Environmental Product Declaration

according to ISO 14025 and EN 15804

This declaration is for:
International Interchar

Provided by:
AkzoNobel

program operator
Stichting MRPI®
publisher
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1.1.00063.2019
EPD registration
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PROGRAM OPERATOR

Stichting MRPI®
Kingsfordweg 151
1043GR
Amsterdam

COMPANY INFORMATION

AkzoNobel
Stoneygate Lane Felling, Gateshead Tyne & Wear
NE10 0JY
United Kingdom
0044 1914696111
pc.communication@akzonobel.com
https://www.international-pc.com/

PRODUCT

International Interchar

MRPI® REGISTRATION

1.1.00063.2019

EPD REGISTRATION

00000961

DATE OF ISSUE

02-08-2019

EXPIRY DATE

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DECLARED UNIT/FUNCTIONAL UNIT

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

SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **ing. Kamiel Jansen, NIBE BV.**
The LCA study has been done by **Max Sonnen & Susana Tecante Gutierrez, Ecomatters.**
The certificate is based on an LCA-dossier according to ISO14025 and NEN-EN15804+A1. It is verified according to the 'EPD-MRPI verification protocol May 2017'. EPD's of construction products may not be comparable if they do not comply with NEN-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.

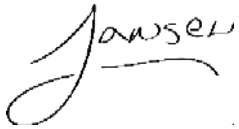
VISUAL PRODUCT

DESCRIPTION OF PRODUCT

A range of single component,borate and chlorine free,water borne intumescent coatings designed for on-site application to structural steel requiring protection from cellulosic fire.

MORE INFORMATION

https://www.international-pc.com/line/interchar

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
(where appropriate[b]) Third party verifier:  Kamiel Jansen, NIBE BV
[a] Product Category Rules [b] Optional for B-to-B communication, mandatory for B-to-C communication (see EN ISO 14025:2010, 9.4).

DETAILED PRODUCT DESCRIPTION

This EPD is representative for the 6 product paints belonging to International Interchar:

- International Interchar 1120;
- International Interchar 1120HY;
- International Interchar 1160;
- International Interchar 1190;
- International Interchar 1260;
- International Interchar 1290.

A range of single component, borate and chlorine free, water borne intumescent coatings designed for on-site application to structural steel requiring protection from cellulosic fire. Interchar products are low VOC acrylic intumescent materials independently fire tested for up to 3-hour fire ratings.

Typical use

To assist in preserving the structural integrity of steelwork in a cellulosic fire. Typical structures requiring this protection include a number of public access buildings e.g Airport Terminals, Leisure Facilities, Convention Centres, Educational Facilities, Shopping Malls, Industrial Complexes, and Hotels

Application Method

Application is done by airless spray, brush, roller.

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 machines. Finally, the paint is undergoing QC (quality control), filtered and filled into the appropriate packaging container. All paint containers are transported from the production sites to a distribution center and finally to the customers.

Pack size

The products are packed in a packaging with a capacity of 20 litres.

COMPONENT (*)	[kg/%]
Pigment: Lightfast Pigments	Confidential
Binder: Ethylene copolymer	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. The coating is produced in Sweden, China, Indonesia, Saudi Arabia, United States and India and the application market is for customers around the world. Likewise, for the end-of-life, the fate of the coating product is described

within a global context.

The software GaBi 9.0 Professional is used to perform the LCA. The latest version of the AkzoNobel database for protective coatings (2017) was used, this includes the background datasets:
• Ecoinvent (2008).
• GaBi Professional Database
• Plastics Europe
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	MNA

X = Module assessed

MNA = Module Not Assessed

REPRESENTATIVENESS

The coating is manufactured in different production sites (Sweden, China, Indonesia, Saudi Arabia, United States and India) and therefore, the following average calculation rule is used: the weighted average of the coating characteristics based on the production volumes per production site of each of the following 6 products is calculated.

• International Interchar 1120;
• International Interchar 1120HY;
• International Interchar 1160;
• International Interchar 1190;
• International Interchar 1260;
• International Interchar 1290.

The used data is representative for all locations and thus this EPD is considered to be representative

for products produced in Sweden, China, Indonesia, Saudi Arabia, United States and India which are sold in a global market.

International Interchar	value
Density (kg/l)	1.43
Coverage (kg/m2)	2.04
Number of Layers	2
Total product used (kg/m2)	4.1

A sensitivity analysis is performed to assess the representativeness of the representative product. The environmental impact results for the individual International Interchar products have a maximum positive difference of 13% when compared with the representative product, within a particular impact category.

ENVIRONMENTAL IMPACT per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADPE	kg Sb-eq.	1.11 E -3	4.95 E -8	2.15 E -7	1.11 E -3	7.27 E -8	1.21 E -6	0	0	0	0	0	0	0	0	2.08 E -9	0	6.76 E -6	INA
ADPF	MJ	3.21 E +2	8.18 E +0	1.16 E +1	3.40 E +2	1.19 E +1	4.37 E +0	0	0	0	0	0	0	0	0	3.42 E -1	0	6.82 E +0	INA
GWP	kg CO2-eq.	1.81 E +1	5.97 E -1	1.16 E +0	1.99 E +1	8.69 E -1	9.57 E -1	0	0	0	0	0	0	0	0	2.49 E -2	0	3.96 E +0	INA
ODP	kg CFC11-eq.	3.71 E -6	1.61 E -8	3.47 E -8	3.76 E -6	1.92 E -10	1.74 E -8	0	0	0	0	0	0	0	0	6.87 E -16	0	4.92 E -8	INA
POCP	kg ethene-eq.	6.74 E -3	4.10 E -4	8.43 E -4	7.99 E -3	3.55 E -4	9.05 E -5	0	0	0	0	0	0	0	0	1.01 E -5	0	2.96 E -4	INA
AP	kg SO2-eq.	8.86 E -2	6.24 E -3	2.60 E -3	9.75 E -2	3.90 E -3	1.08 E -3	0	0	0	0	0	0	0	0	1.10 E -4	0	3.28 E -3	INA
EP	kg (PO4)3--eq.	2.65 E -2	1.03 E -3	9.26 E -4	2.85 E -2	9.77 E -4	1.10 E -3	0	0	0	0	0	0	0	0	2.79 E -5	0	3.18 E -3	INA

INA = Indicator Not Assessed
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.

RESOURCE USE per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	5.15 E +0	3.55 E -1	2.87 E +0	8.37 E +0	6.63 E -1	4.11 E -1	0	0	0	0	0	0	0	0	1.89 E -2	0	8.17 E -4	INA
PERM	MJ	2.48 E -1	1.76 E -4	3.54 E -3	2.51 E -1	3.63 E -9	6.12 E -3	0	0	0	0	0	0	0	0	1.04 E -10	0	2.04 E -2	INA
PERT	MJ	5.39 E +0	3.55 E -1	2.87 E +0	8.62 E +0	6.63 E -1	4.17 E -1	0	0	0	0	0	0	0	0	1.89 E -2	0	2.12 E -2	INA
PENRE	MJ	3.66 E +2	8.23 E +0	1.25 E +1	3.87 E +2	1.20 E +1	5.95 E +0	0	0	0	0	0	0	0	0	3.43 E -1	0	9.93 E +0	INA
PENRM	MJ	6.13 E -2	8.84 E -8	1.20 E -2	7.33 E -2	0	7.05 E -3	0	0	0	0	0	0	0	0	0	0	6.84 E -5	INA
PENRT	MJ	3.66 E +2	8.23 E +0	1.25 E +1	3.87 E +2	1.20 E +1	5.95 E +0	0	0	0	0	0	0	0	0	3.43 E -1	0	9.93 E +0	INA
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	INA
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	INA
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	INA
FW	m3	3.11 E +1	5.21 E -2	1.67 E -1	3.14 E +1	5.06 E -2	4.92 E -2	0	0	0	0	0	0	0	0	1.45 E -3	0	4.71 E -2	INA

INA = Indicator Not Assessed
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 resources excluding non renewable primary energy resources used as materials;
PENRM = Use of non-renewable primary energy 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 IMPACT per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	0	0	4.99 E -2	4.99 E -2	0	7.21 E -1	0	0	0	0	0	0	0	4.08 E +0	0	0	0	INA
NHWD	kg	0	0	4.15 E -2	4.15 E -2	0	0	0	0	0	0	0	0	0	0	0	0	0	INA
RWD	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	INA
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	INA
MFR	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	INA
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	INA
EEE	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	INA
ETE	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	INA

INA = Indicator Not Assessed
HWD = Hazardous waste disposed;
NHWD = Non hazardous waste disposed;
RWD = Radioactive waste disposed;
CRU = Components for re-use;
MFR = Materials for recycling;
MER = Materials for energy recovery;
EEE = Exported electrical energy;
ETE = Exported thermal energy.

CALCULATION RULES

Cut off criteria

There is no cut-off of inputs and outputs in any of the processes during the life cycle stage, hence the environmental impact of all unit processes of each life cycle stage are considered.

Data quality and data collection period

Specific data was collected from AkzoNobel though a questionnaire, including inquiries about coating characteristics and packaging, logistics data (e.g. transport), production information and end-of-life. The data collection period for specific data was the year 2018. Data gaps (i.e. transport data for two productions sites Indonesia and India) 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 are use. 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) and the latest reviewed version of their own AkzoNobel database (2017). Generic data (i.e. upstream acquisition and production of raw materials, energy generation, waste treatment processes) was selected from their own AkzoNobel database (2017), which mostly includes different publicly available databases, such as Ecoinvent, ThinkStep and Plastics Europe. 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 an annual production of coating product for each site. The coating 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 International Interchar 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 and boat. On average, the transport characteristics for this life cycle stage are the following:

Raw materials transport type	Truck 1	Truck 2	Container ship coast
Distance (km)	153	1851	2228
Capacity	34-40 t ,60% payload	40-60 t, 60% payload	70% utilization factor
Bulk density of transported products	1430 kg/m3	1430 kg/m3	1430 kg/m3

A3. Manufacturing

This module covers the manufacturing of the International Interchar coating and includes all

processes linked to production such as storing, mixing, packing and internal transportation. Use of electricity and fuels in coating production are taken into account as well.

Data regarding coating production was provided for the manufacturing sites where International Interchar coating is produced: Sweden, China, Indonesia, Saudi Arabia, United States and India. Furthermore, the specific transportation distances and transportation modes for raw materials, coating packaging and transportation to customer were collected from the AkzoNobel logistics department, except for two production sites were generic data is used. Primary data and site-specific data were retrieved. For electricity used the AkzoNobel electricity country models for 2017 were used for each of the countries where the production site is located. 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. Packaging-related flows in the production process and all up-stream packaging are included in the manufacturing module. For the end-of-life packing of the coatings a landfill scenario is assumed.

A4. Transport to Regional Distribution Centre and customer

All coating containers are transported from the manufacturing facilities 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	Transport from factory to RDC	Transport from factory to RDC	Transport from RDC to customer
Transport Type	Truck 1	Container ship coast	Truck 2
Distance (km)	2063	19	337
Capacity	34-40 t ,60% payload	70% utilization factor	40-60t, 60% payload
Bulk density of transported products	1430 kg/m3	1430 kg/m3	1430 kg/m3

A5. Application and use

This module includes the environmental aspects and impacts associated with the application and of the coating. The use of energy from air spray for coating application purposes is included.

Parameter	Unit
Energy for application (KWh/ kg)	0.1

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	1430 kg/m3

C3. Waste processing and C4. Disposal

The end of life stage is encompassed in these modules. It is assumed that part of the coating is lost during application and the rest is applied. After its lifetime, it is assumed that the coatings end up in incineration. 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 8 KgCO2-eq/kg VOC, which is in line with AkzoNobel characterisation factors for carbon reporting.

Environmental Impact	Unit	A1	A2	A3	A4	A5	C2	C4
Global Warming potential (GWP 100 years)	[kg CO2-Eq.]	1.81E+1	5.97E-1	1.16E+0	8.69E-1	9.57E-1	2.49E-2	3.96E+0
Global Warming potential (GWP 100 years) (*)	[kg CO2-Eq.]	1.81E+1	5.97E-1	1.18E+0	8.69E-1	9.57E-1	2.49E-2	3.96E+0

(*) including VOC characterization factor

DECLARATION OF SVHC

None of the substances contained in the product are listed in the “Candidate List of Substances of Very High Concern for authorisation”, or they do not exceed the threshold with the European Chemicals Agency.

REFERENCES

• EN 15804:2012+A1:2013 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products, of
• 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;
• Stephenson A. Personal communication with Adam Stephenson, AkzoNobel Protective Coatings, United Kingdom (2019);
• Thinkstep GaBi Software-System and Database for Life Cycle Engineering. Copyright 1992-2017 ThinkStep AG;
• AkzoNobel own latest reviewed database version 2017.

REMARKS

None.