# Residential Development at Gwynfaen, POBL

External Render System for carrier board Terrix® ERS-CB1







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#### 1. System Components

The External Render System "Terrix<sup>®</sup> ERS-CB1" is designed and installed in accordance with the design and installation instructions. The SYSTEM comprises the following components factory-produced by the PCC or its supplier.

	System components	Usage (kg/m²)	Thickness
Carrier board	Mechanically fixed cementitious-based render carrier board for external use approved by PCC Terrix. (by others)		12mm
Joint Filler	Terrix RN-LF 8 joint filler (cement-based powder requiring the addition of water 0.26 l/kg). TERRIX® RN-LF 8 consists of main components: white cement, sand, calcium carbonate, polyvinylacetate resin.	0.4-0.7 kg/ Im	/
Base coat	TERRIX® AD-AB microfibre reinforced base coat for render carrier board (cement-based powder requiring the addition of water 0.26 l/kg). TERRIX® AD-AB consists of main components: Portland cement, sand, calcium carbonate, polyvinylacetate resin.	4.0 to 5.0	Mean (dry): 3,4 Minimal (dry): 3,0
Glass fibres reinforcing mesh	Standard mesh: Terrix®145 / R117 A101 / AKE 145 Terrix® AG 145 /03-43 Terrix® VI45 / GG-I45 Terrix® 150 / OPTIMA-NET I50 Terrix® 160 / R131 A101 / AKE 170 Terrix® AG 160 / 03-1 Terrix® 165 / OPTIMA-NET 165 Terrix® 175 / ST 112-100/7KM	1.1m2/m2	1
Primer coat	Ready to use pigmented liquids: • TERRIX® PR-PS-R (used with TERRIX® RD-PS)	0.2 to 0.25	/
Render coat	Ready to use pastes-with polymer-silicate binder TERRIX® RD-PS-S (particle size: 1,5 mm) spray application	2.2	1.5mm
Ancillary materials	All additional materials eg. beads, tapes to be supplied by the SYSTEM producer.		

#### 2. Intended use

TERRIX® ERS-CB1 is intended for use as an external render of buildings' walls. The walls are made of SFS or timber frame or concrete with a reaction to fire classification A1 or A2-s2, d0 according to EN 13501-1.

TERRIX® ERS-CB1 is made of non-load-bearing construction elements. It does not contribute directly to the stability of the wall on which it is installed, but it can contribute to durability by providing enhanced protection from the effect of weathering.

TERRIX® ERS-CB1 can be used on new or existing (retrofit) vertical walls. It can also be used on horizontal or inclined surfaces which are not exposed to precipitation.

TERRIX® ERS-CB1 is not intended to ensure the airtightness of the building structure.

TERRIX® ERS-CB1 is suitable for both low and high-rise buildings.

The provisions made the SYSTEM European Technical Approval (ETA) are based on an assumed **intended working life of at least 25 years**, provided that the conditions laid down in sections 4.2, 5.1 and 5.2 for the packaging, transport, storage and installation as well as appropriate use, maintenance and repair are met. The indications given as to the working life cannot be interpreted as a guarantee given by the manufacturer or the Approval Body but should only be regarded as a means for choosing the appropriate products in relation to the expected economically reasonable working life of the works.

#### 3. Characteristics of the product and methods of verification

#### 3.1 General

The identification tests and the assessment of the fitness for the use of TERRIX® ERS-CB1 according to the Essential Requirements were carried out in compliance with the "ETA Guidance No. 004" concerning External Thermal Insulation Composite Systems with rendering (called ETAG No. 004 in this ETA).

#### 3.2 System characteristics

#### 3.2.1 Reaction to fire

The reaction to fire was determined according to ETAG 004, clause 5.1.2.1. The product as defined under clause 1.1 reached the following classification.

Configuration	The declared organic content	The flame retardant content	Euroclass acc <mark>ording to</mark> EN 13501-1
Adhesive TERRIX® RN-LF 8	Max. 0.54 %	None	
Base Coat TERRIX® AD-BW	Max. 2.51%	None	A2 - s1, d0
Render Coat TERRIX® RD-PS or TERRIX® RD-PS-S	Max. 5.80%	None	

Mounting and fixing:

The assessment of reaction to fire is based on tests with cementitious-based render carrier board thickness of 12 mm, EN ISO 1716 and a render system with maximum organic content and thickness 3 mm.

For the SBI this SYSTEM is mounted directly to a cement-based substrate (reaction to fire A2).

The installation of the SYSTEM was carried out by the manufacturer (holder of approval) following the manufacturer's specifications (instruction sheet) using a single layer of the glass fibre mesh all over the test specimen (no overlapping glass fibre mesh).

The test specimens were prefabricated and did not include any joints. The panel edges were rendered except the upper and bottom edges.

Anchors were not included in the tested SYSTEM as they have no influence on the test result.

Please note that in some member states, the classification based on SBI test is not accepted. Additional tests might be required, e.g. large-scale tests to demonstrate compliance with a member state's fire regulation.



#### 3.2.2 Water absorption (capillary test)

#### Base coat TERRIX® AD- AB

Water absorption after 1 hour	<1kg/m <sup>2</sup>
Water absorption after 24 hours	<0.5kg/m <sup>2</sup>

#### TERRIX® ERS-CB1 System

System components	Water absorption after 24h
TERRIX <sup>®</sup> AD-AB	
TERRIX <sup>®</sup> RD-PS-S	< 0.5kg/m2

#### 3.2.3 Hygrothermal behaviour

Hygrothermal cycles have been performed on a rig.

None of the following defects occurred during the testing:

- blistering or peeling of any finishing,
- failure or cracking associated with joints between insulation product boards or profiles fitted with the system,
- detachment of render,
- cracking allowing water penetration to the insulation layer.

TERRIX<sup>®</sup> ERS-CB1 System is assessed as resistant to hygrothermal cycles.

#### 3.2.4 Freeze/thaw behaviour

The water absorption of both base coats and the rendering systems is less than 0,5 kg/m2 after 24 hours.

TERRIX® ERS-CB1 is assessed as freeze/thaw resistant.

#### 3.2.5 Impact resistance

#### TERRIX® ERS-CB1 System

System components	Single standard mesh	
TERRIX <sup>®</sup> AD-AB		
TERRIX <sup>®</sup> RD-PS-S	Category II	

#### 3.2.6 Water vapour permeability

TERRIX<sup>®</sup> ERS-CB1 System

System components	Equivalent air thickness (m)
TERRIX® AD-AB	≤ 1.0m, result:
TERR <mark>IX<sup>®</sup> RD-PS or TERRIX<sup>®</sup> RD-PS-S</mark>	0.15m



#### 3.2.7 Bond strength

Base coat TERRIX® AD- AB onto carrier board

	Conditionings	
Initial state	After the hygrothermal cycles (on the rig)	After the freeze/thaw cycles (on samples)
< 0,3 MPa	< 0,3 MPa	Test not required because freeze/thaw cycles not
		necessary

TERRIX® EWI-W1 can be installed on the substrate only as mechanical fixed with application of the adhesive TERRIX® AD-BW on a minimal surface of 40 %.

#### 3.2.8 Fixing strength (displacement test)

Test not required because the SYSTEM fulfils the following criteria:

- the bonded area exceeds 20 % in case of mechanically fixed systems with supplementary adhesive.
- E×d=3965N/mm<50000N/mm, where E is modulus of elasticity of the base coat TERRIX® AD-BW without glass fibre mesh and d is mean dried thickness of the base coat.

#### 3.2.9 Durability and serviceability

#### 3.2.9.1 Bond strength after ageing

System	After hygrothermal cycles (on the rig)	After freeze/thaw cycles
TERRIX® EWI-W1 includes: render carrier board TERRIX® AD-AB TERRIX® PR-PS-R TERRIX® RD-PS-S	> 0.25 MPa	Test not required because freeze/ thaw cycles not necessary

#### 3.3 Components' characteristics

#### 3.3.1 Joint filler - Terrix<sup>®</sup> RN-LF 8

Base binder: mixture of hydraulic binding agents;

Colour: white;

Mixing proportions: about 5.5÷6.25 l of water per 25 kg of mortar;

Average usage: 1.5kg/m2 per 1mm of thickness;

Coat thickness: 1-5 mm

Application temperature (ambient and substrate): from +5°C to +25°C

Maximum application relative air humidity: <75%;

Vapour permeability: Sd = 0.05 m (CAT. V1);

Water absorption: w = 0.36 kg/m2h0.5 (CAT. W2)

Packaging: Single-use paper packaging contains 25kg of the product.

Storage: Store in the tightly sealed, original packaging in a dry area ensuring protection against moisture.

Shelf life: 12 months from the date of production (factory sealed packaging).



#### 3.3.2 Base coat - Terrix<sup>®</sup> AD-AB

Base binder: mixture of hydraulic binding agents; Colour: white;

Adhesion to the substrate	to carrier board> 0.25 N / mm <sup>2</sup>
Frost resistance - adhesion to the substrate	after 15 freezes. cycles to carrier board> 0.25 N / mm²
Compressive strength	> 3.5 N/mm <sup>2</sup>
Water vapor permeability $\mu$	μ < 20
Grain	0 - 0.7 mm
Amount of mixing water	0.28 l/kg
Consumption	4 - 5,5 kg/m²
Bulk density of dry mortar	1350 kg/m³

Packaging: Single-use paper packaging contains 25kg of the product. Storage: Store in the tightly sealed, original packaging in a dry area, ensuring protection against moisture. Shelf life: 12 months from the date of production (factory sealed packaging).

#### 3.3.3 Reinforcing mesh

	Description	Alkalis resistance		
Mesh trade name		Residual resistance after ageing (N/mm)	Relative residual resistance: % (after ageing) of the strength in the as delivered state	
Terrix®145 / R1 17A101 / AKE 145	Mass per unit area: 145 g/m² -0 / +10%; Mesh size: 4.0 x 4.5 mm	≥20	≥ 50	
Terrix® 145 / 03-43	Mass per unit area: 145 g/m² -3 / +5%; Mesh size: 3.5 x 4.5 mm	≥20	≥ 50	
Terrix® V 145 / GG-145	Mass per unit area: 145 g/m² -3 / +5%; Mesh size: 4.0 x 4.5 mm	≥ 20	≥ 50	
Terrix <sup>®</sup> 150 / OPTIMA-NET 150	Mass per unit area: 150 g/m² -3 / +5%; Mesh size: 4.0 x 4.5 mm	≥ 20	≥ 50	
Terrix® 160 / R131 A101 / AKE 170	Mass per unit area: 160 g/m² -3 / +10%; Mesh size: 3.5 x 3.8 mm	≥ 20	≥ 50	
Terrix® AG 160 / 03-1	Mass per unit area: 165 g/m² -3 / +10%; Mesh size: 3.5 x 3.8 mm	≥ 20	≥ 50	
Terrix <sup>®</sup> 165 / OPTIMA-NET 165	Mass per unit area: 165 g/m² -3 / +5%; Mesh size: 3.6 x 4.0 mm	≥ 20	≥ 50	
Terrix <sup>®</sup> 175 / ST 112-100/7KM	Mass per unit area: 174 g/m² +8g/m²; Mesh size: 3.8 x 3.2 mm	≥ 20	≥ 50	
Terrix <sup>®</sup> 335 / 03-15 / REDNET E335	Mass per unit area: 335 g/m² -3 / +5% Mesh size: 6.0 x 9.0 mm	≥ 20	≥ 50	

YSTEMS

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#### 3.3.4 Primer - Terrix<sup>®</sup> PR-PS-R

Base binder: special modied potassium water glass and copolymer binder; Pigments: inorganic colour pigments; VOC content: cat. A/h. The product contains less than 30 g/l VOC;

Density: approx. 1,3 g/cm3;

Solids content: min. 44%;

Colour: white or coloured to the colour of the render;

Average coverage:

approx. 0.20 l/m2 (depending on the absorbency of the substrate); Application temperature (air and substrate):  $+5 \degree$ C to  $+25 \degree$ C; Relative humidity:  $\leq 75 \%$ .

Packaging: disposable plastic packaging in 5 and 10 litres.

Storage: The product should be stored in a closed container in a cool but frost-protected room. Opened packages should be sealed tightly and used as soon as possible.

Shelf life: Originally sealed products have a shelf life of 12 months from the date of manufacture (indicated on the side of the packaging).

#### 3.3.5 Render - Terrix<sup>®</sup> RD-PS-S 1.5 polymer-silicate

Base binder: specially modified potassium water glass;

Pigments: non-organic coloured pigments with high resistance to elements. Density: about 1.50 g/cm<sup>3</sup>;

Colours: white and selected colours from PCC colour chart as well as custom pastel colours;

Texture: grained 1.5mm;

Diluent: water;

Average usage: 2.2kg/m2;

Application temperature (ambient and substrate): from +5°C to +25°C Maximum application relative air humidity: ≤75%;

Vapour permeability: Sd = 0.05 m (CAT. V1); Water absorption: w = 0.36 kg/m2h0.5 (CAT. W2)

Packaging: Single-use plastic bucket contains 20kg of the product.

Storage: Store in the tightly sealed, original packaging in a cool area, ensuring protection against frost. Opened packaging should be tightly closed and used as quickly as possible.

Shelf life: 12 months from the date of production (factory sealed packaging).



#### 4. System application

#### 4.1 Substrate preparation

TERRIX® ERS-CB1 to be applied to a sound and clean substrate - render carrier board (without cracks and delaminations), degreased, even and dry, and biological or chemical efflorescence free). The substrate should be free of algae/fungi growth.

In case of microbial contamination, the substrate should be cleaned with a power washer. Subsequently, Terrix<sup>®</sup> PR-AR solution for removing microbial contamination is to be applied as per the product manual. Any loose layers that are not bounded to the substrate (such as loose plasters or flaked paint coats) should be removed. Wash and degrease old and/ or dirty substrate with water and product Terrix<sup>®</sup> PR-CL cleaning agent. Before applying the levelling compound/render - refer to the product manuals and data sheets.

#### 4.1 Joint filler application

Check that the gaps between the carrier boards are between 2-3 mm.

#### TERRIX<sup>®</sup> RN-LF-8 PREPARATION:

Pour the content slowly into a container with clean water (4.5 to 5.0 litres of water) and mix until a uniform consistency is achieved. Wait 5 minutes and remix.

The pot life is 1.5 hours.

#### APPLICATION:

Use a steel trowel to fill the gap between the boards. Then apply a 100-110 mm wide strip of reinforcing mesh with an 8 mm notched trowel and embed a 100 mm wide strip of reinforcing mesh into this. Subsequently, use the flat side of a steel float to smooth out the adhesive so that it forms an even layer and the mesh is completely embedded.

For more details, refer to the product data-sheet.

#### 4.3 Reinforcing coat installation

For creating a reinforcing coat, Terrix<sup>®</sup> AD-AB microfibre reinforced base coat should be used with Terrix<sup>®</sup> reinforcing mesh.

NOTE: All stress patches/ trims and beads should be installed before reinforcing mesh/ base coat application.

#### TERRIX® AD-AB PREPARATION:

Pour the content slowly into a container with clean water (4.5 to 5.0 litres of water) and mix until a uniform consistency is achieved. Wait 5 minutes and remix.

The pot life is 1.5 hours.

Terrix® AD-BW and Terrix® glass fibre reinforcing mesh application:

Use a notched trowel (8-10mm) to distribute adhesive evenly on the entire board. Immerse the mesh in the adhesive letting the mesh be spread evenly and immersed wholly in the mortar.

Should any slight irregularities occur on a dry layer, apply another thin layer of adhesive (approx.1 mm thick) to smooth the surface.

The thickness of the base coat should not exceed 5mm.

NOTE: Minimum mesh overlap - 100mm. Sponging is not permitted.



#### 4.4 Primer coat application

#### Terrix<sup>®</sup> PR-PS-R preparation:

The packaging contains a ready-to-use product. Do not dilute.

#### Application method:

The product to be applied on the substrate by using a paint brush or roller.

#### Drying:

Before applying a render coat, the primer requires seasoning of ca. 24 hours.

Note: Drying time may be longer in low temperatures and high relative humidity. To protect the top coat against inclement weather conditions, scaffolding should be covered with some protective netting or tarpaulin.

Avoid applying in direct sunlight or during strong winds.

#### Useful hints:

The application and setting of product requires dry weather and air temperature above +5°C. Low temperature and high humidity levels may lead to slower product setting. If this is the case, it is necessary to wait until the primer sets and hardens completely before applying the render coat.

All tools should be cleaned with water after work is completed. Application during direct exposure to sunlight or in strong winds is not recommended. To protect unbound product against inclement weather conditions, scaffolding should be covered with protective netting.

#### 4.4 Render coat application

#### TERRIX<sup>®</sup> RD-PS-S preparation:

The packaging contains a ready-to-use product. If stored for a long time and before application, the product should be thoroughly mixed with a low-speed mixer fitted with a basket stirrer until a smooth, homogenous consistency is obtained. Further mixing is not recommended as it may result in excessive aeration of the product. If required, add a small amount of clean water (max. 0.1 ] per 20 kg of the product). Quantity of added water may vary for different substrate types, weather conditions and application method.

#### **Application method:**

Render should be applied onto the substrate by using a pneumatic spraying device at a working pressure of 3+4 atmospheres and a nozzle diameter of 5+6 mm. While spraying, the gun should be held perpendicularly to the substrate at a distance of 0.4-0.6 m.

#### Drying:

Typical binding (setting) time ca. 24h (20°C, 55% RH). Note: Drying time may be longer due to low temperatures and high relative humidity. To assist the drying of the finish coat, the surface should be protected against precipitation and condensation.

Note: If applied in adverse weather conditions ask for winter version of the product Terrix® RD-PS-SW 1.5 which gives the product accelerated 8h wash-off resistance (min temperature 5°C, 75% RH)

#### Useful hints:

The final effect may depend on the substrate type. For non-uniform substrates, it is recommended to skim at first the whole surface with base coat mortar. To avoid colour differences, a single batch product should be used on a single application / architectural element. 'Wet on wet' method should be used. All tools should be cleaned with water after work is completed. To be applied on dry days at temperatures between 5-25°C. Avoid applying in direct sunlight or during strong winds. To protect the top coat against inclement weather conditions, scaffolding should be covered with some protective netting or tarpaulin.



- 5. specific site details
- 5.1 system build-up



DETAIL A.1 V.1.0 wall cross-section



Carrier board (by others)

Terrix® AD-AB base coat

Terrix<sup>®</sup> PR-PS-R polymer-silicate primer

Terrix® RD-PS-S polymer-silicate render

3 Reinforcing fibre-mesh

2

4

5 coat

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#### 5.2 external corner



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#### 5.5 internal corner





Terrix<sup>®</sup> 2022

DETAIL B.9.1 V.1.0 internal corner

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5.6



Terrix<sup>®</sup> 2022

DETAIL G.9 V.1.0 window cill junction (SFS)

SYSTEMS



## Terrix<sup>®</sup> ERS-CB1 5.7 window head Terrix® Approved carrier board (by 1 others) Terrix<sup>®</sup> AD-AB base coat 2 3 Terrix<sup>®</sup> AC-MS reinforcing mesh Terrix® PR-PS-R polymer-silicate primer 4 Terrix® RD-PS-S polymer silicate render 5 1.5mm SIGA WIGLUW black (optional) 6 7 Terrix<sup>®</sup> AC-WB window protection bead Terrix® AC-DB drip bead with mesh 8 715 7 /5 DETAIL G.9.2 V.1.0 Terrix<sup>®</sup> 2022

window head



## Terrix<sup>®</sup> ERS-CB1 5.8 window reveal Terrix® Approved carrier board (by 1 others) Terrix<sup>®</sup> AD-AB base coat 2 3 Terrix<sup>®</sup> AC-MS reinforcing mesh Terrix® PR-PS-R polymer-silicate primer 4 Terrix® RD-PS-S polymer silicate render 5 1.5mm SIGA WIGLUW black (optional) 6 7 Terrix<sup>®</sup> AC-WB window protection bead Terrix<sup>®</sup> AC-CB corner bead with mesh 8 715 /5 DETAIL G.9.3 V.1.0 Terrix<sup>®</sup> 2022

window reveal







DETAIL Q.9.4 V.1.0 through wall vent or pipe



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### 5.11 movement joint



**PCC** Terrix

Terrix<sup>®</sup> 2022

DETAIL Z.9.25 V.1.0 movement joint





5.11 stress patches - openings



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