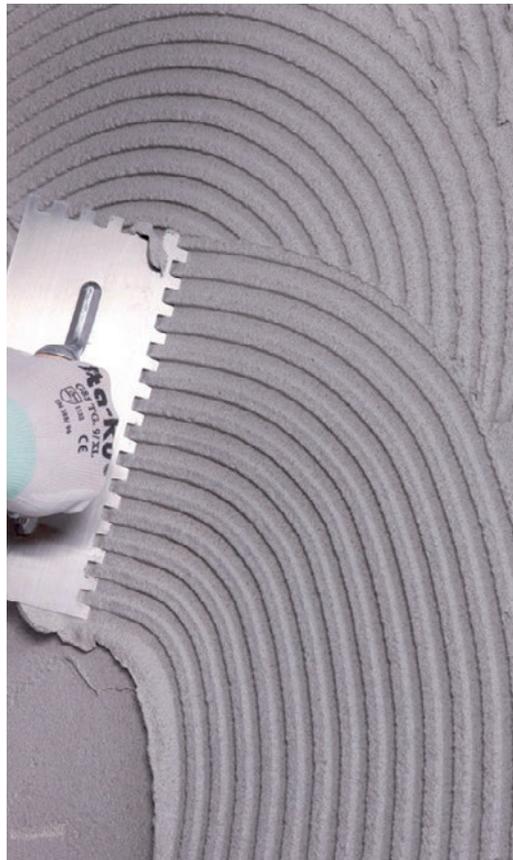




# ENVIRONMENTAL PRODUCT DECLARATION

*In accordance with ISO 14025 for*

**Mapetherm AR1**  
**Mapetherm AR1 GG**  
**Mapetherm AR1 Light**



Programme:  
**The International  
EPD<sup>®</sup> System;**  
[www.environdec.com](http://www.environdec.com)

Programme  
operator:  
**EPD International AB**

EPD registration  
number:  
**S-P-01012**

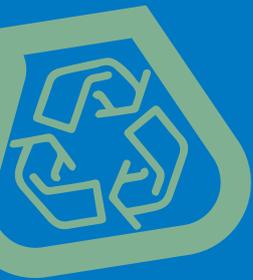
Publication  
date:  
**2017-11-07**

Valid until:  
**2023-11-19**

Geographical  
scope:  
**International**

Revision:  
**2018-11-20**





## 1. COMPANY DESCRIPTION / GOAL & SCOPE

Founded in 1937 in Milan, Italy, Mapei produces adhesives and complementary products for laying all types of floor, wall and coating materials, and also specializes in other chemical products used in the building industry, such as waterproofing products, specialty mortars, admixtures for concrete, products for underground constructions and for the restoration of concrete and historical buildings.

There are currently 85 subsidiaries in the Mapei Group, with a total of 80 production facilities located around the world in 35 different countries and in 5 different continents. Mapei also has 18 central laboratories. Most locations are ISO 9001 and ISO 14001 or EMAS-certified.

Mapei's strategy of internationalization is based on two main objectives: being closer to local needs and lowering transportation costs. With the declared objective of being close to buyers and clients, Mapei's presence in the five continents enables the company to comply with the requirements of each location, and to use only locally-based managers and qualified personnel, without changing the approach of Mapei.

Mapei invests 12% in its company's total work-force and 5% of its turnover in Research & Development; in particular, 70% of its R&D efforts are directed to develop eco-sustainable and environmentally friendly products, which give important contribution to all major green rating systems for eco-sustainable buildings such as LEED and BREEAM.

Furthermore, Mapei has developed a sales and technical service network with offices all over the world and offers an efficient Technical Assistance Service that is valued by architects, engineers, contractors and owners.

The goal of the study is to provide necessary data and documentation to produce an EPD according to the requirements of PCR Environdec (version 2.2, 2017-05-30) under EN 15804:2014 and to have more comprehension about the environmental impacts related to **Mapetherm ARI**, **Mapetherm ARI GG** and **Mapetherm ARI Light** manufactured in Mapei S.p.A. located in Robbiano di Mediglia (Italy), Latina (Italy), Sassuolo (Italy), Fiorano (Italy) and in Mapei As located in Sagstua (Norway) including packaging of the finished products.

Target audiences of the study are customers and other parties with an interest in the environmental impacts of **Mapetherm ARI**, **Mapetherm ARI GG** and **Mapetherm ARI Light**.

This analysis shall not support comparative assertions intended to be disclosed to the public.

## 2. PRODUCT DESCRIPTION

**Mapetherm ARI**, **Mapetherm ARI GG** and **Mapetherm ARI Light** are one component cementitious mortars for bonding and levelling thermal insulating panels and insulation cladding systems.

**Mapetherm ARI** and **Mapetherm ARI GG** are supplied in 25 kg multiply bags. **Mapetherm ARI Light** is supplied in 23 kg multiply bags.

These three products are compliant with EN 998-1.

## 3. CONTENT DECLARATION

The main components and ancillary materials of **Mapetherm ARI**, **Mapetherm ARI GG** and **Mapetherm ARI Light** are the following:

Table 1: Composition

Materials	Percentage (%)
Inorganic binders	< 30
Organic binders	< 5
Fillers	< 80
Recycled materials	≤ 7
Additives	< 1
Others (Packaging, ...)	< 2
Other	≤ 3

The products contain neither carcinogenic substances nor substances of very high concern (SVHC) on the REACH Candidate List published by the European Chemicals Agency in a concentration more than 0,1 % (by unit weight).



**Mapetherm ARI**  
**Mapetherm ARI GG**  
**Mapetherm ARI Light**



## 4. DECLARED UNIT AND REFERENCE SERVICE LIFE

The declared unit is 1 kg of powder (packaging included).

Packaging materials include:

- Wooden pallet
- Multipliy bags (paper/PE/paper)
- LDPE used as wrapping material

Due to the selected system boundary, the reference service life of the products is not specified.

## 5. SYSTEM BOUNDARIES AND ADDITIONAL TECHNICAL INFORMATION

The approach is “cradle to gate”.

The following modules have been considered:

- A1, A2, A3 (Product stage): extraction and transport of raw materials, packaging included, and manufacturing process.

Table 2: System boundaries

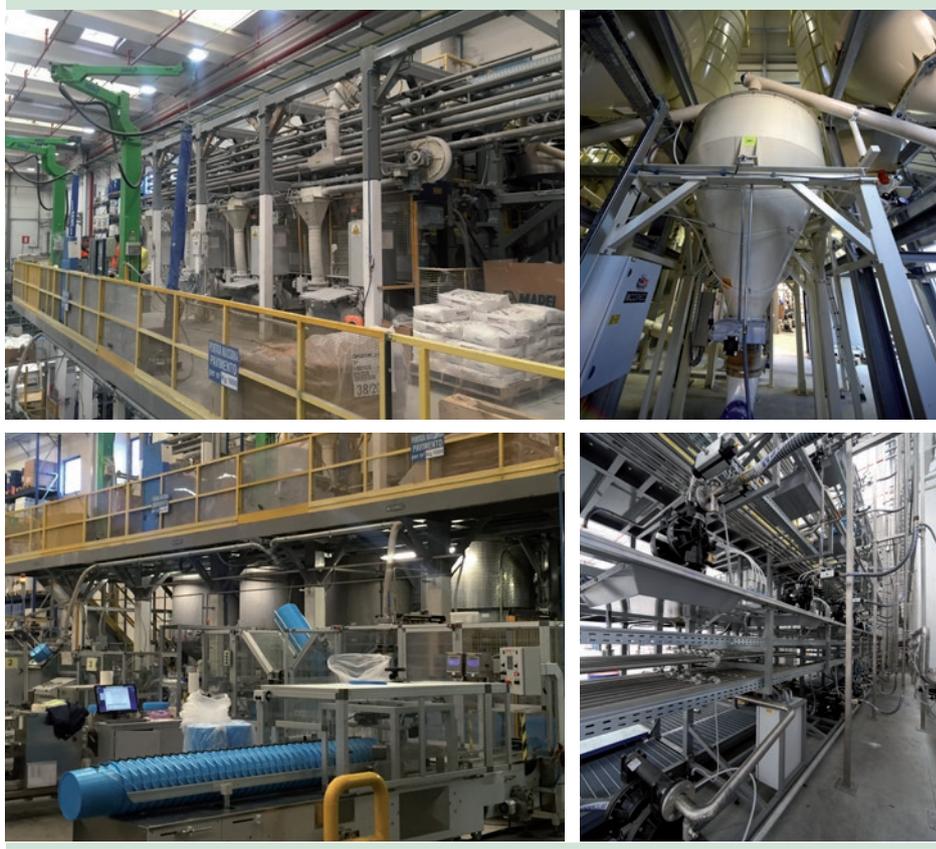
System Boundaries														
A1 – A3			A4 – A5		B1 – B7					C1 – C4				D
PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE					END OF LIFE STAGE				
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	
Raw Material Supply	Transport	Manufacturing	Transport	Installation Process	Use	Maintenance	Repair	Replacement	Refurbishment	Deconstruction/ Demolition	Transport	Waste Processing	Disposal	
					B6	Operational Energy Use								
					B7	Operational Water Use								

included
  excluded

A brief description of production process is the following:

The production process starts from raw materials, that are purchased from external and intercompany suppliers and stored in the plant. Bulk raw materials are stored in specific silos and added automatically in the production mixer, according to the formula of the product. Other raw materials, supplied in bags or big bags, are stored in their warehouse and added automatically or manually in the mixer. The production is a discontinuous process, in which all the components are mechanically mixed in batches. The semi-finished product is then packaged, put on wooden pallets, covered by stretched hoods and stored in the Finished Products' warehouse. The quality of final products is controlled before the sale.

Figure 1: Production process detail



**Mapetherm AR1**  
**Mapetherm AR1 GG**  
**Mapetherm AR1 Light**



Figure 2: Sagstua Plant



## 6. CUT-OFF RULES & ALLOCATION

Criteria for the exclusion of inputs and outputs (cut-off rules) in the LCA, information modules and any additional information are intended to support an efficient calculation procedure. They are not applied in order to hide data.

The following procedure is followed for the exclusion of inputs and outputs:

- All inputs and outputs to a unit process, for which data are available, are included in the calculation.
- Cut-off rules, where applied, are described in Table 3.

Input flows are covered for the whole formula.

Table 3: Cut-off criteria

Process excluded from study	Cut-off criteria	Quantified contribution from process
A3: production (auxiliary materials)	Less than $10^{-5}$ kg/kg of finished product	Sensitivity study demonstrates a relative contribution lower than 0,5%
A3: waste and particle emission	Less than $10^{-5}$ kg/kg of finished product	Sensitivity study demonstrates a relative contribution lower than 0,5%

For the allocation procedure and principles, consider the following table (Table 4).

Table 4: Allocation procedure and principles

Module	Allocation Principle
A1	All data are referred to 1 kg of powder <ul style="list-style-type: none"> <li>• A1: electricity is allocated to the whole plant (for Italian plants) and to mortar plant (for Norwegian plant)</li> </ul>
A3	All data are referred to 1 kg of powder packaged product <ul style="list-style-type: none"> <li>• A3-wastes: all data are allocated to the whole plant (for the Italian plants) and to the mortar plant (for Norwegian plant)</li> </ul>

Mapetherm AR1  
Mapetherm AR1 GG  
Mapetherm AR1 Light



## 7. ENVIRONMENTAL PERFORMANCE & INTERPRETATION



### **GWP<sub>100</sub>**

Global Warming Potential refers to the emission/presence of GHGs (greenhouse gases) in the atmosphere (mainly CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>) which contribute to the increase in the temperature of the planet.



### **AP**

Acidification Potential refers to the emission of specific acidifying substances (i.e. NO<sub>x</sub>, SO<sub>x</sub>) in the air. These substances decrease the pH of the rainfall with predictable damages to the ecosystem.



### **EP**

Eutrophication Potential refers to the nutrient enrichment of flowing water, which determines unbalance in aquatic ecosystems and causes the death of the aquatic fauna.



### **ODP**

Ozone Depletion Potential refers to the degradation of the stratospheric layer of the ozone involved in blocking the UV component of sunrays. Depletion is due to particularly reactive components that originate from chlorofluorocarbon (CFC) or chlorofluoromethanes (CFM).



### **POCP**

The Photochemical Ozone Creation Potential is the ozone formation in low atmosphere. This is quite common in the cities where a great amount of pollutants (like VOC and NO<sub>x</sub>) are emitted every day (industrial emissions and vehicles). It is mainly diffused during the summertime.



### **ADP<sub>e</sub> (elements)**

Abiotic Depletion Potential elements refers to the depletion of the mineral resources.



### **ADP<sub>f</sub> (fossil fuel)**

Abiotic Depletion Potential fossil fuel refers to the depletion of the fossil fuel resources.

Following tables show environmental impacts for the products considered according to CML methodology (2001 – Jan2016). All the results are referred to the declared unit (see chapter § 4).

## Mapetherm AR1

(Italian production)

Table 5: **Mapetherm AR1** (average Italian production): Environmental categories referred to the declared unit

Environmental category	Unit	A1 – A3
 <b>GWP<sub>100</sub></b>	(kg CO <sub>2</sub> eq.)	3,00E-01
 <b>ADPe (element)</b>	(kg Sb eq.)	1,02E-07
 <b>ADPf (fossil)</b>	(MJ)	3,71E+00
 <b>AP</b>	(kg SO <sub>2</sub> eq.)	2,88E-04
 <b>EP</b>	(kg (PO <sub>4</sub> ) <sup>3</sup> eq.)	9,50E-05
 <b>ODP</b>	(kg R-11 eq.)	1,07E-08
 <b>POCP</b>	(kg ethylene eq.)	1,31E-04

**GWP<sub>100</sub>**: Global Warming Potential; **ADPe**: Abiotic Depletion Potential (elements); **EP**: Eutrophication Potential; **AP**: Acidification Potential; **POCP**: Photochemical Ozone Creation Potential; **ODP**: Ozone Depletion Potential; **ADPf**: Abiotic Depletion Potential (fossil)

Mapetherm AR1  
Mapetherm AR1 GG  
Mapetherm AR1 Light

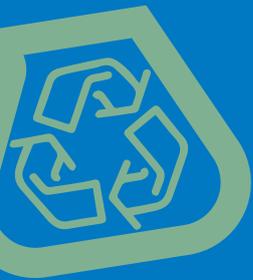


Table 6: **Mapetherm ARI** (average Italian production): Other environmental indicators referred to the declared unit

Environmental Indicator	Unit	A1-A3
RPEE	MJ	4,24E-01
RPEM	MJ	-
TPE	MJ	4,24E-01
NRPE	MJ	3,79E+00
NRPM	MJ	-
TRPE	MJ	3,79E+00
SM	kg	-
RSF	MJ	-
NRSF	MJ	-
W	m <sup>3</sup>	1,74E-03

**RPEE** Renewable primary energy as energy carrier; **RPEM** Renewable primary energy as material utilisation; **TPE** Total use of renewable primary energy sources; **NRPE** Non-renewable primary energy as energy carrier; **NRPM** Non-renewable primary energy as material utilization; **TRPE** Total use of non-renewable primary energy sources; **SM** Use of secondary materials; **RSF** Renewable secondary fuels; **NRSF** Non-renewable secondary fuels; **W** Net use of fresh water

Table 7: **Mapetherm ARI** (average Italian production): Waste production and other output flows referred to the declared unit

Output flow	Unit	A1-A3
NHW	kg	2,39E-05
HW	kg	9,67E-08
RW	kg	0,00E+00
Components for re-use	kg	-
Materials for recycling	kg	-
Materials for energy recovery	kg	-
Exported energy	MJ	-

**HW** Hazardous waste disposed; **NHW** Non Hazardous waste disposed; **RW** Radioactive waste disposed

## Mapetherm AR1 GG grey

(Italian production)

Table 8: **Mapetherm AR1 GG grey** (average Italian production): Environmental categories referred to the declared unit

Environmental category	Unit	A1 – A3
 <b>GWP<sub>100</sub></b>	(kg CO <sub>2</sub> eq.)	3,28E-01
 <b>ADPe (element)</b>	(kg Sb eq.)	1,81E-07
 <b>ADPf (fossil)</b>	(MJ)	3,11E+00
 <b>AP</b>	(kg SO <sub>2</sub> eq.)	2,60E-04
 <b>EP</b>	(kg (PO <sub>4</sub> ) <sup>3-</sup> eq.)	1,11E-04
 <b>ODP</b>	(kg R-11 eq.)	1,45E-08
 <b>POCP</b>	(kg ethylene eq.)	1,49E-04

**GWP<sub>100</sub>**: Global Warming Potential; **ADPe**: Abiotic Depletion Potential (elements); **EP**: Eutrophication Potential; **AP**: Acidification Potential; **POCP**: Photochemical Ozone Creation Potential; **ODP**: Ozone Depletion Potential; **ADPf**: Abiotic Depletion Potential (fossil)

Mapetherm AR1  
Mapetherm AR1 GG  
Mapetherm AR1 Light

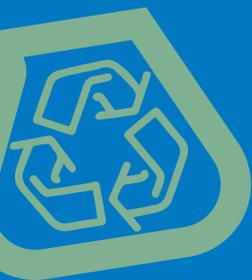


Table 9: **Mapetherm ARI GG grey** (average Italian production): Other environmental indicators referred to the declared unit

Environmental Indicator	Unit	A1-A3
RPEE	MJ	4,25E-01
RPEM	MJ	-
TPE	MJ	4,25E-01
NRPE	MJ	3,18E+00
NRPM	MJ	-
TRPE	MJ	3,18E+00
SM	kg	-
RSF	MJ	-
NRSF	MJ	-
W	m <sup>3</sup>	1,40E-03

**RPEE** Renewable primary energy as energy carrier; **RPEM** Renewable primary energy as material utilisation; **TPE** Total use of renewable primary energy sources; **NRPE** Non-renewable primary energy as energy carrier; **NRPM** Non-renewable primary energy as material utilization; **TRPE** Total use of non-renewable primary energy sources; **SM** Use of secondary materials; **RSF** Renewable secondary fuels; **NRSF** Non-renewable secondary fuels; **W** Net use of fresh water

Table 10: **Mapetherm ARI GG grey** (average Italian production): Waste production and other output flows referred to the declared unit

Output flow	Unit	A1-A3
NHW	kg	2,55E-05
HW	kg	6,50E-08
RW	kg	0,00E+00
Components for re-use	kg	-
Materials for recycling	kg	-
Materials for energy recovery	kg	-
Exported energy	MJ	-

**HW** Hazardous waste disposed; **NHW** Non Hazardous waste disposed; **RW** Radioactive waste disposed

## Mapetherm AR1 GG grey

(Norwegian production)

Table 11: **Mapetherm AR1 GG grey** (produced in Norwegian plant); Environmental categories referred to the declared unit

Environmental category	Unit	A1 – A3
 <b>GWP<sub>100</sub></b>	(kg CO <sub>2</sub> eq.)	2,88E-01
 <b>ADPe (element)</b>	(kg Sb eq.)	1,98E-07
 <b>ADPf (fossil)</b>	(MJ)	2,41E+00
 <b>AP</b>	(kg SO <sub>2</sub> eq.)	3,33E-04
 <b>EP</b>	(kg (PO <sub>4</sub> ) <sup>3-</sup> eq.)	1,50E-04
 <b>ODP</b>	(kg R-11 eq.)	2,00E-09
 <b>POCP</b>	(kg ethylene eq.)	2,74E-05

**GWP<sub>100</sub>**: Global Warming Potential; **ADPe**: Abiotic Depletion Potential (elements); **EP**: Eutrophication Potential; **AP**: Acidification Potential; **POCP**: Photochemical Ozone Creation Potential; **ODP**: Ozone Depletion Potential; **ADPf**: Abiotic Depletion Potential (fossil)

Mapetherm AR1  
Mapetherm AR1 GG  
Mapetherm AR1 Light



Table 12: **Mapetherm ARI GG grey** (produced in Norwegian plant); Other environmental indicators referred to the declared unit

Environmental Indicator	Unit	A1-A3
RPEE	MJ	6,43E-01
RPEM	MJ	-
TPE	MJ	6,43E-01
NRPE	MJ	2,48E+00
NRPM	MJ	-
TRPE	MJ	2,48E+00
SM	kg	-
RSF	MJ	-
NRSF	MJ	-
W	m <sup>3</sup>	1,59E-03

**RPEE** Renewable primary energy as energy carrier; **RPEM** Renewable primary energy as material utilisation; **TPE** Total use of renewable primary energy sources; **NRPE** Non-renewable primary energy as energy carrier; **NRPM** Non-renewable primary energy as material utilization; **TRPE** Total use of non-renewable primary energy sources; **SM** Use of secondary materials; **RSF** Renewable secondary fuels; **NRSF** Non-renewable secondary fuels; **W** Net use of fresh water

Table 13: **Mapetherm ARI GG grey** (produced in Norwegian plant); Waste production and other output flows referred to the declared unit

Output flow	Unit	A1-A3
NHW	kg	8,62E-05
HW	kg	0,00E+00
RW	kg	0,00E+00
Components for re-use	kg	-
Materials for recycling	kg	-
Materials for energy recovery	kg	-
Exported energy	MJ	-

**HW** Hazardous waste disposed; **NHW** Non Hazardous waste disposed; **RW** Radioactive waste disposed

## Mapetherm AR1 GG white

(Italian production)

Table 14: **Mapetherm AR1 GG white** (average Italian production): Environmental categories referred to the declared unit

Environmental category	Unit	A1 – A3
 <b>GWP<sub>100</sub></b>	(kg CO <sub>2</sub> eq.)	3,63E-01
 <b>ADPe (element)</b>	(kg Sb eq.)	1,79E-07
 <b>ADPf (fossil)</b>	(MJ)	2,27E+00
 <b>AP</b>	(kg SO <sub>2</sub> eq.)	3,54E-04
 <b>EP</b>	(kg (PO <sub>4</sub> ) <sup>3</sup> eq.)	1,93E-04
 <b>ODP</b>	(kg R-11 eq.)	6,08E-09
 <b>POCP</b>	(kg ethylene eq.)	2,65E-05

**GWP<sub>100</sub>**: Global Warming Potential; **ADPe**: Abiotic Depletion Potential (elements); **EP**: Eutrophication Potential; **AP**: Acidification Potential; **POCP**: Photochemical Ozone Creation Potential; **ODP**: Ozone Depletion Potential; **ADPf**: Abiotic Depletion Potential (fossil)

Mapetherm AR1  
Mapetherm AR1 GG  
Mapetherm AR1 Light

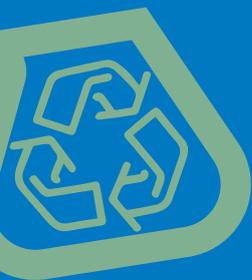


Table 15: **Mapetherm ARI GG white** (average Italian production): Other environmental indicators referred to the declared unit/declared unit

Environmental Indicator	Unit	A1-A3
RPEE	MJ	4,40E-01
RPEM	MJ	-
TPE	MJ	4,40E-01
NRPE	MJ	2,33E+00
NRPM	MJ	-
TRPE	MJ	2,33E+00
SM	kg	-
RSF	MJ	-
NRSF	MJ	-
W	m <sup>3</sup>	1,26E-03

**RPEE** Renewable primary energy as energy carrier; **RPEM** Renewable primary energy as material utilisation; **TPE** Total use of renewable primary energy sources; **NRPE** Non-renewable primary energy as energy carrier; **NRPM** Non-renewable primary energy as material utilization; **TRPE** Total use of non-renewable primary energy sources; **SM** Use of secondary materials; **RSF** Renewable secondary fuels; **NRSF** Non-renewable secondary fuels; **W** Net use of fresh water

Table 16: **Mapetherm ARI GG white** (average Italian production): Waste production and other output flows referred to the declared unit/declared unit

Output flow	Unit	A1-A3
NHW	kg	3,30E-05
HW	kg	8,06E-07
RW	kg	0,00E+00
Components for re-use	kg	-
Materials for recycling	kg	-
Materials for energy recovery	kg	-
Exported energy	MJ	-

**HW** Hazardous waste disposed; **NHW** Non Hazardous waste disposed; **RW** Radioactive waste disposed

## Mapetherm AR1 Light

(Italian production)

Table 17: **Mapetherm AR1 Light white** (Italian production); Environmental categories referred to the declared unit

Environmental category	Unit	A1 – A3
 <b>GWP<sub>100</sub></b>	(kg CO <sub>2</sub> eq.)	3,68E-01
 <b>ADPe (element)</b>	(kg Sb eq.)	3,51E-07
 <b>ADPf (fossil)</b>	(MJ)	2,31E+00
 <b>AP</b>	(kg SO <sub>2</sub> eq.)	3,81E-04
 <b>EP</b>	(kg (PO <sub>4</sub> ) <sup>3</sup> eq.)	2,06E-04
 <b>ODP</b>	(kg R-11 eq.)	6,08E-09
 <b>POCP</b>	(kg ethylene eq.)	2,63E-05

**GWP<sub>100</sub>**: Global Warming Potential; **ADPe**: Abiotic Depletion Potential (elements); **EP**: Eutrophication Potential; **AP**: Acidification Potential; **POCP**: Photochemical Ozone Creation Potential; **ODP**: Ozone Depletion Potential; **ADPf**: Abiotic Depletion Potential (fossil)

Mapetherm AR1  
Mapetherm AR1 GG  
Mapetherm AR1 Light

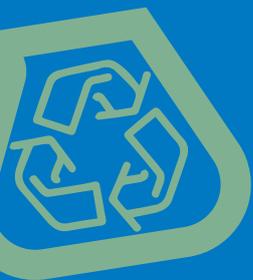


Table 18: **Mapetherm ARI Light white** (Italian production): Other environmental indicators referred to the declared unit

Environmental Indicator	Unit	A1-A3
RPEE	MJ	4,92E-01
RPEM	MJ	-
TPE	MJ	4,92E-01
NRPE	MJ	2,38E+00
NRPM	MJ	-
TRPE	MJ	2,38E+00
SM	kg	6,93E-02
RSF	MJ	-
NRSF	MJ	-
W	m <sup>3</sup>	2,19E-03

**RPEE** Renewable primary energy as energy carrier; **RPEM** Renewable primary energy as material utilisation; **TPE** Total use of renewable primary energy sources; **NRPE** Non-renewable primary energy as energy carrier; **NRPM** Non-renewable primary energy as material utilization; **TRPE** Total use of non-renewable primary energy sources; **SM** Use of secondary materials; **RSF** Renewable secondary fuels; **NRSF** Non-renewable secondary fuels; **W** Net use of fresh water

Table 19: **Mapetherm ARI Light white** (Italian production): Waste production and other output flows referred to the declared unit

Output flow	Unit	A1-A3
NHW	kg	2,50E-05
HW	kg	8,13E-07
RW	kg	0,00E+00
Components for re-use	kg	-
Materials for recycling	kg	-
Materials for energy recovery	kg	-
Exported energy	MJ	-

**HW** Hazardous waste disposed; **NHW** Non Hazardous waste disposed; **RW** Radioactive waste disposed

Tables above show absolute results for all the environmental impact categories. The calculations point out that module **A1** (raw materials extraction and processing) has the highest contribution for all of them, up to 99% of the total impact in the whole system boundary.

Organic and inorganic binders, which are some of the main components in the formulations, carry a significant impact for all environmental categories. Focus on  $GWP_{100}$  are shown in Table 25.

Electricity consumption during the production process doesn't affect considerably the impacts.

The module **A2** (raw materials transport) gives a negative contribution to POCP due to the NO and NO<sub>2</sub> emission factors (for more details, see the methodology used: HBEFA - Handbook Emission Factors for Road Transport).

A specific amount of recycled material is used in **Mapetherm AR1 Light** formulation and the value is shown in Table 18 as SM (secondary material) indicator.

Table 20: Environmental Impact as percentage – **Mapetherm AR1** (Italian production)

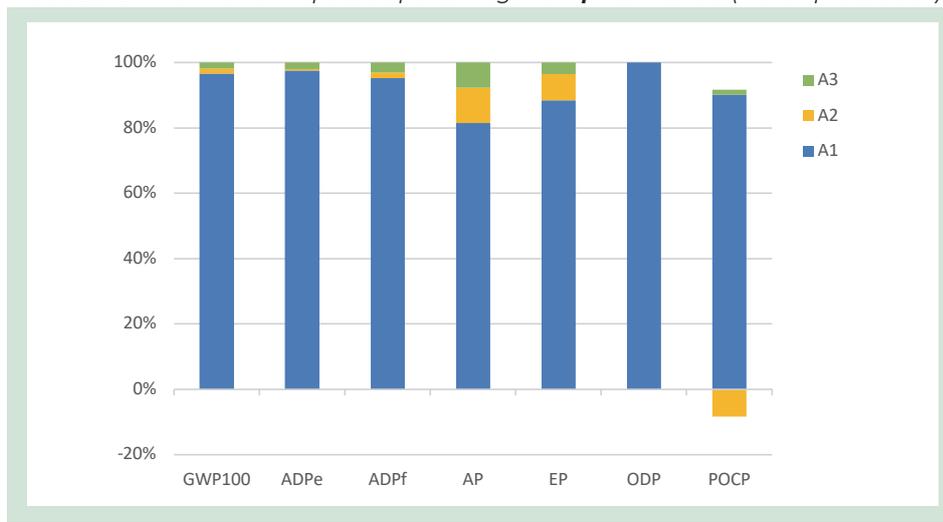




Table 21: Environmental Impact as percentage – **Mapetherm ARI GG grey** (Italian production)

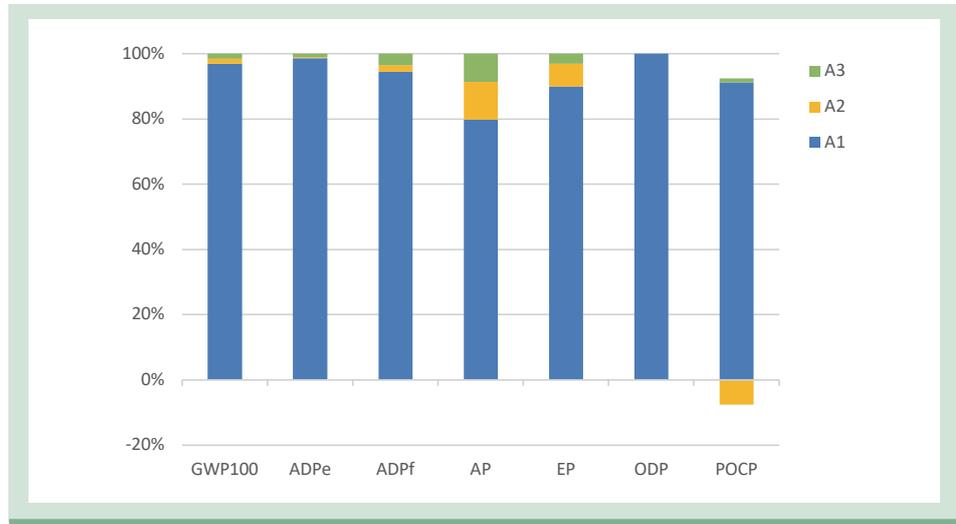


Table 22: Environmental Impact as percentage – **Mapetherm ARI GG grey** (Norwegian production)

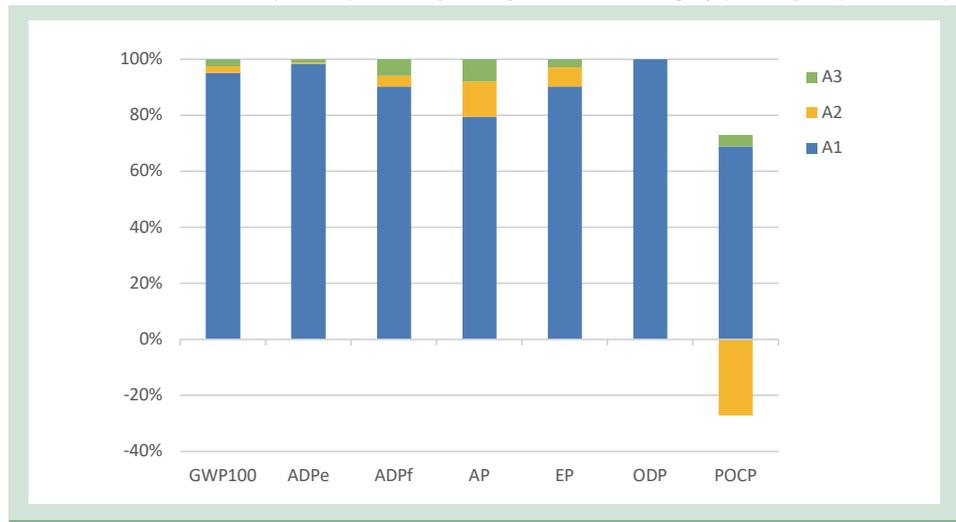
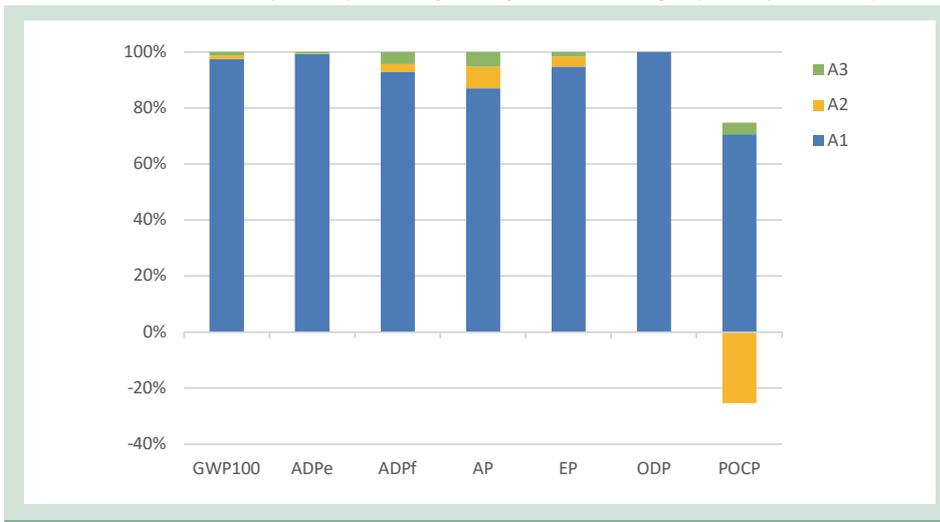


Table 23: Environmental Impact as percentage – **Mapetherm AR1 GG white** (Italian production)



Table 24: Environmental Impact as percentage – **Mapetherm AR1 Light** (Italian production)

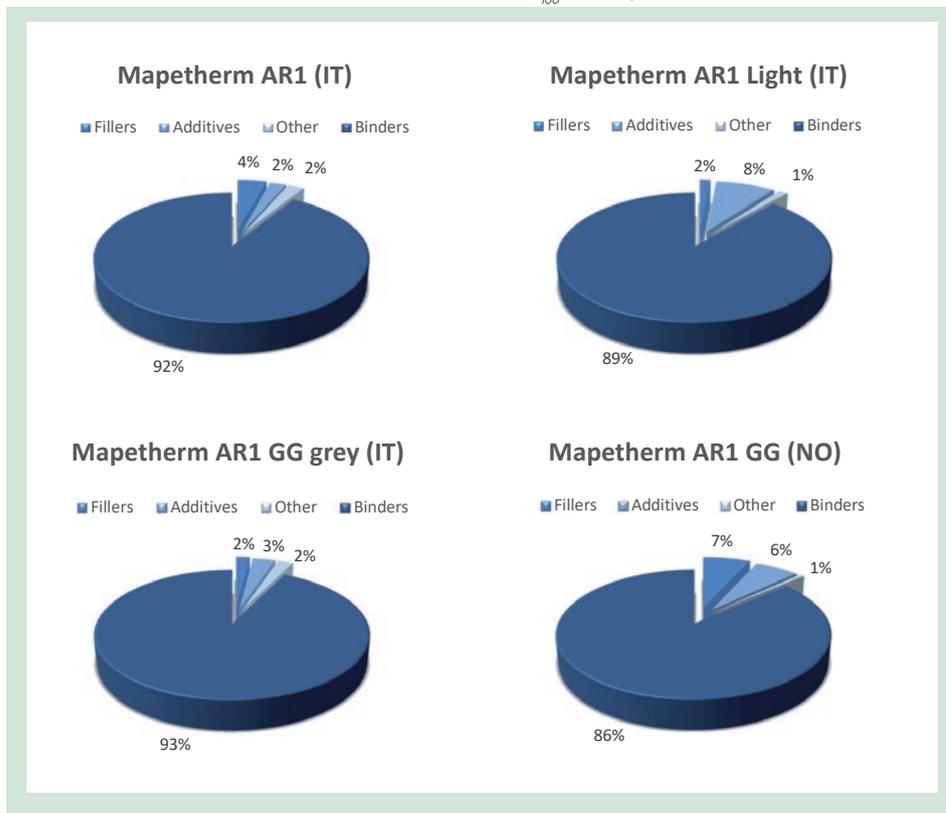


**Mapetherm AR1**  
**Mapetherm AR1 GG**  
**Mapetherm AR1 Light**



The following graphs show the contribution of the module A1 to GWP<sub>100</sub> for the products considered.

Table 25: Relative contribution of the module A1 to GWP<sub>100</sub> for the products studied



More details about electrical mix used in this EPD, is shown below:

	Data source	Amount	Unit
Electricity grid mix (IT) – 2014	GaBi database	0,4020	kg CO <sub>2</sub> -eqv/kWh
Electricity from photovoltaic (IT) – 2014	GaBi database	0,0641	kg CO <sub>2</sub> -eqv/kWh
Electricity grid mix (NO) – 2014	GaBi database	0,0291	kg CO <sub>2</sub> -eqv/kWh

## 8. DATA QUALITY

Table 26: Data quality

Dataset & Geographical reference	Database (source)	Temporary reference
<b>A1; A3</b>		
PTL binder	EPD CEMEX: NEPD-1539-528-NO; EPD AITEC S-P-00880; EPD CIMSA: EPD-CIS-20150243- CAAI-EN	2018 2016 2015
Organic binders	GaBi Database	2012
Fillers (EU)	GaBi Database	2017
Electricity grid mix (NO, IT)	GaBi Database	2014
Additives & others (Packaging components)	GaBi Database; ecoinvent 3.3; PlasticEurope;	2005 – 2017
Electricity from photovoltaic (IT)	GaBi Database	2014
<b>A2</b>		
Truck transport (euro 3, 27ton payload – GLO)	GaBi Database	2017
Oceanic ship (27500 DWT - GLO)	GaBi Database	2017
Light Train (Gross Ton Weight 500 Tons - GLO)	GaBi Database	2017
Electricity mix (EU)	GaBi Database	2014
Diesel for transport (EU)	GaBi Database	2014
Heavy Fuel Oil (EU)	GaBi Database	2014

All data included in table above refer to a period between 2005 and 2017; the most relevant ones are European or specific from supplier, while the others (i.e. transport and minor contribution dataset), come from European and global databases.

All dataset are not more than 10 years old (according to EN 15804 § 6.3.7 “Data quality requirements”). The only exception is represented by one raw material used for one packaging component production coming from PlasticEurope database.

Primary data concern the year 2017 and represent the whole annual production.

**Mapetherm AR1**  
**Mapetherm AR1 GG**  
**Mapetherm AR1 Light**



## 9. SIGNIFICANT CHANGES FROM THE PREVIOUS VERSION

In this revision new primary data (referred to the reference year 2017) and new secondary data have been used for calculation. In addition, the new General Programme Instructions version 3.0 has been considered. Due to these updates, several environmental categories have changed more than  $\pm 10\%$  (GWP100, ADPf, AP, POCP, RPEE, NRPEE, W).

## 10. VERIFICATION AND REGISTRATION

EPD of construction products may not be comparable if they do not comply with EN 15804

Environmental product declarations within the same product category from different programs may not be comparable.

CEN standard EN15804 served as the core PCR	
PCR:	PCR 2012:01 Construction products and Construction services, Version 2.2, 2017-05-30
PCR review was conducted by:	The Technical Committee of the International EPD® System. Chair: Massimo Marino Contact via <a href="mailto:info@environdec.com">info@environdec.com</a>
Independent verification of the declaration and data, according to ISO 14025	<input checked="" type="checkbox"/> EPD Process Certification (Internal) <input type="checkbox"/> EPD Verification (external)
Third party verifier:	Certiquality S.r.l. Number of accreditation: 003H rev14
Accredited or approved by:	Accredia
Procedure for follow-up of data during EPD validity involves third-party verifier	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

## 11. REFERENCES

- EN 13813 “SCREED MATERIAL AND FLOOR SCREEDS. SCREED MATERIAL. PROPERTIES AND REQUIREMENTS”
- EN 15804: SUSTAINABILITY OF CONSTRUCTION WORKS - ENVIRONMENTAL PRODUCT DECLARATIONS - CORE RULES FOR THE PRODUCT CATEGORY OF CONSTRUCTION PRODUCTS
- GENERAL PROGRAMME INSTRUCTIONS OF THE INTERNATIONAL EPD® SYSTEM. VERSION 3.0
- HBEFA - HANDBOOK EMISSION FACTORS FOR ROAD TRANSPORT
- ISO 14025 ENVIRONMENTAL LABELS AND DECLARATIONS - TYPE III ENVIRONMENTAL DECLARATIONS - PRINCIPLES AND PROCEDURES
- ISO 14044 ENVIRONMENTAL MANAGEMENT - LIFE CYCLE ASSESSMENT - REQUIREMENTS AND GUIDELINES
- PCR 2012:01; “PRODUCT GROUP CLASSIFICATION: MULTIPLE UN CPC CODES CONSTRUCTION PRODUCTS AND CONSTRUCTION SERVICES”; VERSION 2.2

## CONTACT INFORMATION

EPD owner:	 <p><b>MAPEI</b><sup>®</sup> ADHESIVES • SEALANTS • CHEMICAL PRODUCTS FOR BUILDING</p> <p>Mapei AS <a href="http://www.mapei.com/NO-NO/">www.mapei.com/NO-NO/</a></p>
LCA Author:	 <p><b>MAPEI</b><sup>®</sup> ADHESIVES • SEALANTS • CHEMICAL PRODUCTS FOR BUILDING</p> <p>Mapei SpA <a href="http://www.mapei.it">www.mapei.it</a>; Environmental Sustainability Office</p>
Programme operator:	 <p><b>EPD</b><sup>®</sup></p> <p>EPD International AB <a href="mailto:info@environdec.com">info@environdec.com</a></p>

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**Mapetherm AR1 GG**  
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**SEDE**

**MAPEI SpA**

Via Cafiero, 22 - 20158 Milano

Tel. +39-02-37673.1

Fax +39-02-37673.214

Internet: [www.mapei.com](http://www.mapei.com)

E-mail: [mapei@mapei.it](mailto:mapei@mapei.it)



[/mapeispa](#)

