Environmental Product Declaration

according to ISO 14025 and EN 15804

This declaration is for:

Intergard 475HS

Provided by:

AkzoNobel



program operator

Stichting MRPI®

publisher

Stichting MRPI®

www.mrpi.nl

MRPI® registration

1.1.00463.2023

date of first issue

06-12-2023

date of this issue

06-12-2023

expiry date

06-12-2028

COMPANY INFORMATION

AkzoNobel
Stoneygate Lane
NE10 0JY
Felling, Gateshead

https://www.akzonobel.com/

PRODUCT

Intergard 475HS

DECLARED UNIT/FUNCTIONAL UNIT

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

DESCRIPTION OF PRODUCT

Epoxy

VISUAL PRODUCT



MRPI® REGISTRATION

1.1.00463.2023

DATE OF ISSUE

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EXPIRY DATE

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MORE INFORMATION

https://www.international-pc.com/products/intergard-475HS

SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **ing. Kamiel Jansen, Aveco de Bondt.**
The LCA study has been done by **Maria Papavasileiou, 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

Stichting MRPI®
Kingsfordweg 151
1043GR
Amsterdam

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: Jansen ing. Kamiel Jansen, Aveco de Bondt
[a] PCR = Product Category Rules

DETAILED PRODUCT DESCRIPTION

A low VOC, high solids, high build, two component epoxy coating.

Typical use

For use as a high build epoxy coating to improve barrier protection for a range of anti-corrosive coating systems in a wide range of environments including offshore structures, petrochemical plants, pulp and paper mills and bridges.
Suitable for use in both maintenance and new construction situations as part of an anti-corrosive coating system.

Application method

Airless spray, Air spray, Brush, Roller

Pack size (L)

20

Production process and conditions of delivery

During paint production, the raw materials are pre-weighed according to the percentage of each in the formulation. The pigment is then dispersed in a mixture of binder using a variety of mixing equipment.
Finally, the paint undergoes QC (quality control), is filtered and filled into the appropriate packaging container(s). All paint containers are transported from the production sites to a distribution center and finally to the customers.

COMPONENT > 1% of total mass	[%]
Pigment: Anti-corrosive pigments	Confidential
Binder: Epoxy Resin	Confidential
Solvent: Organic solvents	Confidential

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 Sweden, Saudi Arabia, China, USA, Korea, Vietnam and India. The paint is produced in Angered, Sweden, Dammam, Saudi Arabia, Suzhou, China, Houston, USA, Chilseo, Korea, Amata, Vietnam and Bangalore, India. The application market is for customers worldwide. Likewise, for the end-of-life, the fate of the paint product is described within an global context.

The software GaBi 10.5.1.124 Professional is used to perform the LCA. In the model Ecoinvent 3.8 database was used.

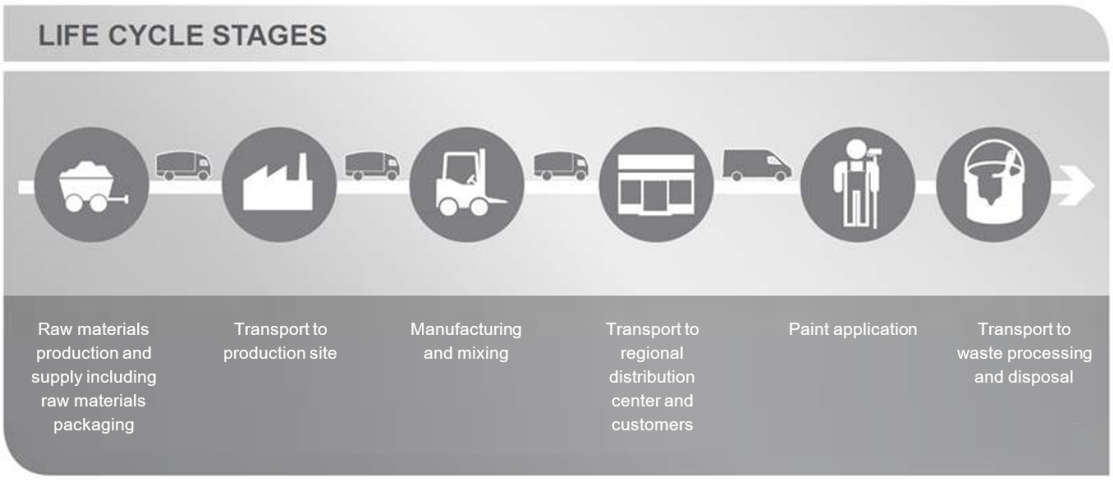
The validity of this EPD is in correspondence with the specifications of the LCA project report.

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. 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	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	ND

X = Modules Assessed

ND = Not Declared



LCA process diagram according to EN 15804 (7.2.1)

REPRESENTATIVENESS

This EPD is representative for one paint product to Intergard 475HS:

1. Intergard 475HS

This EPD is representative for products manufactured in Angered (Sweden), Dammam (Saudi Arabia), Houston (USA), Suzhou (China), Chilseo (Korea), Amata (Vietnam) and Bangalore (India), and sold worldwide.

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

	UNIT	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4
GWP-total	kg CO2 eq.	6.48 E-1	2.08 E-2	1.31 E-1	7.99 E-1	4.41 E-2	3.45 E-1	0.00	2.92 E-3	0.00	1.62 E-1
GWP-fossil	kg CO2 eq.	6.97 E-1	2.07 E-2	1.63 E-1	8.80 E-1	4.40 E-2	3.25 E-1	0.00	2.91 E-3	0.00	1.14 E-1
GWP-biogenic	kg CO2 eq.	-5.37 E-2	6.22 E-5	-3.29 E-2	-8.65 E-2	1.43 E-4	1.98 E-2	0.00	8.72 E-6	0.00	4.81 E-2
GWP-luluc	kg CO2 eq.	5.04 E-3	8.13 E-6	4.81 E-4	5.53 E-3	1.96 E-5	3.65 E-6	0.00	1.14 E-6	0.00	2.26 E-6
ODP	kg CFC11 eq.	5.17 E-8	4.71 E-9	6.65 E-9	6.31 E-8	9.68 E-9	4.34 E-10	0.00	6.60 E-10	0.00	8.12 E-10
AP	mol H+ eq.	8.12 E-3	1.06 E-4	5.86 E-4	8.81 E-3	2.59 E-4	2.43 E-5	0.00	1.48 E-5	0.00	2.71 E-5
EP-freshwater	kg P eq.	1.61 E-4	1.51 E-6	1.67 E-5	1.79 E-4	3.50 E-6	8.30 E-7	0.00	2.12 E-7	0.00	3.37 E-7
EP-marine	kg N eq.	2.61 E-3	3.58 E-5	1.25 E-4	2.77 E-3	8.63 E-5	9.90 E-6	0.00	5.02 E-6	0.00	1.04 E-5
EP-terrestrial	mol N eq.	2.74 E-2	3.91 E-4	1.29 E-3	2.90 E-2	9.44 E-4	1.04 E-4	0.00	5.48 E-5	0.00	1.14 E-4
POCP	kg NMVOC eq.	3.01 E-3	1.17 E-4	4.13 E-4	3.54 E-3	2.76 E-4	9.74 E-3	0.00	1.63 E-5	0.00	3.11 E-5
ADP-minerals & metals	kg Sb eq.	4.56 E-6	4.77 E-8	1.34 E-7	4.74 E-6	1.06 E-7	-3.82 E-8	0.00	6.68 E-9	0.00	7.74 E-9
ADP-fossil	MJ, net calorific value	1.32 E+1	3.24 E-1	2.04 E+0	1.56 E+1	6.80 E-1	5.18 E-2	0.00	4.54 E-2	0.00	6.04 E-2
WDP	m3 world eq. deprived	9.38 E+0	1.72 E-3	2.12 E-2	9.40 E+0	3.83 E-3	1.01 E-3	0.00	2.41 E-4	0.00	2.70 E-3

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 experience 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
PM	Disease incidence	8.11 E-8	1.89 E-9	6.39 E-9	8.94 E-8	4.05 E-9	2.49 E-10	0.00	2.65 E-10	0.00	4.15 E-10
IRP	kBq U235 eq.	6.96 E-2	1.50 E-3	1.09 E-2	8.20 E-2	3.19 E-3	2.98 E-4	0.00	2.11 E-4	0.00	2.48 E-4
ETP-fw	CTUe	3.93 E+1	2.78 E-1	1.50 E+0	4.11 E+1	5.91 E-1	1.49 E-1	0.00	3.90 E-2	0.00	6.68 E-2
HTP-c	CTUh	1.69 E-9	6.99 E-12	1.17 E-10	1.82 E-9	1.67 E-11	1.88 E-10	0.00	9.80 E-13	0.00	1.45 E-10
HTP-nc	CTUh	1.13 E-7	2.40 E-10	1.53 E-9	1.15 E-7	5.07 E-10	2.71 E-9	0.00	3.36 E-11	0.00	4.61 E-10
SQP	---	2.93 E+1	3.61 E-1	3.02 E+0	3.27 E+1	7.29 E-1	2.92 E-2	0.00	5.06 E-2	0.00	1.11 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 experience 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
PERE	MJ	1.36 E+0	3.56 E-3	4.85 E-1	1.85 E+0	8.55 E-3	2.03 E-3	0.00	4.98 E-4	0.00	7.14 E-4
PERM	MJ	3.43 E-4	1.93 E-9	9.07 E-4	1.25 E-3	4.64 E-9	3.96 E-10	0.00	2.70 E-10	0.00	1.20 E-9
PERT	MJ	1.36 E+0	3.56 E-3	4.86 E-1	1.85 E+0	8.55 E-3	2.03 E-3	0.00	4.98 E-4	0.00	7.14 E-4
PENRE	MJ	1.32 E+1	3.24 E-1	2.04 E+0	1.56 E+1	6.80 E-1	5.18 E-2	0.00	4.54 E-2	0.00	6.04 E-2
PENRM	MJ	7.78 E-5	0.00	1.08 E-8	7.78 E-5	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	MJ	1.32 E+1	3.24 E-1	2.04 E+0	1.56 E+1	6.80 E-1	5.18 E-2	0.00	4.54 E-2	0.00	6.04 E-2
SM	kg	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
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	8.92 E-5	2.35 E-5	5.62 E-6	1.18 E-4	6.29 E-5	1.74 E-1	0.00	1.73 E-1	0.00	3.41 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

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
HWD	kg	0.00	0.00	5.47 E-3	5.47 E-3	0.00	2.65 E-2	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	3.27 E-3	3.27 E-3	0.00	0.00	0.00	0.00	0.00	3.90 E-1
RWD	kg	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
MFR	kg	0.00	0.00	0.00	0.00	0.00	1.79 E-2	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
EEE	MJ	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

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
BCCpr	kg C	-1.31 E-2	0.00	0.00	-1.31 E-2	0.00	0.00	0.00	0.00	0.00	1.31 E-2
BCCpa	kg C	0.00	0.00	6.58 E-3	6.58 E-3	0.00	-6.58 E-3	0.00	0.00	0.00	0.00

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

CALCULATION RULES

Cut off criteria

The cut-off is considered in the raw material supply stage (A1). Cut-off of inputs comprises of the raw materials, for which no appropriate proxies were found. In this study there were no cut-off inputs. For recycling of waste packaging material (metal and plastic), a cut-off approach was followed. The cut-off point is chosen to be the end of waste treatment.

Data quality and data collection period

Specific data was collected from AkzoNobel though a questionnaire, including inquiries about paint characteristics and packaging, logistics data (e.g. transport), production information and end-of-life. The data collection period for specific data was the year 2022.

Data gaps (i.e. transport data, end of life scenarios) were covered with data generic values for transport 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 3.8 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 likely to be related to the mass of the products.

Parameter	Value	Unit
VOC content	205.6	g/l
Density	2.0	kg/l
Coverage	5	m2/l
Number of layers	1	Quantity
Total product used	0.390	kg/m2

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 Intergard 475HS 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.

Vehicle type used for transport	Truck
Distance, km	460
Capacity	>32 t ,64% payload

A3. Manufacturing

This module covers the manufacturing of the Intergard 475HS 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 for the manufacturing site where the Intergard 475HS is produced: Angered (Sweden), Dammam (Saudi Arabia), Houston (USA), Suzhou (China), Chilseo (Korea), Amata (Vietnam) and Bangalore (India). The transportation distances and transportation modes for raw materials and packaging materials were retrieved from the Product Environmental Footprint Category Rules – Decorative paints document. The specific transportation distances and transportation modes to customer were collected from the AkzoNobel logistics department. Primary data and site-specific data were retrieved. For electricity sources (standard market mix and renewable mix when applicable) the Ecoinvent 3.8 dataset was used. For upstream (raw material processes) and downstream processes (application, use, and waste processing) generic data is used when no specific data is obtained.

The construction site data includes lighting, heating, offices, etc. 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. On average, the transport characteristics for this life cycle stage are the following

Coatings transport type	factory to RDC	RDC to Point of Sale (customer)	factory to RDC	RDC to Point of Sale (customer)
Transport Type	Truck	Truck	Rail	Container ship
Distance (km)	535	629	1284	2857
Capacity	>32 t, 64% payload	>32 t, 64% payload	Unknown	Unknown

A5. Application and use

This module includes the environmental aspects and impacts associated with the application and of the paint.The energy required for the application of this paint has been included in the study. 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 from the application process have been included in the assessment.

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	80 km
Capacity utilisation	64%

C3. Waste processing and C4. Disposal

The end of life stage is encompassed in these modules. It is assumed that paint is used as exterior paint. It is assumed that part of the paint is lost during application and the rest is applied.

Classification of paint, based on function	% of sold paint to landfill	% of sold paint to incineration
Exterior anti-corrosive coating	88%	12%

DECLARATION OF SVHC

The following substance listed on the REACH candidate list of Substances of Very High Concern is identified in the product or one of its subcomponents (presented below).

Ethylenediamine - Cas number: 107-15-3 - Concentration >0.1%

As part of AkzoNobel's ongoing compliance commitments with regard to chemical safety and REACH specifically, they fullfill the madatory communication requirements imposed via article 33 of the EU REACH regulation.

REFERENCES

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

• 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.

• Ana, Sanseau-Blanchard, 2023. Personal communication with Ana Sanseau-Blanchard, Technical Specialist Marine, Protective & Yacht R&D, International Paint Limited, UK.

• 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 21 12 2021.]

REMARKS

There are no further remarks.