

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A1

Owner of the Declaration	PPA-Europe
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-PPA-20180078-CBG3-EN
Issue date	14.09.2018
Valid to	13.03.2024

Profiled sheets made of aluminium for roof, wall and ceiling constructions
PPA-Europe

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General Information

PPA-Europe

Programme holder

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

Declaration number

EPD-PPA-20180078-CBG3-EN

This declaration is based on the product category rules:

Thin walled profiles and profiled panels of metal, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

14.09.2018

Valid to

13.03.2024



Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)



Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Profiled sheets made of aluminium for roof, wall and ceiling constructions

Owner of the declaration

PPA-Europe
Europark Fichtenhain A 13a
47807 Krefeld
Germany

Declared product / declared unit

1m² industrially produced trapezoidal profiles and standing seam profiles made of aluminium

Scope:

This document is an association EPD and it represents an average EPD, based on vertical averaging of the specific producer data under consideration of the yearly production amounts. Its applicability is limited to profiled sheets made of aluminium, which are manufactured by member companies of the European Association for Panels and Profiles and one additional company.

Five member companies of the European Association for Panels and Profiles and one additional company have provided data for the year 2016:

1. Italpanelli
2. Kalzip
3. Montana Bausysteme
4. Wurzer Profiliertechnik
5. Zambelli RIB-ROOF
6. Aluform System.

These companies are representative for the European production of profiled sheets made of aluminium.

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+A1. 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



Mr Carl-Otto Neven,
(Independent verifier)

Product

Product description/Product definition

The EPD is valid for prefabricated thin walled profiled sheets made of aluminium for loadbearing, self-supporting and non-supporting applications in single- and double-layer roof, wall and ceiling structures.

The profiled sheets are made of a core of aluminium with organic coatings. The LCA is based on vertical averaging of the specific producer datasets under consideration of the respective yearly production amounts.

For the placing of the product on the market in the EU/EFTA (with the exception of Switzerland), /CPR/ applies. The product needs a Declaration of Performance taking into consideration /EN 14782/ or /EN 1090/ and the CE-marking. The data listed in the respective Declaration of Performance apply.

For the application and use, the respective national provisions apply.

Application

The products are used as covering components in single- and double-layer roof and wall structures, as well as in single- and double-layer roof and ceiling structures for mainly static loads.

The profiled sheets are used in interior and exterior application.

Technical Data

Technical specifications for profiled sheets are:

- /EN 14782/

- /EN 508/
- /EN 1090/

Constructional data

Standing seam profile 65/400

Name	Value	Unit
Thickness of the sheet, according /EN 485-4/	0.7	mm
Surface weight	2.9	kg/m ²
Height of the profile, according /EN 508/ or /EN 1090/	65	mm

Base materials/Ancillary materials

Aluminium according /EN 485-2/ or /EN 573-3/

Organic coating according /EN 12944-1/:

Polyester (SP), coil coating, 25 µm on the application side and max. 12 µm on the backside.

The product does not contain any SVHCs (Substances of Very High Concern) /REACH/.

Reference service life

The term of protection depends on the location, weather conditions and the quality of the coating, if applicable.

Thin walled profiled sheets made of aluminium exhibit an estimated service life of > 50 years. This declaration depends on Life Cycle Assessment and relies on the use conditions, according to the /BBSR table/.

LCA: Calculation rules

Declared Unit

The declared unit is 1 m² of aluminium profile. The averaging is done weighted based on the production volume (in m²) per company.

Declared unit

Name	Value	Unit
Declared unit	1	m ²
Grammage	2.9	kg/m ²
Conversion factor to 1 kg (kg/m ²)	2.9	-
Layer thickness	0,0007	m

Type of EPD: 2a) Declaration of a specific product as an average from several manufacturers' plants.

The environmental impact is mainly determined by the raw metal sheet and thus correlates with the area weight, which is declared in the EPD. Under consideration of this limitation the analysis shows a good representativeness of the results declared in the EPDs for the members of PPA Europe.

System boundary

Type of the EPD: cradle to gate - with options

Production stage (modules A1-A3) includes processes that provide materials and energy input for the system, manufacturing and transport processes up to the factory gate, as well as waste processing.

For the end of life a collection rate of 90% is assumed. The 10% lost product is modelled with landfilling. The 90% recollected aluminium is modelled with a credit given as if it was pre-treated (as old scrap) and re-melted to produce secondary aluminium ingot and substituted by the same amount of primary aluminium ingot. The credit is declared in module D.

Geographic Representativeness

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

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.

LCA: Scenarios and additional technical information

The following technical information is a basis for the declared modules.

Transport to the building site (A4)

Name	Value	Unit
Transport distance	100	km
Capacity utilisation (including empty runs)	85	%

Installation (A5)

In the production stage (A1-A3) the following packaging

materials are considered:

Polyethylene film 0.050 kg/m² profile Paper 0.2 kg/m² profile
Wooden pallets 0.120 kg/m² profile A5 covers the recycling of
packaging material at the point of installation. The export of
biogenic carbon dioxide from the packaging material is
declared in the table of results in module A5. Recycling
potential of the packaging material is neglected and not
quantified in module D.

Collection rate of 90% is a conservative assumption.

Reuse, recovery or recycling potential (D)

The avoided production of primary aluminium sheet is
considered. Resulting potential benefits and loads for the metal
recycling are declared in module D.

End of life (C1-C4)

Name	Value	Unit
Collected separately waste type waste type	2.9	kg
Recycling	2.6	kg
Landfilling	0.3	kg

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE 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	X	X	MND	MND	MNR	MNR	MNR	MND	MND	MND	MND	MND	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 m² Aluminium profile (2.9 kg/m²)

Parameter	Unit	A1-A3	A4	A5	C4	D
Global warming potential (GWP)	kg CO ₂ eq	27.0322	0.0165141935483871	0.76	0.00461238	-21.0653
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	4.65E-10	5.54E-15	IND	4.73E-15	-6.39E-07
Acidification potential of land and water (AP)	kg SO ₂ eq	1.31E-01	6.98E-05	IND	2.73E-05	-1.19E-01
Eutrophication potential (EP)	kg PO ₄ ³ eq	7.94E-03	1.74E-05	IND	3.72E-06	-6.15E-03
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg Ethen eq	7.34E-03	-2.56E-05	IND	2.15E-06	-6.38E-03
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	1.37E-05	1.33E-09	IND	1.65E-09	-1.08E-05
Abiotic depletion potential for fossil resources (ADPF)	MJ	304.45	0.228184946236559	IND	0.0596855	-220.165

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A1: 1 m² Aluminium profile (2.9 kg/m²)

Parameter	Unit	A1-A3	A4	A5	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	146.316461800442	0.0115015053763441	IND	0.00720948	-115.934
Renewable primary energy resources as material utilization (PERM)	MJ	1.50053819955817	0	IND	0	0
Total use of renewable primary energy resources (PERT)	MJ	147.817	0.0115015053763441	IND	0.00720948	-115.934
Non renewable primary energy as energy carrier (PENRE)	MJ	358.160484616624	0.22910752688172	IND	0.0618214	-262.771
Non renewable primary energy as material utilization (PENRM)	MJ	2.09151538337629	0	IND	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	360.252	0.22910752688172	IND	0.0618214	-262.771
Use of secondary material (SM)	kg	0	0	0.37	0	2.57
Use of renewable secondary fuels (RSF)	MJ	5.68E-22	0	IND	0	0
Use of non renewable secondary fuels (NRSF)	MJ	6.68E-21	0	IND	0	0
Use of net fresh water (FW)	m ³	3.71E-01	2.13E-05	IND	1.18E-05	-3.15E-01

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A1: 1 m² Aluminium profile (2.9 kg/m²)

Parameter	Unit	A1-A3	A4	A5	C4	D
Hazardous waste disposed (HWD)	kg	6.66E-07	1.2E-08	IND	9.77E-10	3.41E-11
Non hazardous waste disposed (NHWD)	kg	7.24E+00	1.75E-05	IND	2.86E-01	-5.88E+00
Radioactive waste disposed (RWD)	kg	2.2E-02	3.14E-07	IND	8.47E-07	-1.75E-02
Components for re-use (CRU)	kg	0	0	IND	0	0
Materials for recycling (MFR)	kg	0	0	IND	2.574	0
Materials for energy recovery (MER)	kg	0	0	IND	0	0
Exported electrical energy (EEE)	MJ	0	0	IND	0	0
Exported thermal energy (EET)	MJ	0	0	IND	0	0

The CO₂ incorporation by using natural packaging materials (wooden pallets, paper) represent 2.8% of the GWP A1-A3.

References

/ISO 14044/

DIN EN/ ISO 14044/ Environmental management - Life cycle assessment - Requirements and guidelines

/CPR/

REGULATION (EU) No 305/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

/EN 14782/

Self-supporting metal sheet for roofing, external cladding and

internal lining - Product specification and requirements

/EN 508-2/

Roofing products from metal sheet - Specification for self-supporting products of steel, aluminium or stainless steel sheet - Part 2: Aluminium

/EN 1090-1/

Execution of steel structures and aluminium structures - Part 1: Requirements for conformity assessment of structural components

/EN 1090-5/

Execution of steel structures and aluminium structures - Part 5: Technical requirements for cold-formed structural aluminium elements and cold-formed structures for roof, ceiling, floor and wall applications

/EN 485-2/

Aluminium and aluminium alloys - Sheet, strip and plate - Part 2: Mechanical properties

/EN 573-3/

Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition and form of products

/EN ISO 12944-1/

Paints and varnishes - Corrosion protection of steel structures by protective coating systems - Part 1: General introduction

/Alu Recycling/

European Aluminium Association and Organisation of European Aluminium Refiners and Remelters: Aluminium Recycling in Europe, 2006

/Lebenszyklusanalyse 2009/

Holger König, Niklaus Kohler, Johannes Kreißig, Thomas Lützkendorf:

Lebenszyklusanalyse in der Gebäudeplanung Grundlagen Berechnungen Planungswerkzeuge, Institut für internationale Architektur-Dokumentation GmbH&Co. KG, München, 2009

/GaBi ts/

GaBi 8 dataset documentation for the software-system and databases, LBP, University of Stuttgart and thinkstep, Leinfelden-Echterdingen, 2017 (<http://documentation.gabi-software.com/>)

/BBSR table/

BBSR table (german): 'Nutzungsdauern von Bauteilen zur Lebenszyklusanalyse nach BNB', Federal Institute for Research on Building, Urban Affairs and Spatial Development, Referat II Nachhaltiges Bauen; online available under <http://www.nachhaltigesbauen.de/baustoff-und-gebaeuedaten/nutzungsdauern-von-bauteilen.html>

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EINFACH FUNKTIONELL BEDACHT

PCR - Part A

Calculation rules for the Life Cycle Assessment and Requirements on the Background Report, version 1.6, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, April 2017

PCR - Part B

Thin walled profiles and profiled panels of metal, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, July 2014

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SRL





Publisher

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com



Programme holder

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com



thinkstep

Author of the Life Cycle Assessment

thinkstep AG
Hauptstrasse 111- 113
70771 Leinfelden-Echterdingen
Germany

+49 711 341817-0
info@thinkstep.com
www.thinkstep.com



Owner of the Declaration

PPA-Europe
Europark Fichtenhain A 13a
47807 Krefeld
Germany

+49 2151 93630-0
info@ppa-europe.eu
www.ppa-europe.eu