

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	Kima Accessories Aps
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-KIM-20230121-CBC1-EN
Issue date	06.06.2023
Valid to	05.06.2028

Injection moulded polypropylene products Kima Accessories Aps

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General Information

Kima Accessories Aps

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-KIM-20230121-CBC1-EN

This declaration is based on the product category rules:

Boards and panels made of plastic (exterior applications),
01.08.2021
(PCR checked and approved by the SVR)

Issue date

06.06.2023

Valid to

05.06.2028



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Injection moulded polypropylene products

Owner of the declaration

Kima Accessories Aps
Kastanievej 3
6862 Tistrup
Denmark

Declared product / declared unit

1 kilogram of a representative injection moulded polypropylene product.

Scope:

This environmental product declaration describes the production of a representative product made of 100% polypropylene by injection moulding at Kima Accessories facility in Tistrup, Denmark. Hence this declaration is a representative EPD.

It includes the following two products:

- Storm crate
- Insulation disc

The two products mentioned above are made of 100 % virgin polypropylene by injection moulding. The data is based on data collected at the production site and data delivered by suppliers. The data represents the production of the period 01.07.2021 to 30.06.2022.

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

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR		
Independent verification of the declaration and data according to ISO 14025:2011		
<input type="checkbox"/>	internally	<input checked="" type="checkbox"/> externally



Dr.-Ing. Nikolay Minkov,
(Independent verifier)

Product

Product description/Product definition

This environmental product declaration covers two products made of 100 % polypropylene (PP) by injection moulding. The product names and codes are as follows:

- F6100 - Storm crate - 9.4 kg/pcs
- R2022HV3 - Insulation disc - 0.008 kg/pcs

The common function of the product group is to ensure environment and conditions for buildings, to prolong the lifetime of the building. Specifically, the products ensure run-off of rainwater from the roof and into the ground, thereby, protecting the building from water and moisture, as well as a environment for insulation materials. The products have been grouped since they have the overall same function as well as the same production process.

The storm crate is buried under the ground to facilitate water retention, attenuation, and infiltration. It has the following dimensions: 78 x 78 x 42 cm, and a water capacity of 256 L.

The insulation disc is used for mounting insulation to a building. The dimensions of the insulation disc is 70 mm in diameter and the screw hole in the middle is 6 mm.

The production of Kima Accessories injection moulded PP products have so far not been subject to EU harmonization legislation. Hence, for the use and application of the products the respective national provisions at the place of use apply

Application

Storm crate:

The storm crate is a modular cellular crate and is used in storm water retention, attenuation and infiltration applications. The crate is designed to be simple and easily stacked together to create a below ground storm water holding tank or to allow the infiltration of storm water into the ground around it. The void created by the crate can fill up with storm water during heavy rainfalls. The collected storm water then drains away slowly into the drainage.

Insulation disc:

The insulation disc is a polypropylene disc with spikes, that helps mounting insulations, such as mineral wool, to a building. The disc has four spike on one side to ensure grip on the insulation material. The disc has a hole in the middle for screws used for mounting.

Technical Data

The two products covered by this environmental product declaration are made of 100 % virgin polypropylene C705-44NAHP. Which is made for thin wall injection moulding. The PP is tested in accordance with the following standards.

- ISO 1133
- ISO 75-2
- ISO 178

- ISO 179-1
- ISO 306
- ISO 527-2
- ISO 1183
- ISO 3302-1

Constructional data

Name	Value	Unit
Thickness	2 - 3	mm
Gross density	0.9 - 0	kg/m ³
Flexural modulus according to ISO 178	1500	MPa
Melt flow rate (230C/2.16 kg) according to ISO 1133	44	g/10min
Charpy impact strength (23C) according to ISO 179-1	7	kJ/m ²
Charpy impact strength (0C) according to ISO 179-1	5	kJ/m ²
Charpy impact strength (-20C) according to ISO 179-1	4	kJ/m ²
Tensile stress at yield according to ISO 527-2	28	MPa
Heat deflection temperature (0.45 MPa) according to ISO 75-2	100	C
Viscat softening temperature according to ISO 306-1	152	C

Performance data of the product with respect to its characteristics in accordance with the relevant technical provision (no CE-marking).

Base materials/Ancillary materials

The declared product consists solely of PP (100 % polypropylene).

Name	Value	Unit
Polypropylene Virgin	100	%

This product/article/at least one partial article contains substances listed in *the candidate list* (date:12.05.2023) exceeding 0.1 percentage by mass: **No**

Reference service life

The reference service life is not relevant for this LCA since the use stage modules B1-B7 are not included. The storm crate is expected to have a long life time if the entire storm water system is well maintained. For this product, we expect a life time of 50 years, but it might be longer.

The expected lifetime of the insulation disc attached to the roof construction is mounted during the construction of the building or when replacing insulation. The disc is expected to be replaced together with the insulation material. Mineral wool has an expected lifetime of approximately 50 years and the same is assumed for the insulation disc.

LCA: Calculation rules

Declared Unit

The declared unit is 1 kilogram of a representative injection moulded polypropylene product.

Declared unit

Name	Value	Unit
Gross density	0.9	kg/m ³
Declared unit	1	kg

The robustness of the LCA values is judged to be good. The production process of the two products is identical. The only difference is the shape and weight of the two products.

The electricity consumption was found by taking the total electricity consumption of the production facility and dividing it by the total production volume, as it was not possible to measure the individual machines. The geographical representative is good, as all products are manufactured in Denmark. Secondary data is used for modules A1, A2, modules C and D. Collecting primary data in these stages will make the LCA stronger, however, it might not change the overall conclusion of the LCA results.

System boundary

This is a cradle-to-gate EPD with modules A1-A3, C1-C4 and D

Production stage - Module A1-A3

The production stage includes:

- A1, raw material extraction and processing, processing of secondary material from previous product systems, when applicable.
- A2, transport to factory gate and internal transport
- A3, manufacturing of products and packaging, as well as assembly and processing up to the end-of-waste state.

Wastes and losses of the manufacturing processes are included in the processes in which they occur according to the polluter pays principle. The construction of the manufacturing facility is not taken into account, however the production of spare parts for machinery is included in this study. The electricity consumption includes all activities at the manufacturing facility including office equipment. Input data for the manufacturing real plant data were used.

End-of-life stage - Module C1-C4

The end-of-life stage includes:

- C1, deconstruction and demolition
- C2, transport to waste processing
- C3, waste processing for reuse, recovery and/or recycling
- C4, disposal

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The biogenic carbon content quantifies the amount of biogenic carbon in a construction product leaving the factory gate. Both the biogenic content of the product and the accompanying packaging is declared.

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO₂.

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging Cardboard	0.06	kg C
Biogenic carbon content in accompanying packaging Wood	0.04	kg C

The following technical scenario information covers the disposal of the accompanying packaging material of A3, on the construction site as module A5 is not declared in this EPD.

Installation into the building (A5)

The deconstruction of the products is assumed to be done manually. As a result, no processes have been assigned to module C1. 95 % of the products are sold to Danish customers the remaining 5 % is divided between other Scandinavian countries (4 %) and other European countries (1 %). Hence, the transportation distance is modelled for Danish conditions. A transport distance from the building to the waste processing facilities of 50 km is assumed. End-of-life treatment of packaging material is not included as module A5 is not declared.

Benefits and loads beyond the system boundaries - Module D

The benefits and loads include:

- D, potential benefits from reuse, recycling and recovery outside the scope of the study.
- D, potential loads related to processing to reach equivalent materials to virgin input material

In this case, benefits are given to the recycling of the amount of virgin PP. The loads of the regranulation of plastic are included in this study. Furthermore, a benefit is given to the exported energy obtained from waste incineration.

Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product's lifespan: Denmark

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. The system model *EN15804* - cut-off available in the LCI database *Ecoinvent v. 3.9* is used in this EPD.

Name	Value	Unit
Packaging waste for recycling (Cardboard)	0.03	kg
Packaging waste for recycling (Wood pallet)	0.02	kg
Packaging waste for incineration (Plastic film)	0.002	kg
Packaging waste for incineration (Tape)	0.006	kg

End of life (C1-C4)

Name	Value	Unit
Collected separately	0.9	kg
Collected as mixed construction waste	0.1	kg
Recycling PP	0.9	kg
Energy recovery PP	0.1	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information

The following values in the table are amounts contributing to the loads and benefits included in module D.

Name	Value	Unit
Recycling of PP from module C3	0.9	kg
Incineration of PP from module C3	0.1	kg

Credits are only given to the net amount leaving the product system that has passed the end-of-waste state.

In the LCA calculation loads related to obtaining equivalent functions as the original virgin material are included as well as benefits of avoided production of the given virgin material.

LCA: Results

The following table shows the LCA results obtained in this study.

For calculation of the results, characterization was used on a model created of individual inputs from different LCIA methods to comply with *EN15804+A2* which is yet to be fully implemented in the *SimaPro* software. As a result, the LCIA has been calculated in Excel using the following methods from *Ecoinvent v.3.9*:

- EF v.3.1 *EN 15804*
- *EN 15804* inventory indicators according to *ISO 21930*

The additional indicators are retrieved by using ecoinvent cumulative LCIA results for the system model *EN15804*, cut-off. It follows *ISO 21930*; hence the results include all the foreground and background processes.

C1 is declared as 0, since manual deconstruction is assumed.

C4 is declared as 0, since no landfilling is assumed in the end-of-life stage.

The estimated impact results are only relative statements which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins or risks.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End-of-life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	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	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 kg injection moulded polypropylene product

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO ₂ eq	3.15E+00	0	7.39E-03	7.27E-01	0	-1.71E+00
Global Warming Potential fossil fuels (GWP-fossil)	kg CO ₂ eq	3.53E+00	0	7.38E-03	-1.73E-04	0	-1.7E+00
Global Warming Potential biogenic (GWP-biogenic)	kg CO ₂ eq	-3.81E-01	0	5.93E-06	1.4E-04	0	-9.37E-03
Global Warming Potential luluc (GWP-Juluc)	kg CO ₂ eq	2.98E-03	0	3.68E-06	7.33E-09	0	-4.16E-04
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	4.36E-08	0	1.64E-10	1.38E-03	0	-8.19E-09
Acidification potential of land and water (AP)	mol H ⁺ eq	1.25E-02	0	1.69E-05	1.43E-04	0	-5.97E-03
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	8.02E-04	0	5.43E-07	4.12E-04	0	-1.93E-04
Eutrophication potential aquatic marine (EP-marine)	kg N eq	2.47E-03	0	4.39E-06	3.3E-03	0	-1.05E-03
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	2.52E-02	0	4.46E-05	9.88E-04	0	-1.11E-02
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	1.05E-02	0	2.67E-05	1.17E-06	0	-5.54E-03
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	1.49E-05	0	2.41E-08	5.88E+00	0	-7.5E-06
Abiotic depletion potential for fossil resources (ADPF)	MJ	9.95E+01	0	1.08E-01	6.97E-02	0	-6.56E+01
Water use (WDP)	m ³ world eq deprived	1.02E+00	0	5.54E-04	2.76E-01	0	-6.56E-01

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 kg injection moulded polypropylene product

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	7.85E+00	0	1.73E-03	0	0	-9.32E-01
Renewable primary energy resources as material utilization (PERM)	MJ	2.86E+00	0	0	2.76E-01	0	0
Total use of renewable primary energy resources (PERT)	MJ	1.07E+01	0	1.73E-03	-3.55E+01	0	-9.32E-01
Non renewable primary energy as energy carrier (PENRE)	MJ	6.62E+01	0	1.08E-01	4.14E+01	0	-3.61E+01
Non renewable primary energy as material utilization (PENRM)	MJ	3.33E+01	0	0	5.88E+00	0	-2.95E+01
Total use of non renewable primary energy resources (PENRT)	MJ	9.95E+01	0	1.08E-01	3.56E-03	0	-6.56E+01
Use of secondary material (SM)	kg	2.15E-02	0	4.88E-05	2.77E-05	0	-2.5E-03
Use of renewable secondary fuels (RSF)	MJ	4.85E-02	0	5.97E-07	0	0	-2.58E-05
Use of non renewable secondary fuels (NRSF)	MJ	0	0	0	7.2E-03	0	0
Use of net fresh water (FW)	m ³	4.55E-02	0	1.39E-05	3.63E-02	0	-1.64E-02

RESULTS OF THE LCA - WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 kg injection moulded polypropylene product

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	1.48E-01	0	7.34E-05	7.97E-01	0	-2.17E-02
Non hazardous waste disposed (NHWD)	kg	3.69E+00	0	2.3E-03	4.12E-06	0	-8.13E-01

Radioactive waste disposed (RWD)	kg	2.36E-05	0	9.03E-09	0	0	-5.25E-06
Components for re-use (CRU)	kg	0	0	0	8.17E-01	0	0
Materials for recycling (MFR)	kg	1.28E-03	0	8.25E-07	3.87E-07	0	-2.2E-04
Materials for energy recovery (MER)	kg	1.77E-06	0	4.91E-09	1.03E-01	0	-5.12E-07
Exported electrical energy (EEE)	MJ	4.07E-01	0	1.83E-05	2.99E-03	0	-1.43E-02
Exported thermal energy (EET)	MJ	2E-02	0	4.77E-05	1.11E-08	0	-4.98E-03

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 kg injection moulded polypropylene product

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Incidence of disease due to PM emissions (PM)	Disease incidence	1.21E-07	0	5.98E-10	8.09E-02	0	-6.47E-08
Human exposure efficiency relative to U235 (IR)	kBq U235 eq	4.57E-01	0	1.52E-04	1.66E+00	0	-9.11E-02
Comparative toxic unit for ecosystems (ETP-fw)	CTUe	6.92E+00	0	5.27E-02	2.92E-10	0	-1.6E+00
Comparative toxic unit for humans (carcinogenic) (HTP-c)	CTUh	1.69E-09	0	3.5E-12	4.89E-09	0	-4.35E-10
Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	3.09E-08	0	7.65E-11	1.78E+00	0	-8.63E-09
Soil quality index (SQP)	SQP	5.07E+01	0	8.08E-02	ND	0	-1.37E+00

Disclaimer 1 – for the indicator 'Potential Human exposure efficiency relative to U235'. 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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators 'abiotic depletion potential for non-fossil resources', 'abiotic depletion potential for fossil resources', 'water (user) deprivation potential, deprivation-weighted water consumption', 'potential comparative toxic unit for ecosystems', 'potential comparative toxic unit for humans – cancerogenic', 'Potential comparative toxic unit for humans - not cancerogenic', 'potential soil quality index'. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

References

Standards

EN 15804

EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

ISO 75-2:2013

Plastics — Determination of temperature of deflection under load — Part 2: Plastics and ebonite

ISO 178

ISO 178:2019, Plastics – Determination of flexural properties

ISO 179-1

ISO 179-1:2010, Plastics – Determination of Charpy impact properties— Part 1: Non-instrumented impact test

ISO 306

ISO 306:2004, Plastics – Thermoplastics materials- Determination of Vicat softening temperature

ISO 527-2

ISO 527-2:2012, Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics

ISO 1133

ISO 1133:2011, Plastics – Determination of the melt mass-flow rate and melt volume-flow rate of thermoplastics

ISO 1183

ISO 1183:2019, Plastics – Methods for determining the density of non-cellular plastics

ISO 3302-1

ISO 3302-1:2014, Classes and Tolerances

for Products Moulded in Solid Rubber

ISO 14025

EN ISO 14025:2011, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

ISO 14040

ISO 14040:2006, Environmental management –Life cycle assessment - Principles and framework;English version

ISO 14044

ISO 14044:2006, Environment Management – LifeCycle Assessment – Requirements and Instructions;English version
EN ISO 14044:2006.

Further references

ECHA candidate list

Candidate List of substances of very high concern for Authorisation
<https://echa.europa.eu/candidate-list-table> [Accessed 25-05-2023].

EcolInvent 3.9

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**IBU 2021**

Institut Bauen und Umwelt e.V.: General Instructions for the EPD programme of Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021 www.ibu-epd.com

IBU 2023

PCR Guidance-Text for Building-Related Products and

Services, Part B: Requirements on the EPD for Boards and panels made of plastic (exterior applications), Version 1.0

SimaPro 2023

Pré Sustainability,
LCA software SimaPro version 9.5.

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