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European Technical Assessment

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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	**BOLTHERM**
Product family to which the construction product belongs	**Thermal insulation products for buildings with radiant heat reflective components**
Manufacturer	Ropre, SA Parque industrial, Rua M, Lote 15 6200 - 027 Covilha, Portugal
Manufacturing plant(s)	Parque industrial, Rua M, Lote 15 6200 - 027 Covilha, Portugal
This European Technical Assessment contains	6 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"

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Specific parts

1 Technical description of the product

The reflective product BOLTHERM is composed by two external aluminium films (min. 99% of purity) cover with an external coat of PET (polyethylene terephthalate) and other of PE (Polyethylene) of emissivity 0.4, linked by a thermo-welded to several internal layer of polyethylene. The total thickness of the product goes from 5.0 to 20 mm.

The BOLTHERM system is constituted by:

Trade name	Composition
BOLTHERM 121P	Constituted by two external aluminium films (6.5 µm) protected with an external coat made of PET (12 µm) + PE (20 µm), and a core of recycled PE/PET bubbles (5mm). The total thickness is 5 mm.
BOLTHERM 121P IGN	Constituted by two external aluminium films (6.5 µm) protected with an external coat made of PET (12 µm) + PE (20 µm), and a core of recycled PE/PET bubbles (5mm) + Fire Resistant Component. The total thickness is 5 mm.
BOLTHERM 231 P	Constituted by two external aluminium films (6.5 µm) protected with an external coat made of PET (12 µm) + PE (20 µm), and a core of two recycled PE/PET bubbles layers (4 mm + 4 mm). The total thickness is 8 mm.
BOLTHERM 235 P	Constituted by two external aluminium films (6.5 µm) protected with an external coat made of PET (12 µm) + PE (20 µm), and a core of two recycled PE/PET bubbles layers (5 + 5 mm) separated with a PE foam (3mm). The total thickness is 13 mm.
BOLTHERM 235 P IGN	Constituted by two external aluminium films (6.5 µm) protected with an external coat made of PET (12 µm) + PE (20 µm),, and a core of two recycled PE/PET bubbles layers (5 + 5mm) separated with a PE foam (3 mm) + Fire Resistant Component. The total thickness is 13 mm.
BOLTHERM 820	Constituted by two external aluminium films (6.5 µm) protected with an external coat made of PET (12 µm) + PE (20 µm), and a core of 9 PE foam (2 mm) + 8 PET metalized (12 µm). The total thickness is 20 mm.
BOLTHERM 809	Constituted by two external aluminium films (6.5 µm) protected with an external coat made of PET (12 µm) + PE (20 µm), and a core of 4 PE foam (2 mm) + 3 PET metalized (12 µm). The total thickness is 13 mm.
BOLTHERM 61006	Constituted by two external aluminium films (6.5 µm) protected with an external coat made of PET (12 µm) + PE (20 µm), and a core of 1 PE foam (5 mm). The total thickness is 5 mm.
Adhesive band	Refª. – 903 2 (50 mm x 50 m) Refª. – 904 (75 mm x 50 m) Band constituted by aluminium layer of 30 µm without any external protection and an adhesive based on Styrene Butadiene Rubber (SBR).

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

2.1 Intended use(s)

BOLTHERM is a Reflective Thermal Insulation that increases the thermal resistance of the air spaces existing in roofs, walls and floors (without load on all surface of BOLTHERM) o ceilings. 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 **BOLTHERM + 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.

The thermal insulation product shall only be installed in structures where it is protected from rain, weathering and moisture, to avoid that the aluminium 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, provided that 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 + BOLTHERM® 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 B 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 B. 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 BOLTHERM®, 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	**Relevant clause in 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	**Relevant clause in 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	2.2.3	168 hours (NSS). Pass

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)

Basic requirement for construction works 6: Energy economy and heat retention		
Essential characteristic	**Clause EAD**	**Performance**
Thermal core resistance	2.2.9	NPA
Durability of thermal resistance against ageing/ degradation	2.2.10	See 2.2.11
Emissivity	2.2.11	
Alumium layer		0.4
Adhesive tape		0.05
Water vapour diffusion resistance	2.2.12	> 20 000
Water absorption	2.2.13	NPA
Watertightness	2.2.14	NPA
Geometry (mm) (width / length / thickness/ Mass per square meter (g/m^2)	2.2.15 2.2.16	

BOLTHERM 121P / BOLTHERM 121P IGN		1200 / 50 000 / 5 / 330
BOLTHERM 231P		1200 / 25 000 / 8 / 600
BOLTHERM 235P / BOLTHERM 235P IGN		1200 / 20 800 / 13 / 780
BOLTHERM 820		1200 / 12 500 / 20 / 440
BOLTHERM 809		1200 / 16 700 / 10 / 230
BOLTHERM 61006		1200 / 33 330 / 5 / 250
Squareness	2.2.17	NPA
Compressive stress or strength for products exposed to compression loads	2.2.18	NPA
Dimensional stability ($\Delta\varepsilon_l$, width, $\Delta\varepsilon_b$, and thickness, $\Delta\varepsilon_d$) (%)	2.2.19	
BOLTHERM 121P / BOLTHERM 121P IGN		0, 0, +10
BOLTHERM 231P		0, 0, -1
BOLTHERM 235P / BOLTHERM 235 P IGN		0, 0, -4
BOLTHERM 820		0, 0, ---
BOLTHERM 809		0, 0, ---
BOLTHERM 61006		0, 0, +10
Tensile strength parallel to face	2.2.20	NPA
Tensile strength perpendicular to face (initial / ageing) (kPa)	2.2.21	
BOLTHERM 121P / BOLTHERM 121P IGN		0.3 / 0.3
BOLTHERM 231P		0.3 / 0.3
BOLTHERM 235P / BOLTHERM 235P IGN		0.3 / 0.3
BOLTHERM 61006		0.7 / 0.5
Resistance to tearing (initial / ageing) (N)	2.2.22	
Boltherm 121P IGN		62 / 57
BOLTHERM 61006		69 / 70
Peel Strength or mechanical resistance of adhesive tape (N/ 5cm) (initial / ageing)	2.2.23	2 / 2.5
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
BOLTHERM	Thermal insulation products for buildings with radiant heat reflective components	Any	3

According to this decision, system 3 of Attestation of Conformity also applies with regard to external fire performance. The system 3 provides: Tasks for the manufacturer: Factory production control and Tasks for the approved body: Initial type-testing of the product.

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)].

5.1 Tasks of the manufacturer

Factory production control. The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall ensure that the product is in conformity with this ETA.

The manufacturer may only use components stated in the technical documentation of this ETA including Control Plan. The incoming raw materials are subjected to verifications by the manufacturer before acceptance.

The factory production control shall be in accordance with the Control Plan. The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.

Other tasks of the manufacturer. The manufacturer shall, on the basis of a contract, involve a body which is notified for the tasks referred to in section 4 in the field of reflective insulation products in order to undertake the actions laid down in this clause. For this purpose, the control plan shall be handed over by the manufacturer to the notified bodies involved.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of this ETA.

5.2 Tasks of notified bodies

Initial type-testing of the product. The initial type-testing have been conducted by the IETcc to issued this ETA in accordance with chapter 2 of the EAD Nº 040007-00-1201 for “Thermal insulation products for buildings with radiant heat reflective components”. The verifications underlying this ETA have been furnished on samples from the current production; these will replace the initial type-testing carried out by the manufacturer.

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by

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Director

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

[(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.