epd-norge.no
The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Alvdal Skurlag AS
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-1818-767-EN
Registration number:	NEPD-1818-767-EN
ECO Platform reference number:	-
Issue date:	24.06.2019
Valid to:	24.06.2024 (validity extended to 01.09.2024)

Royal-impregnated timber

Alvdal Skurlag AS

www.epd-norge.no

ALVDAL SKURLAG

General information

Product:
Royal-impregnated timber

Owner of the declaration:
Alvdal Skurlag AS
Contact: Per Arve Bjørsagård
Tlf: +47 62 48 93 50
e-post: post@alvdalskurlag.no

Program operator:
Norwegian EPD Foundation
P.O. Box 5250 Majorstuen, 0303 Oslo
Phone: +47 977 22 020
e-mail: post@epd-norge.no

Manufacturer:
Alvdal Skurlag AS
Nord Østerdalsveien 4856
2560 Alvdal

Declaration number:
NEPD-1818-767-EN

Place of production:
Alvdal
Norway

ECO Platform reference number:

Management system:
PEFC ST 2002:2013 - Chain of Custody of Forest Based Products

This declaration is based on Product Category Rules:
CEN Standard EN 15804 serves as core PCR
NPCR015 rev1 wood and wood-based products for use in construction (08/2013).

Organisation no:
NO 999 041 132 MVA

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 information, life cycle assessment data and evidences.

Issue date:
24.06.2019

Valid to:
24.06.2024 (validity extended to 01.09.2024)

Declared unit:
Production of 1 m³ Royal-impregnated timber of pine.

Year of study:
2019

Declared unit with option:

Comparability:
EPD of construction products may not be comparable if they do not comply with EN 15804 and are seen in a building context.

Functional unit:
1 m³ Royal-impregnated timber of pine from cradle-to-grave, with a reference service life of 60 years.

The EPD has been worked out by:
Vegard Ruttenborg

Carlos Einar Myrebøe

Norwegian Institute of Wood Technology

Verification:
The CEN Norm EN 15804 serves as the core PCR. Independent verification of the declaration and data, according to ISO14025:2010

☐ internal ☑ external

Third party verifier:
PhD Ellen Soldal, Research scientist
(Independent verifier approved by EPD Norway)

Approved
Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:
Alvdal Royal is manufactured by a two stage wood-processing method. Firstly the wood is preserved with a copper-based preservative system and then followed by a hot oil treatment under vacuum. The water is evaporated to a point where the water content of the product is satisfactory for installation. The linseed oil is absorbed into all surfaces of the wood. The Royal oil can contain pigments to provide a colouring effect to the product.

Royal-impregnated timber complies with durability class 1 to fungal attack. Royal-impregnation reduces the moisture absorption into the wood and prevents crack formation. The timber is Nordic solid wood of pine.

Technical data:
The declared unit consist of wood with a dry density of 435 kg/m3. At 18 % timber moisture the density is 513.3 kg/m3.

Cladding is produced according to NS-EN 14915, construction wood according to NS-EN 14081 and decking according to SN/TS 3188.
Alvdal Skurlag AS is member of Norwegian Control Scheme for Preservative Treated Wood (Norsk Impregneringskontroll).

Product specification:
Royal-impregnated timber is supplied as cladding, roof, construction wood, laths and decking. A cubic meter is used as unit to represent various dimensions and products of Royal-impregnated timber.

Materials	kg	%
Wood, pine, dry weight	435	81.1
Water content of wood	78.3	14.6
CU-impregnation agent, dry weight	4.5	0.8
Royal oil and pigments	18.55	3.5
Total, product	***536.35***	#######
Plastic packaging	0.63	
Steel packaging	0.31	
Total, with packaging	***537.29***	

Market:
Norway

Reference service life:
The reference service life of the Royal-impregnated cladding is minimum 60 years and depends on climatic conditions effects from external factors. Used as decking, the service life is 30 years.

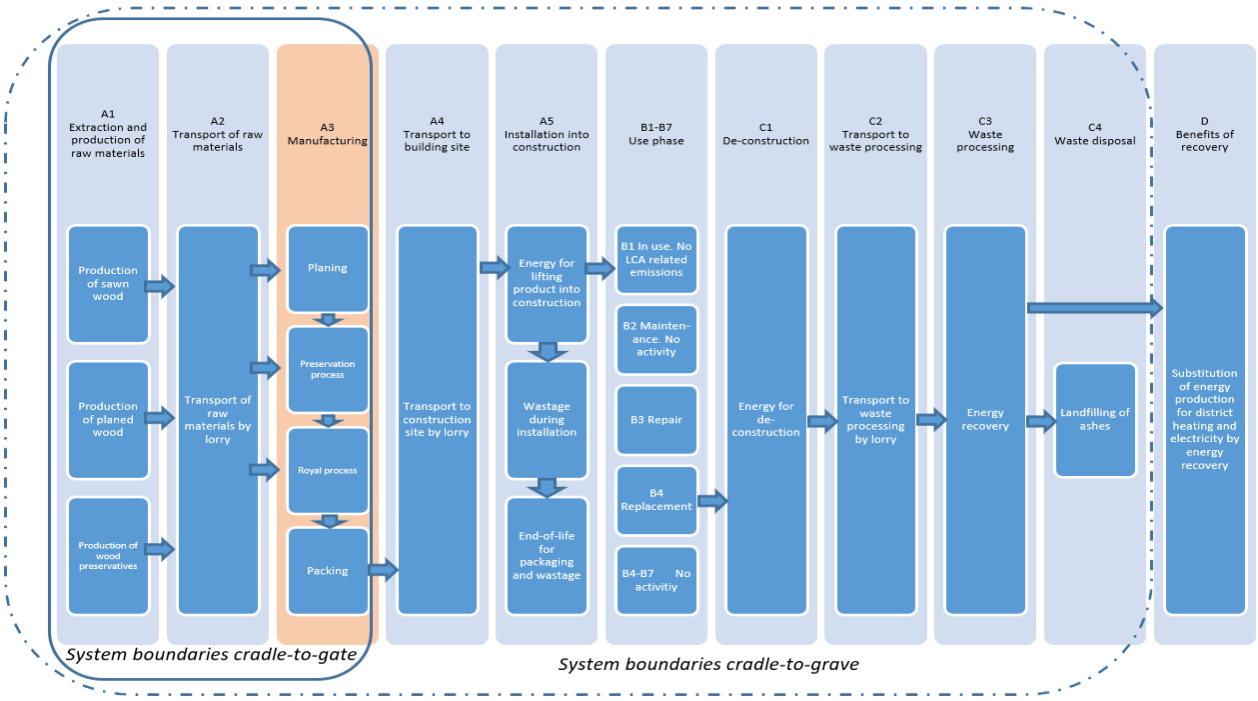
LCA: Calculation rules

Declared unit:
Production of 1 m³ Royal-impregnated timber of pine.

System boundary:
A flow chart with the system boundaries are shown bellow in figure 1.

Module D is calculated based on exported energy from waste processing substituting average electricity and district heating production.

Figure 1: Flow diagram according to the modular approach.



Data quality:
Manufacturing data for the issued product is based on average data for 2017. The data used for the production of sawn wood is based on NEPD-307-179 and with Ecoinvent v3.4 as background data. Data for the production of Royal oil and the copper impregnation agent are specific data which has been collected in a former EPD project. Data for exported energy from waste processing are based on Statistics Norway which is representative for 2017 (2018a, b, c). The rest of the data is from Ecoinvent v3.4, "Allocation cut-off by classification" (2017), but has been adjusted to improve representativeness.

Cut-off criteria:
All major raw materials and all the essential energy is included. The production process for raw materials and energy flows that are included with very small amounts (<1%) are not included. This cut-off rule does not apply for hazardous materials and substances. The production facility in A3 has been initially excluded from the study.

Allocation:
The allocation is made in accordance with the provisions of EN 15804. Incoming energy, water and waste production are sub-divided when possible and allocated with economic allocation when the difference in revenue is high. Effects of primary production of recycled materials allocated to the main product in which the material was used. Economic allocation between saw logs and pulp wood for transport and logging activitiesis used in forestry.

Calculation of biogenic carbon content:
Sequestration and emissions of biogenic carbon is calculated according to EN16485:2014. This approach is based on the modularity principle in EN15804:2012 wich states that all environmental aspects and impacts are declared in the life cycle where they appear. The calculation of biogenic carbon content and conversion to carbon dioxide is done according to NS-EN 16449:2014. Net contribution to GWP from biogenic carbon by each module is shown on page 8. The timber originates from sustainable forestry and has PEFC certified traceability.

LCA: Scenarios and additional technical information

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

It is assumed a transport distance of 330 km from manufacturing to the building site. 300 km is assumed to be on a large size lorry and 30 km on a medium size lorry.

Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption		
Lorry	53	EURO 5, >32 tonnes	300	0.0228	l/tkm	
Lorry	26	EURO 5, 16-32 tonnes	30	0.048	l/tkm	

The assembly at building site includes 5 % product wastage, energy for lifting and waste management of packaging and wastage.

There are no LCA-related impacts during use phase. Copper-impregnated timber exposed to rain or cleaning has a leaching of 5-10% of the copper content (Evans, 2010). Leaching tests is not mandatory in EPD until measuring test methods has been harmonized.

Assembly (A5)

	Unit	Value
Auxiliary	kg	
Water consumption	m^3	
Electricity consumption	MJ	1.00
Other energy carriers	MJ	
Material loss	kg	26.8
Output materials from waste treatment	kg	0.94
Dust in the air	kg	

Use (B1)

	Unit	Value
Leaching of copper	kg	<0,1

It is assumed 5 applications of Royal oil, in total 22,5 kg during the reference service lifetime. 10 % of the product is assumed to be replaced. Prior to each application of Royal oil the surface is cleaned with water and detergent.

The product used as cladding does not require replacement during its lifetime. It is assumed one replacement for the product used as decking.

Maintenance (B2)/Repair (B3)

	Unit	Value
Maintenance cycle*		10
Auxiliary	kg	0.114
Other resources - Royal oil per application	kg	4.5
Water consumption - per application	m^3	2.28
Electricity consumption	kWh	0
Other energy carriers	MJ	0
Material loss	kg	53.64

Replacement (B4)/Refurbishment (B5)

	Unit	Value
Replacement cycle*		30/60
Electricity consumption	kWh	0
Replacement of worn parts	0	0

* Number or RSL (Reference Service Life)

The product has no operational energy use or water consumption.

Copper impregnated wood waste is classified as treated wood (1142) according to NS 9431:2011, but in a case of doubt is is treated as CCA impregnated wood (7098). The waste processing is assumed as wood waste treated with incineration with energy recovery. Ash from incineration is disposed in landfill.

Operational energy (B6) and water consumption (B7)

	Unit	Value
Water consumption	m^3	
Electricity consumption	kWh	
Other energy carriers	MJ	
Power output of equipment	kW	

End of Life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	kg	
Collected as mixed construction waste	kg	536.35
Reuse	kg	
Recycling	kg	
Energy recovery	kg	536.35
To landfill	kg	

The transport of wood waste is based on average distance for Norway in 2007 and was 85 km (Raadal et al., 2009).

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	
Lorry	Unspecified	Unspecified	85	0.045	l/tkm

The benefits of exported energy from energy recovery is calculated with substitution of Norwegian electricity market mix on medium voltage and Norwegian district heating mix. The energy exported and the district heating mix is representative for the year 2017.

Benefits and loads beyond the system boundaries (D)

	Unit	Cladding	Decking
Substitution of electricity	MJ	948	1710
Substitution of district heating	MJ	6520	11759
Substitution of raw materials	kg	0	0

LCA: Results

The results for global warming in A1-A3 includes 797.5 kg of sequestration of carbon dioxide during wood growth, while the same amount gives an large contribution when emitted during waste treatment in C3. The amount of net contribution of biogenic carbon to each module is shown on page 8.

Decking:
The product used as decking includes replacement in module B4. This provides an impact to the results for waste treatment and is therefore reported separately in module D.

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

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries
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	X	X	X	X	X	X	X	X	X	X	X	X

Environmental impact

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	Decking B4	B5
GWP	kg CO_2-eqv	-6.85E+02	1.66E+01	1.01E+01	0.00E+00	2.13E+01	2.11E+01	2.11E+02	0.00E+00
ODP	kg CFC11-eqv	1.65E-05	3.23E-06	1.07E-06	0.00E+00	4.03E-06	2.25E-06	2.25E-05	0.00E+00
POCP	kg C_2H_4-eqv	9.33E-02	2.65E-03	5.10E-03	0.00E+00	2.33E-02	1.07E-02	1.07E-01	0.00E+00
AP	kg SO_2-eqv	1.31E+00	5.34E-02	7.57E-02	0.00E+00	7.00E-01	1.59E-01	1.59E+00	0.00E+00
EP	kg PO_4^{3-}-eqv	5.45E-01	8.96E-03	2.95E-02	0.00E+00	4.57E-01	6.19E-02	6.19E-01	0.00E+00
ADPM	kg Sb-eqv	1.08E-03	3.52E-05	5.73E-05	0.00E+00	1.59E-04	1.20E-04	1.20E-03	0.00E+00
ADPE	MJ	2.24E+03	2.75E+02	1.36E+02	0.00E+00	9.32E+02	2.85E+02	2.85E+03	0.00E+00

Environmental impact

Parameter	Unit	B6	B7	C1	C2	C3	C4	D	Decking D
GWP	kg CO_2-eqv	0.00E+00	0.00E+00	8.62E-03	6.08E+00	9.27E+02	3.64E-02	-4.91E+01	-8.34E+01
ODP	kg CFC11-eqv	0.00E+00	0.00E+00	8.15E-10	1.13E-06	7.16E-07	1.13E-08	-5.58E-06	-9.13E-06
POCP	kg C_2H_4-eqv	0.00E+00	0.00E+00	1.93E-06	1.02E-03	5.18E-03	1.44E-05	-2.56E-02	-4.56E-02
AP	kg SO_2-eqv	0.00E+00	0.00E+00	4.02E-05	2.38E-02	1.26E-01	2.58E-04	-2.63E-01	-4.61E-01
EP	kg PO_4^{3-}-eqv	0.00E+00	0.00E+00	9.70E-06	4.18E-03	3.34E-02	4.10E-05	-6.75E-02	-1.20E-01
ADPM	kg Sb-eqv	0.00E+00	0.00E+00	1.41E-07	1.71E-05	1.37E-05	4.68E-08	-1.79E-04	-3.23E-04
ADPE	MJ	0.00E+00	0.00E+00	9.54E-02	9.86E+01	1.13E+02	1.12E+00	-6.65E+02	-1.12E+03

GWP Global warming potential; ODP Depletion potential of the stratospheric ozone layer; POCP Formation potential of tropospheric photochemical oxidants; AP Acidification potential of land and water; EP Eutrophication potential; ADPM Abiotic depletion potential for non fossil resources; ADPE Abiotic depletion potential for fossil resources

Resource use								Decking	
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**
RPEE	MJ	5.94E+03	4.46E+00	7.28E+02	0.00E+00	1.12E+02	1.53E+03	1.53E+04	0.00E+00
RPEM	MJ	5.95E+03	0.00E+00	-1.38E+02	0.00E+00	4.36E+02	-2.91E+02	-2.91E+03	0.00E+00
TPE	MJ	1.19E+04	4.46E+00	5.90E+02	0.00E+00	5.47E+02	1.24E+03	1.24E+04	0.00E+00
NRPE	MJ	2.01E+03	2.82E+02	1.43E+02	0.00E+00	5.84E+02	3.01E+02	3.01E+03	0.00E+00
NRPM	MJ	5.00E+02	0.00E+00	4.45E+00	0.00E+00	4.50E+02	9.34E+00	9.34E+01	0.00E+00
TRPE	MJ	2.51E+03	2.82E+02	1.48E+02	0.00E+00	1.03E+03	3.10E+02	3.10E+03	0.00E+00
SM	kg	1.71E-01	0.00E+00	8.55E-03	0.00E+00	0.00E+00	1.80E-02	1.80E-01	0.00E+00
RSF	MJ	2.03E+00	0.00E+00	1.79E-01	0.00E+00	0.00E+00	3.77E-01	3.77E+00	0.00E+00
NRSF	MJ	1.35E+00	0.00E+00	1.20E-01	0.00E+00	0.00E+00	2.51E-01	2.51E+00	0.00E+00
W	m^3	8.70E+00	5.55E-02	4.61E-01	0.00E+00	3.83E+00	9.51E-01	9.52E+00	0.00E+00

Resource use								Decking
Parameter	**Unit**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**	**D**
RPEE	MJ	0.00E+00	0.00E+00	1.14E+00	1.27E+00	9.03E+03	2.75E-02	-4.00E+03	-7.19E+03
RPEM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-9.15E+03	0.00E+00	0.00E+00	0.00E+00
TPE	MJ	0.00E+00	0.00E+00	1.14E+00	1.27E+00	-1.18E+02	2.75E-02	-4.00E+03	-7.19E+03
NRPE	MJ	0.00E+00	0.00E+00	1.58E-01	1.00E+02	9.36E+02	1.15E+00	-8.00E+02	-1.37E+03
NRPM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-8.61E+02	0.00E+00	0.00E+00	0.00E+00
TRPE	MJ	0.00E+00	0.00E+00	1.58E-01	1.00E+02	7.54E+01	1.15E+00	-8.00E+02	-1.37E+03
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	1.70E+00	0.00E+00	-2.45E+03	-5.18E+03
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E+00	0.00E+00	-1.63E+03	-3.45E+03
W	m^3	0.00E+00	0.00E+00	8.46E-03	1.80E-02	3.03E-01	1.26E-03	-1.64E+01	-2.89E+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 Non renewable primary energy resources used as energy carrier; NRPM Non renewable 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								Decking	
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**
HW	kg	4.62E-01	1.58E-02	3.11E-01	0.00E+00	4.61E-01	6.54E-01	6.54E+00	0.00E+00
NHW	kg	6.42E+01	2.15E+01	4.93E+00	0.00E+00	6.25E+00	1.03E+01	1.03E+02	0.00E+00
RW	kg	1.01E-02	1.86E-03	6.37E-04	0.00E+00	1.86E-03	1.34E-03	1.34E-02	0.00E+00

End of life - Waste								Decking
Parameter	**Unit**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**	**D**
HW	kg	0.00E+00	0.00E+00	5.13E-05	2.93E-03	2.29E+00	3.65E+00	-3.68E-01	-4.88E-01
NHW	kg	0.00E+00	0.00E+00	7.23E-03	5.90E+00	6.47E+00	1.47E+00	-1.64E+01	-2.96E+01
RW	kg	0.00E+00	0.00E+00	9.72E-07	6.36E-04	1.90E-04	6.39E-06	-3.28E-03	-5.62E-03

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

End of life - Output flow								Decking	
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**
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	6.20E-01	0.00E+00	9.74E-01	0.00E+00	0.00E+00	1.66E-01	1.66E+00	0.00E+00
MER	kg	2.06E+00	0.00E+00	1.03E-01	0.00E+00	0.00E+00	2.16E-01	2.16E+00	0.00E+00
EEE	MJ	1.44E+00	0.00E+00	3.82E+01	0.00E+00	0.00E+00	8.01E+01	8.01E+02	0.00E+00
ETE	MJ	9.92E+00	0.00E+00	2.62E+02	0.00E+00	0.00E+00	5.51E+02	5.51E+03	0.00E+00

End of life - Output flow								Decking
Parameter	**Unit**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**	**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	2.43E-01	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.32E+02	0.00E+00	-9.48E+02	-1.71E+03
ETE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.72E+03	0.00E+00	-6.52E+03	-1.18E+04

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

Reading example: 9,0 E-03 = $9.0*10^{-3}$ = 0.009

Additional Norwegian requirements

Greenhouse gas emission from the use of electricity in the manufacturing phase
National production mix with import, on low voltage (production of transmission lines, in addition to direct emissions and losses in grid) is applied for electricity in the manufacturing process (A3).

Data source	Amount	Unit
Ecoinvent v3.4 (August 2017)	31.0	gram CO_2-eqv/kWh

Dangerous substances

- ☐ The product contains no substances given by the REACH Candidate list or the Norwegian priority list
- ☑ The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0.1 % by weight.
- ☐ The product contain dangerous substances, more then 0.1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.
- ☐ The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskiften, Annex III), see table.

Transport
Transport from production site to a construction site according to scenario A4: 330 km

Indoor environment
There has not been performed tests for emission to indoor environment since the products is intended for outdoor use.

Carbon footprint
To increase the transparency of the climate impacts, the GWP indicator has been divided into sub-indicators:
GWP-IOBC Climate impacts calculated according to instant oxidation principle
GWP-BC Climate impacts calculated from the net impacts of sequestration and emission of biogenic carbon

Climate impact								Decking	
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**
GWP-IOBC	kg CO_2-eqv	1.38E+02	1.66E+01	1.01E+01	0.00E+00	2.13E+01	2.11E+01	2.11E+02	0.00E+00
GWP-BC	kg CO_2-eqv	-8.23E+02	0.00E+00	-2.20E-04	0.00E+00	0.00E+00	-4.62E-04	-4.62E-03	0.00E+00
GWP	kg CO_2-eqv	-6.85E+02	1.66E+01	1.01E+01	0.00E+00	2.13E+01	2.11E+01	2.11E+02	0.00E+00

Climate impact									Decking
Parameter	**Unit**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**	**D**
GWP-IOBC	kg CO_2-eqv	0.00E+00	0.00E+00	8.62E-03	6.08E+00	1.04E+02	3.64E-02	-4.91E+01	-8.34E+01
GWP-BC	kg CO_2-eqv	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.23E+02	0.00E+00	0.00E+00	0.00E+00
GWP	kg CO_2-eqv	0.00E+00	0.00E+00	8.62E-03	6.08E+00	9.27E+02	3.64E-02	-4.91E+01	-8.34E+01

Bibliography

NS-EN ISO 14025:2010	*Environmental labels and declarations - Type III environmental declarations - Principles and procedures*
NS-EN ISO 14044:2006	*Environmental management - Life cycle assessment - Requirements and guidelines*
NS-EN 15804:2012+A1:2013	*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*
Ruttenborg and Myrebøe (2019)	*LCA-report for Alvdal Skurlag AS. Report nr. 325017-1 from Norwegian Institute of Wood Technology, Oslo, Norway.*
NPCR015 rev1	*Product category rules for wood and wood-based products for use in construction.*
Ecoinvent v3.4	*Swiss Centre of Life Cycle Inventories. www.ecoinvent.ch*
Statistics Norway (2018a)	*Table 09469: Net production of district heating by type of heat central, 2017.*
Statistics Norway (2018b)	*Table 04727: District heating balance, 2017.*
Statistics Norway (2018c)	*Table 04730: Consumption of fuel used for gross production of district heating, by type of energy (GWh), 2017.*
NS-EN 16449:2014	*Wood and wood-based products - Calculation of the biogenic carbon content of wood and conversion to carbon dioxide*
NS-EN 16485:2014	*Round and sawn timber - Environmental Product Declarations - Product category rules for wood and wood-based products for use in construction*
Raadal et al. (2009)	*Raadal, H. L., Modahl, I. S. & Lyng, K-A. (2009). Klimaregnskap for avfallshåndtering, Fase I og II. Oppdragsrapport nr 18.09 fra Østfoldforskning.*
Evans, F. G. 2010	*Liten utlakning fra kopperimpregnert tre. Sluttrapport prosjekt Kopperlakning. Norsk Treteknisk Institutt.*
NEPD-307-179-NO	*EPD for skurlast av gran eller furu. Treindustrien.*
NS 9431:2011	*Klassifikasjon av avfall*
NS-EN 14915:2013	*Panelbord og kledning av heltre - Egenskaper, evaluering av samsvar og merking*
Plesser et al. (2013)	*Miljøanalyse av trefasader*

epd-norge.no
The Norwegian EPD Foundation

Program operator and publisher
The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo
Norway
Phone: +47 977 22 020
e-mail: post@epd-norge.no
web www.epd-norge.no

ALVDAL SKURLAG

Owner of the declaration
Alvdal Skurlag AS
Nord Østerdalsvei 4856, 2560 Alvdal
Norway
Phone: +47 62 48 93 50
e-mail: post@alvdalskurlag.no
web www.alvdalskurlag.no

Treteknisk

Author of the Life Cycle Assessment
Vegard Ruttenborg
Norwegian Institute of Wood Technology
P.B. 113 Blindern, NO-0314 Oslo, Norway
Phone: +47 98 85 33 33
e-mail: firmapost@treteknisk.no
web www.treteknisk.no