

Owner: Papiruld Danmark A/S  
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Issued first time: 21-05-2014  
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3<sup>rd</sup> PARTY VERIFIED

# EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804:2012  
+ A1:2013



**Owner of declaration**

Papiruld Danmark A/S  
CVR: 16266035



**Issued:**  
21-05-2019

**Valid to:**  
21-05-2024

**Programme operator**

Danish Technological Institute  
www.dti.dk



**Basis of calculation**

This EPD is developed in accordance with the European standard EN 15804.

**Comparability**

EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

**Programme**

EPD Danmark  
www.epddanmark.dk



**Validity**

This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

**Use**

The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

**Declared products**

Cellulose insulation/Envinsu

**Production site**

Brødeskovvej 40  
Hammersholt  
DK-3400 Hillerød

**Products use**

Cellulose insulation in granular form (loose fill) can be used as insulation in new construction, for additional insulation in existing building and for retrofitting old homes. It can be blown into floors, ceilings, roofs, outer walls, inner walls and floor separations.

**EPD type**

- Cradle-to-gate
- Cradle-to-gate with options
- Cradle-to-grave

CEN standard EN 15804 serves as the core PCR
Independent verification of the declaration and data, according to EN ISO 14025
<input type="checkbox"/> internal <input checked="" type="checkbox"/> external
Third party verifier:  Kim Christiansen

Henrik Fred Larsen  
EPD Danmark

**Declared unit**

1 kg

Life cycle stages and modules (MND = module not declared)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
<b>X</b>	<b>X</b>	<b>X</b>	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

# Product information

## Product description

The main product components are shown in the table below. They represent 100 weight % of the declared product.

Material	Weight-% of declared product
Recycled newspaper/cellulose fibres	> 85%
Borax	< 1%
Boric acid	< 4%
Aluminium hydroxide	< 8%
Water	< 2%

## Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of 1 kg of cellulose insulation, loose fill, at the production site in Hillerød, Denmark. Product specific data are based on average values collected in 2018. Background data are based on GaBi database 8.7 and are less than 10 years old. In four cases, GaBi data were supplemented with data from Ecoinvent 3.5. Generally, the used background datasets are of high quality, and the oldest reference year of all datasets is 2016 – thus the requirements in EN15804 are met.

## Dangerous substances

The cellulose insulation from Papiruld Danmark contains the following substances from the REACH "Candidate List of Substances of Very High Concern for authorisation". (<http://echa.europa.eu/candidate-list-table>)

Material	Weight-% of declared product
Borax	< 1%
Boric acid	< 4%

For more information, please enquire the safety data sheet from Papiruld Danmark.

## Essential characteristics (CE)

Cellulose insulation/Envinsu is covered by a European Technical Assessment (ETA): 13/0623, which is issued by RISE Research Institutes of Sweden AB, 25.06.2018. The DoP is developed according to EU regulation, no. 574/2014.

## Reference Service Life (RSL)

No RSL is declared. This EPD is based on a cradle-to-gate assessment.

## Product Illustration



# LCA background

## Declared unit

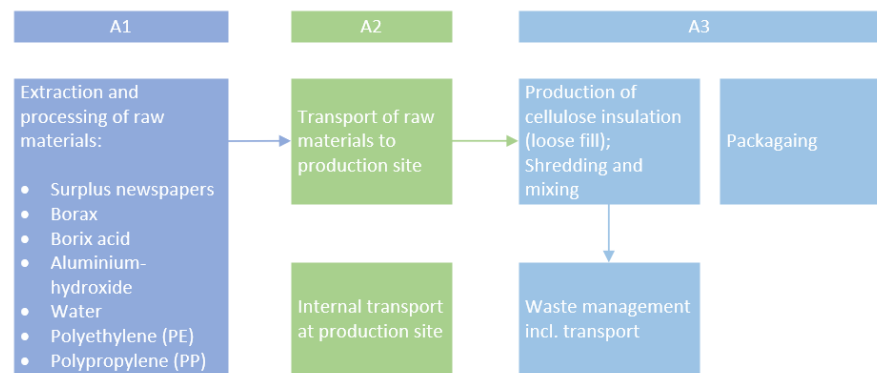
The LCI and LCIA results in this EPD relates to 1kg of cellulose insulation (loose fill).

	Albus	Unit
Declared unit	1	kg
Density	≥40	kg/m <sup>3</sup>
Conversion factor to 1 kg	1	-

## PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804.

## Flow diagram



## System boundaries

This EPD is based on a cradle-to-gate LCA, in which 100% of the weight has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass.

### Product stage (A1-A3) includes:

- A1 – Extraction and processing of raw materials
- A2 – Transport to the production site
- A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the "end-of-waste" state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.



# LCA results

ENVIRONMENTAL IMPACTS PER KG OF CELLULOSE INSULATION/ENVINSU		
Parameter	Unit	A1-A3
GWP	[kg CO <sub>2</sub> -eq.]	1,54E-01
ODP	[kg CFC11-eq.]	1,34E-08
AP	[kg SO <sub>2</sub> -eq.]	9,58E-04
EP	[kg PO <sub>4</sub> <sup>3-</sup> -eq.]	5,43E-04
POCP	[kg ethene-eq.]	4,70E-05
ADPE	[kg Sb-eq.]	7,16E-05
ADPF	[MJ]	2,57E+00
Caption	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 non fossil resources; ADPF = Abiotic depletion potential for fossil resources	

RESOURCE USE PER KG OF CELLULOSE INSULATION/ENVINSU		
Parameter	Unit	A1-A3
PERE	[MJ]	1,40E+00
PERM	[MJ]	0,00E+00
PERT	[MJ]	1,40E+00
PENRE	[MJ]	2,38E+00
PENRM*	[MJ]	3,70E-01
PENRT	[MJ]	2,75E+00
SM	[kg]	9,35E-01
RSF	[MJ]	0,00E+00
NRSF	[MJ]	0,00E+00
FW	[m <sup>3</sup> ]	1,83E-03
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Use of net fresh water	

\* Equals contribution from packaging material of product

WASTE CATEGORIES AND OUTPUT FLOWS PER KG OF CELLULOSE INSULATION/ENVINSU		
Parameter	Unit	A1-A3
HWD	[kg]	1,16E-08
NHWD	[kg]	3,21E-03
RWD	[kg]	7,37E-06
CRU	[kg]	-
MFR	[kg]	-
MER	[kg]	-
EEE	[MJ]	-
EET	[MJ]	-
Caption	HWD = Hazardous waste disposed; 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	

## Additional information

### Indoor air

The product is not in contact/exposed to indoor air after installation.

*The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.*

### Soil and water

*The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.*

## References

<b>Publisher</b>	 <a href="http://www.epddanmark.dk">http://www.epddanmark.dk</a>
<b>Programme operator</b>	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup <a href="http://www.teknologisk.dk">http://www.teknologisk.dk</a>
<b>LCA-practitioner</b>	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup <a href="http://www.teknologisk.dk">http://www.teknologisk.dk</a>
<b>LCA software /background data</b>	Thinkstep GaBi 8.7 2019 incl. databases + Ecoinvent 3.5 2018  <a href="http://www.gabi-software.com">http://www.gabi-software.com</a> <a href="http://www.ecoinvent.org">http://www.ecoinvent.org</a>
<b>3<sup>rd</sup> party verifier</b>	Kim Christiansen – kimconsult.dk

### General programme instructions

Version 1.9

[www.epddanmark.dk](http://www.epddanmark.dk)

#### EN 15804:2012 + A1:2013

DS/EN 15804 + A1:2013 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

#### EN 15942

DS/EN 15942:2011 – " Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

#### ISO 14025

DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

#### ISO 14040

DS/EN ISO 14040:2008 – " Environmental management – Life cycle assessment – Principles and framework"

#### ISO 14044

DS/EN ISO 14044:2008 – " Environmental management – Life cycle assessment – Requirements and guidelines"