Environmental Product Declaration

THE NORTH AMERICAN EPD® SYSTEM

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

Sigma Polysatin SM Satin

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-12190
Publication date:	2024-02-26
Valid until:	2029-01-31

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

EPD of multiple products, based on worst-case results.

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



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): *International EPD System, PCR for Construction Products, 2019:14, version 1.3.1.*
PCR review was conducted by: *Claudia A. Peña, Director of Sustainability at ADDERE Research and Technology*

Life Cycle Assessment (LCA)
LCA accountability: Zixuan Zhang, Product Sustainability Specialist, Product Sustainability CoE
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: Yiping Qu, Product Sustainability Specialist, Product Sustainability COE
Third-party verification: Epsten Group, Inc. 101 Marietta St. NW, Suite 2600, Atlanta, Georgia 30303, USA www.epstengroup.com epstengroup A Salas O'Brien Company
Third-party verifier is accredited by A2LA
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☑ No

EPD Type: Worst case. This EPD is based on the worst case life cycle impacts (of each reported life cycle impact category) of all variations of PPG Sigma Polysatin SM Satin.

The EPD owner has the sole ownership, liability, and responsibility for the EPD. This EPD is intended for B2B communication

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: PPG Industries, 1 PPG Place, Pittsburgh, PA, 15272

Contact: Sustainability.COE@ppg.com

Description of the organisation:

PPG is a global manufacturer of coatings who is the owner of many brands through-out Europe, one of these being Sigma Coatings.

Product-related or management system-related certifications:

PPG's EHS Policy incorporates the elements of voluntary global industry initiatives, including Responsible Care® and Coatings Care®, which help companies manage safe and environmentally responsible practices in the chemicals and coatings industries. At more than 40 of its facilities, PPG has received ISO 14001:2004 certification.

Name and location of production site(s):

Uithoorn, Netherlands

Product Information

Product name: Sigma Polysatin SM Satin

Product identification: Products are identified by name

Product description: Sigma Polysatin SM Satin is a satin interior wall paint, scrub resistance class 1, hiding power class 2

UN CPC code: 35110

Geographical scope: European Union Countries

LCA Information

Declared unit: The declared unit for this EPD is 0.346 kg (1 m2 of substrate covered and protected by Sigma Coatings Paints). Conversion factor of the impact assessment results in this EPD from the declared unit to 1 kg of product is 2.89

Time representativeness: 2022

Database(s) and LCA software used: Ecoinvent 3.9.1, Industry Data 2.0; Simapro v. 9.5.

Electricity usage in A3: Electricity, medium voltage {NL}| electricity, medium voltage, residual mix | Cut-off, S; Climate impact: 0.586kg CO_2eq/kWh (GWP-GHG),

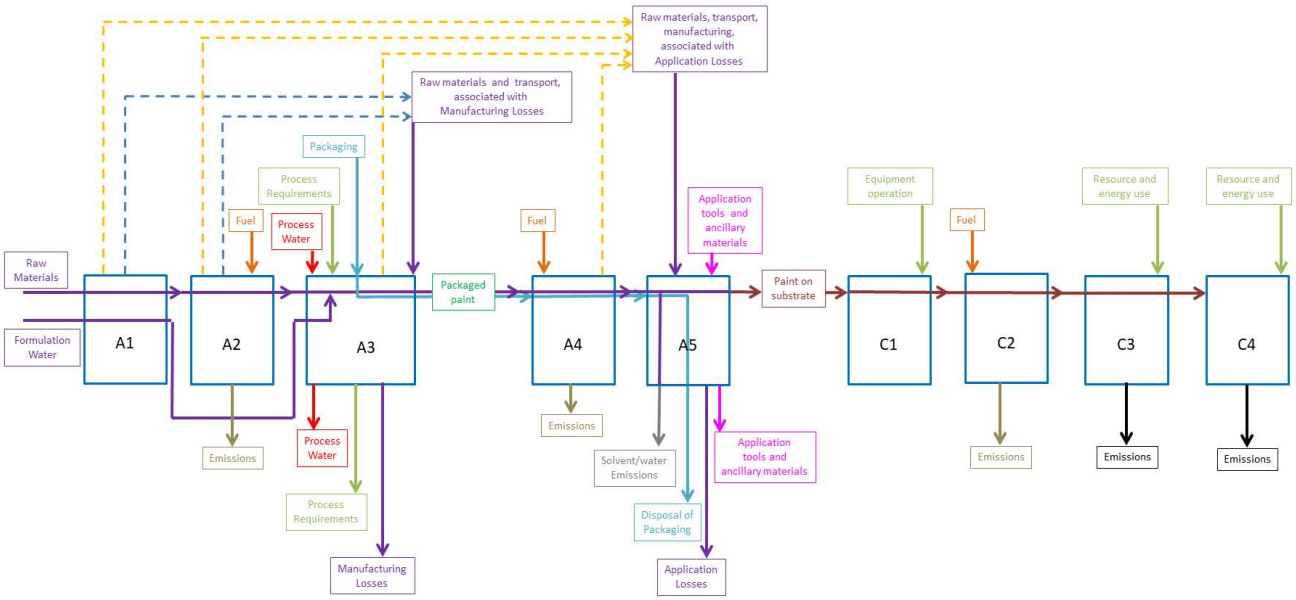
Cut-off rules: Neglected flow in all modules is less than 1% of the energy use and total mass. Cut-off rules do not apply to Module A1, which is 100% modelled.

Allocation method: Mass allocation: A3 energy/material inputs and waste outputs are allocated by total products manufactured over 1 year

Description of system boundaries:

The type of EPD is Cradle to Gate with Options (EPD Type b - Modules A1-A3, A4, A5, C1-C4, and D). B modules are excluded since no use phase maintenance, repair or replacement is expected during the techinical life time.

System diagram:



Please refer the table below for A1-C4 life cycle stages.

More Information

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 and water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	ND	X	X	X	X	X
Geography	EU27	EU27	NL	EU27	EU27		EU27	EU27	EU27	EU27	EU27
Specific data used	13.3% Note 1			-	-	-	-	-	-	-	-
Variation – products	44.1% Note 2			-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-

Note 1: Based on GWP-GHG of Stage A3 divided by GWP-GHG for stages A1-A3. Data for A3 is specific to PPG facilities.

Note 2: Since EPD uses the maximum value of all products, this is based on the ratio of the GWP-GHG of the minimum product to the EPD reported value for Stages A1-A3, i.e., the variation is entirely below the reported result.

Content Information

Product components	Weight, kg	Average Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Binders	7.58E-02~8.06E-02	7.82E-02	-	-
Solvents	1.04E-04~2.59E-04	1.81E-04	-	-
Pigments	7.74E-02~1.38E-01	1.08E-01	-	-
Water	1.38E-01~1.50E-01	1.44E-01	-	-
Total	2.91E-01~3.68E-01	3.30E-01	0.0	0% / 0.0

Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Steel for cans/buckets(Note 1)	1.53E-03	0.49%	0.0
Polypropylene for cans/buckets	1.88E-02	6.03%	0.0
Cardboard for boxes and pallet interleaves	5.05E-04	0.14%	0.50
Wood pallet	1.26E-02	3.61%	0.50
Polyethylene for pallet wrap	7.59E-04	0.24%	0.0
TOTAL	3.42E-02	10.52%	6.57E-03

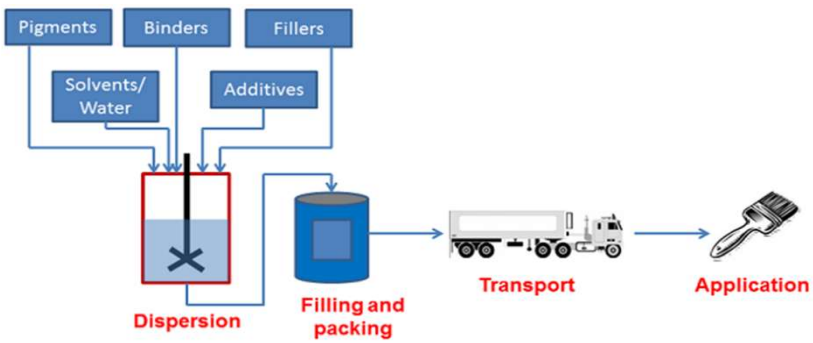
Note 1: Packaging weights are the maximum of the individual products included in the EPD. Packaging weight percentages are assessed on the maximum product weight per declared unit given above.

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per declared unit
None			

Biogenic carbon content	Product's biogenic carbon content at the factory gate kg C
Biogenic carbon content in product	0.00E+00
Biogenic carbon content in accompanying packaging	6.57E-03

Manufacturing Process

The manufacturing process for coatings primarily involves the mixing and dispersing of raw materials into a homogeneous mixture. Raw materials include pigments and fillers, which provide colour, hiding, and gloss control; resins/binders, which dry to form a solid film and adhere the coating to the substrate and additives, which assist with various coating properties. The product is then shipped to the customers as a set for them to mix at the job site before application.



Assumptions beyond module A3

A4

Transportation distance is assumed to be 850 km according to EU geography and location of PPG factories. Transportation mode is assumed to be by Euro 5 16-32 metric ton truck.

A5

The following sub modules and assumptions are included in A5

1. Application tools and ancilliaries: roller, tray and plastic sheeting.
2. Disposal of application waste: an estimate of 1% application lost is assumed. Environmental impact of manufacturing and disposal of 1% product lost is included in A5. Solid content of lost products are assumed to be disposed of as nonhazardous waste to incineration without energy recovery.
3. Primary packaging (steel, plastic and cardboards) are disposed as general waste. Pallet packaging is disposed as wood waste.
4. VOCs were modelled as direct emission to the environment and characterized by their characterization factors according to EVEA Method EN 15804 A2 EPD Ev-DEC 1.13 ei3.9.1 SP9.5.

C1-C4

1. C1: Energy associated with demolition of the substrate structure is prorated for the mass of paint.
2. C2: Transportation to disposal is assumed to 30 km and transportation mode is assumed to be by Euro 5 16-32 metric ton truck.
3. C3: No waste processing options are considered.
4. C4: It is assumed that the paint will be disposed of along with the substrate in a landfill.

D

No benefits and loads beyond the product system boundary were declared since no reuse or recovery occurs for architectural coatings in general. In addition, since landfilling is assumed to be the waste disposal option in C4 module, no “useful energy carrier” is considered leaving the product system. Therefore, no benefit is claimed in module D.

List of excluded processes

1. A3: Raw materials and processing for the packaging of the primary and secondary packaging units are excluded from the system.
2. Personnel related processes, such as transportation of employees to and from work, are excluded.
3. The production and end-of-life processes of infrastructure or capital goods used in the product system are excluded.
4. Construction and infrastructure use of PPG facilities.

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804

Results per declared unit (1 m^2 of substrate covered and protected by Sigma coating)

Indicator	Unit	A1-A3	A4	A5	B1 - B7	C1	C2	C3	C4	D	Variation
GWP - fossil	kg CO_2 eq.	7.23E-01	6.04E-02	8.97E-02	INA	6.23E-05	1.15E-03	0.00E+00	1.01E-02	0.00E+00	161%
GWP -biogenic	kg CO_2 eq.	-2.67E-02	1.92E-05	2.85E-02	INA	1.13E-08	3.65E-07	0.00E+00	6.82E-06	0.00E+00	209%
GWP - luluc	kg CO_2 eq.	6.07E-04	2.96E-05	4.10E-05	INA	7.99E-09	5.62E-07	0.00E+00	1.79E-06	0.00E+00	155%
GWP - total	kg CO_2 eq.	6.97E-01	6.05E-02	1.18E-01	INA	6.23E-05	1.15E-03	0.00E+00	1.01E-02	0.00E+00	161%
ODP	kg CFC 11 eq.	2.49E-08	1.31E-09	8.87E-10	INA	1.30E-12	2.50E-11	0.00E+00	5.63E-11	0.00E+00	259%
AP	mol H^+ eq.	6.01E-03	1.97E-04	2.86E-04	INA	5.50E-07	3.74E-06	0.00E+00	1.71E-05	0.00E+00	320%
EP - freshwater	kg P eq.	2.81E-05	4.83E-07	1.99E-06	INA	3.40E-10	9.18E-09	0.00E+00	3.57E-08	0.00E+00	234%
EP - marine	kg N eq.	6.94E-04	6.69E-05	5.79E-05	INA	2.55E-07	1.27E-06	0.00E+00	6.29E-06	0.00E+00	176%
EP-terrestrial	mol N eq.	7.30E-03	7.15E-04	5.35E-04	INA	2.77E-06	1.36E-05	0.00E+00	6.81E-05	0.00E+00	171%
POCP	kg NMVOC eq.	3.32E-03	2.94E-04	2.33E-04	INA	8.36E-07	5.59E-06	0.00E+00	2.51E-05	0.00E+00	174%
ADP - minerals & metals*	kg Sb eq.	4.20E-06	1.99E-07	2.19E-07	INA	2.89E-11	3.78E-09	0.00E+00	5.13E-09	0.00E+00	167%
ADP - fossil*	MJ	1.34E+01	8.56E-01	1.71E+00	INA	8.07E-04	1.63E-02	0.00E+00	5.19E-02	0.00E+00	143%
WDP*	m^3	5.09E-01	3.49E-03	4.11E-02	INA	1.82E-06	6.63E-05	0.00E+00	2.19E-03	0.00E+00	180%
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 (user) deprivation potential, deprivation-weighted water consumption										

** Disclaimer: 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.*

Varation is defined as the impact indicator results of the worst case product divided by the best case product. For those impact categories which variation is less than 100%, it means smaller number of an indicator is better or has lower environmental impact. Except for GWP indicators, which are determined by the GWP - total.

Potential environmental impact – additional mandatory and voluntary indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1 - B7	C1	C2	C3	C4	D	Variation
GWP-GHG[1]	kg CO_2 eq.	7.25E-01	6.05E-02	8.99E-02	INA	6.23E-05	1.15E-03	0.00E+00	1.01E-02	0.00E+00	161%
Particulate Matter	disease inc.	4.42E-08	4.80E-09	2.60E-09	INA	1.55E-11	9.11E-11	0.00E+00	3.65E-10	0.00E+00	200%
Ionizing radiation, human health (IRP)	kBq U235 eq.	2.39E-02	4.29E-04	2.28E-03	INA	2.56E-07	8.15E-06	0.00E+00	2.90E-05	0.00E+00	190%
Eco-toxicity - freshwater (ETP-fw)	CTUe	7.67E+00	4.23E-01	2.22E-01	INA	3.44E-04	8.03E-03	0.00E+00	1.56E-01	0.00E+00	293%
Human toxicity, cancer effect (HTP-c)	CTUh	4.16E-10	2.73E-11	2.35E-11	INA	3.01E-14	5.21E-13	0.00E+00	1.37E-12	0.00E+00	200%
Human toxicity, non-cancer effects (HTP-nc)	CTUh	8.07E-09	6.03E-10	4.07E-10	INA	1.55E-13	1.15E-11	0.00E+00	2.54E-11	0.00E+00	175%
Land use related impacts/Soil quality (SQP)	dimensionless	6.45E+00	5.07E-01	2.45E-01	INA	5.56E-05	9.69E-03	0.00E+00	1.18E-01	0.00E+00	180%
Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017											

Note 1: GWP-GHG is calculated as GWP - total minus any climate change impact (positive or negative) caused by biogenic carbon emission or uptake.

Varation is defined as the impact indicator results of the worst case product divided by the best case product. For those impact categories which variation is less than 100%, it means smaller number of an indicator is better or has lower environmental impact

Use of resources

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1 - B7	C1	C2	C3	C4	D	Variation
PERE	MJ	4.13E-01	1.18E-02	3.44E-01	INA	6.85E-06	1.97E-04	0.00E+00	7.37E-04	0.00E+00	62%
PERM	MJ	2.69E-01	0.00E+00	-2.69E-01	INA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
PERT	MJ	6.82E-01	1.18E-02	7.41E-02	INA	6.85E-06	1.97E-04	0.00E+00	7.37E-04	0.00E+00	62%
PENRE	MJ	1.06E+01	8.56E-01	2.45E+00	INA	8.07E-04	1.63E-02	0.00E+00	5.19E-02	0.00E+00	154%
PENRM	MJ	2.87E+00	0.00E+00	-7.38E-01	INA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	95%
PENRT	MJ	1.34E+01	8.56E-01	1.71E+00	INA	8.07E-04	1.63E-02	0.00E+00	5.19E-02	0.00E+00	143%
SM	kg	0.00E+00	0.00E+00	0.00E+00	INA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	INA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	INA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
FW	m^3	1.31E-02	1.22E-04	9.09E-04	INA	6.96E-08	2.31E-06	0.00E+00	5.35E-05	0.00E+00	183%
Acronyms	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										

Varation is defined as the impact indicator results of the worst case product divided by the best case product. For those impact categories which variation is less than 100%, it means smaller number of an indicator is better or has lower environmental impact. Except for PERE and PERM, which are determined by the PERT, and PENRE and PENRM, which are determined by the PENRT.

Waste production

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1 - B7	C1	C2	C3	C4	D	Variation
Hazardous waste disposed	kg	1.08E-01	8.08E-04	3.22E-03	INA	1.08E-06	1.55E-05	0.00E+00	1.18E-04	0.00E+00	773%
Non-hazardous waste disposed	kg	2.02E+00	4.86E-02	5.96E-02	INA	5.11E-06	9.24E-04	0.00E+00	2.04E-01	0.00E+00	517%
Radioactive waste disposed	kg	1.81E-05	2.78E-07	1.78E-06	INA	1.60E-10	5.29E-09	0.00E+00	1.82E-08	0.00E+00	196%

Output flows

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1 - B7	C1	C2	C3	C4	D	Variation
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	INA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	INA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	INA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	INA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	INA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A

Varation is defined as the impact indicator results of the worst case product divided by the best case product. For those impact categories which variation is less than 100%, it means smaller number of an indicator is better or has lower environmental impact

Other Environmental Performance Indicators

None included

Additional Environmental Information

None included

Additional Social and Economic Information

None included

Information Related to Sector EPD

Not applicable

Differences Versus Previous Versions

Not applicable

References

General Programme Instructions of the International EPD System®, Version 4.0

EPD International Product Category Rules (PCR) for Construction Products, PCR 2019:14, Version 1.3.1

ISO 14044:2006-10, Environmental Management — Life Cycle Assessment — Requirements and Instructions (ISO 14044:2006); EN ISO 14044:2006

EN 15804+A2:2019, Sustainability of construction works — Environmental Product Declarations — Core rules for the construction products product category