PLACE
OF PRODUCTION
PIETRASANTA (LU),
ITALY

SAVEMA

MARBLE and ORNAMENTALS STONES MANUFACTURED PRODUCTS for ARCHITECTURAL/CONSTRUCTION WORKS

ENVIRONMENTAL PRODUCT DECLARATION
in accordance with ISO 14025:2006
and EN 15804 + A1: 2013

PUBLISHED BY
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2021 - 04 - 26

VALID UNTIL
2026 - 04 - 25

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S A V E M A - MARBLE and ORNAMENTAL STONES MANUFACTURED PRODUCTS for ARCHITECTURAL/CONSTRUCTION WORKS

Holder of the declaration	SAVEMA S. p. A.
Published by	INTERNATIONAL EPD SYSTEM
Declaration number	S-P-04699
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CEN STANDARD EN 15804 SERVED AS THE CORE PCR

PCR 2012:01 CONSTRUCTION PRODUCTS AND CONSTRUCTION SERVICES, VERSION 2.33

PCR REVIEW was conducted by

THE TECHNICAL COMMITTEE of the INTERNATIONAL EPD® System
- Chair: *Massimo Marino*
- Contact via **info@environdec.com**

INDEPENDENT VERIFICATION of the DECLARATION and DATA, ACCORDING to ISO 14025

EPD VERIFICATION (External)

THIRD PART VERIFIER

DNVGL BUSINESS ASSURANCE
www.dnvgl.it

ACCREDITED by

ACCREDIA

SAVEMA

Savema has been founded in 1975 by initiative of two families, Piacentini and Volterrani, since many years in the stone business. Thanks to the founders' market talent and their long-term experience, in less than a decade Savema has established itself as one of the leading global players for the supply of architectural stone works for projects of high quality and large scale. At the same time, Savema started the processing and sales of marble, granite and other stone in slabs / semi-finished products, becoming one of the best-known producers for many marble workshops, importers and distributors worldwide.

PIETRA NATURALE

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SAVEMA - **GENERAL INFORMATION**

PRODUCT
Manufactured marble and ornamental stones in various processes of 1 cm to 6 cm thick and massive pieces/mouldings (average thickness of 14 cm), for buildins and construction works.

DECLARATION BASED on PRODUCT CATEGORY RULES
CONSTRUCTION PRODUCTS
AND CONSTRUCTION SERVICES
2012:01 VERSION 2.33

CPC CODE
151 – MONUMENTAL
AND BUILDING STONES

COMPARABILITY
EPD of construction materials may not be comparable except in accordance with EN 15804 + A1: 2013

PROGRAM HOLDER
International EPD ® System

YEAR OF THE ANALYSIS
The data used refers to the year 2019.
Analysis carried out in the year 2020.

PLACE OF PRODUCTION
Pietrasanta (Lu), Italy

SAVEMA

HOLDER of DECLARATION and MANUFACTURER

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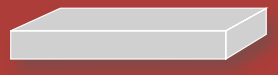
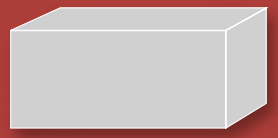
DECLARED UNIT

PIETRA NATURALE

1 m² of manufactured marble and ornamental stones in thickness from 1 cm to 6 cm and massive pieces/mouldings (average thickness 14 cm), for buildings and construction works.



da 1 a 6 cm



massive pieces/ mouldings (average thickness 14 cm)

SAVEMA

International leader for the supply of marble, granite and other ornamental stones specialized in:

- **Architectural stonework** for exteriors or interiors for worldwide primary projects, including artistic and ornamental works.
- **Marble, granite, onyxes, travertine and limestone in slabs**, directed to international wholesalers and dealers.
- **Marble blocks**, quarried in Carrara area and other Italian and foreign quarries.

PIETRA NATURALE

S A V E M A - **COMPANY DESCRIPTION**

SAVEMA S.p.A. is a working company in the natural stone business since 1975, located in Pietrasanta (LU), and in these forty years of activity has acquired a position of international leading company as far as production activity is concerned , workmanship and marketing of marbles, granites and other ornamental stones.

SAVEMA S.p.A. has currently an organic of around 100 employees among executives, employees and workers and has its own establishment in Pietrasanta (Lucca), legal and administrative headquarter of the company.

S A V E M A - **PRODUCT DESCRIPTION**

The analyzed product is 1 m^2 of manufactured marble and ornamental stones of varying thickness (from 1 to 6 cm and massive pieces/mouldings, of average thickness 14 cm). With the definition marble and ornamental stones are included four typologies of product:

- **Marble:** carbonate rock that has acquired a distinctive crystalline texture by recrystallization, most commonly by heat and pressure, during metamorphism, and is composed principally of the carbonate minerals calcite and dolomite, singly or in combination;
- **Limestone:** a rock of sedimentary origin composed principally of calcium carbonate *(calcite)*, or the double carbonate of calcium and magnesium *(dolomite)*, or some combination of these two minerals;
- **Travertino:** a porous or cellularly layered partly crystalline calcite rock of chemical origin;
- **Onice:** translucent, generally layered, cryprocrystalline calcite with colors in pastel shades.

The final product may turn out in slabs of various sizes *(width and length)* processed on surface according to clients request *(polished, honed, flamed, etc.)*.

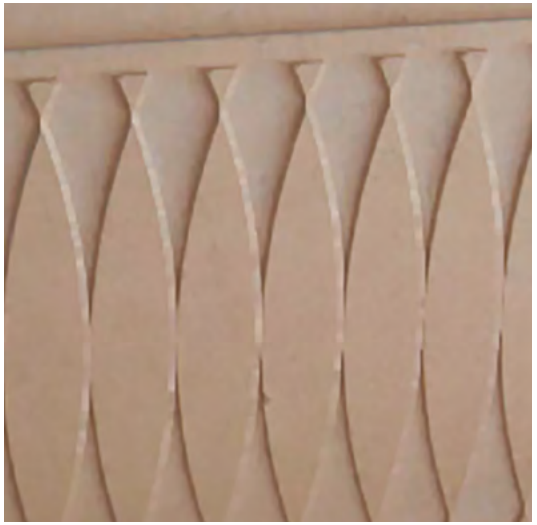
S A V E M A - **SISTEMA SCOPE**

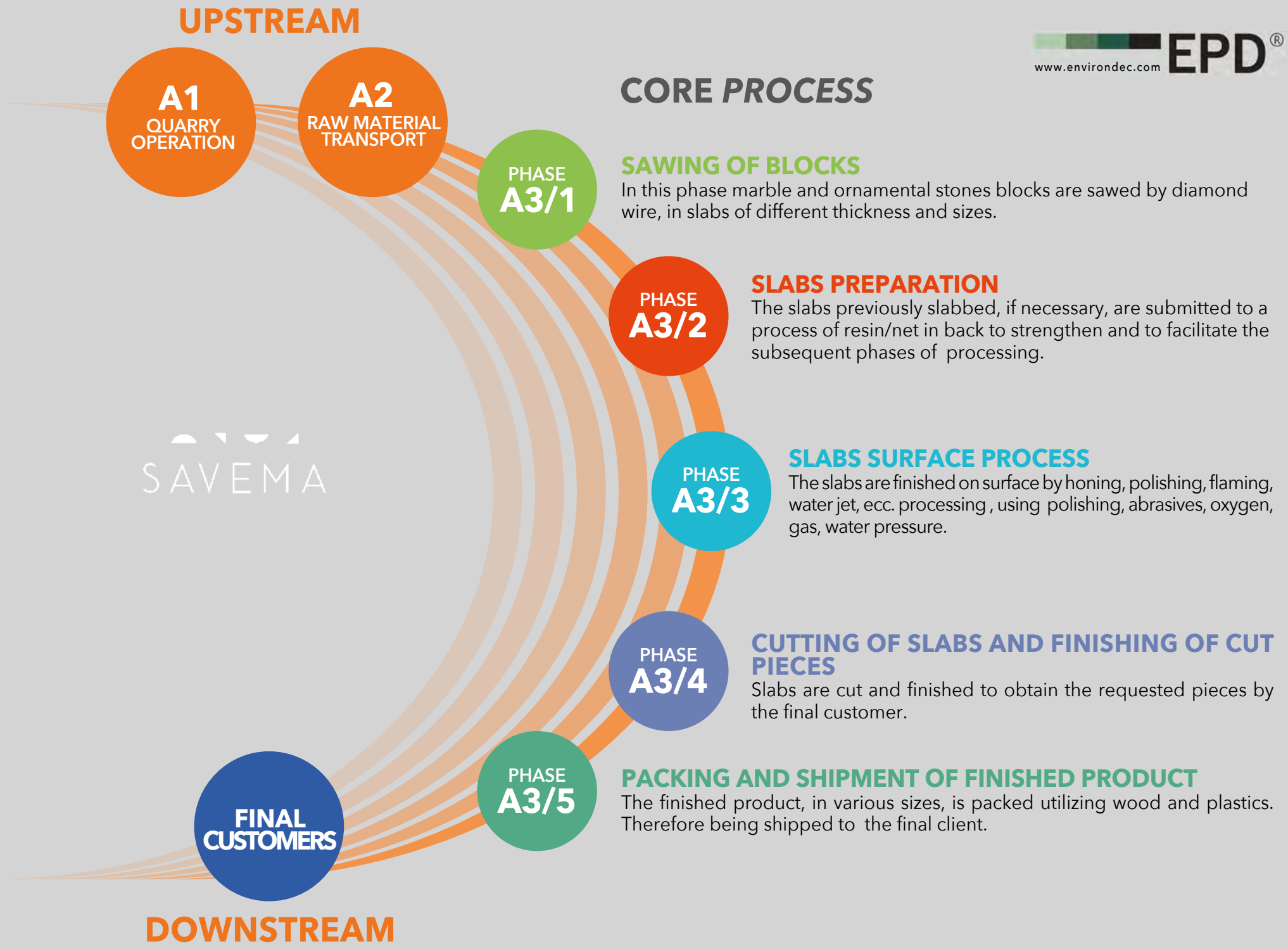
Here below is the process flow. The phase of extraction happens in quarries in Italy, Africa, Europe, Asia, South and North America.

The process of phases A3 is done in SAVEMA S.p.a factory in Pietrasanta, or external companies, however located in Italy.

The phase of packing and shipment is also done in Savema S.p.a. factory located in Pietrasanta.
The productive process calls for the fabrication of a co-product, identified with the term *«rough»* slabs, that is sold prior to phase A3/4 *"Cutting of slabs and finishing of cut pieces"*.

All impacts associated to the co-products were not considered in the impact's assessment of the final product.
All impacts associated with water treatment and disposal of waste produced have been considered. The impacts of the distribution of the product to the end customer were not considered.





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CORE *PROCESS*

PHASE A3/1

SAWING OF BLOCKS

In this phase marble and ornamental stones blocks are sawed by diamond wire, in slabs of different thickness and sizes.

PHASE A3/2

SLABS PREPARATION

The slabs previously slabbed, if necessary, are submitted to a process of resin/net in back to strengthen and to facilitate the subsequent phases of processing.

PHASE A3/3

SLABS SURFACE PROCESS

The slabs are finished on surface by honing, polishing, flaming, water jet, ecc. processing , using polishing, abrasives, oxygen, gas, water pressure.

PHASE A3/4

CUTTING OF SLABS AND FINISHING OF CUT PIECES

Slabs are cut and finished to obtain the requested pieces by the final customer.

PHASE A3/5

PACKING AND SHIPMENT OF FINISHED PRODUCT

The finished product, in various sizes, is packed utilizing wood and plastics. Therefore being shipped to the final client.

S A V E M A - **THE ANALYSIS**
SYSTEM SCOPE

Product Stage			Construction Process Stage			Use Stage						End Of Life Stage				Resource Recovery Stage
Raw Materials	Transport	Manufacturing	Transport	Construction Installation	Use	Manteinance	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	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA

X = Included in the analysis

MNA = Module not assessed

ALLOCATION RULES

The allocation rules used, in accordance with the provisions of EN 15804 + A1: 2013, are specific for each material and the criteria used is that which is identified as the most relevant to the type of work performed. Allocation has been made even for the co-product, using the same criteria as that used for the finished product.
The allocation criteria used were:

- Time required to perform the processing *(elettricity, water)*;
- Criterion of allocation for mass *(oil, wood, plastics)*;
- Criterion of allocation for worked surface *(LPG, oxygen)*.

QUALITY DATA

The data used for the environmental impact assessment of the A2 ed A3 phases are:

- Specific data collected at SAVEMA S.p.A site and referred to the year 2019 for the core activities *(consumption, distances etc)*;
- Selected generic data for almost all Ecoinvent processes used for the LCA model;
- Proxy data contribute to the final impacts is less than 5%.

CUT-OFF CRITERIA

As raw material has been considered marble and ornamental stones, all energy consumption are included with the exception of the energy used for the processing of resin in the respect of the cut-off rule provided by the reference PCR.
Not included are materials of which the total weight does not exceed 5% of the total of the items input weight.
Some accessory materials were considered as significant during the various processing stages.
The total of the considered materials exceeds 99% of the materials used in the manufacturing process.

GEOGRAPHICAL AND TEMPORAL BOUNDARIES

GEOGRAPHICAL BOUNDARIES UPSTREAM PROCESS ▶ Europe, Africa, Asia, South America, North America
GEOGRAPHICAL BOUNDARIES CORE PROCESS ▶ Province of Lucca, Italy
TEMPORAL BOUNDARIES ▶ Production data in the calendar year 2019

S A V E M A - **ENVIRONMENTAL *PERFORMANCES***

IMPACT CATEGORY	Reference Unit	1 cm	2 cm	3 cm	4 cm	5 cm	6 cm	14 cm
ADP (fossil)	**MJ**	9.58E+02	9.78E+02	1,41E+03	1.21E+03	2.96E+03	1.74E+03	4.46E+03
ADP (el)	**kg Sb eq**	2.14E-05	3.90E-05	6,02E-05	5.88E-05	1.00E-04	9.76E-05	2.70E-04
AP	**kg SO_2 eq**	2.39E-01	2.84E-01	4,38E-01	3.69E-01	8.29E-01	5.77E-01	1.52E+00
EP	**kg PO_{4---} eq**	5.81E-02	6.29E-02	9,44E-02	8.18E-02	1.95E-01	1.23E-01	3.23E-01
GWP	**kg CO_2 eq**	6.98E+01	6.96E+01	9,99E+01	8.53E+01	2.12E+02	1.21E+02	3.06E+02
GWP (w/out biogenic)	kg CO_2 eq	6.96E+01	6.93E+01	9,94E+01	8.49E+01	2.11E+02	1.20E+02	3.04E+02
GWP (biogenic)	kg CO_2 eq	1.55E-01	2.94E-01	4,51E-01	4.68E-01	7.29E-01	7.60E-01	2.01E+00
ODP	**kg CFC-11 eq**	1.04E-05	1.09E-05	1,55E-05	1.34E-05	3.27E-05	1.95E-05	5.09E-05
POCP	**kg C_2H_4 eq**	1.06E-02	1.19E-02	1,77E-02	1.50E-02	3.44E-02	2.26E-02	5.80E-02

Since the data of impact among the different thicknesses differ for more than 10%,
the results are introduced for every average product in separate columns for each analyzed thickness
(1 cm., 2 cm., 3 cm., 4 cm., 5 cm., 6 cm., massive pieces/mouldings).

S A V E M A - **ENVIRONMENTAL *PERFORMANCES***

IMPACT CATEGORY	Reference Unit	1 cm	2 cm	3 cm	4 cm	5 cm	6 cm	14 cm
PERT	**MJ**	4.12E+01	4.71E+01	6.82E+01	7.28E+01	1.41E+02	1.04E+02	2.49E+02
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERE	MJ	4.12E+01	4.71E+01	6.82E+01	7.28E+01	1.41E+02	1.04E+02	2.49E+02
PENRT	**MJ**	6.38E+02	7.21E+02	1.05E+03	8.99E+02	2.05E+03	1.34E+03	3.52E+03
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRE	MJ	6.38E+02	7.21E+02	1.05E+03	8.99E+02	2.05E+03	1.34E+03	3.52E+03
SM	**kg**	0.00E+00	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	0.00E+00
NRSF	**MJ**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FWT	**m^3**	5.13E+00	4.18E+00	5.84E+00	5.13E+00	1.50E+01	6.63E+00	1.62E+01

The impacts are aggregated for the A1-A3 phases, as required by the reference PCR.

SAVEMA - **ENVIRONMENTAL *PERFORMANCES***

IMPACT CATEGORY	Reference Unit	1 cm	2 cm	3 cm	4 cm	5 cm	6 cm	14 cm
HWD	kg	3.41E-02	3.40E-02	3.44E-02	3.42E-02	3.64E-02	3.47E-02	3.71E-02
NHWD	kg	5.59E+01	7.21E+01	9.57E+01	8.69E+01	1.47E+02	1.27E+02	3.15E+02
RWD	kg	3.40E-03	4.26E-03	6.17E-03	5.29E-03	1.14E-02	8.19E-03	2.21E-02

ACRONYMS

ENVIRONMENTAL IMPACTS	
AP	Acidification Potential
ADP_{el}	Abiotic Depletion Potential (elements)
EP	Eutrophication Potential
ODP	Ozone Depletion Potential
GWP	Global Warming Potential
POCP	Photochemical Ozone Creation Potential
ADP_f	Abiotic Depletion Potential (fossil)

RESOURCE CONSUMPTION	
PERT	Total use of renewable primary energy resources
PERM	Use of renewable primary energy resources used as raw materials
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials
PENRT	Total use of non-renewable primary energy resources
PENRM	Use of non-renewable primary energy resources used as raw materials
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials
SM	Use of secondary material
RSF	Use of renewable secondary fuels
NRSF	Use of non-renewable secondary fuels
FWT	Total use of net fresh water

WASTE PRODUCTION	
HWD	Hazardous waste disposed
NHWD	Non-hazardous waste disposed
RWD	Radioactive waste disposed

S A V E M A - **DIFFERENCES *of* ENVIRONMENTAL *PERFORMANCES***

The updating of specific data of the production process and of some generic database processes have led to *significant changes in the environmental performance*.
In many cases results have undergone a variation (positive or negative) of more than 10%, so as expected in the GPI it was necessary to update the published environmental declaration.

The **variations in environmental performance** obtained are mainly due to **the following causes:**

VARIATIONS CAUSES ≥ 10%

Update of the production model of the electricity consumed *(italian residual mix 2019)*

Running into full operation of **new production processes** *(p.e. bleaching)*

Variations in the mix of processed materials, and consequently in the supply distance of raw materials and processes performed, according to the changing market demands

Processing of natural products of which hundreds of varieties are present in nature with very different chemical-physical characteristics, which determine the ease of processing the material (given primarily by the different degree of hardness).

CONCLUSIONS

To conclude, the variability of the mix of processed materials and of the of the production processes *(parameters linked both to the trend in demand)* every year are the basis of the variation of environmental performance of the various classes of materials and above all are the cause of the lack of correlation *(direct or reverse)* between thickness and environmental performance.

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DOCUMENTARY REFERENCES

- ISO 14025:2006
- EN 15804 + A1: 2013
- PCR 2012:01 Construction products and Construction services, Version 2.33
- General Programme Instructions 2.5

For data processing we have been used:
- Software: Open LCA 1.9
- Main Database: Ecoinvent 3.3
- Geographical scope EPD: Global

Environmental statements on construction products, recorded with different programs or constructed not in accordance with EN 15804 + A1: 2013, may not be comparable.

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