

Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 +A2



Owner of the declaration:
Ab Rani Plast Oy

Program holder and publisher:
The Norwegian EPD foundation

Declaration number:
NEPD-3293-1904-EN

Registration Number:
NEPD-3293-1904-EN

Issue date: 03.01.2022
Valid to: 03.01.2027

Product:
RaniMoBar
Our premium moisture barrier film RaniMoBar provides structures with long term and effective protection against damage due to moisture. The moisture barrier film is installed to prevent moisture from indoor air entering external structures. Our RaniMoBar construction film has a calculated service life of over 60 years. The film is excellent for use in cold climates.

Manufacturer:
Ab Rani Plast Oy

The Norwegian
EPD Foundation

General information

Product:

RaniMoBar

Program Operator:

The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
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Declaration Number:

NEPD-3293-1904-EN

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2021 + A2:2019 serves as core PCR. NPCR 022 version 2.0 Roof waterproofing

Statements:

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:

One square meter (1 m²)

Functional unit:

One square meter (1 m² of installed plastic film used as moisture barrier in construction with a reference service life of 60 years.

Verification:

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

internal external



Martin Erlandsson

Independent verifier approved by EPD Norway

Owner of the declaration:

Ab Rani Plast Oy
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Manufacturer:

Ab Rani Plast Oy
Tehtaantie 6, FI-68700 Teerijärvi Finland
Phone: +358 20 768 0111
e-mail: raniplast@raniplast.com

Place of production:

Teerijärvi, Finland

Management system:

ISO 9001, ISO 14001

Organisation no:

21073065

Issue date:

03.01.2022

Valid to:

03.01.2027

Year of study:


2020

Comparability:

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

The EPD has been worked out by:

Miia Liikanen
LCA Consulting Oy



Approved (Manager of EPD Norway)

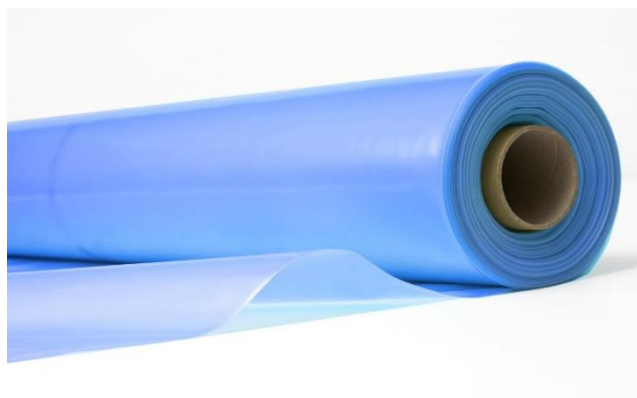
Product

Company presentation:

Ab Rani Plast Oy is a leading Nordic producer of smart packaging solutions and one of the largest family-owned industrial companies in Finland. The company operates in several parts of the world and exports to more than 40 countries. Rani Plast was founded in 1955 in Terjärv, in the region of Ostrobothnia in Western Finland.

Product description:

Our premium moisture barrier film RaniMoBar provides structures with long term and effective protection against damage due to moisture. The moisture barrier film is installed to prevent moisture from indoor air entering external structures. Our RaniMoBar construction film has a calculated service life of over 60 years. The film is excellent for use in cold climates.



Product specification:

The plastic film is produced in three different thicknesses: 0.12 mm, 0.15 mm and 0.20 mm.

0.12 mm plastic film

Product components	Weight, g	Weight-%
LDPE granulates	110.78	99.80%
The carrier resin of color (LDPE/LLDPE)	0.08	0.07%
The pigment of color and UV substance	0.14	0.13%
TOTAL	111.00	
Packaging materials	Weight, g	
Core	13.39	
Wood pallet	4.69	
Packaging film	0.85	
TOTAL	18.93	

0.15 mm plastic film

Product components	Weight, g	Weight-%
LDPE granulates	137.72	99.80%
The carrier resin of color (LDPE/LLDPE)	0.10	0.07%
The pigment of color and UV substance	0.18	0.13%
TOTAL	138.00	

Packaging materials	Weight, g	
Core	16.64	
Wood pallet	5.83	
Packaging film	1.06	
TOTAL	23.53	

0.20 mm plastic film

Product components	Weight, g	Post-consumer material, weight-%
LDPE granulates	184.63	99.80%
The carrier resin of color (LDPE/LLDPE)	0.13	0.07%
The pigment of color and UV substance	0.24	0.13%
TOTAL	185.00	

Packaging materials	Weight, g	
Core	22.31	
Wood pallet	7.82	
Packaging film	1.42	
TOTAL	31.55	

Technical data:

0.111 kg/m² for 0.12 mm thickness

0.138 kg/m² for 0.15 mm thickness

0.185 kg/m² for 0.20 mm thickness

Market:

Norway

Reference service life, product:

60 years

Reference service life, building:

60 years

LCA: Calculation rules

Declared unit:

One square meter (1 m²)

Data quality:

Specific data: production at Ab Rani Plast Oy (2020)

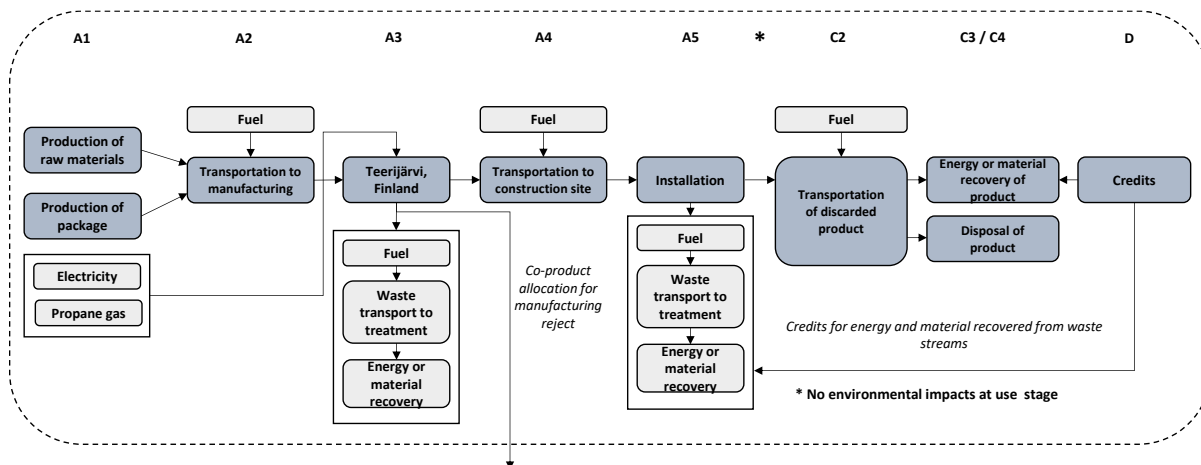
Generic data: GaBi Professional and Ecoinvent databases

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Energy consumption and waste generation are allocated equally among all products of Teerijärvi production plant with mass-based allocation.

System boundary:

Cradle-to-grave.



Cut-off criteria:

All major raw materials and all the essential energy are included. The production process for raw materials with small share of total mass of the product (<1%), could be excluded. The same principle applies for energy flows. This cut-off rule does not apply for hazardous materials and substances. Production of the pigment is excluded due to the cut-off rule.

LCA: Scenarios and additional technical information

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

Transport from production place to assembly/user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value
Truck	43.8%	Truck, EURO 6, 24.7 t payload capacity	1 033	0.03	l/tkm
Railway					
Boat	-	Container ship, TEU 1 000	243	13	g/tkm

Assembly (A5)

	Unit	Value
Material loss	%	1 %

Use (B1)

	Unit	Value
No impacts		

Maintenance (B2)/Repair (B3)

	Unit	Value
No impacts or need for repair		

Replacement (B4)/Refurbishment (B5)

	Unit	Value
No replacement of refurbishment		

*Number of RSL (Reference Service Life)

Operational energy (B6) and water consumption (B7)

	Unit	Value
No energy or water consumption		

End of Life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	kg	0
Collected as mixed construction waste	kg	0
Reuse	kg	0
Recycling	%	38
Energy recovery	%	58
To landfill	%	4

Waste treatment and disposal of RaniMoBar plastic film according to average treatment methods in Norway (Statistics Norway, 2019).

Transport to waste processing (C2)

Type	Capacity utilisation* %	Type of vehicle	Distance km	Fuel/Energy consumption	Value
Truck	90.9%	Truck, EURO 5, 22 t payload capacity	100	0.02	l/tkm

*One-way transportation. Transport distance to waste processing or disposal is estimated to be <100 km from the construction site.

Benefits and loads beyond the system boundaries (D)

0.12 mm plastic film

	Unit	Value
Replaced plastic	1.17E-02	kg
Replaced paper	8.13E-03	kg
Replaced metal	8.81E-08	kg
Replaced wood	8.45E-05	kg
Replaced electricity	3.20E-01	MJ
Replaced heat	2.12E+00	MJ

0.15 mm plastic film

	Unit	Value
Replaced plastic	1.45E-02	kg
Replaced paper	1.01E-02	kg
Replaced metal	1.10E-07	kg
Replaced wood	1.05E-04	kg
Replaced electricity	5.52E-01	MJ
Replaced heat	3.66E+00	MJ

0.20 mm plastic film

	Unit	Value
Replaced plastic	1.95E-02	kg
Replaced paper	1.36E-02	kg
Replaced metal	1.47E-07	kg
Replaced wood	1.41E-04	kg
Replaced electricity	6.90E-01	MJ
Replaced heat	4.58E+00	MJ

Additional technical information

There are no harmful substances released to the indoor air during the use of the product. Emission measurement has been done by SP (Technical Research Institute of Sweden) according to ISO 16000-10.

LCA: Results

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	MNR	MNR	MNR	MNR	MNR	MNR	MNR	X	X	X	X	X	

Core environmental impact indicators

0.12 mm plastic film

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	2.34E-01	2.24E-02	2.42E-02	ND	0.00E+00	6.17E-04	2.23E-01	3.09E-04	-1.39E-01
GWP-fossil	kg CO ₂ eq.	2.44E-01	2.23E-02	1.19E-02	ND	0.00E+00	6.13E-04	2.23E-01	3.18E-04	-1.51E-01
GWP-biogenic	kg CO ₂ eq.	-1.23E-02	-2.97E-05	1.22E-02	ND	0.00E+00	-1.03E-06	1.11E-04	-9.65E-06	1.18E-02
GWP-LULUC	kg CO ₂ eq.	5.47E-04	1.59E-04	3.76E-05	ND	0.00E+00	4.95E-06	1.03E-05	2.58E-07	-3.30E-05
ODP	kg CFC11 eq.	1.11E-09	3.85E-18	1.45E-13	ND	0.00E+00	1.12E-19	1.47E-16	7.21E-19	-7.65E-13
AP	mol H ⁺ eq.	4.68E-04	6.04E-05	1.27E-05	ND	0.00E+00	1.86E-06	3.83E-05	9.63E-07	-7.69E-05
EP-freshwater	kg P eq.	8.78E-06	6.05E-08	1.95E-07	ND	0.00E+00	1.86E-09	9.75E-08	5.82E-08	-2.35E-07
EP-marine	kg N eq.	1.24E-04	2.54E-05	5.47E-06	ND	0.00E+00	8.25E-07	9.14E-06	2.13E-07	-2.62E-05
EP-terrestrial	mol N eq.	1.22E-03	2.85E-04	5.11E-05	ND	0.00E+00	9.24E-06	1.46E-04	2.34E-06	-2.78E-04
POCP	kg NMVOC eq.	3.42E-04	6.66E-05	1.13E-05	ND	0.00E+00	1.65E-06	2.56E-05	6.95E-07	-8.05E-05
ADP-M&M	kg Sb eq.	2.34E-07	1.66E-09	2.87E-09	ND	0.00E+00	4.95E-11	2.18E-09	2.15E-11	-1.11E-08
ADP-fossil	MJ	8.60E+00	2.93E-01	1.06E-01	ND	0.00E+00	8.17E-03	1.97E-01	4.56E-03	2.87E+00
WDP	m ³	2.22E-02	1.96E-04	2.64E-03	ND	0.00E+00	5.97E-06	2.11E-02	-3.57E-06	-1.51E-03

0.15 mm plastic film

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	2.90E-01	2.79E-02	3.01E-02	ND	0.00E+00	7.67E-04	2.77E-01	3.84E-04	-1.73E-01
GWP-fossil	kg CO ₂ eq.	3.05E-01	2.77E-02	1.48E-02	ND	0.00E+00	7.63E-04	2.77E-01	3.95E-04	-1.88E-01
GWP-biogenic	kg CO ₂ eq.	-1.53E-02	-3.69E-05	1.52E-02	ND	0.00E+00	-1.28E-06	1.38E-04	-1.20E-05	1.46E-02
GWP-LULUC	kg CO ₂ eq.	6.80E-04	1.98E-04	4.67E-05	ND	0.00E+00	6.16E-06	1.28E-05	3.21E-07	-4.10E-05
ODP	kg CFC11 eq.	1.38E-09	4.79E-18	1.80E-13	ND	0.00E+00	1.40E-19	1.83E-16	8.96E-19	-9.52E-13
AP	mol H ⁺ eq.	5.82E-04	7.51E-05	1.57E-05	ND	0.00E+00	2.32E-06	4.76E-05	1.20E-06	-9.56E-05
EP-freshwater	kg P eq.	1.09E-05	7.52E-08	2.42E-07	ND	0.00E+00	2.32E-09	1.21E-07	7.23E-08	-2.92E-07
EP-marine	kg N eq.	1.53E-04	3.16E-05	6.80E-06	ND	0.00E+00	1.03E-06	1.14E-05	2.65E-07	-3.26E-05
EP-terrestrial	mol N eq.	1.51E-03	3.54E-04	6.36E-05	ND	0.00E+00	1.15E-05	1.81E-04	2.91E-06	-3.46E-04
POCP	kg NMVOC eq.	4.24E-04	8.28E-05	1.40E-05	ND	0.00E+00	2.05E-06	3.18E-05	8.65E-07	-1.00E-04
ADP-M&M	kg Sb eq.	2.91E-07	2.06E-09	3.57E-09	ND	0.00E+00	6.15E-11	2.71E-09	2.67E-11	-1.38E-08
ADP-fossil	MJ	1.07E+01	3.65E-01	1.32E-01	ND	0.00E+00	1.02E-02	2.45E-01	5.67E-03	3.57E+00
WDP	m ³	2.75E-02	2.44E-04	3.28E-03	ND	0.00E+00	7.42E-06	2.63E-02	-4.44E-06	-1.87E-03

0.20 mm plastic film

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	3.89E-01	3.73E-02	4.03E-02	ND	0.00E+00	1.03E-03	3.71E-01	5.14E-04	-2.32E-01
GWP-fossil	kg CO ₂ eq.	4.08E-01	3.71E-02	1.98E-02	ND	0.00E+00	1.02E-03	3.71E-01	5.30E-04	-2.52E-01
GWP-biogenic	kg CO ₂ eq.	-2.05E-02	-4.95E-05	2.04E-02	ND	0.00E+00	-1.71E-06	1.84E-04	-1.61E-05	1.96E-02
GWP-LULUC	kg CO ₂ eq.	9.12E-04	2.66E-04	6.26E-05	ND	0.00E+00	8.26E-06	1.71E-05	4.31E-07	-5.49E-05
ODP	kg CFC11 eq.	1.85E-09	6.42E-18	2.42E-13	ND	0.00E+00	1.87E-19	2.45E-16	1.20E-18	-1.28E-12
AP	mol H ⁺ eq.	7.80E-04	1.01E-04	2.11E-05	ND	0.00E+00	3.11E-06	6.38E-05	1.60E-06	-1.28E-04
EP-freshwater	kg P eq.	1.46E-05	1.01E-07	3.25E-07	ND	0.00E+00	3.11E-09	1.62E-07	9.69E-08	-3.91E-07
EP-marine	kg N eq.	2.06E-04	4.23E-05	9.11E-06	ND	0.00E+00	1.38E-06	1.52E-05	3.56E-07	-4.37E-05
EP-terrestrial	mol N eq.	2.03E-03	4.74E-04	8.52E-05	ND	0.00E+00	1.54E-05	2.43E-04	3.90E-06	-4.64E-04
POCP	kg NMVOC eq.	5.69E-04	1.11E-04	1.88E-05	ND	0.00E+00	2.74E-06	4.27E-05	1.16E-06	-1.34E-04
ADP-M&M	kg Sb eq.	3.90E-07	2.76E-09	4.79E-09	ND	0.00E+00	8.25E-11	3.63E-09	3.58E-11	-1.86E-08
ADP-fossil	MJ	1.43E+01	4.89E-01	1.77E-01	ND	0.00E+00	1.36E-02	3.28E-01	7.60E-03	4.79E+00
WDP	m ³	3.70E-02	3.27E-04	4.40E-03	ND	0.00E+00	9.95E-06	3.52E-02	-5.95E-06	-2.51E-03

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

Additional environmental impact indicators

0.12 mm plastic film

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PM	Disease incidence	3.74E-09	4.90E-10	9.81E-11	ND	0.00E+00	1.10E-11	2.82E-10	9.39E-12	-5.87E-10
IRP	kBq U235 eq.	8.62E-03	7.66E-05	3.70E-04	ND	0.00E+00	2.23E-06	2.80E-03	7.81E-06	-1.38E-03
ETP-fw	CTUe	4.63E+00	2.18E-01	1.46E-02	ND	0.00E+00	6.11E-03	7.11E-02	4.48E-03	-3.69E-01
HTP-c	CTUh	1.09E-10	4.47E-12	1.39E-12	ND	0.00E+00	1.26E-13	3.51E-12	2.03E-13	-2.50E-11
HTP-nc	CTUh	4.89E-09	2.30E-10	7.12E-11	ND	0.00E+00	7.20E-12	1.62E-10	1.63E-11	-4.95E-10
SQP	Dimensionless	1.47E+00	9.22E-02	1.11E-01	ND	0.00E+00	2.87E-03	4.13E-02	3.19E-04	- 1.46E+00

0.15 mm plastic film

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PM	Disease incidence	4.65E-09	6.09E-10	1.22E-10	ND	0.00E+00	1.37E-11	3.50E-10	1.17E-11	-7.29E-10
IRP	kBq U235 eq.	1.07E-02	9.53E-05	4.60E-04	ND	0.00E+00	2.77E-06	3.48E-03	9.71E-06	-1.72E-03
ETP-fw	CTUe	5.77E+00	2.71E-01	1.82E-02	ND	0.00E+00	7.59E-03	8.85E-02	5.57E-03	-4.59E-01
HTP-c	CTUh	1.35E-10	5.56E-12	1.73E-12	ND	0.00E+00	1.57E-13	4.36E-12	2.53E-13	-3.11E-11
HTP-nc	CTUh	6.08E-09	2.86E-10	8.85E-11	ND	0.00E+00	8.96E-12	2.01E-10	2.03E-11	-6.16E-10
SQP	Dimensionless	1.82E+00	1.15E-01	1.39E-01	ND	0.00E+00	3.56E-03	5.14E-02	3.96E-04	- 1.82E+00

0.20 mm plastic film

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PM	Disease incidence	6.23E-09	8.16E-10	1.64E-10	ND	0.00E+00	1.84E-11	4.70E-10	1.57E-11	-9.78E-10
IRP	kBq U235 eq.	1.44E-02	1.28E-04	6.17E-04	ND	0.00E+00	3.71E-06	4.67E-03	1.30E-05	-2.30E-03
ETP-fw	CTUe	7.73E+00	3.64E-01	2.43E-02	ND	0.00E+00	1.02E-02	1.19E-01	7.46E-03	-6.16E-01
HTP-c	CTUh	1.82E-10	7.45E-12	2.31E-12	ND	0.00E+00	2.10E-13	5.85E-12	3.39E-13	-4.17E-11

HTP-nc	CTUh	8.16E-09	3.83E-10	1.19E-10	ND	0.00E+00	1.20E-11	2.69E-10	2.72E-11	-8.26E-10
SQP	Dimensionless	2.45E+00	1.54E-01	1.86E-01	ND	0.00E+00	4.78E-03	6.89E-02	5.31E-04	-2.43E+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

Classification of disclaimers to the declaration of core and additional environmental impact indicators

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
ILCD type / level 3	Potential Human exposure efficiency relative to U235 (IRP)	1
	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
Potential Soil quality index (SQP)	2	
<p>Disclaimer 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.</p> <p>Disclaimer 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</p>		

Resource use

0.12 mm plastic film

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
RPEE	MJ	4.03E-01	1.53E-02	3.65E-01	ND	0.00E+00	4.72E-04	5.13E-02	3.21E-04	-6.17E-01
RPEM	MJ	2.88E-01	0.00E+00	-2.88E-01	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TPE	MJ	6.91E-01	1.53E-02	7.72E-02	ND	0.00E+00	4.72E-04	5.13E-02	3.21E-04	-6.17E-01
NRPE	MJ	3.45E+00	2.94E-01	2.51E-01	ND	0.00E+00	8.20E-03	7.96E+00	4.12E-01	-2.87E+00
NRPM	MJ	5.14E+00	0.00E+00	-9.19E-02	ND	0.00E+00	0.00E+00	-4.85E+00	-2.02E-01	0.00E+00
TRPE	MJ	8.60E+00	2.94E-01	1.59E-01	ND	0.00E+00	8.20E-03	3.11E+00	2.10E-01	-2.87E+00
SM	kg	0.00E+00	0.00E+00	0.00E+00	ND	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	ND	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	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
W	m ³	1.57E-03	1.79E-05	1.14E-04	ND	0.00E+00	5.50E-07	5.18E-04	5.60E-08	-7.26E-04

0.15 mm plastic film

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
RPEE	MJ	5.02E-01	1.90E-02	4.54E-01	ND	0.00E+00	5.87E-04	6.38E-02	3.98E-04	-7.67E-01
RPEM	MJ	3.58E-01	0.00E+00	-3.58E-01	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TPE	MJ	8.60E-01	1.90E-02	9.59E-02	ND	0.00E+00	5.87E-04	6.38E-02	3.98E-04	-7.67E-01
NRPE	MJ	4.26E+00	3.66E-01	3.12E-01	ND	0.00E+00	1.02E-02	9.90E+00	5.13E-01	-3.57E+00
NRPM	MJ	6.39E+00	0.00E+00	-1.14E-01	ND	0.00E+00	0.00E+00	-6.03E+00	-2.51E-01	0.00E+00
TRPE	MJ	1.07E+01	3.66E-01	1.98E-01	ND	0.00E+00	1.02E-02	3.87E+00	2.61E-01	-3.57E+00
SM	kg	0.00E+00	0.00E+00	0.00E+00	ND	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	ND	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	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
W	m ³	1.95E-03	2.22E-05	1.42E-04	ND	0.00E+00	6.84E-07	6.44E-04	6.96E-08	-9.03E-04

0.20 mm plastic film

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
RPEE	MJ	6.72E-01	2.55E-02	6.08E-01	ND	0.00E+00	7.87E-04	8.56E-02	5.34E-04	-1.03E+00
RPEM	MJ	4.80E-01	0.00E+00	-4.80E-01	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TPE	MJ	1.15E+00	2.55E-02	1.29E-01	ND	0.00E+00	7.87E-04	8.56E-02	5.34E-04	-1.03E+00

NRPE	MJ	5.74E+00	4.91E-01	4.18E-01	ND	0.00E+00	1.37E-02	1.33E+01	6.87E-01	- 4.79E+00
NRPM	MJ	8.57E+00	0.00E+00	-1.53E-01	ND	0.00E+00	0.00E+00	- 8.08E+00	-3.37E-01	0.00E+00
TRPE	MJ	1.43E+01	4.91E-01	2.65E-01	ND	0.00E+00	1.37E-02	5.18E+00	3.51E-01	- 4.79E+00
SM	kg	0.00E+00	0.00E+00	0.00E+00	ND	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	ND	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	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
W	m ³	2.62E-03	2.98E-05	1.90E-04	ND	0.00E+00	9.17E-07	8.64E-04	9.33E-08	-1.21E-03

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

0.12 mm plastic film

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
HW	kg	4.46E-08	1.22E-08	3.82E-09	ND	0.00E+00	3.79E-10	1.08E-10	1.66E-11	-3.50E-09
NHW	kg	1.90E-03	4.49E-05	4.38E-04	ND	0.00E+00	1.30E-06	2.70E-03	4.38E-03	-7.21E-04
RW	kg	7.15E-05	5.20E-07	2.27E-06	ND	0.00E+00	1.51E-08	1.72E-05	5.50E-08	-1.23E-05

0.15 mm plastic film

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
HW	kg	5.55E-08	1.52E-08	4.75E-09	ND	0.00E+00	4.71E-10	1.34E-10	2.07E-11	-4.36E-09
NHW	kg	2.37E-03	5.59E-05	5.44E-04	ND	0.00E+00	1.62E-06	3.36E-03	5.44E-03	-8.96E-04
RW	kg	8.89E-05	6.47E-07	2.83E-06	ND	0.00E+00	1.88E-08	2.14E-05	6.84E-08	-1.52E-05

0.20 mm plastic film

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
HW	kg	7.44E-08	2.03E-08	6.37E-09	ND	0.00E+00	6.32E-10	1.80E-10	2.77E-11	-5.84E-09
NHW	kg	3.16E-03	7.49E-05	7.29E-04	ND	0.00E+00	2.17E-06	4.50E-03	7.30E-03	-1.20E-03
RW	kg	1.19E-04	8.67E-07	3.79E-06	ND	0.00E+00	2.52E-08	2.86E-05	9.17E-08	-2.04E-05

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

End of life – output flow

0.12 mm plastic film

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
CR	kg	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	0.00E+00	0.00E+00	1.41E-02	ND	0.00E+00	0.00E+00	4.18E-02	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	5.82E-03	ND	0.00E+00	0.00E+00	6.37E-02	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETE	MJ	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

0.15 mm plastic film

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
CR	kg	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	0.00E+00	0.00E+00	1.76E-02	ND	0.00E+00	0.00E+00	5.19E-02	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	7.23E-03	ND	0.00E+00	0.00E+00	7.92E-02	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETE	MJ	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

0.20 mm plastic film

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
CR	kg	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	0.00E+00	0.00E+00	2.36E-02	ND	0.00E+00	0.00E+00	6.96E-02	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	9.69E-03	ND	0.00E+00	0.00E+00	1.06E-01	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETE	MJ	0.00E+00	0.00E+00	0.00E+00	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

Information describing the biogenic carbon content at the factory gate

0.12 mm plastic film

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	0
Biogenic carbon content in the accompanying packaging	kg C	0.0078

0.15 mm plastic film

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	0
Biogenic carbon content in the accompanying packaging	kg C	0.0097

0.20 mm plastic film

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	0
Biogenic carbon content in the accompanying packaging	kg C	0.013

Additional Norwegian requirements

Greenhouse gas emission from the use of electricity in the manufacturing phase

Electricity used at Teerijärvi production plant is modelled with basic grid mix electricity dataset. Average electricity grid mix of Finland is modelled with Gabi Professional database. All the necessary background data is included. Country specific individual characteristics are considered. Data represents year 2017.

National electricity grid	Unit	Value
Electricity grid mix of Finland	kg CO ₂ -eq/kWh	0.213

GWP-IOBC Climate impacts calculated according to the principle of instantaneous oxidation
GWP-BC Climate impacts from the net uptake and emission of biogenic carbon from each module.

0.12 mm plastic film

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-IOBC	kg CO ₂ eq.	2.44E-01	2.23E-02	1.19E-02	ND	0.00E+00	6.13E-04	2.23E-01	3.18E-04	-1.51E-01
GWP-BC	kg CO ₂ eq.	-1.23E-02	-2.97E-05	1.22E-02	ND	0.00E+00	-1.03E-06	1.11E-04	-9.65E-06	1.18E-02

0.15 mm plastic film

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-IOBC	kg CO ₂ eq.	3.05E-01	2.77E-02	1.48E-02	ND	0.00E+00	7.63E-04	2.77E-01	3.95E-04	-1.88E-01
GWP-BC	kg CO ₂ eq.	-1.53E-02	-3.69E-05	1.52E-02	ND	0.00E+00	-1.28E-06	1.38E-04	-1.20E-05	1.46E-02

0.20 mm plastic film

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-IOBC	kg CO ₂ eq.	4.08E-01	3.71E-02	1.98E-02	ND	0.00E+00	1.02E-03	3.71E-01	5.30E-04	-2.52E-01
GWP-BC	kg CO ₂ eq.	-2.05E-02	-4.95E-05	2.04E-02	ND	0.00E+00	-1.71E-06	1.84E-04	-1.61E-05	1.96E-02

GWP-IOBC Global warming potential calculated according to the principle of instantaneous oxidation. **GWP-BC** Global warming potential from net uptake and emissions of biogenic carbon from the materials in each module. **GWP** Global warming potential

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 substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.

Indoor environment





The product meets the requirements for low emissions.

Carbon footprint

Carbon footprint has not been worked out for the product.

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
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Statistics Norway. 2019.	Waste account for Norway, by treatment and material (1 000 tonnes) 2012-2019. Available: https://www.ssb.no/en/statbank/table/10513/

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