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The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025

Owner of the declaration:	EPS-foreningen
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-1848-793-EN
Registration number:	NEPD-1848-793-EN
ECO Platform reference number:	
Issue date:	16.08.2019
Valid to:	16.08.2024

EPS fiskekasse, 20kg standard

EPS fish box, 20kg standard

EPS-foreningen
www.epd-norge.no

EPS-foreningen
En bransjeforening i Norsk Industri

General information

Product:
EPS fiskekasse, 20kg standard

Owner of the declaration:
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Manufacturers:
Brødrene Sunde AS; Lerøy Aurora AS, Avd. Tromsø; Jackon AS, Avd. Alsvåg; Viplast; Bewi Polar AS Avd Hamarvik; Vartdal Plastindustri AS; Styro Nor AS; A/S Nesseplast; Løvold Industri AS; Jackon AS, Fredrikstad; Glava AS; Bewi Produkter AS; Atlantic Styro AS

Declaration number:
NEPD-1848-793-EN

Place of production:
Polystyrene supply from European suppliers, manufacturing in Norway

ECO Platform reference number:

Management system:
-

This declaration is based on Product Category Rules:
NPCR023:2019 Packaging products and services

Organisation no:
985156549 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:
16.08.2019

Valid to:
16.08.2024

Declared unit:
-

Year of study:
2018

Declared unit with options:
-

Comparability:
EPD from program operators other than the Norwegian EPD Foundation are not necessarily comparable.

Functional unit:
One delivery of 1000 kg fish using sector average 20 kgs EPS standard fish boxes to market in Norway/Europe

The EPD has been worked out by:
asplan viak
Michael M. Jenssen Erik Skontorp Hognes

Verification:
NPCR023 serves as PCR. Independent verification of the declaration and data, according to ISO14025:2010

☐ internal ☒ external

Third party verifier:
Jane Anderson, ConstructionLCA Ltd
Independent verifier approved by EPD Norway

Approved
Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:
Expanded polystyrene (EPS) fish boxes intended for food-grade, single-use, primary packaging of Norwegian fish to domestic and European markets.

The function of the box is to protect the fish, while at the same time providing thermal insulation to maintain the quality of the fish during transportation. The box is used for round fish and fillets; when packaging fillets, a bag is used (non-vacuum solution). No absorbents are used with fillets as the boxes have drainage holes.

The product studied is the fish box that best represents a typical packaging box for Norwegian fish export. Fish box sizes are standardized in the industry, **the studied product is a 20kg standard fish box (holding 22,5kg fish)**. Fully loaded, trucks carry 891 boxes of fish.

Product specification:
Product composition per functional unit:

Materials	kg	%
Polystyrene (PS)	26,7 (600 gr per box)	94%
Pentane	1,6 (36 gr per box)	6%

Market:
Norway (scenario B1.1) and Europe (scenario B1.2)

Reference service life, product:
Not relevant for single-use packaging.

Technical data:
Dimensions and capacity per 20 kg standard fish box:

Internal net volume (m3)	0.045
Total external volume (m3)	0,0624 – 0,07
Capacity (kg)	22,5 kg fish + 5 kg ice
Dimensions (mm)	800x400x195 – 220
Thickness (mm)	25 – 28
Net packaging unit weight (kg)	0.6
Net weight, fish (kg)	22.5
Net weight, ice (kg)	5
Total weight with fish and ice (kg)	28,1

Conversion factor, per box:
Results per 20kg standard box can be calculated by dividing the results per functional unit with 44,44.

Conversion factor, box sizes
Conversion factor is only valid for cradle-to-gate (A1-A3). A conversion factor encompassing the full cradle-to-grave system is not possible due to differences in box utilization (kg fish per kg box) and transportation scenarios between different box types.

Conversion factors for other box sizes (per box, modules A1-A3):

Box type	Size (mm)	Conversion factor
20 kg standard	800x400x19,5 (22 with lid)	1
20 kg charter	780x390x19,5 (22,5 with lid)	1.6
20 kg filet box	600x400x19,5 (no lid used)	0.6
10 kg box	600x400x14,5 (16,2 with lid)	0.6

LCA: Calculation rules

Functional unit:
One delivery of 1000 kg fish using sector average 20 kgs EPS standard fish boxes to market in Norway/Europe

System boundary:
Cradle-to-grave

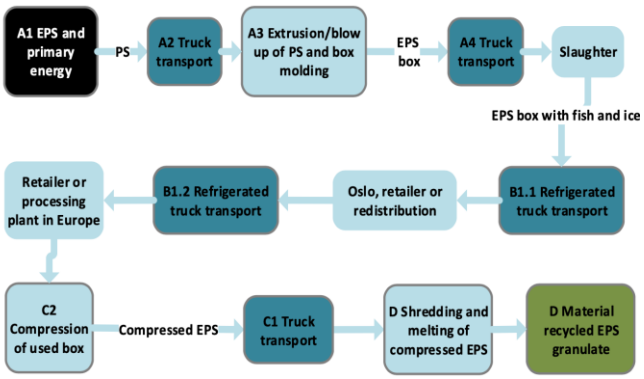

Figure 1: Flowchart showing the system boundaries.

Data quality:
General requirements and guidelines concerning the use of generic and specific data and the quality of those are as described in EN 15804: 2012+A1:2013, clause 6.3.6 and 6.3.7., including ISO14044:2006, 4.2.3.6. The data is representative according to temporal, geographical and technological requirements. Databases used have been ecoinvent v3.4. Calculations have been carried out using Simapro v8.5.

Temporal:
Data for use in module A3 is supplied by the industry and consists of recorded and calculated amounts of specific material and energy consumption from three sites. Specific data has been collected for 2018. Generic data has been created or updated within the last 10 years. Any exceptions are documented in the LCA-report.

Geographical:
The product included in this EPD is manufactured in Norway and is representative for the Norwegian and European markets. Best available proximations are used where Norwegian-specific data are unavailable.

Technological:
Data represents technology in use.

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.

Allocation:
The allocation is made in accordance with the provisions of NPCR023. Input flows, wastes and emissions are allocated equally among all products through mass allocation.

Benefits and loads beyond the system boundary (module D):
Module D is calculated in accordance with NPCR 023.
Recycled EPS from the Norwegian fish boxes is assumed to replace virgin EPS for EPS/XPS insulation manufacturing. Used fish boxes are compacted at the B2B consumer, then transported to an often nearby recycler for melting and regranulating, replacing the need for virgin PS granulate. A 5% value correction is applied. The same scenario is valid for the Norwegian and European market. No losses are assumed.

LCA: Scenarios and additional technical information

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

Transportation scenarios
Transport in A2 describes the transport of polystyrene (PS) beads from European suppliers. Transportation scenarios for wastes accrued in A3 are provided by Avfall Norge (Raadal et al., 2009). Distances from fish box factories to fisheries (A4) and from fisheries to markets (B1.1, B1.2) are based on transport distances from fishiers along the coast of Norway. Expert judgement has been used to derive transport distances for end-of-life modules.

Use-phase
Distribution (B1) is declared with two scenarios; transportation to market in Norway (B1.1) and transportation to market in Europe (B1.2). As there is no maintenance, module B2 is zeroed.

End of life scenario
A 100% recovery rate assumed with a 5% value correction.

Transportation scenarios (A4, C1)

Type	Module	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Truck	A4	4	Lorry, 16-32t EURO5	50	0,0304 l/tkm	15.20
Waste transport	C1	78	Lorry, >32t	100	0,017 l/tkm	1.70

End of Life (C1, C2, C3, C4)

	Unit	Value
Hazardous waste disposed	kg	0
Collected as mixed construction waste	kg	0
Reuse	kg	0
Recycling	kg	26.7
Energy recovery	kg	0
To landfill	kg	0

Benefits and loads beyond the system boundaries (D)

	Unit	Value
Net new scrap	kg	26.7

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

Product stage			Supply		Use stage							End-of-life stage				Supplementary information
Raw material extraction	Transport	Manufacturing	Transport	Assembly	Distribution	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Waste transport	Waste processing	Transport to disposal	Disposal	Benefits and loads beyond the system boundary
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	MNR	X	X	MNR	MNR	MNR	MNR	MNR	X	X	X	X	X

Please note that while included, module B2 shall be calculated as zero for one-time packaging use, according to NPCR023.

Environmental impact

Parameter	Unit	A1-A3	A4	B1.1	B1.2	C1	C2	C3	C4	D
GWP	kg CO_2 -eqv	1.35E+02	3.51E+00	9.68E+00	1.73E+01	1.71E+00	2.36E+00	0.00E+00	0.00E+00	-8.12E+01
ODP	kg CFC11-eqv	9.70E-06	6.53E-07	1.96E-06	3.48E-06	3.20E-07	2.40E-07	0.00E+00	0.00E+00	-1.06E-06
POCP	kg C_2H_4 -eqv	6.56E-01	5.73E-04	1.19E-03	2.14E-03	2.83E-04	4.54E-04	0.00E+00	0.00E+00	-1.61E-02
AP	kg SO_2 -eqv	3.97E-01	1.12E-02	2.94E-02	5.25E-02	5.74E-03	1.25E-02	0.00E+00	0.00E+00	-2.53E-01
EP	kg PO_4^{3-}-eqv	3.65E-02	1.87E-03	5.17E-03	9.22E-03	9.28E-04	1.64E-03	0.00E+00	0.00E+00	-1.95E-02
ADPM	kg Sb-eqv	5.90E-05	1.07E-05	4.62E-06	8.50E-06	3.19E-06	1.02E-06	0.00E+00	0.00E+00	3.06E-06
ADPE	MJ	2.96E+03	5.33E+01	1.31E+02	2.35E+02	2.67E+01	3.58E+01	0.00E+00	0.00E+00	-2.04E+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

Parameter	Unit	A1-A3	A4	B1.1	B1.2	C1	C2	C3	C4	D
RPEE	MJ	1.95E+02	6.90E-01	7.53E-01	1.36E+00	3.03E-01	6.98E+00	0.00E+00	0.00E+00	3.34E+00
RPEM	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	0.00E+00
TPE	MJ	1.95E+02	6.90E-01	7.53E-01	1.36E+00	3.03E-01	6.98E+00	0.00E+00	0.00E+00	3.34E+00
NRPE	MJ	3.07E+03	5.45E+01	1.33E+02	2.37E+02	2.71E+01	5.85E+01	0.00E+00	0.00E+00	-2.10E+03
NRPM	MJ	9.54E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRPE	MJ	4.03E+03	5.45E+01	1.33E+02	2.37E+02	2.71E+01	5.85E+01	0.00E+00	0.00E+00	-2.10E+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	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	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	0.00E+00
W	m^3	2.26E+02	1.02E-02	1.80E-02	3.23E-02	5.24E-03	3.84E-02	0.00E+00	0.00E+00	-1.57E+00

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

Parameter	Unit	A1-A3	A4	B1.1	B1.2	C1	C2	C3	C4	D
HW	kg	2.46E-02	3.17E-05	1.83E-05	3.41E-05	1.57E-05	5.60E-05	0.00E+00	0.00E+00	9.33E-05
NHW	kg	1.14E+01	2.58E+00	2.66E+00	4.95E+00	2.29E+00	1.55E-01	0.00E+00	0.00E+00	-7.26E-01
RW	kg	4.54E-03	3.72E-04	2.09E-04	3.89E-04	1.80E-04	3.40E-04	0.00E+00	0.00E+00	5.85E-04

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

End of life - Output flow

Parameter	Unit	A1-A3	A4	B1.1	B1.2	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	0.00E+00
MR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.7E+01	0.00E+00	0.00E+00	0.00E+00
MER	kg	7.90E-01	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	8.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETE	MJ	6.58E+00	0.00E+00	0.00E+00	0.00E+00	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

Additional Norwegian requirements

Greenhouse gas emission from the use of electricity in the manufacturing phase
The electricity mix used in the manufacturing stage (A3) is specific to Norwegian electricity production and imports, low voltage (including the transmission network; direct emissions to air; electricity losses during transmission). Reference year: 2014.

Data source	Amount	Unit
ecoinvent v3.4	0.031	kg CO_2-eqv/kWh

Dangerous substances

- ▪ The product contains no substances given by the REACH Candidate list or the Norwegian priority list.[1]
- ▫ 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.

[1]No substances as given by REACH are used or have been added to the production.

Indoor environment
No tests have been carried out on the product concerning indoor climate - Not relevant

Carbon footprint
Carbon footprint has not been worked out for the product.

Bibliography

EN 15804:2012+A1:2013	*Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products*
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*
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Raadal et al. (2009)	*Klimaregnskap for avfallshåndtering. Fase I og II: Glassemballasje, metalemballasje, papir, papp, plastemballasje, våtorganisk avfall, treavfall og restavfall fra husholdninger. Avfall Norge–Rapport 5/2009*

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