Statement of Verification

BREG EN EPD No.: 000451 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

PPG Architectural Coatings

is in accordance with the requirements of:

EN 15804:2012+A2:2019

and

BRE Global Scheme Document SD207

This declaration is for:

Sigma Pearl Clean Matt

Company Address

Oceanenweg 2,
1047 BB Amsterdam,
Netherlands

Signed for BRE Global Ltd	Emma Baker Operator	22 September 2022 Date of this Issue
22 September 2022 Date of First Issue		21 September 2027 Expiry Date

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Environmental Product Declaration

EPD Number: 000451

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804+A2 PN 514 Rev 3.0
Commissioner of LCA study	**LCA consultant/Tool**
Ben Wilde Marketing Manager – Johnstone's Trade PPG Architectural Coatings - Region North East Europe	Joanna Zhuravlova, Ecomatters Brienne Wiersema, Ecomatters
Declared/Functional Unit	**Applicability/Coverage**
Protecting and decorating 1m² of substrate, suitably prepared, on the basis of two layers of the product	Product Average.
EPD Type	**Background database**
Cradle to Gate with options	ecoinvent

Demonstration of Verification
CEN standard EN 15804 serves as the core PCR [a]
Independent verification of the declaration and data according to EN ISO 14025:2010 ☐Internal ☒ External
(Where appropriate [b])Third party verifier: Pat Hermon
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Comparability
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A2:2019 for further guidance

Information modules covered

Product			Construction		Use stage							End-of-life					Benefits and loads beyond the system boundary
					Related to the building fabric					Related to the building							
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal		Reuse, Recovery and/or Recycling potential
☑	☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☑	☑	☑	☑		☑

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Oceanenweg 2,
1047 BB Amsterdam,
Netherlands

Construction Product:

Product Description

Tough premium matt emulsion designed for high traffic areas which require frequent cleaning as it helps to prevent stains setting into the paint and makes removing stains and marks easier. It is typically applied with standard roller application on interior walls, using two layers of the product. One EPD is produced per product group. In order to group different paints belonging to the same product type within the EPDs, a representative paint product is constructed. Annual sales volumes are used to construct the weighted average representative paint. Sales volumes are based on the year averaged values for the year 2021.

The average calculation rule is applied to paint composition and performance characteristics (e.g. formulation, density, coverage), as well as the coatings production sites characteristics including the production inputs (electricity, natural gas, coal and water) and outputs (hazardous and non-hazardous waste, and wastewater outputs).

EPD	Paint Product Name	Annual Volumes (% per product)	Paint Application
Sigma Pearl Clean Matt	Sigma Pearl Clean Matt Wn Base	88%	Interior wall, applied with standard roller application.
	Sigma Pearl Clean Matt Zn Base	12%	

Technical Information

Paint Product	Property	Value, Unit
Sigma Pearl Clean Matt Wn Base	Spreading rate	15 m2/l
	Time to touch dry	2 h
	Time to recoat	4 h
	Initial coats	2
	Density	1.36 kg/L
	Declared unit	0.301 kg/m2
Sigma Pearl Clean Matt Zn Base	Spreading rate	15 m2/l
	Time to touch dry	2 h
	Time to recoat	4 h
	Initial coats	2
	Density	1.20 kg/L
	Declared unit	0.267 kg/m2

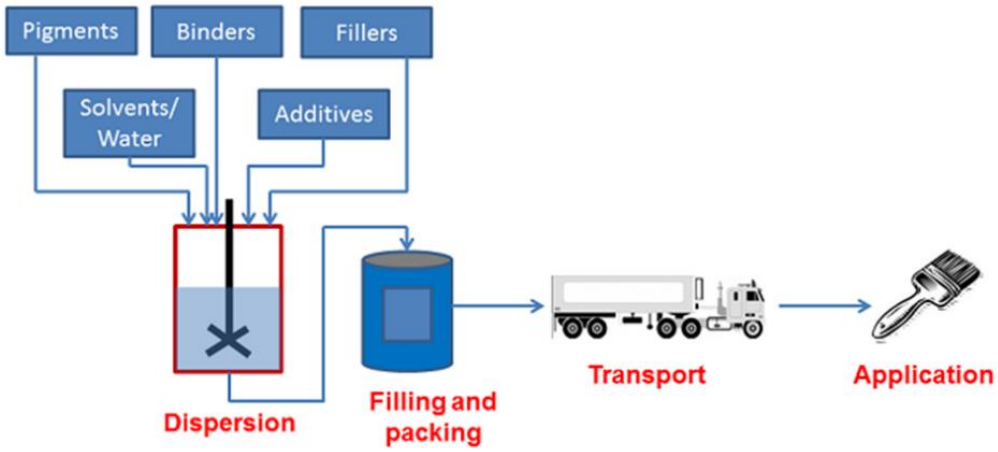
Main Product Contents

Material/Chemical Input	%
Binder	20 – 27.5
Water	35 - 55
Additives	1 - 2
Biocide	0 – 0.05
Filler	15 - 20
Glycols and Esters	2 - 3
Pigment	0 - 20

Manufacturing Process

The manufacturing process involves the mixing and dispersing of raw materials into a homogeneous mixture. The product is then packaged for distribution to the customer.

Process flow diagram



Construction Installation

All surfaces should be sound, clean, dry and free from grease. Remove any crazed or flaking paint.
Stir well before use and apply by brush, roller or paint pad. When using a roller, use a medium pile synthetic type. Apply liberally and evenly; avoid overspreading. Do not apply when air or surface temperature is less than 10°C or in damp conditions. If more than one can of colour is to be used in the same area, intermix before use.

End of Life

The end-of-life stage (module C) of paints is reached when the paint products are discarded with the surface they are applied on; thus, the paint is normally not separated from that surface during the disposal process. The end of life the product is that of the end of life of the underlying substrate. After its disposal, it is assumed that the dried paint film ends up entirely in a landfill, in line with the PEFCR for decorative paints (v1.). Therefore, landfilling is the 100% scenario included in this EPD.

Benefits and loads beyond the product system boundary are reported as additional information in module D. The module declares net benefits and loads from net flows leaving the product system that have passed the end-of-waste state, except

those which have been allocated as co-products. Net impacts in module D are calculated according to Annex D of EN15804+A2.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

Protecting and decorating 1m² of substrate, suitably prepared, on the basis of two layers of the product, a spreading rate of 15 m2/L and a weight of 0.297 kg/m2. These characteristics apply for the paint application on an interior wall.

System boundary

The system boundaries of the product LCA follow the modular design defined by EN15804+A2. This cradle-to-gate with options study includes the Product stage (A1-A3), Transport stage (A4), Installation stage (A5), Deconstruction (C1), End-of-life transport (C2), Waste processing (C3), Disposal (C4) and Reuse, recovery and/or recycling potential (D).

Data sources, quality and allocation

Data related to in-house PPG processes has been collected from PPG reporting systems and is of high quality. The data collection period is the full year of 2019.
For life cycle modelling of the process, Sphera Gabi 10.5.1.124 software (2021 version) is used. All relevant background datasets are taken from Ecoinvent 3.7.1 (September 2020 version) and Raw materials LCI database for the European coatings and printing ink industries (CEPE, 2016) and are consistent with the foreground modelling in system limits and allocation procedures.

Electricity used in each manufacturing location is assumed to be 100% from local residual mix (2020 European Residual Mix)

The technological and geographical coverage reflects the physical reality as far as possible taking into account the technology mix, location, and representativeness of technologies, input materials, and input energies for the region.

Cut-off criteria

No cut-offs were intentionally applied to inputs and outputs within the system boundaries in the models. Cut-offs in the background processes are according to the respective methodologies.

LCA Results

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts									
			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CFC11 eq	mol H^+ eq	kg $(PO_4)^{3-}$ eq
Product stage	Raw material supply	A1	6.79E-01	6.77E-01	1.81E-03	2.23E-04	6.77E-08	4.86E-03	1.60E-04
	Transport	A2	7.53E-03	7.51E-03	1.59E-05	2.20E-06	1.78E-09	3.80E-05	4.93E-07
	Manufacturing	A3	5.24E-02	6.27E-02	-1.03E-02	2.68E-05	5.65E-10	1.74E-04	1.23E-06
	Total (of product stage)	A1-3	7.39E-01	7.47E-01	-8.49E-03	2.52E-04	7.00E-08	5.07E-03	1.61E-04
Construction process stage	Transport	A4	2.78E-02	2.78E-02	6.42E-05	9.14E-06	6.43E-09	1.40E-04	1.86E-06
	Construction	A5	2.62E-02	9.54E-03	1.67E-02	1.29E-07	8.27E-11	4.70E-06	4.96E-07
Use stage	Use	B1	MND	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND	MND
100% Landfilling Scenario									
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.21E-03	1.21E-03	2.55E-06	3.53E-07	2.86E-10	6.09E-06	7.92E-08
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	8.85E-04	8.82E-04	2.73E-06	2.56E-07	3.63E-10	8.32E-06	8.23E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.82E-04	-5.55E-04	-2.63E-05	-9.33E-07	-3.88E-11	-2.49E-06	-4.42E-07

GWP-total = Global warming potential, total;
GWP-fossil = Global warming potential, fossil;
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; and
EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts									
			EP-marine	EP-terrestrial	POCP	ADP-mineral &metals	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m^3 world eq deprived	disease incidence
Product stage	Raw material supply	A1	6.80E-04	6.94E-03	2.50E-03	2.88E-06	1.22E+01	1.72E+01	7.01E-08
	Transport	A2	1.32E-05	1.44E-04	4.29E-05	1.78E-08	1.19E-01	5.89E-04	6.97E-10
	Manufacturing	A3	4.22E-05	4.33E-04	1.36E-04	2.76E-08	6.49E-01	-1.90E-03	2.13E-09
	Total (of product stage)	A1-3	7.35E-04	7.52E-03	2.68E-03	2.93E-06	1.29E+01	1.72E+01	7.29E-08
Construction process stage	Transport	A4	4.86E-05	5.31E-04	1.54E-04	8.89E-08	4.30E-01	2.04E-03	2.19E-09
	Construction	A5	2.16E-05	1.94E-05	1.27E-05	1.59E-09	6.74E-03	6.57E-04	4.85E-11
Use stage	Use	B1	MND	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND	MND
100% Landfilling Scenario									
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	2.11E-06	2.31E-05	6.88E-06	2.85E-09	1.90E-02	9.45E-05	1.12E-10
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	2.91E-06	3.18E-05	9.23E-06	1.97E-09	2.48E-02	1.14E-03	1.63E-10
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-4.47E-07	-3.95E-06	-1.10E-06	-4.58E-10	-1.24E-02	-3.29E-04	-6.69E-12

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
EP-terrestrial = Eutrophication potential, accumulated exceedance;
POCP = Formation potential of tropospheric ozone;
ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;
ADP-fossil = Depletion potential of the stratospheric ozone layer;
WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
PM = Particulate matter.

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts							
			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U^{235} eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	6.69E-02	4.45E+01	9.49E-10	7.39E-08	1.74E+00
	Transport	A2	6.06E-04	9.40E-02	2.80E-12	8.38E-11	1.35E-01
	Manufacturing	A3	1.77E-03	1.56E-01	5.22E-11	6.49E-10	8.48E-01
	Total (of product stage)	A1-3	6.92E-02	4.47E+01	1.00E-09	7.46E-08	2.72E+00
Construction process stage	Transport	A4	2.22E-03	3.39E-01	1.11E-11	2.99E-10	3.62E-01
	Construction	A5	5.50E-05	8.41E+00	7.03E-12	1.98E-10	9.66E-03
Use stage	Use	B1	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND
100% Landfilling Scenario							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	9.73E-05	1.51E-02	4.50E-13	1.34E-11	2.17E-02
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	1.10E-04	1.38E+02	4.63E-13	2.10E-09	5.19E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.51E-04	-5.15E-03	-1.42E-13	-4.42E-12	-1.36E-03

IRP = Potential human exposure efficiency relative to U235;
ETP-fw = Potential comparative toxic unit for ecosystems;
HTP-c = Potential comparative toxic unit for humans;
HTP-nc = Potential comparative toxic unit for humans; and
SQP = Potential soil quality index.

LCA Results (continued)

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	3.59E-01	2.15E-04	3.59E-01	1.22E+01	1.15E-06	1.22E+01
	Transport	A2	1.44E-03	7.08E-10	1.44E-03	1.19E-01	0.00E+00	1.19E-01
	Manufacturing	A3	1.60E-01	3.42E-09	1.60E-01	6.49E-01	1.67E-10	6.49E-01
	Total (of product stage)	A1-3	5.20E-01	2.15E-04	5.20E-01	1.29E+01	1.15E-06	1.29E+01
Construction process stage	Transport	A4	5.58E-03	3.16E-09	5.58E-03	4.30E-01	0.00E+00	4.30E-01
	Construction	A5	5.24E-04	1.96E-10	5.24E-04	6.74E-03	0.00E+00	6.74E-03
Use stage	Use	B1	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND
100% Landfilling Scenario								
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	2.32E-04	1.14E-10	2.32E-04	1.90E-02	0.00E+00	1.90E-02
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	1.99E-04	5.14E-10	1.99E-04	2.48E-02	0.00E+00	2.48E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.48E-03	-5.57E-11	-1.48E-03	-1.24E-02	0.00E+00	-1.24E-02

PERE = Use of renewable primary energy excluding renewable primary energy 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 resource

LCA Results (continued)

Parameters describing resource use, secondary materials and fuels, use of water						
			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m^3
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	4.00E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	1.37E-05
	Manufacturing	A3	0.00E+00	0.00E+00	0.00E+00	-2.52E-05
	Total (of product stage)	A1-3	0.00E+00	0.00E+00	0.00E+00	4.00E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	4.74E-05
	Construction	A5	0.00E+00	0.00E+00	0.00E+00	1.53E-05
Use stage	Use	B1	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND
100% Landfilling Scenario						
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	2.20E-06
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	2.65E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-7.65E-06

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;
NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	3.31E-04	1.35E-03	0.00E+00
	Total (of product stage)	A1-3	3.31E-04	1.35E-03	0.00E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	2.40E-02	0.00E+00
Use stage	Use	B1	MND	MND	MND
	Maintenance	B2	MND	MND	MND
	Repair	B3	MND	MND	MND
	Replacement	B4	MND	MND	MND
	Refurbishment	B5	MND	MND	MND
	Operational energy use	B6	MND	MND	MND
	Operational water use	B7	MND	MND	MND
100% Landfilling Scenario					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	1.68E-01	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00

HWD = Hazardous waste disposed;
NHWD = Non-hazardous waste disposed;
RWD = Radioactive waste disposed

LCA Results (continued)

Other environmental information describing output flows – at end of life								
			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00
	Manufacturing	A3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	9.83E-04
	Total (of product stage)	A1-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	9.83E-04
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00
	Construction	A5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00
Use stage	Use	B1	MND	MND	MND	MND	MND	0.00E+00
	Maintenance	B2	MND	MND	MND	MND	MND	0.00E+00
	Repair	B3	MND	MND	MND	MND	MND	0.00E+00
	Replacement	B4	MND	MND	MND	MND	MND	0.00E+00
	Refurbishment	B5	MND	MND	MND	MND	MND	0.00E+00
	Operational energy use	B6	MND	MND	MND	MND	MND	0.00E+00
	Operational water use	B7	MND	MND	MND	MND	MND	0.00E+00
100% Landfilling Scenario								
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	Description of scenario		
	Fuel type / Vehicle type	Litre of fuel type per distance or vehicle type	Lorry >32 t Lorry 16-32 t
	Distance:	km	350 370
	Capacity utilisation (incl. empty returns)	%	64
	Bulk density of transported products	kg/m^3	1337,44
A5 – Installation in the building	Description of scenario		
	Treatment of waste paint, municipal incineration	%	45
	Treatment of waste paint, inert material landfill	%	55
	Waste transport, articulated lorry >32 t	km	80
	Energy recovery from incineration, electricity	MJ/kg of incinerated waste	1,01
	Energy recovery from incineration, heat	MJ/kg of incinerated waste	2,16
	VOC emissions	kg/l	0,0001
C1 to C4 End of life,	Description of scenario		
	Waste transport, articulated lorry >32 t	km	80
	Treatment of waste paint, municipal incineration (wood paint)	%	100
	Treatment of waste paint, inert material landfill (wall paint)	%	100
	Biocides leaching to freshwater	%	100

Summary, comments and additional information

Interpretation

The results of the LCIA indicate which life cycle stage contributes the most to a specific environmental impact.

Analysis of the results shows that most of the impact comes from the raw materials stage (A1) for most of the impact categories. This high contribution of raw materials to the impact indicators is not unexpected. As paints are at the end of the chemical value chain much of the expenditure of energy, raw materials, processing, waste processing, etc. in bringing the product to existence has occurred prior to the entry of the raw materials onto the PPG production site.

In impact category Ecotoxicity, freshwater the highest impact occurs in stage A5 application. This can be caused by the direct emissions of biocides leaching to freshwater.

References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A1:2013. London, BSI, 2013.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.

BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.

Dahlgren, L. at al, (2016) Raw materials LCI database for the European coatings and printing ink industries. Documentation of methodology v. 3.0. Commissioned by CEPE. IVL Swedish Environmental Research Institute Ltd.

EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

ISO 14040:2006 Environmental management — Life cycle assessment — Principles and framework

ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines

Product Environmental Footprint Category Rules - Decorative Paints. Version 1.0, 2018. Developed by the Technical Secretariat Decorative Paints of the European Council of the Paint, Printing Ink and Artists' Colours Industry

Thinkstep GaBi Software-System and Database for Life Cycle Engineering. Copyright 1992-2018 ThinkStep AG.

Wernet, G., Bauer, C., Steubing, B., Reinhard, J., Moreno-Ruiz, E., and Weidema, B. (2016). The ecoinvent database version 3 (part I): overview and methodology. The International Journal of Life Cycle Assessment, [online] 21(9), pp.1218–1230. Available at: <http://link.springer.com/10.1007/s11367-016-1087-8> [Accessed 14.12.2021].

Wilde, B., Personal communication with Ben Wilde, Marketing Manager – Johnstone's Trade, PPG Architectural Coatings - Region North East Europe (2021)

2020 European Residual Mix, Results of the calculation of Residual Mixes for the calendar year 2020, Version 1.0, 2021-05-31. Retrieved from: https://www.aib-net.org/facts/european-residual-mix