

Environmental Product Declaration



THE INTERNATIONAL EPD® SYSTEM



In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Longitudinal Barrier: ANDROMEDA H4b

from

SMA Road Safety s.r.l.



Programme:

Programme operator:

EPD registration number:

Publication date:

Valid until:

The International EPD® System, www.environdec.com

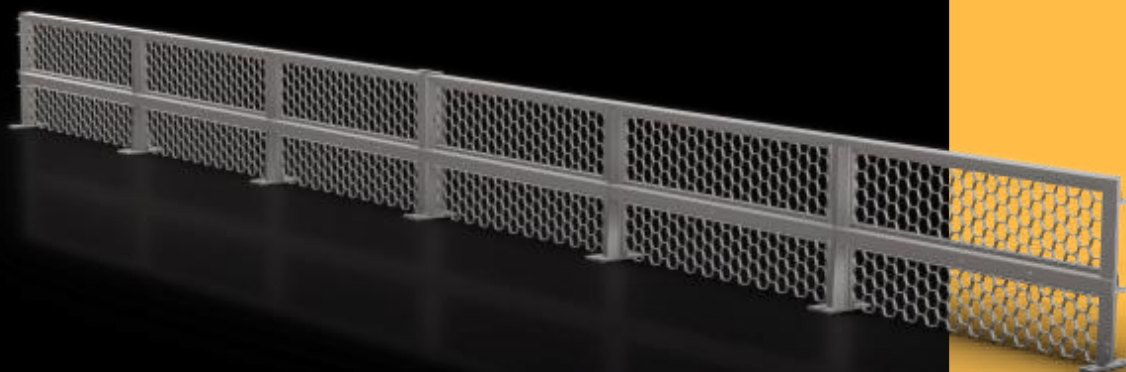
EPD International AB

EPD-IES-0015960

2024-10-15

2029-10-15

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): *CONSTRUCTION PRODUCTS, 2019:14, version 1.3.4, UN CPC 53211*

PCR review was conducted by: *Martin Erlandsson, IVL Swedish Environmental Research Institute, martin.erlandsson@ivl.se*

Life Cycle Assessment (LCA)

LCA accountability: *SMA Road Safety srl*

Life Cycle Assessment (LCA) practitioner contacts

zorzoandrea@outlook.it

Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

☐ EPD verification by individual verifier

Third-party verifier: *<name, organisation, and signature of the third-party verifier>*

Approved by: The International EPD® System

OR

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

☒ EPD verification by accredited certification body

Third-party verification: *IMQ S.p.A* is an approved certification body accountable for the third-party verification

The certification body is accredited by: *Accredia (0011VV Rev 000)*

OR

Independent third-party verification of the declaration and data, according to ISO 14025:2006 via:

☐ EPD verification by EPD Process Certification*

Internal auditor: *<name, organisation>*

Third-party verification: *<name, organisation>* is an approved certification body accountable for third-party verification

Third-party verifier is accredited by: *<name of accreditation body & accreditation number, where applicable>*

*For EPD Process Certification, an accredited certification body certifies and reviews the management process and verifies EPDs published on a regular basis. For details about third-party verification procedure of the EPDs, see GPI.

Procedure for follow-up of data during EPD validity involves third party verifier:

☐ Yes ☒ No

[Procedure for follow-up the validity of the EPD is at minimum required once a year with the aim of confirming whether the information in the EPD remains valid or if the EPD needs to be updated during its validity period. The follow-up can be organized entirely by the EPD owner or together with the original verifier via an agreement between the two parties. In both approaches, the EPD owner is responsible for the procedure being carried out. If a change that requires an update is identified, the EPD shall be re-verified by a verifier]

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD: SMA Road Safety Srl

Web-site: <https://www.smaroadsafety.com/en/>

Contact: p.mele@amssrl.com

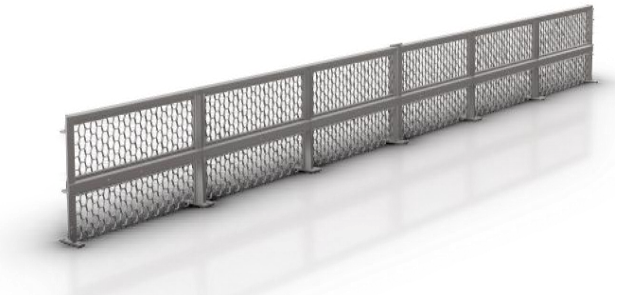
Description of the organisation: SMA Road Safety Srl is leader in Road Safety Industry with its cutting-edge barriers designed according to the Innovation, Transparency and Safety principles.

Product-related or management system-related certifications: n.a.

Name and location of production site(s): Via Dante Giacosa Snc, 81025 Marcianise (CE) – Italy.

Product information

ANDROMEDA H4b is a longitudinal Pre-assembled barrier to be installed on the bridgeside or on a curb. First solution of longitudinal H4 barrier supplied in 5,70-meter modules already pre-assembled at the SMA factory, which only require anchoring to the ground. The metal mesh formed by empty hexagonal meshes between the handrails, guarantees greater visibility in curves because it does not obstruct the driver's viewing range. The Andromeda H4 barrier can be used as a side barrier, bridge edge and medium barrier, allowing a considerable recovery of space on the carriageway



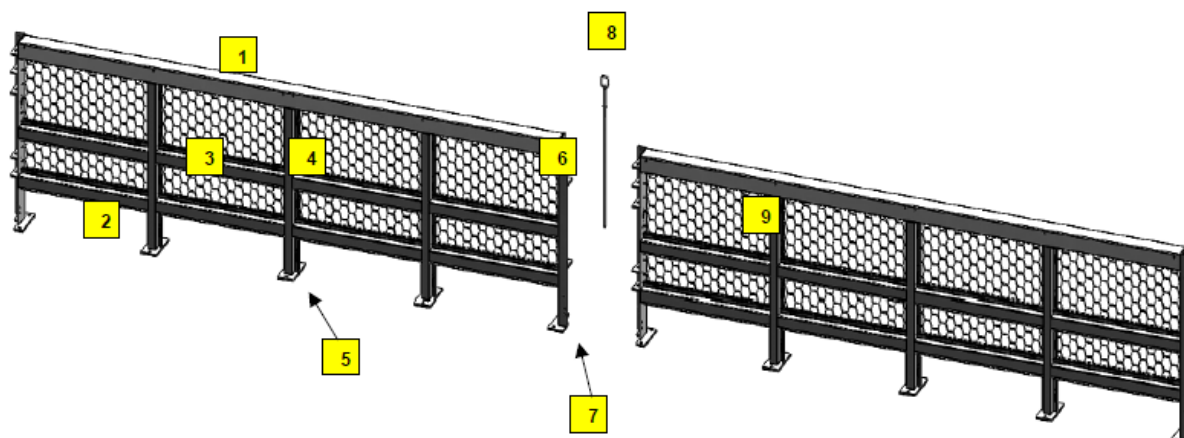
The characteristics of the "above ground" barrier Longitudinal Barrier under analysis are described below.

ANDROMEDA H4b	
Height from the soil	1320 mm
Total width	180 mm
Post distance	1500 mm
Anchor depth into the ground	165/200 mm
Minimum lenght of need	60 m
Pre-assembled modul lenght	5,7 m

Main components

1. Beam of the upper handrail
2. Beam of the lower handrail
3. Beam of the median handrail
4. Medium Post
5. Fixing plate of medium post
6. External post

7. Fixing plate of external post
8. Latch



ANDROMEDA H4b are equipped with tags for the use of NFC (Near Field Communication) technology compatible with tablets and smartphones equipped with the Android operating system.

Directives and reference standards

The structure and the main parts are treated with hot-dip galvanizing processes according to UNI 1461 and electrolytic galvanizing according to UNI ISO 2081.

Complete list of reference standards

- . ENV 1317-2
- . UNI EN 22768: 1996: Tolerances
- . UNI 1461: Hot-dip galvanizing

UN CPC code: 53211 “Highways (except elevated highways), streets and roads” which includes “safety installations for roads”

Geographical scope:

- . A1-A3 *IT*
- . C1-C4 *EU*

LCA information

Declared unit: 1 kg of Longitudinal Barrier

Reference service life: SMA devices are guaranteed for 10 years against corrosion (not relevant)

Time representativeness: 2023

Database(s) and LCA software used: Ecoinvent 3.10 & Simapro 9.6.0.1

Calculation method Used: EN 15804 + A2 (adapted) V1.01 / EF 3.1 normalization and weighting set

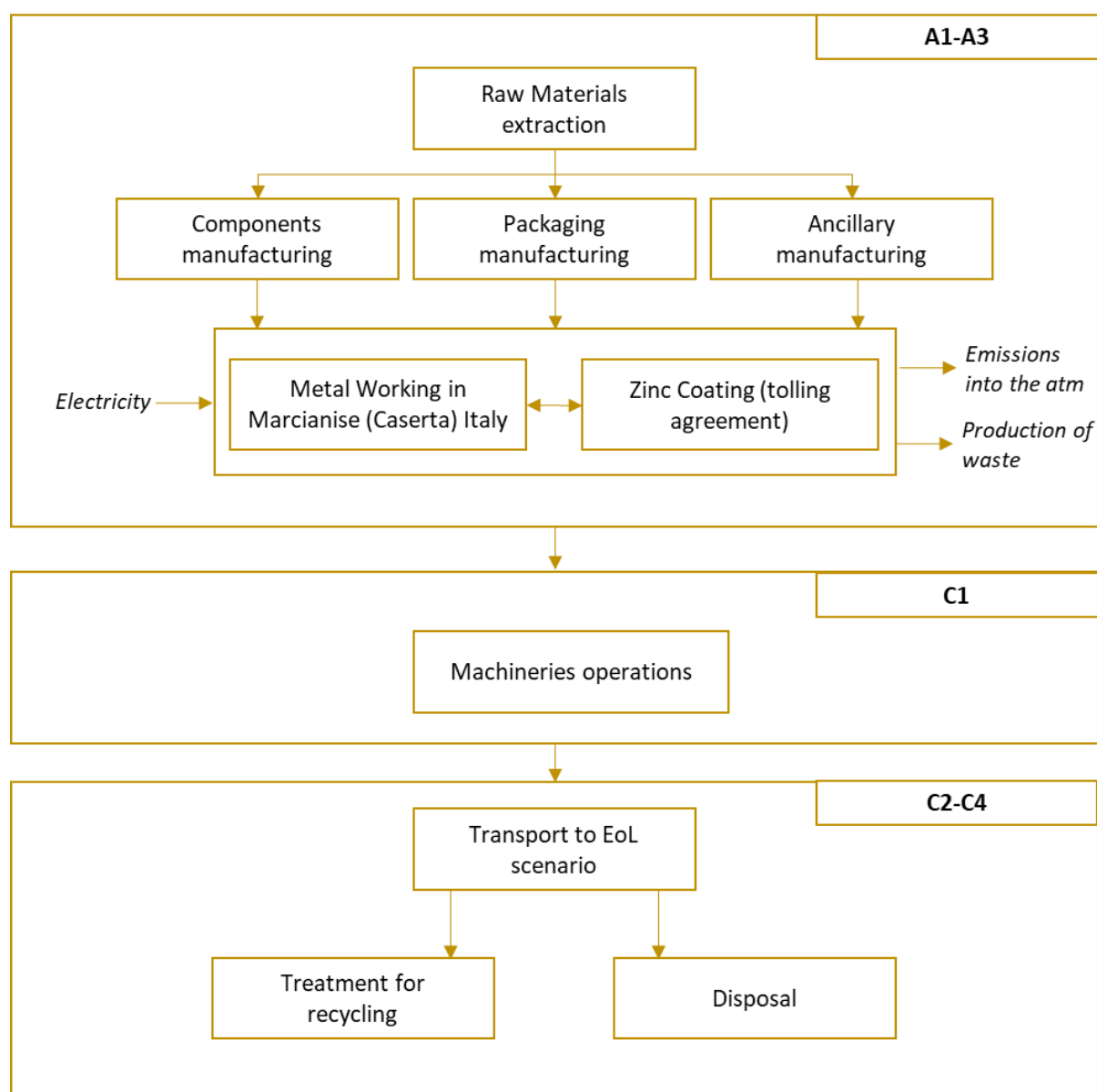
Description of system boundaries: Cradle to Gate + module C and module D

*Distribution phase A4 not included in the system boundaries since the products are sold at the company gate and the transportation to the installation site is under the responsibility of the customer.

Cut-off: in accordance with the prescriptions of EN 15804

Allocation: mass allocation

System diagram:



	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	-	-	-	-	-	-	-	-	-	X	X	X	X	X
Geography	IT	IT	IT	-	-	-	-	-	-	-	-	-	EU	EU	EU	EU	EU
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

LCA Scenarios and other Technical Information

Phase A3 70% Italian Residual Mix 2022, Medium Voltage (grid);

GWP-GHG: 6,41E-01 kg CO₂ eq/kWh

30% Photovoltaic (self produced);

GWP-GHG: 7,53E-02 kg CO₂ eq/kWh

Phase C1 Usage of diesel fuelled machine operation: 0,026 minutes

Phase C2 100 km

Phase C3 100% sent to sorting and pressing

Phase C4 10% from sorting process, sent to landfill

Content information

Product components	Weight, kg	Material, weight-%	Biogenic material, weight-% and kg C/kg
Steel	0,95	95,00%	0,00%
Zinc	0,05	5,00%	0,00%
TOTAL	1		

The product is distributed without the use of any packaging.

Results of the environmental performance indicators

The results are reported per declared unit. It is discouraged the use of the results of modules A1-A3 (A1-A5 for services) without considering the results of module C.

Product recently on the market – Results of this EPD shall be used with care as the LCI data is not yet based on 1 year of production which may result in increased uncertainty.

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO2 eq	2,72E+00	1,93E-03	1,52E-02	1,97E-02	2,72E-04	-1,74E+00
GWP-biogenic	kg CO2 eq	5,37E-02	2,96E-07	4,97E-06	2,65E-05	9,18E-08	-8,02E-03
GWP-luluc	kg CO2 eq	1,72E-03	6,59E-08	3,73E-07	1,78E-05	1,11E-08	-4,48E-04
GWP-total	kg CO2 eq	2,78E+00	1,93E-03	1,52E-02	1,97E-02	2,72E-04	-1,75E+00
ODP	kg CFC11 eq	2,42E-08	3,01E-11	3,10E-10	2,29E-10	4,02E-12	-8,34E-09
AP	mol H+ eq	1,11E-02	1,03E-05	1,77E-05	1,38E-04	2,47E-06	-6,97E-03
EP-freshwater	kg P eq	2,19E-04	1,81E-09	1,27E-08	3,62E-07	9,77E-10	-8,00E-05
EP-marine	kg N eq	3,20E-03	4,72E-06	3,93E-06	5,39E-05	1,12E-06	-1,42E-03
EP-terrestrial	mol N eq	2,63E-02	5,18E-05	4,29E-05	5,90E-04	1,23E-05	-1,65E-02
POCP	kg NMVOC eq	9,31E-03	1,66E-05	3,84E-05	1,76E-04	3,72E-06	-5,54E-03
ADP-metals*	kg Sb eq	9,11E-05	8,01E-11	5,02E-10	7,46E-10	1,07E-11	-1,32E-05
ADP-fossil*	MJ	3,14E+01	2,52E-02	2,00E-01	2,51E-01	3,49E-03	-1,83E+01
WDP*	m3 depriv.	-1,21E+00	1,99E-05	8,52E-05	1,23E-03	3,16E-06	-1,10E-01

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

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-GHG	kg CO2 eq	2,74E+00	1,93E-03	1,52E-02	1,97E-02	2,72E-04	-1,81E+00

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Resource use indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	2,79E+00	5,01E-05	6,22E-04	9,44E-03	8,73E-06	-1,39E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,79E+00	5,01E-05	6,22E-04	9,44E-03	8,73E-06	-1,39E+00
PENRE	MJ	3,18E+01	2,52E-02	2,01E-01	2,52E-01	3,50E-03	-1,84E+01
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	3,18E+01	2,52E-02	2,01E-01	2,52E-01	3,50E-03	-1,84E+01
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	-2,05E-02	7,92E-07	5,14E-06	4,17E-05	1,21E-07	-5,27E-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 material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

Output flows

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	2,55E-03	1,73E-07	1,33E-06	1,22E-06	2,31E-08	-1,69E-04
Non-hazardous waste disposed	kg	1,68E-01	7,21E-07	5,96E-06	4,49E-05	2,00E-01	-8,68E-02
Radioactive waste disposed	kg	3,80E-05	1,29E-09	1,88E-08	1,92E-07	2,14E-10	-9,54E-06

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Component for reuse	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	1,37E-01	0,00E+00	0,00E+00	9,00E-01	0,00E+00	0,00E+00
Material for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Additional environmental performance indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Ecotoxicity, freshwater**	CTUe	9,94E+01	8,88E-04	6,86E-03	3,08E-02	1,64E-04	-1,18E+02
Particulate matter	disease inc.	2,17E-07	1,99E-10	8,98E-10	3,12E-09	6,95E-11	-1,28E-07
Ionising radiation*	kBq U-235 eq	5,49E-02	2,25E-06	2,73E-05	3,18E-04	3,69E-07	-1,33E-02
Land use	Pt	5,27E+00	5,35E-05	4,49E-04	9,72E-03	4,12E-03	-3,09E+00
Human toxicity, cancer**	CTUh	2,21E-07	2,00E-12	1,06E-12	2,69E-12	5,92E-14	-4,45E-07
Human toxicity, non-cancer**	CTUh	5,81E-08	4,54E-12	1,01E-10	6,56E-11	3,64E-13	-1,44E-08

*This impact category deals mainly with the eventual impact of low dosing 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 radiative waste in underground facilities. Potential ionizing radiation from soil, from radon and from some materials is also not measured by this indicator

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

References

- General Programme Instructions of the International EPD® System. Version 4.0.
- EN 15804:2012+A2:2019/AC:2021
- Product Category Rules (PCR): CONSTRUCTION PRODUCTS, 2019:14, version 1.3.4, UN CPC 53211
- RAPPORTO di ANALISI DEL CICLO DI VITA (LCA) Del TERMINALE DI BARRIERA ERMES T4