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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-1408-462-EN
Registration number:	NEPD-1408-462-EN
ECO Platform reference number:	-
Issue date:	25.09.2017
Valid to:	25.09.2022

Jotafloor PU Topcoat, Jotun U.A.E. Ltd. (L.L.C.)

Jotun A/S

www.epd-norge.no

General information

Product:

Jotafloor PU Topcoat, Jotun U.A.E. Ltd. (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-1408-462-EN

Place of production:

Jotun U.A.E. Ltd. (L.L.C.)
P.O.Box 3671, Al Quoz Industrial Area, Dubai, U.A.E.

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: 25.09.2017

Valid to: 25.09.2022

Declared unit:

1 kg Jotafloor PU Topcoat, Jotun U.A.E. Ltd. (L.L.C.)

Year of study:

2017

Declared unit with option:

A1,A2,A3,A4

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:	Fredrik Bruu Ringdal

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:

Jotafloor PU Topcoat is a two component isocyanate cured polyurethane coating. It is a high performance, non yellowing product. It is easy to apply. This product is tintable in a wide range of colors in Jotun's Multicolor Industry (MCI) system. It has excellent gloss and colour retention. It has good chemical, abrasion and impact resistance. If enhanced slip resistance is required, Jotafloor Non Slip Aggregate can be used in the system. The declared product is to be used as topcoat in atmospheric environments, and is suitable on approved primers on concrete substrates.

The declared product is designed for a wide range of floors with various levels of mechanical and chemical exposure. It is specially designed for areas exposed to direct sunlight where gloss and color stability is desired. This product is recommended as a topcoat as part of the car parks, parking bays, pedestrian walkways, industrial floors, drive ways, ramps and traffic deck systems.

Product specification

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

The material composition of the mixed product is given below:

Materials	
Binder	25 - 50 %
Solvent	25 - 50 %
Filler	10 - 25 %
Titianium dioxide	10 - 25 %
Additive	0.3 - 1 %

Technical data:

Product mixing ratio (by volume):
Jotafloor PU Topcoat Comp A: 5 parts
Jotafloor PU Topcoat Comp B: 1 part

Density comp A: 1.32 to 1.37 g/cm³
Density comp B: 1.13 g/cm³
Solids by volume: 63 ± 2 %
Dry film thickness: 50 - 80 µm
Wet film thickness: 80 - 130 µm
Theoretical spreading rate: 12.6 - 7.9 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:

United Arab Emirates

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 Jotafloor PU Topcoat, Jotun U.A.E. Ltd. (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. 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.

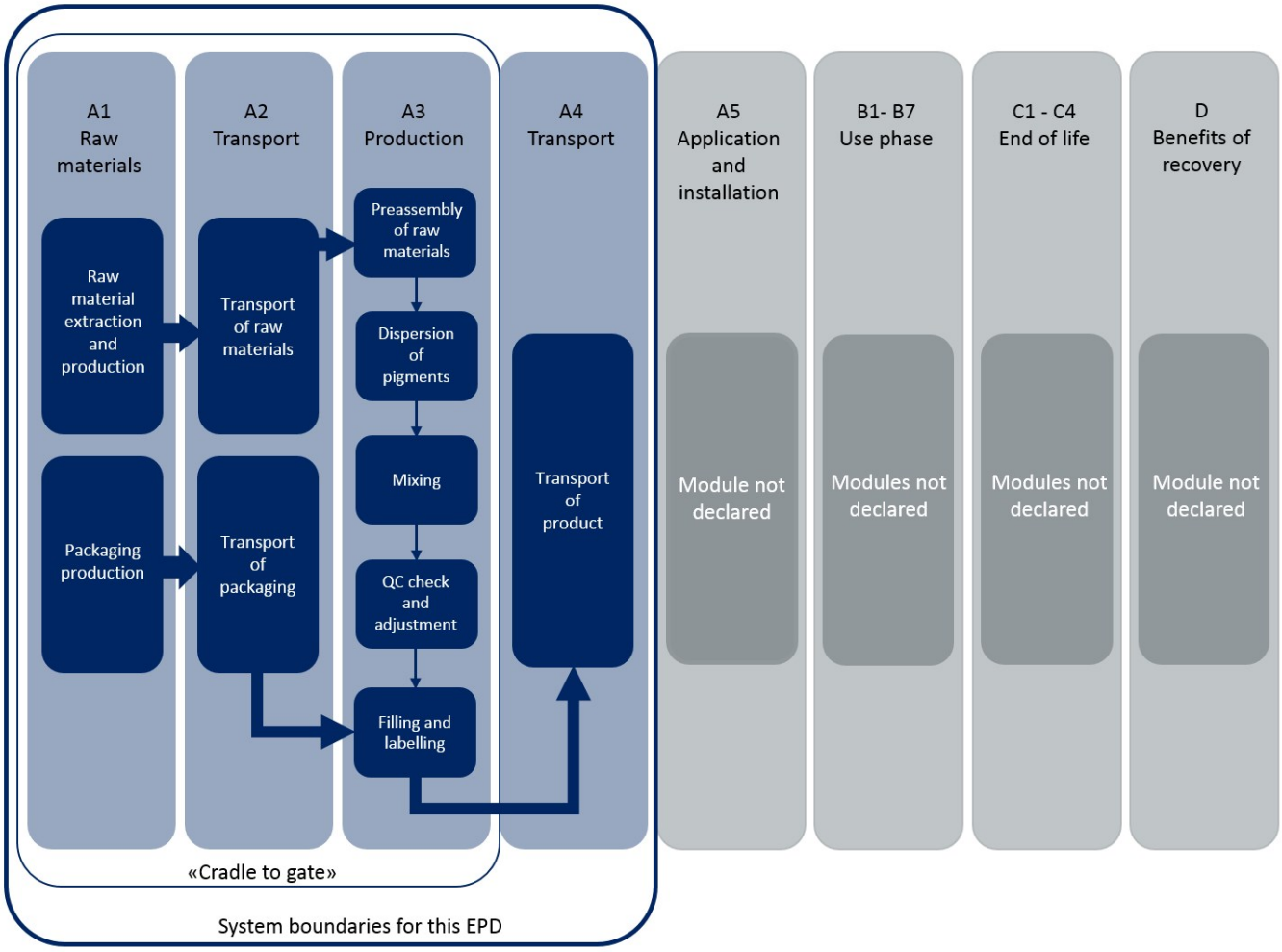
Data quality:

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
Packaging	Ecoinvent 3.2 Alloc Rec	Database	2015
Jotafloor PU Topcoat Comp A	Owner of EPD	Database	
Jotafloor PU Topcoat Comp B	Owner of EPD	Database	

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, with option A4 transport to market.



Additional information:

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

LEED®v4 (2013)
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 U.A.E.
SS Credit: Heat Island Reduction
Selected colour(s) of this product meets the requirements of:
- SRI of at least 39 for Steep-sloped roof
- SRI of at least 39 for Parking roof covering

BREEAM International (2016)
- Mat 01: Product-specific Type III EPD (ISO 14025;21930, EN 15804) for U.A.E.

BREEAM International (2013)
- Hea 02: VOC content for Two-pack performance Coatings SB (500 g/l) (EU Directive 2004/42/CE).

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.

The only module declared after the factory gate is A4 Transport to market.

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	53,0 %	Truck World, EURO 3	53	0,019595	l/tkm	1,04
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	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	.	MND

Environmental impact

Parameter	Unit	A1-A3	A4
GWP	kg CO_2 -eq	4,20E+00	5,00E-03
ODP	kg CFC11 -eq	1,04E-06	9,73E-10
POCP	kg C_2H_4-eq	3,36E-03	9,39E-07
AP	kg SO_2 -eq	2,51E-02	2,65E-05
EP	kg PO_4^{3-} -eq	5,18E-03	6,13E-06
ADPM	kg Sb -eq	3,21E-05	9,19E-09
ADPE	MJ	7,92E+01	8,27E-02

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

Resource use

Parameter	Unit	A1-A3	A4
RPEE	MJ	3,68E+00	1,08E-03
RPEM	MJ	8,35E-01	3,33E-04
TPE	MJ	4,52E+00	1,41E-03
NRPE	MJ	8,39E+01	8,39E-02
NRPM	MJ	0,00E+00	0,00E+00
TRPE	MJ	8,39E+01	8,39E-02
SM	MJ	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00
W	m^3	7,53E-02	1,86E-05

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

End of life - Waste

Parameter	Unit	A1-A3	A4
HW	kg	2,86E-04	4,46E-08
NHW	kg	2,15E+00	7,04E-03
RW	kg	0,00E+00	0,00E+00

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

End of life - Output flow

Parameter	Unit	A1-A3	A4
CR	kg	0,00E+00	0,00E+00
MR	kg	1,39E-03	0,00E+00
MER	kg	3,47E-03	0,00E+00
EEE	MJ	0,00E+00	0,00E+00
ETE	MJ	0,00E+00	0,00E+00

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

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, United Arab Emirates (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

Not applicable for externally applied products.

Bibliography

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
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 21930:2007 Sustainability in building construction - Environmental declaration of building products
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Vold et al (2017). EPD and LCA tool for Jotun - Technical description and background information, OR 01.17, Ostfold Research, Fredrikstad 2017
CEPE v3.0 Raw materials LCI database for the European coatings and printing ink industries
ecoinvent v3.2 Alloc Rec, Swiss Centre of Life Cycle Inventories

BREEAM International (2013): BREEAM International New Construction Technical Manual. SD5075-1.0, 2013
BREEAM International (2016): BREEAM International New Construction Technical Manual. SD233 1.0, 2016
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
LEED® v4: LEED® v4 for Building design and construction, U.S. Green Building Council®, 2013
REACH: Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006
SVHC candidate list: Candidate List of substances of very high concern for Authorisation IAW Article 59(10) of the REACH Regulation

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