

Environmental Product Declaration

In accordance with ISO 14025 and EN 15804

INTUMESCENT COATING

J.F. Amonn Srl - DivisioneColor Srl/GmbH

Amotherm Brick WB - Amotherm Concrete WB - Amotherm Gyps WB
Amotherm Steel WB - Amotherm Steel WB HI - Amotherm Wood WB



EPD programme: International EPD® System (www.environdec.com)

Programme operator: EPD International AB

CPC code: 35110 (Paints and varnishes and related products)

Registration N°: S-P-01434

First release date: 2019-02-04

Valid until: 2024-02-03

Geographical scope: Global

Divisione | Abteilung Color

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1 THE COMPANY AND THE PRODUCT

Since 200 years, the company J.F. Amonn S.r.l. has a consolidated experience in the production of paints for different type of application and represents the Italian leader for the production of intumescent paints for the protection of structures in the construction sector. In particular, the production brand J.F. Amonn Srl - Color Division Srl/GmbH gather together 4 specialized lines of protective paints: wood protection, passive protection against fire, anti-corrosion for metal sheet roofs, glues and varnishes for wooden floors.

The company has the registered office in Bolzano, one production plant in Italy, at Ponte nelle Alpi (BL), one in Austria, at Korneuburg, and one in Thailand, in Bangkok.

The present study analyses 6 products according to the Life Cycle Assessment (LCA) method and with the aim to achieve the EPD, strengthening its commitment in terms of product sustainability and business management model, as well as its transparent communication with customers.

1.1 PRODUCTS DESCRIPTION

The 6 analysed products are intumescent paints for the protection of construction elements against fire and produced at Ponte nelle Alpi (BL) production plant. Despite they all have the same function and are used in the construction sector, they are not alternative products as each of them has been designed for a specific application on a material support, as precisely specified here below:

- **Amotherm Brick WB:** intumescent paint for the protection of brick surfaces; total production 107.415 kg;
- **Amotherm Concrete WB:** intumescent paint for the protection of reinforced concrete surfaces, cast in situ and prefabricated; total production 96.155 kg;
- **Amotherm Gyps WB:** intumescent paint for the protection of gypsum surfaces; total production 6.373 kg;
- **Amotherm Steel WB:** intumescent paint for the protection of steel surfaces; total production 45.583 kg;
- **Amotherm Steel WB HI:** intumescent paint for the protection of steel surfaces; total production 16.340 kg;
- **Amotherm Wood WB:** intumescent paint for the protection of wooden surfaces; total production 36.423 kg.

The products Amotherm Steel WB and Amotherm Steel WB HI have the same function, composition and production process, but a different name according to commercial reasons. Due to the identity between these two products, with “Steel WB” the present report refers to both of them.

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The reference UN CPC code is 35110 *Paints and varnishes and related products*.

As before mentioned, the six products are not alternative and their environmental profiles are presented separately.



The products and the production plant

2 METHODOLOGY

The environmental performances of the products/services reported into the EPD must be based on the analysis of the life cycle carried out through the application of the Life Cycle Assessment (LCA) method and according to the analysis structure provided by UNI EN ISO 14040:2006, UNI EN ISO 14044:2006, the references provided by UNI EN ISO 14025:2010 and UNI EN 15804:2014, the PCR 2012:01, Version 2.2 – Construction products and construction services and the *General Programme Instructions for The International EPD® System, Version 2.5*.

2.1 DECLARED UNIT

The declared unit is a measurable unit to which all the elements involved into the study are associated, in terms of resources, energy, water, waste and emissions. It substitutes the functional unit in case of cradle to gate EPD and the environmental performance of the products are declared according to it. The declared unit is **1 kg of intumescent paint**, produced and packaged.

The function of all the intumescent paints is to protect the substrate in the event of fire, but the quantity of each type of paint needed per m² of surface varies a lot depending on the features of the

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base material and the fire-proofing performance to be achieved. For information, the list here below reports the typical yields for the fire resistance of the six products under evaluation:

- **Amotherm Brick WB:** 400-1.400 g/m²;
- **Amotherm Concrete WB:** 400-1.400 g/m²;
- **Amotherm Gyps WB:** 800-1.200 g/m²;
- **Amotherm Steel WB e Steel WB HI:** 260-4.050 g/m²;
- **Amotherm Wood WB:** 360-670 g/m².

For these six products, it is declared a Reference Service Life of 10 years, although this value may be highly influenced by the in use conditions.

None of the raw materials used in the six products fall within the *Candidate List of Substances of Very High Concern for the Authorization* of the European Chemicals Agency. In any case the eventual presence of Substances of Very High Concern would be reported in the safety data sheets for each individual product/product group.

2.2 SYSTEM BOUNDARIES

The system boundaries define the scope of the analysis, identifying the processes that are included into the study from what is not involved. The below list describes the processes included into the system boundaries for each life phase following the same approach for all the analysed products.

- **Phase A1 – Raw materials:** this phase includes the procurement of all the raw materials and the components necessary for the production of paints. It also includes the production of the packaging of the finished products.
- **Phase A2 – Transport:** this phase includes the transport of the components necessary for the production of paints. It also includes the transport of the packaging of the finished product, from the producer to Amonn's production plant, and the transport of the production waste, from Amonn's production plant to the place for treatment and disposal of waste.
- **Phase A3 – Production:** this phase includes the treatment of the raw materials for the production of paints, till the packaging of the finished product. It also takes into account the portion of the consumptions due to the overall management of the company. Moreover, it includes the treatment of waste up to their final destination.
- **Phase A4 – Transport:** the products are mainly sold in the national territory and this phase takes into account the impacts due to transport.
- **Phases A5, B1-B7 and C1-C4:** phases of life cycle not included in the study.

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The environmental study and the EPD cover the "from cradle to gate with option" scenario, ie from the cradle to the gate with additional options, as it includes both the phases of extraction of raw materials and production of paints and the sale of the finished product according to the market scenario company.

Product stage			Construction process stage		Use stage								End of life stage				Resource recovery stage
Raw materials	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	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	

Diagram of the life cycle phases

The following diagram describes the phases and the processes defined into the above paragraph by dividing them into upstream, core and downstream process related to all the products.

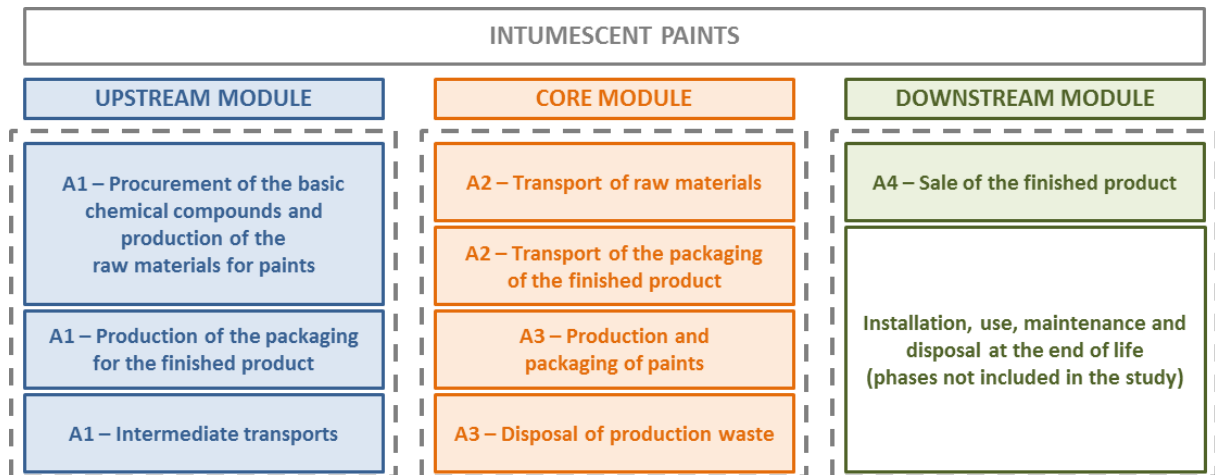


Diagram of the processes related to intumescent paints

Parameter	Description
Vehicle type used for transport	Freight lorry (16-32 ton) EURO5; freight ship to GB and Sardinia [Ecoinvent]
Distance	The places where the products are used are not known; the transport distances were calculated considering the Italian regional capitals and the EU capitals as points of arrival for the products
Capacity utilisation	65%
Bulk density of transported products	1.300±50 g/l
Volume capacity utilisation factor	Not applicable

Phase A4 – Transport to the building site

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2.3 INVENTORY DATA

All the information on the life cycle of the six products represent the state of knowledge available at October 2018 and refer to the year 2017. The data referring to formulas, raw materials, transport scenarios, production direct consumptions and waste disposal represent the situation at year 2017, confirmed also for the year 2018. The general consumptions of the company and the scenario for the sale of the finished products come from the final balance for the year 2017.

The inventory was created by taking all the qualitative and quantitative information from the company Amonn, that provided the formulas of the six products, the energy consumptions for the production and the information referring to the packaging of the finished product and the disposal of the production waste. The impacts due to the raw materials production were analysed on the basis of the technical data sheets gathered from the producers; the transports to Amonn were calculated according to plausible distances. The waste treatment process and the packaging materials were also included in the analysis.

3 ENVIRONMENTAL PERFORMANCE

The processes under evaluation have been modelled through the software SimaPro Analyst, version 8.5.2.0, the general data were gathered from Ecoinvent database version 3 and the environmental performance was assessed through the LCIA method CML-IA baseline, V3.05 / EU25, modified to be compliant with the UNI EN 15804:2014.

The environmental impacts are subdivided into the contribution of life cycle stages: A1 – Upstream module, A2 and A3 – Core Module and A4 – Downstream module.

None of the six products release dangerous substances into indoor air, soil and water during the use stage.

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3.1 AMOTHERM BRICK WB

Potential environmental impacts

PARAMETER		UNIT	A1	A2	A3	A4	TOTAL
Global warming potential (GWP)	Fossil	kg CO ₂ eq.	2,107E+00	0,112E+00	0,017E+00	0,061E+00	2,297E+00
	Biogenic	kg CO ₂ eq.	0,059E+00	0,001E+00	0,006E+00	0,000E+00	0,066E+00
	TOTAL	kg CO ₂ eq.	2,166E+00	0,113E+00	0,023E+00	0,062E+00	2,363E+00
Depletion potential of the stratospheric ozone layer (ODP)		kg CFC 11 eq.	2,58E-07	1,94E-08	8,77E-09	1,11E-08	2,97E-07
Acidification potential (AP)		kg SO ₂ eq.	1,56E-02	8,65E-04	6,72E-05	1,97E-04	1,68E-02
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.	3,76E-03	1,29E-04	2,13E-05	4,41E-05	3,95E-03
Formation potential of tropospheric ozone (POCP)		kg C ₂ H ₄ eq.	8,60E-04	3,61E-05	1,04E-05	9,95E-06	9,16E-04
Abiotic depletion potential – Elements		kg Sb eq.	2,09E-05	2,48E-07	9,94E-09	1,65E-07	2,14E-05
Abiotic depletion potential – Fossil resources		MJ, net calorific value	4,26E+01	0,17E+01	0,16E+01	0,09E+01	4,68E+01

Use of resources

PARAMETER		UNIT	A1	A2	A3	A4	TOTAL
Primary energy resources– Renewable	Use as energy carrier	MJ, net calorific value	2,667	0,182	0,442	0,051	3,342
	Used as raw materials	MJ, net calorific value	0,88617	0,00900	0,00091	0,00498	0,90107
	TOTAL	MJ, net calorific value	3,5529	0,1908	0,4425	0,0565	4,2426
Primary energy resources– Non-renewable	Use as energy carrier	MJ, net calorific value	41,9192	1,8675	1,2343	1,0333	46,0543
	Used as raw materials	MJ, net calorific value	0,6785	0	0	0	0,6785
	TOTAL	MJ, net calorific value	42,5977	1,8675	1,2343	1,0333	46,7328
Secondary material		kg	0,6011	0,0001	0,0004	0,0001	0,6017
Renewable secondary fuels		MJ, net calorific value	0	0	0	0	0
Non-renewable secondary fuels		MJ, net calorific value	0	0	0	0	0
Net use of fresh water		m ³	0,01735	0,00029	0,00003	0,00018	0,01785

Waste production

PARAMETER	UNIT	A1	A2	A3	A4	TOTAL
Hazardous waste disposed	kg	0	0	0,320	0	0,320
Non-hazardous waste disposed	kg	0	0	15,267	0	15,267
Radioactive waste disposed	kg	0	0	0	0	0

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3.2 AMOTHERM CONCRETE WB

Potential environmental impacts

PARAMETER		UNIT	A1	A2	A3	A4	TOTAL
Global warming potential (GWP)	Fossil	kg CO ₂ eq.	2,107E+00	0,112E+00	0,017E+00	0,064E+00	2,300E+00
	Biogenic	kg CO ₂ eq.	0,059E+00	0,001E+00	0,006E+00	0,000E+00	0,066E+00
	TOTAL	kg CO ₂ eq.	2,166E+00	0,113E+00	0,023E+00	0,065E+00	2,366E+00
Depletion potential of the stratospheric ozone layer (ODP)		kg CFC 11 eq.	2,58E-07	1,94E-08	8,77E-09	1,17E-08	2,97E-07
Acidification potential (AP)		kg SO ₂ eq.	1,56E-02	8,65E-04	6,72E-05	2,08E-04	1,68E-02
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.	3,76E-03	1,29E-04	2,13E-05	4,64E-05	3,95E-03
Formation potential of tropospheric ozone (POCP)		kg C ₂ H ₄ eq.	8,60E-04	3,61E-05	1,04E-05	1,05E-05	9,17E-04
Abiotic depletion potential – Elements		kg Sb eq.	2,09E-05	2,48E-07	9,94E-09	1,73E-07	2,14E-05
Abiotic depletion potential – Fossil resources		MJ, net calorific value	4,26E+01	0,17E+01	0,16E+01	0,10E+01	4,69E+01

Use of resources

PARAMETER		UNIT	A1	A2	A3	A4	TOTAL
Primary energy resources– Renewable	Use as energy carrier	MJ, net calorific value	2,667	0,182	0,442	0,054	3,344
	Used as raw materials	MJ, net calorific value	0,88617	0,00900	0,00091	0,00498	0,90107
	TOTAL	MJ, net calorific value	3,5529	0,1908	0,4425	0,0592	4,2453
Primary energy resources– Non-renewable	Use as energy carrier	MJ, net calorific value	41,9192	1,8675	1,2343	1,0876	46,1087
	Used as raw materials	MJ, net calorific value	0,6785	0	0	0	0,6785
	TOTAL	MJ, net calorific value	42,5977	1,8675	1,2343	1,0876	46,7872
Secondary material		kg	0,6011	0,0001	0,0004	0,0001	0,6017
Renewable secondary fuels		MJ, net calorific value	0	0	0	0	0
Non-renewable secondary fuels		MJ, net calorific value	0	0	0	0	0
Net use of fresh water		m ³	0,01735	0,00029	0,00003	0,00018	0,01785

Waste production

PARAMETER	UNIT	A1	A2	A3	A4	TOTAL
Hazardous waste disposed	kg	0	0	0,320	0	0,320
Non-hazardous waste disposed	kg	0	0	15,267	0	15,267
Radioactive waste disposed	kg	0	0	0	0	0

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3.3 AMOTHERM GYPS WB

Potential environmental impacts

PARAMETER		UNIT	A1	A2	A3	A4	TOTAL
Global warming potential (GWP)	Fossil	kg CO ₂ eq.	2,047E+00	0,188E+00	0,017E+00	0,094E+00	2,346E+00
	Biogenic	kg CO ₂ eq.	0,062E+00	0,001E+00	0,007E+00	0,001E+00	0,071E+00
	TOTAL	kg CO ₂ eq.	2,109E+00	0,189E+00	0,024E+00	0,095E+00	2,417E+00
Depletion potential of the stratospheric ozone layer (ODP)		kg CFC 11 eq.	2,49E-07	3,23E-08	8,77E-09	1,71E-08	3,08E-07
Acidification potential (AP)		kg SO ₂ eq.	1,59E-02	1,18E-03	6,68E-05	3,04E-04	1,74E-02
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.	3,73E-03	2,18E-04	1,81E-05	6,81E-05	4,03E-03
Formation potential of tropospheric ozone (POCP)		kg C ₂ H ₄ eq.	8,99E-04	6,37E-05	1,05E-05	1,54E-05	9,88E-04
Abiotic depletion potential – Elements		kg Sb eq.	1,92E-05	5,15E-07	1,10E-09	2,55E-07	2,00E-05
Abiotic depletion potential – Fossil resources		MJ, net calorific value	4,14E+01	0,29E+01	0,16E+01	0,14E+01	4,73E+01

Use of resources

PARAMETER		UNIT	A1	A2	A3	A4	TOTAL
Primary energy resources– Renewable	Use as energy carrier	MJ, net calorific value	1,886	0,053	0,435	0,018	2,393
	Used as raw materials	MJ, net calorific value	0,93935	0,01635	0,00092	0,00769	0,96431
	TOTAL	MJ, net calorific value	2,8255	0,0693	0,4361	0,0262	3,3571
Primary energy resources– Non-renewable	Use as energy carrier	MJ, net calorific value	40,9594	3,1391	1,2265	1,5969	46,9220
	Used as raw materials	MJ, net calorific value	0,4752	0	0	0	0,4752
	TOTAL	MJ, net calorific value	41,4346	3,1391	1,2265	1,5969	47,3972
Secondary material		kg	0,8393	0,0002	0,0006	0,0001	0,8402
Renewable secondary fuels		MJ, net calorific value	0	0	0	0	0
Non-renewable secondary fuels		MJ, net calorific value	0	0	0	0	0
Net use of fresh water		m ³	0,01760	0,00051	0,00003	0,00027	0,01841

Waste production

PARAMETER	UNIT	A1	A2	A3	A4	TOTAL
Hazardous waste disposed	kg	0	0	0,410	0	0,410
Non-hazardous waste disposed	kg	0	0	14,296	0	14,296
Radioactive waste disposed	kg	0	0	0	0	0

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3.4 AMOTHERM STEEL WB – STEEL WB HI

Potential environmental impacts

PARAMETER		UNIT	A1	A2	A3	A4	TOTAL
Global warming potential (GWP)	Fossil	kg CO ₂ eq.	2,056E+00	0,159E+00	0,017E+00	0,087E+00	2,319E+00
	Biogenic	kg CO ₂ eq.	0,072E+00	0,001E+00	0,006E+00	0,001E+00	0,080E+00
	TOTAL	kg CO ₂ eq.	2,128E+00	0,160E+00	0,023E+00	0,088E+00	2,399E+00
Depletion potential of the stratospheric ozone layer (ODP)		kg CFC 11 eq.	2,37E-07	2,74E-08	8,77E-09	1,58E-08	2,89E-07
Acidification potential (AP)		kg SO ₂ eq.	1,78E-02	1,06E-03	6,77E-05	2,81E-04	1,93E-02
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.	3,90E-03	1,85E-04	2,20E-05	6,29E-05	4,17E-03
Formation potential of tropospheric ozone (POCP)		kg C ₂ H ₄ eq.	1,04E-03	5,37E-05	1,05E-05	1,42E-05	1,12E-03
Abiotic depletion potential – Elements		kg Sb eq.	2,23E-05	4,17E-07	9,95E-09	2,35E-07	2,30E-05
Abiotic depletion potential – Fossil resources		MJ, net calorific value	4,12E+01	0,24E+01	0,16E+01	0,13E+01	4,65E+01

Use of resources

PARAMETER		UNIT	A1	A2	A3	A4	TOTAL
Primary energy resources– Renewable	Use as energy carrier	MJ, net calorific value	2,000	0,044	0,435	0,017	2,496
	Used as raw materials	MJ, net calorific value	1,05493	0,01361	0,00091	0,00710	1,07655
	TOTAL	MJ, net calorific value	3,0546	0,0575	0,4362	0,0242	3,5725
Primary energy resources– Non-renewable	Use as energy carrier	MJ, net calorific value	41,1489	2,6572	1,2420	1,4741	46,5222
	Used as raw materials	MJ, net calorific value	0,4078	0	0	0	0,4078
	TOTAL	MJ, net calorific value	41,5567	2,6572	1,2420	1,4741	46,9300
Secondary material		kg	0,8908	0,0002	0,0004	0,0001	0,8915
Renewable secondary fuels		MJ, net calorific value	0	0	0	0	0
Non-renewable secondary fuels		MJ, net calorific value	0	0	0	0	0
Net use of fresh water		m ³	0,02112	0,00043	0,00003	0,00025	0,02183

Waste production

PARAMETER	UNIT	A1	A2	A3	A4	TOTAL
Hazardous waste disposed	kg	0	0	0,320	0	0,320
Non-hazardous waste disposed	kg	0	0	14,404	0	14,404
Radioactive waste disposed	kg	0	0	0	0	0

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3.5 AMOTHERM WOOD WB

Potential environmental impacts

PARAMETER		UNIT	A1	A2	A3	A4	TOTAL
Global warming potential (GWP)	Fossil	kg CO ₂ eq.	2,083E+00	0,115E+00	0,017E+00	0,080E+00	2,295E+00
	Biogenic	kg CO ₂ eq.	0,060E+00	0,001E+00	0,006E+00	0,000E+00	0,067E+00
	TOTAL	kg CO ₂ eq.	2,143E+00	0,116E+00	0,023E+00	0,081E+00	2,362E+00
Depletion potential of the stratospheric ozone layer (ODP)		kg CFC 11 eq.	2,66E-07	2,00E-08	8,77E-09	1,46E-08	3,09E-07
Acidification potential (AP)		kg SO ₂ eq.	1,54E-02	9,06E-04	6,65E-05	2,71E-04	1,67E-02
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.	3,75E-03	1,33E-04	1,69E-05	5,90E-05	3,96E-03
Formation potential of tropospheric ozone (POCP)		kg C ₂ H ₄ eq.	8,75E-04	3,73E-05	1,04E-05	1,34E-05	9,36E-04
Abiotic depletion potential – Elements		kg Sb eq.	2,15E-05	2,52E-07	9,95E-09	2,15E-07	2,19E-05
Abiotic depletion potential – Fossil resources		MJ, net calorific value	4,33E+01	0,17E+01	0,16E+01	0,12E+01	4,79E+01

Use of resources

PARAMETER		UNIT	A1	A2	A3	A4	TOTAL
Primary energy resources– Renewable	Use as energy carrier	MJ, net calorific value	2,631	0,178	0,442	0,068	3,318
	Used as raw materials	MJ, net calorific value	0,90070	0,00925	0,00092	0,00654	0,91742
	TOTAL	MJ, net calorific value	3,5314	0,1876	0,4427	0,0741	4,2358
Primary energy resources– Non-renewable	Use as energy carrier	MJ, net calorific value	42,5201	1,9254	1,2227	1,3604	47,0287
	Used as raw materials	MJ, net calorific value	0,7896	0	0	0	0,7896
	TOTAL	MJ, net calorific value	43,3097	1,9254	1,2227	1,3604	47,8183
Secondary material		kg	0,5204	0,0001	0,0005	0,0001	0,5211
Renewable secondary fuels		MJ, net calorific value	0	0	0	0	0
Non-renewable secondary fuels		MJ, net calorific value	0	0	0	0	0
Net use of fresh water		m ³	0,01692	0,00030	0,00003	0,00023	0,01748

Waste production

PARAMETER	UNIT	A1	A2	A3	A4	TOTAL
Hazardous waste disposed	kg	0	0	0,324	0	0,324
Non-hazardous waste disposed	kg	0	0	15,520	0	15,520
Radioactive waste disposed	kg	0	0	0	0	0

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4 PROGRAMME-RELATED INFORMATION AND VERIFICATION

The EPD owner has the sole ownership, liability and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com
EPD registration number:	S-P-01434
Published:	2019-02-04
Valid until:	2024-02-03
Product Category Rules:	PCR 2012:01. Construction products and construction services. Version 2.2
Product group classification:	UN CPC 35110
Reference year for data:	2017
Geographical scope:	Italy

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): <i>PCR 2012:01 – Construction products and construction services – Version 2.2</i>
PCR review was conducted by: <i>Martin Erlandsson, IVL Swedish Environmental Research Institute, martin.erlandsson@ivl.se</i>
Independent third-party verification of the declaration and data, according to ISO 14025:2006: <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Third party verifier: <i>DNV GL Business Assurance</i>
<i>In case of accredited certification bodies:</i> Accredited by: <i>Accredia</i>
<i>In case of recognised individual verifiers:</i> Approved by: <i>The International EPD® System</i>
Procedure for follow-up of data during EPD validity involves third party verifier: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

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5 REFERENCES

- Amonn-LCA vernici-Report_R01. Studio LCA finalizzato alla certificazione EPD. Nov. 2018;
- UNI EN 15804:2014 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products;
- PCR 2012:01, Version 2.2 – Construction products and construction services, International EPD System, valid until 03-03-2019;
- GPI – General Programme Instructions for The International EPD® System, Version 2.5, 12-11-2017;
- SimaPro Analyst version 8.5, Prè Consultant;
- Ecoinvent v. 3.

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