ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A1*

Owner of the Declaration	ArcelorMittal Construction
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-AMC-20210146-CBB2-EN
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Valid to	30/01/2027

Building Steel Profiles
ArcelorMittal Construction

Institut Bauen und Umwelt e.V.

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ECO PLATFORM EPD EN 15804 VERIFIED

General Information

ArcelorMittal Construction	Building Steel Profiles
Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the declaration** ArcelorMittal Construction Morinval 55800 Contrisson France
Declaration number EPD-AMC-20210146-CBB2-EN	**Declared product / declared unit** The declared unit is 1m² of organic coated steel profile from the ArcelorMittal Construction product range.
This declaration is based on the product category rules: Thin walled profiles and profiled panels of metal, 01.2019 (PCR checked and approved by the SVR)	**Scope:** The Life Cycle Assessment is based on data collected from the ArcelorMittal plants producing organic coated steel profiles, representing 95% of the production in 2019.
Issue date 31/01/2022	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+A1*. In the following, the standard will be simplified as *EN 15804*.
Valid to 30/01/2027	**Verification** The standard *EN 15804* serves as the core PCR Independent verification of the declaration and data according to *ISO 14025:2010* ☐ internally ☒ externally
Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)	
Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.))	Mr Carl-Otto Neven (Independent verifier)

Product

Product description/Product definition
This Environmental Product Declaration refers to organic coated steel profile produced by ArcelorMittal Construction. These products are made of cold-rolled steel profiles for roof, wall, facades and floors applications.

The targeted applications are as follow:

- Roof & Decking
- Traditional wall
- Facade architectural
- Sidings
- Cassettes
- Wall liner trays
- Floors

These profiles are available in different thicknesses from 0.4 to 1.5 mm. They can be covered with different metallic coating with masses from 60 to 350 g/m². They are also constituted of an organic coating with thicknesses from 12 to 205 µm.

They are produced in the ArcelorMittal Construction production plants located in France, The Netherlands, Belgium, Sweden, Slovakia, Germany, Poland, Spain, Portugal and Romania.

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (*CPR*) applies. The product needs a declaration of performance taking into consideration *EN 1090-1:2009 Execution of steel and aluminium structures – Part 1: Procedures for attestation of conformity for load-bearing components* and the CE-marking.

For the application and use the respective national provisions apply.

Application
Steel profiles, covered by this EPD, are used as roof, wall, façade and floors for all types of construction.

The wide range of profiles meets the different performance needs: structural, acoustic, thermal, fire resistance.

Technical Data
The final product (i.e. metallic layer plus organic coating and forming shape) varies according to the intended end use of the products.

Constructional data

Name	Value	Unit
Density	7850	kg/m3
Modulus of elasticity	210000	N/mm2
Coefficient of thermal expansion	12	10-6K-1
Thermal conductivity	48	W/(mK)

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN 1090-1:2009 Execution of steel and aluminium structures – Part 1: Procedures for attestation of conformity for load-bearing components.*

Base materials/Ancillary materials
The products covered by this Environmental Product Declaration are steel profiles produced in the different production plants of ArcelorMittal Construction. They are mainly composed of a galvanized and pre-painted steel sheet.

Steel is mainly iron and carbon, with small amounts of alloying elements. These elements modify the chemical and physical properties of steel such as strength, durability and corrosion resistance. High strength low alloyed (HSLA) carbon steel has a carbon content lower than 0.2 %.

The metallic coating includes only Zinc or Zinc, Aluminum and Magnesium. The organic coatings are made from polyester, polyurethane or polyvinylidene fluoride (PVDF) resins.

This product contains substances listed in the *candidate list* (date: 02.05.2021) exceeding 0.1 percentage by mass: no.

Reference service life
The reference service life for the profile product range is not declared, since the lifetime will depend on specific applications as well as environmental conditions.

As a structural part of the building, steel profiles are expected and specified to reach the same service life as that of the building. The steel reference service life can be up to 100 years.

LCA: Calculation rules

Declared Unit
The declared unit is 1 m² of organic coated steel profile in the ArcelorMittal Construction product range.

Declared unit

Name	Value	Unit
Declared unit	1	m^2
conversion factor [Mass/Declared Unit] (surface weight in kg/m²)	6.16	-

The mean product described in this EPD has been determined to give an average value for the most representative product in terms of volume production. The use of this mean value allows extrapolation on the global range with a relative difference on global warming potential not exceeding 9 % of the extreme thickness.

System boundary
Type of the EPD: cradle-to-gate - with options. Module A1-A3, Module C3 and module D were considered.

Modules A1-A3 of organic coated steel profile production include the following:

- The provision of resources, additives, and energy
- Transport of resources and additives to the production site. Production processes on-site including energy, production of additives, disposal of production residues, and consideration of related emissions
- Recycling of production/manufacturing scrap. Steel scrap is assumed to reach the end-of-waste status once it is shredded and sorted, thus becoming the input to the product system in the inventory.

Module C3 takes into account the sorting and shredding of after-use steel that is recycled, as well as the non-recovered scrap due to sorting efficiency which is landfilled. A conservative value of 2 % landfill is considered.

Module D refers to the end-of-life of organic coated steel profile, including reuse and recycling. For recycling, the net amount of steel scrap made available over the whole life cycle is considered.

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 Envision version 9.2.1.68, based on SP35, created with *GaBi ts Software* version 8.7 was used to calculate this EPD.

LCA: Scenarios and additional technical information

The end of life for average organic coated steel profile products consists of 98 % recycling and 2 % landfill, with the corresponding benefits and burdens. This is based on the *European Commission Technical Steel Research*, the *German Ministry of Environmental Affairs* and internal documentation within ArcelorMittal.

End of life (C1-C4)

Name	Value	Unit
Recycling	6.032	kg
Landfilling	0.123	kg

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

Name	Value	Unit
Recycling	98	%

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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	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	MND	MND	X	MND	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 m² Building Steel Profiles

Parameter	Unit	A1-A3	C3	D
Global warming potential	[kg CO_2-Eq.]	1.80E+1	1.23E-2	-1.09E+1
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	3.60E-11	4.24E-14	2.15E-12
Acidification potential of land and water	[kg SO_2-Eq.]	3.41E-2	4.17E-5	-2.63E-2
Eutrophication potential	[kg $(PO_4)^{3-}$-Eq.]	3.31E-3	4.92E-6	-2.25E-3
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	5.68E-3	2.93E-6	-3.38E-3
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	6.53E-4	5.86E-9	1.12E-6
Abiotic depletion potential for fossil resources	[MJ]	1.72E+2	1.38E-1	-8.65E+1

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A1: 1 m² Building Steel Profiles

Parameter	Unit	A1-A3	C3	D
Renewable primary energy as energy carrier	[MJ]	1.42E+1	6.89E-2	7.92E+0
Renewable primary energy resources as material utilization	[MJ]	0.00E+0	0.00E+0	0.00E+0
Total use of renewable primary energy resources	[MJ]	1.42E+1	6.89E-2	7.92E+0
Non-renewable primary energy as energy carrier	[MJ]	1.82E+2	2.11E-1	-8.16E+1
Non-renewable primary energy as material utilization	[MJ]	0.00E+0	0.00E+0	0.00E+0
Total use of non-renewable primary energy resources	[MJ]	1.82E+2	2.11E-1	-8.16E+1
Use of secondary material	[kg]	2.99E-1	0.00E+0	5.73E+0
Use of renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0
Use of non-renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0
Use of net fresh water	[m³]	4.69E-2	9.43E-5	3.83E-3

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A1: 1 m² Building Steel Profiles

Parameter	Unit	A1-A3	C3	D
Hazardous waste disposed	[kg]	3.61E-7	1.34E-9	-5.73E-8
Non-hazardous waste disposed	[kg]	1.14E-1	1.23E-1	-1.74E-1
Radioactive waste disposed	[kg]	3.91E-3	2.89E-5	1.95E-3
Components for re-use	[kg]	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	[kg]	0.00E+0	6.03E+0	0.00E+0
Materials for energy recovery	[kg]	0.00E+0	0.00E+0	0.00E+0
Exported electrical energy	[MJ]	0.00E+0	0.00E+0	0.00E+0
Exported thermal energy	[MJ]	0.00E+0	0.00E+0	0.00E+0

Note: 0.29912 kg scrap is used to manufacture 6.1555 kg of 1 m² of Building Steel Profiles. After use, 6.0324 kg steel is recycled, 0 kg is reused. The potential environmental impact calculated for module D depends on the net amount of scrap left in the system, which is 6.0324 - 0.29912 - 0 = 5.7333 kg . This means that the system produces a net steel scrap output of 5.7333 kg, thus module D shows an environmental benefit.

References

EN 1090
EN 1090-1:2009 Execution of steel and aluminium structures – Part 1: Procedures for attestation of conformity for load-bearing components.

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

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

European Commission Technical Steel Research
Sansom, M.and Meijer, J.:Life-cycle assessment (LCA) for steel construction, European Commission technical steel research, 2001-12.

GaBi Envision
GaBi Software System and Database for Life Cycle Engineering, thinkstep AG, Leinfelden-Echterdingen, 2019 (http://documentation.gabi-software.com/).

GaBi ts Software
GaBi ts dataset documentation for the GaBi Software System and Database for Life Cycle Engineering, thinkstep AG, Leinfelden-Echterdingen, 2019 (http://documentation.gabi-software.com/).

IBU 2021
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

PCR Part A
PCR - Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report, Institut Bauen und Umwelt e.V., www.bauumwelt.com, 2019.

PCR Part B
PCR - Part B: Requirements of the EPD for Thin walled profiles and profiled panels of metal, Institut Bauen und Umwelt e.V., www.bauumwelt.com, 2019.

Candidate list - REACH
Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
https://echa.europa.eu/candidate-list-table

ArcelorMittal EPD I-tool
I-tool for EPD developed by thinkstep AG 17.12.2018. File: 2021_05_17_iTool_Profiles.

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.

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