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European Technical Assessment

ETA 13/ 0525
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General Part

Technical Assessment Body issuing the European Technical Assessment:
Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc)

Trade name of the construction product	**POLYREFLEX®**
Product family to which the construction product belongs	**Thermal insulation products for buildings with radiant heat reflective components**
Manufacturer	**OPTIMER SYSTEM, S.A** C/ Plata, 47 28890 Loeches, Madrid, España
Manufacturing plant(s)	YS Karton Cardboard Products Ltd Chaim Herzog Street 35, Rosh Haayin, Israel Reflectherm Parque Industrial do Tortosendo, Rua H, Lote 73 C, Tortosendo, Portugal
This European Technical Assessment contains	7 pages. + Annex 1. Contain confidential information and is not included in the ETA when that assessment is publicly available.
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	European Assessment Document (EAD) Nº 040007-00-1201 for "Thermal insulation products for buildings with radiant heat reflective components"
This version replaces	ETA 13/ 0525 issued on 28/ 04/ 2021

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Specific parts

1 Technical description of the product

The low reflective products of the POLYREFLEX® system is constituted by:

1. **POLYREFLEX®**. One or two external aluminium layers (min. 99% of purity) of low emissivity (0,05) linked in the whole surface to one or several internal layer of polyethylene and/or aluminium. The total thickness of the product goes from 0,15 to 16 mm.

Trade name	Composition
POLYREFLEX SUPER LB NET	Constituted by two external aluminium films with reinforcement mesh.
POLYREFLEX SILVER	Formed by an aluminized PE layer and aluminium face, without an inner core.
POLYREFLEX UNO POLYREFLEX RF1	Thermo-reflective isolation constituted by one external aluminium films (16 µm) with one support layer of polyethylene burbles (thickness 4 mm).
POLYREFLEX SUPER POLYREFLEX RF2	Constituted by two external aluminium films (16 µm) with and without auto adhesive band, and one internal of polyethylene burbles (3-4 mm).
POLYREFLEX BIG	Constituted by two external aluminium films (16 µm) and one internal of polyethylene burbles (8 mm).
POLYREFLEX ULTRA	Constituted by two external aluminium films (16 µm) and two internal layers of polyethylene with big bubbles (8 mm). Between these polyethylene layers there are one aluminium films (16 µm), the burbles in contact with the internal aluminium are open, creating small air space with low emissivity. The total thickness is 16 mm.

2. **POLYREFLEX® BLH**. Made up of two outer layers of polyethylene / polyethylene foam bubbles heat-welded over the entire surface to an internal aluminum film.

POLYREFLEX BLH F	Constituted by one external polyethylene bubbles layer (3 mm), one internal metallized polyester film and one external polyethylene foam 5 mm).
POLYREFLEX BLH B	Constituted by two external polyethylene bubbles layer (3 mm) and one internal aluminium film.
POLYREFLEX BLH B-BIG	Constituted by two external polyethylene bubbles layer (8 mm) and one internal aluminium film.

3. **POLYREFLEX® MULTI**. Two external aluminum films (min. 98.5% of purity) of low emissivity (0,09), linked by a thermal sealing on the edge to one/several internal layer of polyethylene, polyester or aluminized PET. The thickness of the product can vary between 7 - 50 mm.

POLYREFLEX MULTI-7-7	(Thickness 7 mm and 7 layers). Constituted by two external aluminium layers protected with PE + 3 internal foam PE layers (1 mm) + 2 PET layers between the foams.
POLYREFLEX MULTI-5-20	(Thickness 20 mm and 5 layers). Constituted by two external aluminium layers protected with PE + 2 internal polyester fiber (10 mm) + 1 aluminized PET layers between the fibers.
POLYREFLEX MULTI-7-33	(Thickness 33 mm and 7 layers). Constituted by two external aluminium layers protected with PE + 3 internal polyester fiber (10 mm) + 2 aluminized PET layers between the fibers.
POLYREFLEX MULTI-7-40	(Thickness 40 mm and 5 layers). Constituted by two external aluminium layers protected with PE + 3 internal polyester fiber (13 mm) + 2 aluminized PET layers between the fibers.
POLYREFLEX MULTI-9-50	(Thickness 50 mm and 9 layers). Constituted by two external aluminium layers protected with PE + 4 internal polyester fiber (10 mm) + 3 aluminized PET layers between the fibers.

4. **POLYREFLEX® SUPER PETMET**. Two external PET aluminized layers of low emissivity (0,26) linked by a one or several internal layer of polyethylene and/or aluminium.

POLYREFLEX SUPER PETMET	Constituted by polyethylene aluminized film and aluminium layer. with one support layer of polyethylene burbles (thickness 3-4 mm)

The composition of the components

Trade name	Composition
External and internal Aluminium plasticizer	12 µm thick metallised polyester sheet
External and internal aluminium layer	Layers of aluminium with 12 and 16 of thickness with a minimum content of 99% of aluminium. These present an external coat of anti-corrosive lacquer (1-2 g/m^2). This aluminium is adhered by an bi-component adhesive ((2-3 g/m²) to a polyethylene film (50 µm thickness)
Layer of polyethylene burbles	It is made of a polyethylene with a density ≤ 0,94 g/cm³, fluidity index ≤ 2,5 dg/min. The weigh/surface is 150 or 300 g/m^2 (high density) and their thickness varies from 4 to 16 mm, depending to the product. The thermal conductivity is 0,036 (150 g/m^2) y 0.040 (300 g/m^2) W/mK.
Layer of polyethylene foam	Chemical closed cell cross linked LDPE foam density of 25 kg/m^3. Thermal Conductivity 0.038 W/mK.
Polyester wool	100% polyester wool of 10 and 13 mm thickness, depending on the product, with 70 and 80 g/m^2 respectively. Thermal conductivity is 0.039 W/mK.
Reinforcement mesh	Mesh of glass fiber of 16 g/m^2 (aprox) with 5x5 cm weave.
Adhesive band	Styrene butadiene rubber (SBR) based.

POLYREFLEX® is designed and installed in accordance with the manufacturer design and installation instructions.

2 Specification of the intended use in accordance with the applicable European Assessment Document (hereinafter EAD)

2.1 Intended use(s)

POLYREFLEX is a reflective thermal isolated that increases the thermal resistance of the air spaces existing in walls, ceilings, roofs and floors (without load on all surface of POLYREFLEX. The thermal properties of this product are related with the low emissivity surface of the aluminium foil and the space air in contact with them. The thermal resistance of these products is mainly due to the union of **POLYREFLEX® + space air**.

The best thermal resistances are obtained when this product are incorporated into a non-ventilated air space. The minimum thickness recommended for the air space is 2 cm.

POLYREFLEX BLH. It contains a low-E aluminum interlayer with its own space air in contact with it, so this product does not need to be in contact with other external space air. Its intended use is on floors.

The thermal insulation product shall only be installed in structures where it is protected from rain, weathering and moisture, to avoid that the aluminum surface gets dirty and its thermal properties are reduced.

This European Technical Approval does not cover the complete or finished system of insulation. As for the application of all products insulating, the national codes of practice and regulations must be respected for design and implementation of construction systems.

2.2 Relevant general conditions for the use of the kit

The provisions made in this European Technical Assessment are based on an assumed working life of 25 years from installation in the works, according to EAD 040007-00-1201, if the conditions lay down for the installation, packaging, transport and storage as well as appropriate use, maintenance and repair are met. In this respect.

The indications given on the working life cannot be interpreted as a guarantee given neither by the product manufacturer nor by EOTA nor by the Technical Assessment Body issuing this ETA, but are regarded only as a means for choosing the right product in relation to the expected economically reasonable working life of the works.

Installation. The fitness of use of this kit can only be assumed if this is installed according to the manufacturer's instructions, which are part of the MTD to this ETA placed at IETcc. Particularly, it is recommended to consider:

- In all the cases, the user must fulfill the national regulations, in particular in term of fire, wind resistance, risk of condensation and durability of the constructions. The fitness for use of the product is subjected to the following conditions of implementation:
    - Installation carried out by appropriate installer under the supervision of the project representative.
    - Installation in accordance with the manufacturer's specifications.
- It can only be used the components of the kit indicated in this ETA,
- The value of thermal resistance or of thermal coefficient of transmission U of the constructive element has to be determined in accordance with the relevant national provisions. The global thermal resistance of a space air + POLYREFLEX® depend of several factor, such as:
    - Emissivity of each low emissivity layer given in the ETA.
    - Thickness of each air space.
    - Ventilation amount of each air space (tight, weakly or highly ventilated),
    - Orientation of air space: for heat flow up, down or horizontal (see Annex D of EN ISO 6946).
    - The thermal resistance of a non-ventilated air space when it is in contact with this product, is determined according to the standard EN 6946, annex D. In the calculation of the global thermal transmission coefficient of a constructive element, it is necessary to consider the thermal bridges (EN 10211). Note: when the air space is slightly ventilated, the thermal resistance of the air space is the middle and when this air space is ventilated, the thermal resistance of the air space is negligible (EN 6946).
- Constructions integrating the reflective product must be designed and carried out in order to eliminate any condensation risk inside and on the surface from the structural component. The calculation of the condensation risk can carry out according to standard EN 13788.

Before, the installation of POLYREFLEX®, it is recommended to read its security card.

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

The identification tests and the assessment for the intended use of this product according to the Basic Works Requirements were carried out in compliance with the European Assessment Document (EAD) Nº 040007-00-1201 for “Thermal insulation products for buildings with radiant heat reflective components”)

Methods of verification and of assessing and judging are listed afterwards.

3.1 Safety in case of fire (BWR 2)

Basic requirement for construction works 2: Safety in case of fire		
Essential characteristic	**Clause EAD**	**Performance**
Reaction to fire	2.2.1	NPA

3.2 Hygiene, health and environment (BWR 3)

Basic requirement for construction works 3: Hygiene, health, and the environment		
Essential characteristic	**Clause EAD**	**Performance**
Biological resistance	2.2.2	Not relevant for products made out of film or PE/PET foam or other plastic foams

3.3 Safety and accessibility in use (BWR 4)

Basic requirement for construction works 4: Safety and accessibility in use		
Essential characteristic	**Clause EAD**	**Performance**
Corrosion developing capacity (POLYREFLEX)	2.2.3	96 hours (NSS). Pass
Corrosion developing capacity (POLYREFLEX SILVER)	2.2.3	96 hours (NSS). Pass
Corrosion developing capacity (POLYREFLEX MULTII)	2.2.3	NPA
Corrosion developing capacity (POLYREFLEX SUPER PETMET)	2.2.3	NPA

3.4 Protection against noise (BWR 5)

Basic requirement for construction works 5: Protection against noise		
Essential characteristic	**Clause EAD**	**Performance**
Specific airflow resistivity	2.2.4	NPA
Dynamic stiffness	2.2.5	NPA
Impact sound reduction	2.2.6	NPA
Compressibility	2.2.7	NPA
Sound absorption	2.2.8	NPA

3.5 Energy economy and heat retention (BWR 6)

<table>
<tr><th colspan="8">Basic requirement for construction works 6: Energy economy and heat retention</th></tr>
<tr><th>Essential characteristic</th><th>Clause EAD</th><th colspan="6">Performance</th></tr>
<tr><td rowspan="14">Thermal core resistance</td><td rowspan="14">2.2.9</td><td colspan="4">POLYREFLEX SUPER LB NET</td><td colspan="2">0.00</td></tr>
<tr><td colspan="4">POLYREFLEX SILVER</td><td colspan="2">0.00</td></tr>
<tr><td colspan="4">POLYREFLEX UNO and RF1</td><td colspan="2">0.11</td></tr>
<tr><td colspan="4">POLYREFLEX SUPER, RF2 and PETMET</td><td colspan="2">0.11</td></tr>
<tr><td colspan="4">POLYREFLEX BIG</td><td colspan="2">0.22</td></tr>
<tr><td colspan="4">POLYREFLEX ULTRA</td><td colspan="2">0.43</td></tr>
<tr><td colspan="4">POLYREFLEX BLH F</td><td colspan="2">0.21</td></tr>
<tr><td colspan="4">POLYREFLEX BLH B</td><td colspan="2">0.20</td></tr>
<tr><td colspan="4">POLYREFLEX BLH B-BIG</td><td colspan="2">0.40</td></tr>
<tr><td colspan="4">POLYREFLEX MULTI 7-7</td><td colspan="2">0.11</td></tr>
<tr><td colspan="4">POLYREFLEX MULTI 5-20</td><td colspan="2">0.56</td></tr>
<tr><td colspan="4">POLYREFLEX MULTI 7-33</td><td colspan="2">0.9</td></tr>
<tr><td colspan="4">POLYREFLEX MULTI 7-40</td><td colspan="2">1.05</td></tr>
<tr><td colspan="4">POLYREFLEX MULTI 9-50</td><td colspan="2">1.31</td></tr>
<tr><td>Durability of thermal resistance against ageing/ degradation</td><td>2.2.10</td><td colspan="6">See 2.2.11</td></tr>
<tr><td rowspan="5">Emissivity</td><td rowspan="5">2.2.11</td><td rowspan="2">Adhesive Band
(before and after ageing (28 d)</td><td colspan="2">POLIFIX</td><td colspan="2">0.25 / 0.31</td></tr>
<tr><td colspan="2">ALUFIX</td><td colspan="2">0.05 / 0.08</td></tr>
<tr><td rowspan="2">External Aluminium layer
(before and after ageing (28 d)</td><td colspan="2">POLYREFLEX</td><td colspan="2">0.05 / 0.05</td></tr>
<tr><td colspan="2">POLYREFLEX MULTI</td><td colspan="2">0.07 / 0.09</td></tr>
<tr><td>External Aluminized PET layer
(before and after ageing (28 d)</td><td colspan="2">POLYREFLEX SUPER PETMET</td><td colspan="2">0,25 / 0,26</td></tr>
<tr><td>Water vapour diffusion resistance</td><td>2.2.12</td><td colspan="6">μ = 4500 (4 mm)</td></tr>
<tr><td>Water absorption</td><td>2.2.13</td><td colspan="6">NPA</td></tr>
<tr><td>Watertightness</td><td>2.2.14</td><td colspan="6">NPA</td></tr>
<tr><td rowspan="16">Geometry / Mass per square meter (g/m^2)</td><td rowspan="16">2.2.15
2.2.16</td><td>Samples</td><td>Width (m)</td><td>Length (m)</td><td>Thickness (mm)</td><td>Surface roll (m^2)</td><td>g/m^2</td></tr>
<tr><td>POLYREFLEX SUPER LB NET</td><td>1.2</td><td>75</td><td>0.10</td><td>90</td><td>140</td></tr>
<tr><td>POLYREFLEX SILVER</td><td>1.2</td><td>100</td><td>0.13</td><td>120</td><td>159</td></tr>
<tr><td>POLYREFLEX UNO, RF1</td><td>1.2</td><td>15/35/ 40</td><td>3-4</td><td>18/42/48</td><td>200</td></tr>
<tr><td>POLYREFLEX SUPER, RF2 y SUPER PETMET</td><td>1.2</td><td>15/35/ 40</td><td>3-4</td><td>18/42/48</td><td>252</td></tr>
<tr><td>POLYREFLEX BIG</td><td>1.2</td><td>15/30</td><td>8</td><td>18/36</td><td>255</td></tr>
<tr><td>POLYREFLEX ULTRA</td><td>1.2</td><td>20</td><td>16</td><td>24</td><td>350</td></tr>
<tr><td>POLYREFLEX BLH F</td><td>1.2</td><td>15/30</td><td>8</td><td>18/36</td><td>200</td></tr>
<tr><td>POLYREFLEX BLH B</td><td>1.2</td><td>30</td><td>8</td><td>36</td><td>400</td></tr>
<tr><td>POLYREFLEX BLH B-BIG</td><td>1.2</td><td>20</td><td>18</td><td>24</td><td>1200</td></tr>
<tr><td>POLYREFLEX MULTI 7-7</td><td>1.25</td><td>20</td><td>7</td><td>25</td><td>244</td></tr>
<tr><td>POLYREFLEX MULTI 5-20</td><td>1.25</td><td>12/20</td><td>20</td><td>15/25</td><td>320</td></tr>
<tr><td>POLYREFLEX MULTI 7-33</td><td>1.25</td><td>12</td><td>33</td><td>15</td><td>395</td></tr>
<tr><td>POLYREFLEX MULTI 7-40</td><td>1.25</td><td>8</td><td>40</td><td>10</td><td>425</td></tr>
<tr><td>POLYREFLEX MULTI 9-50</td><td>1.25</td><td>12</td><td>50</td><td>15</td><td>480</td></tr>
<tr><td>Squareness</td><td>2.2.17</td><td colspan="6">NPA</td></tr>
<tr><td>Compressive stress or strength for products exposed to compression loads</td><td>2.2.18</td><td colspan="6">NPA</td></tr>
<tr><td rowspan="16">Dimensional stability (Δ%)</td><td rowspan="16">2.2.19</td><td colspan="6">The samples are keep for 48 h at 70 ºC and 50 % HR</td></tr>
<tr><td>Samples</td><td>Width</td><td colspan="2">Length</td><td colspan="2">Thickness</td></tr>
<tr><td>POLYREFLEX SUPER LB NET</td><td>0</td><td colspan="2">-0,1</td><td colspan="2">5</td></tr>
<tr><td>POLYREFLEX SILVER</td><td>0</td><td colspan="2">-0,1</td><td colspan="2">5</td></tr>
<tr><td>POLYREFLEX UNO, RF1</td><td>- 0,3</td><td colspan="2">-0,3</td><td colspan="2">-12</td></tr>
<tr><td>POLYREFLEX SUPER, RF2</td><td>-0,3</td><td colspan="2">-0,1</td><td colspan="2">-21</td></tr>
<tr><td>POLYREFLEX SUPER PETMET</td><td>NPA</td><td colspan="2">NPA</td><td colspan="2">NPA</td></tr>
<tr><td>POLYREFLEX BIG</td><td>-0.3</td><td colspan="2">-0,4</td><td colspan="2">-14</td></tr>
<tr><td>POLYREFLEX ULTRA</td><td>-0,3</td><td colspan="2">-0,3</td><td colspan="2">-20</td></tr>
<tr><td>POLYREFLEX BLH F</td><td>-0,25</td><td colspan="2">-0,25</td><td colspan="2">-1,5</td></tr>
<tr><td>POLYREFLEX BLH B</td><td>-0,25</td><td colspan="2">-0,25</td><td colspan="2">-1,5</td></tr>
<tr><td>POLYREFLEX BLH B-BIG</td><td>-0.3</td><td colspan="2">-0,4</td><td colspan="2">-14</td></tr>
<tr><td>POLYREFLEX MULTI 7-7</td><td>-0,25</td><td colspan="2">-0,25</td><td colspan="2">------</td></tr>
<tr><td>POLYREFLEX MULTI 5-20</td><td>-0,25</td><td colspan="2">-0,25</td><td colspan="2">------</td></tr>
<tr><td>POLYREFLEX MULTI 7-33</td><td>-0,25</td><td colspan="2">-0,25</td><td colspan="2">------</td></tr>
<tr><td>POLYREFLEX MULTI 7-40</td><td>-0,25</td><td colspan="2">-0,25</td><td colspan="2">------</td></tr>
<tr><td>POLYREFLEX MULTI 9-50</td><td>-0,25</td><td colspan="2">-0,25</td><td colspan="2">------</td></tr>
<tr><td>Tensile strength parallel to faces</td><td>2.2.20</td><td colspan="6">NPA</td></tr>
</table>

Tensile strength perpendicular to faces (kPa)	2.2.21	Samples	Initial (kPa)	Ageing 28 d, 70 ºC, 95 % HR	
		POLYREFLEX UNO, RF1	42	65	
		POLYREFLEX SUPER, RF2	42	65	
		POLYREFLEX SUPER PETMET	NPA	NPA	
		POLYREFLEX BIG	42	65	
		POLYREFLEX ULTRA	12	11	
Resistance to tearing (initial / ageing) (N)	2.2.22	Samples	Initial	Ageing 28 d, 70 ºC, 95 % HR	
		POLYREFLEX SUPER LB NET	NPA	NPA	
		POLYREFLEX SILVER	NPA	NPA	
		POLYREFLEX UNO, RF1	75	72	
		POLYREFLEX SUPER, RF2	75	72	
		POLYREFLEX SUPER PETMET	NPA	NPA	
		POLYREFLEX BIG	54	53	
		POLYREFLEX ULTRA	54	53	
		POLYREFLEX MULTI 7-7	56	57	
		POLYREFLEX MULTI 5-20	54	50	
		POLYREFLEX MULTI 7-33	54	50	
		POLYREFLEX MULTI 7-40	54	50	
		POLYREFLEX MULTI 9-50	54	50	
Peel Strength or mechanical resistance of adhesive tape (N/ 5cm)	2.2.23	Samples	Initial	Ageing 28 d, 70 ºC, 95 % HR	Ageing 90 d, 70 ºC, 95 % HR
		Tape ALU-FIX	22	20	17
		Tape POLYFIX	13	19	17
Compressive creep for products exposed to compression load	2.2.24	NPA			
Behaviour under point load for products exposed to compression load	2.2.25	NPA			

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

According to the decision 1999/91/CE of January 1991of the European Commission a system 3 of assessment and verification of constancy of performance) applies.

Product	Intended uses	Level / Classes	System
POLYREFLEX®	Thermal insulation products for buildings with radiant heat reflective components	Any	3

5 Technical details necessary for the implementation of the AVCP system, as provided for the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan which is deposited at IETcc[(1)].

[(1)] The Control Plan is a confidential part of the ETA and only handed over to the notified certification body involved in the assessment and verification of constancy of performance.

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Issued in Madrid on10 of April of 2025
by

Director

On behalf of the Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc – CSIC)