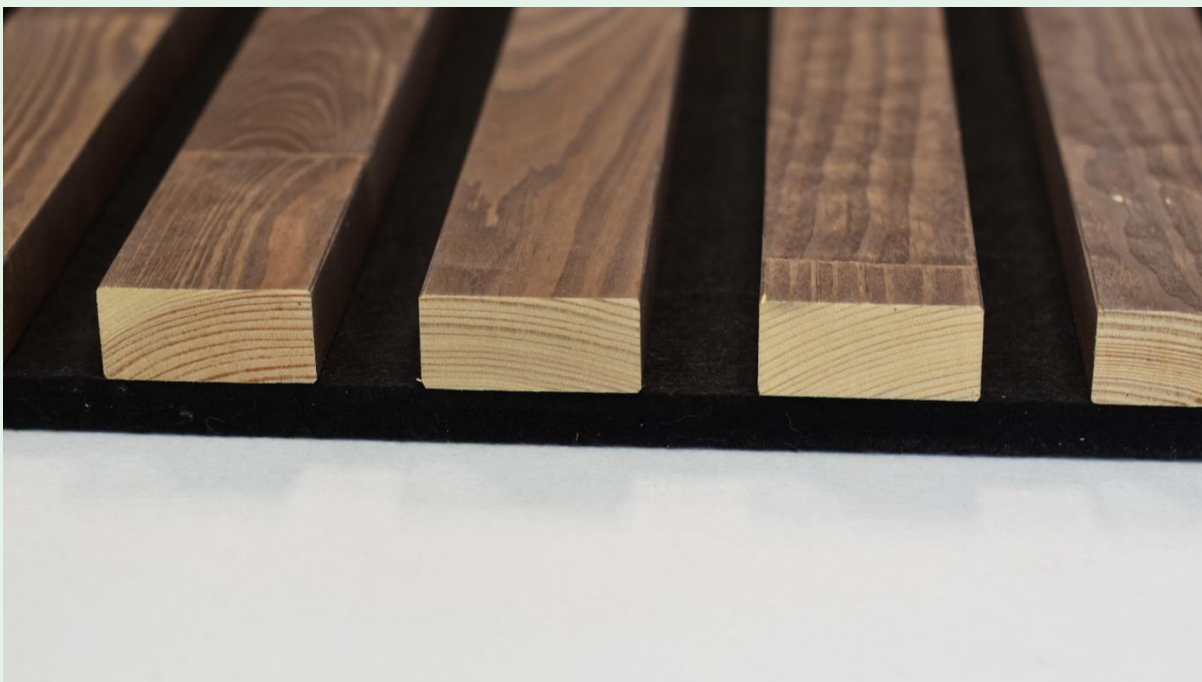


Environmental Product Declaration

In accordance with ISO14025:2006 and EN15804:2012+A2:2019

Rib Element with Kingkus



The Norwegian
EPD Foundation

Owner of the declaration:
Vyrk AS

Product name:
Rib Element with Kingkus

Declared unit:
1 m²

Product category /PCR:
ISO 14044:2006, NS-EN 15804:2012, ISO
14025:2006, NPCR Part A:2021 Construction
products and services Ver 2 and NPCR 10 Part
B for building boards Ver 2.

Program holder and publisher:
The Norwegian EPD foundation

Declaration number:
NEPD-7667-7047-EN

Registration number:
NEPD-7667-7047-EN

Issue date:
01.10.2024

Valid to:
01.10.2029

General information

Product:

Rib Element with Kingkus

Program operator:

The Norwegian EPD Foundation
 Post Box 5250 Majorstuen, 0303 Oslo, Norway
 Tlf: +47 23 08 80 00
 e-mail: post@epd-norge.no

Declaration number:

NEPD-7667-7047-EN

This declaration is based on Product Category Rules:

NPCR Part A:2021 Construction products and services Ver 2 and NPCR 10 Part B for building boards Ver 2 (03 2022).

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer, life cycle assessment data and evidences.

Declared unit:

1 m2 installed rib element with board material kingkus, including end-of-life handling.

Declared unit with option:

A1-A3, A4, A5, C1, C2, C3, C4, D

Functional unit:

-

Verification:

Independent verification of the declaration and data, according to ISO14025:2010

internal external



Independent verifier approved by EPD Norway

Owner of the declaration:

Vyrk AS
 Contact person: Steinar Lyseng
 Phone: 911 21 291
 e-mail: steinar@vyrk.no

Manufacturer:

Vyrk AS
 Støligoto 2, 2943 Rogne
 Phone: 99 11 99 59
 e-mail: post@vyrk.no

Place of production:

Trysil, Norway

Management system:

Miljøfyrtårn certified

Organisation no:

919 349 476 MVA

Issue date:

01.10.2024

Valid to:

01.10.2029

Year of study:

Data for year 2023. LCA developed in 2024.

Comparability:

EPD of construction products may not be able to compare if they do not comply with EN 15804 and are seen in a building context.

The EPD has been worked out by:

Carla Assuad and Simen Skrindsrud
 Vyrk AS



Approved Manager of EPD Norway

Product

Product description:

The element is designed for covering walls and ceilings in indoors and outdoors spaces with a standard climate. It features a board Kingkus and linear ribs attached to the board. The surface is treated with either oil, lacquer, lacquer fire retardant, or varnish. The ribs are placed on the board with 40% opening between the ribs.

The ribs have a hardwood core material. In this study oak is used as reference with 21mm thickness, but it can be sold with different types of hardwood and dimensions. The ribs can be surface treated with fire retardant lacquer and holds the fireclass B s1,d0.

Kingkus is a 12mm plate made of polyester fibre. The board is very light with sound-absorbing properties and can be delivered in an number of colours and thicknesses. This fibre acoustic board can be used alone or as a back plate for linear rib elements and gives the room a unique expression and a good acoustic indoor environment. The board is made of 100% polyester fibre, where at least 75% of the polyester fibre comes from recycled materials. The plate contributes to a safe indoor environment and contains no chemical binders. The Kingkus 12mm board holds a sound absorption class D, Formaldehyde class E0, and fire class B-s2,d0.

The complete product does not hold any fire class itself, only the materials included.

Product specification:

The core material used in the board is Kingkus with ribs. The ribs have a hardwood core material. In this study oak is used as reference with 21mm thickness, but it can be sold with different types of hardwood and dimensions.

The EPD covers all dimensions. The mounting system is not included as multiple options are available.

The EPD is an average EPD as multiple surface treatments are available. A conservative approach is used so that the EPD describes the surface treatment with the highest environmental impact for each category.

Product materials	Value	%
Ribs (Hardwood) 21mm	8,44	76%
Kingkus 12mm	2,40	21%
Lacquer/Oil/varnish	0,33	3%
Total product	11,17	100%
Packaging materials	Value	%
Wood Pallet	0,32	81%
Plastic Wrapping	0,08	19%
Total packaging	0,40	100%

Technical data:

The rib board has a density of $\geq 11,17$ kg/m². With wood moisture content 14-18 %.

Market:

Sweden, Denmark, and Norway. The scenario describes use in Norway.

Reference service life, product:

Reference service life is 50 years. The actual service life depends on maintenance and external impacts.

Reference service life, building:

Reference service life is 50 years. The actual service life depends on climatic conditions and external impacts, such as construction and maintenance.

Additional technical information.

Vyrk AS is not FSC/PEFC certified, but all constituents are purchased from certified providers.

LCA: Calculation rules

Declared unit:

1 m2 installed rib element board with core material Kingkus and hardwood ribs, surface treated, including end-of-life handling.

Cut-off criteria:

In accordance with 6.3.5 of the PCR.

Allocation:

Allocation has been made according to EN15804:2012 + A2: 2019 and in accordance with chapter 6.3.5 PCR for building boards. For the production, energy use, water and waste at fabrication are mass-allocated to produce different panels and slats.

Ecoinvent v3.8, allocation, cut-off by classification is used as the background database. The database apply economic allocation.

Data quality:

Quantities of all raw materials are measured to the production of 1 m2 of element, based on the average consumption at the factory in 2023. The EPDs used to describe A1-A3 LCA impacts are in the following table. Remaining data is sourced from the Ecoinvent database (v.3.8) using the LCA-software Simapro (v 9.5.0.2). Characterization factors have been used from EN15804:2012 + A2: 2019.

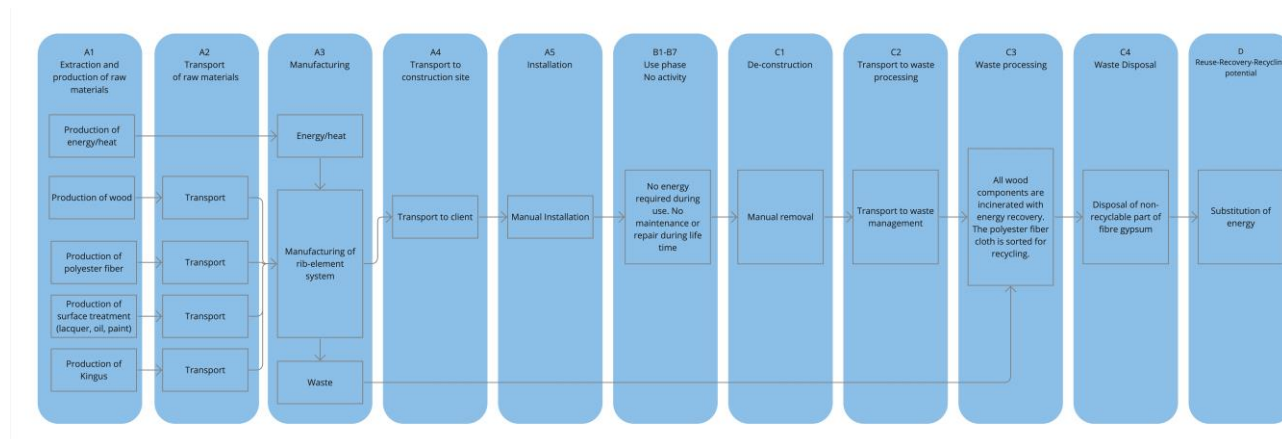
Raw material	EPD	Year
Rib element	3015-EPD-030064863	2020-2025
Lacquer fire retardant	Component 1: 20230333569 Component 2: 20230333565	2023-2028
Varnish	NEPD-1789-754	2019-2024

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Assembly stage		Use stage								End of life stage				Benefits & loads beyond system boundary
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-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	

System boundary:

The EPD covers all steps from raw material extraction for all raw materials to finished rib element (module A1-A4), assembly (A5) and end-of-life (C1-C4 and D). The flow chart below describes the system analyzed.



LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Transport from production place to assembly/user (A4)

Transport from production place to assembly/user (A4)	Capacity utilisation (incl. return) %	Type of Vehicle	Distance (km)	Fuel/Energy consumption	Unit	Value (liter/t)
Truck, EURO 5	37%	Lorry, 16-32, EURO 5	300	0,045	l/tkm	13,54

Assembly (A5)

It is assumed no spill at installation as the panels are custom-made/ordered in specific dimensions. Only manual work is required; hence no energy consumption is assumed. Waste treatment of the packaging is included in A5. The mounting system is not covered by the EPD.

End of Life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	kg	0
Collected as mixed construction waste	kg	0
Reuse	kg	0
Recycling	kg	0
Energy recovery	kg	8,44
To landfill	kg	2,40

The waste processing is assumed as wood waste treated with incineration with energy recovery.

Transport to waste processing (C2)

Transport from production place to assembly/user (A4)	Capacity utilisation (incl. return) %	Type of Vehicle	Distance (km)	Fuel/Energy consumption	Unit	Value (liter/t)
Truck	37%	Lorry, 16-32, EURO 5	85	0,045	l/tkm	3,84

Benefits and loads beyond the system boundaries (D)

Benefits and loads beyond the system boundaries (D)	Unit	Value
Substitution of electricity, in Norway	MJ	4,7
Substitution of thermal energy, district heating, in Norway	MJ	143,3

The benefits of exported energy from energy recovery in a treatment facility is calculated with substitution of Norwegian electricity market mix and Norwegian district heating mix (SSB 2022). Conversion factors for efficiencies and losses from waste to delivered energy are included.

Results are shown for the declared unit: 1 m² installed rib element, surface treated, including end-of-life handling with core board material Kingkus.

Core environmental impact indicators

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	1,71E+00	5,86E-01	6,56E-01	0,00E+00	1,61E-01	2,51E+01	3,69E-04	-9,82E-01
GWP-fossil	kg CO ₂ eq.	2,70E+01	5,86E-01	1,57E-01	0,00E+00	1,60E-01	1,04E-01	3,69E-04	-6,34E-01
GWP-biogenic	kg CO ₂ eq.	-2,53E+01	0,00E+00	4,99E-01	0,00E+00	0,00E+00	2,50E+01	0,00E+00	-3,46E-01
GWP-LULUC	kg CO ₂ eq.	4,32E-02	2,30E-04	1,39E-06	0,00E+00	6,30E-05	3,68E-05	1,15E-07	-2,07E-03
ODP	kg CFC11 eq.	4,30E-05	1,36E-07	4,67E-10	0,00E+00	3,71E-08	3,68E-05	1,72E-10	-7,87E-08
AP	mol H ⁺ eq.	1,93E-01	2,38E-03	1,34E-04	0,00E+00	6,51E-04	3,51E-03	3,29E-06	-6,57E-03
EP-freshwater	kg P eq.	4,98E-03	3,78E-05	2,10E-06	0,00E+00	1,03E-05	6,81E-05	3,08E-08	-1,62E-04
EP-marine	kg N eq.	4,16E-02	7,17E-04	7,11E-05	0,00E+00	1,96E-04	1,75E-03	1,17E-06	-2,44E-03
EP-terrestrial	mol N eq.	4,75E-01	7,83E-03	7,23E-04	0,00E+00	2,14E-03	1,89E-02	1,29E-05	-2,76E-02
POCP	kg NMVOC eq.	1,48E-01	2,40E-03	1,87E-04	0,00E+00	6,57E-04	4,94E-03	3,75E-06	-7,09E-03
ADP-M&M	kg Sb eq.	2,07E-04	2,04E-06	1,43E-08	0,00E+00	5,58E-07	3,77E-07	1,01E-09	-1,35E-05
ADP-fossil	MJ	4,50E+02	8,86E+00	3,97E-02	0,00E+00	2,43E+00	1,06E+00	1,26E-02	-8,91E+00
WDP	m ³	3,26E+01	2,65E-02	1,25E-03	0,00E+00	7,27E-03	3,30E-02	6,80E-05	-1,47E-01

GWP-total: Global Warming Potential; **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:** Depletion potential of the stratospheric ozone layer; **AP:** Acidification potential, Accumulated Exceedance; **EP-freshwater:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; See "additional Norwegian requirements" for indicator given as PO₄ eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	4,62E-06	5,06E-08	1,02E-09	0,00E+00	1,38E-08	2,82E-08	6,84E-11	-4,73E-07
IRP	kBq U235 eq.	2,36E+00	4,56E-02	1,52E-04	0,00E+00	1,25E-02	4,03E-03	5,81E-05	-1,11E-01
ETP-fw	CTUe	5,02E+02	6,92E+00	1,15E-01	0,00E+00	1,89E+00	2,42E+00	6,78E-03	-5,43E+01
HTP-c	CTUh	1,78E-08	2,24E-10	1,21E-10	0,00E+00	6,13E-11	3,38E-09	1,71E-13	-4,99E-10
HTP-nc	CTUh	3,73E-07	7,27E-09	6,23E-10	0,00E+00	1,99E-09	9,86E-09	3,34E-12	-2,01E-08
SQP	Dimensionless	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

PM: Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

¹ 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.

² The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Resource use

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
RPEE	MJ	4,47E+02	1,25E-01	1,78E-03	0,00E+00	3,42E-02	4,75E-02	3,20E-04	-5,82E+01
RPEM	MJ	1,42E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	4,62E+02	1,25E-01	1,78E-03	0,00E+00	3,42E-02	4,75E-02	3,20E-04	-5,82E+01
NRPE	MJ	4,60E+02	8,86E+00	3,97E-02	0,00E+00	2,43E+00	1,06E+00	1,26E-02	-8,91E+00
NRPM	MJ	3,39E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	4,63E+02	8,86E+00	3,97E-02	0,00E+00	2,43E+00	1,06E+00	1,26E-02	-8,91E+00
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
W	m ³	8,32E-01	9,24E-04	1,88E-04	0,00E+00	2,53E-04	5,32E-03	1,63E-05	-1,23E-01

RPEE Renewable primary energy resources used as energy carrier; **RPEM** Renewable primary energy resources used as raw materials; **TPE** Total use of renewable primary energy resources; **NRPE** Nonrenewable primary energy resources used as energy carrier; **NRPM** Nonrenewable primary energy resources used as materials; **TRPE** Total use of non-renewable primary energy resources; **SM** Use of secondary materials; **RSF** Use of renewable secondary fuels; **NRSF** Use of non-renewable secondary fuels; **W** Use of net fresh water.

End of life – Waste

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HW	KG	1,35E-01	4,51E-04	8,40E-04	0,00E+00	1,23E-04	9,89E-04	4,69E-02	-9,94E-01
NHW	KG	6,48E+00	4,56E-01	2,39E-03	0,00E+00	1,25E-01	5,61E-02	1,94E-02	-1,99E-01
RW	KG	8,88E-04	5,99E-05	9,03E-08	0,00E+00	1,64E-05	2,42E-06	7,66E-08	4,58E-05

HW Hazardous waste disposed; **NHW** Non-hazardous waste disposed; **RW** Radioactive waste disposed.

End of life – output flow

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
CR	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
MR	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	8,44E-01	0,00E+00	3,96E-01	0,00E+00	0,00E+00	8,44E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,55E+00
ETE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,08E+02

CR Components for reuse; **MR** Materials for recycling; **MER** Materials for energy recovery; **EEE** Exported electric energy; **ETE** Exported thermal energy.

Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	2,30E+00
Biogenic carbon content in the accompanying packaging	kg C	8,77E-02

Additional requirements

Location based electricity mix from the use of electricity in manufacturing

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (foreground/core) per functional unit.

National electricity grid	Unit	Value
Electricity, low voltage {NO} market for Cut-off, U	kg CO2 -eq/kWh	2,70E-02

Additional environmental impact indicators required for construction products

In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
EP-freshwater*	kg PO4 eq.	3,09E-02	4,11E-04	1,27E-04	0,00E+00	1,13E-04	3,34E-03	5,50E-07	-1,67E-03
GWP-IOBC	kg CO2 eq.	2,72E+01	5,86E-01	1,57E-01	0,00E+00	1,61E-01	1,10E-01	3,69E-04	-6,36E-01
GWP-BC	kg CO2 eq.	-2,55E+01	0,00E+00	4,99E-01	0,00E+00	0,00E+00	2,50E+01	0,00E+00	-3,46E-01
GWP	kg CO2 eq.	1,71E+00	5,86E-01	6,56E-01	0,00E+00	1,61E-01	2,51E+01	3,69E-04	-9,82E-01

GWP-IOBC Global warming potential calculated according to the principle of instantaneous oxidation.

Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

- The product contains no substances given by the REACH Candidate list.
- The product contains substances given by the REACH Candidate list that are less than 0,1 % by weight.
- The product contains dangerous substances, more then 0,1% by weight, given by the REACH Candidate List, see table.
- The product is classified as hazardous waste, see table.

Indoor environment

Ribbons not tested. Kingkus tested according to EN 717-1:2004 and holds formaldehyde class E0.

Carbon footprint

While a carbon footprint analysis has not been conducted for the product separately, the results section does include an evaluation of Global Warming Potential (GWP) with such an analysis. The GWP total results presented in this EPD document represents the carbon footprint of the product studied

Bibliography

ISO 14025:2010	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14044:2006	Environmental management - Life cycle assessment - Requirements and guidelines
EN 15804:2012+A2:2019	Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
ISO 21930:2007	Sustainability in building construction - Environmental declaration of building products
NPCR 010 part B	For Buildingboards
3015-EPD-030064863	Rib element from 2MAX,s.r.o
EPD-component 1: 20230333569	EPD for Teknos fire retardant laquer INIES Les données environnementales et sanitaires de référence pour le bâtiment (base-inies.fr)
EPD -component 2: 20230333565	EPD for Teknos fire retardant laquer INIES Les données environnementales et sanitaires de référence pour le bâtiment (base-inies.fr)
LCI/LCA report	Vyrk AS. (2024). <i>Environmental Product Declaration for Vyrk Wall Panel System</i> . Report No: 02. Prepared by Carla Assuad and Simen Skrindsrud. Report date: 12.06.2024

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		web	ECO Portal