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Trade name of the construction product

Designação comercial do produto de construção

Product family to which the construction product belongs

Família de produtos a que o produto de construção pertence

Manufacturer

Fabricante

Manufacturing plant(s)

Instalações de fabrico

This European Technical Assessment contains

A presente Avaliação Técnica Europeia contém

This European Technical Assessment is issued in accordance with Regulation (EU) No. 305/2011, on the basis of

A presente Avaliação Técnica Europeia é emitida ao abrigo do Regulamento (UE) n.º 305/2011, com base no

THERMOBUILD

In-situ formed loose fill thermal and/or acoustic insulation product made of granulated natural cork and rubber

Produto de isolamento térmico e/ou acústico realizado in situ, constituído por grânulos soltos de cortiça natural e de borracha

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European Assessment Document (EAD) No. 040369-01-1201: Insulation made of loose-fill or compound granulated expanded cork or loose-fill granulated natural cork and rubber

Documento de Avaliação Europeu (EAD) n.º 040369-01-1201: Produto de isolamento constituído por grânulos soltos ou compostos de cortiça expandida granulada ou por grânulos soltos de cortiça natural e de borracha

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1. Technical description of the product

This European Technical Assessment (ETA) applies to in-situ formed loose fill thermal and/or acoustic insulation product made of granulated recycled natural cork and recycled rubber with trade name *Thermobuild*. The ETA holder is ultimately responsible for the product specified in this ETA.

The granulated recycled natural cork is obtained by grinding and/or milling all kinds of cork industry derivatives, the less noble sub-layers of the cork industry that are commonly waste, used corks, and end-of-life cork linings removed from homes and other applications.

Regarding rubber, granules are obtained from tire recycling with a rubber polymer base.

The product is delivered to the construction works site packed in plastic fabric sacks with a nominal volume of 0.06 m³.

The in-situ loose fill insulation product is applied manually or mechanically (with a blowing machine) and may form layers (which serve as thermal and acoustic insulation) of any desired thickness, in new buildings and in rehabilitation works.

The European Technical Assessment is issued for the product on the basis of agreed data/information, deposited with Laboratório Nacional de Engenharia Civil, which identifies the product that has been assessed and judged. The European Technical Assessment applies only to products satisfying the requirements of this agreed data/information.

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

Intended use

The in-situ formed loose fill granulated recycled natural cork and recycled rubber is intended for use in fully supported specifications as:

- Thermal insulation and/or acoustic insulation (sound absorption, airborne sound insulation) in horizontal or low sloped surfaces of flat or pitched roofs and ceilings, inside cavities, or exposed in non-habitable attic floors;
- Thermal insulation and/or acoustic insulation (sound absorption, airborne/impact sound insulation) of ground or raised floors, inside cavities between beams, joist battens, and similar substructures.
- Thermal insulation and/or acoustic insulation (sound absorption, airborne sound insulation) of double leaf walls.

General assumptions

The construction product shall not be used in places where it may be exposed to wetting, weathering and direct contact to soil, exposed to compression loads, exposed to naked flame during rehabilitation works or be in contact with surfaces at high temperature.

Where necessary the loose fill insulation is used in conjunction with a water vapour barrier, a weatherproof or separation layer as specified by the designer, but such elements are not covered by this ETA.

Apart from meeting specific insulation requirements also requirements and regulations concerning components and materials to be used in combination with the thermal insulation as well as the entire solution build-up are necessary for the successful use of the insulation in the intended uses. Evaluation of the thermal insulation takes account of the end-use conditions.

Concerning the application of the insulation material, the respective national regulations shall be observed.

The design value of the thermal conductivity or thermal resistance shall be laid down according to relevant national provisions.

For evaluating the in-situ formed loose fill thermal and/or acoustic insulation product made of granulated recycled natural cork and recycled rubber it is assumed that:

- a. The product will be transported, stored and installed according to the manufacturer's instructions or (in absence of such instructions) according to the usual practice of the building professionals;
- b. The existing waterproofing layer (roofs, wet areas) shall be watertight and in good condition;
- c. The supporting element shall be sufficiently structurally sound to carry the additional imposed load exerted by the insulating layer without undue deformation;
- d. If required, the adequate ventilation above the insulation layer is assured;
- e. If required, a separation layer is provided.

This European Technical Assessment, based on the provisions, test and assessment methods in the EAD 040369-01-1201, have been written based upon the assumed intended working life of the in-situ formed loose fill insulation for the intended use of 50 years, provided that the product is subjected to appropriate use and maintenance.

The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right product in relation to the expected economically reasonable working life of the works.

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

Sampling, conditioning, testing and the assessment for the intended use of this in-situ formed loose fill thermal insulation according to the Basic Requirements were carried out in compliance with the EAD 040369-01-1201 – *Insulation made of loose-fill or compound granulated expanded cork or loose-fill granulated natural cork and rubber*.

Table 1 presents the relevant performance of the product and the corresponding methods used in its assessment.

TABLE 1

Performance of the product and methods used for its assessment

Basic requirement for construction works	Essential characteristic	Assessment method	Type of expression of product performance (level, class, description)		
BWR 2 Safety in case of fire	Reaction to fire	EN 13501-1 CDR 2016/364 EN 11925-2 EAD, Annex A	Class E (insulating layer thickness ≥ 40 mm)		
	Propensity to undergo continuous smouldering	EN 16733 EAD, Annex B	The product shows propensity to undergo continuous smouldering		
BWR 3 Hygiene, health and the environment	Content, emission and/or release of dangerous substances <i>VOC and SVOC</i>	EN ISO 16000-9 EN ISO 16000-6 EN 16516	Compound	CAS	Concentration ($\mu\text{g}/\text{m}^3$)
			Acetic acid	64-19-7	24.0
			Butanone	78-93-3	10.7
			Methyl isobutyl ketone	108-10-1	29.5
			Cyclohexanone	108-94-1	25.4
			α -pinene	80-56-8	8.21
			2-ethyl-1-hexanol	104-76-7	6.70
			Benzothiazole	95-16-9	21.6
			Longifolene	475-20-7	4.07
			TVOC	–	132
TSVOC	–	< 5.0			
<i>Formaldehyde</i>	EN ISO 16000-3 EN ISO 16000-9 EN ISO 16000-11	Compound	CAS	Concentration ($\mu\text{g}/\text{m}^3$)	
		Formaldehyde	50-00-0	< 0.34*	
* Limit of detection					
<i>PAH e B[a]P</i>	ISO 13877 ISO 18287 NIOHS 5515	Compound	CAS	Concentration ($\mu\text{g}/\text{m}^3$)	
		Acenaphthene	83-32-9	< 6.01E-06*	
		Acenaphthylene	202-96-8	< 6.01E-06*	
		Anthracene	120-12-7	< 6.01E-06*	
		Benzo[a]anthracene	56-55-3	< 6.01E-06*	
		Benzo[a]pyrene	50-32-8	< 6.01E-06*	
		Benzo[b]fluoranthene	205-99-2	< 6.01E-06*	
		Benzo[ghi]perylene	191-24-2	< 6.01E-06*	
		Benzo[k]fluoranthene	207-08-9	< 6.01E-06*	
		Chrysene	218-01-9	< 6.01E-06*	
		Dibenz[ah]anthracene	53-07-3	< 6.01E-06*	
		Fluoranthene	206-44-0	< 6.01E-06*	
		Fluorene	86-73-7	< 6.01E-06*	
		Indeno[123cd]pyrene	193-39-5	< 6.01E-06*	
		Naphthalene	91-20-3	2.40E-04	
		Phenanthrene	85-01-8	< 6.01E-06*	
Pyrene	129-00-0	< 6.01E-06*			
Σ PAH	–	2.40E-04			
* Limit of detection					
<i>Nitrosamines</i>	Kautschuck Gummi Kunststoffe, Nr. 6/91 OSHA 38	Compound	CAS	Concentration ($\mu\text{g}/\text{m}^3$)	
		N-nitrosodibutylamine	924-16-3	< 4.40E-05*	
		N-nitrosodiethylamine	55-18-5	< 4.40E-05*	
		N-nitrosodimethylamine	62-75-9	< 4.40E-05*	
		N-nitrosodiphenylamine	86-30-6	< 4.40E-05*	
		N-nitrosomethylethylamine	10595-95-6	< 4.40E-05*	
		N-nitrosomorpholine	59-89-2	< 4.40E-05*	
		N-nitrosopiperidine	100-75-4	< 4.40E-05*	
		N-nitrosopyrrolidine	930-55-2	< 4.40E-05*	
		Σ Nitrosamines	–	–	
* Limit of detection					
Biological resistance	EAD, Annex C EN ISO 846	Intensity of growth: 2			
Water vapour diffusion resistance	EN 12086 (Condition A)	$\mu = 2.3$ (thickness = 100 mm)			

TABLE 1

Performance of the product and methods used for its assessment (cont.)

Basic requirement for construction works	Essential characteristic	Assessment method	Type of expression of product performance (level, class, description)	
BWR 4 Safety and accessibility	Corrosion developing capacity	EN 15101-1, Annex D	Copper coupon: Class CR Zinc coupon: Class CR	
BWR 5 Protection against noise	Impact sound reduction	EN ISO 10140-3 EN ISO 10140-5 EN ISO 717-2	Assessed floor build-up: Gypsum board (12 mm); wooden structure, made by joists (160 × 80 mm) spaced 400 mm apart and an air gap / air gap fully filled with <i>Thermobuild</i> (160 mm); wooden floor (20 mm) $\Delta L_w = 6$ dB	
	Airborne sound insulation	EN ISO 10140-2 EN ISO 10140-5 EN ISO 717-1	Assessed floor build-up: Gypsum board (12 mm); wooden structure, made by joists (160 × 80 mm) spaced 400 mm apart and an air gap fully filled with <i>Thermobuild</i> (160 mm); wooden floor (20 mm) $R_w = 47$ dB	
	Sound absorption	EN ISO 354 EN ISO 11654	Thickness = 50 mm Thickness = 160 mm	$\alpha_w = 0.40$ (H) (class D) $\alpha_w = 0.85$ (L) (class B)
	Airflow resistance	EN ISO 9053-1	Performance not assessed	
BWR 6 Energy economy and heat retention	Thermal conductivity of insulation	EN 12667 EAD, Annex E EN 13170, Annex A	$\lambda_{10, dry, 90/90} = 0.053$ W/(m.K)	
	Moisture conversion coefficients	EN 10456 EAD, Annex E	mass related moisture content: at 23 °C/50% HR $u_{23,50} = 0.022$ kg/kg at 23 °C/80% HR $u_{23,80} = 0.028$ kg/kg mass related moisture content conversion coefficients: $f_{u1} = 3.15$ kg/kg (dry – 23/50) $f_{u1} = 6.93$ kg/kg (23/50 – 23/80)	
	Moisture conversion factors		$F_{m1} = 1.07$ (dry – 23/50) $F_{m2} = 1.05$ (23/50 – 23/80)	
	Moisture adsorption (hygroscopic sorption properties)	EN ISO 12571	mass related moisture content: at 23 °C/50% HR $u_{23,50} = 0.017$ kg/kg at 23 °C/80% HR $u_{23,80} = 0.027$ kg/kg	
	Loose bulk density (ρ)	EN 1097-3	$\rho = 185$ kg/m ³ ± 10%	
	Settlement	EN 15101-1, Annex B (method B.1)	$S_{yc} = 3.93\%$ Class SH 5	
	Water absorption (short term, partial immersion)	EN ISO 29767 (method A)	$W_p \leq 0,79$ kg/m ² (thickness = 150 mm)	
	Particle size distribution	EN 933-1	Sieve mesh size (mm)	Cumulative percent passing (% w/w)
		4.0	99.4	
		2.0	12.0	
		1.0	0.1	
		0.5	0.1	

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

According to Decision 1999/91/EC, as amended by Decision 2001/596/EC, of the European Commission the system of assessment and verification of constancy of performance (according to Annex V of Regulation (EU) N° 305/2011) is 3.

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Laboratório Nacional de Engenharia Civil prior to CE marking.

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By

Laboratório Nacional de Engenharia Civil (LNEC)

The Board of Directors



Carlos Pina
President

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