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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-1590-610-EN
Registration number:	NEPD-1590-610-EN
ECO Platform reference number:	-
Issue date:	10.07.2018
Valid to:	10.07.2023

Pilot WF, Jotun Coatings (Zhangjiagang) Co. Ltd.

Jotun A/S

www.epd-norge.no

General information

Product:

Pilot WF, Jotun Coatings (Zhangjiagang) Co. Ltd.

Owner of the declaration:

Jotun A/S
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Program operator:

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Manufacturer:

Jotun A/S

Declaration number: NEPD-1590-610-EN

Place of production:

Jotun Coatings (Zhangjiagang) Co. Ltd.
No. 15 Changjiang Road, Jiangsu Yangtze River Internat. Chemical Industry Park, Zhangjiagang, China

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: 10.07.2018

Valid to: 10.07.2023

Declared unit:

1 kg Pilot WF, Jotun Coatings (Zhangjiagang) Co. Ltd.

Year of study:

2018

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 v2.0
Approval:
Company specific data are:

Collected/registered by:	Anne Elisabeth Thorstensen
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:

Pilot WF is a one component water borne acrylic emulsion coating. It is a versatile, fast drying product for exterior and interior use. It has a semi gloss finish with good color and gloss retention. Dries down to 50 °F (10 °C). Ideal for new construction or maintenance where fast dry to handle and over coating times are required. To be used as topcoat in atmospheric environments. It is part of a complete water borne system with a recommended Jotun water borne primer. This product is part of a complete system which is certified not to spread surface flames.

Protective:
Suitable as topcoat in systems for a wide range of industrial structures, structural steel, piping and concrete to be exposed to corrosivity categories up to C5 (ISO 12944-2). Recommended for refineries, power plants, bridges, buildings and mining equipment. Recommended for accommodation and working spaces.

Marine:
Suitable as topcoat in systems for a wide range of marine structures in corrosivity categories up to C5 (ISO 12944-2). Recommended for accommodation and engine rooms.

Product specification

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

The material composition of the product is given below:

Materials	
Binder	25 - 50 %
Water	25 - 50 %
Titanium dioxide	10 - 25 %
Solvent	3 - 5 %
Additive	1 - 3 %
Biocide	0.1 - 0.3 %
Filler	0.1 - 0.3 %
Pigment	<0.1 %

Technical data:

Density: 1.2 kg/l
Solids by volume: 39 ± 2 %
Dry film thickness: 40 - 80 µm
Wet film thickness: 105 - 205 µm
Theoretical spreading rate: 9.8 - 4.9 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 and Application Guide 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 Pilot WF, Jotun Coatings (Zhangjiagang) Co. Ltd.

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. This cut-off rule does 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.

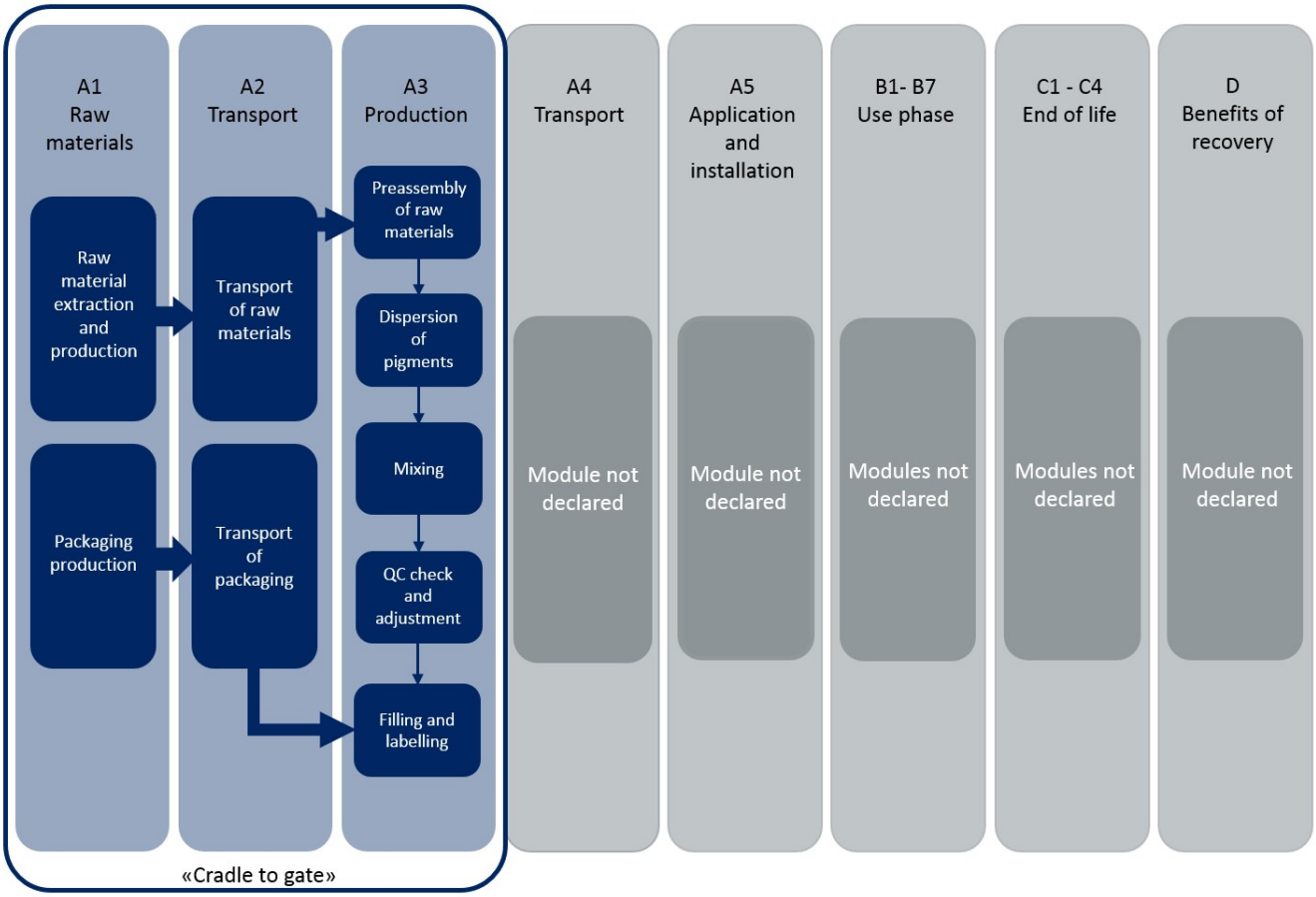
Data quality:

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 Industrial Maintenance Coatings (250 g/l) (CARB(SCM)2007) and emissions between 0.5 and 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: Fully inventoried chemical ingredients to 100 ppm and not containing substances on the REACH Authorization list – Annex XIV, the Restriction list – Annex XVII and the SVHC candidate list.
- Environmental Product Declarations. Product-specific Type III EPD (ISO 14025;21930, EN 15804) for Jotun Abu Dhabi Ltd. (L.L.C.) and Jotun Coatings (Zhangjiagang) Co. Ltd.

LEED® (2009):
IEQ Credit 4.2: The VOC requirements of Green Seal Standard GC-03, 1997.

BREEAM International (2016):
- Hea 02: VOC emission ((ISO 16000-series (2006) or CDPH method 1.1 (2010)) and the VOC content for One-pack performance coatings (100 g/l).
- Mat 01: Product-specific Type III EPD (ISO 14025;21930, EN 15804) for Jotun Abu Dhabi Ltd. (L.L.C.) and Jotun Coatings (Zhangjiagang) Co. Ltd.

BREEAM International (2013):
- Hea 02: VOC content for One-pack performance coating WB (140 g/l) (EU Directive 2004/42/CE).

BREEAM® NOR (2012/2016):
- Hea 9/02: VOC content for One-pack performance coating WB (140 g/l) (EU Directive 2004/42/CE) and emission demands (ISO 16000-series).
- Mat 1.5/01: The product Safety Data Sheet confirms that the product does not contain any substances on the Norwegian A20 list.

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 (A5)

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

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	

Replacement (B4)/Refurbishment (B5)

.	Unit	Value
Replacement cycle*		
Electricity consumption	kWh	
Replacement of worn parts		

* Described above if relevant

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)

.	Unit	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	

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	3,21E+00	2,13E-01	1,05E-01
ODP	kg CFC11 -eq	3,50E-07	3,74E-08	1,77E-09
POCP	kg C_2H_4-eq	1,76E-03	1,42E-04	2,11E-05
AP	kg SO_2 -eq	2,04E-02	4,35E-03	5,24E-04
EP	kg PO_4^{3-} -eq	4,79E-03	4,54E-04	1,44E-04
ADPM	kg Sb -eq	3,49E-05	4,81E-08	5,58E-08
ADPE	MJ	5,44E+01	3,10E+00	9,13E-01

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	3,18E+00	7,31E-02	7,87E-02
RPEM	MJ	7,10E-01	1,37E-02	7,11E-03
TPE	MJ	3,89E+00	8,68E-02	8,58E-02
NRPE	MJ	5,89E+01	3,23E+00	9,40E-01
NRPM	MJ	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	5,89E+01	3,23E+00	9,40E-01
SM	MJ	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	5,31E-02	4,32E-04	3,14E-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	4,91E-05	1,74E-06	8,01E-03
NHW	kg	2,05E+00	3,94E-02	1,22E-01
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	3,94E-03
MER	kg	0,00E+00	0,00E+00	9,85E-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, Kina	ecoinvent 3.3 Alloc Rec	1194,03	g CO2-ekv/kWh

Dangerous substances

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

Indoor environment

The declared product is tested by RISE Research Institutes of Sweden/SP Technical Research Institute of Sweden or Eurofins in accordance with the ISO 16000-series and CDPH method 1.1 (2010), and passes the demands of the French AFSSET (2011), German AgBB (2015), Belgian decree (2014) and Finnish M1 (2017).

Bibliography

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