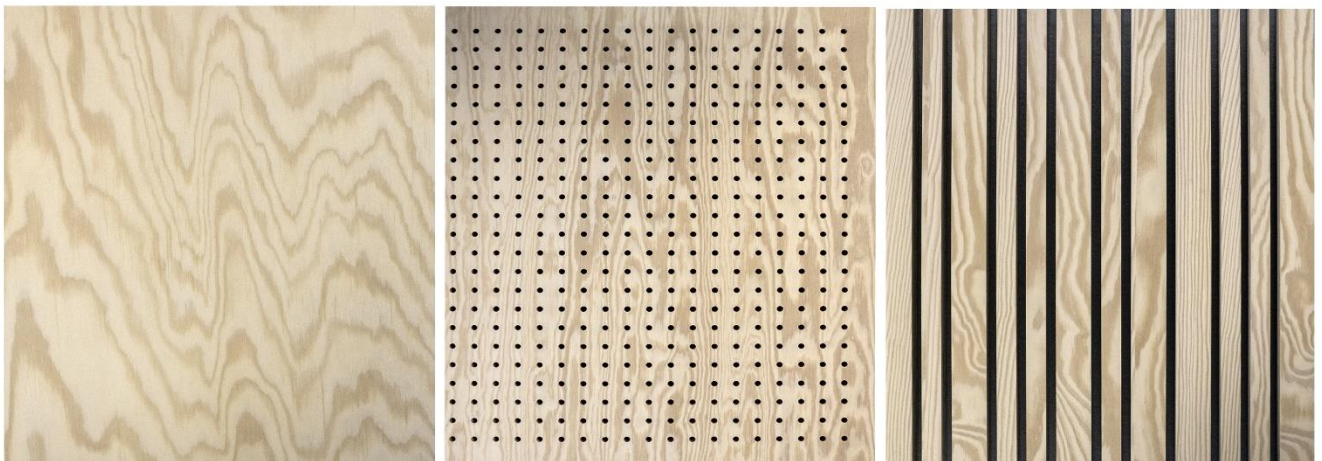


Owner: Keflico A/S
No.: MD-23168-EN
Issued: 29-09-2023
Valid to: 29-09-2028

3rd PARTY VERIFIED

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804



Owner of declaration
Keflico A/S.
Juelstrupparken 24
9530 Støvring, Denmark.
VAT: DK23980010



Issued:
29-09-2023

Valid to:
29-09-2028

Programme
EPD Danmark
www.epddanmark.dk



- Industry EPD
 Product EPD

Declared product(s)
Keflico Design Panels Birch

Number of declared datasets/product variations: 3

Production site
Fabriksvej 12, 15 and 16
7441 Bording, Denmark.

100% wind power with GO is used in module A3 for production.

Product(s) use
The panels are used either as acoustic panels or wall/ceiling panels.

Declared/ functional unit
1 m² panels (for indoor use)

Year of production site data (A3)
2022

EPD version
First edition

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 <input type="checkbox"/> internal <input checked="" type="checkbox"/> external
Third party verifier:  Linda Højbye

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

Product information

Product description

The main product components are shown in the table below.

Material	Weight-% of declared product
Birch plywood	95-98
Veneer	<1
Glue and hardener	<1
Fire retardant lacquer	<1
Acoustic cloth*	<1

*Only Echo and Sono variants

There are three variants:

1. Keflico Design Panels Basic: a plane panel with veneer and lacquer
2. Keflico Design Panels Sono: a panel with veneer, perforation/holes and lacquer as well as an acoustic cloth
3. Keflico Design Panels Echo: a panel with veneer, lacquer, lamella and an acoustic cloth

Product packaging:

The composition of the sales- and transport packaging of the product is shown in the table below.

Material	Weight-% of packaging
Cardboard	56
LDPE film	44

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of Keflico Design Panels Birch on the production site located in Denmark. Product specific data are based on average values

collected in the period 2022 where economic allocation is applied complying with EN 15804 and EN 16485. The EPD is a product specific EPD declaring three different variants of Keflico Design Panels Birch. Background data are based on LCA for Experts 10.7 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.

The products are produced and sold in Denmark. Therefore, a Danish EoL scenario is included, and the geographical region covered is Denmark.

Hazardous substances

Keflico Design Panels Birch does not contain substances listed on the "Candidate List of Substances of Very High Concern for authorisation"

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

Essential characteristics

Keflico Design Panels Birch are covered by harmonised technical specification EN 16485. Declaration of performance according to EU regulation 305/2011 is available for all declared product variations.

The birch wood is approved for the class of reaction to fire according to EN 13501-1: B-s1,d0 and D-s2, d2, for fire-protective ability.

Further technical information can be obtained by contacting the manufacturer or on the manufacturer's website:

<https://www.keflico.com/>

Reference Service Life (RSL)

No RSL is declared. This EPD is based on a cradle to gate with modules C1-4 and D and does not include the use stage.

Picture of product(s)

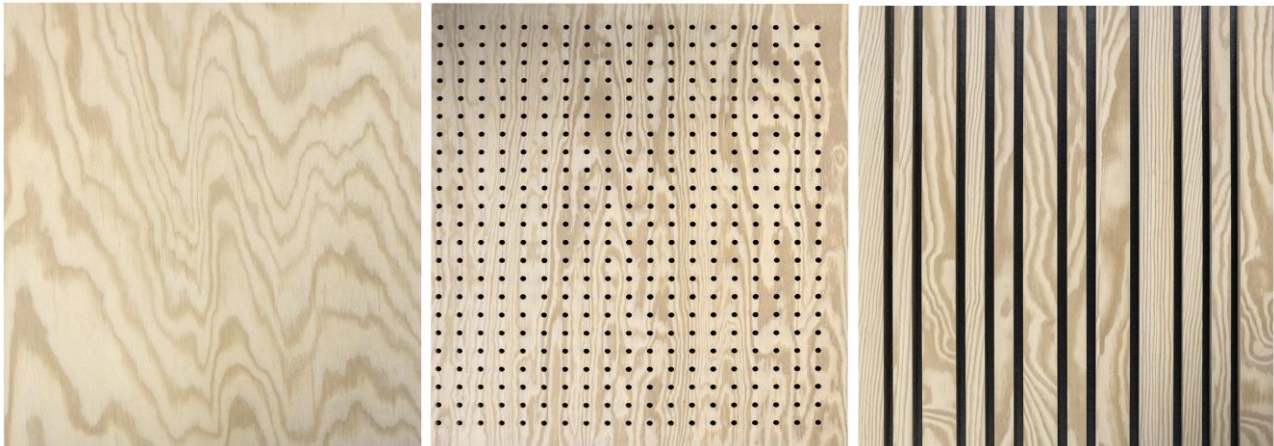


Figure 1: Keflico Design Panels made of birch with Basic, Sono and Echo variants from left to right.

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to 1 m² Keflico Design Panel Birch.

Name	Value	Unit
Declared unit	1	m ²
Density	8,2-8,5	kg/m ²
Conversion factor to 1 kg.	0,12	-
Moisture content	8-12	%

Functional unit

Not defined.

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804 and EN 16485.

Guarantee of Origin – certificates

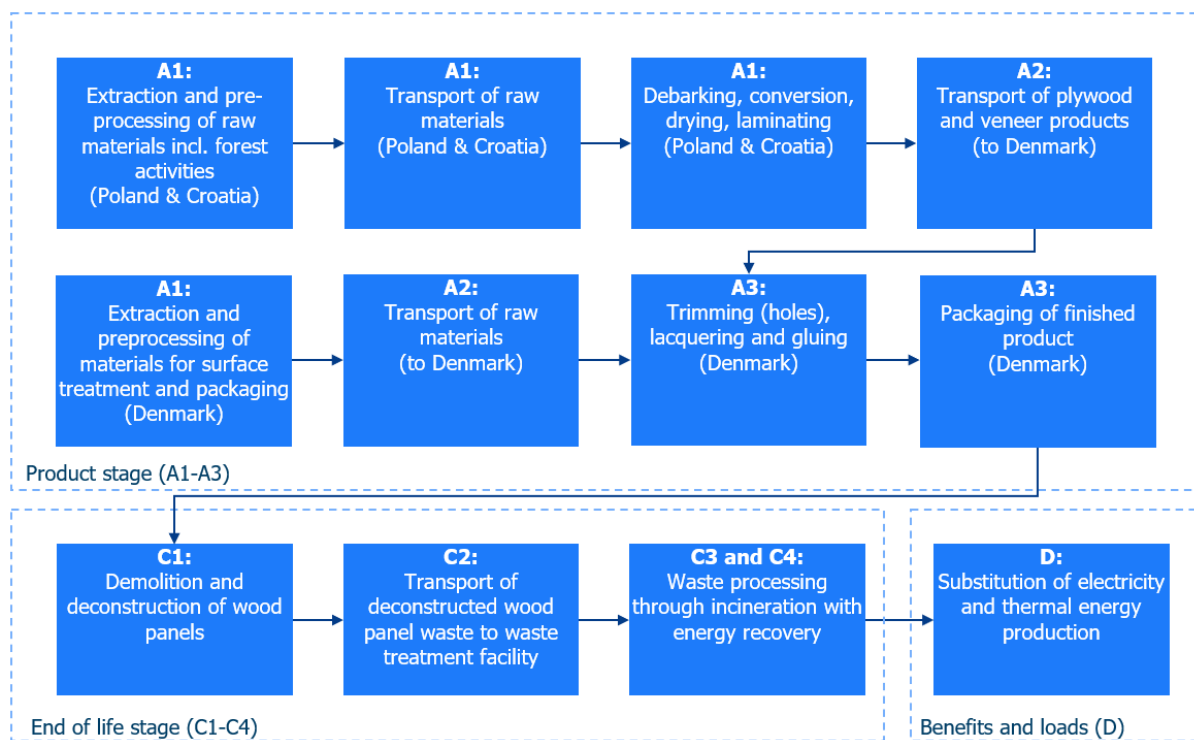
Foreground system:

The product is produced using 100% wind power certified with GO in Denmark at the production site in Bording, Denmark.

Background system:

Upstream processes are modelled using residual grid mix. Downstream processes are modelled using consumption mix.

Flowdiagram



System boundary

This EPD is based on a cradle-to-gate LCA with options, where modules C1-C4 and D are also considered, in which 100 %-weight of the product 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. Also, the cut-off criteria shall be 1% of renewable and non-renewable primary energy usage and 1% of the total mass input of that unit process, according to EN 15804:2012+A2:2019, 6.3.6.

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.

Keflico A/S receives plywood from Poland and veneer from Croatia. At the production site in Bording, Denmark, the veneer is attached to the plywood using glue and hardener and lastly, the combined product is treated with fire retardant lacquer. For the Basic variant no further treatment is carried out. For the Sono variant an acoustic cloth is attached, and the panel is perforated. For the Echo variant also an acoustic cloth is attached, and the panel is produced with slats.

Construction process stage (A4-A5) includes:

Modules are not included in this study.

Use stage (B1-B7) includes:

Modules are not included in this study.

End of Life (C1-C4) includes:

When the buildings are being demolished the Keflico Design Panels Birch are transported to incineration in Denmark with energy recovery.

At the demolition site it is estimated that 3% of the wood-based panels are lost at the deconstruction site. The losses are assumed to be broken down aerobically.

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

During the incineration process, heat and electricity is produced.

LCA results

The LCA results are separated into three sections, one for each variant, namely Keflico Design Panel Basic, Keflico Design Panel Sono and lastly, Keflico Design Panel Echo.

Keflico Design Panel Basic

ENVIRONMENTAL IMPACTS PER m ²									
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	-7,85E+00	2,14E-01	1,95E-01	0,00E+00	2,16E-01	1,73E+01	0,00E+00	-3,50E+00
GWP-fossil	[kg CO ₂ eq.]	6,24E+00	2,15E-01	1,12E-01	0,00E+00	2,17E-01	3,26E+00	0,00E+00	-3,44E+00
GWP-biogenic	[kg CO ₂ eq.]	-1,41E+01	-2,97E-03	8,26E-02	0,00E+00	-2,99E-03	1,40E+01	0,00E+00	-6,00E-02
GWP-luluc	[kg CO ₂ eq.]	1,55E-02	1,96E-03	4,38E-05	0,00E+00	1,97E-03	3,46E-05	0,00E+00	-1,43E-03
ODP	[kg CFC 11 eq.]	3,47E-07	2,75E-14	1,06E-13	0,00E+00	2,77E-14	1,33E-12	0,00E+00	-3,20E-11
AP	[mol H ⁺ eq.]	7,33E-02	1,08E-03	1,85E-04	0,00E+00	1,25E-03	7,67E-03	0,00E+00	-1,45E-02
EP-freshwater	[kg PO ₄ eq.]	8,65E-04	7,72E-07	2,39E-06	0,00E+00	7,78E-07	1,21E-06	0,00E+00	-7,31E-05
EP-marine	[kg N eq.]	2,85E-02	5,15E-04	9,20E-05	0,00E+00	6,08E-04	3,56E-03	0,00E+00	-4,79E-03
EP-terrestrial	[mol N eq.]	2,93E-01	5,74E-03	9,67E-04	0,00E+00	6,76E-03	4,17E-02	0,00E+00	-4,05E-02
POCP	[kg NMVOC eq.]	7,57E-02	1,02E-03	2,06E-04	0,00E+00	1,14E-03	8,83E-03	0,00E+00	-1,04E-02
ADPm ¹	[kg Sb eq.]	4,03E-05	1,39E-08	2,07E-09	0,00E+00	1,40E-08	1,92E-08	0,00E+00	-1,09E-06
ADPf ¹	[MJ]	9,30E+01	2,88E+00	2,45E-01	0,00E+00	2,90E+00	4,00E+00	0,00E+00	-3,63E+01
WDP ¹	[m ³ world eq. deprived]	6,05E+00	2,55E-03	2,72E-02	0,00E+00	2,57E-03	1,50E+00	0,00E+00	-8,08E-01
Caption	GWP-total = Global 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 = Acidification; 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 depletion potential								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.								
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, as declared in the project report of this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER m ²									
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	[Disease incidence]	7,96E-07	5,35E-09	1,02E-09	0,00E+00	6,03E-09	2,51E-08	0,00E+00	-1,07E-07
IRP ²	[kBq U235 eq.]	1,95E-01	8,06E-04	1,12E-03	0,00E+00	8,12E-04	8,30E-03	0,00E+00	-2,10E-01
ETP-fw ¹	[CTUe]	8,82E+01	2,04E+00	6,13E-01	0,00E+00	2,06E+00	1,33E+00	0,00E+00	-1,67E+01
HTP-c ¹	[CTUh]	1,59E-08	4,19E-11	2,56E-11	0,00E+00	4,21E-11	2,18E-10	0,00E+00	-1,42E-09
HTP-nc ¹	[CTUh]	2,88E-07	2,32E-09	2,94E-09	0,00E+00	2,83E-09	1,75E-08	0,00E+00	-4,78E-08
SQP ¹	-	1,97E+03	1,20E+00	8,49E-02	0,00E+00	1,21E+00	1,31E+00	0,00E+00	-3,02E+02
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)								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.								
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 m ²									
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	[MJ]	4,46E+02	2,09E-01	1,32E-01	0,00E+00	2,11E-01	1,43E+00	0,00E+00	-1,36E+02
PERM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	4,46E+02	2,09E-01	1,32E-01	0,00E+00	2,11E-01	1,43E+00	0,00E+00	-1,36E+02
PENRE	[MJ]	9,31E+01	2,89E+00	2,45E-01	0,00E+00	2,91E+00	4,00E+00	0,00E+00	-3,63E+01
PENRM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	9,31E+01	2,89E+00	2,45E-01	0,00E+00	2,91E+00	4,00E+00	0,00E+00	-3,63E+01
SM	[kg]	0,00E+00	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	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	0,00E+00
FW	[m ³]	1,53E-01	2,29E-04	6,57E-04	0,00E+00	2,31E-04	3,53E-02	0,00E+00	-3,12E-02
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								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.								

WASTE CATEGORIES AND OUTPUT FLOWS PER m ²									
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	[kg]	5,46E-09	8,94E-12	-4,97E-11	0,00E+00	9,01E-12	-9,77E-11	0,00E+00	1,47E-08
NHWD	[kg]	3,01E-01	4,40E-04	4,11E-02	0,00E+00	4,43E-04	2,51E-01	0,00E+00	-2,25E-01
RWD	[kg]	3,13E-04	5,40E-06	8,27E-06	0,00E+00	5,44E-06	7,37E-05	0,00E+00	-1,83E-03

CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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	0,00E+00
EEE	[MJ]	1,09E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,13E+01	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,17E+01	0,00E+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; EEE = Exported electrical energy; EET = Exported thermal energy								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.								

BIOGENIC CARBON CONTENT PER m ²		
Parameter	Unit	At the factory gate
Biogenic carbon content in birch variants	[kg C]	3,93
Biogenic carbon content in accompanying packaging for birch variants	[kg C]	4,22E-03
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

Keflico Design Panel Sono

ENVIRONMENTAL IMPACTS PER m ²									
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	-8,72E+00	2,11E-01	1,08E+00	0,00E+00	2,12E-01	1,70E+01	0,00E+00	-3,45E+00
GWP-fossil	[kg CO ₂ eq.]	6,02E+00	2,12E-01	1,22E-01	0,00E+00	2,13E-01	3,20E+00	0,00E+00	-3,38E+00
GWP-biogenic	[kg CO ₂ eq.]	-1,48E+01	-2,93E-03	9,59E-01	0,00E+00	-2,94E-03	1,38E+01	0,00E+00	-5,91E-02
GWP-luluc	[kg CO ₂ eq.]	1,54E-02	1,93E-03	4,37E-05	0,00E+00	1,94E-03	3,40E-05	0,00E+00	-1,40E-03
ODP	[kg CFC 11 eq.]	8,31E-07	2,71E-14	1,06E-13	0,00E+00	2,72E-14	1,30E-12	0,00E+00	-3,14E-11
AP	[mol H ⁺ eq.]	7,03E-02	1,07E-03	2,85E-03	0,00E+00	1,23E-03	7,54E-03	0,00E+00	-1,43E-02
EP-freshwater	[kg PO ₄ eq.]	8,43E-04	7,62E-07	2,39E-06	0,00E+00	7,65E-07	1,19E-06	0,00E+00	-7,19E-05
EP-marine	[kg N eq.]	2,73E-02	5,14E-04	1,43E-03	0,00E+00	5,98E-04	3,51E-03	0,00E+00	-4,71E-03
EP-terrestrial	[mol N eq.]	2,80E-01	5,72E-03	1,59E-02	0,00E+00	6,65E-03	4,10E-02	0,00E+00	-3,99E-02
POCP	[kg NMVOC eq.]	7,26E-02	1,01E-03	3,79E-03	0,00E+00	1,12E-03	8,68E-03	0,00E+00	-1,03E-02
ADPm ¹	[kg Sb eq.]	3,48E-05	1,37E-08	1,09E-09	0,00E+00	1,38E-08	1,89E-08	0,00E+00	-1,08E-06
ADPf ¹	[MJ]	8,61E+01	2,84E+00	2,44E-01	0,00E+00	2,85E+00	3,93E+00	0,00E+00	-3,57E+01
WDP ¹	[m ³ world eq. deprived]	5,36E+00	2,52E-03	2,72E-02	0,00E+00	2,53E-03	1,48E+00	0,00E+00	-7,95E-01
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 = Acidification; 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 depletion potential								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.								
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, as declared in the project report of this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER m ²									
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	[Disease incidence]	7,66E-07	5,31E-09	3,99E-08	0,00E+00	5,93E-09	2,47E-08	0,00E+00	-1,05E-07
IRP ²	[kBq U235 eq.]	1,85E-01	7,95E-04	1,12E-03	0,00E+00	7,99E-04	8,16E-03	0,00E+00	-2,07E-01
ETP-fw ¹	[CTUe]	8,43E+01	2,02E+00	6,35E-01	0,00E+00	2,02E+00	1,30E+00	0,00E+00	-1,64E+01
HTP-c ¹	[CTUh]	1,15E-08	4,13E-11	1,46E-10	0,00E+00	4,14E-11	2,14E-10	0,00E+00	-1,39E-09
HTP-nc ¹	[CTUh]	2,83E-07	2,29E-09	4,93E-09	0,00E+00	2,78E-09	1,72E-08	0,00E+00	-4,70E-08
SQP ¹	-	1,97E+03	1,19E+00	7,88E-02	0,00E+00	1,19E+00	1,29E+00	0,00E+00	-2,97E+02
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)								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.								
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 m ²									
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	[MJ]	4,46E+02	2,07E-01	7,03E-02	0,00E+00	2,07E-01	1,40E+00	0,00E+00	-1,34E+02
PERM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	4,46E+02	2,07E-01	7,03E-02	0,00E+00	2,07E-01	1,40E+00	0,00E+00	-1,34E+02
PENRE	[MJ]	8,62E+01	2,85E+00	2,44E-01	0,00E+00	2,86E+00	3,94E+00	0,00E+00	-3,57E+01
PENRM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	8,62E+01	2,85E+00	2,44E-01	0,00E+00	2,86E+00	3,94E+00	0,00E+00	-3,57E+01
SM	[kg]	0,00E+00	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	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	0,00E+00
FW	[m ³]	1,36E-01	2,26E-04	6,57E-04	0,00E+00	2,27E-04	3,48E-02	0,00E+00	-3,07E-02
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								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.								

WASTE CATEGORIES AND OUTPUT FLOWS PER m ²									
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	[kg]	5,45E-09	8,82E-12	-4,96E-12	0,00E+00	8,86E-12	-9,61E-11	0,00E+00	1,44E-08
NHWD	[kg]	3,01E-01	4,34E-04	4,10E-02	0,00E+00	4,36E-04	2,47E-01	0,00E+00	-2,22E-01
RWD	[kg]	3,13E-04	5,33E-06	8,24E-06	0,00E+00	5,35E-06	7,24E-05	0,00E+00	-1,80E-03

CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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	0,00E+00
EEE	[MJ]	1,09E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,10E+01	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,02E+01	0,00E+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; EEE = Exported electrical energy; EET = Exported thermal energy								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.								

BIOGENIC CARBON CONTENT PER m ²		
Parameter	Unit	At the factory gate
Biogenic carbon content in birch variants	[kg C]	3,87
Biogenic carbon content in accompanying packaging for birch variants	[kg C]	4,22E-03
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

Keflico Design Panel Echo

ENVIRONMENTAL IMPACTS PER m ²									
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	-7,87E+00	2,08E-01	1,95E-01	0,00E+00	2,08E-01	1,67E+01	0,00E+00	-3,38E+00
GWP-fossil	[kg CO ₂ eq.]	5,72E+00	2,09E-01	1,12E-01	0,00E+00	2,09E-01	3,14E+00	0,00E+00	-3,32E+00
GWP-biogenic	[kg CO ₂ eq.]	-1,36E+01	-2,89E-03	8,26E-02	0,00E+00	-2,88E-03	1,35E+01	0,00E+00	-5,79E-02
GWP-luluc	[kg CO ₂ eq.]	1,56E-02	1,91E-03	4,37E-05	0,00E+00	1,90E-03	3,34E-05	0,00E+00	-1,38E-03
ODP	[kg CFC 11 eq.]	7,66E-07	2,68E-14	1,06E-13	0,00E+00	2,67E-14	1,28E-12	0,00E+00	-3,08E-11
AP	[mol H ⁺ eq.]	7,23E-02	1,07E-03	1,85E-04	0,00E+00	1,21E-03	7,40E-03	0,00E+00	-1,40E-02
EP-freshwater	[kg PO ₄ eq.]	7,81E-04	7,52E-07	2,39E-06	0,00E+00	7,50E-07	1,17E-06	0,00E+00	-7,05E-05
EP-marine	[kg N eq.]	2,87E-02	5,13E-04	9,18E-05	0,00E+00	5,87E-04	3,44E-03	0,00E+00	-4,62E-03
EP-terrestrial	[mol N eq.]	2,96E-01	5,71E-03	9,66E-04	0,00E+00	6,52E-03	4,02E-02	0,00E+00	-3,91E-02
POCP	[kg NMVOC eq.]	7,65E-02	1,01E-03	2,06E-04	0,00E+00	1,10E-03	8,52E-03	0,00E+00	-1,01E-02
ADPm ¹	[kg Sb eq.]	2,85E-05	1,36E-08	1,02E-09	0,00E+00	1,35E-08	1,86E-08	0,00E+00	-1,05E-06
ADPf ¹	[MJ]	7,76E+01	2,80E+00	2,44E-01	0,00E+00	2,80E+00	3,86E+00	0,00E+00	-3,50E+01
WDP ¹	[m ³ world eq. deprived]	4,70E+00	2,49E-03	2,72E-02	0,00E+00	2,48E-03	1,45E+00	0,00E+00	-7,80E-01
Caption	GWP-total = Global 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 = Acidification; 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 depletion potential								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.								
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, as declared in the project report of this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER m ²									
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PM	[Disease incidence]	8,09E-07	5,28E-09	1,02E-09	0,00E+00	5,81E-09	2,43E-08	0,00E+00	-1,03E-07
IRP ²	[kBq U235 eq.]	1,65E-01	7,85E-04	1,12E-03	0,00E+00	7,83E-04	8,01E-03	0,00E+00	-2,03E-01
ETP-fw ¹	[CTUe]	7,83E+01	1,99E+00	6,12E-01	0,00E+00	1,99E+00	1,28E+00	0,00E+00	-1,61E+01
HTP-c ¹	[CTUh]	8,00E-09	4,08E-11	2,38E-11	0,00E+00	4,06E-11	2,10E-10	0,00E+00	-1,37E-09
HTP-nc ¹	[CTUh]	2,82E-07	2,26E-09	2,93E-09	0,00E+00	2,73E-09	1,69E-08	0,00E+00	-4,61E-08
SQP ¹	-	1,97E+03	1,17E+00	7,84E-02	0,00E+00	1,17E+00	1,26E+00	0,00E+00	-2,91E+02
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)								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.								
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 m ²									
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	[MJ]	4,46E+02	2,04E-01	6,62E-02	0,00E+00	2,03E-01	1,38E+00	0,00E+00	-1,32E+02
PERM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	4,46E+02	2,04E-01	6,62E-02	0,00E+00	2,03E-01	1,38E+00	0,00E+00	-1,32E+02
PENRE	[MJ]	7,77E+01	2,81E+00	2,44E-01	0,00E+00	2,81E+00	3,86E+00	0,00E+00	-3,50E+01
PENRM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	7,77E+01	2,81E+00	2,44E-01	0,00E+00	2,81E+00	3,86E+00	0,00E+00	-3,50E+01
SM	[kg]	0,00E+00	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	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	0,00E+00
FW	[m ³]	1,21E-01	2,23E-04	6,57E-04	0,00E+00	2,23E-04	3,41E-02	0,00E+00	-3,01E-02
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								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.								

WASTE CATEGORIES AND OUTPUT FLOWS PER m ²									
Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
HWD	[kg]	5,44E-09	8,71E-12	-2,03E-12	0,00E+00	8,69E-12	-9,43E-11	0,00E+00	1,42E-08
NHWD	[kg]	3,01E-01	4,29E-04	4,10E-02	0,00E+00	4,28E-04	2,42E-01	0,00E+00	-2,18E-01
RWD	[kg]	3,13E-04	5,27E-06	8,23E-06	0,00E+00	5,25E-06	7,11E-05	0,00E+00	-1,77E-03

CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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	0,00E+00
EEE	[MJ]	1,09E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,06E+01	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,85E+01	0,00E+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; EEE = Exported electrical energy; EET = Exported thermal energy								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.								

BIOGENIC CARBON CONTENT PER m ²		
Parameter	Unit	At the factory gate
Biogenic carbon content in birch variants	[kg C]	3,80
Biogenic carbon content in accompanying packaging for birch variants	[kg C]	4,22E-03
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂	

Additional information

LCA interpretation

The raw material which is of most importance is birch plywood constitute most of the Keflico Design Panels. The plywood production in Poland requires considerable amounts of raw materials and energy and leaves behind a significant share of waste that needs treatment.

Technical information on scenarios

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	-	kg
Collected with mixed waste	8,2 – 8,5	kg
For reuse	-	kg
For recycling	-	kg
For energy recovery	8,2 – 8,5	kg
For final disposal	-	kg
Assumptions for scenario development	-	As appropriate

Re-use, recovery and recycling potential (D)

Scenario information/Materiel	Value	Unit
Electricity from incineration	20-22	MJ
Heat from incineration	89-92	MJ

Indoor air

The EPD gives information on release of dangerous substances to indoor air, namely formaldehyde.

A formaldehyde test DIN EN 717-1:2005 has been carried out to determine the release of formaldehyde from the wood-based panels. The test confirms that the wood-based panel comply with the standards (Formaldehyde test No. 31/23/4937/01-A).

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.

References

Publisher	 www.epddanmark.dk <small>Template version 2023.1</small>
Programme operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Gritt Cortnum Andersen Mirko Miseljic FORCE Technology Park Allé 345 2605 Brøndby, Denmark. www.forcetechnology.com 
LCA software / background data	<i>LCA for Experts 10.7 incl. Sphera database 2023.1 & Ecoinvent 3.8</i> https://sphera.com/product-sustainability-gabi-data-search/
3rd party verifier	Linda Høibye Life Cycle Assessment Consulting

General programme instructions

General Programme Instructions, version 2.0, spring 2020
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 16485

DS/EN 16485:2014 – "Wood and wood-based products for use in construction".

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"