

ENVIRONMENTAL PRODUCT DECLARATION

Self-locking blocks
for external pavements

CLASSICI – DESIGN – FILTRANTI

Produced in the manufacturing site of

FERRARA

Via Ferrara, 31 – Poggio Renatico (FE) - ITALIA

First issue:
18.06.2020

Valid until:
18.06.2025

Paver 
esperienza e innovazione da oltre 50 anni



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Declaration conforming to ISO 14025 and EN 15804:2012+A1

GENERAL INFORMATION

EPD OWNER: PAVER Costruzioni S.p.a. – Strada di Cortemaggiore, 25 – Piacenza (PC) – ITALIA

Manufacturing site: Via Ferrara, 31 – Poggio Renatico (FE) - ITALIA

This declaration is prepared conforming to the EPDIItaly program, in adherence with the General Programme instructions.
The detailed version of the regulations and other information are available at www.epditaly.it

PAVER Costruzioni S.p.a. relieves EPDIItaly of any responsibility from the non-compliance of the environmental legislation self-declared by itself.

This declaration is drafted for the self-locking blocks of the Series: CLASSICI – DESIGN - FILTRANTI
Detailed information on the products included in this study are available in the successive pages of this declaration.

Reference PCR: ICMQ-001/15 rev. 2.1 dated 03/06/2019

CPC code: 375 (Articles of concrete, cement and plaster)

Independent verification of the declaration and the data reported according to EN ISO 14025:2010 ☐ Internal ☒ External

Third party verification performed by: **ICMQ S.p.A.** - Via Gaetano de Castillia, 10 - 20124 Milano (MI) - ITALIA (www.icmq.it)

*Environmental declarations of products of the same category but belonging to different programmes may not be comparable.
In particular, EPD of construction products may not be comparable if they don't conform to EN 15804.*

CONTACT

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The Life Cycle Assessment (LCA) study and this EPD have been developed in collaboration with **Qoncert S.r.l.**
(info@qoncert.it; www.qoncert.it).

GENERAL INFORMATION OF THE COMPANY

PAVER Costruzioni S.p.A. is one of the leading manufacturers in the fields of pre-fabricated concrete structures for buildings and urban furnishings. In its 50 years of existence the organization has had a constant development up to the current structure of having an articulated production in four manufacturing locations present in the central and northern Italy.

The focal points of the production are the speed of execution, durability and quality of the materials. The products correspond well to technical and aesthetic needs: from the antique style to the innovative design, from the drainable flooring to the anti-seismic construction, from the acoustic to the thermal insulation.

The company aims to apply environmental and social sustainability policies, especially in the approach adopted for environmental sustainability, aims to maintain the quality and re-use of natural resources. For this reason all self-locking blocks, curbstones made by PAVER contain a percentage of recycled material.

All PAVER production units are currently certified according to ISO 14001 "Environmental Management Systems" to guarantee continuous monitoring of their impacts and to guarantee continuous improvement of their environmental performance.

For further information: www.paver.it



PRODUCT DESCRIPTION

This Environmental Declaration reports the environmental performance of the self-locking blocks for external pavements of the Series :

CLASSICI



The Classici series comprises of smaller blocks characterized by square forms and gives an urban texture to any area in a city, satisfying the aesthetic and architectural needs of designers and administrators and at the same time guaranteeing extreme wear resistance with minimal maintenance. It is suitable for creating spaces of all kinds, from sidewalks to large parking lots, from public squares to areas in the industrial zones.



(VOLTERRA)

DECORPAV



DOPPIO T



FENICE



LISTELLO



MATTONSEI



MATTONOTTO



PALIO



TRIOTTO



UNOPAV



VOLTERRA



PRODUCT DESCRIPTION

This Environmental Declaration reports the environmental performance of the self-locking blocks for external pavements of the Series:



The DESIGN Series has been designed to meet the needs of contemporary design.

Clear texture with little obvious gaps, captivating colors and natural finishes designed for open spaces, pedestrian and vehicular traffic. The colors are almost all flamed, ranging from shades of gray to brown to best meet new architectural trends.

LONDRA



LISTONE



SAINT FLORENT



OSLO



VARSAVIA



(LONDRA)

PRODUCT DESCRIPTION

This Environmental Declaration reports the environmental performance of the self-locking blocks for external pavements of the Series :



The FILTRANTI Series is made with a special mixture with increased grain size. This mixture increases its filtering capacity and favors the passage of water towards the aquifer without the use of aids for collecting surface water.

DOPPIO T



MATTONOTTO



MATTONSEI



OSLO



PALIO



TRIOTTO



VARSAVIA



VOLTERRA



(TRIOTTO)

PRODUCT COMPOSITION

All the blocks belonging to the three series under study are composed of two layers: the lower layer (also called the "rough" layer) is made with a mixed design made up of aggregates (sand, gravel, recycled materials), cement, water and additives. The upper layer (also called the "fine" layer) is also made with a mixed design consisting of aggregates (sands, quartz granules) cement, water and plasticizers.

The final composition of the blocks is obtained by combining the raw materials used in the two layers:

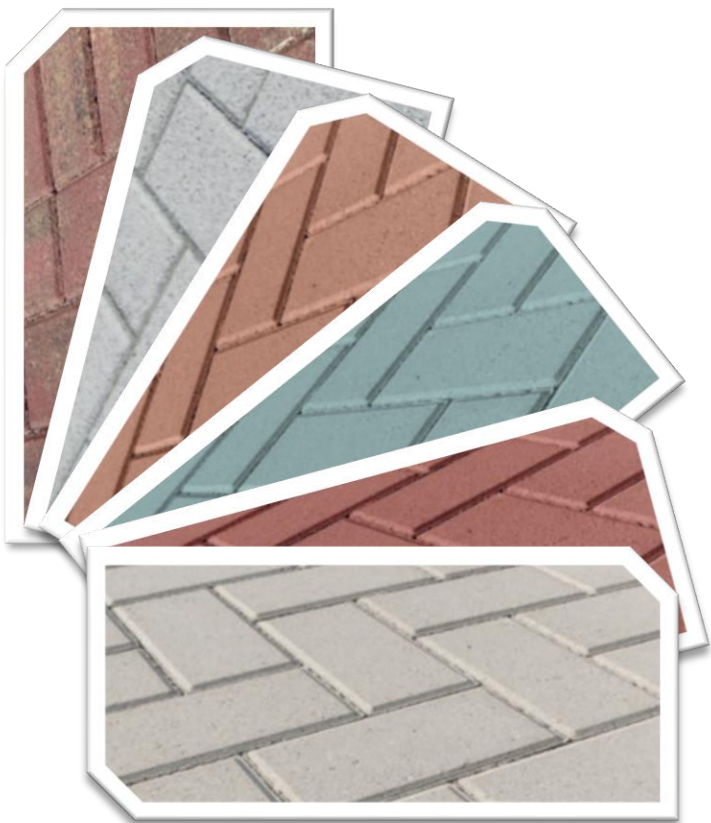
Material	CLASSICI		DESIGN		FILTRANTI	
	%mass	kg/ton _{BLOCK}	%mass	kg/ton _{BLOCK}	%mass	kg/ton _{BLOCK}
Sand (virgin)	29,49 %	294,9 kg	29,49 %	294,9 kg	0,67 %	6,7 kg
Sand (recycled)	6,32 %	63,2 kg	6,32 %	63,2 kg	10,82 %	108,0 kg
Gravel (virgin)	10,28 %	102,8 kg	10,28 %	102,8 kg	31,65 %	316,5 kg
Gravel (recycled)	27,67 %	276,7 kg	27,67 %	276,7 kg	30,11 %	301,1 kg
Production waste (ground and re-used)	9,49 %	94,9 kg	9,49 %	94,9 kg	4,63 %	46,3 kg
Quartz granulated	3,43 %	34,3 kg	3,43 %	34,3 kg	6,76 %	67,6 kg
Cement	10,58 %	105,8 kg	10,58 %	105,8 kg	11,32 %	113,2 kg
Water	2,71 %	27,1 kg	2,71 %	27,1 kg	3,96 %	39,6 kg
Additives	0,03 %	0,3 kg	0,03 %	0,3 kg	0,08 %	0,8 kg
TOTAL	100,00 %	1000,0 kg	100,00 %	1000,0 kg	100,00 %	1000,0 kg

NOTE: All the products included in this EPD do not contain or release harmful substances (Regulations (EU) 1907/2006 (REACH) and (EU) 1272/2008).

FINISHINGS AND COLORS

The blocks belonging to the three series under study are available in different surface finishes according to the required aesthetic needs.

The different finishes can be obtained through appropriate adjustments to the ingredients of the 'fine' layer mix.

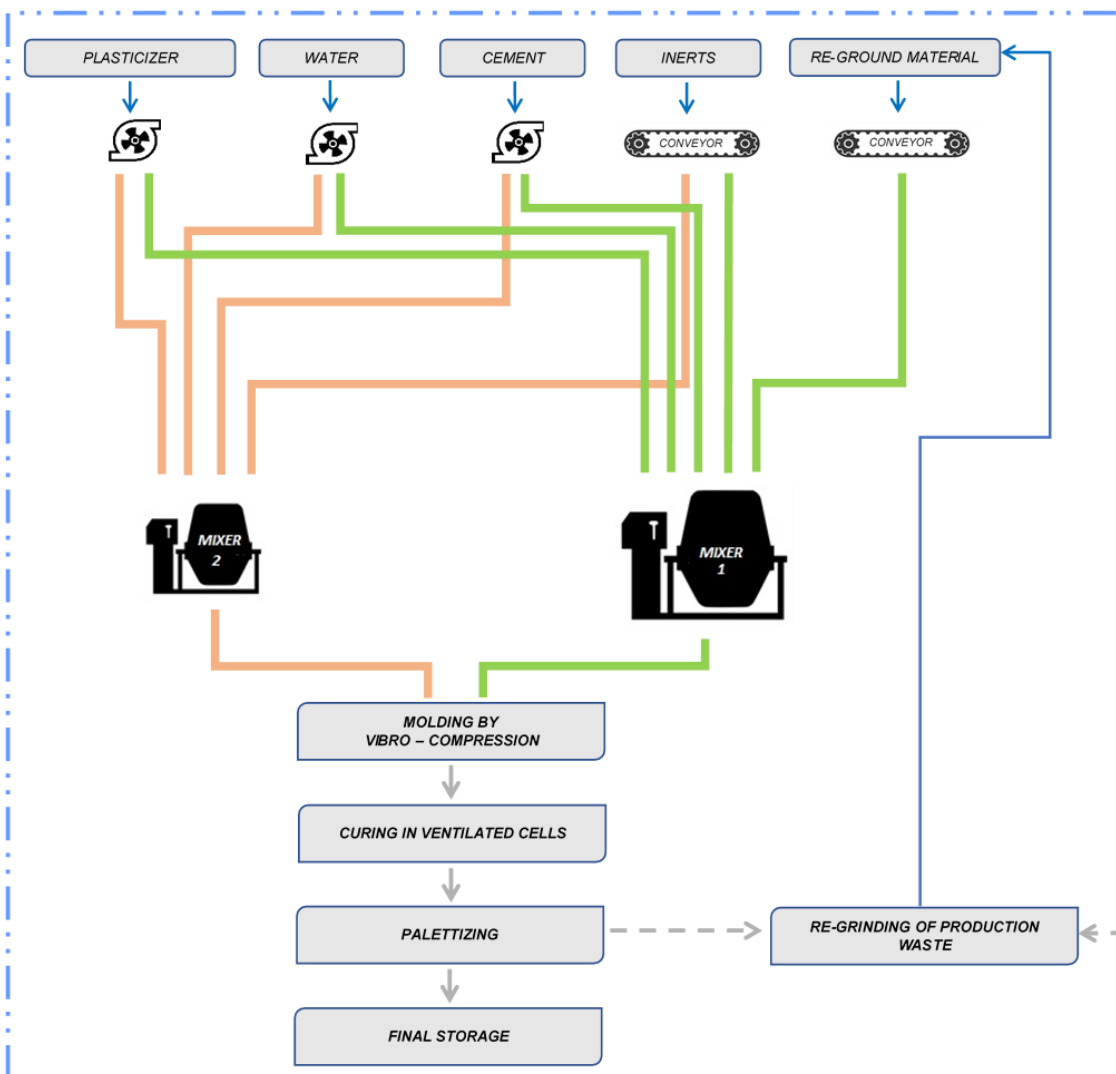


This EPD declaration lists the environmental performance of the blocks made with "quartz" finish and "gray" coloring, obtained without coloring agents added to the mixture of the 'fine' layer.



The blocks are also available in other finishes (eg. the "standard" finish does not require the use of quartz granulate in the mixture of the fine layer) and in other colors, based on the proportion of the dyes added to the mixture of the fine layer (eg. green colored blocks are made with the use of green chromium oxide, the yellow blocks are obtained with the use of yellow iron oxide, the "mix color" blocks are made by adding different metal oxides characterized by different colors to the mixture, etc.). The impact of the different finishes and colors on the overall life cycle impacts is not assessed in this EPD.

PRODUCTION PROCESS



The production process is analogous to all three types of blocks presented in this EPD.

The **principal phases** included are as follows:

- Receival and storage of raw materials
- Raw material handling from the storage to the processing department
- Making the mixtures in the concrete mixers
- Vibro-compression molding
- Curing of the blocks in ventilated cells
- Palettizing and final storage

SYSTEM BOUNDARIES AND EPD TYPE

This LCA study analyzes the life cycle of the blocks “**from cradle to gate**”, therefore the system boundaries include the production and supply of raw materials (A1), transport (A2) and production (A3). Instead, the following phases are excluded from the system boundaries: distribution (A4), installation (A5), use (B1-B7) and end of life (C1-C4). The study did not evaluate the presence of any benefits beyond the system boundaries (D).

PRODUCTION STAGE			CONSTRUCTION STAGE	USE STAGE								END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE BOUNDARIES OF THE SYSTEM
Extraction and supply of raw materials	Transport to the manufacturer	Product manufacture	Transport from the manufacturer to the site of use	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	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
✓	✓	✓	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

MND: *Module Not Declared*

EPD TYPE : Specific, only for the products listed in the successive page of this declaration

DATABASE : Ecoinvent, 2018, v 3.5, released 2018-11

SOFTWARE : Simapro 9.0.0.35

GEOGRAPHICAL VALIDITY OF THE EPD : ITALY – Products manufactured and sold in the country

REFERENCE PERIOD : Year 2018

PROCESSES INCLUDED IN SYSTEM BOUNDARIES

UPSTREAM – Module A1



Impacts associated with the production of all the raw materials used as ingredients:

- *For virgin raw materials, both the impacts associated with the materials and those associated with the related production processes were considered.*
- *For recycled raw materials, only the impacts of the recycling process were considered.*
- *For the internally ground material, in line with the provisions of the allocation rules applied to the study, no environmental load was attributed to the incoming material while the impacts associated with the rework were calculated (transport using internal material handling, grinding process).*

Furthermore, as foreseen by the reference PCR, the impacts associated with the energy consumption of the production unit were also included within module A1, namely:

- *Electricity consumption*
- *LPG consumption*



PROCESSES INCLUDED IN SYSTEM BOUNDARIES

CORE – Module A2

In the A2 module the following were considered:

- *External transport of raw materials and packaging materials to the Paver plant*
- *External transport of forgings (auxiliary materials)*
- *Internal transport related to the product handling using diesel-powered vehicles*



CORE – Module A3

Within the A3 module the followed were evaluated:

- *Water consumption of the plant (excluding the use as raw material)*
- *The production of waste from the entire plant and its final treatment*
- *Packaging production*
- *The production of forgings (auxiliary materials)*
- *Emissions to air from the combustion of LPG for heating*



CALCULATION RULES

Functional Unit: 1 ton of self-locking blocks

Reference Service Life: N.D. – LCA carried out with "cradle to gate" approach

Data quality	Allocazioni	Cut-off
<p>This EPD is based on primary data for the fundamental aspects, such as: the type of raw materials used and the composition of the products examined, the distances between the suppliers of the raw materials and the production site, the energy consumption of the plant.</p> <p>All processes for which primary data were not available, reference was made to secondary data taken from the LCA ecoinvent v3.5 database, Allocation, Cut-off by classification.</p> <p>As required by the PCR "Construction products and construction services", the use of generic data (proxy data) was limited and their contribution does not exceed 10% of the overall impact.</p>	<p>For virgin raw materials, both the impacts associated with the materials and those associated with the related production processes were considered.</p> <p>For recycled raw materials, only the impacts of the recycling process were considered. Recycled outputs are considered inputs for the subsequent life cycle.</p> <p>Some impacts of production (electricity, LPG used for heating and waste) have been allocated among the products analyzed on an economic basis.</p>	Not present
		Exclusions
		<p>As required by the PCR used, the Company's capital assets were not considered and as was the contribution of the infrastructure, which was also excluded.</p> <p>The impacts related to the transport of the personnel to and from the workplace were also excluded.</p>

CALCULATION METHOD

<i>Impact categories:</i>	<i>"CML-IA baseline v3.05"</i>
<i>Energy resources:</i>	<i>"Cumulative Energy Demand v1.11"</i>
<i>Net consumption of water:</i>	<i>"ReCiPe 2016 Mid-point (H) v1.03"</i>
<i>Radioactive wastes:</i>	<i>"EDIP 2003 v1.07"</i>

1. Results: ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACTS	UNIT	CLASSICI Series				DESIGN Series				FILTRANTI Series			
		UPSTREAM	CORE		TOTAL	UPSTREAM	CORE		TOTAL	UPSTREAM	CORE		TOTAL
		A1	A2	A3		A1	A2	A3		A1	A2	A3	
GWP	[kg CO ₂ -Eq.]	1,07E+02	2,22E+01	8,09E+00	1,37E+02	1,07E+02	2,22E+01	8,09E+00	1,37E+02	1,12E+02	2,16E+01	8,05E+00	1,42E+02
ODP	[kg CFC ₁₁ -Eq.]	4,67E-06	4,12E-06	6,37E-07	9,42E-06	4,67E-06	4,12E-06	6,37E-07	9,42E-06	4,55E-06	4,01E-06	6,34E-07	9,19E-06
AP	[kg SO ₂ -Eq.]	2,57E-01	8,62E-02	3,28E-02	3,76E-01	2,57E-01	8,62E-02	3,28E-02	3,76E-01	2,65E-01	8,39E-02	3,26E-02	3,81E-01
POCP	[kg C ₂ H ₄ -Eq.]	9,48E-03	3,69E-03	3,10E-03	1,63E-02	9,48E-03	3,69E-03	3,10E-03	1,63E-02	1,03E-02	3,60E-03	3,08E-03	1,70E-02
EP	[kg (PO ₄) ³⁻ -Eq.]	6,87E-02	2,03E-02	1,20E-02	1,01E-01	6,87E-02	2,03E-02	1,20E-02	1,01E-01	7,14E-02	1,98E-02	1,19E-02	1,03E-01
ADPE	[kg Sb-Eq.]	3,93E-05	6,55E-05	2,06E-05	1,25E-04	3,93E-05	6,55E-05	2,06E-05	1,25E-04	4,60E-05	6,37E-05	2,02E-05	1,30E-04
ADPF	[MJ]	5,04E+02	3,38E+02	1,30E+02	9,71E+02	5,04E+02	3,38E+02	1,30E+02	9,71E+02	5,25E+02	3,29E+02	1,29E+02	9,83E+02

GWP Global Warming Potential

ODP Depletion potential of the stratospheric ozone layer

AP Acidification Potential of land and water

POCP Formation potential of tropospheric ozone photochemical oxidants

EP Eutrophication Potential

ADPE Abiotic depletion potential for non-fossil resources

ADPF Abiotic depletion potential for fossil resources

2. Results: RESOURCE USAGE

ENVIRONMENTAL IMPACTS	UNIT	CLASSICI Series				DESIGN Series				FILTRANTI Series			
		UPSTREAM	CORE		TOTAL	UPSTREAM	CORE		TOTAL	UPSTREAM	CORE		TOTAL
		A1	A2	A3		A1	A2	A3		A1	A2	A3	
PERE	[MJ]	4,98E+01	2,45E+00	4,23E+00	5,64E+01	4,98E+01	2,45E+00	4,23E+00	5,64E+01	4,74E+01	2,38E+00	4,20E+00	5,40E+01
PERM	[MJ]	1,15E+01	1,13E+00	3,68E+02	3,81E+02	1,15E+01	1,13E+00	3,68E+02	3,81E+02	1,33E+01	1,10E+00	3,68E+02	3,82E+02
PERT	[MJ]	6,12E+01	3,57E+00	3,72E+02	4,37E+02	6,12E+01	3,57E+00	3,72E+02	4,37E+02	6,07E+01	3,48E+00	3,72E+02	4,36E+02
PENRE	[MJ]	6,00E+02	3,64E+02	1,50E+02	1,11E+03	6,00E+02	3,64E+02	1,50E+02	1,11E+03	6,26E+02	3,55E+02	1,50E+02	1,13E+03
PENRM	[MJ]	4,74E-03	1,11E-02	3,32E-02	4,91E-02	4,74E-03	1,11E-02	3,32E-02	4,91E-02	5,58E-03	1,08E-02	3,32E-02	4,97E-02
PENRT	[MJ]	6,00E+02	3,64E+02	1,50E+02	1,11E+03	6,00E+02	3,64E+02	1,50E+02	1,11E+03	6,26E+02	3,55E+02	1,50E+02	1,13E+03
SM	[kg]	3,60E+02	0,00E+00	0,00E+00	3,60E+02	3,60E+02	0,00E+00	0,00E+00	3,60E+02	4,32E+02	0,00E+00	0,00E+00	4,32E+02
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m³]	8,94E-01	6,20E-02	7,97E-02	1,04E+00	8,94E-01	6,20E-02	7,97E-02	1,04E+00	5,61E-01	6,04E-02	7,95E-02	7,01E-01

PERE Use of renewable primary energy excluding renewable primary energy resources used as raw materials

PERM Use of renewable primary energy resources used as raw materials

PERT Total use of renewable primary energy resources

PENRE Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials

PENRM Use of non-renewable primary energy resources used as raw materials

PENRT Total use of non-renewable primary energy resources

SM Use of secondary material

RSF Use of renewable secondary fuels

NRSF Use of non-renewable secondary fuels

FW Use of net fresh water

3. Results: OUTPUT FLOWS AND WASTE CATEGORIES

ENVIRONMENTAL IMPACTS	UNIT	CLASSICI Series				DESIGN Series				FILTRANTI Series			
		UPSTREAM	CORE		TOTALE	UPSTREAM	CORE		TOTALE	UPSTREAM	CORE		TOTAL
		A1	A2	A3		A1	A2	A3		A1	A2	A3	
HWD	[kg]	0,00E+00	0,00E+00	1,59E-01	1,59E-01	0,00E+00	0,00E+00	1,59E-01	1,59E-01	0,00E+00	0,00E+00	1,59E-01	1,59E-01
NHWD	[kg]	0,00E+00	0,00E+00	2,16E+01	2,16E+01	0,00E+00	0,00E+00	2,16E+01	2,16E+01	0,00E+00	0,00E+00	2,16E+01	2,16E+01
RWD	[kg]	2,82E-03	2,32E-03	3,46E-04	5,49E-03	2,82E-03	2,32E-03	3,46E-04	5,49E-03	2,82E-03	2,26E-03	3,44E-04	5,42E-03
CRU	[kg]	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
MFR	[kg]	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
MER	[kg]	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
EEE	[MJ]	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
EET	[MJ]	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

N.D. Not Declared

HWD	Hazardous waste disposal
NHWD	Non-hazardous waste disposal
RWD	Radioactive waste disposed
CRU	Components for re-use
MFR	Materials for recycling
MER	Materials for energy recovery
EEE	Exported electrical energy
EET	Exported thermal energy

RIFERIMENTI

- ISO 14025:2006 – Environmental labels and declarations - Type III environmental declarations - Principles and procedures.
- ISO 14040:2006 – Environmental management – Life cycle assessment – Principles and framework.
- ISO 14044:2006/AMD1:2017 – Environmental management – Life cycle assessment – Requirements and guidelines.
- EN 15804:2012+A1:2013 – Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
- PCR ICMQ 001/15-rev 2.1 Product Category Rules “Prodotti da costruzione e servizi per costruzioni” (Building-Related Products and Services) - www.epditaly.it
- Regolamento EPDItaly Revision 4 dated 03.06.2019 - www.epditaly.it
- SimaPro v9.0.0.35 - www.pre-sustainability.com
- Database Ecoinvent, 2018, v 3.5, dated November 2018 - www.ecoinvent.org
- LCA report issued by Qoncert S.r.l. – Masselli autobloccanti per pavimentazioni esterne – Stabilimento: Ferrara – Rev. 01 – 15.06.2020