Environmental Product Declaration

according to ISO 14025 and EN 15804

This declaration is for:

Alesta® SD

SuperDurable Architectural

Provided by:

Axalta Coating Systems

program operator

Stichting MRPI®

publisher

Stichting MRPI®

www.mrpi.nl

MRPI® registration

1.1.00295.2022

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COMPANY INFORMATION

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MRPI® REGISTRATION

1.1.00295.2022

DATE OF ISSUE

16-06-2022

EXPIRY DATE

16-06-2027

PRODUCT

Alesta® SD
SuperDurable Architectural

DECLARED UNIT/FUNCTIONAL UNIT

1 kg powder coating

DESCRIPTION OF PRODUCT

Alesta® SD Architectural is a range of products based on premium weathering polyester resin, incorporating high quality exterior grade pigments with outstanding exterior durability

VISUAL PRODUCT

MORE INFORMATION

To learn more about Alesta® please visit the website: https://www.axalta.com/corporate/en_US/products-and-customers/powder-coatings-/alesta.html

SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **ing. Kamiel Jansen, Aveco de Bondt.**
The LCA study has been done by **Joanna Zhuravlova and Brienne Wiersema, Ecomatters B.V..**
The certificate is based on an LCA-dossier according to ISO14025 and EN15804+A2. It is verified according to the 'MRPI®-EPD verification protocol November 2020.v4.0'. EPDs of construction products may not be comparable if they do not comply with EN15804+A2. Declaration of SVHC that are listed on the 'Candidate List of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

PROGRAM OPERATOR

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ir. J-P den Hollander, Managing director MRPI®

DEMONSTRATION OF VERIFICATION
CEN standard EN15804 serves as the core PCR[a]
Independent verification of the declaration and data, according to EN ISO 14025:2010: internal: external: X
Third party verifier: ing. Kamiel Jansen, Aveco de Bondt
[a] PCR = Product Category Rules

DETAILED PRODUCT DESCRIPTION

Company information

Axalta is a global coatings company focused on providing customers with innovative, colorful and sustainable solutions. With more than 150 years of experience in the coatings industry, Axalta continues to find ways to serve customers with the finest coatings, application systems and technology.

Product description

Alesta® SD Architectural is a range of products based on premium weathering polyester resin, incorporating high quality exterior grade pigments with outstanding exterior durability, especially formulated for application on aluminum extrusion and sheets, steel and galvanized steel substrates. Alesta® SD Architectural meets the requirements of the building industry thanks to its outstanding outdoor durability. It is designed to surpass the most severe specifications.

Highlights

- Excellent outdoor weathering resistance, adapted to severe environments
- Optimized and homogeneous baking conditions for all finishes resulting in an overall energy saving
- Available in a wide selection of colours, effects and gloss levels
- Special interest for large projects, exposed systems like gate, veranda, pergola & also high-end outdoor furniture & lighting
- Longer life cycle (aesthetic) & sustainable choice
- Able to increase quality of aluminium systems with a limited extra cost versus benefits
- Lower maintenance costs

Target applications

Alesta® SD Architectural powder coatings are typically used in the following applications:

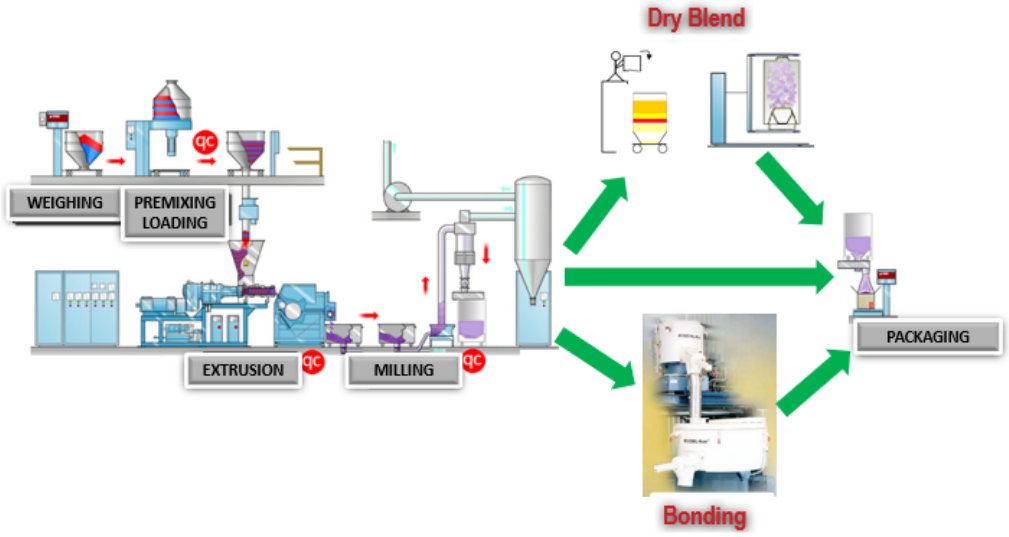
- Aluminium curtain walls for prestigious buildings
- Doors, window frames, cladding and other parts in architecture and construction
- Buildings in severe environments
- Urban furniture, shopping fittings, garden furniture, lighting and any other industrial applications where resistance to atmospheric aggression is essential
- Aluminum profiles and sheets
- Verandas, doors, window frames, facades
- Steel or galvanized steel for cladding

Technical characteristics

To obtain information regarding product characteristics, film properties, approvals, curing conditions, storage stability etc. please refer to the Technical Data Sheets (TDS). To obtain information regarding the durability and the warranty period, please consult the local sales organization. Regarding the safe use of powder coatings, please refer to the Safety Data Sheets (SDS).

Production process

The manufacturing process involves weighing and pre-mixing of raw materials, extrusion, cooling and crushing, grinding, sieving and for the manufacture of metallics, bonding or dry-blending stages are involved.



Sustainability

Sustainability is central to Axalta's business. From environmental and social performance to the sustainability benefits our products and services provide and our strong corporate governance practices, being an engaged business partner and a good neighbor are fundamental to our growth and success.

Our manufacturing facilities around the world continually enhance their processes to minimize our impact on the environment.Many Axalta products and application technologies are developed to support not only our own sustainability goals, but also those of our customers by increasing productivity and reducing emissions, energy use, and waste. We engage with a variety of stakeholders including customers, suppliers, investors, industry organizations, non-governmental organizations and others to listen, learn and find ways to continually improve our performance.

Our new 2030 goals reflect how meaningful environmental progress, inclusive social values and strong corporate governance are at the heart of Axalta's operations and success.

For more information, please visit axalta.com/sustainability.

COMPONENT (> 1%)	[kg / %]
Polyester resin	Confidential
Curing agent	Confidential
Pigments	Confidential
Additives	Confidential
Extenders	Confidential

(*) > 1% of total mass

SCOPE AND TYPE

This Life Cycle Assessment (LCA) is a Cradle to Gate with options, modules C1-C4 and module D. All major steps from the extraction of natural resources to the final disposal of the product are included in the scope of the study. The life cycle stages included are A1-A5, C1-C4, D. All impacts associated with mining activities, the upstream production of materials and energy, downstream waste treatment are included in the product systems.

This EPD is an average EPD representative for Alesta® SD products produced in United Arab Emirates, China, Indonesia, Malaysia and sold worldwide.

The software GaBi 10.5.1.124 is used to perform the LCA. Background processes sourced from Ecoinvent v3.7 (2020) and the Raw materials LCI database for the European coatings and printing ink industries (2016).

The validity of this EPD is in correspondence with the specifications of the LCA project report.

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport gate to site	Assembly	Use	Maintenance	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	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

X = Modules Assessed

ND = Not Declared

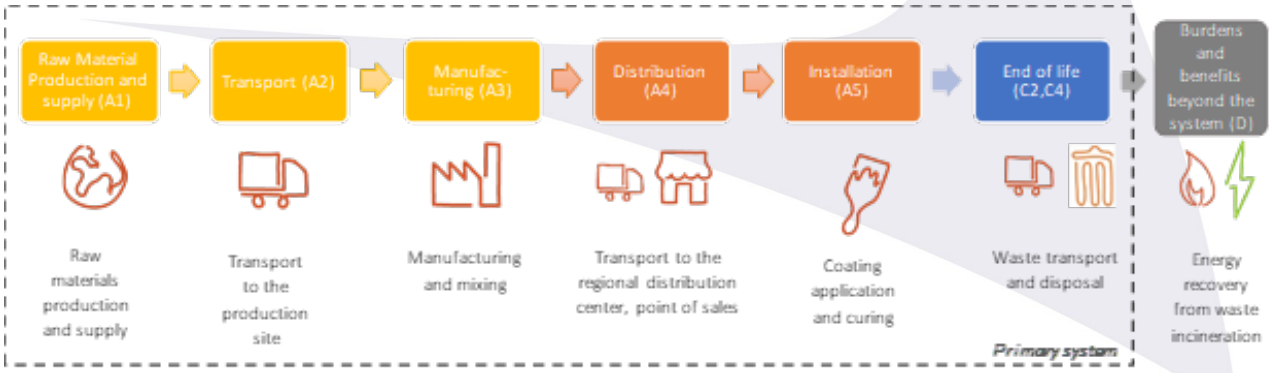


Figure: LCA process diagram according to EN 15804 (7.2.1)

REPRESENTATIVENESS

The declaration is based on a representative sample formulation for a powder coating produced in different production sites, grouped based on their location.

This EPD is representative for Alesta® SD products produced in United Arab Emirates, China, Indonesia, Malaysia.

ENVIRONMENTAL IMPACT per functional unit or declared unit (core indicators A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	5.92 E+0	5.10 E-2	1.43 E-1	6.11 E+0	1.02 E-1	4.31 E+0	0.00	7.20 E-3	0.00	2.15 E+0	-2.23 E-1
GWP-fossil	kg CO2 eq.	5.96 E+0	5.09 E-2	1.37 E-1	6.14 E+0	1.02 E-1	4.29 E+0	0.00	7.18 E-3	0.00	2.15 E+0	-2.16 E-1
GWP-biogenic	kg CO2 eq.	-4.01 E-2	1.08 E-4	5.55 E-3	-3.45 E-2	2.35 E-4	1.63 E-2	0.00	1.52 E-5	0.00	1.21 E-4	-6.76 E-3
GWP-luluc	kg CO2 eq.	3.21 E-3	1.49 E-5	1.19 E-4	3.34 E-3	3.34 E-5	1.45 E-4	0.00	2.10 E-6	0.00	4.18 E-6	-2.41 E-4
ODP	kg CFC11 eq.	2.09 E-5	1.20 E-8	1.52 E-8	2.09 E-5	2.35 E-8	6.18 E-7	0.00	1.70 E-9	0.00	2.13 E-9	-2.08 E-8
AP	mol H+ eq.	2.43 E-2	2.57 E-4	2.59 E-4	2.49 E-2	5.10 E-4	3.80 E-3	0.00	3.63 E-5	0.00	1.91 E-4	-7.01 E-4
EP-freshwater	kg PO4 eq.	6.34 E-4	3.34 E-6	4.07 E-5	6.78 E-4	6.80 E-6	4.93 E-5	0.00	4.71 E-7	0.00	2.95 E-6	-1.14 E-4
EP-marine	kg N eq.	4.13 E-3	8.91 E-5	8.45 E-5	4.30 E-3	1.78 E-4	1.14 E-3	0.00	1.26 E-5	0.00	8.68 E-5	-1.34 E-4
EP-terrestrial	mol N eq.	4.11 E-2	9.73 E-4	6.60 E-4	4.27 E-2	1.94 E-3	1.22 E-2	0.00	1.37 E-4	0.00	9.52 E-4	-1.22 E-3
POCP	kg NMVOC eq.	1.84 E-2	2.90 E-4	1.73 E-4	1.89 E-2	5.61 E-4	4.10 E-3	0.00	4.10 E-5	0.00	2.35 E-4	-3.53 E-4
ADP-minerals & metals	kg Sb eq.	1.71 E-5	1.20 E-7	3.35 E-7	1.75 E-5	3.25 E-7	1.39 E-6	0.00	1.70 E-8	0.00	5.52 E-8	-1.41 E-7
ADP-fossil	MJ, net calorific value	1.05 E+2	8.03 E-1	9.06 E-1	1.07 E+2	1.57 E+0	6.90 E+1	0.00	1.13 E-1	0.00	2.12 E-1	-4.38 E+0
WDP	m3 world eq. deprived	3.34 E+2	3.99 E-3	2.90 E-2	3.34 E+2	7.45 E-3	1.16 E-1	0.00	5.63 E-4	0.00	7.85 E-3	-8.59 E-2

GWP-total = Global Warming Potential total
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 Exceedence
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 Exceedence
POCP = Formation potential of tropospheric ozone photochemical oxidants
ADP-minerals&metals = Abiotic Depletion Potential for non fossil resources [2]
ADP-fossil = Abiotic Depletion for fossil resources potential [2]
WDP = Water (user) deprivation potential, deprivation-weighted water consumption [2]

Disclaimer [2]

- The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

ENVIRONMENTAL IMPACT per functional unit or declared unit (additional indicators A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	3.41 E-7	4.72 E-9	2.88 E-9	3.49 E-7	8.02 E-9	1.16 E-8	0.00	6.66 E-10	0.00	1.52 E-9	-1.91 E-9
IRP	kBq U235 eq.	1.88 E+0	4.10 E-3	5.35 E-3	1.89 E+0	8.12 E-3	3.79 E-2	0.00	5.79 E-4	0.00	6.97 E-4	-6.47 E-2
ETP-fw	CTUe	4.14 E+2	6.37 E-1	2.60 E+0	4.17 E+2	1.24 E+0	4.72 E+0	0.00	8.99 E-2	0.00	5.78 E-1	-1.40 E+0
HTP-c	CTUh	4.86 E-9	1.90 E-11	7.53 E-11	4.95 E-9	4.07 E-11	5.01 E-10	0.00	2.68 E-12	0.00	2.77 E-9	-4.26 E-11
HTP-nc	CTUh	2.41 E-7	5.67 E-10	1.02 E-9	2.43 E-7	1.09 E-9	3.98 E-9	0.00	8.01 E-11	0.00	8.42 E-9	-1.19 E-9
SQP	---	1.24 E+1	9.16 E-1	8.22 E-1	1.42 E+1	1.32 E+0	1.14 E+0	0.00	1.29 E-1	0.00	1.06 E-1	-3.67 E-1

PM = Potential incidence of disease due to PM emissions
IRP = Potential Human exposure efficiency relative to U235 [1]
ETP-fw = Potential Comparative Toxic Unit for ecosystems [2]
HTP-c = Potential Comparative Toxic Unit for humans [2]
HTP-nc = Potential Comparative Toxic Unit for humans, non-cancer [2]
SQP = Potential soil quality index [2]

Disclaimer [1]

- This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer [2]

- The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

RESOURCE USE per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	3.57 E+0	9.77 E-3	1.61 E-1	3.74 E+0	2.04 E-2	1.78 E-1	0.00	1.38 E-3	0.00	5.09 E-3	-3.81 E-1
PERM	MJ	1.21 E-4	4.79 E-9	3.95 E-8	1.21 E-4	1.16 E-8	4.10 E-8	0.00	6.77 E-10	0.00	2.80 E-9	-1.49 E-8
PERT	MJ	3.57 E+0	9.77 E-3	1.61 E-1	3.74 E+0	2.04 E-2	1.78 E-1	0.00	1.38 E-3	0.00	5.09 E-3	-3.81 E-1
PENRE	MJ	1.05 E+2	8.03 E-1	9.06 E-1	1.07 E+2	1.57 E+0	6.90 E+1	0.00	1.13 E-1	0.00	2.12 E-1	-4.38 E+0
PENRM	MJ	1.09 E-5	0.00	0.00	1.09 E-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	MJ	1.05 E+2	8.03 E-1	9.06 E-1	1.07 E+2	1.57 E+0	6.90 E+1	0.00	1.13 E-1	0.00	2.12 E-1	-4.38 E+0
SM	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	7.78 E+0	9.28 E-5	6.76 E-4	7.78 E+0	1.73 E-4	2.71 E-3	0.00	1.31 E-5	0.00	1.83 E-4	-2.00 E-3

PERE = Use of renewable energy excluding renewable primary energy resources
PERM = Use of renewable energy resources used as raw materials
PERT = Total use of renewable primary energy resources
PENRE = Use of non-renewable primary energy resources excluding non-renewable 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 materials
RSF = Use of renewable secondary fuels
NRSF = Use of non renewable secondary fuels
FW = Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	0.00	0.00	4.66 E-2	4.66 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	1.06 E-2	1.06 E-2	0.00	1.17 E-1	0.00	0.00	0.00	1.00 E+0	0.00
RWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CRU	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

HWD = Hazardous Waste Disposed
NHWD = Non Hazardous Waste Disposed
RWD = Radioactive Waste Disposed
CRU = Components for reuse
MFR = Materials for recycling
MER = Materials for energy recovery
EEE = Exported Electrical Energy
ETE = Exported Thermal Energy

BIOGENIC CARBON CONTENT per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
BCCpr	kg C	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BCCpa	kg C	0.00	0.00	0.00	0.00	0.00	6.00 E-3	0.00	0.00	0.00	0.00	0.00

BCCpr = Biogenic carbon content in product
BCCpa = Biogenic carbon content in packaging

CALCULATION RULES

Data quality and data collection period

Data quality requirements follow EN15804+A2:2019, data is checked for plausibility with mass balances in the foreground processes. Used datasets are complete according to the system boundary, and are as current as possible. Data collection period is of reference year 2021, based on 1 year averaged data. Data gaps such as i.e. transport data, waste treatment scenarios, were covered with generic values as described in the Product Environmental Footprint Category Rules - Decorative Paints document version 1.0 published by CEPE and reviewed in April 2018. Processes used in the background modelling are referring to the widely used databases of recent release (Ecoinvent 3.7.1, 2020; CEPE, 2016) and are consistent with the foreground modelling in system limits and allocation procedures. 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. Data quality is assessed as fair and adequate to the goal and scope of the study.

Cut-off criteria and allocation procedures

No cut-offs were intentionally applied to inputs and outputs within the system boundaries in the models. Coproduct and system allocation in the foreground system is according to the EN15804+A2. Cut-off and allocation procedures in the background processes are according to the respective methodologies and estimated to be methodologically consistent with the foreground system.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

Product stage (A1-A3) includes the extraction and processing of raw materials for the products, energy consumption (A1), their transportation to the production site by road (A2), the manufacturing process and the product packaging (A3). Data regarding paint production and packaging was provided for the average powder coating formulation and for the production sites where the coating is produced. Data on transportation distances and transportation modes are derived from the default scenarios of the product environmental footprint category rules (PEF CR) for decorative paints v.1 (2018). Electricity consumption was modelled based on the primary data on the amount and source of the electricity, with the use of Ecoinvent 3.7.1 database for modelling of the background processes. During the manufacturing process, two types of waste are generated: hazardous and non-hazardous.

Product's distribution to the building site (A4) includes transportation of the products along the distribution leg. The distribution leg includes two intermediate points between the production site and the final user: regional distribution centre (RDC) and point of sales (PoS).

Transportation parameters	Raw materials transportation	Packaging transportation	Transportation to the RDC	Transportation to the PoS
Vehicle type used for transport	Articulated lorry	Articulated lorry	Articulated lorry	Articulated lorry
Distance, km	460	250	350	370
Capacity, %	64	64	64	64
Average load factor, t	>32	>32	>32	16-32

Stage A5 refers to the coating application. The stage includes coating curing in the oven, coating waste and packaging material waste treatment. According to PEF CR for decorative paints (v1), coating waste during application and packaging are treated as non-hazardous waste. In that scenario 45% of the waste is incinerated and 55% ends up in landfill. When waste is incinerated, it is done with energy recovery.

Waste treatment parameters	unit	Value
Energy recovery from incineration, electricity	MJ/kg of incinerated waste	1.01
Energy recovery from incineration, heat	MJ/kg of incinerated waste	2.16

Stage C1 refers to de-construction and demolition activities. Coating removal is part of the substrate's life cycle and it is not a coating specific process. No specific demolition or dismantling activities are applied to coatings, and therefore no impact is allocated to this life cycle stage. Stage C2 includes the transport of coating waste from demolition site to a landfill or incineration site. The transport distance is based on the scenario reflected in PEFCR for Decorative paints (v1), and contains transport over 80 km with an articulated lorry. There are no reuse, recovery or recycling activities after the coating's end of life. Therefore, no impact is allocated to the stage C3. Final disposal (C4) was modelled according to the information received from Axalta. Typical end of life scenario after disposal is incineration with energy recovery (90%) and landfilling (10%).

DECLARATION OF SVHC

According to the Declaration of SVHC for the products under study, one of the raw materials, Triglycidylisocyanurat (TGIC) CAS 2451-62-9 is listed in the “Candidate List of Substances of Very High Concern for authorisation” of the European Chemicals Agency.

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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 â€” Life cycle assessment â€” Principles and framework

ISO 14044:2006 Environmental management â€” Life cycle assessment â€” 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.1218â€“1230. Available at: <http://link.springer.com/10.1007/s11367-016-1087-8> [Accessed 10.02.2022].

Communication with Axalta (2022)

REMARKS

None