



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 11 July 2018

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

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

BDSA

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16 pages including 4 annexes which form an integral part of this assessment

Annex 5 Control Plan contains confidential information and is not included in the European Technical Assessment when that assessment is publicly available

ETAG 004, edition 2000, amended 2013, used as EAD according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011.



### European Technical Assessment ETA-16/0051 English translation prepared by DIBt

Page 2 of 16 | 11 July 2018

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Page 3 of 16 | 11 July 2018

English translation prepared by DIBt

### **Specific Part**

#### 1 Technical description of the product

#### 1.1 Definition of the kit

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 the table below.

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 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 a part of the kit.

#### 1.2 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     (see annex 1 for product characteristics)     factory-prefabricated expanded polystyrene (EPS)     - standard EPS     - elastified EPS     Adhesives	- -	≤ 400 ≤ 200
	<ul> <li>QUALICOL (cement based powder requiring addition of about 21 – 23 % of water)</li> </ul>	4.0 to 7.5 (powder)	-
	Mechanically fixed ETICS with profiles and supplementary adhesive:  Insulation product (see annex 1 for product characteristics) factory-prefabricated expanded polystyrene (EPS) standard EPS  Supplementary adhesive (equal to bonded ETICS)  Profiles (see annex 3 for product characteristics) "Sto-Halteleiste PVC" und "Sto-Verbindungsleiste PVC" Polyvinylchlorid (PVC) – Profile	_	60 to 200



Page 4 of 16 | 11 July 2018

English translation prepared by DIBt

	Components	Coverage	Thickness
	National application documents shall be taken into account	[kg/m²]	[mm]
Insulation	Anchors for profiles		
material	(see annex 2 for product characteristics)		
associated	- WS 8 L		
method of	- WS 8 N		
fixing	- ejotherm SDK U		
	- SDF-K plus		
	- ejotherm NK U		
	Mechanically fixed ETICS with anchors and		
	supplementary adhesive:		
	Insulation product		
	(see annex 1 for product characteristics)		
	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 according to EAD 330196-01-0604 <sup>1</sup>		
	with characteristics defined in annex 2	404.05	0.51.50*
Base coat	QUALIFIBRE PLUS	4.0 to 9.5	2.5 to 5.0 <sup>*</sup>
	Ready to use paste (cement free): acrylic copolymer binder, silicate fillers, fibres and additives		
	QUALIFIBRE PLUS QS	4.0 to 9.5	2.5 to 5.0*
	Ready to use paste (cement free): acrylic copolymer binder, silicate fillers, fibres and additives		
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.	_	_
	(see annex 4 for product characteristics)  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		
	(see annex 4 for product characteristics)		

EAD 330196-01-0604

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

Z79515.16



Page 5 of 16 | 11 July 2018

English translation prepared by DIBt

	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. 2.9 ca. 2.4	Regulated by particle		
Ancillary material	Remains the responsibility of the manufacturer.				
* The minimum thickness of the rendering system (base coat and finishing coat) is 4.0 mm.					

# 2. Specification of the intended use in accordance with the applicable European assessment Document (hereinafter called EAD)

#### 2.1 Intended use

This ETICS is intended to be used as external insulation to the walls of buildings made of masonry (bricks, blocks, stones ...) or concrete (cast on site or as prefabricated panels) with and without rendering. The characteristics of the walls shall be verified prior to use of the ETICS, especially regarding conditions for reaction to fire classification and for fixing of the ETICS either by bonding or mechanically. It shall be designed to give the wall to which it is applied satisfactory thermal insulation.

The ETICS is non load-bearing construction element. 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 effects of weathering.

The ETICS can be used on new or existing (retrofit) vertical walls.

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

The choice of the method of fixing depends on the characteristics of the substrate, which could need preparation (see clause 7.2.1 of ETAG 004) and on the national instructions.

The verifications and assessment methods on which this European Technical Assessment (hereinafter called 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.

#### 2.2 Manufacturing

The ETA is issued for the ETICS on the basis of agreed data/information, deposited with the DIBt, which identifies the ETICS that has been assessed and judged. Changes to the ETICS or the components or their production process, which could result in this deposited data/information being incorrect, should be notified to the DIBt before the changes are introduced. The DIBt will decide whether such changes affect the approval and consequently the validity of the CE marking on the basis of the approval and if so whether further assessment or alterations to the approval shall be necessary.



Page 6 of 16 | 11 July 2018

English translation prepared by DIBt

### 2.3 Design and installation

The installation instructions including special installation techniques and provisions for the qualification 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 the chapters 7.1 and 7.2 of ETAG 004 used as EAD, which summarize 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 Packing, 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 to ensure that this information is made know to the concerned people.

#### 2.5 Use, maintenance, 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)

Only products which are compatible with the ETICS shall be used.

Necessary repairs should be performed 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 know to the concerned people.

### 3 Characteristics of products and methods of verification

#### 3.0 General

The performances of the kit as described in this chapter are valid provided that the components of the kit comply with Annexes 1 to 4.

#### 3.1 Mechanical resistance and stability (BWR 1)

not relevant size\*

#### 3.2 Safety in case of fire (BWR 2)

Reaction to fire (ETAG 004 - clause 5.1.2)

Configurations	Organic content	Flame retardant content	Euroclass according to EN 13501-1
Base coat: QUALIFIBRE PLUS QS	max. 7.6 %	min. 10.0°%	
EPS-insulation product	In quanity ensuring Euroclass E according to EN 13501-1	In quanity ensuring Euroclass E according to EN 13501-1	B – s2,d0



Page 7 of 16 | 11 July 2018

English translation prepared by DIBt

Configurations	Organic content	Flame retardant content	Euroclass according to EN 13501-1
Profile	-	-	
Anchors	-	-	
rendering system : Base coat with finishing coat i	B – s2,d0		
QUALIMARBRE IT/IR	max. 9.6 % min.7.6 %		
QUALISIL IT/IR	111ax. 9.0 %	min.7.6 %	

### 3.3 Hygiene, health and environment (BWR 3)

### 3.3.1 Water absorption (capillarity test) (ETAG 004 - clause 5.1.3.1)

Base coat	Water absorption after 1 h < 1,0 kg/m²	Water absorption after 24 h < 0.5 kg/m²
QUALIFIBRE PLUS	х	Х
QUALIFIBRE PLUS QS	Х	Х

#### Rendering system:

		Water absorption after 24 h	
		< 0.5 kg/m²	≥ 0.5 kg/m²
Rendering systems:	QUALIMARBRE IT/IR	х	
Base coats with finishing coat indicated hereafter:	QUALISIL IT/IR	х	

### 3.3.2 Hygrothermal behaviour (ETAG 004 - clause 5.1.3.2)

Pass (without defects)

### 3.3.3 Impact resistance (ETAG 004 – clause 5.1.3.3)

Standard mesh: QUALITRAM

Rendering system: Base coats with	QUALI	TRAM		QUALITRAM and QUALITRAM RENFORCEE		
finishing coat indicated hereafter:	QUALIFIBRE PLUS	QUALIFIBRE PLUS QS	QUALIFIBRE PLUS	QUALIFIBRE PLUS QS		
QUALIMARBRE I T/R	Category II		Category I			
QUALIMARBRE IT/IR	Category II		Cate	gory I		



Page 8 of 16 | 11 July 2018

English translation prepared by DIBt

### 3.3.4 Water vapour permeability (ETAG004 – clause 5.1.3.4)

Rendering system: Base coats with	Equivalent air	thickness s <sub>d</sub>
finishing coat indicated hereafter:	QUALIFIBRE PLUS	QUALIFIBRE PLUS QS
QUALIMARBRE IT/IR	≤ 1.5 m (Test result obtained with QUALIMARBRE IT: 1.0 m)	≤ 1.0 m (Test result obtained with QUALIMARBRE IT: 0.85 m)
QUALISIL IT/IR	≤ 1.0 m (Test result obtained with QUALISIL IT: 0.9 m)	≤ 1.0 m (Test result obtained with QUALISIL IT: 0.75 m)

#### 3.3.5 Release of dangerous substances (ETAG 004 - clause 5.1.3.5, EOTA TR 034)

Essential characteristic	Performance
Release of dangerous substances	no performance assessed

#### 3.4 Safety and accessibility in use (BWR 4)

# 3.4.1 Bond strength between base coat and insulation product (EPS) (ETAG 004 - clause 5.1.4.1.1)

	Conditioning			
Base coat	Initial state	After hygrothermal cycles	After freeze/thaw test	
QUALIFIBRE PLUS	≥ 0.08 MPa	≥ 0.08 MPa	Test not required	
QUALIFIBRE PLUS QS	≥ 0.08 MPa	≥ 0.08 MPa	because freeze/thaw cycles not necessary	

# 3.4.2 Bond strength between adhesive and substrate resp. insulation product (ETAG 004 - clause 5.1.4.1.2 and 5.1.4.1.3)

		Conditioning		
Adhesive	Substrate resp. insulation product	Initial state	2 d immersion in water and 2 h drying	2 d immersion in water and 7 d drying
QUALICOL	Concrete	≥ 0.25 MPa	≥ 0.08 MPa	≥ 0.25 MPa
QUALICOL	EPS	≥ 0.08 MPa	≥ 0.03 MPa	≥ 0.08 MPa

#### Bonded surface:

For bonded ETICS the calculated minimal bonded surface area, according to ETAG 004, clause 6.1.4.1.3 is 40 %.

### 3.4.3 Bond strength after ageing (ETAG 004 – clause 5.1.7.1):

Rendering system: Base coats with	QUALIMARBRE IT/IR	≥ 0.08 MPa
finishing coat indicated hereafter	QUALISIL IT/IR	≥ 0.00 MFa

#### 3.4.4 Fixing strength (displacement test) (ETAG 004 - clause 5.1.4.2)

Test not required therefore no limitation of ETICS length required.



Page 9 of 16 | 11 July 2018

English translation prepared by DIBt

### 3.4.5 Wind load resistance (ETAG 004 - clause 5.1.4.3)

The following failure loads only apply to the listed combination of component characteristics and the characteristics of the insulation product given in annex 1.

#### 3.4.5.1 Safety in use of mechanically fixed ETICS using profiles

	Dimensions	500 mm x 500 mm
Characteristics	Thickness	≥ 60 mm
of the EPS (standard EPS) Tensile strength perpendicular to the faces ≥ 15		≥ 150 kPa
	Shear modulus	≥ 1.0 N/mm²
	Horizontal profiles fixed every 30 cm and 49.4 cm long vertical connection profiles	Minimal: 950 Average: 1010

### 3.4.5.2 Safety in use of mechanically fixed ETICS using anchors

Apply to all anchors listed in the clause 1.2 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	l/mm²
Plate diameter of anchor		Ø 60 mm	Ø 90 mm	
Failure loads	Anchors not placed at the panel joints (Static Foam Block Test)	R <sub>panel</sub>	Minimal: 510 Average: 520	Minimal: 720 Average: 730
[N]	Anchors placed at the panel joints (Pull-through test)	R <sub>joint</sub>	Minimal: 400 Average: 430	Minimal: 430 Average: 470

Apply to all anchors listed in the clause 1.2 mounted on the insulation panels surface				
Characteristics	Thickness		≥ 60 mm	
of the EPS	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	
Anchors not placed at the panel joints Failure loads (Static Foam Block Test)		R <sub>panel</sub>	Minimal: 350 Average: 360	
[N]	Anchors placed at the panel joints (Pull-through test)	R <sub>joint</sub>	Minimal: 300 Average: 310	



Page 10 of 16 | 11 July 2018

English translation prepared by DIBt

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 [d]	Conditions of installation*
ejotherm STR U, ejotherm STR U 2G (ETA-04/0023)	100 mm > d ≥ 80 mm (for standard and elastified EPS)	<ul> <li>Maximum installation depth of the anchor plate: 15 mm (≜ thickness of insulation cover)</li> <li>Maximum depth of die: 5 mm</li> </ul>
	≥ 100 mm (for standard and elastified EPS)	<ul> <li>Maximum installation depth of the anchor plate: 15 mm (≜ thickness of insulation cover)</li> <li>Maximum depth of die: 20 mm</li> </ul>
TERMOZ 8 SV (ETA-06/0180)	≥ 80 mm (for standard EPS only)	<ul> <li>Maximum installation depth of the anchor plate: 15 mm (≜ thickness of insulation cover)</li> </ul>
* according to the appropriate ETA of anchor		

#### 3.4.6 Render strip tensile test (ETAG 004 – clause 5.5.4.1)

No performance assessed for the width of cracks.

### 3.5 Protection against noise (BWR 5)

For the protection against noise no performance was assessed for this product.

#### 3.6 Energy economy and heat retention (BWR 6)

#### 3.6.1 Thermal resistance

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  $R_{\text{render}}$  which is about 0.02 (m²·K)/W.

$$R = R_D + R_{render}$$

The thermal bridges caused by 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<sub>c</sub>: corrected thermal transmittance [W/(m·K)] number of anchors per m<sup>2</sup> n: local influence of thermal bridge caused by an anchor. The values  $\chi_p$ : listed below can be taken into account if not specified in the anchor's ETA:  $\chi_{\rm p} = 0.004 \, \text{W/K}$ for anchors with a galvanized steel screw with the head covered by a plastic material  $\chi_{\rm p} = 0.002 \, \text{W/K}$ for anchors with a stainless steel screw covered by plastic anchors and for anchors with an air gap at the head of the screw  $\chi_{D} = 0.004 \text{ W/K}$ for anchors with a galvanized steel screw with the head covered by a plastic material

The thermal bridges caused by profiles are negligible.



Page 11 of 16 | 11 July 2018

English translation prepared by DIBt

# 4 Assessment and verification of constancy of performance 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 Assessment and verification of constancy of performance system (AVCP) applies suitable following table (see Annex V to Regulation (EU) No 305/2011).

Product	Intended use	Levels or classes (Reaction to fire)	Systems
QUALISOSTYL PLUS	ETICS in external wall subject	A1 <sup>(1)</sup> , A2 <sup>(1)</sup> , B <sup>(1)</sup> , C <sup>(1)</sup>	1
1 203	to fire regulations	A1 <sup>(2)</sup> , A2 <sup>(2)</sup> , B <sup>(2)</sup> , C <sup>(2)</sup> , D, E, (A1 to E) <sup>(3)</sup> , F	2+
	ETICS in external wall not subject to fire regulations	any	2+

<sup>(1)</sup> 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 EAD

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

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Brigitte Strathmann p. p. Head of Department

beglaubigt: Windhorst

<sup>(2)</sup> Products/materials not covered by footnote (1)

<sup>(3)</sup> 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)



Page 12 of 16 | 11 July 2018

English translation prepared by DIBt

### Annexes:

Annex 1: Thermal insulation product characteristic

Annex 2: Profiles
Annex 3: Anchors

Annex 4: Reinforcement



Page 13 of 16 | 11 July 2018

English translation prepared by DIBt

### Annex 1: Thermal insulation product characteristic

Factory-prefabricated, uncoated panels made of expanded polystyrene (EPS) to EN 13163:2015 shall be used, having the description and characteristics defined in the Table below.

Delow.			
		fixed ETICS	
	For bonded	with anchors	with profiles
Description and characteristics	ETICS	and	and
		supplementary	supplementary
		adhesive	adhesive****
Reaction to fire; EN 13501-1:2007		Class E*	
Thermal resistance	Defined in t	he CE marking in	reference to
[(m²·K)/W]		EN 13163:2015	
Tolerances	T		
Length; EN 822:2013		$\pm$ 0.6 % or $\pm$ 3 mm	
	whichever gives	s the greatest num	nerical tolerance
Width Image To N. 000,0040		(class L3)	
Width [mm]; EN 822:2013		± 2 (class W2)	
Thickness [mm]; EN 823:2013		± 1 (class T1)	
Squareness [mm/m]; EN 824:2013		± 2 (class S2)	
Flatness [mm/m]; EN 825: 2013		5 (class P5)	
Dimensional stability under	T		
- laboratory conditions [%]; EN 1603:2013	± 0.2 (class DS(N)2)		
- specified temperature and humidity conditions [%]; EN 1604:2013	2 (level DS(70,-)2 or level DS(70,-)1)		
Water absorption (long term partial immersion) [kg/m²]; EN 12087:2013	W <sub>lp</sub> ≤ 0.5		
Water vapour diffusion resistance factor; EN 12086:2013	μ = 20 – 78		
Tensile strength perpendicular to the faces in dry conditions <sup>**</sup> [kPa]; EN 1607:2013			
- standard EPS	$\sigma_{mt} \geq 80$	$\sigma_{mt} \geq 100$	$\sigma_{mt} \geq 150$
- elastified EPS***	$\sigma_{mt} \geq 80$	$\sigma_{mt} \geq 80$	not used
Bending strength** [kPa]; EN 12089:2013			
Apparent density [kg/m³]; EN 1602: 2013	$\rho_a \leq 30$		
Shear strength** [kPa]; EN 12090: 2013	$20 \le f_{tk} \le 170$		
Shear modulus [MPa]; EN 12090: 2013			
- standard EPS	$1.0 \leq G_m \leq 3.8$		
- elastified EPS***	$0.3 \le G_m \le 1.0$	$0.3 \le G_m \le 1.0$	not used
Testing of characteristics see EN 13163:20	•	•	•

### Testing of characteristics see EN 13163:2015.

See the conditions of clause 3.2 for the EPS.

Minimal value of all single values

Elastified EPS is made from standard EPS by short time high load pressing to reduce the dynamic stiffness.

The protection against noise of the entire wall is improved by the use of elastified EPS related to an ETICS with standard EPS.

Thermal insulation materials for mechanically fixed ETICS with profiles must circumferentially at the edges, 24 mm from the inner surface, get an approx. 3 mm wide and 13 to 18 mm deep groove cut-in at the factory.



Page 14 of 16 | 11 July 2018

English translation prepared by DIBt

#### **Annex 2: Anchors**

All anchors with ETA according to EAD330196-01-0604<sup>1</sup> with characteristics having the description below shall be used in the mechanically fixed ETICS:

- plate diameter of anchor ≥ 60 mm resp. ≥ 90 mm
- plate stiffness ≥ 0.3 kN/mm
- load resistance of the anchor plate ≥ 1.0 kN

These characteristics and the characteristic tension resistance of the anchors shall be taken from the corresponding ETA.

The anchors listed in the Table in clause 1.2 with reference to the respective ETA shall be used in the mechanically fixed ETICS with profiles for fixing the horizontal profiles.

Trade name	ETA-number
WS 8 L	ETA-02/0019
WS 8 N	ETA-03/0019
IsoFux ND-8Z	ETA-04/0032
SDF-K plus	ETA-04/0064
ejotherm NK U	ETA-05/0009



Page 15 of 16 | 11 July 2018

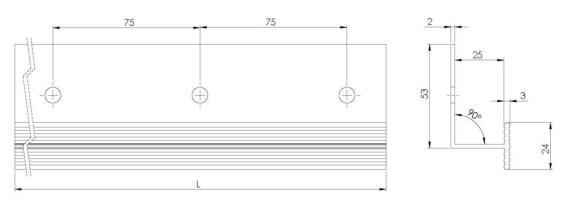
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#### **Annex 3: Profiles**

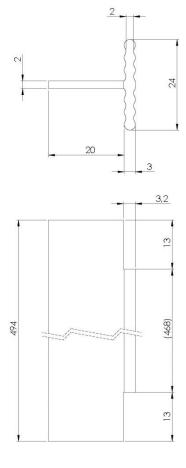
Polyvinyl chloride (PVC) profiles, PVC-U, EGL, 082-05-T33 to EN ISO 1163-1:1999 are to be used in the mechanically fixed ETICS with profiles.

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

### Horizontal profile - "Sto-Halteleiste PVC" (dimensions in millimeters)



### Vertical connection profile - "Sto-Verbindungsleiste PVC" (dimensions in millimeters)





Page 16 of 16 | 11 July 2018

English translation prepared by DIBt

### Annex 4: Reinforcement (glass fibre mesh)

Characteristics (alkali resistance): Pass

	Description	Residual strength after ageing [N/mm]	Relative residual strength after ageing, of the strength in the as-delivered state [%]
"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	≥ 20	≥ 50
"QUALITRAM RENFORCEE"	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	no performance assessed	no performance assessed