

Environmental product declaration

In accordance with ISO 14025 and EN15804+A2

ArcelorMittal Construction Long span decking TP 127 Magnelis



The Norwegian EPD Foundation

Owner of the declaration:

ArcelorMittal Construction Norge AS

Product:

ArcelorMittal Construction Long span decking TP 127 Magnelis

Declared unit:

1 kg

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 013:2021 Part B for Steel and aluminium construction products

Program operator:

The Norwegian EPD Foundation

Declaration number:

NEPD-4736-3990-EN

Registration number:

NEPD-4736-3990-EN

Issue date: 18.07.2023

Valid to: 18.07.2028

EPD Software:

LCA.no EPD generator ID: 63665

General information

Product

ArcelorMittal Construction Long span decking TP 127 Magnelis

Program operator:

Post Box 5250 Majorstuen, 0303 Oslo, Norway
The Norwegian EPD Foundation
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Declaration number: NEPD-4736-3990-EN

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 013:2021 Part B for Steel and aluminium construction products

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Declared unit:

1 kg ArcelorMittal Construction Long span decking TP 127 Magnelis

Declared unit with option:

A1-A3,A4,A5,C1,C2,C3,C4,D

Functional unit:

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPD-Norway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Alexander Borg, Asplan Viak AS
(no signature required)

Owner of the declaration:

ArcelorMittal Construction Norge AS
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Phone: +47 41 723939
e-mail: stig-tore.sjaastad@arcelormittal.com

Manufacturer:

ArcelorMittal Construction Sverige AB
Västanvindsgatan 13
SE-652 21 Karlstad, Sweden

Place of production:

ArcelorMittal Construction Sverige AB - Karlstad
Västanvindsgatan 13
SE-652 21 Karlstad, Sweden

Management system:

ISO 9001, ISO 14001, ISO 45001

Organisation no:

976289862

Issue date: 18.07.2023

Valid to: 18.07.2028

Year of study:

2022

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

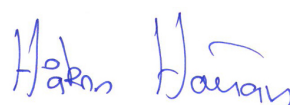
Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway.

Developer of EPD: Stig Tore Sjaastad

Reviewer of company-specific input data and EPD: Bendik Hovde

Approved:



Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

ArcelorMittal Construction's TP-127 - Magnelis is a high profile load bearing sheet optimised to withstand large spans for roof construction applications. It is used for insulated roof ceilings. The profiled sheets are made of a core of steel, which is protected against corrosion with a zinc magnesium coating.

Product specification

The nominal thickness of the profiled sheet varies from 0,7 to 1,50 mm. The height is 127 mm. The top and bottom flange is 121 mm respectively 75 mm. The pitch covering is 320 mm, while the covering width is 960 mm. TP 127 - Magnelis is cold formed at the production facility and the steel grade varies from S350-420GD and has a Magnelis® coating ZM120 (120 g/m² total for both sides), which allows the product to be suitable in environments with higher levels of corrosivity (C4) due to its 3% magnesium content, Magnelis® coated steel offers self-healing on cut edges and corrosion resistance in chloride and ammonia atmospheres.

Materials	kg	%
Metal - Galvanized Steel	1,00	100,00
Total	1,00	

Packaging	kg	%
Packaging - Wood	0,02	100,00
Total incl. packaging	1,02	

Technical data:

ArcelorMittal Construction Long Span decking TP127 - Magnelis fulfills the requirement of the harmonized standard of EN 1090, EXC1 - EXC3, and is CE certified (Certification number: 0416-CPD-7127-01). Performance data of the product in accordance with the declaration of performance EN 14782 with respect to its essential characteristics according to EN 1090.

Market:

The main market areas are the Nordic countries.

Reference service life, product

High profiled sheets made of steel must withstand a term of protection of at least 15 years. The term of protection is the period until first slight renewals in the surface is required, only if there is no need of frequent inspections and service. The term of protection depends on the location, weather conditions and the quality of the coating. Profiled sheets made of steel exhibit an estimated service life of 40 - 45 years depending on Life Cycle Assessment.

Reference service life, building or construction works

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 lifetime depends on specific applications as well as environmental conditions.

LCA: Calculation rules

Declared unit:

1 kg ArcelorMittal Construction Long span decking TP 127 Magnelis

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Packaging - Wood	ecoinvent 3.6	Database	2019
Metal - Galvanized Steel	not yet published	EPD	YYYY

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

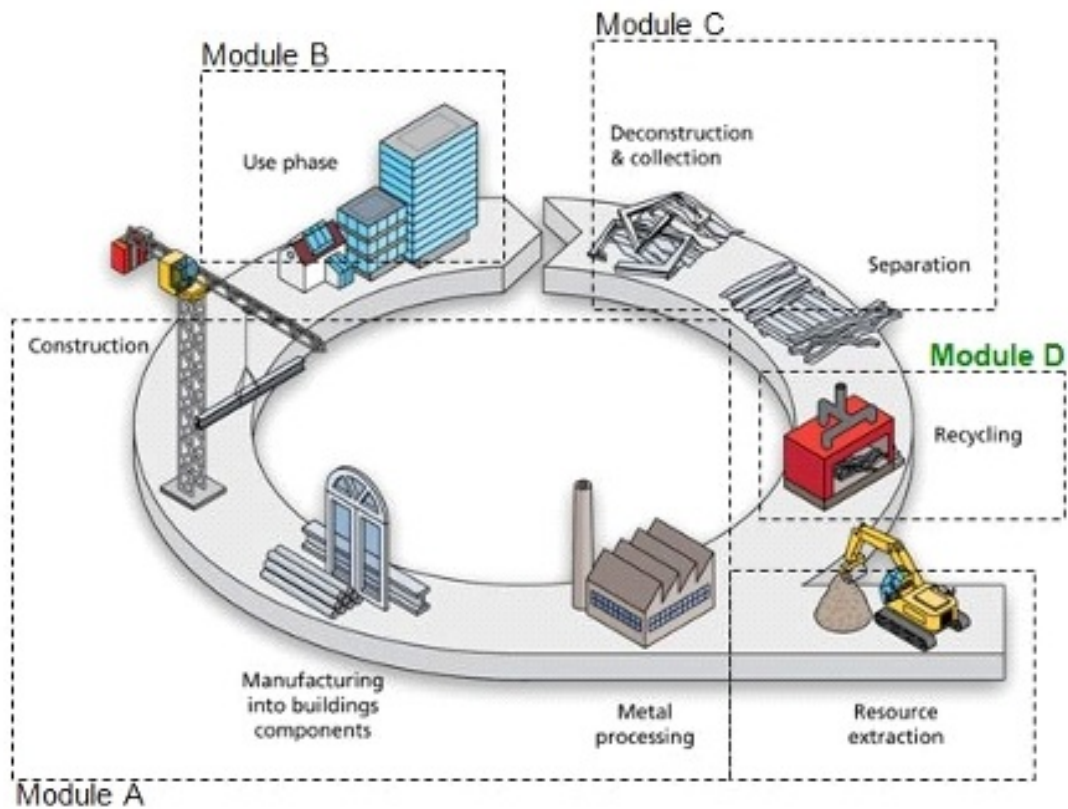
Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	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	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:

Type of EPD: cradle to gate - with options. All relevant life cycle stages are covered.
 Modules A1-A5, C2-C4 and module D were considered.

The product stages A1-A3 include the following:

- Transporting and Receiving the raw material to the fabrication plant
- All relevant production processes in the plant including energy inputs, emissions and the electricity consumptions
- Waste processing until end of waste state or disposal of any waste residues during the production of TP-127 Magnelis
- Production and recycling of packaging
- Manufacturing of the Long span decking



Additional technical information:

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

The construction installation stages A4-A5 include the following:

- For the transport to the construction site an assumption of an average truck trailer of 16-32 tonnes payload has been taken into consideration. Transport distance of the finished product to the customer has been estimated with approximate 300km. All values are based on annual average delivery data
- For the assembly stage average values been taken.

The use stages (B1-B7) and C1 have not been considered in the Life Cycle Assessment.

The end of life stage C2-C4 include the following:














- Stages C2-C4 include average assumptions, provision for all materials and transports, and use of related energy and water
- It takes into account the sorting and shredding of after-use steel, as well as the non-recovered scrap due to sorting efficiency, which is landfilled
- Packaging waste is recycled by the customers through their waste management system

Module D (Beyond the system boundaries) is included.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km)	36,7 %	300	0,043	l/tkm	12,90
Assembly (A5)		Unit	Value		
Waste, packaging, wood beam, softwood, raw, dried, u=20%, average treatment (kg) - A5, inkl. 85 km transp.	kg	0,02			
Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km)	36,7 %	80	0,043	l/tkm	3,44
Waste processing (C3)		Unit	Value		
Materials to recycling (kg)	kg	0,90			
Disposal (C4)		Unit	Value		
Waste, scrap steel, to landfill (kg)	kg	0,10			
Benefits and loads beyond the system boundaries (D)		Unit	Value		
Substitution of primary steel with net scrap (kg)	kg	0,82			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact										
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D	
 GWP-total	kg CO ₂ -eq	3,01E+00	4,90E-02	3,60E-02	0	1,31E-02	0,00E+00	4,29E-04	-9,00E-01	
 GWP-fossil	kg CO ₂ -eq	3,03E+00	4,90E-02	6,23E-04	0	1,31E-02	0,00E+00	4,28E-04	-8,99E-01	
 GWP-biogenic	kg CO ₂ -eq	-2,84E-02	2,03E-05	3,54E-02	0	5,41E-06	0,00E+00	3,64E-07	-4,96E-04	
 GWP-luluc	kg CO ₂ -eq	5,89E-04	1,74E-05	1,60E-07	0	4,65E-06	0,00E+00	8,40E-08	-4,03E-04	
 ODP	kg CFC11 -eq	5,94E-08	1,11E-08	9,90E-11	0	2,96E-09	0,00E+00	2,09E-10	-2,85E-08	
 AP	mol H+ -eq	6,16E-03	1,41E-04	5,01E-06	0	3,76E-05	0,00E+00	4,18E-06	-4,47E-03	
 EP-FreshWater	kg P -eq	6,38E-06	3,92E-07	7,47E-09	0	1,04E-07	0,00E+00	3,20E-09	-5,53E-05	
 EP-Marine	kg N -eq	1,45E-03	2,79E-05	2,15E-06	0	7,43E-06	0,00E+00	1,57E-06	-9,25E-04	
 EP-Terrestrial	mol N -eq	1,53E-02	3,12E-04	2,30E-05	0	8,31E-05	0,00E+00	1,73E-05	-9,45E-03	
 POCP	kg NMVOC -eq	5,19E-03	1,19E-04	5,92E-06	0	3,18E-05	0,00E+00	4,94E-06	-4,50E-03	
 ADP-minerals&metals ¹	kg Sb -eq	6,22E-05	1,35E-06	1,01E-08	0	3,61E-07	0,00E+00	3,79E-09	-1,55E-05	
 ADP-fossil ¹	MJ	2,87E+01	7,41E-01	7,32E-03	0	1,98E-01	0,00E+00	1,38E-02	-7,57E+00	
 WDP ¹	m ³	1,99E+01	7,17E-01	1,13E-02	0	1,91E-01	0,00E+00	2,91E-02	4,66E+01	







GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"

*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Remarks to environmental impacts








Additional environmental impact indicators										
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D	
 PM	Disease incidence	1,56E-08	3,00E-09	6,10E-11	0	8,00E-10	0,00E+00	8,90E-11	-7,46E-08	
 IRP ²	kgBq U235 -eq	2,24E-02	3,24E-03	2,65E-05	0	8,64E-04	0,00E+00	6,00E-05	3,23E-03	
 ETP-fw ¹	CTUe	2,99E+00	5,49E-01	8,34E-03	0	1,46E-01	0,00E+00	6,83E-03	-5,01E+01	
 HTP-c ¹	CTUh	7,00E-12	0,00E+00	1,00E-12	0	0,00E+00	0,00E+00	0,00E+00	-4,32E-09	
 HTP-nc ¹	CTUh	3,24E-09	6,00E-10	4,40E-11	0	1,60E-10	0,00E+00	4,00E-12	9,40E-08	
 SQP ¹	dimensionless	4,26E+00	5,18E-01	4,10E-03	0	1,38E-01	0,00E+00	5,04E-02	-5,66E-01	

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"

*INA Indicator Not Assessed




1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator
2. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Resource use										
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D	
 PERE	MJ	1,72E+00	1,06E-02	1,50E-04	0	2,83E-03	0,00E+00	2,13E-04	-6,14E-01	
 PERM	MJ	3,24E-01	0,00E+00	-3,24E-01	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
 PERT	MJ	2,04E+00	1,06E-02	-3,24E-01	0	2,83E-03	0,00E+00	2,13E-04	-6,14E-01	
 PENRE	MJ	2,85E+01	7,41E-01	7,32E-03	0	1,98E-01	0,00E+00	1,38E-02	-7,56E+00	
 PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
 PENRT	MJ	2,85E+01	7,41E-01	7,32E-03	0	1,98E-01	0,00E+00	1,38E-02	-7,56E+00	
 SM	kg	8,68E-02	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
 RSF	MJ	2,46E-03	3,79E-04	4,39E-06	0	1,01E-04	0,00E+00	4,39E-06	3,25E-02	
 NRSF	MJ	7,87E-03	1,36E-03	5,00E-05	0	3,62E-04	0,00E+00	1,26E-05	9,45E-01	
 FW	m ³	6,47E-03	7,92E-05	5,33E-06	0	2,11E-05	0,00E+00	1,65E-05	-1,89E-03	

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 materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"






*INA Indicator Not Assessed

End of life - Waste										
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D	
 HWD	kg	2,23E-04	3,82E-05	0,00E+00	0	1,02E-05	0,00E+00	0,00E+00	-4,67E-03	
 NHWD	kg	2,40E-01	3,60E-02	2,32E-02	0	9,61E-03	0,00E+00	1,00E-01	-3,67E-01	
 RWD	kg	2,02E-04	5,05E-06	0,00E+00	0	1,35E-06	0,00E+00	0,00E+00	2,48E-06	

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

*Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"

*INA Indicator Not Assessed

End of life - Output flow										
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D	
 CRU	kg	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
 MFR	kg	4,30E-02	0,00E+00	5,48E-07	0	0,00E+00	9,00E-01	0,00E+00	0,00E+00	
 MER	kg	0,00E+00	0,00E+00	2,31E-02	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
 EEE	MJ	0,00E+00	0,00E+00	1,61E-02	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
 EET	MJ	0,00E+00	0,00E+00	2,44E-01	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

*Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"

*INA Indicator Not Assessed

Biogenic Carbon Content		
Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	9,65E-03

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Data source	Amount	Unit
Electricity, Sweden (kWh)	ecoinvent 3.6	54,94	g CO ₂ -eq/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list or the Norwegian priority list.

Indoor environment

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO ₂ -eq	3,03E+00	4,90E-02	3,60E-02	0	1,31E-02	0,00E+00	0,00E+00	-1,35E+00

GWPI-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

Bibliography

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ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.






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NPCR Part A: Construction products and services. Ver. 2.0. April 2021, EPD-Norge.

NPCR 013 Part B for Steel and Aluminium Construction Products , Ver. 4.0, 06.10.2021, EPD Norway.

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