

ENVIRONMENTAL PRODUCT DECLARATION

according to ISO 14025 and EN 15804

Declaration owner	Peter Seppel Gesellschaft m.b.H.
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Program owner	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-PSG-20150321-IBA1-DE
Date of issue	14.12.2015
Valid to:	13.05.2021

Thermofloc – cellulose insulation borate-free
Peter Seppel Gesellschaft m.b.H.

www.bau-umwelt.com / <https://epd-online.com>



1. General Information

<p>Peter Seppele Gesellschaft m.b.H.</p> <hr/> <p>Program owner IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany</p> <hr/> <p>Declaration number EPD-PSG-20150321-IBA1-DE</p> <hr/> <p>This declaration is based on the product category rules: Insulation made of cellulose fibres, 05.2015 (PCR reviewed and approved by the independent expert council)</p> <hr/> <p>Date of issue 14.12.2015</p> <hr/> <p>Valid to: 13.05.2021</p> <hr/> <p>Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.)</p> <hr/> <p>Dr. Burkhard Lehmann (CEO of IBU)</p>	<p>Thermofloc – cellulose insulation borate-free</p> <hr/> <p>Owner of the Declaration Peter Seppele Gesellschaft m.b.H. Bahnhofstraße 79, A-9710 Feistritz/Drau</p> <hr/> <p>Declared product/declared unit The required modules were determined in accordance with EN 15804 for a life cycle assessment of the Thermofloc product "from the cradle to the factory gate with options." The considered modules A1-A3, A4-A5, C1-C4 and D were calculated and declared in accordance with the PCR for insulation made of cellulose fibres for 1 kg of insulation.</p> <hr/> <p>Scope: Thermofloc – borate-free cellulose insulation from the factory of Peter Seppele Gesellschaft m.b.H., Bahnhofstraße 79, 9710-Feistritz/Drau, in Austria. The owner of the declaration is liable for the underlying information and evidence; liability by IBU in connection with the manufacturer's information, life cycle assessment data and evidence is excluded.</p> <hr/> <p>Verification</p> <table border="1"> <tr> <td colspan="2">CEN standard /EN 15804/ is used as the core PCR</td> </tr> <tr> <td colspan="2">Verification of the EPD by an independent third party in accordance with /ISO 14025/</td> </tr> <tr> <td><input type="checkbox"/> internal</td> <td><input checked="" type="checkbox"/> external</td> </tr> </table> <hr/> <p>Matthias Klingler, Independent tester appointed by SVR</p>	CEN standard /EN 15804/ is used as the core PCR		Verification of the EPD by an independent third party in accordance with /ISO 14025/		<input type="checkbox"/> internal	<input checked="" type="checkbox"/> external
CEN standard /EN 15804/ is used as the core PCR							
Verification of the EPD by an independent third party in accordance with /ISO 14025/							
<input type="checkbox"/> internal	<input checked="" type="checkbox"/> external						

2. Product

2.1 Product description

Thermofloc cellulose insulation is manufactured from unmixed paper from daily newspapers plus additives to protect against fire and mould. The cellulose insulation is installed by certified workers with blowing machines specifically equipped for the job.

2.2 Application

- Blow-on insulation that cannot be walked on for ceilings under undeveloped lofts (insulation in between or above the primary structure)
- Blow-in insulation between the flooring sleepers of floor constructions as cavity insulation or alternatively damping
- Application area ceiling/floor:
 - Blow-in insulation for flat roofs with the top cover and unventilated cavities under the roof seal -
 - Blow-in insulation for inclined and unventilated cavities under the roof seal (full rafter insulation)

Application area roof:

- Blow-in insulation for cavities between walls in wooden frame construction
- Blow-in insulation for outside wall cavities in wooden frame construction

Application area walls and facade:

Thermofloc cellulose insulation can be used for purposes where the unloaded insulation is mainly blown into vertical or horizontal cavities to fill the space or blown onto horizontal, slightly curved or slightly inclined ($\leq 10^\circ$) exposed surfaces as an open layer.

2.3 Technical data

The technical data of the product can be seen in the following table.

Structural data

Designation	Value	Units
-------------	-------	-------

Settlement according to ISO 18393 Method A - settling by impact excitation	4.4	%
Settlement according to ISO 18393 Method A - settling by vibration	0	%
Water absorption according to EN 1609 with a thickness of 10 cm and density of 30 or alternatively 60 kg/m ³	14.5 or 44.0	kg
Water vapour diffusion resistance factor μ	2	-
Flow resistance EN29053 at 30 kg/m ³	6.1	kPa/m ²
Nominal value of thermal conductivity λ_D as per EN 10456; Blow-in process	0.039	W/(mK)
Nominal value of thermal conductivity λ_D as per EN 10456; Spraying process	0.042	W/(mK)
Fire behaviour classification according to EN 13501-1 40-100 mm >100 mm	B-s2,d0	-
Resistance to biological effects according to Annex C of the CUAP	0	Class
Metal corrosion according to Annex E of the CUAP	None	-
Harmful substances according to EU Guideline 67/548/EEC	None	-
Moisture conversion factor F_m for thermal conductivity (23°C 50% rel. humidity -23° 80% relative humidity)	1.027	-
Density range depending on the application area	30 - 60	-
Vertical: Outside wall and cavities between intermediate walls	42 - 60	kg/m ³
Inclined: Blow-in insulation in cavities under roof seal >10° inclination	42 - 60	kg/m ³
Horizontal: Blow-in insulation in flat roof ceiling cavities	42 - 60	kg/m ³
Horizontal: Exposed blow-on insulation that cannot be walked on for ceiling constructions	30 - 44	kg/m ³

2.4 Placing on the market/application rules

ETA-05/0186 valid to 13.11.2015

2.5 Delivery condition

The insulation is delivered in PE bags each with 12, 12.5 or 14 kg on pallets each with 21 or alternatively 24 bags per pallet. The pallets are delivered to the customer by truck.

2.6 Base materials/auxiliary materials

For the production of Thermofloc products, exclusively newspaper is used in the form of used paper of the class 2.01 and/or 2.02 in accordance with OENORM EN 643 as a base raw material. There is around 91.6 percent by weight of this in the product, and it is supplied by different waste management companies.

Mineral-based additives are added as a stabilising mould and flame inhibitor (referred to a "flame inhibitor" in the following). There is around 8.4 percent by weight of flame inhibitor in the product. The functional chemical group of the flame inhibitor is sulphate.

2.7 Manufacturing

1) Unmixed newspaper of class 2.01 and/or 2012 in accordance with EN 643 is taken to the facility with the help of a forklift. The base and auxiliary materials for Thermofloc cellulose insulation are delivered to the plant by truck and stored there until production. The Thermofloc cellulose insulation is manufactured in the production site in Feistritz an der Drau (Austria). The production process is described in the following points.

2) The newspapers reach the shredder via conveyor belt, where the paper is shredded.

3) The shredded newspaper is transported further to the preliminary container by a bucket conveyor via a magnetic separator and non-ferrous metal separator from where it reaches the refiner via weighing belts.

4) In the refiners, the paper is defibered and impregnated in order to protect the cellulose insulation against fire, mould and pests.

5) The cellulose insulation is blown into a filter preliminary container via pipelines and blowers. From there, it is transported further for sacking with the help of augers, where the cellulose insulation is pressed into shape in the pressing chamber by means of a press punch and packaged airtight in sacks. The sacks are placed on disposable pallets with the help of a robot and finally wrapped with Power-Stretch film for export.

2.8 Environment and health during production

During production there is < 1mg/m³ dust emission. No ingredients with an environmentally hazardous potential are used. Measures for health and environmental protection in the manufacturing process that go beyond the national regulations or plant-specific requirements are described in the scope of the environmental management system according to ISO 14001.

2.9 Product processing/installation

The cellulose insulation is installed by certified workers with blowing machines specifically equipped for the job.

2.10 Packaging

The products are packaged in PE sacks, placed on pallets and covered with Power-Stretch film.

2.11 Usage condition

No material changes to the composition are to be expected during the utilisation phase with proper use.

2.12 Environment & health during use

With proper use of the product, no hazards to water, air and soil are to be expected according to today's knowledge.

2.13 Reference service life

A conservative estimate of the reference service life of cellulose fibre flakes is 50 years under the following conditions: flawless product, planning, execution and maintenance quality, no extreme inside or outside environmental conditions, Central European climate. /Service Life Catalogue of Bau-EPD GmbH for the preparation of EPDs/, Dated 22.04.2014.

2.14 Extraordinary effects

Fire

Fire Protection

Designation	Value
Building material class	B
Burning drops	d0
Smoke gas development	s2

Water

The behaviour of the product in the event of unexpected exposure to water as well as possible consequences to the environment is not known to the manufacturer.

Mechanical destruction

The behaviour of the product in the event unexpected mechanical destruction as well as possible consequences to the environment is not known to the manufacturer.

2.15 End of life phase

Unpolluted cellulose insulation can be reprocessed. If this is not the case, or alternatively if the insulation is polluted, then it is disposed of as residual waste and incinerated in a waste incineration plant (thermal utilisation).

2.16 Disposal

Possible disposal routes are re-use or thermal utilisation. The Austrian Waste Code /ASN/ for the product is 91101; the European waste code /EWC/ is 170604.

2.17 Additional Information

<https://www.thermofloc.at/>

3. LCA: Calculation rules

3.1 Declared unit

The required modules were selected in accordance with EN 15804 for a life cycle assessment of the Thermofloc product "from the cradle to the factory gate with options." The considered modules A1-A3, A4-A5, C1-C4 and D were selected and declared in accordance with the PCR for insulation made of cellulose fibres for 1 kg of insulation.

Declared unit

Designation	Value	Units
Declared unit	1	kg
Gross density	30 - 60	kg/m ³

3.2 System limit

Assessment from the cradle to the grave. The life cycle assessment refers to the provision (module A1), transport (module A2), manufacture (module A3), delivery (module A4), installation (module A5), disposal phase (modules C1-C4) as well as the credits and debits (module D).

3.3 Estimations and assumptions

For the transport costs of all inputs and outputs taken into consideration, either the actual transport distances rounded to km were used or assumptions were made. 150 km was assumed as an average transport distance for the waste disposal. This corresponds to the assumed average transport to the waste incineration plants around Austria.

The average delivery distance to the construction site is 635 km.

10 rounds are assumed for the euro pallets.

3.4 Cutting rules

Auxiliary substances such as lubrication oils were not declared. Based on a sensitivity analysis that was carried out, it can be assumed that unconsidered auxiliary substances make up a total of much less than 5% of each individual impact category.

The machines, facilities and other infrastructure required for manufacturing the insulation concerned were not taken into consideration in the life cycle assessment.

All the data from the operating data acquisition for the Thermofloc cellulose insulation of Peter Seppele Ges.m.b.H. were taken into consideration. All raw materials used for the formula and the determined production waste were taken into consideration in the assessment.

3.5 Background data

The modelling was carried out with the Umberto NXT Universal (Version 7.1) software developed by ifu Hamburg GmbH with the use of the /GaBi Professional Database/ 2014. To ensure the comparability of the results, the background data of the data source PE was used whenever possible. Since there was no respective GaBi Professional data record, a data record of the /GaBi Extension database XIIIb: ecoinvent 3.1 integrated/ (2014) was used for the starting material of the flame inhibitor.

3.6 Data quality

The data quality requirements specified in PCR-A/IBU 2013 were complied with. The data that was used was transmitted in June - July 2015 and refers to 2014 as the operating year.

3.7 Period of observation

The period of observation ran from January to December 2014.

3.8 Allocation

No by-products are created. The complete treatment of the waste from manufacturing lies within the system limits and does not require any declaration in Module D.

Since separate GaBi data records exist for the thermal utilisation of polyethylene and the pallets, there are no multi-input processes.

The "Thermal Waste Treatment" scenario was selected for the disposal phase as well as the deployment phase. In the process, the "end of waste characteristics" status was not reached before incineration. It is assumed that the plant has an R1 value of <0.6. The environmental impact of the waste

treatment and incineration processes is therefore declared as a removal process in C4 and A5 (packaging materials) respectively. The useful energy produced during waste treatment is declared as exported energy in C4 and A5 respectively and the credits produced with the generated energy in Module D. (see IBU 2013)

The used paper is a secondary raw material. The collection and sorting of the used paper is credited as complete waste treatment to the previous product system and not to the product of Peter Seppele Ges.m.g.H. Only the transport to the plant is credited for this.

No secondary fuels are used.

3.9 Comparability

Basically, a comparison or assessment of EPD data is only possible if all the data records to be compared are created in accordance with /EN 15804/ and the building context or alternatively product-specific features are taken into consideration.

4. LCA: Scenarios and other technical information

The following technical information is a foundation for the declared modules.

Transport to building site (A4)

Designation	Value	Units
Transport distance	250 and 800	km
Average transport distances domestically and abroad		
Utilisation (including empty trips)	100	%
Gross density of the transported products	30 - 60	kg/m ³
Volume utilisation factor	1	-

Installation in the building (A5)

Designation	Value	Units
Auxiliary material	-	kg
Water consumption	-	m ³
Other resources	-	kg
Power consumption	2.60E-05	kWh
Other energy carriers	-	MJ
Material loss	-	kg
Output substances as a consequence of waste treatment at the construction site	-	kg
Dust in the air	-	kg
VOC in the air	-	kg

Reference service life

Designation	Value	Units
Reference service life	50	a

End of life (C1-C4)

Designation	Value	Units
Collected separately	-	kg
Collected as mixed construction waste	-	kg
For re-use	-	kg
For recycling	-	kg
For energy recovery	0.916	kg
For landfilling	-	kg

Re-use, recovery and recycling potential (D), relevant scenario information

Designation	Value	Units
-------------	-------	-------

Cellulose insulation not polluted; re-use	1	kg
Cellulose insulation polluted; energy recovery	0.916	kg

5. LCA: Results

SPECIFICATION OF THE SYSTEM LIMITS (X= INCLUDED IN THE LIFE CYCLE ASSESSMENT; MND = MODULE NOT DECLARED)

Production stage			Stage of the construction of the building		Utilisation stage								Disposal stage				Credits and debits outside the system limit
Raw material supply	Transport	Manufacturing	Transport from manufacturer to place of use	Assembly	Use / application	Maintenance	Repair	Replacement	Renewal	Energy use for operation of building	Water use for operation of building	Renaturalisation/ demolition	Transport	Waste management	Elimination	Re-use, recover or recycling potential	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X	

RESULTS OF THE LIFE CYCLE ASSESSMENT ENVIRONMENTAL IMPACTS: 1 kg Thermofloc cellulose insulation

Parameter	Units	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
GWP	[kg CO ₂ equiv.]	4.30E-2	1.90E-2	1.80E-2	3.30E-2	2.20E-2	0.00E+0	7.87E-3	0.00E+0	3.10E-2	-8.26E-1
ODP	[kg CFC11 equiv.]	2.69E-9	1.21E-13	2.33E-13	6.19E-14	5.09E-14	0.00E+0	1.46E-14	0.00E+0	6.46E-12	-5.95E-12
AP	[kg SO ₂ equiv.]	4.77E-4	8.63E-5	9.80E-5	1.48E-4	1.67E-6	0.00E+0	3.50E-5	0.00E+0	2.95E-4	-5.18E-3
EP	[kg (PO ₄) ³⁻ equiv.]	5.87E-5	2.20E-5	8.20E-6	4.00E-5	3.14E-7	0.00E+0	9.45E-6	0.00E+0	5.18E-5	-5.43E-4
POCP	[kg ethylene equiv.]	2.94E-5	-2.88E-5	1.13E-5	-5.03E-5	1.94E-7	0.00E+0	-1.19E-5	0.00E+0	2.10E-5	-3.94E-4
ADPE	[kg Sb equiv.]	2.19E-6	8.94E-10	2.01E-8	1.72E-9	1.15E-10	0.00E+0	4.07E-10	0.00E+0	2.37E-8	-6.71E-8
ADPF	[MJ]	6.56E-1	2.61E-1	5.59E-1	4.43E-1	2.51E-3	0.00E+0	1.05E-1	0.00E+0	3.58E-1	-8.71E+0

Legend: GWP = Global Warming Potential; ODP = Ozone Depletion Potential; AP = Acidification Potential of soil and water; EP = Eutrophication Potential; POCP = Photochemical Ozone Creation Potential; ADPE = Abiotic Depletion Potential for Elements; ADPF = Abiotic Depletion Potential for Fossil fuels

RESULTS OF THE LIFE CYCLE ASSESSMENT USE OF RESOURCES: 1 kg Thermofloc cellulose insulation

Parameter	Units	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	3.80E-2	1.50E-2	5.96E-1	3.40E-2	4.00E-4	0.00E+0	8.00E-3	0.00E+0	4.00E-02	-1.65E+0
PERM	[MJ]	1.29E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00	0.00E+0
PERT	[MJ]	1.30E+1	1.50E-2	5.96E-1	3.40E-2	4.00E-4	0.00E+0	8.00E-3	0.00E+0	4.00E-02	-1.65E+0
PENRE	[MJ]	7.52E-1	2.63E-1	6.07E-1	4.45E-1	3.00E-3	0.00E+0	1.05E-1	0.00E+0	4.22E-1	-9.09E+0
PENRM	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	[MJ]	7.52E-1	2.63E-1	6.07E-1	4.45E-1	3.00E-3	0.00E+0	1.05E-1	0.00E+0	4.22E-1	-9.09E+0
SM	[kg]	9.16E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m ³]	1.50E-4	2.48E-5	4.51E-4	2.00E-5	4.85E-5	0.00E+0	4.72E-6	0.00E+0	3.79E-3	-1.94E-3

Legend: PERE = Renewable Primary Energy as Energy Source; PERM = Renewable Primary Energy for Material Utilisation; PERT = Total Renewable Primary Energy; PENRE = Non-Renewable Primary Energy as Energy Source; PENRM = Non-Renewable Primary Energy for Material Utilisation; PENRT = Total Non-Renewable Primary Energy; SM = use of Secondary Materials; RSF = Renewable Secondary Fuels; NRSF = Non-Renewable Secondary Fuels; FW = Use of Fresh Water Resources

RESULTS OF THE LIFE CYCLE ASSESSMENT OUTPUT FLOWS AND WASTE CATEGORIES 1 kg Thermofloc cellulose insulation

Parameter	Units	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	7.56E-7	1.33E-7	2.97E-5	3.57E-7	1.27E-10	0.00E+0	8.43E-8	0.00E+0	0.00E+0	-3.22E-6
NHWD	[kg]	6.17E-2	2.50E-3	2.45E-2	4.50E-3	2.08E-5	0.00E+0	1.06E-3	0.00E+0	2.11E-5	-7.53E-1
RWD	[kg]	3.34E-5	5.41E-7	1.02E-6	7.84E-7	2.38E-7	0.00E+0	1.85E-7	0.00E+0	9.25E-6	-9.17E-5
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.10E-2	0.00E+0	0.00E+0	0.00E+0	1.70E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	9.20E-2	0.00E+0	0.00E+0	0.00E+0	4.01E+0	0.00E+0

Legend: HWD = Hazardous Waste for Landfill; NHWD = Non-Hazardous Waste Disposed; RWD = Radioactive Waste Disposed; CRU = Components for Re-Use; MFR = Materials For Recycling; MER = Materials for Energy Recovery; EEE = Exported Electrical Energy; EET = Exported Thermal Energy

6. LCA: Interpretation

It must be noted that the impact assessment results are only relative statements that contain no statements about "end points" of the impact categories, overruns of limits, safety margins or risks.

6.1 Indicators of the life cycle inventory

6.1.1 Use of fresh water resources

The main part of the net fresh water use results from the manufacture of the mineral flame inhibitor. No

water is used in the production and blowing-in of the cellulose insulation.

6.1.2 Waste

The largest part of the waste that is produced is non-hazardous waste. No hazardous and radioactive waste

occurs in the production of Thermofloc.

6.1.3 Primary energy use, non-renewable and renewable

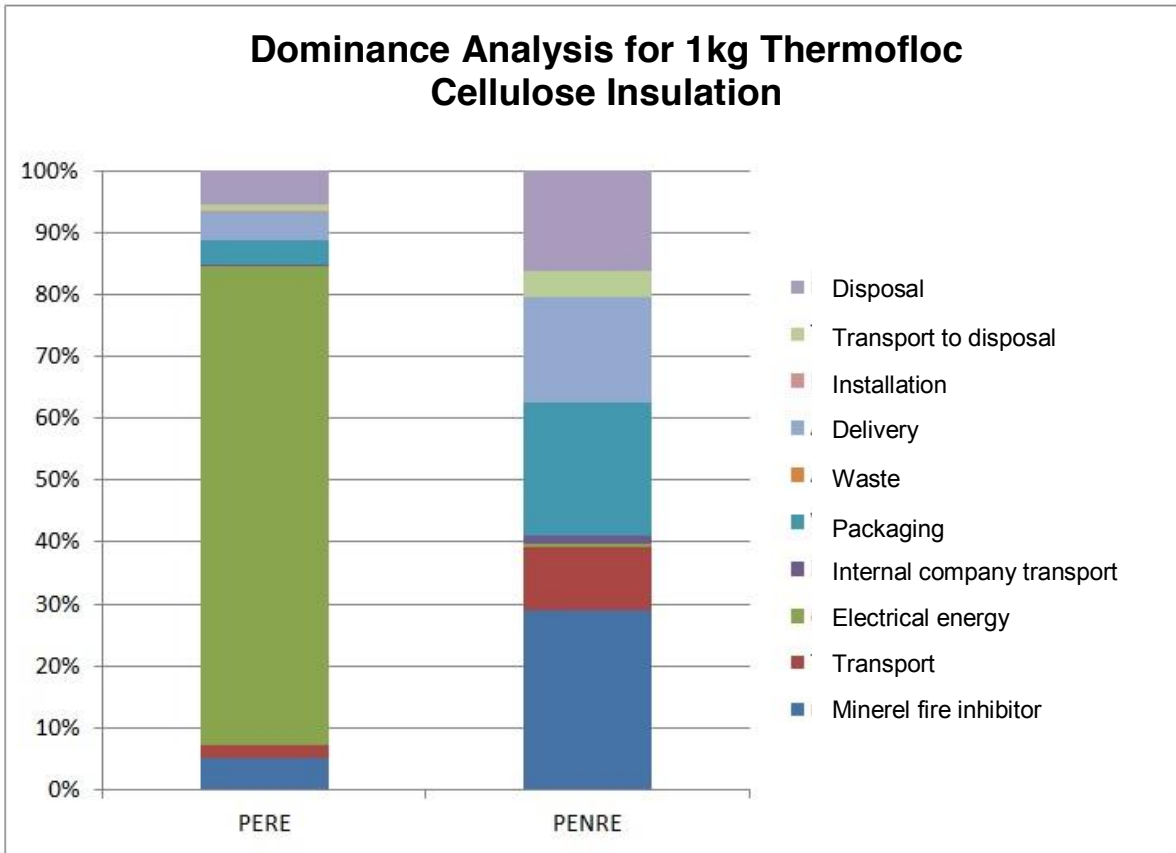


Fig. 5: Dominance analysis of the primary energy use

The primary energy consumption of non-renewable resources (**PENRE**) is determined to be 50% for the use of gas and electricity for the production of the mineral flame inhibitor and plastic packaging. Furthermore, the delivery, disposal and transport have relevant amounts of the primary energy consumption of non-renewable energy sources. The electricity mix purchased by Kelag is responsible for around 80% of the consumption of renewable energy (**PERE**). Other factors such as the mineral flame inhibitor, packaging, delivery and disposal make up a total of almost 20%.

6.2 Indicators of the impact assessment

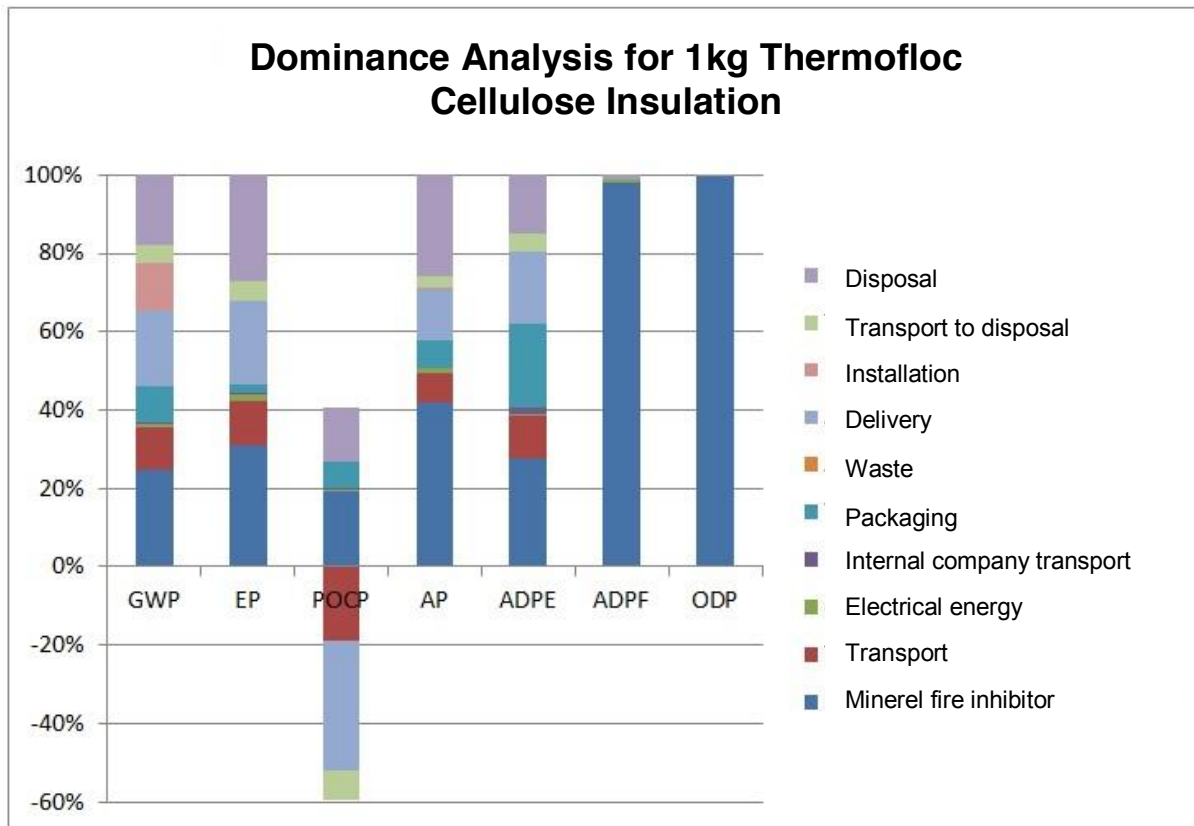


Fig. 6: Dominance analysis of the indicators of the impact assessment

6.2.1 Global Warming Potential (GWP)

The global warming potential (GWP) is determined through the starting material of the flame inhibitor, transport for delivery of the products and through incineration in the waste incineration plant.

6.2.2 Eutrophication Potential (EP)

The main causes of the eutrophication potential are the mineral flame inhibitor, transport of the raw materials to the plant as well as to customers, and disposal in the waste incineration plant.

6.2.3 Photochemical Ozone Creation Potential (POCP)

The transport results in negative values for the POCP, which is attributable to the methods stipulated in EN 15804 in which specific nitrogen oxides have a negative POCP. It should not be concluded that the photochemical oxidation potential is generally improved through the emission of waste gasses. The mineral flame inhibitor and disposal of the product in the waste incineration plant are the largest amount of the negative impacts.

6.2.4 Acidification Potential (AP)

Primarily the mineral flame inhibitor contributes to the acidification potential at 40%, followed by disposal in the waste incineration plant and delivery of the cellulose insulation.

6.2.5 Abiotic Depletion Potential for Elements (ADPE)

The mineral flame inhibitor, packaging, delivery as well as incineration in the waste incineration plant make up almost 100% of the elementary abiotic resource consumption.

6.2.6 Abiotic Depletion Potential for Fossil fuels (ADPF)

At approximately 100%, the abiotic resource consumption of fossil fuels is dominated by the starting product of the mineral flame inhibitor.

6.2.7 Ozone Depletion Potential (ODP)

Just like with the abiotic resource consumption of fossil fuels, the mineral flame inhibitor dominates with just short of 100% of the impact category of the ozone depletion potential.

7. Evidence

Formaldehyde and VOC emissions

As part of the natureplus mark of quality, a test chamber test was carried out for formaldehyde and VOC emissions /test report no. H 6960 FM; Bremer

Umweltinstitut GmbH/, of 04.01.2013. The natureplus threshold values were complied with for formaldehyde and VOC

8. Literature sources

ISO 14046 Environmental management — Water footprint — Principles, requirements and guidelines; English version ISO 14046:2014

Service life catalogue for the preparation of EPDs
Service life catalogue of Bau-EPD GmbH for the preparation of EPDs, Dated 22.04.2014

OENORM EN 643

Paper and board - European list of standard grades of paper and board for recycling, Edition 2014-12-01

ISO 18393-1

Thermal insulation products - Determination of ageing by settlement - Part 1: Blown loose-fill insulation for ventilated attics, Edition: 2012-07-01

ETA-05/0186

European Technical Approval, Austrian Institute for Building Technology

OENORM EN 1609

Thermal insulating products for building applications - Determination of short-term water absorption by partial immersion, Edition: 2013-04-15

OENORM EN 29053

Acoustics - Materials for acoustical applications - Determination of airflow resistance, Edition: 1993-08-01

OENORM EN 13501-1

Fire classification of construction products and construction methods – Part 1: Classification using test data from fire reaction of construction products, Edition: 2009-12-01

ISO 14001

Environmental management systems - Requirements with guidance for use, Edition: 2015-09-15

ASN

Waste Code Number:: Ordinance of the Federal Minister for Agriculture and Forestry, the Environment and Water Management Concerning a List of Wastes (Ordinance on the List of Wastes)

EWC

Ordinance on the List of Wastes from 10 December 2001 (BGBl. I S. 3379), which was last amended by Article 5 paragraph 22 of the act on 24 February 2012 (BGBl. I S. 212).

GaBi Professional database

GaBi Professional Database 2014, Hrsg. PE International AG, Leinfelden – Echterdingen, 2013.

GaBi Extension database XIIIb: ecoinvent 3.1 integrated

GaBi Extension database XIIIb: ecoinvent 3.1 integrated 2013, Hrsg. PE International AG, Leinfelden – Echterdingen, 2013.

IBU 2015

PCR guide test for building-based products and services – Part B: Requirements of the EPD for insulation made of cellulose fibres, Version 1.0, of 05.05.2015

Test report no. H 6960 FM

Bremer Umweltinstitut GmbH, of 04.01.2013

Institut Bauen und Umwelt e.V., Berlin (Hrsg.): Preparation of Environmental Product Declarations (EPDs);

General principles of the EPD programme of Institut Bauen und Umwelt e.V. (IBU), 2013-04.

Product category rules for building products part A:

Calculation rules for the life cycle assessment and requirements of the background report. 2013-04.

ISO 14025

DIN EN ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

EN 15804

EN 15804:2012-04+A1 2013, Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction products.

**Publisher**

Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Tel +49 (0)30 3087748- 0
Fax +49 (0)30 3087748- 29
Mail info@bau-umwelt.com
Web www.bau-umwelt.com

**Program owner**

Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Tel +49 (0)30 3087748- 0
Fax +49 (0)30 3087748- 29
Mail info@bau-umwelt.com
Web www.bau-umwelt.com

**Author of the Life Cycle Assessment**

Österreichisches Institut für Bauen und
Ökologie GmbH
Alserbachstraße 5/8
1090 Vienna
Austria

Tel +43 13192005
Fax +43 13192005-50
Mail philipp.boogman@ibo.at
Web www.ibo.at

**Owner of the Declaration**

Peter Seppel Gesellschaft m.b.H.
Bahnhofstraße 79
9710 Feistritz/Drau
Austria

Tel +43 (0) 4245 6201
Fax +43 4245 6336
Mail office@thermofloc.com
Web <https://www.thermofloc.at>

*According to my oath as an interpreter and translator for the English language,
I herewith confirm that the translation corresponds exactly with the
attached original text/certified copy/copy.*

Klagenfurt, 21 December 2015