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Designated according to Article 29 of Regulation (EU) No 305/2011

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European Technical Assessment

ETA-05/0186 of 25.05.2018

General part

Technical Assessment Body issuing the European Technical Assessment	Österreichisches Institut für Bautechnik (OIB) Austrian Institute of Construction Engineering
Trade name of the construction product	Thermofloc F and Thermofloc B
Product family to which the construction product belongs	Insulation material made of loose, free cellulose fibres
Manufacturer	Peter Seppele Gesellschaft m.b.H. Bahnhofstrasse 79 9710 Feistritz/Drau AUSTRIA
Manufacturing plant	Plant 1
This European Technical Assessment contains	12 pages
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	European Assessment Document (EAD) "In-situ formed loose fill thermal and/or acoustic insulation products made of vegetable fibres", EAD 040138-00-1201
This European Technical Assessment replaces	European Technical Assessment ETA-05/0186 with validity from 14.11.2016

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Specific part

1 Technical description of the product

1.1 Definition of the construction product

This European technical assessment applies to insulation materials with the designation:

"Thermofloc F" (borate free) and "Thermofloc B" (borate reduced)

This product consists of cellulose fibres and serves for the production of insulation layers by means of machine processing.

The machine processing is carried out in dry conditions.

"Thermofloc F" and "Thermofloc B" are installed with different densities (density range **28 kg/m³ - 60 kg/m³**) depending on the area of application.

1.2 Manufacturing

The cellulose fibres are made from waste paper by mechanical crushing.

The waste paper used in the manufacturing process has to fulfil the following quality criteria:

Glazed paper content	0 %
Humidity	≤ 12 %

During this manufacturing process the cellulose fibres are equipped with a borate free or borate reduced fire protection.

The European Technical Assessment is issued for the product on the basis of agreed data/information, deposited with the Österreichisches Institut für Bautechnik, which identifies the product that has been assessed and judged.
Changes to the product or manufacturing process, which could result in this deposited data/information being incorrect, should be notified to the Österreichisches Institut für Bautechnik before the changes are introduced.

The Österreichisches Institut für Bautechnik will decide whether or not such changes affect the European Technical Assessment and consequently the validity of the CE marking on the basis of the European Technical Assessment and if so whether further assessment or alterations to the European Technical Assessment, shall be necessary.

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

2.1 Intended use

"Thermofloc F" and "Thermofloc B" made of cellulose fibres are used as non-loadable insulating material mainly for intended uses where vertical or horizontal cavities are completely filled or horizontal, arched or moderately pitched (≤ 10°) exposed areas are covered.

Area of application for walls

- Machine processed cavity insulation material for exterior walls of timber frame constructions
- Machine processed cavity insulation material for interior walls of timber frame constructions
- Density range: 48 – 60 kg/m³

Area of application for roofs

- Machine processed cavity insulation material for pitched roofs without ventilation (full rafter insulation)
- Machine processed cavity insulation material for flat roofs with upper covering and non-ventilated cavity under the waterproofing
- Density range: 48 – 60 kg/m³

Area of application for ceilings / floors

- Machine processed exposed insulation material not subject to foot traffic for ceilings under non habitable attics, density range 28 – 47 kg/m³ (thermal insulation layer between or above the load-bearing structure)
- Machine processed cavity insulation material between floor-joists under floor constructions for insulation or cavity damping

2.2 General assumptions

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

In case of use of the product as airborne sound insulation it is necessary to determine the airborne sound insulation for the specific construction work in question in accordance with the relevant technical rules in force.

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

The release of dangerous substances of the insulation product has not been determined. An additional assessment of the product according to national or European provisions in this respect might be necessary.

A European method of testing glowing combustion behavior does not exist. An additional assessment of the product according to national provisions might be necessary until the existing European classification system has been completed.

Concerning product packaging, transport, storage, maintenance, replacement and repair it is the responsibility of the manufacturer to undertake the appropriate measures and to advise his clients on the transport, storage, maintenance, replacement and repair of the product, as he considers necessary.

The provisions made in this ETA are based on an assumed intended working life of the insulation product of 50 years. 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.

It is assumed that the product will be installed according to the manufacturer's instructions or (in absence of such instructions) according to the usual practice of the building professionals to guarantee a precise compression of the cellulose fibres.

The installation is carried out by appropriate personnel which have adequate experience in installing the material under the supervision of the person responsible for technical matters on site. Concerning this matter the manufacturer has to regularly train installers.

When calculating the thermal resistance, the nominal thickness (see table below) of the insulation layer shall be applied.

Area of application	Nominal thickness
Vertical: machine processed cavity insulation in exterior-, interior walls,	clear span of the filled cavity
Pitched: machine processed cavity insulation in roofs (pitch >10°)	clear span of the filled cavity
Horizontal: machine processed cavity insulation in flat roofs and floor constructions	clear span of the filled cavity
Horizontal: machine processed exposed insulation not subject to foot traffic on ceiling constructions (pitch ≤ 10°)	up to 33 cm 10 % and over 33 cm installation thickness 15% insulation thickness shall be added to the nominal thickness

For horizontal machine processed installation of exposed insulation not subject to foot traffic the insulation layer shall have a constant installation thickness taking into account the nominal thickness. For that purpose suitable height marks shall be arranged in sufficient distances before the processing.

When blowing 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.

In case of installation on pitched or arched areas slipping of the thermal insulation product is to be prevented by suitable measures.

The construction shall be designed and installed in such a way that no harmful condensation occurs within the works.

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

The performance of the product only applies if the insulation material is installed according to the manufacture's installation instructions and if they are protected from precipitation, wetting or weathering in built-in state and during transport, storage and installation.

For sampling, conditioning and testing the provisions of the EAD No 040138-00-1201 "In-situ formed loose fill thermal and/or acoustic insulation products made of vegetable fibres" apply.

Basic requirements for construction works	Essential characteristics	Method of verification	Performance
BWR 2	Reaction to fire	EN 13501-1:2009	Clause 3.1.1 of the ETA
BWR 3	Biological resistance	EAD "In-situ formed loose fill thermal and/or acoustic insulation products made of vegetable fibres", Annex B	Clause 3.2.1 of the ETA
BWR 5	Sound absorption	EN ISO 354:2003 and EN ISO 11654:1997	Clause 3.3.1 of the ETA
BWR 6	Thermal conductivity	EAD "In-situ formed loose fill thermal and/or acoustic insulation products made of vegetable fibres", Annex A	Clause 3.4.1 of the ETA
	Water vapour diffusion resistance	EN 12086	Clause 3.4.2 of the ETA
	Water absorption	EN 1609, Method A	Clause 3.4.3 of the ETA
	Corrosion developing capacity	EN 15101-1, Annex E	Clause 3.4.4 of the ETA
	Settlement / density	EN 15101-1, Annex B and EAD	Clause 3.4.5 of the ETA
	Critical moisture content	No performance assessed	
	Specific airflow resistivity	EN 29053, Method A	Clause 3.4.7 of the ETA
	Hygroscopic sorption properties	No performance assessed	

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3.1 Safety in case of fire (BWR 2)

3.1.1 Reaction to fire

The reaction to fire of "Thermofloc F" and "Thermofloc B" is classified according to EN 13501-1.

End use application	Class according to EN 13501-1
- installation density of "Thermofloc F" and "Thermofloc B" is 30 kg/m³ to 60 kg/m³, - insulation layer thickness ≥ 100 mm, - end use application without air gap - end use application substrates defined in EN13238 for the following standard substrate: "wood based panel": density of the board ≥ 680 ± 50 kg/m³, board thickness ≥ 12 ± 2 mm, reaction to fire of the board: class D; "calcium silicate board": density of the board 870 ± 50 kg/m³, board thickness ≥ 11 ± 2 mm, reaction to fire of the board: class A2	**B-s2,d0**
- installation density of "Thermofloc F" and "Thermofloc B" is 28 kg/m³ to 60 kg/m³, - insulation layer thickness ≥ 40 mm	**E**

3.2 Hygiene, health and the environment (BWR 3)

3.2.1 Biological resistance

The test and the assessment of the resistance to growth of mould fungus has been verified according to the EOTA testing procedure (Annex B of EAD "In-situ formed loose fill thermal and/or acoustic insulation products made of vegetable fibres"; issued November 2015.). The reached **class** of "Thermofloc F" and "Thermofloc B" is **0**.

3.3 Protection against noise (BWR 5)

3.3.1 Sound absorption

The sound absorption coefficient α_s of "Thermofloc F" and "Thermofloc B" is determined according to EN ISO 354 with mounting type A. Both the practical sound absorption coefficient α_p and the weighted sound absorption α_w are calculated according to EN ISO 11654.

For a density of 31,16 kg/m³ and a thickness of 100 mm of "Thermofloc F" the following apply:

Frequency (Hz)	α_s	α_p	α_w
125	0,27	0,30	**1,00**
250	0,90	0.95	
500	1,11	1,00	
1000	1,02	1,00	
2000	1,12	1,00	
4000	1,18	1,00	

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For a density of 53,33 kg/m³ and a thickness of 100 mm of "Thermofloc F" the following apply:

Frequency (Hz)	α_s	α_p	α_w
125	0,44	0,50	
250	1,04	1,00	
500	1,12	1,00	**1,00**
1000	1,08	1,00	
2000	1,21	1,00	
4000	1,48	1,00	

For a density of 34,66 kg/m³ and a thickness of 200 mm of "Thermofloc F" the following apply:

Frequency (Hz)	α_s	α_p	α_w
125	0,66	0,80	
250	1,01	1.00	
500	1,10	1,00	**1,00**
1000	1,04	1,00	
2000	1,13	1,00	
4000	1,30	1,00	

For a density of 31,83 kg/m³ and a thickness of 100 mm of "Thermofloc B" the following apply:

Frequency (Hz)	α_s	α_p	α_w
125	0,27	0,30	
250	0,87	0.90	
500	1,09	1,00	**1,00**
1000	1,02	1,00	
2000	1,12	1,00	
4000	1,20	1,00	

3.4 Energy economy and heat retention (BWR 6)

3.4.1 Thermal conductivity

The assessment of the thermal conductivity of "Thermofloc F" and "Thermofloc B" is carried out according to Annex A of EAD "In-situ formed loose fill thermal and/or acoustic insulation products made of vegetable fibres". The declared value of thermal conductivity is determined according to EN 10456.

The fractile value of thermal conductivity for the density range of 28 kg/m³ - 47 kg/m³ is $\lambda_{(10,dry,90/90)}$ **= 0,0364 W/(m·K)** representing at least 90 % of the production with a confidence limit of 90%

The fractile value of thermal conductivity for the density range of 48 kg/m³ - 60 kg/m³ is $\lambda_{(10,dry,90/90)}$ **= 0,0373 W/(m·K)** representing at least 90 % of the production with a confidence limit of 90%

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The declared value of thermal conductivity for the density range of 28 kg/m³ - 47 kg/m³ is $\lambda_{D(23,50)}$ **= 0,037 W/(m·K)** determined by conversion of the $\lambda_{(10,dry,90/90)}$ value.

The declared value of thermal conductivity for the density range of 48 kg/m³ - 60 kg/m³ is $\lambda_{D(23,50)}$ **= 0,038 W/(m·K)** determined by conversion of the $\lambda_{(10,dry,90/90)}$ value.

For conversion of humidity the following applies:

- the mass related moisture content at 23 °C/50 % relative humidity:
  $u_{23,50}$ **= 0,060 kg/kg**
- the mass related moisture content at 23 °C/80 % relative humidity:
  $u_{23,80}$ **= 0,105 kg/kg**
- the mass related moisture conversion coefficient:
  $f_{u1(dry-23/50)}$ **= 0,213 kg/kg**
  $f_{u2\ (23/50-23/80)}$ **= 0,227 kg/kg**[1]
- the moisture conversion factor dry to 23 °C/50 % relative humidity
  F_{m1} = **1,0129**
- the moisture conversion factor 23 °C/50 % relative humidity to 23 °C/80 % relative humidity
  F_{m2} = **1,0103**

3.4.2 Water vapour diffusion resistance

The water vapour diffusion resistance of "Thermofloc F" and "Thermofloc B" is assessed according to EN 12086:2013, climate condition C.

The mean water vapour diffusion resistance factor at a density of 60kg/m³ for "Thermofloc F" did not exceed the value **1,38**.
The mean water vapour diffusion resistance factor at a density of 60kg/m³ for "Thermofloc B" did not exceed the value **1,42**.

3.4.3 Water absorption

The water absorption of "Thermofloc F" and "Thermofloc B" is assessed according to EN 1609, method A. The mean water absorption at a density of 30/60 kg/m³ and a sample thickness of 100 mm did not exceed the following values:

Product	Density (kg/m³)	W_p (kg/m²)
Thermofloc F	30	**8**
Thermofloc F	60	**28**
Thermofloc B	30	**15**
Thermofloc B	60	**44**

3.4.4 Corrosion developing capacity

The test and the assessment of the corrosion developing capacity on metal products has been verified according to EN 15101, Annex E. No corrosion developing potential of "Thermofloc F" and "Thermofloc B" were determined. The reached **class** of "Thermofloc F" and "Thermofloc B" is **CR**.

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3.4.5 Settlement / density

The assessment of the settlement of "Thermofloc F" is carried out according to the test methods stated in EN 15101-1, Annex B.

Test method according to EN 15101-1, Annex B and EAD	Settlement (%)	Class	Max. thickness (mm)	Min density (kg/m³)
Settling in ceilings acc. Annex B3 and EAD clause 2.2.8.1a	$s_V = 4,4$	-	330	28
Settling in cavities of walls and between rafters acc. Annex B2	$s_d = 0$	**SC 0**	240	48
Settling under impact excitation and constant temperature and humidity condition acc. Annex B3	**No performance assessed**	-	-	-
Settling under cyclical temperature and cyclic humidity acc. Annex B1	**No performance assessed**	-	-	-

The assessment of the settlement of "Thermofloc B" is carried out according to the test methods stated in EN 15101-1, Annex B.

Test method according to EN 15101-1, Annex B and EAD	Settlement (%)	Class	Max. thickness (mm)	Min density (kg/m³)
Settling in ceilings acc. Annex B3 and EAD clause 2.2.8.1a	$s_V = 4,1$	-	330	28
Settling in cavities of walls and between rafters acc. Annex B2	**No performance assessed**	-	-	-
Settling under impact excitation and constant temperature and humidity condition acc. Annex B3	**No performance assessed**	-	-	-
Settling under cyclical temperature and cyclic humidity acc. Annex B1	**No performance assessed**	-	-	-

3.4.6 Critical moisture content

No performance assessed.

3.4.7 Specific airflow resistivity

The airflow resistance of "Thermofloc F" and "Thermofloc B" is assessed according to EN 29053, method A. The mean longitudinal airflow resistance at a density of 30 kg/m³ is at least **6,1 kPa s/m²**.

3.4.8 Hygroscopic sorption properties

No performance assessed

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

According to the Decision 1999/91/EC[1], as amended, the system of assessment and verification of constancy of performance (according to Annex V of Regulation (EU) No 305/2011) is 3.

In addition, according to the Decision 1999/454/EC, amended by Decision 2001/596/EC of the European Commission the system(s) of assessment and verification of constancy of performance, with regard to reaction to fire class B, is 1.

5 Technical details necessary for the implementation of the AVCP system, as provided for the applicable European Assessment Document

5.1 Tasks of the manufacturer

At the manufacturing plant the manufacturer has to implement and continuously maintain a factory production control system.

All elements, requirements and provisions adopted by the manufacturer in this respect are documented in a systematic manner in the form of written policies and procedures.

The records shall be kept at least for ten years and presented to Österreichisches Institut für Bautechnik on request.

The factory production control system ensures that the performance of the product is in conformity with the European Technical Assessment,

If test results are unsatisfactory, the manufacturer shall immediately implement measures to eliminate the defects. Construction products not in conformity with the requirements shall not be CE marked.

Technical details of the actions to be undertaken by the manufacturer in relation to the factory production control are laid down in the control plan deposited at Österreichisches Institut für Bautechnik.

When all criteria of the assessment and verification of constancy of performance are met, the manufacturer shall issue a declaration of performance.

5.2 Taks of the notified product certification body

Technical details of the actions to be undertaken by the notified product certification body are specified in the control plan.

The results of the continuous surveillance, assessment and evaluation of the factory production control shall be made available by the notified product certification body to Österreichisches Institut für Bautechnik on demand.

The notified product certification body shall decide on the issuing, restriction, suspension or withdrawal of the certificate of constancy of performance of the construction product on the basis of the outcome of the assessments and verifications specified in the control plan.

When the provisions of the European Technical Assessment and the control plan are no longer fulfilled, the certificate of constancy of performance is withdrawn by the notified product certification body.

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1 Official Journal of the European Communities no. L 178, 14.7.1999, p. 52

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