Environmental Product Declaration

EPD of multiple products, based on a representative product.
In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

END TERMINAL

ERMES T4; ERMES T1; ERMES T2

from

SMA Road Safety s.r.l.

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0016474
Publication date:	2024-10-15
Valid until:	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

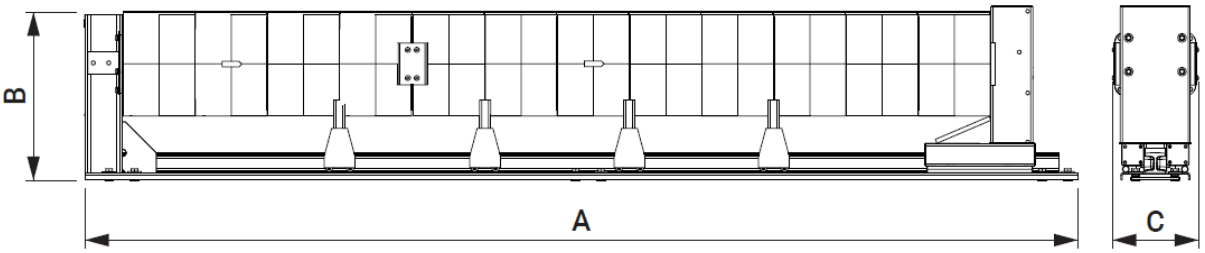
Product information

ERMES T 4 is barrier end terminal, is normally installed at the beginning of a side road safety barrier or as a traffic divider. Its use allows programmed absorption in the event of a collision with a vehicle. SMA devices are guaranteed for 10 years against corrosion.

Available in three models depending on the speed of impact, it can be connected to any type of lateral and median barrier and is tested for use on different types of soil.

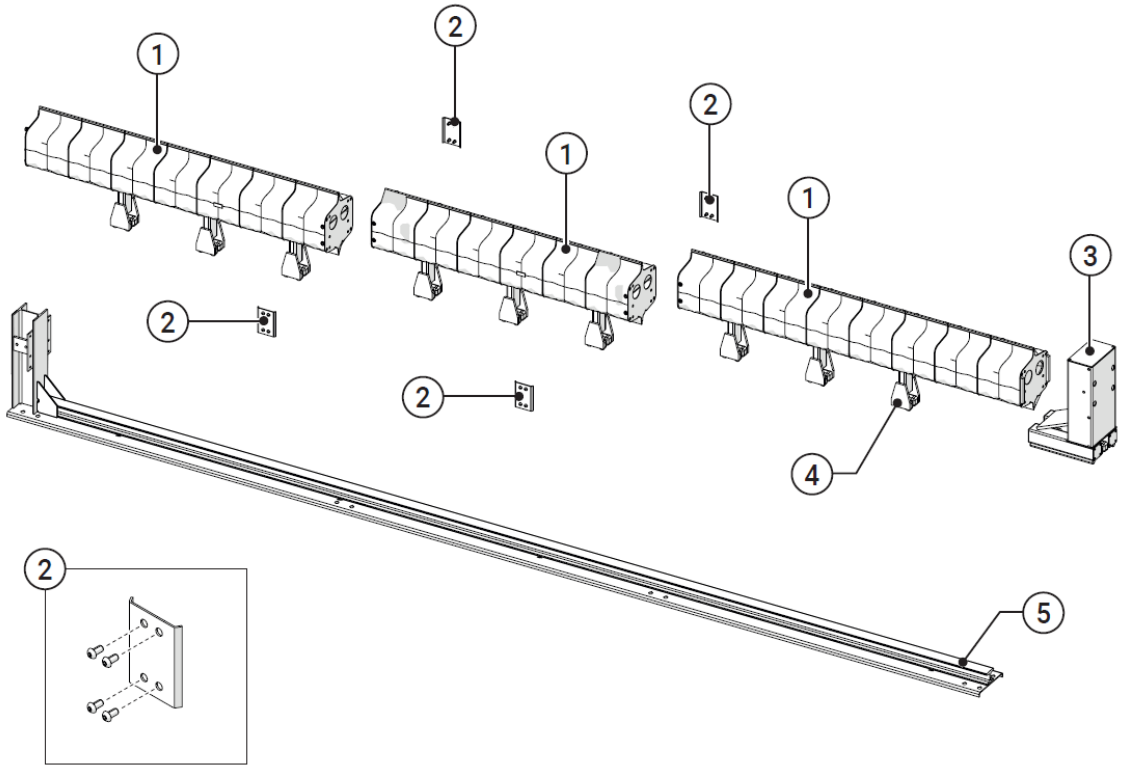
The characteristics of the "above ground" barrier terminal under analysis are described below.

ERMES ET	***T4***
Speed class (km/h)	110
A - Length (mm)	5.833
B - Height above ground (mm)	620
C - Width (mm)	280



Main components

1. Collapsible steel beam made up of modular modules
2. Sheets for beam joins
3. Trolley
4. Sliding foot welded to the collapsible beam
5. End Plate



The weight shown in the table includes the zinc layer which corresponds to 5% of the total.

ERMES ET terminals 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 1317-4 e prEN1317-7: Barrier Terminals
- 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*

Products included in the group

The main characteristics of the products included in the group are reported in the table below:

ERMES ET	*T1*	*T2*
Speed class (km/h)	50	80
A - Length (mm)	2.260	3.542
B - Height above ground (mm)	620	620
C - Width (mm)	280	280

The product ERMES T4 has been selected as representative product being the best seller of the product group

LCA information

Declared unit: 1 kg of End Terminal

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

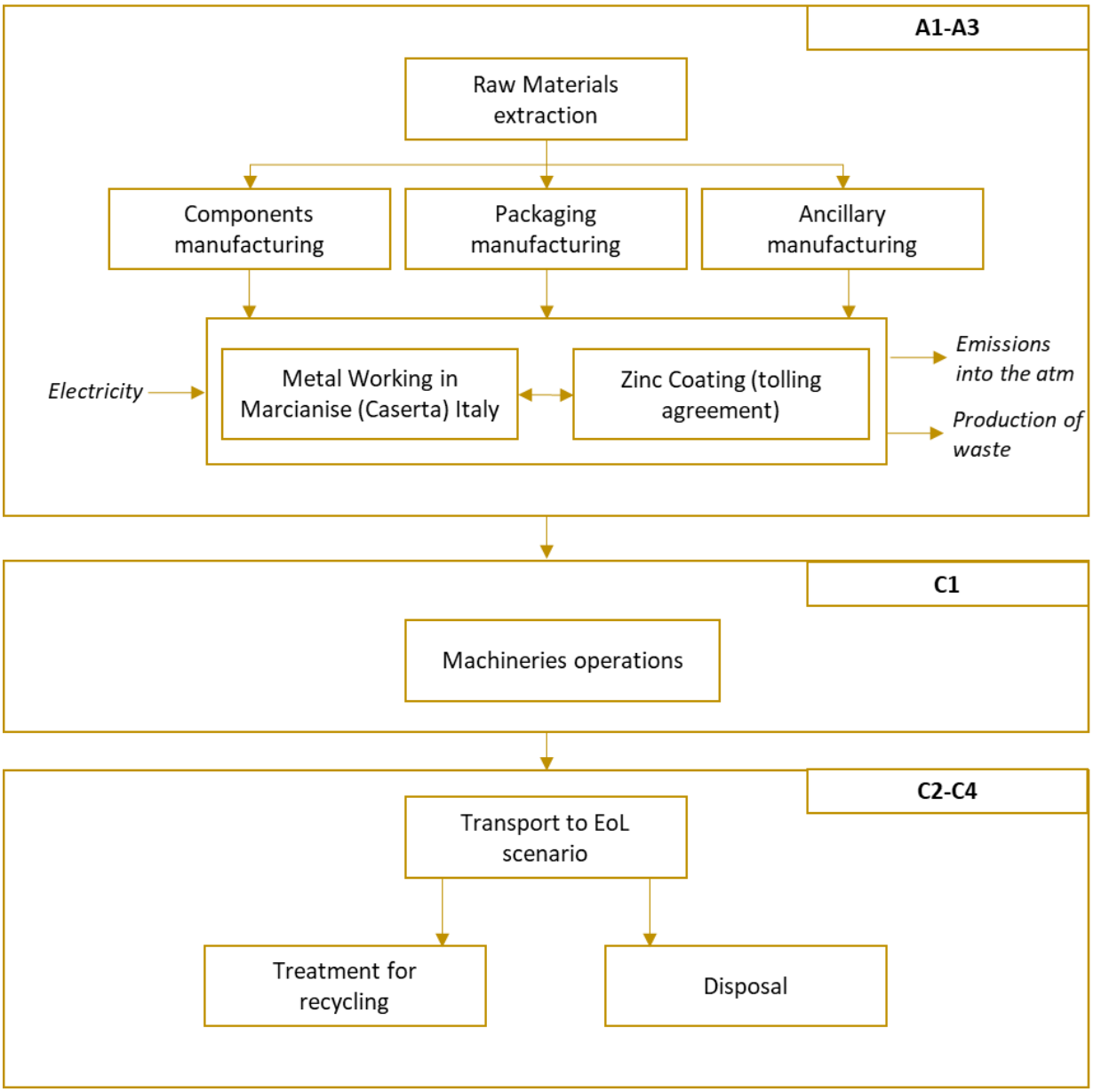
Description of system boundaries: Cradle to Gate + module C and module D

*Distribution phase A4 not included in the systm 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 CO_2 eq/kWh
30% Photovoltaic (self produced);
GWP-GHG: 7,53E-02 kg CO_2 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.

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO2 eq	2,81E+00	1,93E-03	1,50E-02	1,97E-02	2,72E-04	-1,74E+00
GWP-biogenic	kg CO2 eq	5,54E-02	2,96E-07	1,89E-06	2,65E-05	9,18E-08	-8,02E-03
GWP-luluc	kg CO2 eq	1,78E-03	6,58E-08	4,88E-07	1,78E-05	1,11E-08	-4,48E-04
GWP-total	kg CO2 eq	2,86E+00	1,93E-03	1,51E-02	1,97E-02	2,72E-04	-1,75E+00
ODP	kg CFC11 eq	2,49E-08	3,01E-11	2,18E-10	2,29E-10	4,02E-12	-8,34E-09
AP	mol H+ eq	1,15E-02	1,02E-05	2,07E-05	1,38E-04	2,47E-06	-6,97E-03
EP-freshwater	kg P eq	2,26E-04	1,81E-09	3,63E-08	3,62E-07	9,77E-10	-8,00E-05
EP-marine	kg N eq	3,30E-03	4,71E-06	4,30E-06	5,39E-05	1,12E-06	-1,42E-03
EP-terrestrial	mol N eq	2,72E-02	5,17E-05	4,74E-05	5,90E-04	1,23E-05	-1,65E-02
POCP	kg NMVOC eq	9,61E-03	1,66E-05	3,33E-05	1,76E-04	3,72E-06	-5,54E-03
ADP-metals*	kg Sb eq	9,41E-05	7,99E-11	8,88E-10	7,46E-10	1,07E-11	-1,32E-05
ADP-fossil*	MJ	3,24E+01	2,52E-02	2,01E-01	2,51E-01	3,49E-03	-1,83E+01
WDP*	m3 depriv.	-1,25E+00	1,99E-05	1,82E-04	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	2,82E+00	1,93E-03	1,51E-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 re-sources; 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	2,57E-03	1,73E-07	1,38E-06	1,22E-06	2,31E-08	-1,69E-04
Non-hazardous waste disposed	kg	1,74E-01	7,20E-07	8,21E-06	4,49E-05	2,00E-01	-8,68E-02
Radioactive waste disposed	kg	3,92E-05	1,29E-09	7,10E-09	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 recicling	kg	1,41E-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	1,41E-01	0,00E+00	0,00E+00	9,00E-01	0,00E+00	0,00E+00

Additional environmental performance indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Ecotoxicity, freshwater**	CTUe	1,03E+02	8,86E-04	1,31E-02	3,08E-02	1,64E-04	-1,18E+02
Particulate matter	disease inc.	2,24E-07	1,99E-10	9,07E-10	3,12E-09	6,95E-11	-1,28E-07
Ionising radiation*	kBq U-235 eq	5,67E-02	2,25E-06	1,37E-05	3,18E-04	3,69E-07	-1,33E-02
Land use**	Pt	5,44E+00	5,34E-05	8,04E-04	9,72E-03	4,12E-03	-3,09E+00
Human toxicity, cancer**	CTUh	2,28E-07	2,00E-12	1,18E-12	2,69E-12	5,92E-14	-4,45E-07
Human toxicity, non-cancer**	CTUh	6,00E-08	4,53E-12	1,00E-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