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Authorised and notified according to Article 10 of the Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products

MEMBER OF EOTA

European Technical Approval ETA-08/0312

Trade name:	Thermocell in-situ formed loose fill insulation
Holder of approval:	Thermocell Danmark A/S Næssundvej 423A DK 7960 Karby Telephone +45 96 69 50 60 Telefax +45 96 69 50 70 Internet www.thermocell.dk
Generic type and use of construction product:	In-situ formed loose fill thermal insulation material made of vegetable or animal fibres
Valid from: to:	2008-11-24 2013-11-24
Manufacturing plant:	Thermocell Danmark A/S Næssundvej 423A DK 7960 Karby

This European Technical Approval contains: 10 pages



European Organisation for Technical Approvals

Europæisk Organisation for Tekniske Godkendelser

I LEGAL BASIS AND GENERAL CONDITIONS

- 1 This European Technical Approval is issued by ETA-Danmark A/S in accordance with:
- Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products¹, as amended by Council Directive 93/68/EEC of 22 July 1993² and Regulation no. 1882/2003 of the European Parliament and of the Council³.
 - Bekendtgørelse 559 af 27-06-1994 (afløser bekendtgørelse 480 af 25-06-1991) om ikrafttræden af EF direktiv af 21. december 1988 om indbyrdes tilnærmelse af medlemsstaternes love og administrative bestemmelser om byggevarer.
 - Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex to Commission Decision 94/23/EC⁴.
- 2 ETA-Danmark A/S is authorized to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European Technical Approval and for their fitness for the intended use remains with the holder of the European Technical Approval.
- 3 This European Technical Approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European Technical Approval.
- 4 This European Technical Approval may be withdrawn by ETA-Danmark A/S pursuant to Article 5(1) of Council Directive 89/106/EEC.
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- 6 This European Technical Approval is issued by ETA-Danmark A/S in English. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

1 Official Journal of the European Communities N° L40, 11 Feb 1989, p 12.

2 Official Journal of the European Communities N° L220, 30 Aug 1993, p 1.

3 Official Journal of the European Union no. L 284, 31.10.2003, p. 1

4 Official Journal of the European Communities N° L 17, 20 Jan 1994, p 34.

II SPECIAL CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product and intended use

1.1 Definition of the products

This European Technical Approval applies to the insulation made of in-situ formed loose fill wood fibres with the designation:

Thermocell loose fill insulation

The wood fibres are derived from wood by mechanical crushing. During the manufacturing process the product is provided with a fire retardant and an additive for enhancing the biological resistance (amoniumpolyphosphate and boric acid).

1.2 Intended use

The insulating material serves for the production of insulation layers, not exposed to compression loads, by means of blowing at the place of use. The blowing is carried out in dry conditions.

The insulating material is used for thermal insulation. The insulation is not used for airborne sound insulation.

The insulating material can be used for the following intended uses:

Area of application for walls

- Space filling insulation in closed cavities of exterior and interior walls

Area of application for roofs and ceilings / floors

- Insulation in closed cavities between rafters and timber beams as well as cavities in similar structures
- Exposed insulation on horizontal or moderately pitched areas ($\leq 10^\circ$), e.g. insulation of topmost storey ceilings which are not subject to foot traffic, however, are accessible
- Cavity insulation between floor joists battens and similar substructures

The insulation products shall not be used in structures where it will be exposed to wetting, weathering and moisture and in such with direct contact to soil.

The provisions made in this European technical approval are based on an assumed working life of the insulating material of 50 years, provided that the conditions laid down in sections 4.2, 5.1 and 5.2 for the packaging, transport, storage, installation and use are met. 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 products in relation to the expected economically reasonable working life of the works.

2 Characteristics of products and methods of verification

2.1 Composition and manufacturing process

The insulation material shall as far as its composition and manufacturing process is concerned, correspond the product subject to the approval tests. Details of composition and manufacturing process are deposited at ETA-Danmark.

2.2 Density

The density of the insulating material is determined according to ISO/CD 183937. Depending on the area of application the minimum densities stated in Table 1 are to be observed.

Table 1: Densities depending on the area of application

Area of application	Installation density kg/m ³
cavity insulation in walls	46
cavity insulation in pitched roofs, cavity insulation in floors in case of subsequent blowing into closed cavities	46
cavity insulation in floors, exposed insulation on horizontal and moderately pitched areas ($\leq 10^\circ$)	30

Independent of the area of application the density shall not exceed the value of 47 kg/m³.

2.3 Settlement

The settlement is determined according to ISO/CD 183935 following the test methods stated in Table 2. The maximum values of settlement stated in Table 2 are not exceeded.

Table 2: Settlement depending on the test method

Test method according to ISOP/CD 18393	Settlement %	Bulk density kg/m ³	Settled density kg/m ³
Method A – settling by impact excitation	6,8	27,0	29,0
Method C – settling of wall cavity insulation by vibration	0	47,0	47,0
Method D – Settling by specified climatization	8,2	26,6	29,0

2.4 Thermal conductivity

The thermal conductivity of the products is determined according to EN 126677. The declared value of thermal conductivity is determined according to EN 10 456.

The fractile value of thermal conductivity for the density range of 26 kg/m³ - 47 kg/m³ is $\lambda_{(10,dry,90/90)} = 0,0388$ W/(mK) representing at least 90 % of the production with a confidence limit of 90%

The declared value of thermal conductivity for the density range of 26 kg/m³ - 47 kg/m³ is $\lambda_{D(23,50)} = 0,039$ W/(mK) – determined by conversion of the (10,dry,90/90) value.

For conversion of humidity the following applies:

- the moisture content mass by mass at 23 °C/50 % relative humidity: $u_{23,50} = 0,08$ kg/kg
- the moisture content conversion coefficient mass by mass: $f_{u1(dry-23/50)} = 0,042$ kg/kg and 0,31 kg/kg for densities 26 kg/m³ and 47 kg/m³ respectively

No performance is determined for the conversion factor to high moisture content.

For the admissible deviation of an individual value of the thermal conductivity from the declared value the method described in EN 1317210 Annex F applies.

2.5 Reaction to fire

The reaction to fire is tested in accordance with EN ISO 11925-2 respecting the mounting and fixing rules described in annex G of the CUAP and classified in accordance with EN 13501-1

The insulation material meets the classification criteria for Euroclass E within the field of application of a nominal density of 26 – 47 kg/m³

2.6 Resistance to the growth of mould

Verification of the resistance to the growth of mould was performed according to the EOTA testing procedure. The assessment of the growth of fungi according to the standard EN ISO 846, Table 4, resulted in the evaluation level 0.

2.7 Airflow resistance

No performance determined

2.8 Corrosion developing capacity on metal construction products

No performance determined

2.9 Retention of additives

The test and the assessment of the retention of additives have been verified according to the EOTA testing procedure. No decrease in the reaction to fire behaviour or to the resistance to mould growth was determined.

2.10 Water absorption

No performance determined

2.11 Water vapour diffusion factor

In the absence of a measured value the water vapour diffusion resistance factor $\mu = 1$

2.12 Dangerous substances

The product consists of wood fibres and fire retardants and additive for enhancing the biological resistance (amoniumpolyphosphate and boric acid) and complies with the provisions of Guidance Paper H⁵.

The manufacturer has made a declaration in respect to the above

In addition to the specific clauses relating to dangerous substances contained in this European Technical Approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

⁵ Notes are stated in Guidance Paper H: A harmonised approach relating to dangerous substances under the Construction Products Directive, Brussels, 18 February 2000

3 Evaluation of Conformity and CE marking

3.1 Attestation of Conformity system

According to the decision 1999/91/EC of the European Commission amended by decision 2001/596/EC the system 3 of attestation of conformity applies, since the reaction to fire classification is E.

This system of attestation of conformity is defined as follows:

System 3: Declaration of conformity of the product by the manufacturer on the basis of:

(a) Tasks for the manufacturer:

(1) factory production control;

(b) Tasks for the approved body:

(2) initial type-testing of the product.

3.2 Responsibilities

3.2.1 Tasks of the manufacturer

3.2.1.1 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 insure that the product is in conformity with this European technical approval.

The manufacturer may only use initial materials stated in the technical documentation of this European technical approval.

The factory production control shall be in accordance with a control plan relating to this European technical approval, which is part of the technical documentation of this European technical approval. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited with ETA-Danmark

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

3.2.1.2 Other tasks of manufacturer

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 in the field of insulating materials in order to undertake the actions laid down in section 3.2.2. For this purpose, the control plan referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body involved.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of this European technical approval

3.2.2 Tasks of approved bodies

The approved body shall perform the

- initial type-testing of the product

in accordance with the provisions laid down in the control plan.

For initial type-testing the results of the test carried out as part of the assessment for the European technical approval shall be used, provided nothing changes in the production or at the factory. Otherwise the necessary initial type-testing shall be agreed on between ETA-Danmark and the approved bodies involved.

The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

3.3 CE marking

The CE marking shall be affixed on the packaging or on the accompanying commercial document, e. g. the EC declaration of conformity. The letters "CE" shall be accompanied by the following additional information:

- the name and address of the producer (legal entity responsible for the manufacturer),
- the last two digits of the year in which the CE marking was affixed,
- the number of the European technical approval,
- identification of the product (trade name),
- installation density depending on the area of application,
- filling weight
- declared value of thermal conductivity,
- reaction to fire: class according to EN 13501-1

4 Assumptions under which the fitness of the product for the intended use was favourably assessed

4.1 Manufacturing

The European technical approval is issued for the product on the basis of agreed data/information, deposited with ETA-Danmark, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to ETA-Danmark before the changes are introduced. ETA-Danmark will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA shall be necessary.

4.2 Installation

The insulating material shall only be installed in structures where it will be protected from wetting, weathering and moisture.

The installation instructions given by the manufacturer shall be taken into account. Installation by blowing of the insulating material shall be performed by companies trained by the manufacturer.

In case of exposed insulation on pitched areas ($\leq 10^\circ$) slipping of the insulating material shall be avoided by appropriate measures.

The product shall be protected from moisture during installation. The insulating material shall not be exposed to compression loads. The conditions according to clause 1.2 shall be taken into account.

4.2.1 Parameters for the design of construction works or parts of construction works

4.2.1.1 Design value of thermal conductivity

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

4.2.1.2 Nominal thickness

When calculating the thermal resistance, the nominal thickness of the insulation layer according to the below table 3 shall be applied.

Table 3: Nominal thickness depending on processing

processing of the insulating material	nominal thickness
cavity insulation in walls	clear span of the filled cavity
cavity insulation in pitched roofs, cavity insulation in floors in case of subsequent blowing into closed cavities	clear span of the filled cavity
cavity insulation in floors, exposed insulation on horizontal, and moderately pitched areas ($\leq 10^\circ$)	installation thickness of the insulating material minus 20 %

The insulation layer shall have a constant installation thickness taking account of the nominal thickness. For that purpose suitable height marks shall be arranged in sufficient distances before the processing. The executing company shall check the installation thickness.

When blowing in into closed cavities it shall be made sure by appropriate measures (e. g. control drillings) that the cavity is completely filled with the insulating material.

4.2.1.3 Water vapour diffusion resistance coefficient

For the determination of the diffusion-equivalent air layer thickness of the insulating material the water vapour diffusion resistance factor $\mu = 1$ shall be used for calculating

4.2.1.4 Installation density

Depending on the area of application the densities at built-in stage stated in the below table 4 are to be observed.

Table 4: Densities depending on the area of application

Area of application	Installation density kg/m ³
cavity insulation in walls	46
cavity insulation in pitched roofs, cavity insulation in floors in case of subsequent blowing into closed cavities	46
cavity insulation in floors, exposed insulation on horizontal and moderately pitched areas ($\leq 10^\circ$)	30

The density is determined by calculation as a quotient from the mass of the material brought in and the full volume. The executing company shall check the density.

4.2.2 Executing companies

The insulating material may only be installed by companies stated in a list of the manufacturer which have adequate experience in installing the material. Concerning this matter the manufacturer has to train these companies.

The executing company shall issue a certificate which contains the following information with reference to this European technical approval for each application place:

- Identification of the product (trade name),
- Number of the European technical approval,
- Executing company
- Building project and building component
- Date of installation,
- Method of processing
- Installation thickness

5 Indications to the manufacturer

5.1 Packaging, transport and storage

Packaging of the products has to be such that they are protected from moisture during transport and storage unless other measures are foreseen by the manufacturer for this purpose.

5.2 Use, maintenance and repair

In the information accompanying the CE marking the manufacturer shall specify that the product shall be installed following the installation instructions given by the manufacturer (blowing by trained companies according to 4.2.2 only) and that it is to be protected from moisture during transport, storage and installation.



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