epddanmark

ECO PLATFORM EPD VERIFIED

Owner: Woodfiber
No.: MD-22017-EN
Issued: 13-09-2022
Valid to: 13-09-2027

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

Owner of declaration
Woodfiber
Digemosevej 4 DK-4340 Tølløse
DK-36978627

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product(s)
Woodfiber AIR

Number of declared datasets/product variations: 4 (variations concern modules A4-A5, C1-C4 and D)

Production site
Hjälmarsnäsvägen 4B
681 95 Kristinehamn
Sweden

Product(s) use
Loose fill Insulation

Declared/ functional unit
The declared unit is 1 kg insulation material (Woodfiber AIR) at factory gate. Certified green electricity is used at production site

Note: for calculations at the building level, different densities may be assumed depending on the application.

Year of data
2020

EPD version
1st

Issued:
13-09-2022

Valid to:
13-09-2027

Basis of calculation
This EPD is developed in accordance with the European standard EN 15804+A2.

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.

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.

EPD type
☐Cradle-to-gate with modules C1-C4 and D
☒Cradle-to-gate with options, modules C1-C4 and D
☐Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

Ninkie Bendtsen

Martha Katrine Sørensen
EPD Danmark

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
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

Product information

Product description

Woodfiber AIR is a loose-fill insulation material made from wooden fibers, meant for installation in horizontal as well as vertical constructions. The product is suitable for new buildings as well as for renovation projects.

The main product components are shown in the table below.

Material	Weight-% of declared product
Wood pulp	92
Ammonium polyphosphate	5
Water	3

Material	Amount per declared unit [kg]
LDPE Plastic bag/wrap	0,0087
Wood EUR-pallet	0,0079

Waste wood is taken from the Swedish forest and made to Woodfiber pulp. The pulp is shredded and mixed with flame retardant / dust binder in a semi-automated and energy efficient process whereafter it is brought to the marked.

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of 1 kg of Woodfiber AIR on the production site located in Kristinehamn, Sweden. Product specific data are based on average values collected for the year 2020. Background data are based on GaBi *10.6.0.110* and Ecoinvent 3.8 and are less than 10 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

Picture of product(s)

Hazardous substances

Woodfiber AIR does not contain substances listed in the ”Candidate List of Substances of Very High Concern for authorisation”

(http://echa.europa.eu/candidate-list-table)

Essential characteristics

Fire resistance: In accordance with EN 13501-1:2007 +A1:2009, B-s2, d0.

Further technical information can be obtained by contacting the manufacturer or on the manufacturers.

website: www.woodfiber.dk

Reference Service Life (RSL)

The reference service life is not declared, as this EPD is based on a cradle to gate with options, modules C1–C4, and module D where the service life is not relevant.

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to 1 kg of Woodfiber AIR leaving the factory gate.

Name	Value	Unit
Declared unit	1	kg
Density	26-43	kg/m3
Conversion factor to 1 kg	1	

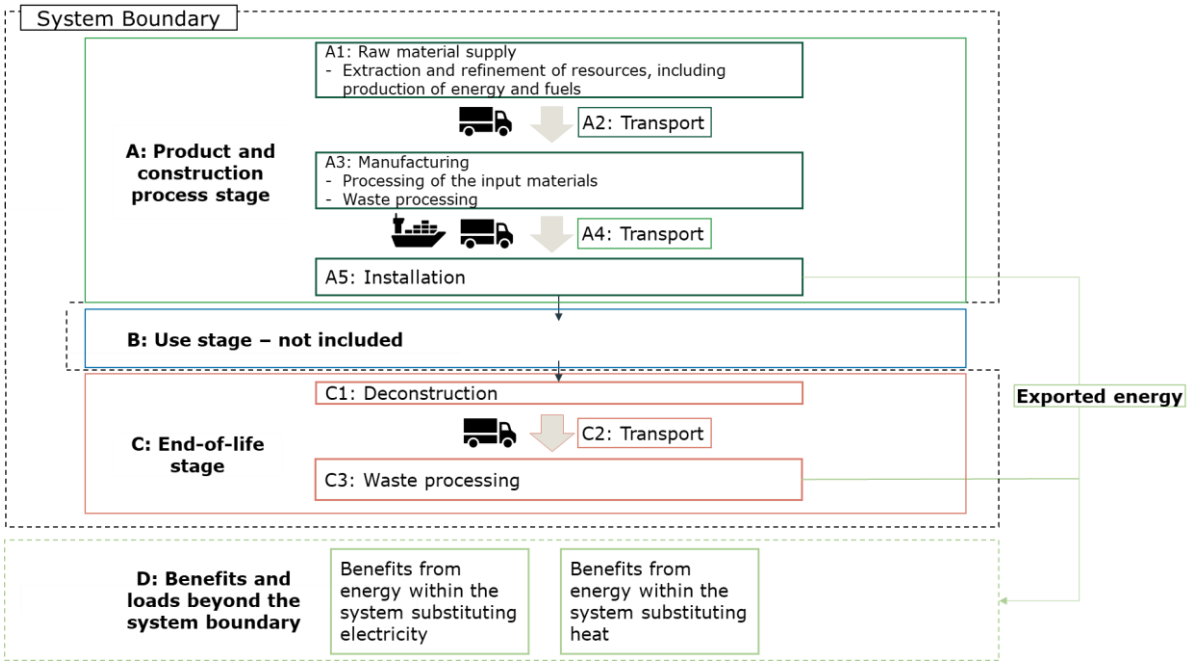
Functional unit

N/A

PCR

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

Flow diagram



System boundary

This EPD is based on a cradle-to-gate LCA with options modules A4, A5, C1-C4 and D, in which 100 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 and 1 % of energy usage and mass for unit processes.

Allocation procedures are applied as described in section 6.4.3. of the DS/EN 15804+A2. Woodfiber AIR is produced at the Kristinehamn production site which has provided site specific data on energy and material use for Woodfiber AIR production.

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.

Construction process stage (A4-A5) includes:

A4 – Transport to customer

There are four assumed markets in this report, including Zealand and Jutland (Denmark), Austria and England. The assumed distances from the production site in Kristinehamn to various construction sites are 608 km by truck to Zealand, 440 km by truck and 67 km by ship to Jutland, 1699 km by truck to Austria and 80 km by ship and 1687 km by truck to England.

A5 – Installation

On site installation is calculated based on the energy consumption of a "worst case" machine to install Woodfiber AIR. The energy consumption differs for the two applications (wall and attic) and a weighted average is used in the calculation. The energy consumption during the installation process is modelled using the country specific grid mix for the assumed markets (Austria, Denmark and England).

Woodfiber AIR waste at the installation site is assumed to be 1% which is expected to be sent to incineration in all three markets. The extra production (A1-A3) and transportation (A4) of Woodfiber AIR for the wasted product at the construction site is accounted for in A5.

Woodfiber AIR packaging waste (wood pallet and plastic) are disposed off be incinerated for all countries. The benefit from this process is accounted for in module D.

End of Life (C1-C4) includes:

The same machine used for installation is used for deconstruction process. The energy consumption during the installation process is modelled using the country specific grid mix for the assumed markets (Austria, Denmark and England).

The end-of-life of Woodfiber AIR comprises of 100% incineration.

The burden from the incineration process is recorded in module C3 and the benefits from the recovered energy replacing heat and electricity that would have been produced from other sources are recorded in module D.

In this study, 1% of product waste produced in module A5 and is sent to incineration with energy recovery, assumed to take place in the same market as the product is used in (Austria, Denmark and England).

Re-use, recovery and recycling potential (D) includes:

When Woodfiber AIR is incinerated in the product system, electricity and heat are produced. The energy is recovered and assumed to replace electricity and heat that would have been produced from other sources. It was assumed that the alternative electricity production consists of the average electricity mix for the assumed markets (Austria, Denmark and England). For heat, the market is more regionalized and a national average thermal energy mix is not as representative. As a simplified assumption, it is therefore assumed that heat from natural gas would be replaced.

LCA results

The results for Woodfiber AIR are presented in four set of tables, representing each of the four markets. The markets presented are:

1. Jutland (Denmark)
2. Sealand (Denmark)
3. Austria
4. England

Result for Woodfiber AIR - Jutland

ENVIRONMENTAL IMPACTS PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
GWP-total	[kg CO_2 eq.]	-1,00E+00	3,50E-02	5,20E-02	1,76E-03	7,69E-03	1,53E+00	-4,66E-01
GWP-fossil	[kg CO_2 eq.]	5,19E-01	3,43E-02	3,47E-02	1,75E-03	7,55E-03	2,67E-02	-4,65E-01
GWP-biogenic	[kg CO_2 eq.]	-1,52E+00	3,65E-04	1,72E-02	6,97E-06	8,15E-05	1,51E+00	-7,23E-04
GWP-luluc	[kg CO_2 eq.]	6,87E-04	2,80E-04	1,38E-05	4,27E-06	6,25E-05	1,72E-05	-4,22E-04
ODP	[kg CFC 11 eq.]	4,70E-08	6,81E-18	4,62E-10	5,71E-17	1,51E-18	2,37E-16	-5,60E-15
AP	[mol H^+ eq.]	3,70E-03	5,19E-05	4,73E-05	3,05E-06	8,28E-06	2,57E-04	-4,54E-04
EP-freshwater	[kg P eq.]	1,02E-04	1,02E-07	1,02E-06	1,09E-08	2,27E-08	3,25E-08	-1,07E-06
EP-marine	[kg N eq.]	1,12E-03	1,75E-05	1,44E-05	1,03E-06	2,68E-06	8,45E-05	-1,67E-04
EP-terrestrial	[mol N eq.]	6,10E-03	2,03E-04	1,07E-04	1,00E-05	3,17E-05	1,23E-03	-1,72E-03
POCP	[kg NMVOC eq.]	1,67E-03	4,75E-05	2,52E-05	2,47E-06	7,22E-06	2,30E-04	-4,37E-04
ADPm[1]	[kg Sb eq.]	7,69E-06	3,05E-09	7,66E-08	8,70E-10	6,78E-10	3,62E-09	-8,69E-08
ADPf[1]	[MJ]	1,30E+01	4,63E-01	1,63E-01	2,11E-02	1,02E-01	3,93E-01	-6,98E+00
WDP[1]	[m^3]	4,45E-01	3,18E-04	1,04E-02	1,65E-04	7,10E-05	1,87E-01	-1,62E-02
Caption	GWP-total = Globale Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use							
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							

ADDITIONAL ENVIRONMENTAL IMPACTS PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
PM	[Disease incidence]	3,15E-08	5,73E-10	3,84E-10	2,81E-11	5,61E-11	1,29E-09	-3,66E-09
IRP[2]	[kBq U235 eq.]	1,28E+00	1,22E-04	1,29E-02	2,10E-04	2,71E-05	3,46E-03	-2,06E-02
ETP-fw[1]	[CTUe]	2,01E+01	3,43E-01	2,12E-01	7,45E-03	7,56E-02	1,70E-01	-7,41E-01
HTP-c[1]	[CTUh]	8,77E-10	6,93E-12	9,83E-12	7,74E-13	1,53E-12	1,14E-11	-1,03E-10
HTP-nc[1]	[CTUh]	1,09E-08	3,60E-10	1,40E-10	1,65E-11	7,94E-11	4,08E-10	-1,73E-09
SQP[1]	-	3,60E+01	1,57E-01	3,93E-01	3,44E-02	3,50E-02	1,08E-01	-3,37E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)							
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.							

RESOURCE USE PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
PERE	[MJ]	1,08E+01	2,62E-02	3,17E-01	4,26E-02	5,86E-03	4,89E+00	-4,17E+00
PERM	[MJ]	4,93E+00*	0,00E+00	-1,17E-01	0,00E+00	0,00E+00	-4,81E+00	0,00E+00
PERT	[MJ]	1,58E+01	2,62E-02	2,00E-01	4,26E-02	5,86E-03	7,63E-02	-4,17E+00
PENRE	[MJ]	1,28E+01	4,64E-01	5,48E-01	2,11E-02	1,02E-01	3,94E-01	-6,98E+00
PENRM	[MJ]	3,82E-01*	0,00E+00	-3,82E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	1,32E+01	4,64E-01	1,65E-01	2,11E-02	1,02E-01	3,94E-01	-6,98E+00
SM	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m^3]	2,98E-02	3,01E-05	4,49E-04	1,75E-05	6,71E-06	4,40E-03	-1,73E-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 = Net use of fresh water							

WASTE CATEGORIES AND OUTPUT FLOWS PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
HWD	[kg]	2,85E-09	2,41E-11	7,29E-11	4,28E-11	5,39E-12	7,10E-11	-4,57E-09
NHWD	[kg]	1,28E-01	7,24E-05	1,68E-03	8,35E-05	1,60E-05	1,30E-02	-8,87E-03
RWD	[kg]	2,82E-03	8,37E-07	3,03E-05	1,89E-06	1,85E-07	2,18E-05	-1,85E-04
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	4,22E-03*	0,00E+00	1,72E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	1,05E-01	0,00E+00	0,00E+00	2,41E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	1,87E-01	0,00E+00	0,00E+00	4,32E+00	0,00E+00
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; EE = Exported energy							

* The Material for Recyling is from the pulp packaging recyling.

BIOGENIC CARBON CONTENT PER [1 KG WOODFIBER AIR]		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	4,60E-01
Biogenic carbon content in accompanying packaging	kg C	3,97E-03

Result for Woodfiber AIR – Sealand

ENVIRONMENTAL IMPACTS PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
GWP-total	[kg CO_2 eq.]	-1,00E+00	4,75E-02	5,20E-02	1,76E-03	7,69E-03	1,53E+00	-4,66E-01
GWP-fossil	[kg CO_2 eq.]	5,19E-01	4,67E-02	3,47E-02	1,75E-03	7,55E-03	2,67E-02	-4,65E-01
GWP-biogenic	[kg CO_2 eq.]	-1,52E+00	5,04E-04	1,72E-02	6,97E-06	8,15E-05	1,51E+00	-7,23E-04
GWP-luluc	[kg CO_2 eq.]	6,87E-04	3,86E-04	1,38E-05	4,27E-06	6,25E-05	1,72E-05	-4,22E-04
ODP	[kg CFC 11 eq.]	4,70E-08	9,33E-18	4,62E-10	5,71E-17	1,51E-18	2,37E-16	-5,60E-15
AP	[mol H^+ eq.]	3,70E-03	5,12E-05	4,73E-05	3,05E-06	8,28E-06	2,57E-04	-4,54E-04
EP-freshwater	[kg P eq.]	1,02E-04	1,40E-07	1,02E-06	1,09E-08	2,27E-08	3,25E-08	-1,07E-06
EP-marine	[kg N eq.]	1,12E-03	1,66E-05	1,44E-05	1,03E-06	2,68E-06	8,45E-05	-1,67E-04
EP-terrestrial	[mol N eq.]	6,10E-03	1,96E-04	1,07E-04	1,00E-05	3,17E-05	1,23E-03	-1,72E-03
POCP	[kg NMVOC eq.]	1,67E-03	4,46E-05	2,52E-05	2,47E-06	7,22E-06	2,30E-04	-4,37E-04
ADPm[1]	[kg Sb eq.]	7,69E-06	4,19E-09	7,66E-08	8,70E-10	6,78E-10	3,62E-09	-8,69E-08
ADPf[1]	[MJ]	1,30E+01	6,30E-01	1,63E-01	2,11E-02	1,02E-01	3,93E-01	-6,98E+00
WDP[1]	[m^3]	4,45E-01	4,39E-04	1,04E-02	1,65E-04	7,10E-05	1,87E-01	-1,62E-02
Caption	GWP-total = Globale Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use							
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							

ADDITIONAL ENVIRONMENTAL IMPACTS PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
PM	[Disease incidence]	3,15E-08	3,47E-10	3,84E-10	2,81E-11	5,61E-11	1,29E-09	-3,66E-09
IRP[2]	[kBq U235 eq.]	1,28E+00	1,68E-04	1,29E-02	2,10E-04	2,71E-05	3,46E-03	-2,06E-02
ETP-fw[1]	[CTUe]	2,01E+01	4,67E-01	2,12E-01	7,45E-03	7,56E-02	1,70E-01	-7,41E-01
HTP-c[1]	[CTUh]	8,77E-10	9,45E-12	9,83E-12	7,74E-13	1,53E-12	1,14E-11	-1,03E-10
HTP-nc[1]	[CTUh]	1,09E-08	4,91E-10	1,40E-10	1,65E-11	7,94E-11	4,08E-10	-1,73E-09
SQP[1]	-	3,60E+01	2,16E-01	3,93E-01	3,44E-02	3,50E-02	1,08E-01	-3,37E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)							
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.							

RESOURCE USE PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
PERE	[MJ]	1,08E+01	3,62E-02	3,17E-01	4,26E-02	5,86E-03	4,89E+00	-4,17E+00
PERM	[MJ]	4,93E+00*	0,00E+00	-1,17E-01	0,00E+00	0,00E+00	-4,81E+00	0,00E+00
PERT	[MJ]	1,58E+01	3,62E-02	2,00E-01	4,26E-02	5,86E-03	7,63E-02	-4,17E+00
PENRE	[MJ]	1,28E+01	6,32E-01	5,48E-01	2,11E-02	1,02E-01	3,94E-01	-6,98E+00
PENRM	[MJ]	3,82E-01*	0,00E+00	-3,82E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	1,32E+01	6,32E-01	1,65E-01	2,11E-02	1,02E-01	3,94E-01	-6,98E+00
SM	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m^3]	2,98E-02	4,15E-05	4,49E-04	1,75E-05	6,71E-06	4,40E-03	-1,73E-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 = Net use of fresh water							

WASTE CATEGORIES AND OUTPUT FLOWS PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
HWD	[kg]	2,85E-09	3,33E-11	7,29E-11	4,28E-11	5,39E-12	7,10E-11	-4,57E-09
NHWD	[kg]	1,28E-01	9,91E-05	1,68E-03	8,35E-05	1,60E-05	1,30E-02	-8,87E-03
RWD	[kg]	2,82E-03	1,15E-06	3,03E-05	1,89E-06	1,85E-07	2,18E-05	-1,85E-04
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	4,22E-03*	0,00E+00	1,72E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	1,05E-01	0,00E+00	0,00E+00	2,41E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	1,87E-01	0,00E+00	0,00E+00	4,32E+00	0,00E+00
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; EE = Exported energy							

*The Material for Recyling is from the pulp packaging recyling.

BIOGENIC CARBON CONTENT PER [1 KG WOODFIBER AIR]		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	4,60E-01
Biogenic carbon content in accompanying packaging	kg C	3,97E-03

Result for Woodfiber AIR – Austria

ENVIRONMENTAL IMPACTS PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
GWP-total	[kg CO_2 eq.]	-1,00E+00	1,33E-01	5,25E-02	2,23E-03	7,69E-03	1,53E+00	-5,54E-01
GWP-fossil	[kg CO_2 eq.]	5,19E-01	1,30E-01	3,52E-02	2,21E-03	7,55E-03	2,67E-02	-5,51E-01
GWP-biogenic	[kg CO_2 eq.]	-1,52E+00	1,41E-03	1,73E-02	1,95E-05	8,15E-05	1,51E+00	-3,16E-03
GWP-luluc	[kg CO_2 eq.]	6,87E-04	1,08E-03	1,46E-05	5,13E-06	6,25E-05	1,72E-05	-5,17E-04
ODP	[kg CFC 11 eq.]	4,70E-08	2,61E-17	4,62E-10	5,93E-17	1,51E-18	2,37E-16	-5,81E-15
AP	[mol H^+ eq.]	3,70E-03	1,43E-04	4,80E-05	3,73E-06	8,28E-06	2,57E-04	-5,65E-04
EP-freshwater	[kg P eq.]	1,02E-04	3,92E-07	1,02E-06	1,07E-08	2,27E-08	3,25E-08	-1,08E-06
EP-marine	[kg N eq.]	1,12E-03	4,63E-05	1,44E-05	1,08E-06	2,68E-06	8,45E-05	-1,92E-04
EP-terrestrial	[mol N eq.]	6,10E-03	5,48E-04	1,08E-04	1,11E-05	3,17E-05	1,23E-03	-2,04E-03
POCP	[kg NMVOC eq.]	1,67E-03	1,25E-04	2,55E-05	2,70E-06	7,22E-06	2,30E-04	-5,18E-04
ADPm[1]	[kg Sb eq.]	7,69E-06	1,17E-08	7,66E-08	8,69E-10	6,78E-10	3,62E-09	-1,15E-07
ADPf[1]	[MJ]	1,30E+01	1,76E+00	1,71E-01	2,90E-02	1,02E-01	3,93E-01	-8,42E+00
WDP[1]	[m^3]	4,45E-01	1,23E-03	1,03E-02	8,72E-05	7,10E-05	1,87E-01	-8,72E-03
Caption	GWP-total = Globale Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use							
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							

ADDITIONAL ENVIRONMENTAL IMPACTS PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
PM	[Disease incidence]	3,15E-08	9,69E-10	3,86E-10	3,03E-11	5,61E-11	1,29E-09	-4,50E-09
IRP[2]	[kBq U235 eq.]	1,28E+00	4,68E-04	1,28E-02	1,49E-04	2,71E-05	3,46E-03	-1,47E-02
ETP-fw[1]	[CTUe]	2,01E+01	1,31E+00	2,15E-01	9,80E-03	7,56E-02	1,70E-01	-1,01E+00
HTP-c[1]	[CTUh]	8,77E-10	2,64E-11	9,98E-12	9,19E-13	1,53E-12	1,14E-11	-1,21E-10
HTP-nc[1]	[CTUh]	1,09E-08	1,37E-09	1,43E-10	1,98E-11	7,94E-11	4,08E-10	-5,35E-09
SQP[1]	-	3,60E+01	6,05E-01	3,83E-01	2,43E-02	3,50E-02	1,08E-01	-2,39E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)							
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.							

RESOURCE USE PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
PERE	[MJ]	1,08E+01	1,01E-01	3,08E-01	3,34E-02	5,86E-03	4,89E+00	-3,28E+00
PERM	[MJ]	4,93E+00*	0,00E+00	-1,17E-01	0,00E+00	0,00E+00	-4,81E+00	0,00E+00
PERT	[MJ]	1,58E+01	1,01E-01	1,91E-01	3,34E-02	5,86E-03	7,63E-02	-3,28E+00
PENRE	[MJ]	1,28E+01	1,77E+00	5,56E-01	2,90E-02	1,02E-01	3,94E-01	-8,42E+00
PENRM	[MJ]	3,82E-01*	0,00E+00	-3,82E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	1,32E+01	1,77E+00	1,73E-01	2,90E-02	1,02E-01	3,94E-01	-8,42E+00
SM	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m^3]	2,98E-02	1,16E-04	4,52E-04	2,09E-05	6,71E-06	4,40E-03	-2,06E-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 = Net use of fresh water							

WASTE CATEGORIES AND OUTPUT FLOWS PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
HWD	[kg]	2,85E-09	9,30E-11	4,39E-11	1,38E-11	5,39E-12	7,10E-11	-3,33E-09
NHWD	[kg]	1,28E-01	2,77E-04	1,64E-03	4,21E-05	1,60E-05	1,30E-02	-6,00E-03
RWD	[kg]	2,82E-03	3,20E-06	3,03E-05	1,89E-06	1,85E-07	2,18E-05	-1,86E-04
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	4,22E-03*	0,00E+00	1,72E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	1,05E-01	0,00E+00	0,00E+00	2,41E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	1,87E-01	0,00E+00	0,00E+00	4,32E+00	0,00E+00
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; EE = Exported energy							

* The Material for Recyling is from the pulp packaging recyling.

BIOGENIC CARBON CONTENT PER [1 KG WOODFIBER AIR]		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	4,60E-01
Biogenic carbon content in accompanying packaging	kg C	3,97E-03

Result for Woodfiber AIR – England

ENVIRONMENTAL IMPACTS PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
GWP-total	[kg CO_2 eq.]	-1,00E+00	1,33E-01	5,25E-02	2,25E-03	7,69E-03	1,53E+00	-5,18E-01
GWP-fossil	[kg CO_2 eq.]	5,19E-01	1,30E-01	3,52E-02	2,20E-03	7,55E-03	2,67E-02	-5,13E-01
GWP-biogenic	[kg CO_2 eq.]	-1,52E+00	1,40E-03	1,73E-02	5,12E-05	8,15E-05	1,51E+00	-5,07E-03
GWP-luluc	[kg CO_2 eq.]	6,87E-04	1,07E-03	9,90E-06	3,95E-07	6,25E-05	1,72E-05	-4,41E-05
ODP	[kg CFC 11 eq.]	4,70E-08	2,60E-17	4,62E-10	7,65E-17	1,51E-18	2,37E-16	-7,53E-15
AP	[mol H^+ eq.]	3,70E-03	1,60E-04	4,84E-05	4,12E-06	8,28E-06	2,57E-04	-5,81E-04
EP-freshwater	[kg P eq.]	1,02E-04	3,90E-07	1,01E-06	1,68E-09	2,27E-08	3,25E-08	-1,69E-07
EP-marine	[kg N eq.]	1,12E-03	5,26E-05	1,45E-05	1,22E-06	2,68E-06	8,45E-05	-1,95E-04
EP-terrestrial	[mol N eq.]	6,10E-03	6,17E-04	1,10E-04	1,31E-05	3,17E-05	1,23E-03	-2,12E-03
POCP	[kg NMVOC eq.]	1,67E-03	1,42E-04	2,62E-05	3,44E-06	7,22E-06	2,30E-04	-5,54E-04
ADPm[1]	[kg Sb eq.]	7,69E-06	1,16E-08	7,65E-08	7,73E-10	6,78E-10	3,62E-09	-7,97E-08
ADPf[1]	[MJ]	1,30E+01	1,76E+00	1,90E-01	4,76E-02	1,02E-01	3,93E-01	-9,71E+00
WDP[1]	[m^3]	4,45E-01	1,22E-03	1,03E-02	1,12E-04	7,10E-05	1,87E-01	-1,11E-02
Caption	GWP-total = Globale Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use							
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							

ADDITIONAL ENVIRONMENTAL IMPACTS PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
PM	[Disease incidence]	3,15E-08	1,35E-09	3,93E-10	3,77E-11	5,61E-11	1,29E-09	-5,90E-09
IRP[2]	[kBq U235 eq.]	1,28E+00	4,66E-04	1,33E-02	6,68E-04	2,71E-05	3,46E-03	-6,57E-02
ETP-fw[1]	[CTUe]	2,01E+01	1,30E+00	2,35E-01	3,06E-02	7,56E-02	1,70E-01	-3,03E+00
HTP-c[1]	[CTUh]	8,77E-10	2,63E-11	9,61E-12	5,52E-13	1,53E-12	1,14E-11	-6,93E-11
HTP-nc[1]	[CTUh]	1,09E-08	1,37E-09	1,49E-10	2,55E-11	7,94E-11	4,08E-10	-2,63E-09
SQP[1]	-	3,60E+01	6,00E-01	3,67E-01	7,76E-03	3,50E-02	1,08E-01	-7,68E-01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)							
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.							
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.							

RESOURCE USE PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
PERE	[MJ]	1,08E+01	1,01E-01	3,00E-01	2,62E-02	5,86E-03	4,89E+00	-2,60E+00
PERM	[MJ]	4,93E+00*	0,00E+00	-1,17E-01	0,00E+00	0,00E+00	-4,81E+00	0,00E+00
PERT	[MJ]	1,58E+01	1,01E-01	1,84E-01	2,62E-02	5,86E-03	7,63E-02	-2,60E+00
PENRE	[MJ]	1,28E+01	1,76E+00	5,74E-01	4,76E-02	1,02E-01	3,94E-01	-9,71E+00
PENRM	[MJ]	3,82E-01*	0,00E+00	-3,82E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	1,32E+01	1,76E+00	1,92E-01	4,76E-02	1,02E-01	3,94E-01	-9,71E+00
SM	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m^3]	2,98E-02	1,15E-04	4,46E-04	1,54E-05	6,71E-06	4,40E-03	-1,54E-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 = Net use of fresh water							

WASTE CATEGORIES AND OUTPUT FLOWS PER [1 KG Woodfiber AIR]								
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
HWD	[kg]	2,85E-09	9,25E-11	4,47E-11	1,46E-11	5,39E-12	7,10E-11	-2,01E-09
NHWD	[kg]	1,28E-01	2,76E-04	1,64E-03	4,80E-05	1,60E-05	1,30E-02	-5,46E-03
RWD	[kg]	2,82E-03	3,19E-06	3,53E-05	6,92E-06	1,85E-07	2,18E-05	-6,80E-04
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	4,22E-03	0,00E+00	1,72E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	1,05E-01	0,00E+00	0,00E+00	2,41E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	1,87E-01	0,00E+00	0,00E+00	4,32E+00	0,00E+00
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; EE = Exported energy							

* The Material for Recyling is from the pulp packaging recyling.

BIOGENIC CARBON CONTENT PER [1 KG WOODFIBER AIR]		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	4,60E-01
Biogenic carbon content in accompanying packaging	kg C	3,97E-03

Additional information

Technical information on scenarios

Transport to the building site by Truck (A4)

Scenario information	Zealand	Jutland	Austria	England	Unit
Fuel type	Diesel, 6.35 wt.% bio components	Diesel, 6.35 wt.% bio components	Diesel, 6.35 wt.% bio components	Diesel, 6.35 wt.% bio components	-
Vehicle type	Truck, Euro 6	Truck, Euro 6	Truck, Euro 6	Truck, Euro 6	-
Transport distance	608	440	1699	1687	km
Capacity utilization (including empty runs)	61	61	61	61	%
Gross density of products transported	158	158	158	158	kg/m^3

Transport to the building site by Ship (A4)

Scenario information	Jutland	England	Unit
Fuel type	Heavy fuel oil, 1.0 wt.% S	Heavy fuel oil, 1.0 wt.% S	-
Vehicle type	Container ship	Container ship	-
Transport distance	67	80	km
Capacity utilization (including empty runs)	70	70	%

Installation of the product in the building (A5)

Scenario information	Value	Unit
Ancillary materials	-	kg
Water use	-	m^3
Other resource use	-	kg
Energy type and consumption	Electricity: 0,00712	kWh
Waste materials	0,0266	kg
Output materials	-	kg
Direct emissions to air, soil or water	-	kg

End of life (C1-C4)

Scenario information	Incineration scenario	Unit
Collected separately	1	kg
Collected with mixed waste	0	kg
For reuse	0	kg
For recycling	0	kg
For energy recovery	1	kg
For final disposal	0	kg

Re-use, recovery and recycling potential (D)

Scenario information/Material	Incineration scenario	Unit
Reuse benefit (replacing new production of Woodfiber AIR)	0	kg
Thermal benefit (Incineration of Woodfiber AIR and packaging material)	4,51	MJ
Electricity benefit (Incineration of Woodfiber AIR and packaging material)	2,51	MJ

Indoor air

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

Publisher	epddanmark www.epddanmark.dk
Programme operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	*Frida Dahlberg, Niclas Silfverstrand and Yevgeniya Arushanyan* *Ramboll Sweden AB* *Krukmakargatan,21* *10462 Stockholm* *e-mail:* yevgeniya.arushanyan@ramboll.se
LCA software /background data	*GaBi 10.6.0.110*
3rd party verifier	*Ninkie Bendtsen* *NIRAS* *Sortemosevej 19* *3450 Allerød* *Danmark* *e-mail: ninb@niras.dk*

General programme instructions
Version 2.0
www.epddanmark.dk

EN 15804
DS/EN 15804 + A2:2019 - "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"