



Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments



European Technical Assessment

ETA-16/0051 of 29 August 2023

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:

Trade name of the construction product

Product family

to which the construction product belongs

Manufacturer

Manufacturing plant

This European Technical Assessment contains

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

This version replaces

Deutsches Institut für Bautechnik

QUALISOSTYL PLUS

Product area code: 4

External Thermal Insulation Composite System with rendering on expanded polystyrene for the use on building

walls

Isolation by Tryba 10 Rue du Debarcadere 75852 PARIS CEDEX 17

FRANKREICH

Isolation by Tryba 10 Rue du Debarcadere 75852 PARIS CEDEX 17 FRANKREICH

17 pages including 5 annexes which form an integral part of this assessment

040083-00-0404

ETA-16/0051 issued on 11 July 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 (hereinafter called EAD)

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 ETICS "QUALISOSTYL PLUS" 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 normally be maintained in order to fully preserve the ETICS performance. Maintenance includes at least:

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

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

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

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



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

3.1 Safety in case of fire (BWR 2)

Wesentliches Merkmal	Leistung
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 EN 1602	(see annex 2) Euroclass E according EN 13501-1 $\rho_a \le 30 \text{ [kg/m}^3\text{]}$
Reaction to fire of foam adhesive	(see annex 2) Euroclass E according EN 13501-1
Façade 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	(see annex 3.1)		
after 1 hour	Average [kg/m²]		
after 24 hours	Average [kg/m²]		
Rendering system after 1 hour after 24 hours	Average [kg/m²] Average [kg/m²]		
EPS insulation product after 24 h	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 after 24 h is less than 0.5 kg/m² for all configurations of the ETICS. The ETICS is so assessed as freeze/thaw resistant.		
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]		



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3.3 Safety and accessibility in use (BWR 4)

Essential characteristic	Performance	
	renonnance	
Bond strength between base coat and EPS insulation product	(see Annex 4.1) - Minimal value/ average value [kPa], rupture type: Initial state (28 d immersion) - Minimal value/ average value [kPa], rupture type: after hygrothermal cycles	
between adhesive and substrate	(see Annex 4.2) - Thickness [mm] of the used adhesives - Minimal value/ average value [kPa], rupture type: Initial state (dry conditions) - Minimal value/ average value [kPa], rupture type: after 2 d immersion in water, 2 h drying - Minimal value/ average value [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 [kPa], Initial state (dry conditions) - Minimal value/ average value [kPa], after 2 d immersion in water, 2 h drying - Minimal value/ average value [kPa], after 2 d immersion in water, 7 d drying	
of foam adhesive	(see annex 4.4) - Minimal value/ average [kPa]	
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 4.5) - 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	$\begin{split} \sigma_{mt} \geq 80 \text{ kPa} & \text{ (bonded ETICS)} \\ \sigma_{mt} \geq 100 \text{ kPa (bonded ETICS bonded} \\ & \text{ETICS with anchors)} \end{split}$	
elastified EPS	$\sigma_{mt} \ge 80 \text{ kPa}$ (bonded ETICS, bonded ETICS with anchors)	



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Essential characteristic	Performance	
Shear strength of the ETICS	$20 \le f_{\tau k} \le 170 \text{ [kPa]}$	
Shear modulus of the ETICS		
standard EPS	$1.0 \le G_m \le 3.8 \text{ [MPa]}$	
elastified EPS	$0.3 \le G_m \le 1.0 \text{ [MPa]}$	
Pull-through resistance of the fixing of profiles	≥ 0.5 kN	
Render strip tensile test	No performance assessed for the width of cracks	
Shear strength of foam adhesive	$f_{\tau k}$ = 75,8 [kPa] minimal value $f_{\tau k}$ = 81,0 [kPa] average	
Shear modulus of foam adhesive	$G_m = 0.91$ [MPa] minimal value $G_m \le 0.96$ [MPa] average	
Post expansion behavior of foam adhesive	max. 11 [mm]	
Bond strength after ageing	(see annex 4.6)	
finishing coat tested on the rig	Minimal value/ average [kPa]	
finishing coat not tested on the rig	Minimal value/ average [kPa]	
Tensile strength of the glass fibre	(see annex 4.7)	
mesh in the as-delivered state	Average [N/mm]	
Residual tensile strength of the glass	(see annex 4.7)	
fibre mesh after aging	Average [N/mm]	
Relative residual tensile strength of the glass fibre mesh after aging	(see annex 4.7) Average [%]	
Elongation of the glass fibre	(see annex 4.7)	
mesh in the as-delivered state	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)
Thermal resistance of E1103	Calculated value or measurement value R [(m² · K)/W]
thermal transmittance of	(see annex 5)
ETICS	Calculated value or measurement value U [W/(m²·K)]



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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
ETICS in external wall		A1 ⁽¹⁾ , A2 ⁽¹⁾ , B ⁽¹⁾ , C ⁽¹⁾	1
	subject to fire regulations	A1 ⁽²⁾ , A2 ⁽²⁾ , B ⁽²⁾ , C ⁽²⁾ , D, E, (A1 bis E) ⁽³⁾ , F	2+
(4)	ETICS in external wall not subject to fire regulations	beliebig	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)

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 August by Deutsches Institut für Bautechnik

Anja Rogsch	beglaubigt:
Head of Section	Keküllüoglu

⁽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)



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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	Bonded ETICS:		
material with	Insulation product		
associated method of	factory-prefabricated expanded polystyrene (EPS)*		
fixing	- standard EPS	_	≤ 400
9	- elastified EPS	_	≤ 200
	Adhesives		
	 QUALICOL (cement based powder requiring addition of about 21 – 23 % of water) 	4.0 to 7.5 (powder)	_
	Foam adhesive QUALIFIX (foam adhesive on polyurethane, ready to use, in bottles supplied)	0.20 l/m²	-
	Mechanically fixed ETICS with anchors and supplementary adhesive:		
	Insulation product		
	factory-prefabricated expanded polystyrene (EPS)*		
	- standard EPS	_	60 to 400
	- elastified EPS	_	60 to 200
	Supplementary adhesive		
	(equal to bonded ETICS)		
	Anchors for insulation product all anchors with ETA acc. to EAD 330196-01-06041		
Base coat	QUALIFIBRE PLUS	4.0 to 9.5	2.5 to 5.0**
	Ready to use paste (cement free): acrylic copolymer binder		
	QUALIFIBRE PLUS QS	4.0 to 9.5	2.5 to 5.0**
	Ready to use paste (cement free): acrylic copolymer binder		
Glass fibre mesh	QUALITRAM Alkali- and slide-resistant glass fibre mesh with mass per unit area of about 160 g/m² and mesh size of about 4.0 mm x 4.0 mm	_	_
	QUALITRAM RENFORCEE	_	_
	(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 500 g/m² and mesh size of about 7.5 mm x 7.5 mm		

EAD 330196-01-0604

Plastic anchors for fixing of external thermal insulation composite systems with rendering



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	Components National application documents shall be taken into account	Coverage [kg/m²]	Thickness [mm]
Finishing coat	Ready to use pastes – acrylic binder: QUALIMARBRE IT (particle size 1.5 mm) QUALIMARBRE IR (particle size 1.5 mm) Ready to use pastes – acrylic/ siloxane binder: QUALISIL IR (particle size 1.5 mm) QUALISIL IT (particle size 1.5 mm)	ca. 2.3 ca. 2.2 ca. 2.3 ca. 2.2	Regulated by particle size**
Ancillary Remains the responsibility of the manufacturer. material			
* Factory-prefabricated, uncoated panels made of expanded polystyrene (EPS) shall be used. ** The minimum thickness of the rendering system (base coat and finishing coat) is 4.0 mm.			



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Annex 2 Safety in case of fire (BWR 2) Reaction to fire

Configuration	Organic content	Flame retardant content	Euroclass according to EN 13501-1	
Foam adhesive: QUALIFIX	> 95.0 %	no flame retardant		
Base coat: "QUALIFIBRE PLUS" "QUALIFIBRE PLUS QS"	max. 7.6 %	min. 10.0%		
EPS- insulation product	Euroclass E according to EN 13501-1	Euroclass E according to EN 13501-1	B - s2,d0	
Profile	-	-		
Anchor	-	-		
Rendering system:				
Base coat with finishing coat in				
QUALIMARBRE IT/IR	max. 9.6 %	min. 7.6 %		
QUALISIL IT/IR	ΠΙάλ. 9.0 /0	111111. 1.0 70		



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Annex 3

Hygiene, health and environment (BWR 3)

3.1 Water absorption (capillarity test)

Base coat:

Base coat	Average water absorption [kg/m²]	
	after 1 h	after 24 h
QUALIFIBRE PLUS	0.05	0.13
QUALIFIBRE PLUS QS	0.05	0.18

Rendering system:

Rendering system: base coat "QUALIFIBRE PLUS" with	Average water absorption [kg/m²]		
finishing coat indicated hereafter	after 1 h	after 24 h	
QUALIMARBRE IT/IR	0.03	0.14	
QUALISIL IT/IR	0.02	0.13	

Rendering system: base coat "QUALIFIBRE PLUS QS" with	Average water absorption [kg/m²]		
finishing coat indicated hereafter	after 1 h	after 24 h	
QUALIMARBRE IT/IR	0.04	0.14	
QUALISIL IT/IR	0.03	0.42	

3.2 Impact resistance

Standard mesh: QUALITRAM

Rendering system: base coat with finishing coat indicated hereafter:	"QUALITRAM"		"QUALITRAM" and "QUALITRAM RENFORCEE"	
	"QUALIFIBRE PLUS"	"QUALIFIBRE PLUS QS"	"QUALIFIBRE PLUS"	"QUALIFIBRE PLUS QS"
QUALIMARBRE IT/IR	Category II		Category I	
QUALISIL IT/IR	Category II		Categ	jory l



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3.3 Water vapour permeability

Rendering system: base coat "QUALIFIBRE PLUS" with finishing coat indicated hereafter	Equivalent air thickness s _d [m]
QUALIMARBRE IT/IR	≤ 1.5 m (Test result obtained with QUALIMARBRE IT: 1.0 m)
QUALISIL IT/IR	≤ 1.0 m (Test result obtained with QUALISIL IT: 0.9 m)

Rendering system: base coat "QUALIFIBRE PLUS QS" with finishing coat indicated hereafter	Equivalent air thickness s _d [m]
QUALIMARBRE IT/IR	≤ 1.0 m (Test result obtained with QUALIMARBRE IT: 0.85 m)
QUALISIL IT/IR	≤ 1.0 m (Test result obtained with QUALISIL IT: 0.75 m)



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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
QUALIFIBRE PLUS	Average	125	124	Test not
QUALIFIBRE PLUS	Minimal value	110	115	required because
	Average	83	130	freeze/thaw
QUALIFIBRE PLUS QS	Minimal value	73	111	cycles not necessary

4.2 Bond strength between adhesive and substrate

Substrate: concrete		Rupture	Conditioning			
		type	type Initial state [kPa]	2 d immersion in water and 2 h drying [kPa]	2 d immersion in water and 7 d drying [kPa]	
QUALICOL	Average	*	1930	770	1890	
(3 - 5 mm)	Minimal value		1770	631	1793	

Initial state [kPa]: 100% in substrate

2 d immersion in water and 2 h drying [kPa]: 60% in adhesive; 40% in substrate

2 d immersion in water and 7 d drying [kPa]: 100% in substrate

4.3 Bond strength between adhesive and insulation product (EPS)

	Rup ty		Conditioning			
			type Initial state [kPa]	2 d immersion in water and 2 h drying [kPa]	2 d immersion in water and 7 d drying [kPa]	
QUALICOL	Average	in	110	90	145	
l f	Minimal value	insulation product	86	60	105	

minimal bonded surface area

 $S [\%] = 0.03 \text{ N/mm}^2 \text{ x } 100 \text{ / } 0.08 \text{ N/mm}^2$

S = 37.5%

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



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4.4 Bond strength of foam adhesive

Foam adhe	sive	Standard application conditions [kPa]	Modification of foam thickness [kPa]	Modification of processing time (open time 5 min) [kPa]	Modification of temperature (low temperature) [kPa]	Modification of temperature (low temperature) [kPa]
	Average	112	82	99	88	132
QUALIFIX	Minimal value	104	76	92	79	127

4.5 Wind load resistance

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

4.5.1 Wind load resistance of ETICS mechanically fixed with anchors

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



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

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

Anchor	Thickness of the EPS [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) Incision depth: 20 mm 			
	≥ 100 mm (for standard and elastified EPS)	 Maximum installation depth of the anchor plate: 15 mm (≜ thickness of insulation cover) Incision depth: 35 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 app	* according to the appropriate ETA of anchor				

4.6 Bond strength after aging

Base coat "QUALIFIBRE PLUS" with finishing coat indicated hereafter		7 d immersion in water and 7 d drying [kPa]
QUALIMARBRE IT/IR	Average	165
	Minimal value	148
QUALISIL IT/IR	Average	90
	Minimal value	78

Base coat "QUALIFIBRE PLUS QS" with finishing coat indicated hereafter		7 d immersion in water and 7 d drying [kPa]
QUALIMARBRE IT/IR	Average	146
	Minimal value	140
QUALISIL IT/IR	Average	128
	Minimal value	119



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4.7 Reinforcement (glass fibre mesh)

QUALITRAM	Average warp	Average weft
Tensile strength in as-delivered state	2236 N / 50 mm	2434 N / 50 mm
Residual tensile strength after aging	1494 N / 50 mm	1523 N / 50 mm
Relative residual tensile strength after aging	66.8 %	68.1 %
Elongation in as-delivered state	3.9 %	4.2 %
Elongation after aging	2.7 %	2.6 %

QUALITRAM RENFORCEE	Average warp	Average 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 %



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Annex 5

Energy economy and heat retention (BWR6)

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 6946:2007 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 ($m^2 \cdot K$)/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

 $\chi_{\text{p}}\!\!:\hspace{1cm}$ local influence of thermal bridge caused by an anchor. The values

listed below can be taken into account if not specified in the

anchor's ETA:

 $\chi_P = 0.004 \text{ W/K}$ for anchors with a galvanized steel screw with the head covered by

a plastic material

 $\chi_p = 0.002 \text{ W/K}$ for anchors with a stainless steel screw covered by plastic anchors

and for anchors with an air gap at the head of the screw