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Anstalt des öffentlichen Rechts

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Ermächtigt und notifiziert gemäß Artikel 10 der Richtlinie des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte (89/106/EWG)

DIBt

Mitglied der EOTA

European Technical Approval ETA-05/0008

English translation prepared by DIBt

Handelsbezeichnung *Trade name*	Zostera-Dämm
Zulassungsinhaber *Holder of approval*	Seegras Innovation GmbH i. Gr. Dorfstraße 6 23948 Niederklütz
Zulassungsgegenstand und Verwendungszweck *Generic type and use of construction product*	Loser Wärmedämmstoff aus Seegras *Loose fill thermal insulating material made of sea grass*
Geltungsdauer vom *Validity from* bis *to*	31. Januar 2005 31. Januar 2010
Herstellwerk *Manufacturing plant*	Seegras Innovation GmbH i. Gr. Dorfstraße 23948 Grundshagen
Diese europäische technische Zulassung umfasst *This European Technical Approval contains*	8 Seiten *8 pages*

I LEGAL BASES AND GENERAL CONDITIONS

1 This European Technical Approval is issued by Deutsches Institut für Bautechnik 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 products[1], amended by the Council Directive 93/68/EEC of 22 July 1993[2];
- *Gesetz über das In-Verkehr-Bringen von und den freien Warenverkehr mit Bauprodukten zur Umsetzung der Richtlinie 89/106/EWG des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte und anderer Rechtsakte der Europäischen Gemeinschaften (Bauproduktengesetz - BauPG) vom 28. April 1998[3];*
- Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex of Commission Decision 94/23/EC[4];

2 Deutsches Institut für Bautechnik 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 Deutsches Institut für Bautechnik, in particular after information by the Commission on the basis of Article 5 (1) of Council Directive 89/106/EEC.

5 Reproduction of this European Technical Approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of the Deutsches Institut für Bautechnik. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European Technical Approval.

6 The European Technical Approval is issued by the approval body in its official language. This version corresponds to the version circulated within EOTA. Translations into other languages have to be designated as such.

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1 Official Journal of the European Communities N° L 40, 11.02.1989, p. 12

2 Official Journal of the European Communities N° L 220, 30.08.1993, p. 1

3 *Bundesgesetzblatt I, p. 812, zuletzt geändert durch Gesetz* ('last amended by law on') *vom 15.12.2001, Bundesgesetzblatt I, p. 3762*

4 Official Journal of the European Communities N° L 17, 20.01.1994, p. 34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product and intended use

1.1 Definition of product

This European technical approval applies to the loose fill thermal insulating material made of sea grass with the designation:

"Zostera-Dämm"

For production of the thermal insulating material the natural see grass is cleaned, crushed and dried. The product contains no additives added during the production process.

1.2 Intended use

The thermal insulating material serves for the production of insulation layers, not exposed to compression loads, by means of machine processing at the place of use.

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

Area of application for walls

- Space-filling insulation in closed cavities of external and interior walls of timber frame constructions and similar structures

Area of application for roofs and ceilings/floors

- Insulation in closed cavities between rafters and timber beams as well as in cavities of corresponding structures
- Exposed insulation on horizontal areas, e. g. insulation of topmost storey ceilings which are not subjected to foot traffic, however, are accessible
- Cavity insulation between flooring joist battens and similar substructures

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

The thermal insulating material shall not be used in ventilated facades.

As to the application of the thermal insulation material, the respective national regulations shall in addition be observed.

The requirements given in this European technical approval are based on an assumed intended working life of the insulating material of 50 years. This indications on the working life cannot be interpreted as a guarantee given by the producer, but are regarded only as a means for choosing the right product in relation to the expected economically reasonable working life of the works.

2 Characteristics of the product and methods of verification

2.1 Composition and production methods

With regard to composition and production method the thermal insulating material shall correspond to that which was the basis for the approval tests. Composition and production methods are deposited with Deutsches Institut für Bautechnik.

The ETA is issued for the product on the basis of agreed data/information deposited with Deutsches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product/production process, which could result in this deposited data/information being incorrect, shall be notified to Deutsches Institut für Bautechnik before the changes are introduced. Deutsches Institut für Bautechnik 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/alterations to the ETA shall be necessary.

2.2 Density and settlement

The density and the settlement of the thermal insulating material are determined according to ISO/CD 18393[5] following the test methods stated in Table 1.
The density at built-in stage shall be at least 70 kg/m³ and shall not exceed the value of 80 kg/m³. The maximum values of settlement stated in Table 1 are not exceeded.

Table 1: Settlement depending on the test method

Test method according to ISO/CD 18393	maximum settlement in %
Method A – Settling by impact excitation	4
Method C – Settling of wall cavity insulation by vibration	0
Method D – Settling by specified climatization	11

2.3 Thermal conductivity

The thermal conductivity of the thermal insulating material is determined at a reference temperature of 10° C according to EN 12667[6]. The declared value of thermal conductivity, determined according to the standard EN ISO 10456[7] for a moisture content of the thermal insulating material at 23 °C/50 % relative humidity, amounts to:

$\lambda = 0.045$ W/(m · K)

The declared value of thermal conductivity is representative for at least 90 % of the production with a confidence level of 90 % and applies to the density range given in section 2.2. from 70 kg/m³ to 80 kg/m³.
For conversion of humidity the following applies:

- the mass-related moisture content at 23 °C/50 % relative humidity: u = 0.14 kg/kg
- the mass-related moisture content at 23 °C/80 % relative humidity: u = 0.33 kg/kg
- the conversion coefficient for the mass-related moisture content : $f_{u1(dry-23/50)} = 0.20$
- the conversion coefficient for the mass-related moisture content : $f_{u2(23/50-23/80)} = 0.96$

For the admissible deviation of an individual value of the thermal conductivity from the declared value the method described in EN 13172[8] section 7 applies.

2.4 Reaction to fire

The reaction to fire of the thermal insulating material is tested according to the standard EN ISO 11925[9] and classified according to the standard EN 13501-1[10]. The insulating product meets the criteria of class E according to EN 13501-1.

2.5 Resistance to the growth of mould

Verification of the resistance to the growth of mould was performed according to the EOTA testing procedure (CUAP "In situ formed loose fill thermal insulation material and/or acoustic insulation material made of vegetable or animal fibres" Edition June 2003). The assessment of the growth of fungi according to the standard EN ISO 846[11], Table 4, resulted in the evaluation level 3.

5	ISO/CD 18393:2002-08	Thermal insulation – Accelerated ageing of thermal insulation materials – Assessment of settling of loose-fill thermal insulation used in attic and closed cavity applications
6	EN 12667:2001-01:	Thermal performance of building materials and products – Determination of thermal resistance by means of guarded hot plate and heat flow meter methods – Products of high and medium thermal resistance
7	EN ISO 10456:1999-12:	Building materials and products – Procedures for determining declared and design thermal values
8	EN 13172:2001-05:	Thermal insulation products - Evaluation of conformity
9	EN ISO 11925-2:2002-02:	Reaction to fire tests for building products – Part 2: Ignitability when subjected to direct impingement of flame
10	EN 13501-1:2002-06:	Fire classification of construction products and building elements Part 1: Classification using data from reaction to fire tests
11	EN ISO 846:1997-06:	Plastics – Evaluation of the action of microorganisms

In order to avoid a growth of mould fungi, the constructive use conditions according to clause 5.2 are to be observed.

2.6 Airflow resistance

Airflow resistance of the thermal insulating material is determined according to the standard EN 29053[12], Method A. The mean value of the airflow resistance per unit length at a density of at least 75 kg/m³ is 1.0 kPa · s/m² or more.

2.7 Corrosion-developing capacity

No performance determined.

2.8 Water absorption

No performance determined.

2.9 Dangerous substances

In addition to the specific clauses (see 2.1) 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 EC Construction Products Directive, these requirements need also to be complied with, when and where they apply.

3 Attestation of conformity and CE marking

3.1 System of attestation of conformity

System 3 according to directive 89/106/EEC[2], Annex III.2.(ii), second possibility:

a) Tasks for the manufacturer: - factory production control

b) Tasks for the approved body: - initial type-testing of the product

3.2 Responsibilities

3.2.1 Tasks for the manufacturer; factory production control

The manufacturer shall have a factory production control system at his plant and shall exercise regular controls.

All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures. The factory production control system ensures that the product is in conformity with this European technical approval.

In the framework of the factory production control the manufacturer shall carry out tests and controls in accordance with the control plan[13].

Details as to extent, nature and frequency of testing and controls to be performed within the factory production control shall correspond to the control plan[13] which is part of the technical documentation to this European technical approval.

The results of the factory production control shall be recorded and evaluated. The records shall include at least the following information:

- Name of the product and of the initial materials,
- type of control or test,
- date of manufacture of the products and date of testing the products or of the initial materials,

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12 EN 29053: 1993-03: Acoustics - Materials for acoustical applications - Determination of airflow resistance

13 The control plan has been deposited at the Deutsches Institut für Bautechnik and is handed over only to the approved bodies involved in the conformity attestation procedure

- result of the control and the test and, as far as applicable, comparison with requirements,
- signature of the person responsible for the factory production control.

On request the records shall be presented to Deutsches Institut für Bautechnik.

3.2.2 Tasks for the approved body

3.2.2.1 Initial type-testing of the product

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 Deutsches Institut für Bautechnik and the approved bodies involved.

3.3 CE marking

The CE marking shall be affixed on the packaging or the accompanying label. In addition to the initials "CE" the following information shall be given:

- Name, address and identifying mark of the manufacturer and the manufacturing plant,
- the last two digits of the year in which the CE marking was affixed,
- number of the European technical approval,
- identification of the product (trade name),
- installation density
- filling weight
- declared value of thermal conductivity,
- reaction to fire: (Class)[14],

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

4.1 Manufacture

With regard to composition and production method the insulating material shall correspond to that which was the basis for the approval tests. Composition and production methods are deposited with Deutsches Institut für Bautechnik.

4.2 Installation

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

Concerning the application of the thermal insulating material in the construction works the use conditions according to clauses 1.2 and 5.2 are to be observed.

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

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 Table 2 shall be applied.

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14 European classification of the reaction to fire of building materials according to Commission Decision 2000/147/EC of 8 February 2000 implementing Article 20 of Directive 89/106/EEC on construction products

Table 2: 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	clear span of the filled cavity
cavity insulation in floors, exposed insulation on horizontal areas	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 thermal insulating material the water vapour diffusion resistance factor μ = 1 and/or 2 shall be used for calculating[15].

4.2.2 Installation density

The density of the thermal insulating material at built-in stage shall be at least 70 kg/m³ and shall not exceed the value of 80 kg/m³.

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.

4.2.3 Executing companies

The thermal insulating material may only be processed 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 Recommendations for the manufacturer

5.1 Recommendations on packaging, transport and storage

Packaging of the product shall be performed such that the insulating material is protected from moisture during transport and storage, unless other measures are foreseen by the manufacturer for this purpose.

5.2 Recommendations on installation

The product shall be protected from moisture during installation. The thermal insulating material shall not be exposed to compression loads.

The thermal insulation material may be used for external building components, if the following conditions have been fulfilled:

15 The most unfavourable value for the construction work shall be applied each.

1) The thermal insulation material is installed in dry condition (mass-related moisture content u < 25 %)

2) The moisture of the carcassing timber at the time of closing the internal face of the component is u ≤ 20%, for pitched roofs with pantiling u ≤ 35%.

3) For external components with water shell and for pitched roofs with roof covering the coverings shall be as follows:

3a) External/upper covering with s_d < 0.1 m (air layers between insulating material and covering need not be taken into account)

3b) Internal/lower covering with vapour barrier s_d > 100 m with the level of air barrier/vapour barrier being permanently joint-tight such that no flowing air from inside to outside may enter the construction. A vapour barrier having a humid-variable diffusion resistance (s_d > 10 m in winter climate, s_d approx. 0.5 m in summer climate) can also be used.

5.3 Accompanying information

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 (by machine by trained companies according to 4.2.3) and that it is to be protected from moisture during transport, storage and installation.

Dipl.-Ing. Jasch