

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

ETA-11/0436  
of 13 March 2024

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

RELIUS V510, V510D, V510M

Product family  
to which the construction product belongs

Product area code: 4  
External Thermal Insulation Composite System with  
rendering on expanded polystyrene intended for use on  
building walls

Manufacturer

RELIUS Farbenwerke GmbH  
Heimertinger Straße 10  
87700 Memmingen  
DEUTSCHLAND

Manufacturing plant

RELIUS Farbenwerke GmbH  
Heimertinger Straße 10  
87700 Memmingen  
DEUTSCHLAND

This European Technical Assessment  
contains

17 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

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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 the ETICS.

The ETICS kit comprises a prefabricated insulation product of expanded polystyrene (EPS) to be bonded and if necessary additionally 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 and finishing coat (site applied), the base coat contains reinforcement. The rendering system 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.

### 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 6.

The verifications and assessment methods on which this ETA is based lead to the assumption of a working life of the "RELIUS V510, V510D, V510M" 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.

### 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 of the EPS-insulation product according to EN 1602	(see annex 2) Euroclass E according EN 13501-1 Value [kg/m <sup>3</sup> ]
Facade fire performance	no performance assessed

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

Essential characteristic	Performance
<b>Release of dangerous substances</b>	no performance assessed
<b>Water absorption</b> Base coat after 1 hour after 24 hours  Rendering system after 1 hour after 24 hours  EPS insulation product after 24 hours	(see annex 3.1)  Average [kg/m <sup>2</sup> ] Average [kg/m <sup>2</sup> ]  Average [kg/m <sup>2</sup> ] Average [kg/m <sup>2</sup> ]  Maximum value 0.5 kg/m <sup>2</sup>
<b>Water-tightness of the ETICS:</b> Hygrothermal behaviour on the test wall	Pass without defects
<b>Water-tightness of the ETICS:</b> freeze/thaw behaviour	The water absorption of the base coats as well as the rendering systems is less than 0.5 kg/m <sup>2</sup> after 24 hours for all configurations of the ETICS.  The ETICS is so assessed as free/thaw resistant
<b>impact resistance</b>	(see annex 3.2) Category
<b>Water vapour permeability</b> - Rendering system - EPS insulation product	(see annex 3.3) s <sub>d</sub> value [m]  μ = 20 - 70      Thickness of the insulation product 360 mm

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

Essential characteristic	Performance
<p><b>Bond strength</b> between base coat and EPS-insulation product</p> <p>between adhesive and substrate</p> <p>between adhesive and EPS insulation</p>	<p>(see annex 4.1) - Minimal value/average [kPa] - Minimal value/average [kPa]</p> <p>(see annex 4.2) - Thickness [mm] of the used adhesives - Minimal value/average [kPa] - Minimal value/ average [kPa] - Minimal value/ average [kPa]</p> <p>(see annex 4.3) - Thickness [mm] of the used adhesives - Minimal value/average [kPa] - Minimal value/ average [kPa] - Minimal value/ average [kPa]</p>
<b>Fixing strength (displacement test)</b>	Test not required therefore no limitation of ETICS length required.
<p><b>Wind load resistance of ETICS</b> pull-through test of fixing static foam block test</p>	<p>(see annex 4.4) - <math>R_{\text{panel}}</math> [kN/fixing], - <math>R_{\text{joint}}</math> [kN/fixing], - Plate diameter of anchor <math>\geq 60</math> mm resp. <math>\geq 90</math> mm - plate stiffness <math>\geq 0.3</math> kN/mm<sup>2</sup> - load resistance of the anchor plate <math>\geq 1.0</math> kN</p>
<p><b>Tensile strength perpendicular to the faces</b> in dry conditions standard EPS</p>	<p><math>\sigma_{\text{mt}} \geq 80</math> kPa (bonded ETICS) <math>\sigma_{\text{mt}} \geq 100</math> kPa (mechanically fixed ETICS with anchors and supplementary adhesive) <math>\sigma_{\text{mt}} \geq 150</math> kPa (bonded ETICS with profiles)</p>

Essential characteristic	Performance
<b>Shear modulus of the ETICS</b> standard EPS	$1.0 \leq G_m \leq 3.8$ MPa
<b>Pull-through resistance of fixings from profiles</b>	$\geq 0,5$ kN
<b>Render strip tensile test</b>	no performance assessed
<b>Bond strength after ageing</b> finishing coat tested on the rig finishing coat not tested on the rig	(see annex 4.5) Minimal value/average [kPa] Minimal value/average [kPa]
<b>Tensile strength of the glass fibre mesh in the as-delivered state</b>	(see annex 4.6) Average [N/mm]
<b>Residual tensile strength of the glass fibre mesh after aging</b>	(see annex 4.6) Average [N/mm]
<b>Relative residual tensile strength of the glass fibre mesh after aging</b>	(see annex 4.6) Average [%]
<b>Elongation of the glass fibre mesh in the as-delivered state</b>	(see annex 4.6) Average [%]
<b>Elongation of the glass fibre mesh after aging</b>	(see annex 4.6) Average [%]

### 3.4 Protection against noise (BWR 5)

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

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

Essential characteristic	Performance
<b>Thermal resistance of ETICS</b>	(see annex 5) Calculated value or measurement value R [(m <sup>2</sup> · K)/W]
<b>Thermal transmittance of ETICS</b>	(see annex 5) Calculated value or measurement value U [W/(m <sup>2</sup> · 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 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
RELIUS V510, V510D, V510M	ETICS in external wall subject to fire regulations	A1 <sup>(1)</sup> , A2 <sup>(1)</sup> , B <sup>(1)</sup> , C <sup>(1)</sup>	1
		A1 <sup>(2)</sup> , A2 <sup>(2)</sup> , B <sup>(2)</sup> , C <sup>(2)</sup> , D, E, (A1 bis E) <sup>(3)</sup> , F	2+
	ETICS in external wall not subject to fire regulations	any	2+
<p><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)</p> <p><sup>(2)</sup> Products/materials not covered by footnote (1)</p> <p><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)</p>			

**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 13 March 2024 by Deutschen Institut für Bautechnik

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Head of Section

*beglaubigt:*  
Keküllüoğlu

Annex 1

Composition of the ETICS

	Components National application documents shall be taken into account	Coverage [kg/m <sup>2</sup> ]	Thickness [mm]
Insulation material with associated method of fixing	<b>Bonded ETICS:</b> <ul style="list-style-type: none"> <li>• <b>Insulation product</b> factory-prefabricated expanded polystyrene (EPS)* <ul style="list-style-type: none"> <li>– standard EPS</li> </ul> </li> <li>• <b>Adhesive</b> <ul style="list-style-type: none"> <li>– <b>RELIUS WDVS PHS KLEBER</b> (cement based powder requiring addition of about 25 % of water)</li> <li>– <b>RELIUS WDVS K.A.M.</b> (cement based powder requiring addition of about 25 % of water)</li> <li>– <b>RELIUS V 600 ZF</b> (organic based ready to use paste – binder polymerdispersion)</li> </ul> </li> </ul>	<p style="text-align: center;">–</p> <p style="text-align: center;">} about 4.0 (powder)</p> <p style="text-align: center;">about 3.2 (prepared)</p>	<p style="text-align: center;">≤ 360</p> <p style="text-align: center;">–</p> <p style="text-align: center;">–</p>
	<b>Mechanically fixed ETICS with profiles and supplementary adhesive:</b> <ul style="list-style-type: none"> <li>• <b>Insulation product</b> factory-prefabricated expanded polystyrene (EPS)* <ul style="list-style-type: none"> <li>– standard EPS</li> </ul> </li> <li>• <b>Supplementary adhesive</b> (equal to bonded ETICS)</li> <li>• <b>Profiles</b> <ul style="list-style-type: none"> <li>– "RELIUS Halteleiste PVC"</li> <li>– "RELIUS Verbindungsschiene PVC"</li> </ul>           Polyvinyl chloride (PVC) – profiles </li> <li>• <b>Anchors for profiles</b> <ul style="list-style-type: none"> <li>– WS 8 L</li> <li>– WS 8 N</li> <li>– ejothem SDK U</li> <li>– SDF-K plus</li> <li>– ejothem NK U</li> </ul> </li> </ul>	<p style="text-align: center;">–</p>	<p style="text-align: center;">60 to 200</p>



	<b>Components</b> National application documents shall be taken into account	<b>Coverage</b> [kg/m <sup>2</sup> ]	<b>Thickness</b> [mm]
<b>Insulation material with associated method of fixing</b>	<p><b>Mechanically fixed ETICS with anchors and supplementary adhesive:</b></p> <ul style="list-style-type: none"> <li>• <b>Insulation product</b> factory-prefabricated expanded polystyrene (EPS)<sup>*</sup> <ul style="list-style-type: none"> <li>– Standard EPS</li> </ul> </li> <li>• <b>Supplementary adhesive</b> (equal to bonded ETICS)</li> <li>• <b>Anchors for insulation product</b> All anchors with ETA nach EAD330196-01-0604<sup>1</sup></li> </ul>	–  4.0 to 6.0	60 to 360  –
<b>Base coat</b>	<p><b>RELIUS V 600 ZF</b> identical with the equally named adhesives given above</p>	4.2 to 7.2 (prepared)	3.0 to 6.0
<b>Glass fibre mesh</b>	<p><b>RELIUS GITTERGEWEBE</b> Alkali- and slide-resistant glass fibre mesh with mass per unit area of about 165 g/m<sup>2</sup> and mesh size of about 4.0 mm x 4.0 mm.</p>	–	–
<b>Finishing coat</b>	<ul style="list-style-type: none"> <li>• Ready to use paste – binder polymerdispersion: <ul style="list-style-type: none"> <li><b>RELIUS EDELPUTZ K<sup>**</sup></b> (particles size 1 – 1.5 – 2 and 3 mm)</li> <li><b>RELIUS RILLENPUTZ R<sup>**</sup></b> (particles size 1 – 1.5 – 2 and 3 mm)</li> </ul> </li> <li>• Ready to use paste - acrylosiloxane binder: <ul style="list-style-type: none"> <li><b>RELIUS SILCOSAN<sup>**</sup>EDELPUTZ K<sup>**</sup></b> (particles size 1 – 1.5 – 2 and 3 mm)</li> <li><b>RELIUS SILCOSAN<sup>**</sup>RILLENPUTZ R<sup>**</sup></b> (particles size 1 – 1.5 – 2 and 3 mm)</li> </ul> </li> </ul>	2.0 to 4.0  2.0 to 4.0	Regulated by particles size
<b>Ancillary material</b>	Remains the responsibility of the manufacturer.		
<p><sup>*</sup> Factory-prefabricated, uncoated panels made of expanded polystyrene (EPS) to EN 13163 shall be used</p> <p><sup>**</sup> K / R indicates different structures of the finishing coats</p>			

<sup>1</sup> EAD330196-01-0604

Plastic anchors made of virgin or non-virgin material for fixing of external thermal insulation composite systems with rendering (and previous versions)

## 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	max. 7.5 %	min. 20.0 %	B - s2,d0
EPS insulation product	Euroclass E according to EN 13501-1	Euroclass E according to EN 13501-1	
profile	-	-	
anchors	-	-	
<b>Rendering system:</b> Base coat with finishing coat indicated in annex 1:			
RELIUS EDELPUTZ K RELIUS RILLENPUTZ R	max. 6.5 %	min. 5.0 %	
RELIUS SILCOSAN EDELPUTZ K RELIUS SILCOSAN RILLENPUTZ R	max. 6.5 %	min. 5.0 %	

#### 2.2 Apparent density of the EPS-insulation product according to EN 1602

$\rho_a \leq 30 \text{ kg/m}^3$

### Annex 3

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

#### 3.1 Water absorption (capillarity test)

##### Base coat:

Base coat	Thickness	Average water absorption [kg/m <sup>2</sup> ]	
		after 1h	after 24 h
RELIUS V 600 ZF	3 mm	0.002	0.058

##### Rendering system:

Rendering system: base coat "RELIUS V 600 ZF" with finishing coat indicated hereafter	Thickness	Average water absorption [kg/m <sup>2</sup> ]	
		after 1h	after 24 h
RELIUS EDELPUTZ K RELIUS RILLENPUTZ R	-	no performance assessed	no performance assessed
RELIUS SILCOSAN EDELPUTZ K RELIUS SILCOSAN RILLENPUTZ R	6 mm	0.016	0.310

#### 3.2 Impact resistance

Rendering system: base coat "RELIUS V 600 ZF" with finishing coat indicated hereafter	Single standard mesh: "RELIUS GITTERGEWEBE"
RELIUS EDELPUTZ K RELIUS RILLENPUTZ R	II
RELIUS SILCOSAN EDELPUTZ K RELIUS SILCOSAN RILLENPUTZ R	II

#### 3.3 Water vapour permeability

Rendering system: base coat "RELIUS V 600 ZF" with finishing coat indicated hereafter	Equivalent air thickness s <sub>d</sub> [m]
RELIUS EDELPUTZ K RELIUS RILLENPUTZ R	≤ 1.0 m (Test result obtained with particle size 6 mm: 0.6 m)
RELIUS SILCOSAN EDELPUTZ K RELIUS SILCOSAN RILLENPUTZ R	≤ 1.0 m (Test result obtained with particle size 6 mm: 0.6 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
RELIUS V 600 ZF	Average	133	118	Test not required because freeze/thaw cycles not necessary
	Minimal value	122	98	

**4.2 Bond strength between adhesive and substrate**

Substrate: concrete		Conditioning		
		Initial state [kPa]	2 d immersion in water and 2 h drying [kPa]	2 d immersion in water and 7 d drying [kPa]
RELIUS WDVS PHS KLEBER (3 – 5 mm)	Average	1058	1771	3531
	Minimal value	562	1103	2531
RELIUS WDVS K.A.M. (3 – 5 mm)	Average	1150	680	830
	Minimal value	1070	89	315
RELIUS V 600 ZF (3 – 5 mm)	Average	689	89	315
	Minimal value	635	84	397

#### 4.3 Bond strength between adhesive and insulation product (EPS)

		Conditioning		
		Initial state [kPa]	2 d immersion in water and 2 h drying [kPa]	2 d immersion in water and 7 d drying [kPa]
RELIUS WDVS PHS KLEBER (3 – 5 mm)	Average	170	171	179
	Minimal value	152	153	160
RELIUS WDVS K.A.M. (3 – 5 mm)	Average	100	94	100
	Minimal value	90	90	100
RELIUS V 600 ZF (3 – 5 mm)	Average	133	143	137
	Minimal value	122	138	122

##### Bonded surface

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

$$S = 37.5 \%$$

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

English translation prepared by DIBt

#### 4.4 Wind load resistance

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

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

Characteristics of the EPS (standard EPS)	Dimensions	500 mm x 500 mm
	Thickness	≥ 60 mm
	<b>Tensile strength perpendicular to the faces</b>	<b>≥ 150 kPa</b>
	Shear modulus	≥ 1.0 N/mm <sup>2</sup>
Failure load [kN / panel] (Static Foam Block Test)	Horizontal profiles fixed every 30 cm and 49.4 cm long vertical connection profiles	Minimal: 0,095 Average: 0,101

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

Apply to all anchors listed in the annex 1 mounted on the insulation panels surface				
Characteristics of the EPS (standard EPS)	Thickness		≥ 60 mm	
	<b>Tensile strength perpendicular to the faces</b>		<b>≥ 100 kPa</b>	
	Shear modulus		≥ 1.0 N/mm <sup>2</sup>	
Plate diameter of anchor			Ø 60 mm	Ø 90 mm
Failure loads [kN]	Anchors not placed at the panel joints (Static Foam Block Test)	R <sub>panel</sub>	Minimal: 0.51 Average: 0.52	Minimal: 0.72 Average: 0.73
	Anchors placed at the panel joints (Pull-through test)	R <sub>joint</sub>	Minimal: 0.40 Average: 0.43	Minimal: 0.43 Average: 0.47

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:

Anchors	Thickness of the EPS [t]	Conditions of installation*
ejothem STR U (ETA-04/0023)	≥ 80 mm	– Maximum installation depth of the anchor plate: 15 mm (≙ thickness of insulation cover) – Incision depth: 20 mm
	≥ 100 mm	– Maximum installation depth of the anchor plate: 15 mm (≙ thickness of insulation cover) – Incision depth: 35 mm
* according to the appropriate ETA of anchor		

#### 4.5 Bond strength after ageing

Base coat with finishing coat indicated hereafter		After hygrothermal cycles [kPa] with base coat "RELIUS V 600 ZF"
RELIUS EDELPUTZ K	Average	no performance assessed
RELIUS RILLENPUTZ R	Minimal value	
RELIUS EDELPUTZ K	Average	113
RELIUS RILLENPUTZ R	Minimal value	97

#### 4.6 Reinforcement (glass fibre mesh)

RELIUS GITTERGEWEBE	Average warp	Average weft
Tensile strength in as-delivered state	2438 N / 50 mm	2872 N / 50 mm
Residual tensile strength after aging	1267 N / 50 mm	1607 N / 50 mm
Relative residual tensile strength after aging	52.0 %	55.9 %
Elongation in as-delivered state	4.1 %	4.4 %
Elongation after aging	2.0 %	2.2 %

## 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  $0.02 \text{ (m}^2 \cdot \text{K)/W}$ .

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

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

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

Where:	$U_c$ :	corrected thermal transmittance [ $\text{W}/(\text{m}^2 \cdot \text{K})$ ]
	$n$ :	number of anchors per $\text{m}^2$
	$\chi_p$ :	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:
	$\chi_p = 0.004 \text{ W/K}$	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

The thermal bridges caused by profiles are negligible.



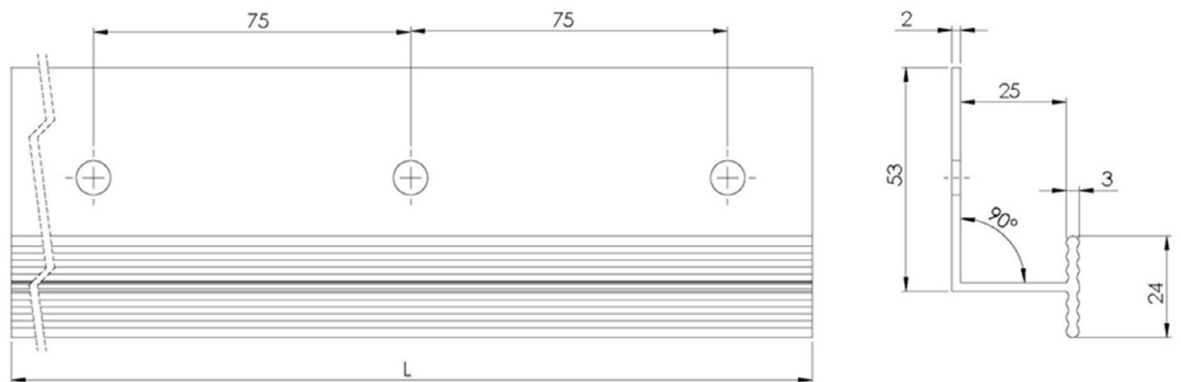
## Annex 6

### Profiles

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

The Pull-through resistance of fixings from profiles is  $\geq 500$  N.

### Horizontal profile – "RELIUS Halteleiste PVC" (dimensions in millimetres)



### Vertical connection profile – "RELIUS Verbindungsschiene PVC" (dimensions in millimetres)

