

Environmental Product Declaration



Complies with ISO 14025 and EN 15804 for the following product lines:

Aluminium profiles for windows and doors, for the following series:

MAR73HTI
MA72HP
MA77HTI
MA77HTI
MABLINDTT
MAS106TT EVO
MAS129TT
MAS150TT
MAS170TT
MAXVISION

of the organization



Programme:
Programme operator:
Registration number:
Date of publication:
Date of revision:
Valid until:

The International EPD® System, www.envIRONDEC.com

EPD International AB

S-P-05526

2022-02-22

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Information on the Programme operator

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com
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Product category rules (PCR): Construction products (PCR 2019:14), Version 1.11, 2021-02-05.
Revision of the PCR conducted by: <i>Claudia A. Peña</i>
Independent verification of the declaration and contents, according with ISO 14025:2006: ☐ EPD process certification ☒ EPD verification (external)
Third party verification: Ugo Pretato (Studio Fieschi & Soci srl) – <i>Recognized Individual Verifier</i> Accredited or approved by: The International EPD® System
Procedure for reviewing data during EPD validity involves third party verifier: ☐ Yes ☒ No

The owner of the EPD has sole ownership of and responsibility for the EPD.

EPDs within the same product category but from different certification schemes or not in line with EN 15804:2012+A2:2019 may not be comparable.

Company profile

EPD Owner: **Colma Srl**, via Carlo Alberto dalla Chiesa, 8 80059 Torre del Greco (NA)

Web: www.colmasrl.com

EPD contact: Pasquale Avagliano

E mail: p.avagliano@colmasrl.it

Mobile: +39. 347 488 9368

Description of the organization: COLMA srl, founded in the 1990s, is a leading company in the field of trade in non-ferrous metals. It is mainly specialised in the trade of aluminium, accessories and complements. COLMA is one of the leading companies in the field of systems for windows and doors, curtain walls and accessories. The main field of application is the design and production of systems for windows, doors, shutters and accessories for the building industry, with its own thermal break profile assembly plants and painting and decoration plants for aluminium surface treatments. Thanks to its 30000 square metres of warehouses with ready-made goods and the presence of all the departments for the production of windows and doors, it can satisfy all requests for profiles and commercial bars.

Name and location of the production site: Via Vicinale Chiesa (zona P.I.P.) 81030 – Teverola (CE)

Product description

Product name

MAR73HTI
MA72HP
MA77HTI
MABLINDTT
MAS106TT EVO
MAS129TT
MAS150TT
MAS170TT
MAXVISION

Product identification: Aluminium frame and curtain wall profiles, components partly made from recycled materials.

Product description: The products included in this EPD are profiles for aluminium windows and doors.

All products considered are manufactured by assembling different components:

- extruded aluminium alloy profiles
- Thermoplastic rods

The assembled products are then subjected to a protective surface finish by powder coating and subsequent sublimation treatment.

This manufacturer's environmental statement (EPD) relates to an average product from a single production plant.

This manufacturer's environmental statement (EPD) relates to an average product from a single production plant, calculated on production volumes for year 2020, of the following profile series:

- MAR73HTI – swing series
- MA72HP – swing series
- MA77HTI – swing series
- MABLINDTT – swing series for armoured doors and windows
- MAS106TT EVO – sliding/lift series
- MAS129TT – lift series
- MAS150TT – lift series
- MAS170TT – lift series
- MAXVISION – sliding series

Annex I also shows the main environmental impacts of the individual profiles that characterise the average profile.

CPC code: 42120 – Doors, windows and their frames and thresholds for doors, of iron, steel or aluminium

Geographical scope: Italy

Technical performance of the products

MAR73HTI

	Fixed frame size	73,5 mm
	Mobile frame size	77 mm
	Standard lateral knot	92 mm
	Standard central knot	148 mm
	Perimeter leakage	5 mm
	Permeability to air	Class 4
	Watertightness	Class E1350
	Wind load resistance	Class C5
	Thermal insulation Uw (Ug=1,0 W/mqK)	1,20 W/mqK

MA72HP

	Fixed frame size	72 mm
	Mobile frame size	80 mm
	Standard lateral knot	94/73,5 mm
	Standard central knot	144/95 mm
	Perimeter leakage	4,5 mm
	Permeability to air	Class 4
	Watertightness	Class E900
	Wind load resistance	Class C5
	Thermal insulation Uw (Ug=1,0 W/mqK)	1,25 W/mqK

MA77HTI

	Fixed frame size	77 mm
	Mobile frame size	85 mm
	Standard lateral knot	94/73,5 mm
	Standard central knot	144/95 mm
	Perimeter leakage	4,5 mm
	Permeability to air	Class 4
	Watertightness	Class E1350
	Wind load resistance	Class C5
	Thermal insulation Uw (Ug=1,0 W/mqK)	1,15 W/mqK

MABLINDTT

	Fixed frame size	92 mm
	Mobile frame size	100 mm
	Standard lateral knot	134 mm
	Standard central knot	183 mm
	Perimeter leakage	5 mm
	Permeability to air	Class 4
	Watertightness	Class E900
	Wind load resistance	Class C5
	Thermal insulation Uw (Ug=1,0 W/mqK)	1,34 W/mqK

MAS106TT EVO

	Fixed frame size	106/90 mm
	Mobile frame size	45 mm
	Standard lateral knot	116 mm
	Standard central knot	90/40 mm
	Perimeter leakage	8,5 mm
	Permeability to air	Class 4
	Watertightness	Class E1200
	Wind load resistance	Class A3
	Thermal insulation Uw (Ug=1,0 W/mqK)	1,81 W/mqK

MAS129TT

	Fixed frame size	129 mm
	Mobile frame size	58 mm
	Standard lateral knot	133 mm
	Standard central knot	116,5 mm
	Perimeter leakage	8,5 mm
	Permeability to air	Class 4
	Watertightness	Class 9A
	Wind load resistance	Class B5
	Thermal insulation Uw (Ug=1,0 W/mqK)	2,06 W/mqK

MAS150TT

	Fixed frame size	150 mm
	Mobile frame size	59,8 mm
	Standard lateral knot	133 mm
	Standard central knot	116,5 mm
	Perimeter leakage	8,5 mm
	Permeability to air	Class 4
	Watertightness	Class 9A
	Wind load resistance	Class B5
	Thermal insulation Uw (Ug=1,0 W/mqK)	2,06 W/mqK

MAS170TT

	Fixed frame size	170 mm
	Mobile frame size	72 mm
	Standard lateral knot	140 mm
	Standard central knot	115,5/56 mm
	Perimeter leakage	8,5 mm
	Permeability to air	Class 4
	Watertightness	Classe E1200
	Wind load resistance	Class C5
	Thermal insulation Uw (Ug=1,0 W/mqK)	1,75 W/mqK

MAXVISION


Fixed frame size	161,8 mm
Mobile frame size	58 mm
Standard lateral knot	72 mm
Standard central knot	27 mm
Perimeter leakage	8,5 mm
Permeability to air	Class 4
Watertightness	Class 8A
Wind load resistance	Class C3
Thermal insulation Uw (Ug=1,0 WmqK)	1,26 W/mqK

Information about LCA

Declared unit: 1 kg of profile, including packaging

Reference service life: n.a.

Temporal representativeness:

For all production phases (A1-A3), primary data with the following characteristics were used:

- industrial production data (consolidated data on at least 1 or 2 years of production)
- supplied directly by the respective companies responsible for the production processes
- updating less than 5 years (as required by EN 15804:2012+A2:2019)

Materials/process	Type	Source	Year
Al profile extrusion	Primary process data	ALEX Spa	2020
Al profile oxidation	Primary process data	Oxall	2020
PA 66 GF25 bars extrusion	Primary process data	TECHNOFORM BAUTEC	2020
Knurling, assembly and packaging of profiles	Primary process data	COLMA Srl	2020
Surface finish with powder coating and sublimation	Primary process data	COLMA Srl	2020

Ecoinvent v.3.7..1 databases were used for the secondary data.

Materials/process	Geographical scope	Year
Primary aluminium	Europe	2021
Post-consumer recycled aluminium	Europe	2021
Pre-consumer recycled aluminium	Europe	2021
Polietilene film-Low Density (packaging)	Europe	2021
Glass fibre for Poliammide	Global	2021
Steel bars extrusion	Global	2021
Paint production	Global	2021
Sublimation film production	Global	2021

Database e software LCA used:

SimaPro Analyst ver.9.1.1.1, Ecoinvent v.3.7.1

Stages of the system analysed:

- A1: primary and secondary aluminium production, production of plastic granules, transport to extrusion sites, extrusion processes for aluminium profiles and plastic bars, powder coating production, sublimation film production, generation of the energy consumed in all the different process steps.
- A2: transport of raw materials to the assembly site in Teverola (CE).
- A3: knurling and assembly of components, product surface finishing (painting/sublimation) and packaging at the Teverola (CE) plant.
- C1: No dismantling is considered for the profile alone, for which reference is made to the complete frame.
- C2: transport of profile components (after dismantling at end-of-life) to waste collection and treatment centres.
- C3: pre-treatment of waste for recovery and disposal.
- C4: landfill of non-recoverable materials.
- D: potential benefits from the reuse, recycling or recovery of profile materials (aluminium).

The aluminium end-of-life destination and the environmental benefits associated to the recycling of the aluminium profile are quantified respectively in modules C3 and D, considering an end-of-life scenario with 90% recycling destination (reference to Eurostat data for material recovery rates and to EAA for the elaboration of the aluminium recycling process). For all other materials, a disposal process in landfill or incinerator was considered, quantified in module C4 (also in this case reference is made to Eurostat data, Italy case). For the transport of all materials to the treatment plants, 50 km from the disposal centre and for aluminium 150 km from the recycling centre were considered, based on the location of the plants present on the territory.

Description of system boundaries:

cradle-to-gate with modules C1-C4 and D

Excluded life cycle stages: The transport and installation phases of the finished product (A4-A5), the subsequent use phases (B modules) and the dismantling phase (C1), which is not applicable to the product studied, were excluded from the study

Additional information

Energy

The Teverola plant, where the assembly process is carried out, has a photovoltaic (PV) system, the energy produced from which is sold to the distribution network operator. The energy produced by PV partially covers the energy demand of the plant, so the energy consumption has been allocated according to the two different energy sources (grid energy for 80% and PV generation process for the remaining part).

For grid electricity, the Italian Residual Mix provided by the AIB (Association of Issuing Bodies) for 2020 was used.

Italian residual mix for 2020

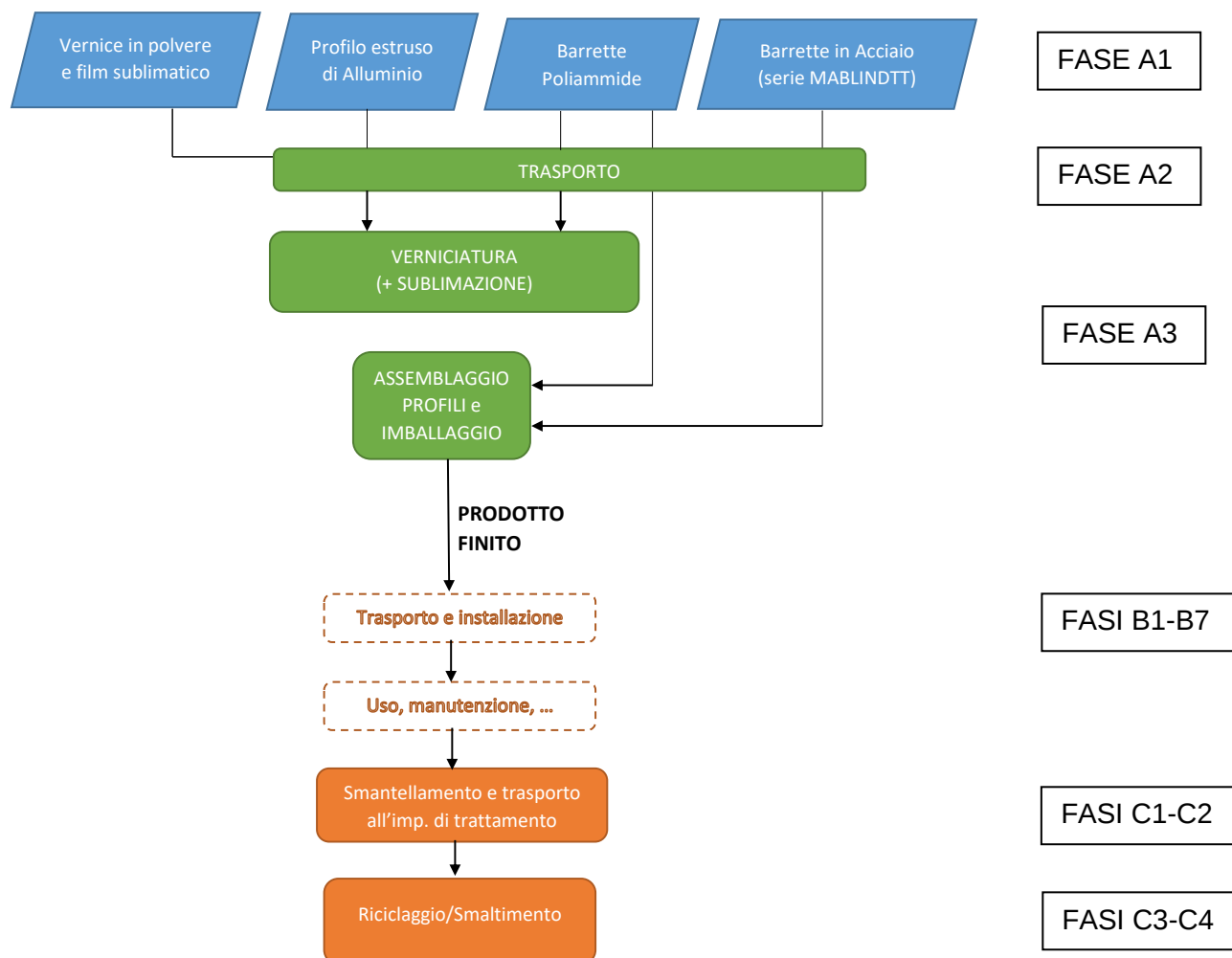
Primary sources	%
Natural gas	54,43%
Coil	17,40%
Heating oil	3,87%
Lignite	0,54%
Other fossil sources	2,11%
Nuclear	11,42%
Idroelectric and sea	1,72%
Wind	1,75%
Solar	5,02%
Biomass	1,73%
Geothermal	0%
Other renewables (biogas)	0%

The impact in terms of CO₂ equivalent for the electricity mix used (GWP-GHG indicator) is 0.702 kgCO₂ eq./kWh.

Assumptions

Outflows: Waste production is only calculated for the Teverola site.

LCA study realized by Environment Park Spa
(Parco Scientifico Tecnologico per l'Ambiente
Via Livorno, 60 10144 – Torino, Italy;
www.envipark.com)



	Product		Construction process			Use							End of life				Recovery
	Raw materials production	Transport	Production	Transport	Installation	Use	Maintenance	Repair	Substitution	Refurbishment	Energy use	Water use	Demolition of construction	Transport	Waste treatment	Disposal	Reuse-Recovery-Recycling potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Declared modules	X	X	X	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	X	X	X	X	X
Scope	GLO	GLO	IT	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	IT	IT	IT	IT	GLO
Specific data used	> 90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-

Content declaration

The functional unit considered (1 kg of product including packaging) has the following composition

Materials	Weight [kg]	Post consumer material %	Renewable material %
Aluminium	0,84	20	0
Poliammide	0,113	0	0
Paint	0,0255	0	0
Steel	0,001	0	0
Sublimatic film	0,0045	0	0
Materials	Weight [kg]	weight % (respect to product)	
Packaging	0,016	1,6%	

The products used do not contain any substances on the European Chemical Agency's SVHC candidate list.

The amount of recycled material in the aluminium profile (as shown in the table), makes the product compliant with the parameters required by the minimum environmental criteria for building construction and renovation work - "C.A.M. Edilizia - Entrusting of design and works services for the new construction, renovation and maintenance of public buildings" D.M. 11/10/2017

Environmental performance

Environmental impacts

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Global warming (GWP fossile)	kg CO2 eq	5,98	0,05	0,50	6,53	0	0,04	0	2,66E-03	-4,25
Global warming (GWP bio-genico)	kg CO2 eq	0,03	1,23E-04	3,81E-03	0,03	0	1,50E-04	0	5,91E-05	-0,01
Global warming (GWP-luluc)	kg CO2 eq	0,09	1,72E-05	1,30E-04	0,09	0	2,31E-05	0	1,27E-06	-0,08
Global warming (GWP-totale)	kg CO2 eq	6,10	0,05	0,50	6,65	0	0,04	0	2,72E-03	-4,35
Ozone layer depletion (ODP)	kg CFC-11 eq	5,20E-07	1,16E-08	5,92E-08	5,91E-07	0	9,15E-09	0	4,55E-10	-3,05E-07
AP	Mol H ⁺ eq	0,04	2,05E-04	1,60E-03	0,04	0	1,63E-04	0	1,54E-05	-0,03
EP fresh water	kg PO4 ³⁻ eq	6,45E-03	1,06E-05	2,34E-04	0,01	0	1,27E-05	0	2,24E-06	-0,01
EP fresh water	kg P eq	2,10E-03	3,47E-06	7,61E-05	2,18E-03	0	4,15E-06	0	7,29E-07	-1,70E-03
EP aquatic	Kg N eq	5,99E-03	6,28E-05	2,85E-04	0,01	0	4,59E-05	0	4,45E-06	-4,41E-03
EP land	Mol N eq	0,06	6,86E-04	2,84E-03	0,07	0	4,99E-04	0	4,81E-05	-0,05
POFP	Kg NMVOC eq	0,02	2,10E-04	1,08E-03	0,02	0	1,55E-04	0	1,44E-05	-0,01
ADP mineral/metal	kg Sb eq	8,43E-05	1,85E-07	1,84E-06	8,63E-05	0	2,77E-07	0	7,41E-09	-6,96E-05
ADP (fossil fuels)	MJ	65,05	0,78	8,23	74,05	0	0,64	0	0,05	-40,86
WDP	M ³	1,73	2,12E-03	0,11	1,84	0	2,25E-03	0	1,02E-03	-1,22

Other environmental indicators

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
GWP-GHG	kg CO2 eq	5,86	0,05	0,48	6,40	0	0,04	0	0	-4,18

Consumption of resources

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Renewable primary energy (energy carrier)	MJ	34,12	0,01	0,39	34,52	0	0,01	0	2,28E-03	-29,87
Renewable primary energy (raw materials)	MJ	0	0	0	0	0	0	0	0	0
Renewable primary energy TOTAL	MJ	34,12	0,01	0,39	34,52	0	0,01	0	2,28E-03	-29,87
Non-renewable primary energy (energy carrier)	MJ	60,98	0,78	7,49	69,25	0	0,64	0	0,05	-40,86

Non-renewable primary energy (raw materials)	MJ	4,07	0	0,74	4,80	0	0	0	0	0
Non-renewable primary energy TOTAL	MJ	65,05	0,78	8,23	74,05	0	0,64	0	0,05	-40,86
SM	kg	0,34	0	0	0,34	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
FW	m3	1,18E-04	0	6,72E-03	0,01	0	0	0	0	0

Waste production

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	Kg	0	0	0	0	0	0	0	0	0
Non-Hazardous waste disposed	Kg	9,04E-04	0	5,10E-04	1,41E-03	0	0	0	4,704	0
Radioactive waste disposed	kg	2,67E-04	5,31E-06	1,29E-05	2,85E-04	0	2,13E-06	0	2,19E-07	-1,86E-04

Output flows

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Components for reuse	kg	0	0	0	0	0	0	0	0	0
Recycling material	kg	0	0	0	0	0	0	0,76	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0
Energy exported, electricity	MJ	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0

Other environmental information

Release of hazardous substances in the use phase

The product does not release any hazardous substances during use. The coating is carried out in accordance with the technical specifications and guidelines of the QUALICOAT¹ quality label for coated aluminium in architecture, which does not use substances that are harmful to humans or the environment.

References

- General Programme Instructions of the International EPD® System. Version 3.0.
- Construction products and construction services (PCR 2019:14), Version 1.11, 2021-02-05.
- ISO 14040:2006 e ISO 14044:2006, Gestione ambientale - Valutazione del ciclo di vita - Principi e quadro di riferimento, requisiti e linee guida
- EN 15804:2012+A2:2019, Sostenibilità delle opere da costruzione - Dichiarazioni ambientali di prodotto - Regole fondamentali per la categoria di prodotti da costruzione
- "Studio LCA di sistemi per serramenti in alluminio, PVC e legno-alluminio per l'azienda Colma srl" Environment Park, rev 10/12/2021
- "Environmental Profile Report for the European Aluminium Industry – Life Cycle inventory data for aluminium production and transformation processes in Europe", EAA, Febbraio 2018
- Position paper "Recycled content vs. End of Life recycling rate", rev. 1, 26.5.2016

¹ <http://www.qualital.eu/QUALICOAT.php>

Annex I – Environmental impacts of individual profiles

Composition of aluminium profiles

Product	Alluminium	PA	Steel	Paint	PE	Tot
MAR73HTI	85,5%	11,0%	0%	3,0%	0,5%	100,0%
MA72HP*	83,0%	13,5%	0%	3,0%	0,5%	100,0%
MA77HTI**	87,3%	9,2%	0%	3,0%	0,5%	100,0%
MABLINDTT	72,9%	1,1%	23,3%	2,3%	0,4%	100,0%
MAS106TT EVO	83,3%	13,2%	0%	3,0%	0,5%	100,0%
MAS129TT***	92,6%	3,9%	0%	3,0%	0,5%	100,0%
MAS170TT	89,0%	7,6%	0%	3,0%	0,5%	100,0%
MAXVISION	92,5%	4,0%	0%	3,0%	0,5%	100,0%

*Include profili MA72HP linea C90, AS, FG

**Include profili MA77HTI linea C90, AS, FG

***Include profili MAS129TT e MAS150TT

Environmental impacts MAR73HTI

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Global warming (GWP fossile)	kg CO2 eq	6,05	0,05	0,47	6,58	0	0,02	0	2,71E-03	-4,32
Global warming (GWP bio-genico)	kg CO2 eq	0,03	1,23E-04	4,34E-03	0,03	0	7,62E-05	0	6,02E-05	-0,01
Global warming (GWP-luluc)	kg CO2 eq	0,10	1,73E-05	1,07E-04	0,10	0	1,18E-05	0	1,30E-06	-0,09
Global warming (GWP-totale)	kg CO2 eq	6,18	0,05	0,48	6,70	0	0,02	0	2,77E-03	-4,42
Ozone layer depletion (ODP)	kg CFC-11 eq	5,26E-07	1,17E-08	5,94E-08	5,97E-07	0	4,66E-09	0	4,63E-10	-3,10E-07
AP	Mol H ⁺ eq	0,04	2,06E-04	1,49E-03	0,04	0	8,28E-05	0	1,57E-05	-0,03
EP fresh water	kg PO4 ³⁻ eq	6,54E-03	1,06E-05	2,08E-04	0,01	0	6,48E-06	0	2,28E-06	-0,01
EP fresh water	kg P eq	2,13E-03	3,46E-06	6,77E-05	2,20E-03	0	2,11E-06	0	7,42E-07	-1,73E-03
EP aquatic	Kg N eq	6,07E-03	6,32E-05	2,61E-04	0,01	0	2,33E-05	0	4,53E-06	-4,48E-03
EP land	Mol N eq	0,06	6,89E-04	2,60E-03	0,07	0	2,54E-04	0	4,90E-05	-0,05
POFP	Kg NMVOC eq	0,02	2,11E-04	9,64E-04	0,02	0	7,90E-05	0	1,46E-05	-0,02
ADP mineral/metal	kg Sb eq	8,56E-05	1,86E-07	1,68E-06	8,74E-05	0	1,41E-07	0	7,55E-09	-7,07E-05
ADP (fossil fuels)	MJ	65,71	0,78	7,42	73,91	0	0,32	0	0,05	-41,53
WDP	M ³	1,74	2,13E-03	0,08	1,83	0	1,14E-03	0	1,04E-03	-1,24

Other environmental indicators

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
GWP-GHG	kg CO2 eq	5,94	0,05	0,46	6,45	0	0,02	0	2,65E-03	-4,25

Consumption of resources

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Renewable primary energy (energy carrier)	MJ	34,11	0,01	0,36	34,49	0	0,01	0	2,32E-03	-30,37
Renewable primary energy (raw materials)	MJ	0	0	0	0	0	0	0	0	0
Renewable primary energy TOTAL	MJ	34,11	0,01	0,36	34,49	0	0,01	0	2,32E-03	-30,37
Non-renewable primary energy (energy carrier)	MJ	61,76	0,78	7,19	69,72	0	0,32	0	0,05	-41,53
Non-renewable primary energy (raw materials)	MJ	3,96	0	0,23	4,19	0	0	0	0	0
Non-renewable primary energy TOTAL	MJ	65,72	0,78	7,42	73,91	0	0,32	0	0,05	-41,53

Environmental impacts MA72HP

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Global warming (GWP fossile)	kg CO2 eq	6,05	0,05	0,46	6,56	0	0,02	0	2,63E-03	-4,20
Global warming (GWP bio-genico)	kg CO2 eq	0,03	1,29E-04	4,21E-03	0,03	0	7,40E-05	0	5,84E-05	-0,01
Global warming (GWP-luluc)	kg CO2 eq	0,09	1,81E-05	1,04E-04	0,09	0	1,14E-05	0	1,26E-06	-0,08
Global warming (GWP-totale)	kg CO2 eq	6,17	0,05	0,46	6,68	0	0,02	0	2,69E-03	-4,30
Ozone layer depletion (ODP)	kg CFC-11 eq	5,29E-07	1,22E-08	5,77E-08	5,99E-07	0	4,52E-09	0	4,50E-10	-3,02E-07
AP	Mol H ⁺ eq	0,04	2,15E-04	1,44E-03	0,04	0	8,04E-05	0	1,53E-05	-0,03
EP fresh water	kg PO4 ³⁻ eq	6,46E-03	1,11E-05	2,02E-04	0,01	0	6,29E-06	0	2,21E-06	-0,01
EP fresh water	kg P eq	2,10E-03	3,61E-06	6,58E-05	2,17E-03	0	2,05E-06	0	7,20E-07	-1,68E-03
EP aquatic	Kg N eq	6,03E-03	6,59E-05	2,53E-04	0,01	0	2,27E-05	0	4,40E-06	-4,36E-03
EP land	Mol N eq	0,06	7,19E-04	2,52E-03	0,07	0	2,47E-04	0	4,75E-05	-0,05
POFP	Kg NMVOC eq	0,02	2,20E-04	9,37E-04	0,02	0	7,67E-05	0	1,42E-05	-0,01
ADP mineral/metal	kg Sb eq	8,45E-05	1,94E-07	1,64E-06	8,63E-05	0	1,37E-07	0	7,33E-09	-6,88E-05
ADP (fossil fuels)	MJ	66,52	0,81	7,21	74,54	0	0,31	0	0,05	-40,37
WDP	M ³	1,77	2,22E-03	0,08	1,86	0	1,11E-03	0	1,01E-03	-1,21

Other environmental indicators

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
GWP-GHG	kg CO2 eq	5,92	0,05	0,45	6,42	0	0,02	0	2,58E-03	-4,13

Consumption of resources

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Renewable primary energy (energy carrier)	MJ	33,84	0,01	0,35	34,21	0	0,01	0	2,25E-03	-29,52
Renewable primary energy (raw materials)	MJ	0	0	0	0	0	0	0	0	0
Renewable primary energy TOTAL	MJ	33,84	0,01	0,35	34,21	0	0,01	0	2,25E-03	-29,52
Non-renewable primary energy (energy carrier)	MJ	61,66	0,81	6,98	69,45	0	0,31	0	0,05	-40,37
Non-renewable primary energy (raw materials)	MJ	4,86	0	0,23	5,09	0	0	0	0	0
Non-renewable primary energy TOTAL	MJ	66,52	0,81	7,21	74,54	0	0,31	0	0,05	-40,37

Environmental impacts MA77HTI

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Global warming (GWP fossile)	kg CO2 eq	6,06	0,05	0,48	6,59	0	0,02	0	2,77E-03	-4,42
Global warming (GWP bio-genico)	kg CO2 eq	0,03	1,19E-04	4,43E-03	0,03	0	7,78E-05	0	6,14E-05	-0,01
Global warming (GWP-luluc)	kg CO2 eq	0,10	1,68E-05	1,09E-04	0,10	0	1,20E-05	0	1,32E-06	-0,09
Global warming (GWP-totale)	kg CO2 eq	6,18	0,05	0,49	6,72	0	0,02	0	2,83E-03	-4,52
Ozone layer depletion (ODP)	kg CFC-11 eq	5,24 E-07	1,13E-08	6,06E-08	5,96E-07	0	4,76E-09	0	4,73E-10	-3,18E-07
AP	Mol H ⁺ eq	0,04	2,00E-04	1,51E-03	0,05	0	8,45E-05	0	1,61E-05	-0,03
EP fresh water	kg PO4 ³⁻ eq	6,60 E-03	1,03E-05	2,12E-04	0,01	0	6,62E-06	0	2,33E-06	-0,01
EP fresh water	kg P eq	2,15 E-03	3,35E-06	6,90E-05	2,22E-03	0	2,15E-06	0	7,57E-07	-1,77E-03
EP aquatic	Kg N eq	6,10 E-03	6,12E-05	2,66E-04	0,01	0	2,38E-05	0	4,62E-06	-4,59E-03
EP land	Mol N eq	0,06	6,67E-04	2,65E-03	0,07	0	2,59E-04	0	5,00E-05	-0,05
POFP	Kg NMVOC eq	0,02	2,04E-04	9,82E-04	0,02	0	8,07E-05	0	1,49E-05	-0,02
ADP mineral/metal	kg Sb eq	8,64 E-05	1,80E-07	1,72E-06	8,82E-05	0	1,44E-07	0	7,71E-09	-7,24E-05
ADP (fossil fuels)	MJ	65,13	0,75	7,56	73,45	0	0,33	0	0,05	-42,49
WDP	M ³	1,72	2,06E-03	0,08	1,81	0	1,17E-03	0	1,06E-03	-1,27

Other environmental indicators

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
GWP-GHG	kg CO2 eq	5,94	0,05	0,47	6,46	0	0,02	0	2,71E-03	-4,35

Consumption of resources

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Renewable primary energy (energy carrier)	MJ	35,31	0,01	0,37	35,69	0	0,01	0	2,37E-03	-31,07
Renewable primary energy (raw materials)	MJ	0	0	0	0	0	0	0	0	0
Renewable primary energy TOTAL	MJ	35,31	0,01	0,37	35,69	0	0,01	0	2,37E-03	-31,07
Non-renewable primary energy (energy carrier)	MJ	61,82	0,75	7,33	69,91	0	0,33	0	0,05	-42,50
Non-renewable primary energy (raw materials)	MJ	3,31	0	0,23	3,54	0	0	0	0	0
Non-renewable primary energy TOTAL	MJ	65,13	0,75	7,56	73,45	0	0,33	0	0,05	-42,50

Environmental impacts MABLINDTT

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Global warming (GWP fossile)	kg CO2 eq	4,97	0,04	0,40	5,41	0	0,02	0	2,31E-03	-3,69
Global warming (GWP bio-genico)	kg CO2 eq	0,02	8,71E-05	3,71E-03	0,02	0	6,50E-05	0	5,13E-05	-0,01
Global warming (GWP-luluc)	kg CO2 eq	0,08	1,24E-05	9,04E-05	0,08	0	1,00E-05	0	1,11E-06	-0,07
Global warming (GWP-totale)	kg CO2 eq	5,08	0,04	0,41	5,52	0	0,02	0	2,36E-03	-3,77
Ozone layer depletion (ODP)	kg CFC-11 eq	4,12E-07	7,98E-09	5,06E-08	4,71E-07	0	3,97E-09	0	3,95E-10	-2,65E-07
AP	Mol H ⁺ eq	0,04	1,41E-04	1,26E-03	0,04	0	7,06E-05	0	1,34E-05	-0,03
EP fresh water	kg PO4 ³⁻ eq	5,76E-03	7,49E-06	1,76E-04	0,01	0	5,52E-06	0	1,94E-06	0,00
EP fresh water	kg P eq	1,88E-03	2,44E-06	5,75E-05	1,94E-03	0	1,80E-06	0	6,32E-07	-1,47E-03
EP aquatic	Kg N eq	5,20E-03	4,29E-05	2,22E-04	0,01	0	1,99E-05	0	3,86E-06	-3,83E-03
EP land	Mol N eq	0,05	4,68E-04	2,21E-03	0,06	0	2,17E-04	0	4,18E-05	-0,04
POFP	Kg NMVOC eq	0,02	1,43E-04	8,18E-04	0,02	0	6,74E-05	0	1,25E-05	-0,01
ADP mineral/metal	kg Sb eq	7,17E-05	1,34E-07	1,43E-06	7,32E-05	0	1,20E-07	0	6,44E-09	-6,04E-05
ADP (fossil fuels)	MJ	51,57	0,53	6,30	58,41	0	0,28	0	0,04	-35,45
WDP	M ³	1,34	1,49E-03	0,07	1,41	0	9,75E-04	0	8,84E-04	-1,06

Other environmental indicators

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
GWP-GHG	kg CO2 eq	4,89	0,04	0,39	5,31	0	0,02	0	2,26E-03	-3,63

Consumption of resources

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Renewable primary energy (energy carrier)	MJ	29,40	0,01	0,31	29,72	0	0,01	0	1,98E-03	-25,92
Renewable primary energy (raw materials)	MJ	0	0	0	0	0	0	0	0	0
Renewable primary energy TOTAL	MJ	29,40	0,01	0,31	29,72	0	0,01	0	1,98E-03	-25,92
Non-renewable primary energy (energy carrier)	MJ	51,18	0,53	6,12	57,83	0	0,28	0	0,04	-35,45
Non-renewable primary energy (raw materials)	MJ	0,40	0	0,18	0,58	0	0	0	0	0
Non-renewable primary energy TOTAL	MJ	51,57	0,53	6,30	58,41	0	0,28	0	0,04	-35,45

Environmental impacts MAS106TT EVO

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Global warming (GWP fossile)	kg CO2 eq	6,05	0,05	0,46	6,56	0	0,02	0	2,64E-03	-4,22
Global warming (GWP bio-genico)	kg CO2 eq	0,03	1,28E-04	4,22E-03	0,03	0	7,42E-05	0	5,86E-05	-0,01
Global warming (GWP-luluc)	kg CO2 eq	0,09	1,80E-05	1,04E-04	0,09	0	1,15E-05	0	1,26E-06	-0,08
Global warming (GWP-totale)	kg CO2 eq	6,17	0,05	0,46	6,69	0	0,02	0	2,70E-03	-4,32
Ozone layer depletion (ODP)	kg CFC-11 eq	5,29E-07	1,21E-08	5,79E-08	5,99E-07	0	4,54E-09	0	4,51E-10	-3,03E-07
AP	Mol H ⁺ eq	0,04	2,14E-04	1,45E-03	0,04	0	8,07E-05	0	1,53E-05	-0,03
EP fresh water	kg PO4 ³⁻ eq	6,47E-03	1,10E-05	2,03E-04	0,01	0	6,31E-06	0	2,22E-06	-0,01
EP fresh water	kg P eq	2,11E-03	3,59E-06	6,60E-05	2,18E-03	0	2,06E-06	0	7,23E-07	-1,68E-03
EP aquatic	Kg N eq	6,03E-03	6,56E-05	2,54E-04	0,01	0	2,27E-05	0	4,41E-06	-4,38E-03
EP land	Mol N eq	0,06	7,15E-04	2,53E-03	0,07	0	2,47E-04	0	4,77E-05	-0,05
POFP	Kg NMVOC eq	0,02	2,19E-04	9,40E-04	0,02	0	7,70E-05	0	1,43E-05	-0,01
ADP mineral/metal	kg Sb eq	8,46E-05	1,93E-07	1,64E-06	8,64E-05	0	1,37E-07	0	7,35E-09	-6,91E-05
ADP (fossil fuels)	MJ	66,42	0,81	7,23	74,47	0	0,32	0	0,05	-40,55
WDP	M ³	1,77	2,21E-03	0,08	1,85	0	1,11E-03	0	1,01E-03	-1,22

Other environmental indicators

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
GWP-GHG	kg CO2 eq	5,93	0,05	0,45	6,43	0	0,02	0	2,59E-03	-4,15

Consumption of resources

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Renewable primary energy (energy carrier)	MJ	33,95	0,01	0,35	34,31	0	0,01	0	2,26E-03	-29,65
Renewable primary energy (raw materials)	MJ	0	0	0	0	0	0	0	0	0
Renewable primary energy TOTAL	MJ	33,95	0,01	0,35	34,31	0	0,01	0	2,26E-03	-29,65
Non-renewable primary energy (energy carrier)	MJ	61,67	0,81	7,00	69,49	0	0,32	0	0,05	-40,55
Non-renewable primary energy (raw materials)	MJ	4,75	0	0,23	4,98	0	0	0	0	0
Non-renewable primary energy TOTAL	MJ	66,42	0,81	7,23	74,47	0	0,32	0	0,05	-40,55

Environmental impacts MAS129TT

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Global warming (GWP fossile)	kg CO2 eq	6,08	0,05	0,51	6,63	0	0,02	0	5,36E-02	-4,68
Global warming (GWP bio-genico)	kg CO2 eq	0,02	1,08E-04	4,71E-03	0,03	0	8,25E-05	0	4,67E-04	-0,01
Global warming (GWP-luluc)	kg CO2 eq	0,10	1,52E-05	1,15E-04	0,10	0	1,27E-05	0	1,33E-05	-0,09
Global warming (GWP-totale)	kg CO2 eq	6,20	0,05	0,51	6,76	0	0,02	0	5,40E-02	-4,79
Ozone layer depletion (ODP)	kg CFC-11 eq	5,17E-07	1,02E-08	6,43E-08	5,92E-07	0	5,04E-09	0	9,66E-09	-3,36E-07
AP	Mol H ⁺ eq	0,04	1,81E-04	1,60E-03	0,05	0	8,97E-05	0	2,06E-04	-0,04
EP fresh water	kg PO4 ³⁻ eq	6,77E-03	9,31E-06	2,24E-04	0,01	0	7,02E-06	0	2,15E-05	-0,01
EP fresh water	kg P eq	2,21E-03	3,03E-06	7,29E-05	2,28E-03	0	2,29E-06	0	7,01E-06	-1,87E-03
EP aquatic	Kg N eq	6,20E-03	5,53E-05	2,81E-04	0,01	0	2,53E-05	0	4,90E-05	-4,86E-03
EP land	Mol N eq	0,06	6,04E-04	2,80E-03	0,07	0	2,75E-04	0	5,28E-04	-0,05
POFP	Kg NMVOC eq	0,02	1,85E-04	1,04E-03	0,02	0	8,56E-05	0	1,58E-04	-0,02
ADP mineral/metal	kg Sb eq	8,87E-05	1,63E-07	1,81E-06	9,06E-05	0	1,53E-07	0	1,48E-07	-7,66E-05
ADP (fossil fuels)	MJ	63,42	0,68	7,99	72,10	0	0,35	0	0,81	-45,00
WDP	M ³	1,66	1,87E-03	0,09	1,74	0	1,24E-03	0	3,69E-03	-1,35

Other environmental indicators

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
GWP-GHG	kg CO2 eq	5,97	0,04	0,50	6,51	0	0,02	0	5,29E-02	-4,60

Consumption of resources

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Renewable primary energy (energy carrier)	MJ	37,11	0,01	0,39	37,51	0	0,01	0	2,73E-02	-32,90
Renewable primary energy (raw materials)	MJ	0	0	0	0	0	0	0	0	0
Renewable primary energy TOTAL	MJ	37,11	0,01	0,39	37,51	0	0,01	0	2,73E-02	-32,90
Non-renewable primary energy (energy carrier)	MJ	62,02	0,68	7,76	70,46	0	0,35	0	0,81	-45,00
Non-renewable primary energy (raw materials)	MJ	1,40	0	0,23	1,63	0	0	0	0	0
Non-renewable primary energy TOTAL	MJ	63,42	0,68	7,99	72,10	0	0,35	0	0,81	-45,00

Environmental impacts MAS170TT

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Global warming (GWP fossile)	kg CO2 eq	6,07	0,05	0,49	6,61	0	0,02	0	2,82E-03	-4,51
Global warming (GWP bio-genico)	kg CO2 eq	0,03	1,16E-04	4,52E-03	0,03	0	7,93E-05	0	6,26E-05	-0,01
Global warming (GWP-luluc)	kg CO2 eq	0,10	1,63E-05	1,11E-04	0,10	0	1,22E-05	0	1,35E-06	-0,09
Global warming (GWP-totale)	kg CO2 eq	6,20	0,05	0,49	6,74	0	0,02	0	2,88E-03	-4,61
Ozone layer depletion (ODP)	kg CFC-11 eq	5,22E-07	1,10E-08	6,18E-08	5,95E-07	0	4,85E-09	0	4,82E-10	-3,24E-07
AP	Mol H ⁺ eq	0,04	1,94E-04	1,54E-03	0,05	0	8,62E-05	0	1,64E-05	-0,04
EP fresh water	kg PO4 ³⁻ eq	6,66E-03	1,00E-05	2,16E-04	0,01	0	6,74E-06	0	2,37E-06	-0,01
EP fresh water	kg P eq	2,17E-03	3,26E-06	7,02E-05	2,24E-03	0	2,20E-06	0	7,72E-07	-1,80E-03
EP aquatic	Kg N eq	6,14E-03	5,95E-05	2,71E-04	0,01	0	2,43E-05	0	4,71E-06	-4,67E-03
EP land	Mol N eq	0,06	6,49E-04	2,70E-03	0,07	0	2,64E-04	0	5,10E-05	-0,05
POFP	Kg NMVOC eq	0,02	1,98E-04	1,00E-03	0,02	0	8,23E-05	0	1,52E-05	-0,02
ADP mineral/metal	kg Sb eq	8,71E-05	1,75E-07	1,75E-06	8,91E-05	0	1,47E-07	0	7,86E-09	-7,37E-05
ADP (fossil fuels)	MJ	64,68	0,73	7,70	73,11	0	0,34	0	0,05	-43,29
WDP	M ³	1,70	2,01E-03	0,08	1,79	0	1,19E-03	0	1,08E-03	-1,30

Other environmental indicators

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
GWP-GHG	kg CO2 eq	5,96	0,05	0,48	6,48	0	0,02	0	2,76E-03	-4,43

Consumption of resources

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Renewable primary energy (energy carrier)	MJ	35,89	0,01	0,37	36,28	0	0,01	0	2,41E-03	-31,65
Renewable primary energy (raw materials)	MJ	0	0	0	0	0	0	0	0	0
Renewable primary energy TOTAL	MJ	35,89	0,01	0,37	36,28	0	0,01	0	2,41E-03	-31,65
Non-renewable primary energy (energy carrier)	MJ	61,95	0,73	7,47	70,15	0	0,34	0	0,05	-43,29
Non-renewable primary energy (raw materials)	MJ	2,74	0	0,23	2,97	0	0	0	0	0
Non-renewable primary energy TOTAL	MJ	64,68	0,73	7,70	73,11	0	0,34	0	0,05	-43,29

Environmental impacts MAXVISION

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Global warming (GWP fossile)	kg CO2 eq	6,07	0,05	0,51	6,63	0	0,02	0	2,93E-03	-4,69
Global warming (GWP bio-genico)	kg CO2 eq	0,02	1,08E-04	4,71E-03	0,03	0	8,24E-05	0	6,51E-05	-0,01
Global warming (GWP-luluc)	kg CO2 eq	0,10	1,52E-05	1,14E-04	0,10	0	1,27E-05	0	1,40E-06	-0,09
Global warming (GWP-totale)	kg CO2 eq	6,20	0,05	0,51	6,76	0	0,02	0	3,00E-03	-4,80
Ozone layer depletion (ODP)	kg CFC-11 eq	5,17E-07	1,03E-08	6,42E-08	5,92E-07	0	5,04E-09	0	5,01E-10	-3,37E-07
AP	Mol H ⁺ eq	0,04	1,81E-04	1,60E-03	0,05	0	8,96E-05	0	1,70E-05	-0,04
EP fresh water	kg PO4 ³⁻ eq	6,77E-03	9,33E-06	2,24E-04	0,01	0	7,01E-06	0	2,46E-06	-0,01
EP fresh water	kg P eq	2,20E-03	3,04E-06	7,28E-05	2,28E-03	0	2,28E-06	0	8,02E-07	-1,87E-03
EP aquatic	Kg N eq	6,20E-03	5,54E-05	2,81E-04	0,01	0	2,53E-05	0	4,90E-06	-4,86E-03
EP land	Mol N eq	0,06	6,05E-04	2,80E-03	0,07	0	2,75E-04	0	5,30E-05	-0,05
POFP	Kg NMVOC eq	0,02	1,85E-04	1,04E-03	0,02	0	8,55E-05	0	1,58E-05	-0,02
ADP mineral/metal	kg Sb eq	8,86E-05	1,63E-07	1,81E-06	9,06E-05	0	1,53E-07	0	8,17E-09	-7,67E-05
ADP (fossil fuels)	MJ	63,46	0,68	7,98	72,12	0	0,35	0	0,05	-45,05
WDP	M ³	1,66	1,87E-03	0,09	1,75	0	1,24E-03	0	1,12E-03	-1,35

Other environmental indicators

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
GWP-GHG	kg CO2 eq	5,97	0,04	0,50	6,51	0	0,02	0	2,87E-03	-4,61

Consumption of resources

IMPACT	UNIT	A1	A2	A3	Tot. A1-A3	C1	C2	C3	C4	D
Renewable primary energy (energy carrier)	MJ	37,08	0,01	0,39	37,48	0	0,01	0	2,51E-03	-32,94
Renewable primary energy (raw materials)	MJ	0	0	0	0	0	0	0	0	0
Renewable primary energy TOTAL	MJ	37,08	0,01	0,39	37,48	0	0,01	0	2,51E-03	-32,94
Non-renewable primary energy (energy carrier)	MJ	62,02	0,68	7,75	70,45	0	0,35	0	0,05	-45,05
Non-renewable primary energy (raw materials)	MJ	1,44	0	0,23	1,67	0	0	0	0	0
Non-renewable primary energy TOTAL	MJ	63,46	0,68	7,98	72,12	0	0,35	0	0,05	-45,05



