LIFE CYCLE ASSESSMENT

based on ISO 14040 und ISO 14044

ALUMINIUM EXTRUSION PROFILES

LCA holder:
Vimetco Extrusion
Strada Milcov, nr. 1, 230077
Județul Olt, Slatina, România
https://vimetcoextrusion.com/

LCA creator: PeoplePlanetProfit GmbH
Date of creation: 26.04.2022
Note: The LCA was calculated with the software Umberto LCA +. The procedure for its preparation can be requested.

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Valid until: 26.04.2027
Note on validity: This manufacturer-specific balance sheet is valid for five years from the date of creation.

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Summary

Life cycle assessment holder	Vimetco Extrusion Strada Milcov, nr. 1, 230077 Județul Olt, Slatina, România https://vimetcoextrusion.com/
Life cycle assessment creator	PeoplePlanetProfit GmbH Kapuzinerstraße 8 88212 Ravensburg
Designation	Aluminium extrusion profiles
Document number	LCA-VE-AA-122
Creation date	26.04.2022
Valid until	26.04.2027
Goal	This life cycle assessment is used to present the environmental aspects of aluminium extrusion profiles of Vimetco Extrusion over the life cycle cradle to gate with options.
Procedures and notes	The methodologies for the development of environmental labeling can be requested. A comparison of the life cycle assessment values is possible in principle, but not recommended, as assumptions in the report, life cycle assessment models and the accounting software may differ from each other. The life cycle assessment was calculated using the Umberto LCA + software and the Ecoinvent 3 database based on ISO 14040 and ISO 14044. The procedure is documented in a life cycle assessment report. The life cycle assessment study includes the definition of the objective and the scope of the investigation, the factual balance, the impact assessment, and the evaluation.

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Description and definition of the product	Aluminium extrusion profiles with the following raw material specifications: Alloy 6060i, Alloy 6005, Alloy 6063, Alloy 6082.
Considered life cycle stages	In the life cycle assessment, the life cycle from cradle to gate with options was considered.
Information modules	The following information modules or life cycle phases were considered: • Production A1 – A3, Transport A4 • Transport to End of Life C2, Waste processing C3, Disposal C4 • Recycling potential D
Data basis	The data of the life cycle assessment were collected by Vimetco Extrusion and checked by PPP.
System boundaries	The system boundaries refer to the plant in Slatina, Romania., Outsourced processes are not present or considered.
Functional/ Declared unit	The following units have been defined: • 1 ton of extruded aluminium profile The following life cycle assessments were calculated in relation to the unit: • 1 ton of extruded aluminium profile with the raw material input of aluminium alloy 6060i, 6005 or 6082. • 1 ton of extruded aluminium profile with the raw material input of aluminium alloy 6063.
Reference useful life	Since the aluminium profiles, when used properly do not require replacement in relation to the useful life of any product/construction, the useful life is irrelevant for the scenarios.
Information modules and assumptions	As far as possible, the life cycle phases are fully represented via scenarios. If several scenarios are available, the common scenario is marked in blue. A1 Raw material supply

The data for raw material extraction comes from upstream suppliers if available or was modelled in the software.

A2 Transport

The upstream transport routes were accounted for the respective raw materials.
Other transport routes were not considered, either because they are marginal and have no relevant impact on the balances or because they were not available.

A3 Production

The production-relevant data were recorded and balanced accordingly.

A4 Transport

An average transport route to the customers was calculated as the downstream transport route.

A5 Installation

Module not declared.

B1 Use stage

Module not declared.

B2 Maintenance

Module not declared.

B3 Repair

Module not declared.

B4 Replacement

Module not declared.

B5 Refurbishment

Module not declared.

C1 Deconstruction

Module not declared.

C2 Transport to End of Life

The transport is carried out by 40 t truck, fully loaded, 50 km to the collection point.

C3 Waste processing

Recycling of Aluminium 95 %.

C4 Disposal

Disposal of Aluminium 5 %.

D Benefits and Loads

The input mass of aluminium scrap (post-consumer scrap) was subtracted from the aluminium scrap to be recycled at the end of the life cycle to obtain the net consumption of aluminium scrap from the product system. Module D includes the benefits and burdens of recycling this remaining net aluminium scrap. The thermal recycling of the aluminium scrap (post-consumer scrap) was also considered.

Additional relevant environmental aspects

In addition to the classic LCIA factors according to EN ISO 14025, the GWP was divided into GWP fossil, GWP biogenic and GWP land use. The background to this is EN ISO 14067.

Additional environmental information

No additional environmental information has been considered.

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Environmental aspects over the life cycle

1 metric t of extruded aluminium alloy 6060i,6005,6082		Production	Installation	Use stage								End-of-Life			Next product system
	Unit	Production A1 – A3	Transport A4	Installation/Assembly A5 (x)	Use B1 (X)	Maintenance B2 (X)	Repair B3 (X)	Replacement B4 (X)	Refurbishment B5 (X)	Operational energy consumption B6 (X)	Operational water use B7 (X)	Deconstruction C1 (X)	Transport to End of Life C2	Waste processing C3	Disposal C4	Benefits and Loads D
GWP (100)	CO2 e	8,34E+03	1,52E+02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	4,70E+00	3,28E+01	4,22E-01	-4,10E+03
GWP (100) biogenic	CO2 e	9,72E+01	5,12E-02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,58E-03	1,49E-02	2,20E-04	-2,22E+01
GWP (100) fossil	CO2 e	8,12E+03	1,52E+02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	4,69E+00	3,26E+01	4,21E-01	-3,98E+03
GWP (100) land use	CO2 e	1,16E+02	5,61E-02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,73E-03	1,83E-01	1,28E-03	-1,05E+02

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PER	MJ e	4,04E+04	2,58E+01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	7,98E-01	1,10E+01	1,21E-01	-2,63E+04
PENR	MJ e	1,31E+05	2,47E+03	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	7,62E+01	5,01E+02	1,03E+01	-6,60E+04
ODP	CFC-11 e	7,00E-04	3,49E-05	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,08E-06	6,35E-06	1,37E-07	-4,53E-04
POCP	C2H4 e	3,58E+00	1,94E-02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	6,01E-04	6,15E-03	1,03E-04	-2,47E+00
EP	PO4 e	2,00E+01	1,12E-01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3,45E-03	4,13E-02	5,79E-04	-7,49E+00
AP	SO2 e	4,12E+01	5,63E-01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,74E-02	2,26E-01	3,07E-03	-2,23E+01
ADPE	Sb e	9,84E-02	3,57E-04	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,10E-05	1,13E-04	1,18E-06	-3,42E-03
ADPF	MJ e	1,23E+05	7,05E+01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	7,05E+01	4,64E+02	9,47E+00	-6,22E+04

X = Module not declared.

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1 metric t of extruded aluminium alloy 6063		Production	Installation	Use stage								End-of-Life			Next product system
	Unit	Production A1 – A3	Transport A4	Installation/Assembly A5 (x)	Use B1 (X)	Maintenance B2 (X)	Repair B3 (X)	Replacement B4 (X)	Refurbishment B5 (X)	Operational energy consumption B6 (X)	Operational water use B7 (X)	Deconstruction C1 (X)	Transport to End of Life C2	Waste processing C3	Disposal C4	Benefits and Loads D
GWP (100)	CO2 e	1,04E+04	1,52E+02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	4,70E+00	3,28E+01	4,22E-01	-5,47E+03
GWP (100) biogenic	CO2 e	9,75E+01	5,12E-02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,58E-03	1,49E-02	2,20E-04	-2,36E+01
GWP (100) fossil	CO2 e	1,02E+04	1,52E+02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	4,69E+00	3,26E+01	4,21E-01	-5,34E+03
GWP (100) land use	CO2 e	1,11E+02	5,61E-02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,73E-03	1,83E-01	1,28E-03	-1,06E+02
PER	MJ e	3,97E+04	2,58E+01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	7,98E-01	1,10E+01	1,21E-01	-2,70E+04
PENR	MJ e	1,47E+05	2,47E+03	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	7,62E+01	5,01E+02	1,03E+01	-7,85E+04

ODP	CFC-11 e	7,34E-04	3,49E-05	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,08E-06	6,35E-06	1,37E-07	-4,91E-04
POCP	C2H4 e	4,16E+00	1,94E-02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	6,01E-04	6,15E-03	1,03E-04	-2,92E+00
EP	PO4 e	2,23E+01	1,12E-01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3,45E-03	4,13E-02	5,79E-04	-9,10E+00
AP	SO2 e	5,29E+01	5,63E-01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,74E-02	2,26E-01	3,07E-03	-3,00E+01
ADPE	Sb e	9,39E-02	3,57E-04	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,10E-05	1,13E-04	1,18E-06	-4,56E-03
ADPF	MJ e	1,39E+05	2,28E+03	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	7,05E+01	4,64E+02	9,47E+00	-7,39E+04

X = Module not declared.

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ADPE - Abiotic depletion potential elements
This category refers to the depletion of abiotic (non-living) resources. These are, for example, peat or clay, and the weighting applies the mineral depletion potential for 1 kg per mineral energy resource to the ratio of 1 kg antimony equivalents (kg Sb eq.).

ADPF – Abiotic depletion potential fossil fuel
This category refers to the depletion of abiotic (non-living) fossil fuel resources that contain hydrocarbon compounds. These are, for example, methane, coal or petroleum. The weighting puts the fossil depletion potential for 1 kg per fossil energy resource in relation to 1 kg of oil equivalents in megajoules (MJ).

AP – Acidification potential
This category refers to the depletion of abiotic (non-living) fossil fuel resources that contain hydrocarbon compounds. These are, for example, methane, coal or petroleum. The weighting puts the fossil depletion potential for 1 kg per fossil energy resource in relation to 1 kg of oil equivalents in megajoules (MJ).

EP – Eutrophication potential
Eutrophication is defined as high concentrations of macronutrients phosphorus (P) and nitrogen (N) in aquatic and terrestrial ecosystems. The eutrophication potential of 1 kg for each eutrophication-causing emission in air, water and soil to the ratio of 1 kg phosphate equivalents (kg PO_4^{3}- eq.) serves as a weighting.

GWP – Climate change
The global warming potential (GWP) is based on the radiative properties of greenhouse gases (GHG). The index measures the emission of a particular GHG in a unit of mass in the atmosphere over a given time relative to carbon dioxide (CO2).

ODP – Stratospheric ozone depletion
Stratospheric ozone depletion is mainly caused by the chemical reactions of the product of atomic Cl and ClO compounds with ozone. The stratospheric ozone depletion potential serves as an impact indicator and the weighting is done at the ratio of 1 kg chlorofluorocarbon-11 equivalents (kg FCK-11 eq.).

PENR – Primary energy nonrenewable
Non-renewable primary energy is exhaustible. Primary energy includes the energy that is present in the energy sources themselves and the weighting is in megajoules (MJ).

PER – Primary energy renewable
Renewable primary energy is inexhaustible. Primary energy includes the energy that is present in the energy sources themselves and the weighting is in megajoules (MJ).

POCP – Photochemical oxidation
Photochemical oxidants are formed by the action of sunlight on certain primary air pollutants. The photochemical ozone creation potential of 1 kg for each emission of volatile organic compounds or carbon monoxide in the air to the ratio of 1 kg ethylene equivalent (kg C2H4 eq.) serves as a weighting.