Environmental Product Declaration

according to ISO 14025 and EN 15804

This declaration is for:

Nordsjo Professional Interior Wallpaints

Provided by:

Akzo Nobel Decorative Coatings

MRPI
milieu relevante product informatie

Nordsjö PROFESSIONAL

program operator
Stichting MRPI®
publisher
Stichting MRPI®
www.mrpi.nl

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1.1.00221.2021
date of first issue
20-05-2021
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20-05-2026

ECO PLATFORM EPD EN 15804 VERIFIED

COMPANY INFORMATION

Akzo Nobel Decorative Coatings
Staffanstorpsvägen 50
205 17 Malmö
Sweden

https://www.akzonobel.com/

PRODUCT

Nordsjo Professional Interior Wallpaints

DECLARED UNIT/FUNCTIONAL UNIT

All impacts are calculated using the declared unit “decoration of 1 m² of surface”

DESCRIPTION OF PRODUCT

This EPD covers a range of high-quality water-borne wall paints for interior use from Nordsjo Professional

VISUAL PRODUCT

MRPI® REGISTRATION

1.1.00221.2021

DATE OF ISSUE

20-05-2021

EXPIRY DATE

20-05-2026

MORE INFORMATION

www.nordsjoprofessional.se
www.nordsjoprofessional.dk
www.nordsjoprofessional.no

SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **ing. Kamiel Jansen, Primum.**
The LCA study has been done by **Joanna Zhuravlova, Ecomatters.**
The certificate is based on an LCA-dossier according to ISO14025 and EN15804+A1. 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+A1. 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

Stichting MRPI®
Kingsfordweg 151
1043GR
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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: Kamiel Jansen, Primum
[a] PCR = Product Category Rules

DETAILED PRODUCT DESCRIPTION

This EPD is representative for the 11 product paints belonging to the Nordsjo Professional Interior Wallpaints, as described below.

Product Information

This EPD covers a range of high-quality water-borne wall paints for interior use from Nordsjo Professional. The decorating interior wall paints for the European market are designed to meet variable requirements of professional painters concerning durability, washability and environmental sustainability. This EPD is representing environmental impacts of an average water-borne wall paint from Nordsjo Professional based on production data. The EPD is representing environmental impacts of the following products:

Waterborne paint for walls and ceilings for interior use. The paint for a long lasting beautiful interior finish with a perfect even appearance.

Nordsjo Professional A20

Nordsjö Professional A20 is a satin acrylic wall paint for creating a modern surface in rooms that get plenty of light. Nordsjö Professional A20 is a semi-matte waterborne wall
paint that offers excellent coverage and is intended for interior walls made of plaster, concrete, lightweight concrete, various types of boards (e.g. plywood, plaster, chip), fibreglass wallpapers for painting, etc. It is primarily used for painting walls in kitchens, hallways, common areas, offices rooms, classrooms, hospitals and in industrial settings where a semi-gloss surface is desired that can be washed.

Nordsjo Professional A5

NordsjöProfessionalA5 is an matte acrylic wall paint for creating a modern surface in rooms that get plenty of light. NordsjöProfessionalA5 offers good coverage and is intended for interior walls made of plaster, concrete, lightweight concrete, various types of boards (e.g. plywood, plaster, chip), fibreglass wallpapers for painting, etc.

Nordsjo Professional A7

Nordsjö Professional A7 is a matte waterborne acrylic wall paint for creating a modern, silky-matte surface in rooms that get plenty of light. Nordsjö Professional A7 is intended for interior walls made of plaster, concrete, lightweight concrete, various types of boards (e.g. plywood, plaster, chip), fibreglass wallpapers for painting, etc.. - For an extra decorative wall paint for a perfect long lasting aesthetic result.

Interior water borne paint specifically designed for ceilings.

Nordsjo Professional XTREME

Nordsjö Professional Xtreme 1 is a white, reflective free ceiling paint with extra good opacity and touch up properties. Its application properties makes it easy to work with.Suitable for rooms that get plenty of light. Intended for interior walls made of plaster, concrete, lightweight concrete, various types of boards (e.g. plywood, plaster, chip), fibreglass wallpapers for painting, etc. - For an extra

white ceiling with an natural matt end smooth finish, good touch up properties for spot repair.

Interior water borne paints for easy use and application.

Nordsjo Professional 20

Nordsjö Professional 20 is a semi-gloss waterborne wall paint that offers excellent coverage and is intended for interior walls made of plaster, concrete, lightweight concrete, various types of boards (e.g. plywood, plaster, chip), fibreglass wallpapers for painting, etc. It is primarily used for painting walls in kitchens, hallways, common areas, offices rooms, classrooms, hospitals and in industrial settings where a semi-gloss surface is desired that can be washed. - For large new build and renovation projects, specially designed to cover large surfaces efficiently.

Nordsjo Professional 3

Nordsjö Professional 3 is a white, matte, water based wall paint that offers excellent coverage and is intended for interior walls made of plaster, concrete, lightweight concrete, various types of boards (e.g. plywood, plaster, chip), fibreglass wallpapers for painting, etc. - For large new build and renovation projects, specially designed to cover large surfaces efficiently.

Nordsjo Professional 5

Professional 5 is a matt waterborne wall paint that offers excellent coverage and is intended for interior walls made of plaster, concrete, lightweight concrete, various types of boards (e.g. plywood, plaster, chip), fibreglass wallpapers for painting, etc. - For large new build and renovation projects, specially designed to cover large surfaces efficiently.

Nordsjo Professional 7

Nordsjö Professional 7 is a matte, water based wall paint that offers excellent coverage and is intended for interior walls made of plaster, concrete, lightweight concrete, various types of boards (e.g. plywood, plaster, chip), fibreglass wallpapers for painting, etc.

Nordsjo Professional P10

Nordsjö Professional P10 is a waterborne, durable, matte acrylic wall paint intended for interior walls made of plaster, concrete, lightweight concrete, various types of boards (e.g. plywood, plaster, chip), fiberglass and paintable wallpapers.

Nordsjo Professional P25

Nordsjö Professional P25 is a waterborne, semi-matte, durable acrylic wall paint that offers excellent coverage for creating a modern surface in rooms that get plenty of light. Nordsjö Professional P25 is intended for interior walls made of plaster, concrete, lightweight concrete, various types of boards (e.g. plywood, plaster, chip), fiberglass and paintable wallpapers. It is primarily used for painting walls in kitchens, hallways, common areas, offices rooms, classrooms, hospitals and in industrial settings where a semi-gloss surface is desired that can be washed.

Nordsjo Professional P6

Nordsjö Professional P6 is a waterborne, durable, breathable, matte acrylic wall paint intended for interior walls made of plaster, concrete, lightweight concrete, various types of boards (e.g. plywood, plaster, chip), fiberglass and paintable wallpapers.

COMPONENT (> 1%)*	[kg / %]
Pigment: Lightfast Pigments	Confidential
Binder: Acrylic Copolymer Dispersion	Confidential
Solvent: Water	Confidential

(*) > 1% of total mass

SCOPE AND TYPE

The type of this EPD is Cradle-to-Gate with options. All major steps from the extraction of natural resources to the final disposal of the product are included in the environmental performance of the manufacturing phase, except those that are not relevant to the environmental performance of the product. This declaration does not imply an indicator result of zero. This EPD is representative for products produced in Malmö, Sweden and the application market is for European Union, Russia and the UK.

The software GaBi 10.0.0.71 Professional is used to perform the LCA. In the model the data used is sourced from the Ecoinvent 3.6 database and the Raw materials LCI database for the European Council of the Paint, Printing Ink and Artists' Colours Industry (CEPE).

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

All impacts associated with the upstream production of materials and energy are included in the system boundaries. Mining activities and controlled landfills are included in the product systems. Similarly, wastewater treatment activities are also considered within the technological systems. The emissions and resource extractions derived from these processes are considered elementary exchanges between the product systems and the environment.

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	X	X	X	X	X	X	X	X	X	X	X	ND

X = Modules Assessed

ND = Not Declared

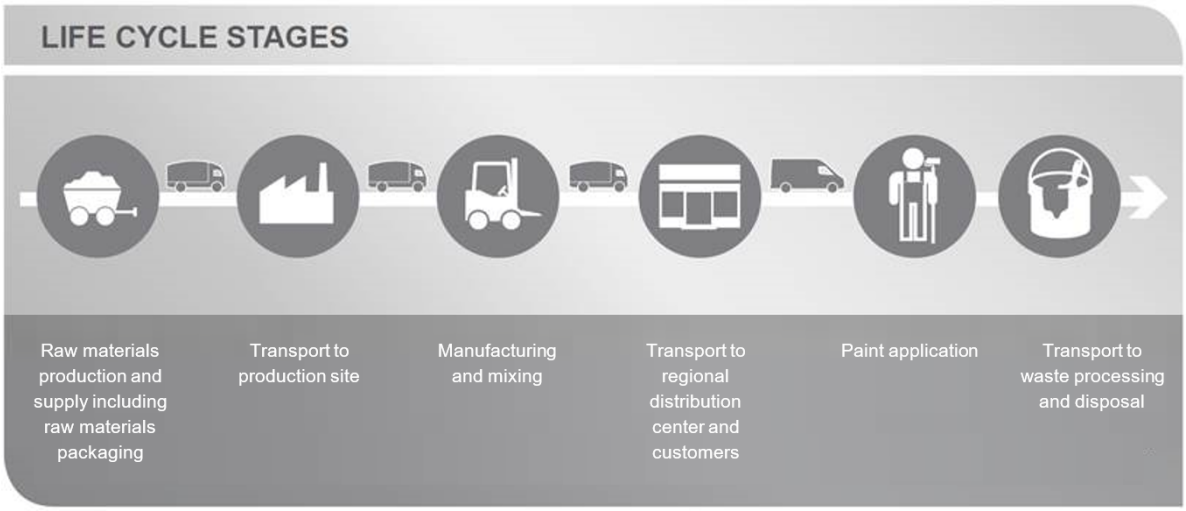

Figure: LCA process diagram according to EN 15804 (7.2.1)

REPRESENTATIVENESS

The representative product consists of a weighted average based on annual production volumes of the formulation and characteristics (i.e. packaging format) of the 11 products within the Nordsjo Professional Interior Wallpaints.

This EPD is representative for products produced in Malmö, Sweden and sold in European Union, Russia and the UK.

Density (kg/l) = 1.356;
Coverage (kg/m²) = 0.128;
Number of layers = 2;
Total product used (kg/m²) = 0.255.

A sensitivity analysis is performed to assess the representativeness of the representative product. The environmental impact results for one of the individual Nordsjo Professional Interior Wallpaints products have maximum positive difference of 934%, when compared with the representative product, in the Photochemical Ozone Creation Potential impact category.

ENVIRONMENTAL IMPACT per functional unit or declared unit (indicators A1)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
ADPE	kg Sb. eq.	2.04 E-6	1.03 E-7	3.64 E-7	2.51 E-6	5.85 E-7	4.13 E-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.98 E-8	0.00	1.71 E-8
ADPF	MJ	1.06 E+1	9.30 E-2	2.30 E+0	1.30 E+1	3.77 E-1	3.45 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.56 E-2	0.00	3.94 E-2
GWP	kg CO2 eq.	5.27 E-1	5.98 E-3	1.01 E-1	6.34 E-1	2.48 E-2	1.56 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.28 E-3	0.00	7.44 E-2
ODP	kg CFC 11 eq.	6.12 E-8	1.10 E-9	1.23 E-9	6.35 E-8	4.42 E-9	3.58 E-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.35 E-10	0.00	4.47 E-10
POCP	kg ethene eq.	7.21 E-4	2.50 E-6	6.97 E-5	7.93 E-4	9.75 E-6	1.16 E-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.61 E-7	0.00	1.30 E-6
AP	kg SO2 eq.	7.36 E-3	2.39 E-5	3.69 E-4	7.75 E-3	9.91 E-5	2.20 E-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.00 E-6	0.00	1.32 E-5
EP	kg (PO4)3- eq.	1.37 E-3	7.16 E-6	6.83 E-5	1.44 E-3	2.98 E-5	3.42 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.69 E-6	0.00	1.39 E-5

ADPE = Abiotic Depletion Potential for non-fossil resources
ADPF = Abiotic Depletion Potential for fossil resources
GWP = Global Warming Potential
ODP = Depletion potential of the stratospheric ozone layer
POCP = Formation potential of tropospheric ozone photochemical oxidants
AP = Acidification Potential of land and water
EP = Eutrophication Potential
HTP = Human Toxicity Potential
FAETP = Fresh water aquatic ecotoxicity potential
MAETP = Marine aquatic ecotoxicity potential
TETP = Terrestrial ecotoxicity potential
ECI = Environmental Cost Indicator
ADPF = Abiotic Depletion Potential for fossil resources expressed in [kg Sb-eq.]
ND = Not Declared

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

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
PERE	MJ	2.97 E-1	1.00 E-3	8.24 E-2	3.80 E-1	4.16 E-3	4.97 E-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55 E-4	0.00	4.45 E-4
PERM	MJ	1.93 E-4	5.86 E-10	8.89 E-3	9.08 E-3	2.95 E-9	2.84 E-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.28 E-10	0.00	7.74 E-10
PERT	MJ	2.97 E-1	1.00 E-3	9.13 E-2	3.89 E-1	4.16 E-3	4.97 E-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55 E-4	0.00	4.45 E-4
PENRE	MJ	1.14 E+1	9.43 E-2	2.44 E+0	1.39 E+1	3.82 E-1	3.50 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.63 E-2	0.00	4.00 E-2
PENRM	MJ	1.64 E-6	0.00	1.04 E-7	1.75 E-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	MJ	1.14 E+1	9.43 E-2	2.44 E+0	1.39 E+1	3.82 E-1	3.50 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.63 E-2	0.00	4.00 E-2
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	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	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	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	3.43 E-1	1.13 E-5	8.94 E-4	3.44 E-1	4.31 E-5	1.20 E-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.11 E-6	0.00	4.10 E-5

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
ND = Not Declared

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

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	kg	0.00	0.00	3.17 E-3	3.17 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	4.27 E-3	4.27 E-3	0.00	1.18 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26 E-1
RWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	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	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	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	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	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	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
ND = Not Declared

CALCULATION RULES

Cut off criteria

The cut-off is not considered in any of the life cycle stages.

In the electricity for paint manufacturing process, transmission and transformation losses were not accounted for in case of renewable energy sources (hydro power). The reason for that exclusion is the fact that transformation and transmission losses account together for less than 1% of the energy input and it is not expected to influence the results significantly.

Data quality and data collection period

Specific data was collected from AkzoNobel though a questionnaire, including inquiries about paint characteristics, production information and end-of-life. The data collection period for specific data was the year 2019.

Transport data (for raw materials, paint and packaging materials), packaging materials use and packaging material end of life scenarios were covered with data 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. Further data gaps (i.e. end-of-life transport data) were covered with data from internal AkzoNobel LCA studies concerning the same type of products (paints and coatings). Generic data (i.e. upstream acquisition and production of raw materials, energy generation, transport, waste treatment processes) was selected from Ecoinvent 3.6 database. In the case of missing data, a relevant proxy was searched and adjusted to the corresponding unit process.

Allocation procedure

To allocate the emissions and inputs to the manufactured products, the decision-hierarchy in ISO 14044 is used (ISO 2006). It is not possible to sub-divide the site data into a more detailed level or find physical causalities between inputs and outputs, thus allocation is done based on mass, considering the annual production of paint product for each site. The paint production is basically a process of mixing ingredients and, therefore, the environmental impact is fairly to be related to the mass of the products.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

A1. Raw materials supply

This module considers the extraction and processing of all raw materials and energy which occur upstream to the Nordsjo Professional Interior Wallpaints manufacturing process, as well as waste processing up to the end-of waste state.

A2. Transport of raw materials to manufacturer

This includes the transport distance of the raw materials to the manufacturing facility via road. Based on Product Environmental Footprint Category Rules - Decorative Paints the transport characteristics for this life cycle stage are the following:

Transport Type	Lorry, total weight >32 t
Distance (km)	460
Capacity	64%
Bulk density of transported products	1356 kg/m3

A3. Manufacturing

This module covers the manufacturing of the Nordsjo Professional Interior Wallpaints paint and includes all processes linked to production such as storing, mixing, packing and internal transportation. Use of electricity, fuels and auxiliary materials in paint production is taken into account as well.

Data regarding paint production was provided by AkzoNobel for the manufacturing sites where theNordsjo Professional Interior Wallpaints paints are produced. Primary data and site-specific data were retrieved. For electricity sources Ecoinvent 3.6 datasets were used. For upstream (raw material processes) and downstream processes (application, use, and waste processing) generic data is used when no specific data was obtained. The transportation distances and transportation modes for raw materials, paint packaging and transportation to customer were taken from Product Environmental Footprint Category Rules - Decorative Paints.

The manufacture of production equipment and infrastructure is not included in the system boundary.

A4. Transport to Regional Distribution Centre and customer

All paint containers are transported from the production facility into a distribution centre and then finally to the customer. Based on Product Environmental Footprint Category Rules - Decorative Paints the transport characteristics for this life cycle stage are the following:

Description	Transport from factory to RDC	Transport from RDC to customer
Transport Type	Lorry, total weight >32 t	Lorry, total weight >32 t
Distance (km)	350	370
Capacity	64%	64%
Bulk density of transported products	1356 kg/m3	1356 kg/m3

A5. Application and use

This module includes the environmental aspects and impacts associated with the application of the paint. It is assumed that no energy is required during the application of this paint. The use of paintbrushes and other appliances used during application are not included.

There are some raw materials added in the paint formulations which contain small amounts of solvents. The VOC emissions during application of paint are included in this module.

C2. Transport to incineration or landfill

This module includes one-way transportation distance of the demolition or sorting site to the dump site.

End-of-life transport type	Transport to waste processing
Vehicle type	Truck 34t-40t payload average fleet
Distance	100 km
Capacity utilisation	60%
Bulk density of transported products	1356 kg/m3

C3. Waste processing and C4. Disposal

The end of life stage is encompassed in these modules. It is assumed that paint is used as interior paint or exterior paint. In both cases, it is assumed that part of the paint is lost during application and the rest is applied.

The coating lost during application is assumed to be non-hazardous waste and disposed of in landfill (35%) and incinerated (65%). After its lifetime, it is assumed that part of the coatings end up in landfill (88%) and in incineration (12%) as non-hazardous waste. These assumptions are based on best knowledge of the end of life of coating from direct contact with AkzoNobel.

ADDITIONAL INFORMATION ON ENVIRONMENTAL IMPACTS

The CML-IA methods do not have characterization factors for the “unspecified VOC” emission flow in the Global Warming Potential environmental impact category. However, VOCs are known to have influence in this category. In order to include the impacts of the VOCs and align with current practice of AkzoNobel, it was decided to calculate the VOC impact on Global Warming Potential separately. The Global Warming Potential impact category has been modified, adding a generic factor of 4.23 kgCO2-eq/kg VOC, which is in line with AkzoNobel characterisation factors for carbon reporting.

Description	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	C2	C4
GWP 100 years	[kg CO2-Eq.]	5.27E-1	5.98E-3	1.01E-1	6.34E-1	2.48E-2	1.56E-1	2.28E-3	7.44E-2
GWP 100 years incl. VOC char. fact.	[kg CO2-Eq.]	5.27E-1	5.98E-3	1.02E-1	6.35E-1	2.48E-2	1.58E-1	2.28E-3	7.44E-2

DECLARATION OF SVHC

Based on the recipe information obtained from the manufacturer, a few substances of very high concern for authorisation (in accordance with Article 59(10) of the REACH Regulation) where identified. All of the substances are present well below the communication and notification threshold of 0,1 % (w/w) as mandated in article 7 and 33 of the REACH regulation.

REFERENCES

• EN 15804:2012+A1:2013 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products, of 11/2013.

• ISO 14040/14044 on Life Cycle Assessments

• 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.

• Coenen, J., Personal communication with Job Coenen, Business Development Manager Sustainability, AkzoNobel, 2021

• AkzoNobel, Deco Paints LCA study, 2020

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

• Raw materials LCI database for the European Council of the Paint, Printing Ink and Artists' Colours Industry (CEPE), version 3.0, IVL Swedish Environmental Research Institute, 2016

• 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 20-01-2021]

REMARKS

None