

ENVIRONMENTAL PRODUCT DECLARATION

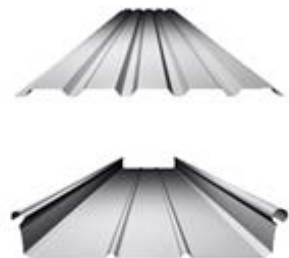
as per /ISO 14025/ and /EN 15804/

Owner of the Declaration	European Association for Panels and Profiles e. V. (PPA-Europe)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
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Profiled sheets made of aluminium for roof, wall and ceiling constructions

European Association for Panels and Profiles (PPA-Europe)

www.ibu-epd.com / <https://epd-online.com>



General Information

European Association for Panels and Profiles

Programme holder

IBU - Institut Bauen und Umwelt e.V.
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10178 Berlin
Germany

Declaration number

EPD-PPA-20180078-CBG2-EN

This Declaration is based on the Product Category Rules:

Thin walled profiles and profiled panels of metal, 07.2014
(PCR tested and approved by the SVR)

Issue date

14.09.2018

Valid to

13.09.2023



Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)



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

Owner of the Declaration

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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. Italtpanelli
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.

Verification

The CEN Norm /EN 15804/ serves as the core PCR

Independent verification of the declaration according to /ISO 14025/

internally externally



Mr Carl-Otto Neven
(Independent verifier appointed by SVR)

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

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
Surface weight	2.9	kg/m ²
Conversion factor to 1 kg	0.34	-

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% recycled aluminium is modelled with a credit given as if it was pre-treated (as old scrap) and remelted to produce secondary aluminium ingot and

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/.

substituted by the same amount of primary aluminium ingot. The credit is declared in module D.

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. GaBi 8 software and databases /GaBi ts/ were used as calculation basis.

Factors for different types

The LCA results for the aluminium profiles declared in the EPD refer to a standing seam aluminium profile. In order to enable the user of the EPD to calculate the results for trapezoidal profiles, the factors in the following table can be used for the calculation. For A1-A3, A4, C and D, the LCA results of the declared product have to be multiplied with these factors. The average weight of the trapezoidal profile is 2.4 kg/m².

Impact Categories	standing seam profile 65/400	trapezoidal profile 35/207	standing seam profile 65/400	trapezoidal profile 35/207	standing seam profile 65/400	trapezoidal profile 35/207	standing seam profile 65/400	trapezoidal profile 35/207
	A1-A3	A1-A3	A4	A4	C4	C4	D	D
GWP	1	0.83	1	0.85	1	0.85	1	0.82
ODP	1	0.9	1	0.85	1	0.85	1	0.82
AP	1	0.83	1	0.85	1	0.85	1	0.82
EP	1	0.83	1	0.85	1	0.85	1	0.82
POCP	1	0.83	1	0.85	1	0.85	1	0.82
ADPE	1	0.84	1	0.85	1	0.85	1	0.82
ADPF	1	0.85	1	0.85	1	0.85	1	0.82

The declared results for A5 are valid for all product variations..

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
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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 g/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.

End of life (C1-C4)

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

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.

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

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: 1 m² Aluminium profile (2.9 kg/m²)

Parameter	Unit	A1-A3	A4	A5	C4	D
Global warming potential	[kg CO ₂ -Eq.]	27.03	0.02	0.76	0.00	-21.07
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	4.65E-10	5.54E-15	IND	4.73E-15	-6.39E-7
Acidification potential of land and water	[kg SO ₂ -Eq.]	1.31E-1	6.98E-5	IND	2.73E-5	-1.19E-1
Eutrophication potential	[kg (PO ₄) ³ -Eq.]	7.94E-3	1.74E-5	IND	3.72E-6	-6.15E-3
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	7.34E-3	-2.56E-5	IND	2.15E-6	-6.38E-3
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	1.37E-5	1.33E-9	IND	1.65E-9	-1.08E-5
Abiotic depletion potential for fossil resources	[MJ]	304.45	0.23	IND	0.06	-220.17

RESULTS OF THE LCA - RESOURCE USE: 1 m² Aluminium profile (2.9 kg/m²)

Parameter	Unit	A1-A3	A4	A5	C4	D
Renewable primary energy as energy carrier	[MJ]	146.32	0.01	IND	0.01	-115.93
Renewable primary energy resources as material utilization	[MJ]	1.50	0.00	IND	0.00	0.00
Total use of renewable primary energy resources	[MJ]	147.82	0.01	IND	0.01	-115.93
Non-renewable primary energy as energy carrier	[MJ]	358.16	0.23	IND	0.06	-262.77
Non-renewable primary energy as material utilization	[MJ]	2.09	0.00	IND	0.00	0.00
Total use of non-renewable primary energy resources	[MJ]	360.25	0.23	IND	0.06	-262.77
Use of secondary material	[kg]	0.00	0.00	0.37	0.00	2.57
Use of renewable secondary fuels	[MJ]	5.68E-22	0.00E+0	IND	0.00E+0	0.00E+0
Use of non-renewable secondary fuels	[MJ]	6.68E-21	0.00E+0	IND	0.00E+0	0.00E+0
Use of net fresh water	[m ³]	3.71E-1	2.13E-5	IND	1.18E-5	-3.15E-1

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

1 m² Aluminium profile (2.9 kg/m²)

Parameter	Unit	A1-A3	A4	A5	C4	D
Hazardous waste disposed	[kg]	6.66E-7	1.20E-8	IND	9.77E-10	3.41E-11
Non-hazardous waste disposed	[kg]	7.24E+0	1.75E-5	IND	2.86E-1	-5.88E+0
Radioactive waste disposed	[kg]	2.20E-2	3.14E-7	IND	8.47E-7	-1.75E-2
Components for re-use	[kg]	0.00	0.00	IND	0.00	0.00
Materials for recycling	[kg]	0.00	0.00	IND	2.57	0.00
Materials for energy recovery	[kg]	0.00	0.00	IND	0.00	0.00
Exported electrical energy	[MJ]	0.00	0.00	IND	0.00	0.00
Exported thermal energy	[MJ]	0.00	0.00	IND	0.00	0.00

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

References

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/ISO 14025/
DIN EN /ISO 14025:2011-10/, Environmental labels and declarations — Type III environmental declarations — Principles and procedures

/EN 15804/
/EN 15804:2012-04+A1 2013/, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

/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

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/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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