



Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Gipave®

from **Iterchimica S.p.A.**



Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-09734
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): PCR 2019:14 Construction products (EN 15804:A2) (1.2.5) prepared by IVL Swedish Environmental Research Institute, EPD International Secretariat

UN CPC 35 Other chemical products; man-made fibres

PCR review was conducted by: *The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.*

Life Cycle Assessment (LCA)

LCA accountability: Alessio Zapparoli a.zapparoli@greenwichsrl.it (Greenwich S.r.l.) <https://greenwichsrl.it>, Elisa Bertuletti Elisa.Bertuletti@iterchimica.it (Iterchimica S.p.A.)

Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006 via:

EPD verification by EPD Process Certification*

Internal auditor: Federica Gilardelli f.gilardelli@greenwichsrl.it

Third-party verification: Certiquality is an approved certification body accountable for third-party verification

Third-party verifier is accredited by: ACCREDIA, certificate n. 003H rev. 17.

*For EPD Process Certification, an accredited certification body certifies and reviews the management process and verifies EPDs published on a regular basis. For details about third-party verification procedure of the EPDs, see GPI.

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD: Iterchimica S.p.A. Via Guglielmo Marconi, 21, 24040 Suisio (BG) Italy

Contact: Elisa Bertuletti - QC & R&D Manager Elisa.Bertuletti@iterchimica.it

Description of the organisation: Iterchimica is an Italian company leader in the production of high-tech additives and sustainable technologies for asphalt pavements. Iterchimica's commercial policy combines the quality of products and services with technical support, assistance and consultancy in order to meet customers' requests and specifications' requirements from the project to the construction

Vision

Safety and environmental impact reduction through the reuse and recycling of existing asphalt pavements, by using innovative production materials and technologies.

Mission

Long-lasting, safe and ecological roads. From the project to the construction.

For more than 50 years Iterchimica has been producing high-tech additives for the construction of longer-lasting and sustainable asphalt pavements. The company is strongly customer-oriented and provides technical assistance and know-how from the project to the construction and laying of asphalt pavements.



Product-related or management system-related certifications: UNI EN ISO 9001:2015, UNI EN ISO 14001:2015

Name and location of production site: Lombardy, Italy

Product information

Product name: Gipave®. This EPD is for a specific product.

Product identification: Gipave is a latest generation polymeric supermodifier based on graphene and "hard" plastics, designed for the construction and maintenance of long-lasting and eco-sustainable road surfaces.

Product description:

Patented High-Tech Graphene-
Enhanced Polymeric Supermodifier



UN CPC code: UN CPC 35 Other chemical products; man-made fibres

Geographical scope: Global

LCA information

Declared unit: 1 kg

Time representativeness: 2022

Database and LCA software used: EPD Process n. P5114, based on Ecoinvent 3.8, Simapro 9.4.0.2

Description of system boundaries: Cradle to gate. Modules C1–C4 and module D are not considered because:

- products are physically integrated with other products during installation so they cannot be physically separated from them at end of life;
- products are no longer identifiable at end of life as a result of a physical or chemical transformation process;
- products do not contain biogenic carbon.

System diagram:

More information: Alessio Zapparoli [a.zapparoli@greenwichsrl.it.](mailto:a.zapparoli@greenwichsrl.it), Elisa Bertuletti
Elisa.Bertuletti@iterchimica.it

Process description

Through an innovative patented selection process, the plastics normally destined for waste-to-energy plants (defined as "hard") can be recycled and reused in subsequent production cycles, creating long-term value.

Allocation

The allocation established for the mass balance of the products, in accordance with the reference PCR, was made on the basis of the production in kg referring to the year 2022.

The consumption of electricity and plant waste were allocated to production of the reference year.

Data quality

About generic data, throughout the analysis, the following criteria were applied:

- geographic equivalence, considering similar Italian or at most European systems;
- technological equivalence, considering comparable technological systems through literature searches;
- equivalence with respect to system boundaries, considered systems that consider similar inputs and outputs and similar phases.

As regards generic data, information between 2010 and 2020 was considered. Site-specific data refer to the year 2022.

Proxy Data

Thanks to the knowledge and collaboration of the technical staff of Iterchimica S.p.A. it was possible to model the incoming raw materials with precision where available congruent Ecoinvent 3.8 database. For more information, contact the LCA accountable.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	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
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	EU27	EU27	ITA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Specific data used	>90%			ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-
Variation – products	-			ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-
Variation – sites	-			ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-

Content information

GIPAVE®

COMPOSITION: Mixture of graphene, specific additives and technically-selected waste plastics.

Gipave® is made by 99,5% of post-consumer material.

Components & Hazardous materials: Confidential. For more information please contact us.

Environmental Information - Results per declared unit (1 kg)

GIPAVE® (1 kg)

IMPACT CATEGORY		UNIT	A1	A2	A3	A1-A3
MAIN INDICATORS	GWP-fossil	kg CO2 eq.	4,26E-01	4,15E-02	2,07E-01	6,75E-01
	GWP-biogenic	kg CO2 eq.	-1,14E-02	2,23E-05	-5,36E-02	-6,49E-02
	GWP-luluc	kg CO2 eq.	8,81E-05	1,72E-05	3,87E-04	4,93E-04
	GWP-total	kg CO2 eq.	4,15E-01	4,15E-02	1,54E-01	6,11E-01
	ODP	Kg CFC11 eq	5,39E-05	9,02E-09	2,91E-08	5,39E-05
	AP	Mol H+ eq.	1,60E-03	2,11E-04	1,01E-03	2,82E-03
	EP-freshwater	Kg P eq.	7,42E-05	3,12E-06	5,42E-05	1,32E-04
	EP-marine	Kg N eq.	2,78E-04	7,13E-05	2,57E-04	6,07E-04
	EP-terrestrial	Mol N eq.	2,92E-03	7,79E-04	2,07E-03	5,77E-03
	POCP	Kg NMVOC eq.	8,67E-04	2,22E-04	6,19E-04	1,71E-03
	ADPF (2)	MJ	1,59E-06	1,43E-07	1,06E-06	2,79E-06
	ADPE (2)	Kg Sb eq.	6,59E+00	6,16E-01	8,53E-01	8,06E+00
	Water Use (2)	m3 world eq deprived	1,55E-01	2,13E-03	3,05E-02	1,88E-01
	GWP-GHG (EN15804+A1)	kg CO2 eq	4,17E-01	4,11E-02	2,02E-01	6,60E-01
ADDITIONAL INDICATORS	PM	disease inc.	6,70E-09	3,64E-09	1,24E-08	2,27E-08
	IRP (1)	kBq U235 eq.	4,30E-02	2,83E-03	1,11E-02	5,69E-02
	ETP-fw (2)	CTUe	3,48E+00	5,30E-01	4,88E+01	5,28E+01
	HTP-nc (2)	CTUh	2,33E-09	5,14E-10	4,80E-09	7,65E-09
	HTP-c (2)	CTUh	1,13E-10	1,57E-11	2,40E-10	3,69E-10
	SQP (2)	Pt	2,90E+00	4,18E-01	5,27E+00	8,59E+00
RESOURCE USE	PERE	MJ	7,61E-01	7,10E-03	1,04E+00	1,81E+00
	PERM	MJ	3,09E-01	0,00E+00	4,17E-02	3,50E-01
	PERT	MJ	1,07E+00	7,10E-03	1,08E+00	2,16E+00
	PENRE	MJ	-3,64E+01	0,00E+00	2,21E+00	-3,42E+01
	PENRM	MJ	4,36E+01	0,00E+00	2,83E-03	4,36E+01
	PENRT	MJ	7,14E+00	0,00E+00	2,21E+00	9,35E+00
	SM	Kg	9,95E-01	0,00E+00	1,67E-03	9,97E-01
	RSF	MJ	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
	FW	m3	3,17E-03	7,05E-05	1,12E-03	4,35E-03
WASTE PRODUCTION AND OUTPUT FLOWS	HWD	kg	9,93E-06	1,63E-06	2,48E-06	1,40E-05
	NHWD	kg	1,50E-02	3,13E-02	5,74E-02	1,04E-01
	RWD	kg	1,40E-05	4,03E-06	6,06E-06	2,41E-05
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MER	kg	0,00E+00	0,00E+00	6,70E-01	6,70E-01
	EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Acronyms. GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP =

Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (use) deprivation potential, deprivation-weighted water consumption
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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water
HWD Hazardous waste disposed; NHWD Non-hazardous waste disposed; RWD Radioactive waste disposed; CRU Components for re-use; MFR Material for recycling; MER Materials for energy recovery; EEE Exported energy, electricity; EET Exported energy, thermal

Disclaimers (1) The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator. (2) This indicator mainly concerns the possible impact on human health of low-dose ionizing radiation from the nuclear fuel cycle. It does not consider the effects due to possible nuclear accidents, occupational exposure or disposal of radioactive waste in underground landfills. Potential ionizing radiation from the ground, radon and some building materials are also not evaluated by this indicator.

References

General Programme Instructions of the International EPD® System. Version 3.1.

UNI EN ISO 14040: 2021, Gestione ambientale – Valutazione del ciclo di vita – Principi e quadro di riferimento.

UNI EN ISO 14044: 2021, Gestione ambientale – Valutazione del ciclo di vita – Requisiti e linee guida.

UNI EN ISO 14025:2010, Etichette e dichiarazioni ambientali - Dichiarazioni ambientali di Tipo III - Principi e procedure

EN 15804:2012 + A2:2019, Sostenibilità delle costruzioni – Dichiarazioni ambientali di prodotto – Regole chiave di sviluppo per categoria di prodotto.

PCR 2019:14 Construction products (EN 15804:A2) (1.2.5) prepared by IVL Swedish Environmental Research Institute, EPD International Secretariat

Association of Issuing Bodies – European Residual Mixes. Results of the calculation of Residual Mixes for the calendar year 2020. Version 1.0, 2021-05-31

Background report. Life Cycle Assessment di Prodotti per il settore stradale. Gipave®. Rev. 00 del 28/06/2023. Iterchimica S.p.A. Giugno 2023 Studio redatto da A. Zapparoli (Greenwich S.r.l.) e E. Bertuletti (Iterchimica S.p.A.)

