

# ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	<b>European Association for Panels and Profiles</b>
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
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Valid to	23.10.2018

## Profiled sheets made of steel for roof, wall and deck constructions European Association for Panels and Profiles

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## General Information

### European Association for Panels and Profiles

#### Programme holder

IBU - Institut Bauen und Umwelt e.V.  
Panoramastraße 1  
D-10178 Berlin

#### Declaration number

EPD-EPQ-20130236-CBE1-EN

#### This Declaration is based on the Product Category Rules:

Thin walled profiles and profiled panels of metal, 2013-07 (PCR tested and approved by the independent expert committee (SVA))

#### Issue date

24.10.2013

#### Valid to

23.10.2018



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



Dr.-Ing. Burkhard Lehmann  
(CEO of IBU)

### Profiled sheets made of steel for roof, wall and deck constructions

#### Owner of the Declaration

European Association for Panels and Profiles  
Europark Fichtenhain A 13a  
D-47807 Krefeld

#### Declared product / Declared unit

1m<sup>2</sup> industrially produced trapezoidal profiles, linetrays and folded profiles made of steel

#### Scope:

The applicability of this document is restricted to profiled sheets made of steel produced by member companies of the European Association for Panels and Profiles.

Data has been provided by 11 member companies of the European Association for Panels and Profiles for the year 2011. These companies represent between 70% and 100% for the different product types of the members producing steel profiles. Production volume of these companies contributes up to 70% to the European market.

The owner of the declaration shall be liable for the underlying information and evidence.

#### Verification

The CEN Norm EN 15804 serves as the core PCR

Independent verification of the declaration and data according to ISO 14025

internally  externally



Olivier Muler  
(Independent tester appointed by SVA)

## Product

### Product description

Prefabricated thin walled profiled sheets made of steel for load-bearing, self-supporting and non-supporting application in single- and double-layer roof, wall and ceiling structures.

The profiled sheets are made of a core of steel, which is protected against corrosion with zinc and organic coatings. The LCA is based on vertical averaging of the specific producer datasets under consideration of the respective yearly production amounts.

The products must comply with the Regulation (EU) No 305/2011 taking into account the harmonised technical specification /EN 14782/; they may be put on the market with the Declaration of Performance and the CE-mark.

### Application

Application as covering component in single- and double-layer roof and wall structures, as well as for the use as a supporting tray in single- and double-layer roof, wall and ceiling structures for mainly static loads.

The profiled sheets are used in interior and exterior application.

The application takes place according to national regulations.

### Technical Data

Technical specification for profiled sheets are given in:

- /EN 14782/
- /EN 1090-2/
- /DIN 18807-1 to 3/

### Constructional data

Trapezoidal profile 35/207	Value	Unit
Thickness of the sheet, according DIN 18807 or /DIN EN 508/	0.75	mm
Height of the profile, according DIN 18807 or DIN EN 508	32-35	mm
Surface weight	6.8	kg/m <sup>2</sup>
Trapezoidal profile 135/310	Value	Unit
Thickness of the sheet, according DIN 18807 or DIN EN 508	0.75	mm
Height of the profile, according DIN 18807 or DIN EN 508	135-137	mm
Surface weight	11.3	kg/m <sup>2</sup>

Liner-tray 130/600	Value	Unit
Thickness of the sheet, according DIN 18807 or DIN EN 508	0.75	mm
Height of the profile, according DIN 18807 or DIN EN 508	130	mm
Surface weight	11.2	kg/m <sup>2</sup>
Folded profile 65/400	Value	Unit
Thickness of the sheet, according DIN 18807 or DIN EN 508	0.75	mm
Height of the profile, according DIN 18807 or DIN EN 508	65	mm
Surface weight	9.1	kg/m <sup>2</sup>

#### Base materials / Ancillary materials

No /REACH/ materials included.

#### Steel according /EN 10169/:

S 280 GD to S 320 GD

#### Metallic coating according /EN 10346/:

Zinc Z 275, coating 275 g/m<sup>2</sup>. The zinc layer has a content of at least 99 weight percent zinc an typical thickness of 20 µm.

#### Organic coating according /EN 12944-1/:

Polyester (SP), coil coating, 25 µm on the application side and max.15 µm on the back side.

#### Reference service life

Thin walled profiled sheets made of steel with the use in lightweight metal constructions must withstand a term of protection of at least 15 years minimum. The term of protection is the period until first slight renewals in the surface are needed, only if there is no need of frequently inspections and service.

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

Thin walled profiled sheets made of steel exhibit an estimated service life of 40 – 45 years. This declaration depends on Life Cycle Assessment and relies on the use conditions.

## LCA: Calculation rules

#### Declared Unit

The declared unit is 1 m<sup>2</sup> of steel profile with the technical characteristics declared in 2.3. Averaging was done vertically based on the specific datasets under consideration of the yearly production amounts in square meter.

#### Declared unit

Trapezoidal profile 35/207	Value	Unit
Declared unit	1	m <sup>2</sup>
Surface weight	6.8	kg/m <sup>2</sup>
Conversion factor to 1 kg	1/6.8	-
Trapezoidal profile 135/310	Value	Unit
Declared unit	1	m <sup>2</sup>
Surface weight	11.3	kg/m <sup>2</sup>
Conversion factor to 1 kg	1/11.3	-
Liner-tray 130/600	Value	Unit
Declared unit	1	m <sup>2</sup>
Surface weight	11.2	kg/m <sup>2</sup>
Conversion factor to 1 kg	1/11.2	-
Folded profile 65/400	Value	Unit
Declared unit	1	m <sup>2</sup>
Surface weight	9.1	kg/m <sup>2</sup>
Conversion factor to 1 kg	1/9.1	-

#### System boundary

Type of 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. This means after use stage and demolition, 10% of construction steel products is considered as lost, 90% of construction steel products is recycled. The 10% lost product is modelled with landfilling. The 90% recycled steel is modelled with a credit given as if it was re-melted in an *Electric Arc Furnace* secondary steel plan and substituted by the same amount of steel which is produced in a Blast Furnace primary steel plan (*worldsteel* LCA methodology).

#### 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.

#### End of life (C1-C4)

Name	Value	Unit
Recycling	90	%
Landfilling	10	%

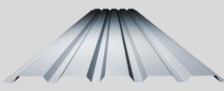
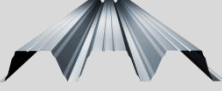


Collection rate is a conservative assumption.

## 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	Construction-installation process	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	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m<sup>2</sup> steel sheet

		 Trapezoidal profile 35/207			 Trapezoidal profile 135/310			 Liner-tray 130/600			 Folded profile 65/400		
Parameter	Unit	A1 - A3	C4	D	A1 - A3	C4	D	A1 - A3	C4	D	A1 - A3	C4	D
GWP	[kg CO <sub>2</sub> -Äq.]	16,30	0,01	-9,58	26,50	0,02	-15,80	26,50	0,02	-15,80	21,70	0,01	-13,10
ODP	[kg CFC11-Äq.]	8,50E-10	7,24E-12	7,17E-10	1,36E-09	1,21E-11	1,18E-09	1,44E-09	1,20E-11	1,18E-09	1,37E-09	9,75E-12	9,78E-10
AP	[kg SO <sub>2</sub> -Äq.]	0,058	0,000	-0,037	0,095	0,000	-0,060	0,095	0,000	-0,060	0,080	0,000	-0,050
EP	[kg PO <sub>4</sub> <sup>3-</sup> -Äq.]	5,12E-03	7,87E-06	-3,06E-03	8,43E-03	1,31E-05	-5,03E-03	8,50E-03	1,30E-05	-5,03E-03	7,01E-03	1,06E-05	-4,17E-03
POCP	[kg Ethen Äq.]	7,52E-03	6,12E-06	-5,48E-03	1,21E-02	1,02E-05	-9,01E-03	1,21E-02	1,01E-05	-9,00E-03	1,03E-02	8,24E-06	-7,47E-03
ADPE	[kg Sb Äq.]	1,32E-03	3,39E-09	-2,60E-07	2,16E-03	5,64E-09	-4,28E-07	2,16E-03	5,61E-09	-4,28E-07	1,80E-03	4,56E-09	-3,55E-07
ADPF	[MJ]	189,00	0,13	-89,40	307,00	0,21	-147,00	307,00	0,21	-147,00	258,00	0,17	-122,00
Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non fossil resources; ADPF = Abiotic depletion potential for fossil resources												

### RESULTS OF THE LCA - RESOURCE USE: 1 m<sup>2</sup> steel sheet

		Trapezoidal profile 35/207			Trapezoidal profile 135/310			Liner-tray 130/600			Folded profile 65/400		
Parameter	Unit	A1 - A3	C4	D	A1 - A3	C4	D	A1 - A3	C4	D	A1 - A3	C4	D
PERE	[MJ]	9	-	-	15	-	-	18	-	-	19	-	-
PERM	[MJ]	0	-	-	0	-	-	0	-	-	0	-	-
PERT	[MJ]	9	0	1	15	0	2	18	0	2	19	0	2
PENRE	[MJ]	196	-	-	318	-	-	319	-	-	269	-	-
PENRM	[MJ]	0	-	-	0	-	-	0	-	-	0	-	-
PENRT	[MJ]	196	0	-84	318	0	-139	319	0	-138	269	0	-115
SM	[kg]	0	-	-	-	-	-	-	-	-	-	-	-
RSF	[MJ]	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	[MJ]	0	0	0	0	0	0	0	0	0	0	0	0
FW	[kg]	90	-0,4	-15	146	-0,6	-26	149	-0,6	-26	104	-0,4	-18
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Use of net fresh water												

### RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m<sup>2</sup> steel sheet

		Trapezoidal profile 35/207			Trapezoidal profile 135/310			Liner-tray 130/600			Folded profile 65/400		
Parameter	Unit	A1 - A3	C4	D	A1 - A3	C4	D	A1 - A3	C4	D	A1 - A3	C4	D
HWD	[kg]	0,018	0,0	0,0	0,026	0,0	0,0	0,0277	0,0	0,0	0,0125	0,0	0,0
NHWD	[kg]	0,208	0,677	-0,125	0,34	1,13	-0,21	0,34	1,12	-0,21	0,28	0,91	-0,17
RWD	[kg]	2,86E-03	2,35E-06	2,27E-03	4,59E-03	3,91E-06	3,73E-03	4,69E-03	3,89E-06	3,73E-03	4,22E-03	3,16E-06	3,09E-03
CRU	[kg]	-	-	0	-	-	0	-	-	0	-	-	0
MFR*	[kg]	-	-	6,4	-	-	10,6	-	-	10,5	-	-	8,6
MER	[kg]	-	-	0	-	-	0	-	-	0	-	-	0
EEE	[MJ]	0	0	0	0	0	0	0	0	0	0	0	0
EET	[MJ]	0	0	0	0	0	0	0	0	0	0	0	0
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy												

\* incl. 4% scrap from production waste ( looped within A1-A3)

## References

**Institut Bauen und Umwelt e.V.**, Berlin(Ed.):

**General principles**

for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2011-06.

**PCR Part A**

Product Category Rules for Construction Products. Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report, 2011-07.

**PCR Part B**

Product Category Rules for Construction Products Part B: Requirements on the EPD for Thin walled profiles and profiled panels of metal, 2012-07.

[www.bau-umwelt.com](http://www.bau-umwelt.com)

**EN ISO 14025**:2011-10: Environmental labels and declarations – Type III environmental declarations – Principles and procedures

**EN 15804**:2012-04: Sustainability of construction works – Environmental Product Declarations – Core rules for the product category of construction products

**DIN 18542**:2009-07, Sealing of outside wall joints with impregnated sealing tapes made of cellular plastics - Impregnated sealing tapes - Requirements and testing

**DIN 18807-1 bis 3**:1987-06, Trapezoidal sheeting in building; trapezoidal steel sheeting; structural analysis and design

**EN 508-1**:2009-07, Roofing products from metal sheet - Specification for self-supporting products of steel, aluminium or stainless steel sheet - Part 1: Steel

**EN 1090-1&2**:2012-02, Execution of steel structures and aluminium structures

**EN 10169**:2012-06, Continuously organic coated (coil coated) steel flat products - Technical delivery conditions

**EN 10346**:2009-07, Continuously hot-dip coated steel flat products - Technical delivery conditions

**EN 14782**:2006-03, Self-supporting metal sheet for roofing, external cladding and internal lining - Product specification and requirements

**EN 14783**:2006-12, Fully supported metal sheet and strip for roofing, external cladding and internal lining - Product specification and requirements

**EN ISO 12944**:1998-07, Paints and varnishes - Corrosion protection of steel structures by protective paint systems

**GaBi 6**: Software and databasis for Life Cycle Engineering. LBP, University of Stuttgart and PE International. 2012.

**GaBi Documentation**: Documentation of the GaBi 5 datasets. LBP, University of Stuttgart and PE International. 2011. <http://documentation.gabi-software.com/>





German **General Technical Approvals** for folded profiles of the respective manufacturers

**EPAQ** European Quality Regulations for Profiles

**REACH** Regulation concerning the Registration , Evaluation , Authorisation and Restriction of **C**hemicals

Following companies are represented with their products in this EPD:



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