Tensile strength of the glass fibre mesh in the as-delivered state	(see annex 4.7) Average [N/mm]
Residual tensile strength of the glass fibre mesh after aging	(see annex 4.7) Average [N/mm]
Relative residual tensile strength of the glass fibre mesh after aging	(see annex 4.7) Average [%]
Elongation of the glass fibre mesh in the as-delivered state	(see annex 4.7) Average [%]
Elongation of the glass fibre mesh after aging	(see annex 4.7) Average [%]

3.4 Protection against noise (BWR 5)

Essential characteristic	Performance
Airborne sound insulation of ETICS	no performance assessed
Dynamic stiffness of the EPS insulation product	no performance assessed
Air flow resistance of the EPS insulation product	no performance assessed

3.5 Energy economy and heat retention (BWR 6)

Essential characteristic	Performance
Thermal resistance of ETICS	(see annex 5) Calculated value or measurement value R [(m² ·K)/W]
thermal transmittance of ETICS	(see annex 5) Calculated value or measurement value U [W/(m² ·K)]

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

In accordance with EAD No. 040083-00-0404 the applicable European legal act is: 97/556/EC changed by 2001/596/EC

The systems to be applied are:

Product	Intended use	Levels or classes (Reaction to fire)	Systems
"StoTherm Vario 3"	ETICS in external wall subject to fire regulations	A1 (1), A2 (1), B (1), C (1)	1
		A1 (2), A2 (2), B (2), C (2), D, E, (A1 bis E) (3), F	2+
	ETICS in external wall not subject to fire regulations	any	2+

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

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

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

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Deutsches Institut für Bautechnik.

Issued in Berlin on 29 October 2025 by Deutsches Institut für Bautechnik

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beglaubigt:
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Annex 1

Composition of the ETICS

	Components National application documents shall be taken into account	**Coverage [kg/m²]**	**Thickness [mm]**
Insulation material with associated method of fixing	Bonded ETICS: • Insulation product factory-prefabricated expanded polystyrene (EPS)* – standard EPS – elastified EPS • Adhesive – **Sto Levell FT** (cement based powder requiring addition of 28 % of water) – **StoLevell Novo** (cement based powder requiring addition of about 37 % of water) – **StoLevell Uni** (cement based powder requiring addition of 24 – 26 % of water) – **Sto-Baukleber** (cement based powder requiring addition of 21 – 23 % of water) – **Sto-Dispersionskleber** (organic based ready to use paste)	 – – 3.0 to 7.5 (powder) 3.0 to 7.5 (powder) 3.0 to 7.5 (powder) 3.0 to 7.5 (powder) 1.0 to 1.5	 ≤ 400 ≤ 200 – – – – –
	Mechanically fixed ETICS with profiles and supplementary adhesive: • **Insulation product** factory-prefabricated expanded polystyrene (EPS)* – standard EPS • **Supplementary adhesive** (equal to bonded ETICS) • **Profiles** – "Sto-Halteleiste PVC" – "Sto-Verbindungsleiste PVC" Polyvinyl chloride (PVC) profiles • **Anchors for profiles** – WS 8 L – WS 8 N – ejotherm SDK U – SDF-K plus – ejotherm NK U	 – 	 60 to 200
	Mechanically fixed ETICS with anchors and supplementary adhesive: • **Insulation product** factory-prefabricated expanded polystyrene (EPS)* – standard EPS – elastified EPS • **Supplementary adhesive** (equal to bonded ETICS) • **Anchors for insulation product** all anchors with ETA acc. to EAD 330196-01-0604[1]	 – – 	 60 to 400 60 to 200
Base coat	**StoLevell Novo** Identical with the equally named adhesive given above.	5.0 to 10.0 (powder)	5.0 to 10.0

[1] EAD 330196-01-0604 Plastic anchors for fixing of external thermal insulation composite systems with rendering

	Components National application documents shall be taken into account	**Coverage [kg/m²]**	**Thickness [mm]**
Glass fibre mesh	• **Sto-Glasfasergewebe** Alkali- and slide-resistant glass fibre mesh with mass per unit area of about 165 g/m² and mesh size of about 6.0 mm x 6.0 mm	–	–
	• **Sto-Glasfasergewebe F** Alkali- and slide-resistant glass fibre mesh with mass per unit area of about 165 g/m² and mesh size of about 4.0 mm x 4.0 mm	–	–
	• **Sto-Panzergewebe** (reinforced mesh implemented in addition to the meshes described above to improve the impact resistance) Alkali- and slide-resistant glass fibre mesh with mass per unit area of about 450 g/m² and mesh size of about 7.5 mm x 7.5 mm	–	–
Key coat**	**StoPrep Miral** **Sto-Putzgrund** **Sto-Putzgrund QS** **StoPrep Isol Q** Ready to use pigmented acrylic-resin dispersion liquids. StoPrep Miral with additional potassium silicate binder. For the compatibility with the finishing coats see below.	0.3 to 0.4 0.3 to 0.4 0.3 to 0.4 0.3 to 0.4	- - - -
Finishing coat	• Ready to use pastes – acrylate binder:		
	Stolit K (particle size 1.0 to 6.0 mm)	2.2 to 6.5	regulated by particle size
	Stolit R (particle size 1.5 to 6.0 mm)	2.2 to 6.1	
	Stolit Effect (particle size 3.0 mm)	4.5 to 5.5	
	Stolit MP (thin, middle or thick layer)	2.2 to 4.7	1.5 to 3.5
	Stolit Milano	2.0 to 4.0	1.0 to 2.0
	Stolit K (particle size 1.5 mm) **+ Stolit Milano**	about 2.3 + about 3.0	2.0 to 3.0
	StoMarlit K (particle size 1.5 to 3.0 mm)	2.6 to 4.9	regulated by particle size
	StoMarlit R (particle size 1.5 to 3.0 mm)	2.5 to 4.4	
	Sto-Ispolit K (particle size 1.5 to 2.5 and 3.5 mm)	2.3 to 4.3	
	Sto-Ispolit R (particle size 1.5 to 3.5 mm)	2.3 to 4.3	
	Sto-Ispolit MP (thin, middle or thick layer)	2.3 to 4.3	1.5 to 3.5
	StoSuperlit K (particle size 1.5 to 2.0 mm)	4.5 to 6.0	regulated by particle size
	StoLotusan K (particle size 1.0 to 3.0 mm)	2.0 to 5.0	
	StoLotusan MP (thin, middle or thick layer)	2.2 to 4.7	1.5 to 3.5
	• Ready to use paste - acrylic binder -associated with a decorative paint:		
	StoNivellit + **StoColor Silco** (acrylic/siloxane binder)	3.0 to 3.5 0.2 to 0.4 l/m²	1.0 to 1.5
	• Ready to use paste - acrylic binder - associated with synthetic briquettes		
	Sto-Klebe- und Fugenmörtel + **StoCleyer B - size I, II and III**	3.0 to 3.5 48 to 76 pieces/m²***	4.0 to 7.0
	Sto-Klebe- und Fugenmörtel + **StoEcoshape**	3.0 to 3.5 2.4 to 780 pieces/m²***	

	Components National application documents shall be taken into account	**Coverage [kg/m²]**	**Thickness [mm]**
Finishing coat	• Ready to use pastes – acrylic/siloxane binder:		
	Sto-Silkolit K (particle size 1.5 to 2.5 and to 3.5 mm)	2.3 to 4.3	regulated by particle size
	Sto-Silkolit R (particle size 1.5 to 3.5 mm)	2.3 to 4.3	
	Sto-Silkolit MP (thin, middle or thick layer)	2.3 to 4.3	1.5 to 3.5
	StoSilco K (particle size 1.0 to 3.0 mm)	2.0 to 5.0	regulated by particle size
	StoSilco R (particle size 1.5 to 3.5 mm)	2.9 to 4.5	
	StoSilco MP (thin, middle or thick layer)	2.2 to 4.7	1.5 to 3.5
	• Ready to use paste – acrylic binder: (application between 0 °C and 15 °C):		
	Stolit QS K (particle size 1.0 to 3.0 mm)	2.0 to 4.8	regulated by particle size
	Stolit QS R (particle size 1.5 to 3.0 mm)	2.2 to 4.5	
	Stolit QS MP (thin, middle or thick layer)	2.2 to 4.7	1.5 to 3.5
	Ready to use paste – acrylic/siloxane binder (application between 0 °C and 15 °C):		
	StoSilco QS K (particle size 1.0 to 3.0 mm)	2.0 to 5.0	regulated by particle size
	StoSilco QS R (particle size 1.5 to 3.0 mm)	2.9 to 4.5	
	StoSilco QS MP (thin, middle or thick layer)	2.2 to 4.7	1.5 bis 3.5
	• Ready to use pastes – silicate binder:		
	StoSil K (particle size 1.0 to 3.0 mm)	2.2 to 4.4	regulated by particle size
	StoSil R (particle size 1.5 to 3.0 mm)	2.4 to 3.9	
	StoSil MP (thin, middle or thick layer)	1.5 to 4.0	1.5 bis 3.5
	• Cement based powder requiring addition of about 25 % in weight of water:		
	StoMiral K (particle size 1.5 to 6.0 mm)	1.7 to 5.0	regulated by particle size
	StoMiral R (particle size 1.5 to 6.0 mm)	1.7 to 4.5	
	StoMiral MP (fine structure)	1.5 to 4.0	1.5 bis 3.5
	• Cement based powder requiring addition of about 20 to 23 % of water associated with a decorative paint:		
	StoMiral Nivell F (fine structure)	3.0 to 4.5	2.0 to 5.0
	• Cement based powder requiring addition of about 30 % of water associated with a decorative paint:		
	Sto-Strukturputz K (particle size 2.0 and 3.0 mm)	2.3 to 2.7	regulated by particle size
	Sto-Strukturputz R (particle size 2.0 and 3.0 mm)	2.4 to 2.7	
	• Cement based powder requiring addition of about 24 to 32 %:		
	StoMiral EKP (particle size 2.0 to 4.0 mm)	15.0 to 28.0	8.0 to 10.0****
Decorative Paint (optional)	Ready to use paint with acrylic/siloxane binder:		
	StoColor Silco	0.2 to 0.4	–
	StoColor Jumbosil	0.2 to 0.4	
	StoColor Maxicryl	0.2 to 0.4	
	StoColor Crylan	0.2 to 0.4	
	StoColor Lotusan	0.2 to 0.4	

* Factory-prefabricated, uncoated panels made of expanded polystyrene (EPS) shall be used

** The instruction to the installer concerning the use of a key coat remains the responsibility of the ETA-holder.

*** Depend on the size of the pieces (I, II or III).

**** The applied thickness of 10 to 25 mm is reduced to 8 to 10 mm by scraping.

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Annex 2

Safety in case of fire (BWR 2)

2.1 Reaction to fire

Configurations	Organic content	Flame retardant content	Euroclass according to EN 13501-1
Base coat "StoLevell Novo"	max. 3.1%	no flame retardant	
EPS insulation product	Euroclass E according to EN 13501-1	Euroclass E according to EN 13501-1	
Profiles	-	-	
anchors	-	-	
Rendering system: Base coat with finishing coat and compatible key coat indicated hereafter:			
Stolit K/R (particle size 3.5 to 6.0 mm) with key coat "Sto-Putzgrund"	max. 9.6 %	min. 8.0 %	B - s2,d0
Stolit K/R (particle size 1.0 to 3.0 mm) with key coat "Sto-Putzgrund"		min. 8.0 %	B - s2,d0
Stolit Effect/MP with key coat "Sto-Putzgrund"			
Stolit Milano with key coat "Sto-Putzgrund"			
Stolit K1,5 + Stolit Milano with key coat "Sto-Putzgrund"			
StoMarlit K/R with key coat "Sto-Putzgrund"		no flame retardant	
Sto-Ispolit K/R/MP with key coat "Sto-Putzgrund"			
StoLotusan K/MP with key coat "Sto-Putzgrund"		min. 10.2 %	
StoNivellit + StoColor Silco with key coat "Sto-Putzgrund"			
Sto-Silkolit K/R/MP with key coat "Sto-Putzgrund"		no flame retardant	
StoSilco K/R/MP with key coat "Sto-Putzgrund"		min. 7.7 %	
Stolit QS K/R/MP with key coat "Sto-Putzgrund QS"/"StoPrep QS"			
StoSilco QS K/R/MP with key coat "Sto-Putzgrund QS"/"StoPrep Isol Q"	max. 9.2 %	min. 9.4 %	B - s2,d0

Configurations	Organic content	Flame retardant content	Euroclass according to EN 13501-1
StoSil K/R/MP with key coat "StoPrep Miral"	max. 6.0 %	no flame retardant	B - s1,d0
StoMiral K/R/MP with key coat "StoPrep Miral"	max. 1.8 %		
StoMiral Nivell F + with key coat "StoPrep Miral" in Verbindung mit einem dekorativen Schlussanstrich			
Sto-Strukturputz K/R with key coat "StoPrep Miral" associated with a decorative paint			
StoMiral EKP with key coat "StoPrep Miral"			
Sto-Klebe- und Fugenmörtel + StoCleyer B with key coat "Sto-Putzgrund"	max. 8.0 % max. 7.9 %	min. 15.0% min. 20.0%	B - s2,d0
Sto-Klebe- und Fugenmörtel + StoEcoshape with key coat "Sto-Putzgrund"	max. 8.0 % max. 7.9 %	min. 15.0% min. 20.0%	
StoSuperlit K with key coat "Sto-Putzgrund"	-	-	no performance assessed

Annex 3

Hygiene, health and environment (BWR 3)

3.1 Water absorption (capillarity test)

Base coat:

Base coat	Thickness [mm]	Mean value water absorption [kg/m²]	
		after 1 h	after 24 h
StoLevell Novo	10	0.03	0.24

Rendering system:

Rendering system: base coat "StoLevell Novo" with finishing coat indicated hereafter	Thickness [mm]	Mean value water absorption [kg/m²]	
		after 1 h	after 24 h
Stolit K/R/MP/Effect	2	0.02	0.16
Stolit Milano	1,5	0.01	0.10
Stolit K1,5 + Stolit Milano	2,5	0.01	0.09
StoMarlit K/R	2	0.04	0.23
Sto-Ispolit K/R/MP	2,5	0.03	0.25
StoLotusan K/MP	2	0.03	0.13
Sto-Klebe- und Fugenmörtel + StoCleyer B	-	0.03	0.17
Sto-Klebe- und Fugenmörtel + StoEcoshape	-	0.03	0.17
StoSuperlit K	2	0.03	0.19
StoNivellit + StoColor Silco	1,5	0.09	0.26
Sto-Silkolit K/R/MP	2,5	0.05	0.37
StoSilco K/R/MP	2	0.04	0.29
Stolit QS K/R/MP	2	0.02	0.28
StoSilco QS K/R/MP	2	0.05	0.29
StoSil K/R/MP	2	0.22	0.82
StoMiral K/R/MP	2	0.02	0.25
StoMiral Nivell F + StoColor Silco	3	0.02	0.21
Sto-Strukturputz K/R + StoColor Silco	2	0.02	0.15
StoMiral EKP	8 – 10	no performance assessed	

3.2 Impact resistance

Standard mesh: "Sto-Glasfasergewebe" and "Sto-Glasfasergewebe F"

Rendering system Base coat "StoLevell Novo" with finishing coat indicated hereafter	**Standard mesh**	**Standard mesh + Sto-Panzergewebe**
Stolit K/R/Effect/MP	Category II	Category I
Stolit Milano	Category III	no performance assessed
Stolit K1,5 + Stolit Milano	Category II	Category II
Sto-Ispolit K/R/MP		
StoMarlit K/R	Category II	Category I
StoLotusan K/MP		
Sto-Klebe- und Fugenmörtel + StoCleyer B	Category I	Category I
Sto-Klebe- und Fugenmörtel + StoEcoshape		
StoSuperlit K	Category II	Category I
StoNivellit + StoColor Silco	Category III	Category II
Sto-Silkolit K/R/MP	Category II	Category II
StoSilco K/R/MP		Category I
Stolit QS K/R/MP		
StoSilco QS K/R/MP	Category II	Category I
StoSil K/R/MP		Category II
StoMiral K/R/MP		
StoMiral Nivell F		
Sto-Strukturputz K/R		
StoMiral EKP	Category I	Category I

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3.3 Water vapour permeability

Rendering system: base coat "StoLevell Novo" with finishing coat and compatible key coat indicated hereafter (evaluated without decorative coating or key coat, if not stated differently)	**Equivalent air thickness s_d** [m] (Test results obtained with a layer thickness of the base coat of 6 mm)
Stolit K/R/Effect/MP	≤ 1.0 m (Test result obtained with Stolit K2: 0.4 m)
Stolit Milano	≤ 1.0 m (Test result obtained with t = 1 mm: 0.6 m)
Stolit K1,5 + Stolit Milano	≤ 1.0 m (Test result obtained with t = 2.5 mm: 0.8 m)
StoMarlit K/R	≤ 1.0 m (Test result obtained with StoMarlit K2: 0.4 m)
Sto-Ispolit K/R/MP	≤ 1.0 m (Test result obtained with t = 2.5 mm: 0.41 m)
StoLotusan K/R/MP	≤ 1.0 m (Test result obtained with StoLotusan K2: 0.11 m)
Sto-Klebe- und Fugenmörtel + StoCleyer B	≤ 1.0 m (Test result obtained with size III: 0.6 m)
Sto-Klebe- und Fugenmörtel + StoEcoshape	≤ 1.0 m (Test result obtained with size III: 0.6 m)
StoSuperlit	≤ 1.0 m (Test result obtained with "Farbsand" (special colour coated grain) K2: 0.4 m) (Test result obtained with "Silmer" (natural coloured grain) K2: 0.3 m)
StoNivellit + StoColor Silco	≤ 1.0 m (Test result obtained with t = 1 mm: 0.4 m)
Sto-Silkolit K/R/MP	≤ 1.0 m (Test result obtained with t = 2.5 mm: 0.21 m)
StoSilco K/R/MP	≤ 1.0 m (Test result obtained with StoSilco K2: 0.3 m)
Stolit QS K/R/MP	≤ 1.0 m (Test result obtained with Stolit QS K2: 0.3 m)
StoSilco QS K/R/MP	≤ 1.0 m (Test result obtained with StoSilco QS K2: 0.3 m)
StoSil K/R/MP	≤ 1.0 m (Test result obtained with StoSil K2: 0.2 m)
StoMiral K/R/MP	≤ 1.0 m (Test result obtained with StoMiral K2: 0.1 m)
StoMiral Nivell F associated with a decorative paint	≤ 1.0 m (Test result obtained with t = 2 mm and a double coat of paint "StoColor Silco": 0.2 m) (Test result obtained with t = 2 mm and a double coat of paint "StoColor Jumbosil": 0.2 m)
Sto-Strukturputz K/R associated with a decorative paint	≤ 1.0 m (Test result obtained with Sto-Strukturputz K3 and a double coat of paint "StoColor Silco": 0.2 m) (Test result obtained with Sto-Strukturputz K3 and a double coat of paint "StoColor Jumbosil": 0.3 m)
StoMiral EKP	≤ 1.0 m (Test result obtained with t = 11 mm: 0.4 m)

Annex 4

Safety and accessibility in use (BWR 4)

4.1 Bond strength between base coat and insulation product (EPS)

		Conditioning		
		Initial state [kPa]	**After hygrothermal cycles [kPa]**	**After freeze/thaw test**
StoLevell Novo	Mean value	90	100	Test not required because freeze/thaw cycles not necessary
	Minimum value	71	61	

4.2 Bond strength between adhesive and substrate

			Conditioning		
Substrate: concrete		**Rupture type**	**Initial state [kPa]**	**2 d immersion in water and 2 h drying [kPa]**	**2 d immersion in water and 7 d drying [kPa]**
Sto-Baukleber (5 mm)	Mean value	in adhesive	1210	1150	1620
	Minimum value		930	970	1210
StoLevell Uni (5 mm)	Mean value		1793	637	2560
	Minimum value		1596	467	2489
StoLevell Novo (5 mm)	Mean value		515	350	490
	Minimum value		413	319	401
StoLevell FT (5 mm)	Mean value		1233	369	1157
	Minimum value		784	299	1026
Sto-Dispersionskleber (3 – 5 mm)	Mean value		1527	1481	1043
	Minimum value		1364	1349	870

4.3 Bond strength between adhesive and insulation product (EPS)

			Conditioning		
		Rupture type	**Initial state [kPa]**	**2 d immersion in water and 2 h drying [kPa]**	**2 d immersion in water and 7 d drying [kPa]**
Sto-Baukleber (3 – 5 mm)	Mean value	in insulation product	128	120	141
	Minimum value		107	119	132
StoLevell Uni (3 – 5 mm)	Mean value		145	65	145
	Minimum value		110	55	115
StoLevell Novo (3 – 5 mm)	Mean value		125	65	140
	Minimum value		106	50	129
StoLevell FT (3 – 5 mm)	Mean value		112	53	125
	Minimum value		87	44	118
Sto-Dispersionskleber (3 – 5 mm)	Mean value		190	200	170
	Minimum value		180	170	160

Minimum bonded surface area

S [%] = 0.03 N/mm² x 100 / 0.08 N/mm²

S = 37.5 %

The Minimum bonded surface S of bonded ETICS is 40 %.

4.4 Wind load resistance

The following failure loads only apply to the listed combination of component characteristics and the characteristics of the insulation product.

4.4.1 Wind load resistance of ETICS mechanically fixed with profiles

Characteristics of the EPS **(standard EPS)**	Dimensions	500 mm x 500 mm
	Thickness	≥ 60 mm
	Tensile strength perpendicular to the faces	**≥ 150 kPa**
	Shear modulus	≥ 1,0 N/mm²
Failure loads [kN / panel] (Static Foam Block Test)	Horizontal profiles fixed every 30 cm and 49.4 cm long vertical connection profiles	Minimal: 0.095 Mean value: 0.101

4.4.2 Wind load resistance of ETICS mechanically fixed with anchors

Apply to all anchors listed in annex 1 mounted on the insulation panels surface				
Characteristics of the EPS **(standard EPS)**	Thickness		≥ 60 mm	
	Tensile strength perpendicular to the faces		**≥ 100 kPa**	
	Shear modulus		≥ 1.0 N/mm²	
Plate diameter of anchor			∅ 60 mm	∅ 90 mm
plate stiffness			≥ 0.3 kN/mm	
load resistance of the anchor plate			≥ 1.0 kN	
Failure load [kN]	Anchors not placed at the panel joints (Static Foam Block Test)	R_{panel}	Minimal: 0.51 Mean value: 0.52	Minimal: 0.72 Mean value: 0.73
	Anchors placed at the panel joints (Pull-through test)	R_{joint}	Minimal: 0.40 Mean value: 0.43	Minimal: 0.43 Mean value: 0.47

Apply to all anchors listed in annex 1 mounted on the insulation panels surface			
Characteristics of the EPS **(elastified EPS)**	Thickness		≥ 60 mm
	Tensile strength perpendicular to the faces		**≥ 80 kPa**
	Shear modulus		≥ 0.3 N/mm²
Plate diameter of anchor			∅ 60 mm
plate stiffness			≥ 0.3 kN/mm
load resistance of the anchor plate			≥ 1.0 kN
Failure load [kN]	Anchors not placed at the panel joints (Static Foam Block Test)	R_{panel}	Minimal: 0.35 Mean value: 0.36
	Anchors placed at the panel joints (Pull-through test)	R_{joint}	Minimal: 0.30 Mean value: 0.31

The failure loads specified above with a plate diameter of anchor of 60 mm apply to the following anchors with deep mounting only under the following conditions:

Anchor	Thickness of the EPS panel [t]	Conditions of installation*
ejotherm STR U, ejotherm STR U 2G (ETA-04/0023)	100 mm > t ≥ 80 mm (for standard and elastified EPS)	– Maximum installation depth of the anchor plate: 15 mm (≙ thickness of insulation cover) – Cutting depth 20 mm
	≥ 100 mm (for standard and elastified EPS)	– Maximum installation depth of the anchor plate: 15 mm (≙ thickness of insulation cover) – Cutting depth 35 mm
IsoFux NDT8LZ (ETA-05/0080)	≥ 80 mm (for standard and elastified EPS)	– Cutting depth 20 mm
TERMOZ 8 SV (ETA-06/0180)	≥ 80 mm (for standard EPS only)	– Maximum installation depth of the anchor plate: 15 mm (≙ thickness of insulation cover)
* according to the appropriate ETA of anchor		

4.5 Render strip tensile test

The Mean value value of crack width of the base coat reinforced with the different glass fibre meshes measured at a render strain value of 1 % is:

StoLevell Novo with the mesh indicated hereafter	**Mean value value of crack width $w_{m(1\%)}$**
Sto-Glasfasergewebe	0.09 mm
Sto-Glasfasergewebe F	No performance assessed

4.6 Bond strength after aging

Base coat "StoLevell Novo" with finishing coat indicated hereafter		7 d immersion in water and 7 d drying [kPa]	After hygrothermal cycles [kPa]
Stolit K/R/Effect/MP	Mean value	121	
	Minimum value	95	
Stolit Milano	Mean value	140	
	Minimum value	130	
Stolit K1,5 + Stolit Milano	Mean value	150	
	Minimum value	142	
Sto-Ispolit K/R/MP	Mean value	104	
	Minimum value	94	
StoMarlit K/R	Mean value	122	
	Minimum value	116	
StoLotusan K/MP	Mean value	120	
	Minimum value	126	
Sto-Klebe- und Fugenmörtel + StoCleyer B	Mean value	80	
	Minimum value	65	
Sto-Klebe- und Fugenmörtel + StoEcoshape	Mean value	80	
	Minimum value	65	
StoSuperlit	Mean value	132	
	Minimum value	110	
StoNivellit	Mean value	122	
	Minimum value	106	
Sto-Silkolit K/R/MP	Mean value	118	
	Minimum value	101	
Sto-Silco K/R/MP	Mean value	138	
	Minimum value	123	
Stolit QS K/R/MP	Mean value	118	109
	Minimum value	104	95
StoSilco QS K/R/MP	Mean value	121	
	Minimum value	102	
StoSil K/R/MP	Mean value	121	
	Minimum value	103	
StoMiral K/R/MP	Mean value	134	93
	Minimum value	106	80
StoMiral Nivell F	Mean value	139	
	Minimum value	120	
Sto-Strukturputz K/R	Mean value	135	
	Minimum value	106	
StoMiral EKP	Mean value	135	
	Minimum value	129	

4.7 Reinforcement (glass fibre mesh)

Sto-Glasfasergewebe	**Mean value warp**	**Mean value weft**
Tensile strength in as-delivered state	2154 N / 50 mm	2883 N / 50 mm
Residual tensile strength after aging	1274 N / 50 mm	1807 N / 50 mm
Relative residual tensile strength after aging	59.1 %	62.7 %
Elongation in as-delivered state	3.7 %	3.8 %
Elongation after aging	1.8 %	2.1 %

Sto-Glasfasergewebe F	**Mean value warp**	**Mean value weft**
Tensile strength in as-delivered state	2150 N / 50 mm	2450 N / 50 mm
Residual tensile strength after aging	1100 N / 50 mm	1380 N / 50 mm
Relative residual tensile strength after aging	59.1 %	62.7 %
Elongation in as-delivered state	3.7 %	3.8 %
Elongation after aging	1.8 %	2.1 %

Sto-Panzergewebe	**Mean value warp**	**Mean value weft**
Tensile strength in as-delivered state	7954 N / 50 mm	8936 N / 50 mm
Residual tensile strength after aging	5886 N / 50 mm	5051 N / 50 mm
Relative residual tensile strength after aging	74.0 %	56.5 %
Elongation in as-delivered state	4.3 %	4.4 %
Elongation after aging	3.2 %	2.7 %

Annex 5

Energy economy and heat retention (BWR 6)

5.1 Thermal resistance und thermal transmittance

The nominal value of the additional thermal resistance R provided by the ETICS to the substrate wall is calculated in accordance with EN ISO 6946 from the nominal value of the insulation product's thermal resistance R_D given accompanied to the CE marking and from the thermal resistance of the rendering system R_{render} which is about 0.02 (m² ·K)/W.

$R = R_D + R_{render}$

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

$U_c = U + \chi_p \cdot n$

Where:	U_c:	corrected thermal transmittance [W/(m² ·K)]
	n:	number of anchors per m²
	χ_p:	local influence of thermal bridge caused by an anchor. The values listed below can be taken into account if not specified in the anchor's ETA:
	χ_p = 0.004 W/K	for anchors with a galvanized steel screw with the head covered by a plastic material
	χ_p = 0.002 W/K	for anchors with a stainless steel screw covered by plastic anchors and for anchors with an air gap at the head of the screw

The thermal bridges caused by profiles are negligible.

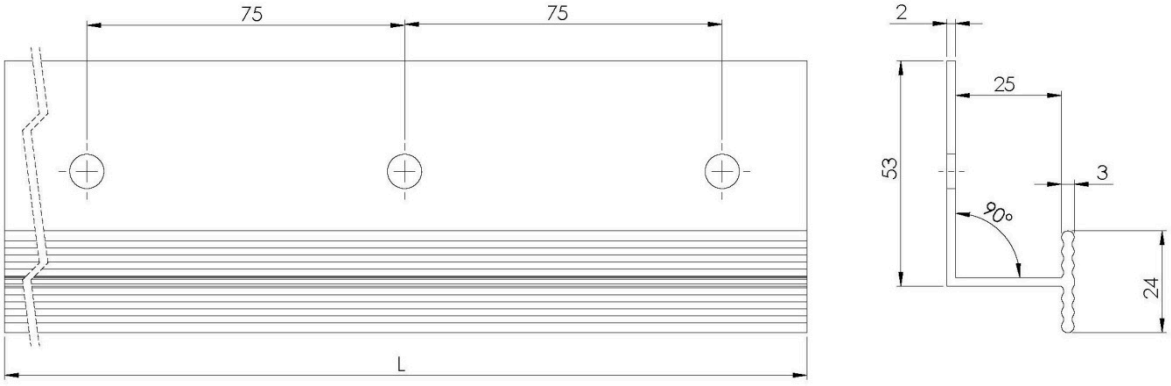
Annex 6

Profiles

Polyvinyl chloride (PVC) profiles, PVC-U, EGL, 082-05-T33 to EN ISO 1163-1, are to be used in the mechanically fixed ETICS with profiles.

The Pull-through resistance of fixings from profiles is ≥ 500 N.

Horizontale profil – "Sto-Halteleiste PVC" (dimensions in millimetres)



Vertical connection profile – "Sto-Verbindungsleiste PVC" (dimensions in millimetres)