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The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Jotun A/S
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-1759-734-EN
Registration number:	NEPD-1759-734-EN
ECO Platform reference number:	-
Issue date:	15.04.2019
Valid to:	15.04.2024

Jotashield Colourxtreme Silk, Jotun Paints Co. L.L.C.

Jotun A/S

www.epd-norge.no

General information

Product:

Jotashield Colourxtreme Silk, Jotun Paints Co. L.L.C.

Owner of the declaration:

Jotun A/S
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Program operator:

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Manufacturer:

Jotun A/S

Declaration number: NEPD-1759-734-EN

Place of production:

Jotun Paints Co. L.L.C.
P.O. Box 672, Code No.111, Oman

ECO Platform reference number:

Management system:

ISO 9001:2008 Certificate nr: 0044915-00, ISO 14001:2004 Certificate nr 0044914-00, OHSAS 18001:2007 Certificate nr: 0044916-00.

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A1:2013 serves as core PCR.
Product descriptions and scenarios are based on IBU PCR Part B for coatings with organic binders. This also applies for inorganic coatings.

Organisation no:

923 248 579

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Issue date: 15.04.2019

Valid to: 15.04.2024

Declared unit:

1 kg Jotashield Colourxtreme Silk, Jotun Paints Co. L.L.C.

Year of study:

2019

Declared unit with option:

A1,A2,A3

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

Functional unit:

Author of the Life Cycle Assessment:

The declaration is developed using eEPD v3.0 from LCA.no
Approval:
Company specific data are:

Collected/registered by:	Anne Elisabeth Årdal
Internal verification by:	Anne Lill Gade

Verification:

Independent verification of data, other environmental information and the declaration according to ISO14025:2010, § 8.1.3 and § 8.1.4

External

Third party verifier:

Sign

Senior Research Scientist, Anne Rønning

(Independent verifier approved by EPD Norway)

Approved:

Sign

Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

Jotashield Colourxtreme Silk is a superior quality, exterior, 100% pure acrylic water based topcoat. The unique heat reflective features and UV protected colours offer outstanding protection against heat from infrared (IR) rays and destructive effect of UV rays present in sunlight. This product is specially designed to withstand the harsh middle east weather conditions and provides durable & long lasting silk finish with low dirt pick up.

The declared product is a low-VOC product that contributes to reducing energy consumption in cooling the interiors of buildings. Its unique formulation protects concrete from carbonation (acts as anticarbonation coating). Jotashield Colourxtreme Silk is ideal for decorating and protecting exterior surfaces.

Product specification

For information on Green Building Standard credits, see "Additional Information" on page 4.

The material composition of the declared mixed product is given below:

Materials	
Water	50 - 75 %
Binder	10 - 25 %
Filler	10 - 25 %
Titanium dioxide	10 - 25 %
Solvent	1 - 3 %
Additive	0.3 - 1 %
Biocide	< 0.1 %

Technical data:

Specific gravity: 1.26
Solids by volume: 35 ± 2 volume%
Dry film thickness: 35 - 50 µm
Wet film thickness: 100 - 143 µm
Theoretical spreading rate: 10 - 7 m²/l

The most representative and worst case formulation produced at the manufacturing site is chosen for this EPD. For products with a selection of colours, this will be the formulation with the highest content of titanium dioxide.

The product packaging is based on an average sized metal packaging, including secondary packaging such as pallets and plastic wrapping.

For safety, health and environmental conditions, see the Safety Data Sheet for the declared product on www.jotun.com.

For information on technical data, application and use of the product, see the Technical Data Sheet for the declared product on www.jotun.com.

Market:

Global. Transport to market is not included in this EPD.

Reference service life, product

The reference service life of the product is highly dependent on the conditions of use.

Estimated service life, object

The coated object is not declared.

LCA: Calculation rules

Declared unit:

1 kg Jotashield Colourxtreme Silk, Jotun Paints Co. L.L.C.

Cut-off criteria:

All major raw materials and essential energy is included. The production process for raw materials and energy flows with very small amounts (less than 0.1 % dry matter) are not included. In total, more than 99% of the material input is included. These cut-off criteria do not apply for non-energy related emissions (such as wastes, hazardous materials and substances).

Allocation:

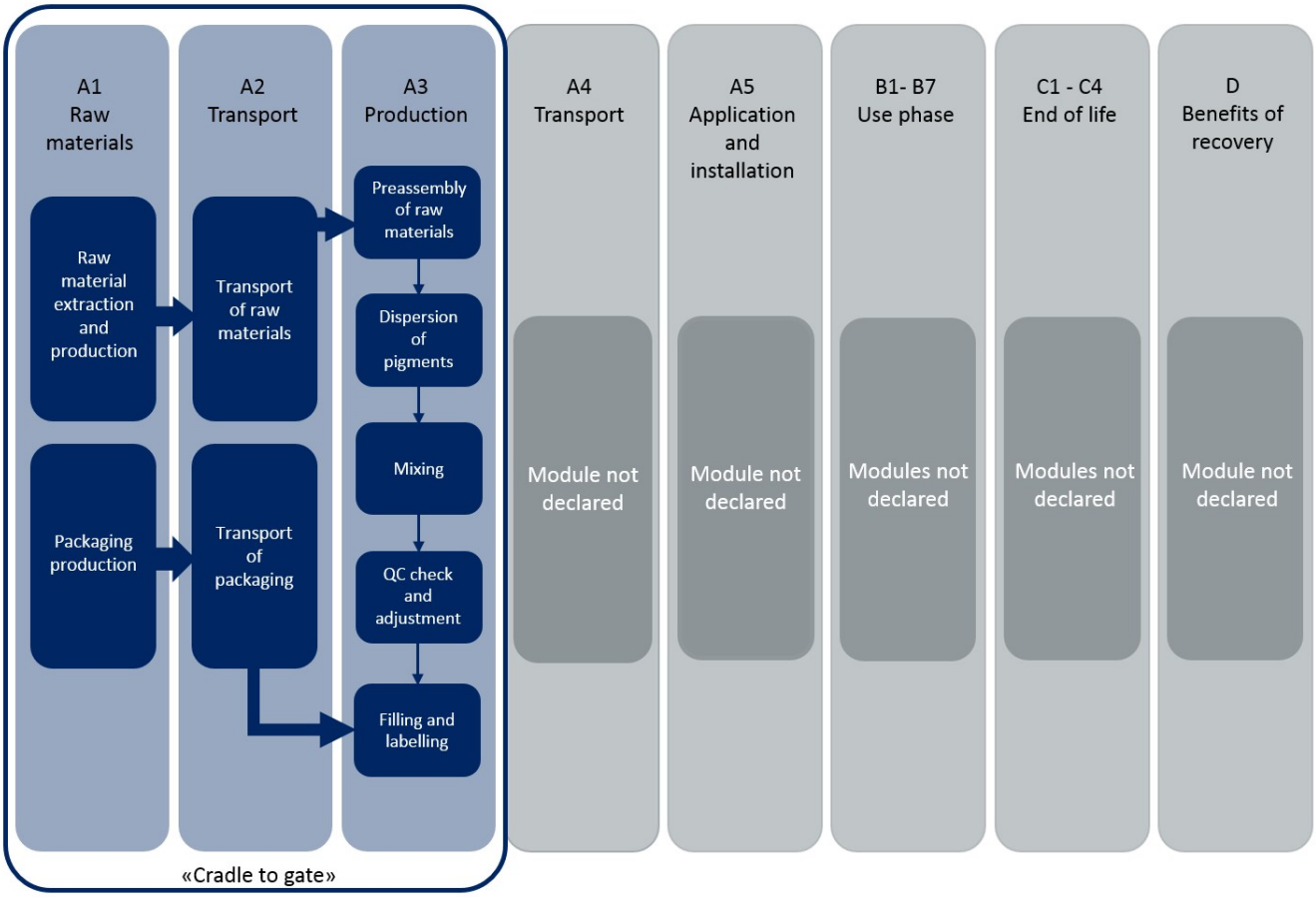
The allocation is made in accordance with the provisions of EN 15804. Incoming energy, water and waste production in-house is primarily allocated equally among all products through mass allocation. Specific allocation was performed for certain waste flows according to information provided by the site manager. VOC emissions have been allocated entirely to the production of solvent based paints. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

The CEPE database is used as basis for the raw material composition. Specific data for the product composition and raw material amounts has been provided by the manufacturer and represents the production of the declared product. Production site data was collected in 2015. Representative data from ecoinvent v3.2 was used for other processes. The data quality for the material input in A1 is presented in tabular form.

Materials	Source	Data quality	Year
Additives	CEPE RM Database v3.0	Database	2016
Binders and Resins	CEPE RM Database v3.0	Database	2016
Others	CEPE RM Database v3.0	Database	2016
Pigments and Fillers	CEPE RM Database v3.0	Database	2016
Solvents	CEPE RM Database v3.0	Database	2016
Packaging	Østfoldforskning	Database	2017

System boundary:
The flowchart in the figure below illustrates the system boundaries for the analysis, in accordance with the modular principle of EN 15804. The analysis is a cradle-to-gate (A1 - A3) study.



Additional information:
The declared product contributes to Green Building Standard credits by meeting the following specific requirements:

LEED®v4 (2013)
EQ credit: Low-emitting materials
- VOC content for Nonflat Coatings (100 g/l) (CARB(SCM)2007) and emission 0.5 - 5.0 mg/m3 (CDPH method 1.1).
MR credit: Building product disclosure and optimization
- Material Ingredients, Option 2: Material Ingredient Optimization, International Alternative Compliance Path - REACH optimization. The product has fully inventoried chemical ingredients to 100 ppm and do not contain substances on the REACH Authorization list – Annex XIV, the Restriction list – Annex XVII or the SVHC candidate list.
- Environmental Product Declarations. Product-specific Type III EPD (ISO 14025;21930, EN 15804) for Jotun U.A.E. Ltd. (L.L.C.) and Jotun Paints Co. L.L.C.
SS Credit: Heat Island Reduction
Selected colour(s) of this product meets the requirements of:
- SR of at least 0.33 for Non-roof structures
- SRI of at least 39 for Steep-sloped roof
- SRI of at least 82 for Low-sloped roof
- SRI of at least 39 for Parking roof covering

LEED® (2009):
SS Credit 7.1: Heat Island Effect - Nonroof
Hardscape, Roof structures and Parking roof covering. Selected colour(s) have SRI of at least 29.
SS Credit 7.2: Heat Island Effect - Roof
Selected colour(s) have SRI of at least 29 for Steep-sloped roof and 78 for Low-sloped roof.

BREEAM International (2016)
- Hea 02: VOC emission demands ((ISO 16000-series (2006) or CDPH method 1.1 (2010)).
- Mat 01: Product-specific Type III EPD (ISO 14025;21930, EN 15804) for Jotun U.A.E. Ltd. (L.L.C.) and Jotun Paints Co. L.L.C.

Additional certificates and approvals may be available on request.

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

This is a cradle to gate (A1-A3) EPD with no declared modules after the factory gate. Transport from place of production to user (A4) has to be calculated by the user.

Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck					l/tkm	
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

Assembly

.	Unit	Value
Auxiliary	kg	
Water consumption	m^3	
Electricity consumption	kWh	
Other energy carriers	MJ	
Material loss		
Output materials from waste treatment		
Dust in the air		
VOC emissions		

Use (B1)

.	Unit	Value

Maintenance (B2)/Repair (B3)

.	Unit	Value
Maintenance cycle*	-	
Auxiliary	kg	
Other resources	kg	
Water consumption	m^3	
Electricity consumption	kWh	
Other energy carriers	MJ	
Material loss	kg	
VOC emissions	kg	

ment (B4)/Refurbishment (B5)

.	Unit	Value
Re...		
Electric...	kWh	
Replacement ...		

* Described above i...

Operational energy (B6) and water consumption (B7)

.	Unit	Value
Water consumption	m^3	
Electricity consumption	kWh	
Other energy carriers	MJ	
Power output of equipment	kW	

End of Life (C1, C3, C4)

.	Uni...	Value
Hazardous waste disposed	kg	
Collected as mixed construction waste	kg	
Reuse	kg	
Recycling	kg	
Energy recovery	kg	
To landfill	kg	

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck					l/tkm	
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

Scenarios after A1-A3 are not included

LCA: Results

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		User stage							End of life stage				.	Beyond the system bondaries
Raw materials	Transport	Manufacturing	Transport	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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	.	MND

Environmental impact

Parameter	Unit	A1	A2	A3
GWP	kg CO_2 -eq	2,28E+00	6,68E-02	1,04E-01
ODP	kg CFC11 -eq	1,87E-07	1,24E-08	1,45E-08
POCP	kg C_2H_4-eq	1,20E-03	2,74E-05	2,74E-05
AP	kg SO_2 -eq	1,42E-02	8,24E-04	6,45E-04
EP	kg PO_4^{3-} -eq	3,27E-03	1,10E-04	8,18E-05
ADPM	kg Sb -eq	2,34E-05	7,29E-08	2,04E-07
ADPE	MJ	3,35E+01	1,04E+00	1,55E+00

GWP Global warming potential; ODP Depletion potential of the stratospheric ozone layer; POCP Formation potential of tropospheric photochemical oxidants; AP Acidification potential of land and water; EP Eutrophication potential; ADPM Abiotic depletion potential for non fossil resources; ADPE Abiotic depletion potential for fossil resources

Reading example: 9,0 E-03 = 9,0*10-3 = 0,009
*INA Indicator Not Assessed

Resource use

Parameter	Unit	A1	A2	A3
RPEE	MJ	2,60E+00	1,84E-02	9,32E-03
RPEM	MJ	5,99E-01	4,38E-03	1,96E-03
TPE	MJ	3,20E+00	2,28E-02	1,13E-02
NRPE	MJ	3,64E+01	1,07E+00	1,57E+00
NRPM	MJ	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	3,64E+01	1,07E+00	1,57E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00
W	m^3	3,56E-02	1,97E-04	2,55E-04

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE 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; W Use of net fresh water

Reading example: 9,0 E-03 = 9,0*10-3 = 0,009
*INA Indicator Not Assessed

End of life - Waste

Parameter	Unit	A1	A2	A3
HW	kg	3,86E-05	5,73E-07	8,40E-06
NHW	kg	1,67E+00	5,62E-02	1,89E-02
RW	kg	INA*	INA*	INA*

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

Reading example: 9,0 E-03 = 9,0*10-3 = 0,009
*INA Indicator Not Assessed

End of life - Output flow

Parameter	Unit	A1	A2	A3
CR	kg	0,00E+00	0,00E+00	0,00E+00
MR	kg	0,00E+00	0,00E+00	1,13E-03
MER	kg	0,00E+00	0,00E+00	2,82E-03
EEE	MJ	INA*	INA*	INA*
ETE	MJ	INA*	INA*	INA*

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Reading example: 9,0 E-03 = 9,0*10-3 = 0,009
*INA Indicator Not Assessed

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Data source	Amount	Unit
Electricity, Oman (kWh)	ecoinvent 3.3 Alloc Rec	1113,82	g CO2-ekv/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list.

Indoor environment

The declared product is emission tested by RISE Research Institutes of Sweden/SP Technical Research Institute of Sweden or Eurofins in accordance with California Department of Public Health (CDPH) Standard Method v1.1–2010.

Bibliography

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ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.
EN 15804:2012+A1:2013 Environmental product declaration - Core rules for the product category of construction products.
ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.
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CDPH method 1.1 (2010): Standard method for the testing and evaluation of volatile organic chemical emissions from indoor sources. California Department of Public Health
EU Directive 2004/42/CE: The limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products
ISO 16000-series of indoor air standards for VOCs sampling and determination, i.e. 3, 6(2011); 9, 10, 11(2006)
LEED® v4 (2013): LEED® v4 for Building design and construction, U.S. Green Building Council®
LEED® (2009): LEED® 2009 for New construction and Major renovations Rating system. U.S. Green Building Council®
REACH (2006): Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006. REACH Authorization list – Annex XIV, the Restriction list – Annex XVII and the SVHC candidate list

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