



Series: TECHNICAL APPROVALS

## TECHNICAL APPROVAL ITB AT-15-8980/2016

On the basis of the Regulation of the Minister of Infrastructure of November ,8 2004 on technical approvals and organizational bodies authorized to issue them (OJ of 2014., Item 1040), following the approval procedure carried out in the Building Research Institute in Warsaw, at the request of the following company:

**GREINPLAST Spółka z o.o.**  
**36-007 Krasne, Krasne 512 B**

it is stated the following products are suitable for use in the construction industry:

### **Set of products for thermal insulation systems and facade claddings GREINPLAST OE**

within the scope and on the terms set out in the Annex, which is an integral part of this Technical Approval ITB.

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DYREKTOR  
Instytutu Techniki Budowlanej

*dr inż. Marcin M. Kruk*

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The Technical Approval ITB AT-15-8980 / 2016 is an amendment to the Technical Approval ITB AT-15-8980 / 2012. The Technical Approval Document ITB AT-15-8980/2016 contains 20 pages. The text of this document can be copied only in its entirety. Publication or distribution of the Approval content in any other form shall require a written agreement with the Building Research Institute.

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## 1. SUBJECT OF THE APPROVAL

The subject of this ITB Technical Approval are sets of products for thermal insulation and cladding of external walls of buildings with the GREINPLAST OE system.

Execution of thermal insulation in the case of a non-insulated building consists in fixing to the existing walls, from the outside, a layered system consisting of Styrofoam (EPS) as a thermal insulation material, reinforced layer made of adhesive mortar and reinforcing mesh, and GREINPLAST OEA facade panels, bonded by means of an adhesive. Styrofoam boards should be bonded to the substrate with adhesive mortar (bonding area not less than 40%) or adhesive mortar and mechanical fasteners (bonded system).

The cladding consists in bonding to the existing walls, from the outside, GREINPLAST OEA facade panels.

The manufacturer of sets of products covered by the Approval and the manufacturer of products included in the sets is GREINPLAST Spółka z o.o., 36-007 Krasne, Krasne 512 B.

The set of GREINPLAST OE thermal insulation products includes the following products, which the manufacturer should provide to the recipients as a set:

- 1) Adhesive mortar under the trade name of GREINPLAST KS – for bonding Styrofoam boards to the substrate, supplied as a dry mix, which should be mixed with water in a weight ratio of  $0.23 \div 0.27$  l per 1 kg of dry mix before use. The mortar can be applied manually or mechanically. The consumption of adhesive mortar is  $4.0 \div 6.0$  kg/m<sup>2</sup>.
- 2) Adhesive mortar under the trade name of GREINPLAST K – for bonding Styrofoam boards to the substrate (used interchangeably with GREINPLAST KS mortar) and for making a reinforced layer on Styrofoam boards for plastering, supplied in the form of a dry mix, which should be mixed with water in a weight ratio of  $0.24 \div 0.27$  l per 1 kg of dry mix before use. The mortar can be applied manually or by machine. The consumption of adhesive mortar is  $4.0 \div 6.0$  kg/m<sup>2</sup> (for bonding Styrofoam boards) and  $3.0 \div 4.0$  kg/m<sup>2</sup> (for reinforcing layer). The thickness of the reinforcement layer is  $2.5 \div 4.0$  mm.
- 3) Primer under the trade name of GREINPLAST F – intended for priming the reinforced layer, applied optionally. The approximate consumption of primer is  $0,4$  l/m<sup>2</sup>.
- 4) Acrylic adhesive under the trade name of GREINPLAST KA – for bonding GREINPLAST OEA facade panels to the substrate, delivered as ready-to-use, transparent, white, gray adhesive or of a different colour, as recommended by Greinplast Sp. z o.o. depending on the type of facade panels used. The maximum adhesive consumption is  $2.5$  kg/m<sup>2</sup>.
- 5) Facade panels under the trade name of GREINPLAST OEA, manufactured by water dispersion of acrylic copolymers, quartz sand, mineral fillers and additives, in the form of ready-to-bond panels. GREINPLAST OEA facade panels have a rectangular shape with dimensions  $(150 \div 605) \times (190 \div 2000)$  mm and a thickness of  $2.0 \div 7.0$  mm. The surface of the panels imitates the textures of building materials: wooden planks (OEA-D type), wooden fashioned baulks (OEA-BC type), fashioned baulks with a plait (OEA-BW type), travertine (OEA-T type), rustic brick (type OEA-C), ceramic mosaic tiles (OEA-M type), façade stone (OEA-K type), facade tiles (OEA-P type), architectural concrete (OEA-BA type), basalt slabs (OEA-KB type), granite slabs (OEA-KG type), marble slabs (OEA-KM type) or sandstone slabs (OEA-KP type). Panels with other dimensions (widths and lengths) and other surface textures may be produced, after agreement between the Manufacturer and the recipient.
- 6) Paints: acrylic paint under the trade name of GREINPLAST FA-Podkład or acrylic-silicone (hydrophobic) paint under the trade name of GREINPLAST FH-Podkład (used interchangeably) –

for making the undercoat, acrylic paint under the trade name of GREINPLAST FA-Lazur – for the topcoat, so-called glaze, and a paint under the trade name of GREINPLAST FLA – for simultaneous application of the undercoat and topcoat. The priming and topcoat paints differ in the pigment content and constitute a protective coating of the GREINPLAST OEA panels. Paints are supplied in the colours recommended by Greinplast Sp. z o.o. to achieve a specific decorative effect. The consumption of GREINPLAST FLA paint is  $0.1 + 0.12 \text{ l/m}^2$  (when applying twice). Approximate consumption of GREINPLAST FA-Podkład and FA-Lazur paint and GREINPLAST FH-Podkład paint is  $0.12 \text{ l/m}^2$  (when applying once) and not more than  $0.3 \text{ l/m}^2$ .

The set of products for GREINPLAST OE cladding includes the following products, which should be delivered to the recipients by the manufacturer:

- 1) Primer under the trade name of GREINPLAST F – intended for priming the reinforced layer, optional. The approximate paint consumption is  $0.4 \text{ kg/m}^2$ .
- 2) Acrylic adhesive under the trade name of GREINPLAST KA – for bonding GREINPLAST OEA facade panels to the substrate, delivered as ready-to-use, transparent, white, grey adhesive or of a different colour, as recommended by Greinplast Sp. z o.o. depending on the type of facade panels used. The maximum adhesive consumption is  $2.5 \text{ kg/m}^2$ .
- 3) Facade panels under the trade name of GREINPLAST OEA, manufactured by water dispersion of acrylic copolymers, quartz sand, mineral fillers and additives, in the form of ready-to-bond panels. GREINPLAST OEA facade panels have a rectangular shape with dimensions  $(150 \div 605) \times (190 \div 2000)$  mm and a thickness of  $2.0 \div 7.0$  mm. The surface of the panels imitates the textures of building materials: wooden planks (OEA-D type), wooden fashioned baulks (OEA-BC type), fashioned baulks with a plait (OEA-BW type), travertine (OEA-T type), rustic brick (type OEA-C), ceramic mosaic tiles (OEA-M type), façade stone (OEA-K type), facade tiles (OEA-P type), architectural concrete (OEA-BA type), basalt slabs (OEA-KB type), granite slabs (OEA-KG type), marble slabs (OEA-KM type) or sandstone slabs (OEA-KP type). Panels with other dimensions (widths and lengths) and other surface textures may be produced, after agreement between the Manufacturer and the recipient.
- 4) Paints: acrylic paint under the trade name of GREINPLAST FA-Podkład or acrylic-silicone (hydrophobic) paint under the trade name of GREINPLAST FH-Podkład (used interchangeably) – for making the undercoat, acrylic paint under the trade name of GREINPLAST FA-Lazur – for the topcoat, so-called glaze, and a paint under the trade name of GREINPLAST FLA – for simultaneous application of the undercoat and topcoat. The priming and topcoat paints differ in the pigment content and constitute a protective coating of the GREINPLAST OEA panels. Paints are supplied in the colours recommended by Greinplast Sp. z o.o. to achieve a specific decorative effect. The consumption of GREINPLAST FLA paint is  $0.1 + 0.12 \text{ l/m}^2$  (when applying twice). Approximate consumption of GREINPLAST FA-Podkład and FA-Lazur paint and GREINPLAST FH-Podkład paint is  $0.12 \text{ l/m}^2$  (when applying once) and not more than  $0.3 \text{ l/m}^2$ .

Required technical properties of products included in the GREINPLAST OE sets and thermal insulation materials and façade claddings made with their use are given in para. 3

## 2. INTENDED USE, SCOPE AND CONDITIONS OF USE

The sets of GREINPLAST OE products are intended for insulating external walls and for making external wall claddings (façade cladding) of newly erected and used buildings.

The sets of GREINPLAST OE products are intended for use on mineral substrates.

For thermal insulation systems made using the sets of GREINPLAST OE products, Styrofoam boards according to PN-EN 13163 should be used:

- 1) Styrofoam boards according to PN-EN 13163+A1:2015:
  - a) at least, with the properties resulting from the code: EPS-EN 13163-T1-L2-W2-S5-P5-BS75-DS(N)2-DS(70,-)2-TR100,
  - b) at least, with the properties resulting from the code: EPS-EN 13163-T1-L2-W2-S5-P5-BS75-DS(N)2-DS(70,-)2-TR80, covered by the ITB Technical and Quality Recommendation or a voluntary Certificate issued by an accredited certification body and recommended by the applicant of this Approval,  
at least, reaction-to-fire class E in accordance with PN-EN 13501-1+A1:2010 (corresponding to the term “self-extinguishing” according to the Regulation of the Minister of Infrastructure of April 12, 2002, Journal of Laws No. 75/2002, item 690, with later changes), meeting the following additional requirements:
    - surface dimensions: not greater than 600 x 1200 mm,
    - board surfaces: rough, after cutting from blocks,
    - board edges: straight, sharp, without nicks.
- 2) Glass fibre mesh with commercial symbols:
  - VERTEX 145, meeting the requirements of AT-15-9035/2012,
  - TG-22, meeting the requirements of AT-15-4479/2013,
  - SSA-1363-150 SM0.5, meeting the requirements of AT-15-8489/2014,
  - EUROWEK STANDARD / EUROWEK PREMIUM / EUROWEK PROFESSIONAL / EUROWEK PROFESSIONAL SYSTEM / EUROWEK LUX / FGM-150, meeting the requirements of AT-15-6372/2015,
  - Halico A150, meeting the requirements of AT-15-8963/2015,
  - TG-15, meeting the requirements of AT-15-2682/2013
  - SSA-1363-160 SM0.5A, meeting the requirements of AT-15-9268/2014,  
used in one layer or optionally – in two layers.
- 3) Mechanical connectors – placed on the market.
- 4) Materials for finishing particular areas of façade – strips, tapes, corner grids, sealing materials and other accessories.

Before starting the insulation application, the condition of the substrate should always be assessed. The substrate should be even, load-bearing, firm, dry and free of any substances that reduce the adhesion.

The GREINPLAST OE thermal insulation systems, in accordance with the description given in para. 1, applied on non-flammable surfaces (at least reaction to fire class A2-s3, d0 according to PN-EN 13501-1+A1:2010), have been classified as not-spreading-fire (NRO) through the walls when exposed to fire from the façade side, with the thickness of Styrofoam boards of 20 ÷ 300 mm.

The GREINPLAST OE façade claddings, in accordance with the description given in para. 1, applied on non-flammable surfaces (at least reaction to fire class A2-s3, d0 according to PN-EN 13501-1+A1:2010), have been classified as not-spreading-fire (NRO) through the walls when exposed to

fire from the façade side.

In the GREINPLAST OE thermal insulation system, Styrofoam boards should be fixed to the substrate with GREINPLAST K or GREINPLAST KS adhesive mortar. Styrofoam boards should be bonded with staggered vertical joints. The adhesive mortar should cover at least 40% of the surface area of a board. A reinforced layer of GREINPLAST K adhesive mortar with embedded glass fibre mesh should be applied on the surface of bonded Styrofoam boards. Before bonding GREINPLAST OEA façade panels, the reinforced layer can be primed with GREINPLAST F primer (optionally used, according to the Manufacturer's recommendations).

GREINPLAST OEA panels are bonded to a suitably prepared reinforced layer, using GREINPLAST KA adhesive, applied by means of a notched trowel, both to the substrate and to the bottom surface of the panels. The panel should be pressed firmly to the substrate so that the adhesive spreads evenly over its entire surface. Apply GREINPLAST FA primer or GREINPLAST FH primer to the front side of the bonded panels. After the primer paint has dried completely, GREINPLAST FA-Lazur topcoat is applied, which after applying, is wiped with a slightly moistened sponge to remove excess paint and partially reveal the primer. Alternatively, GREINPLAST FLA may be applied to panels, which is both the undercoat and topcoat. The layer system of the GREINPLAST OE thermal insulation system is shown in Fig. 1.

In the case of GREINPLAST OE façade claddings, GREINPLAST OEA façade panels are bonded to a suitably prepared substrate (the substrate may be optionally primed with GREINPLAST F primer) using GREINPLAST KA adhesive (description as above). Apply GREINPLAST FA primer or GREINPLAST FH primer to the front side of the bonded panels. After the primer paint has dried completely, GREINPLAST FA-Lazur topcoat is applied, which after applying, is wiped with a slightly moistened sponge to remove excess paint and partially reveal the primer. Alternatively, GREINPLAST FLA may be applied to panels, which is both the undercoat and topcoat. The layer system of the GREINPLAST OE façade cladding system is shown in Fig. 2.

The use of GREINPLAST OE product sets should be in accordance with the technical design developed for a specific facility and the company guidelines of the Applicant of this ITB Technical Approval.

A project should include:

- applicable standards (including PN-EN ISO 13788:2013) and technical and construction regulations, in particular the Regulation of the Minister of Infrastructure of April 12, 2002 on technical conditions that should be met by buildings and their location – OJ No. 75, item 690, as amended,
- provisions of this ITB Technical Approval,
- ITB Instruction No. 447/2009,
- Technical Conditions for the Execution and Acceptance of Construction Works ITB: Part C. Number 8, and specify at least:
  - method of preparing the substrate,
  - thickness of Styrofoam boards (in the case of thermal insulation system),
  - method of bonding insulation boards to the substrate (in the case of thermal insulation system),
  - type, number and arrangement of mechanical fasteners (in the case of thermal insulation system),
  - method of finishing specific areas of façade (window and door jambs, balconies, plinths, expansion joints and others).

The Applicant of the Technical Approval should ensure delivery of completed sets of GREINPLAST OE products to the recipients – according to the specifications included in technical designs.

Construction works related to the use of product kits covered by the Approval should be performed

by specialized companies.

Adhesive mortars can be applied at temperatures between 0°C and +25°C. Adhesives and paints can be applied at temperatures between +5°C and +25°C. When carrying out thermal insulation works, the time intervals between applying of individual layers should be observed in accordance with the Manufacturer's instructions.

The products included in the GREINPLAST OE system are covered by Hygienic Certificates and Radiation Hygiene Certificates of the National Institute of Hygiene.

### 3. TECHNICAL PROPERTIES. REQUIREMENTS

#### 3.1. Products included in the sets

**3.1.1. Adhesive mortars.** The required technical properties of GREINPLAST K and GREINPLAST KS adhesive mortars are given in Table 1.

**Table 1**

Item	Properties	Requirements				Test methods
		GREINPLAST K		GREINPLAST KS		
1	2	3*	4**	5*	6*	7
1	External appearance of dry mixture	homogeneous dry mixture, uniform in colour, without any lumps and mechanical impurities				ZUAT-15/V.03/2010
2	Bulk density, g/cm <sup>3</sup>	1,33 ±10%		1,30 ±10%		PN-EN 1097-3:2000
3	Ash content at 450°C, %	95,1 *5-98,5		96,5 - 99,8		ETAG 004
4	Resistance to shrinkage cracking	no scratches within the layer up to 8 mm				ZUAT-15/V.03/2010
5	Adhesion of adhesive mortar to Styrofoam board, MPa: - in air-dry conditions - after 48 hours of immersion in water bath and 2 hours of drying at (+23±2)°C and (50± 5)% RH - after 48 hours of immersion in water bath and 7 days of drying at (+23±2)°C and (50± 5)% RH	>0,08 >0,03 >0,08	>0,08 >0,03 >0,08	>0,08 >0,03 >0,08	>0,08 >0,03 >0,08	ETAG 004
6	Adhesion of adhesive mortar to concrete, MPa: - in air-dry conditions - after 48 hours of immersion in water bath and 2 hours of drying at (+23±2)°C and (50± 5)% RH - after 48 hours of immersion in water bath and 7 days of drying at (+23±2)°C and (50± 5)% RH	>0,25 >0,08 >0,25	>0,25 >0,08 >0,25	>0,25 >0,08 >0,25	>0,25 >0,08 >0,25	ETAG 004

**3.1.2. Paints.** The required technical properties of GREINPLAST F primer are given in Table 2. The required technical properties of GREINPLAST FLA, GREINPLAST FA paints (*Podkład* and *Lazur*) and GREILPLAST FH paint are given in Table 3.

**Table 2**

Item	Properties	Requirements	Test methods
		GREINPLAST F	
1	2	3	4
1	External appearance	homogeneous thick liquid, uniform in colour, with a fine-grained filler	ZUAT-15/V.03/2010
2	Apparent density, g/cm <sup>3</sup>	1,66 ±10%	ETAG 004
3	Dry extract, %	67,7 (- 3,4 / + 6,8) at temp. 105°C	ETAG 004
4	Ash content, %: - at temp. 450°C - at temp. 900°C	88,5 ± 4,4 50,8 ± 2,5	ETAG 004

**Table 3**

Item	Properties	Requirements			Test methods
		GREINPLAST FLA	GREINPLAST FA	GREINPLAST FH	
1	2	3	4	5	6
1	External appearance	homogeneous liquid, uniform in colour, without mechanical impurities and foreign inclusions			ZUAT-15/V.03/2010
2	Apparent density, g/cm <sup>3</sup>	1,04 ±10%	1,44 ±10%	1,50 ± 10%	ETAG 004
3	Dry extract, %	31,6 (-1,6/+3,2) at temp. 105°C	58,0 (-2,9/+5,8) at temp. 105°C	65,3 (-3,3/+6,5) at temp. 105°C	ETAG 004
4	Ash content, %: - at temp. 450°C - at temp. 900°C	7,4 ±0,4 7,1 ±0,4	78,6 ±3,9 60,5 ±3,0	76,0 ±3,8 62,5 ±3,1	ETAG 004
5*	Susceptibility to algal growth	-	not susceptible to algal growth		ZUAT-15/V.03/2010 PN-EN 15458:2014

\* property specified in the approval procedure, not covered by the initial type test and testing of finished products

**3.1.3. Acrylic adhesive.** The required technical properties of GREINPLAST KA acrylic adhesive are given in Table 4.

**Table 4**

Item	Properties	Requirements	Test methods
		GREINPLAST KA	
1	2	3	4
1	External appearance	homogeneous liquid, uniform in colour, without mechanical impurities and foreign inclusions	ZUAT-15A/.03/2010
2	Apparent density, g/cm <sup>3</sup>	1,81 ±10%	ETAG 004
3	Dry extract, %	83,9 ±4,2 w temp. 105°C	ETAG 004
4	Ash content at temp. 450°C, %	87,6 ± 4,4	ETAG 004
5	Ash content at temp. 900°C, %	68,6 ± 3,4	ETAG 004



**3.1.4. Façade panels GREINPLAST OEA.** The required technical properties of GREINPLAST OEA façade panels are given in Table 5.

**Table 5**

Item	Properties	Requirements	Test methods
		GREINPLAST OEA	
1	2	3	4
1	External appearance	Rough internal surface, textured external surface (facing)	Visual examination
2	Thickness, mm	2,0 + 7,0	PN-EN 823:1998
3	Permissible dimensional deviations, % - length - width	±0,3 ±1,5	PN-EN 822:1998
4	Dimensional stability, %, after 48 hours at 70°C, towards: - thickness - width and length	±3,0 ±0,1	PN-EN 1604:1999

### 3.2. Thermal insulation systems GREINPLAST OE

The required technical properties of GREINPLAST OE thermal insulation systems are given in Table 6.

**Table 6**

Item	Properties	Requirements	Test methods
		3	
1	2	3	4
1	Water absorption (capillarity test) after 1 h, kg/m <sup>2</sup> : - reinforced coat - finishing coat	< 0,3 < 0,1	ETAG 004
2	Water absorption (capillarity test) after 24 h, kg/m <sup>2</sup> : - reinforced coat - finishing coat	< 0,5 < 0,3	ETAG 004
3	Resistance to hard body impact, after ageing	Category I	ETAG 004
4	Water vapour permeability – resistance to water vapour diffusion, m	< 2,0	ETAG 004
5	Frost resistance of finishing coat	no damage: scratches, damages, loosening and blistering	ETAG 004
6	Bond strength between finishing coat and Styrofoam board, MPa: - at laboratory conditions - after ageing - after freeze-thaw cycles	> 0,08 > 0,08 > 0,08	ETAG 004
7	Fire classification in terms of fire spreading through the walls when exposed to fire from the façade side	not-spreading-fire – NRO*	PN-90/B-02867+Az1:2001

\* Fire classification applies to thermal insulation systems according to item 1, on non-combustible substrates (at least reaction to fire class A2-s3, d0 according to PN-EN 13501-1+A1:2010)

### 3.3. Façade claddings GREINPLAST OE

The required technical properties of GREINPLAST OE facade claddings are given in Table 7.

**Table 7**

Item	Properties	Requirements	Test methods
1	2	3	4
1	External appearance	panels adhere evenly to substrate covered with adhesive	Visual examination
2	Resistance to impact with Baronnie's hammer of weight of 500 g: - dry conditions - wet conditions	there is no falling away and chipping of tiles	p. 5.6.1
3	Measurement of bond strength by pull-off, MPa: - at laboratory conditions - after freeze-thaw cycles	> 1,0 > 0,7	PN-EN 1542:2000 and p. 5.6.2
4	Water-vapour transmission expressed by: - water-vapour transmission rate, V, g/m <sup>2</sup> ·24h - water-vapour diffusion - equivalent air layer thickness, s <sub>d</sub> , m	> 10,0 < 2,0	PN-EN ISO 7783:2011
5	Liquid water permeability, kg/m <sup>2</sup> ·24h <sup>u,b</sup>	< 0,3	PN-EN 1062-3:2008
6	Fire classification in terms of fire spreading through the walls when exposed to fire from the façade side	not-spreading-fire (NRO)*	PN-B-02867:1990/Az1:2001
* Fire classification applies to thermal insulation systems according to item 1, on non-combustible substrates (at least reaction to fire class A2-s3, d0 according to PN-EN 13501-1+A1:2010)			

### 4. PACKAGING, STORAGE AND TRANSPORT

The products included in the GREINPLAST OE sets should be delivered in the original manufacturer's packages of and stored and transported in accordance with the manufacturer's instructions.

For each product, the Manufacturer is obliged to attach information containing at least the following data:

- name and address of the Manufacturer,
- product identification containing the product name,
- ITB Technical Approval number AT-15-8980/2016,
- number and date of issue of the national declaration of conformity,
- expiry date, if specified,
- net mass, if determined,
- name of the certification body that participated in the conformity assessment,
- construction mark.

The method of marking the product with a construction mark should comply with the regulation of the Minister of Infrastructure of 11 August 2004 on the methods of declaring the conformity of construction products and the method of marking them with a construction mark (Journal of Laws No. 198/2004, item 2041, as amended).

In addition, if the separate provisions indicate the obligation to mark the product under the

Regulation of the Minister of Health of 20 April 2012 on the labelling of packaging of dangerous substances and mixtures and some mixtures (consolidated text: Journal of Laws of 2015, item 450 ) and Regulation (EC) No 1272/2008 of the European Parliament and of the Council on the classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC and amending Regulation (EC) No. 1907/2006 (CLP) and attaching information on the health or life risks arising from the safety data sheet under Regulation (EC) No 1907/2006 (as amended) by the European Parliament and the Council on the registration, evaluation, authorization and restriction of chemicals (REACH), the documentation should be accompanied by documentation in the appropriate form, containing the required by law provisions labelling and information.

## **5. ASSESSMENT OF CONFORMITY**

### **5.1. General rules**

According to Article 4, Article 5, Paragraph 1, Clause 3 and Article 8, Paragraph 1 of the Act of April 16, 2004 on construction products (Journal of Laws No. 92/2004, item 881, as amended), sets of products covered by this Technical Approval, may be placed on the market and used for the performance of works construction to the extent corresponding to their intended use, if the manufacturer has made a conformity assessment, issued a national declaration of conformity with the Technical Approval ITB AT-15-8980/2016 and labelled the construction mark in accordance with applicable regulations.

Pursuant to the Ordinance of the Minister of Infrastructure of August 11, 2004 on the methods of declaring the conformity of construction products and the method of marking them with a construction mark (Journal of Laws No. 198/2004, item 2041, as amended), assessment of conformity of sets of products for thermal insulation and cladding using the GREINPLAST OE system covered by the Technical Approval ITB AT-15-8980/2016 is made by the Manufacturer using the 2+ system.

In the case of the system 2+ used for the conformity assessment, the Manufacturer may issue a national declaration of conformity with the Technical Approval ITB AT-15-8980/2016, based on:

a) manufacturer's tasks:

initial type testing,

factory production control,

tests of finished products (samples) taken at the factory, carried out in accordance with an established tests plan, covering the tests quoted in para. 5.4.3,

b) tasks of the accredited body:

certification of the factory production control based on: an initial inspection of the production plant and factory production control and continuous supervision, assessment and approval of factory production control.

### **5.2. Initial type testing**

The initial type test is a test confirming the required technical and functional properties, performed before the set of products is placed on the market and used.

The initial type testing of GREINPLAST OE thermal insulation systems includes:

- water absorption of the reinforced coat and the topcoat,
- resistance to hard body impact,
- water vapour permeability – resistance to diffusion,

- frost resistance of the topcoat,
- adhesion of the topcoat to a Styrofoam board (at laboratory conditions, after aging and after frost resistance cycles),
- fire classification in the extent of fire spreading through walls when exposed to fire from the façade side.

The initial type testing of GREINPLAST OE façade claddings includes:

- impact resistance,
- water vapour permeability,
- water transmission coefficient,
- adhesion to concrete (at laboratory conditions and after frost resistance cycles),
- fire classification in the extent of fire spreading through walls when exposed to fire from the façade side.

The tests, which in the approval procedure were the basis for determining the technical and functional properties of the product, constitute the initial type test for the conformity assessment.

### **5.3. Factory production control**

Factory production control includes:

1. specification and testing of component products and materials,
2. inspection and testing in the manufacturing process and testing of finished products (clause 5.4.2), conducted by the Manufacturer in accordance with the established test plan and according to the rules and procedures set out in the factory production control documentation, adapted to the production technology and aimed at obtaining products with required properties.

Production control should ensure that the product complies with the Technical Approval ITB AT-15-8980/2016. The results of production control should be systematically recorded. The records should confirm that the products meet the criteria for conformity assessment. Individual products or lots of products and related production details must be fully identifiable and reproducible.

### **5.4. Testing of finished products**

#### **5.4.1. Testing program**

The testing program includes:

- on-going tests,
- periodic tests.

#### **5.4.2. On-going tests**

On-going tests include checking:

- adhesive mortars, adhesives and paints with regard to:
  - external appearance,
  - bulk density (in the case of adhesive mortars),
  - apparent density (in the case of other products),
- panels with regard to:
  - external appearance,
  - dimensions.

### 5.4.3. Periodic tests

Periodic tests include checking:

- adhesive mortars with regard to:
  - ash content,
  - resistance to the formation of shrinkage cracks,
  - adhesion to concrete,
  - adhesion to Styrofoam,
- adhesives and paints with regard to:
  - dry matter content,
  - ash content,
- panels with regard to:
  - dimensional stability,
- thermal insulation system with regard to fire spreading through walls when exposed to fire from the façade side,
- facade cladding with regard to fire spreading through walls when exposed to fire from the façade side

### 5.5. Frequency of tests

On-going tests should be conducted in accordance with the established test plan, but not less frequently than for each batch of products. The size of a batch of products should be specified in the documentation of the factory production control.

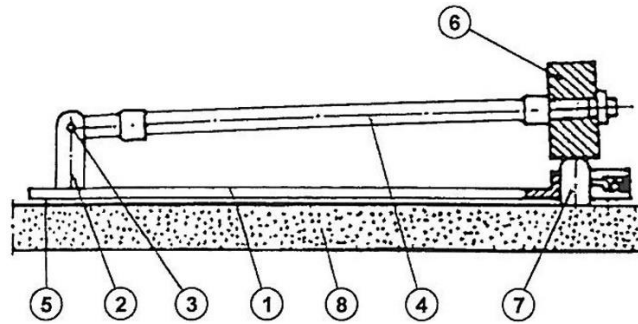
Periodic tests should be carried out at least once every 3 years.

### 5.6. Test methods

For testing, there should be used test methods according to the standards listed in tables 1-7 and the descriptions below.

#### 5.6.1. Checking the resistance to hard body impact

Five cladding samples should be prepared for the test. The test should be carried out using a device called the Baronnie's hammer (Fig. 1). The Baronnie's hammer consists of a base (1) on feet (5), in which there is a hole with a spring-loaded clamp of a punch (7) and a movable shank (4) with a length of 40 cm, pivotally connected (3) on a support (2) with a base. The shank should be provided with a weight (6) of 250 or 500 g, and the punch should have 5 parallel wedge-shaped cuts on the surface.



**Fig. 1. Baronnie's hammer**

The test should be performed on 2 samples. The device should be placed on the surface of a test sample so that it does not move during the measurement, and the punch should be inserted, with its side with cuts directed towards the tested surface, in the hole of the device's base. Then the shank with the weight should be raised to the position perpendicular to the surface to be tested, and then it should drop freely. Without changing the position of the device, the impact must be repeated after the punch has been turned by 90°. As a result of the test, a grid of cuts in the form of squares with a side of 5 mm should be obtained on the surface of the sample. The test should be performed on a sample stored in laboratory conditions and on a sample immersed for 2 hours in water. The test should be performed in three places on each of these samples. The sample should be checked by lightly rubbing the impact area with a palm and visually assessed for the condition of the damage.

#### **5.6.2. Checking the adhesion to concrete using the pull-off method**

The test should be performed in accordance with PN-EN 1542:2000 standard on samples stored in laboratory conditions and on samples subjected to freezing and thawing cycles. Samples should be subjected to 25 cycles of subsequent freezing and thawing. One cycle consists of storing samples at  $-20\pm 2^{\circ}\text{C}$  for at least 2 hours and thawing in water at  $+20\pm 2^{\circ}\text{C}$  for at least 2 hours. After the test, the samples should be inspected and determined whether there are changes on the tested surface, and especially whether there are scratches and cracks, chipping and peeling, as well as loosening or peeling off the topcoat from the substrate. The result of the test is the adhesion to concrete, calculated in accordance with PN-EN 1542:2000 with an accuracy of 0.1 MPa, for each place where the standard damage has been achieved.

#### **5.7. Sampling for testing**

Samples for testing should be taken in accordance with PN-83/N-03010.

#### **5.8. Evaluation of test results**

Manufactured products and completed sets of products should be considered compliant with the requirements of this ITB Technical Approval, if the results of all tests are positive.

## 6. FORMAL AND LEGAL ARRANGEMENTS

**6.1.** This Approval shall replace the Technical Approval ITB AT-15-8980/2012.

**6.2.** This Technical Approval ITB AT-15-8980/2016 is a document stating the suitability of sets of products for thermal insulation and cladding of external walls of buildings with the GREINPLAST OE system for use in construction, to the extent resulting from the provisions of the Approval.

According to the Article 4, Article 5 (1) (3) and the Article 8 (1) of the Act of April 16, 2004 on construction products (Journal of Laws No. 92/2004, item 881, as amended) sets of products covered by this Technical Approval, may be placed on the market and used for the execution of construction works to the extent corresponding to their usability and purpose, if the manufacturer has made a conformity assessment, issued a national declaration of conformity with the Technical Approval ITB AT-15-8980/2016 and labeled products with a construction mark, in accordance with the applicable regulations.

**6.3.** This Technical Approval ITB does not violate rights resulting from regulations on protection of industrial property, in particular the Act of June 30, 2000 – Industrial Property Law (consolidated text: Journal of Laws of 2013, item 1410, as amended). Providing these rights is the responsibility of the users of this Technical Approval ITB.

**6.4.** ITB, when issuing the Technical Approval, is not responsible for any infringement of exclusive and acquired rights.

**6.5.** This Technical Approval ITB does not release the Manufacturer of the products included in the sets from the responsibility for the proper quality of these materials and contractors of construction works from responsibility for the proper use and implementation of the technical solution that is the subject of this Technical Approval ITB.

**6.6.** In the contents of brochures, announcements and other documents related to the use of sets of products for thermal insulation and cladding of external walls of buildings for construction using the GREINPLAST OE system there should be included information about this Technical Approval ITB AT-15-8980/2016 granted to these sets.

## 7. TERM OF VALIDITY

The Technical Approval ITB AT-15-8980/2016 is valid until May 17, 2021.

The validity of the Technical Approval ITB may be extended for subsequent periods, if its Applicant or formal successor, applies to the Institute of Building Technology in this matter with an appropriate application, no later than 3 months before the expiry date of this document.

**THE END**

## ADDITIONAL INFORMATION

### Standards and related documents

PN-90/B-02867/Az1:2001	Fire protection of buildings. The method of testing of fire spreading through walls
PN-83/N-03010	Statistical quality control. Random selection of product units for the sample
PN-EN 822:1998	Thermal insulating products for building applications - Determination of length and width
PN-EN 823:1998	Thermal insulating products for building applications - Determination of thickness
PN-EN 1062-3:2008	Paints and varnishes. Coating materials and coating systems for exterior masonry and concrete. Determination of liquid water permeability
PN-EN 1097-3:2000	Tests for mechanical and physical properties of aggregates. Determination of loose bulk density and voids
PN-EN 1542:2000	Products and systems for the protection and repair of concrete structures. Test methods. Measurement of bond strength by pull-off.
PN-EN 1604:1999	Thermal insulating products for building applications. Determination of dimensional stability under specified temperature and humidity conditions.
PN-EN 13163+A1:2015	Thermal insulation products for buildings. Factory made expanded polystyrene (EPS) products. Specification.
PN-EN 13501-1+A1:2010	Fire classification of construction products and building elements. Part 1. Classification using data from reaction to fire tests.
PN-EN 15458:2014	Paints and varnishes. Laboratory method for testing the efficacy of film preservatives in a coating against algae.
PN-EN ISO 1716:2010	Reaction to fire tests for building products. Determination of the heat of combustion.
PN-EN ISO 7783:2011	Paints and varnishes. Determination of water-vapour transmission properties. Cup method.
PN-EN ISO 13788:2013	Hygrothermal performance of building components and building elements. Internal surface temperature to avoid critical surface humidity and interstitial



condensation. Calculation methods.

AT-15-2682/2013	<i>Fibre glass mesh TG 15</i>
AT-15-4479/2013	<i>Fibre glass mesh TG 22</i>
AT-14-9035/2012	<i>Fibre glass mesh VERTEX 145</i>
AT-15-8489/2014	<i>Fibre glass mesh SSA-1363-150 SM0.5</i>
AT-15-6372/2015	<i>/ Fibre glass mesh EUROWEK STANDARD / EUROWEK PREMIUM / EUROWEK PROFESSIONAL / EUROWEK PROFESSIONAL SYSTEM / EUROWEK LUX / FGM-150</i>
AT-15-8963/2015	<i>Fibre glass mesh Halico A150</i>
AT-15-9268/2014	<i>Fibre glass mesh SSA-1363-160 SM0.5A</i>
ZUAT-15/V.03/2013	Sets of products for thermal insulation of external walls with the use of foamed polystyrene as a thermal insulation material and a thinned ETICS facade finishing
ETAG 004	External thermal insulation composite systems with rendering
Instrukcja ITB nr 447/2009	External thermal insulation composite systems for buildings ETICS. Design and
Instruction ITB No. 447/2009	implementation rules

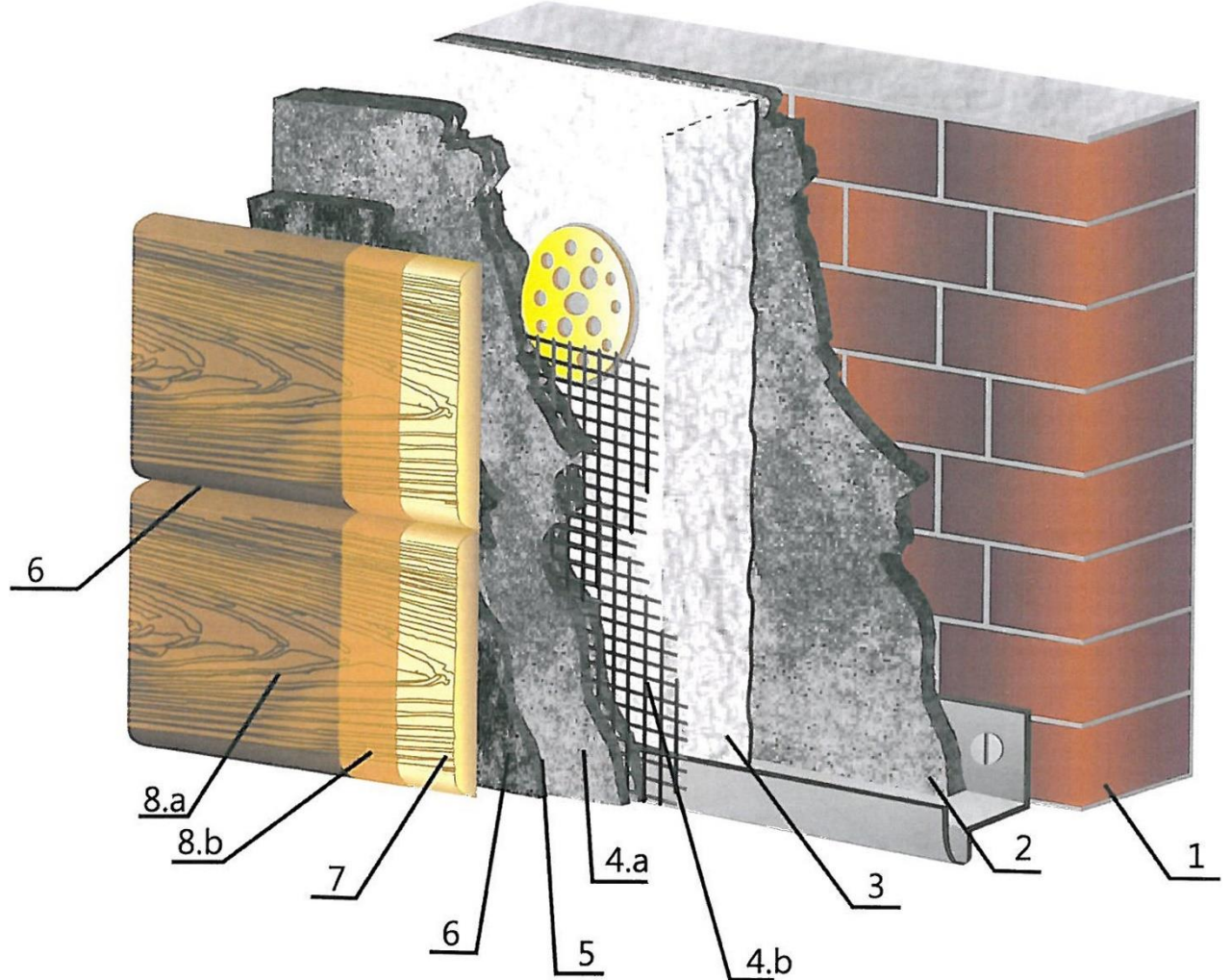
#### **Reports, test reports, classifications and assessments**

1. 03038.1/15/R30NP i 03038.2/15/R30NP Klasyfikacje ogniowe w zakresie rozprzestrzeniania ognia przez ściany przy działaniu ognia od strony elewacji, Zakład Badań Ogniowych ITB, Warszawa 2015 r.
2. LK00-03038/15/R34NK LK00-03038. 1/15/R30NP and 03038.2/15/R30NP *Fire classifications in the field of fire spreading through the walls when exposed to fire from the façade side, Fire Research Institute ITB, Warsaw 2015).*
3. 03038/15/R33NM *Expert opinion on the possibility of introducing new meshes for Greinplast thermal insulating systems, Department of Building Materials, ITB, Warsaw 2015).*
4. 03038/15/R37NM *Opinion on the possibility of declaring in technical approvals additional properties - susceptibility to algal growth – Greinplast facade paints and plasters, Department of Building Materials, ITB, Warsaw 2015).*
5. LM00-3038/14/R22NM *Report on testing of Greinplast FLA facade paint, Department of Building Materials, ITB, Warsaw 2014).*
6. *Test reports no. 637/14/SG, 2004/14, 640/14/SG, 2003/14, 643/14/SG, 2006/14, 244/13/SG, 655/13, 242/13/SG, 656/13, 693/14/SG, 1994/14, 651/14/SG, 1993/14, 645/15/SG, 757/15/SG, Institute of Ceramics and Building Materials, Krakow 2014).*
7. *(Research work on GREINPLAST OEA facade panels to achieve technical approval, 3038/12 / R11NK (LK00-3038/12/R11NK), Department of Structures and Building Elements, ITB).*
8. *Badania laboratoryjne zestawu wyrobów do wykonywania okładzin elewacyjnych z paneli Greinplast OEA dla celów aprobacyjnych, 3038/12/R12NM (LM00-3038/12/R12NM), Zakład Materiałów Budowlanych ITB (Laboratory tests of a set of products for making façade claddings using Greinplast OEA panels for approval purposes, 3038/12/R12NM (LM00-3038/12/R12NM), Department of Building Materials, ITB).*

9. *Identification tests of products included in the GREINPLAST thermal insulation systems – for the needs of the European Technical Approval, NT-651/A/08, Department of New Finishing Techniques, ITB).*
10. *Laboratory tests of GREINPLAST thermal insulation systems (based on mineral wool and foamed polystyrene as thermal insulation materials), NT-659/A/07 – for the needs of the European Technical Approval, Department of New Finishing Techniques, ITB).*
11. *(Selective laboratory tests of GREINPLAST thermal insulation systems – for the needs of the European Technical Approval, NT-575/A/08, Department of New Finishing Techniques, ITB).*

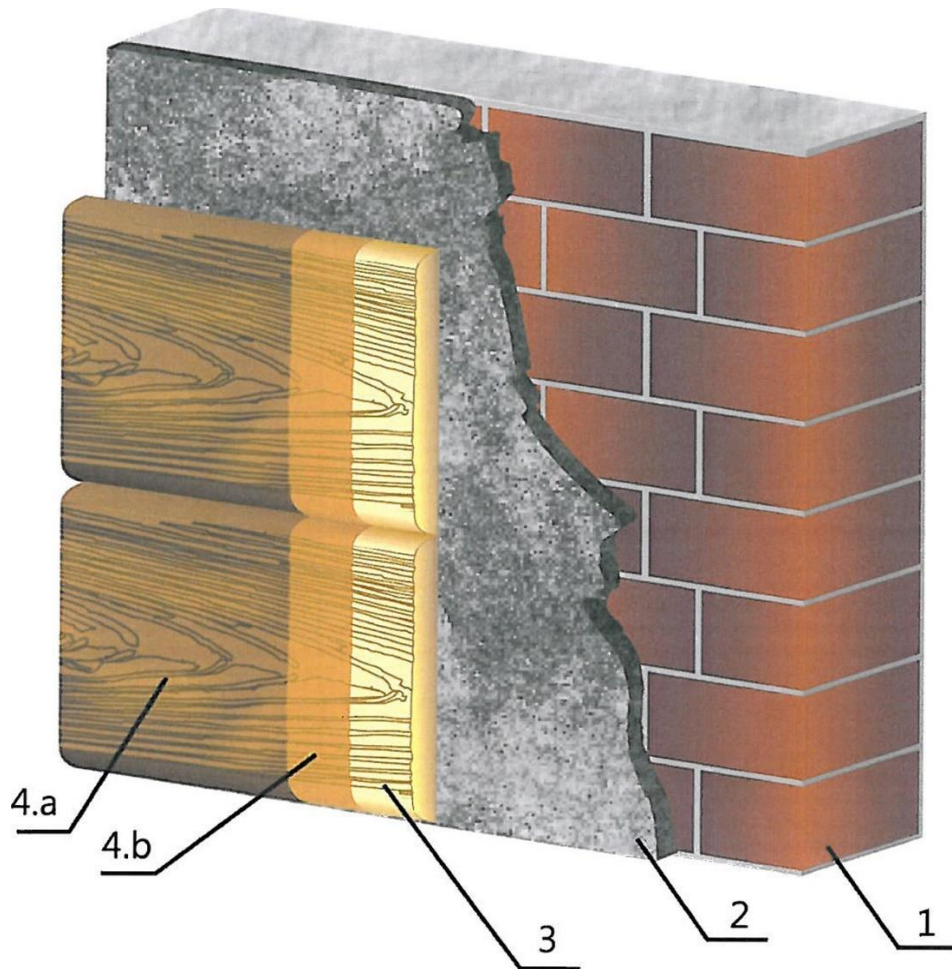
## **FIGURES**

- Fig. 1.** Layers of the thermal insulation systems GREINPLAST OE ..... 19
- Fig. 2.** Layers of the façade cladding GREINPLAST OE ..... 20



1. Mineral, non-flammable substrate (at least class A2-s3,d0 according to PN-EN 13501-1+A1:2010)
2. Adhesive mortar GREINPLAST K or GREINPLAST KS
3. Thermal insulation board EPS
4. Reinforced coat:
  - a) Adhesive mortar GREINPLAST K
  - b) Fibber glass mesh
5. Primer GREINPLAST F – optional
6. Acrylic adhesive GREINPLAST KA
7. Façade panel GREINPLAST OEA
8. Paints:
  - a) primer: GREINPLAST FA-Podkład or GREINPLAST FH-Podkład
  - b) topcoat paint (for wiping) GREINPLAST FA-Lazur
  - or
  - a), b) undercoat and topcoat GREINPLAST FLA

**Fig. 1.** Layers of the thermal insulation systems GREINPLAST OE



1. Mineral, non-flammable substrate (at least class A2-s3,d0 according to PN-EN 13501-1+A1:2010), depending on the condition, optionally primed with GREINPLAST F primer
2. Acrylic adhesive GREINPLAST KA
3. Façade panel GREINPLAST OEA
4. Paints:
  - a) primer: GREINPLAST FA-Podkład or GREINPLAST FH-Podkład
  - b) topcoat paint (for wiping) GREINPLAST FA-Lazur
  - or
  - a), b) undercoat and topcoat GREINPLAST FLA

**Fig. 2.** Layers of the façade cladding GREINPLAST OE