ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

NORECOAT FD PRIMER, NORECOAT HS PRIMER, NOREGUARD HS, NOREPOX HS

NOR-MAALI OY

Programme Operator:	*EPD registration number:*	*Publication date:*	*Valid until:*	*Geographical scope:*
The Building Information Foundation RTS sr	RTS_219_23	23.05.2023	23.05.2028	*Finland*

GENERAL INFORMATION

Product name	NorECOat FD Primer, NorECOat HS Primer, Noreguard HS, Norepox HS
Additional label(s)	
Product number / reference	
Place(s) of production	Lahti, Finland
CPC code	

MANUFACTURER INFORMATION

Manufacturer	Nor-Maali Oy
Address	Vanhatie 20, 15240 Lahti, Finland
Contact details	sds@nor-maali.fi
Website	www.nor-maali.fi

PRODUCT IDENTIFICATION **The Building Information Foundation RTS sr**

EPDs within the same product category but from different programmes may not be comparable.

Jukka Seppänen
RTS EPD Committee Secretary

Laura Apilo
Managing Director

EPD INFORMATION

The EPD owner has the sole ownership, liability, and responsibility for the EPD. Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	The Building Information Foundation RTS sr
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804 serves as the core PCR. In addition, the RTS PCR (English version, 26.8.2020) is used. Product specific complementary category rules have not been applied in this EPD
EPD author	Kirsi Wolczkiewicz, Laila Huovinen-Manu, Inkeri Seppälä / Sweco Finland Oy
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
Verification date	05.05.2023
EPD verifier	Anni Viitala, Granlund Oy
EPD number	RTS_219_23
ECO Platform nr.	-
Publishing date	23.05.2023

EPD valid until 23.05.2028

PRODUCT INFORMATION

PRODUCT DESCRIPTION

The following products are covered by this EPD:

NorECOat FD Primer	A two-component fast drying high solids epoxy primer with a special hardener. Cures in low temperatures.
NorECOat HS Primer	A two-component, fast drying high solids epoxy primer. The paint cures in low temperatures.
Noreguard HS	A two-component, fast drying high solids epoxy coating. Product contains active rust preventing pigments. The paint cures in low temperatures.
Norepox HS	Two-component epoxy topcoat with a special hardener. Can be piled after a short drying time. The paint cures at low temperatures.

PRODUCT APPLICATION

NorECOat FD Primer

NORECOAT FD PRIMER is used over blast cleaned steel surfaces as a primer in epoxy paint systems in environmental classes C2-C5. Specially recommended for frameworks of industry buildings, pipe bridges, conveyors and structural constructions of process industry. Can also be overcoated with polyurethane paints.

Surface should be dry when applied. The mixing ratio is 4:1 (resin:cure) by volume. Stir the resin and cure separately and then mix both components thoroughly. Applied with an airless spray or brush.

NorECOat HS Primer

NORECOAT HS PRIMER is specially recommended for blast cleaned steel surfaces as a primer or a midcoat in epoxy paint systems in environmental classes C2-C5. It is also suitable for frameworks of industry buildings, pipe bridges, conveyors and structural constructions of process industry. Suitable for the projects, where there is a requirement for use of Mastic type coatings. NORECOAT HS PRIMER can also be used for immersion service in fresh water and sea water.

Surface should be dry when applied. The mixing ratio is 5:1 (resin:cure) by volume. Stir the resin and cure separately and then mix both components thoroughly. Applied with a high pressure airless spray or brush.

Noreguard HS

NOREGUARD HS is recommended to use as a primer, mid or top coat on zinc epoxy primer or other two-component epoxy primer in environmental classes C2-C5. Can be used as a single-coat (DTM) system in environmental classes C1-C3.

Surface should be dry when applied. The mixing ratio is 5:1 (resin:cure) by volume. Stir the resin and cure separately and then

mix both components thoroughly. Applied with a high pressure airless spray or brush.

Norepox HS

NOREPOX HS is used over blast cleaned steel surfaces as a single-coat (DTM) system in environmental classes C2-C3 and as a topcoat in epoxy paint systems in environmental classes C2-C5. Norepox HS is specially recommended for frameworks of industry buildings, pipe bridges, conveyors and structural constructions of process industry.

Surface should be dry when applied. The mixing ratio is 4:1 (resin:cure) by volume. Stir the resin and cure separately and then mix both components thoroughly. Applied with a high pressure airless spray or brush.

For more information on technical data, application and use of the product, see the Technical Data Sheet and for safety, health and environmental conditions, see the Safety Data Sheet for the declared products on www.nor-maali.fi.

PRODUCT STANDARDS

No relevant standards. More information can be found at the company website.

TECHNICAL SPECIFICATIONS

	NorECOat FD Pr	NorECOat HS Pr	Noreguard HS	Norepox HS
Spreading rate (typical):	4.5 – 8.3 m^2/L	3.9 – 9.5 m^2/L	3.9 – 9.5 m /L	5.6 – 8.5 m /L
Dry film thickness:	80 - 150 µm	80 - 200 µm	80 - 200 µm	80 - 120 µm
Finish:	Matt	Semi matt	Semi gloss	Semi gloss
Drying time:	Dry to touch in 2.5 h (+23°C and film thickness 80 µm)	Dry to touch in 3 h (+23°C and film thickness 80 µm)	Dry to touch in 4 h (+23°C and film thickness 80 µm)	Dry to touch in 2.5 h (+23°C and film thickness 80 µm)
Pot life:	2 h after mixing	1 h after mixing	1 h after mixing	1 h after mixing

PHYSICAL PROPERTIES OF THE PRODUCT

	NorECOat FD Pr	NorECOat HS Pr	Noreguard HS	Norepox HS
Volume of solids:	68 ± 2%	78 ± 2%	78 ± 2%	68 ± 2%
Mass of solids:	1160 g/L	1390 g/L	1300 g/L	1100 g/L
VOC-value:	290 g/L	190 g/L	210 g/L	290 g/L
Density:	1.45 kg/L	1.58 kg/L	1.51 kg/L	1.39 kg/L

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at www.nor-maali.fi/

PRODUCT RAW MATERIAL COMPOSITION

Product and Packaging Material	Weight, kg	Post-consumer %	Renewable %	Country Region of origin
Binders	0,35	0	20	Europe, India, South Korea
Solvents	0,16	0	0	Finland, Europe, Russia
Pigments	0,04	0	0	Europe
Fillers	0,43	0	0	Europe, Turkey
Additives	0,01	0	0	Europe, China
Thickeners	0,01	0	0	Europe, Japan
Packaging	0,07	0	23	Europe, Finland

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	-	
Minerals	47	Europe, Turkey
Fossil materials	53	Europe, Russia, Japan, China
Bio-based materials	-	

SUBSTANCES, REACH - VERY HIGH CONCERN

Substances of very high concern	EC	CAS
ethylenediamine	203-468-6	107-15-3

	NorECOat FD Pr	NorECOat HS Pr	Noreguard HS	Norepox HS
Share of SVHC	<1,3%	<0,5%	<0,5%	0%

PRODUCT LIFE-CYCLE

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. Installation (A5) covers application losses, waste treatment and evaporating VOCs.

PRODUCT USE AND MAINTENANCE (B1-B7)

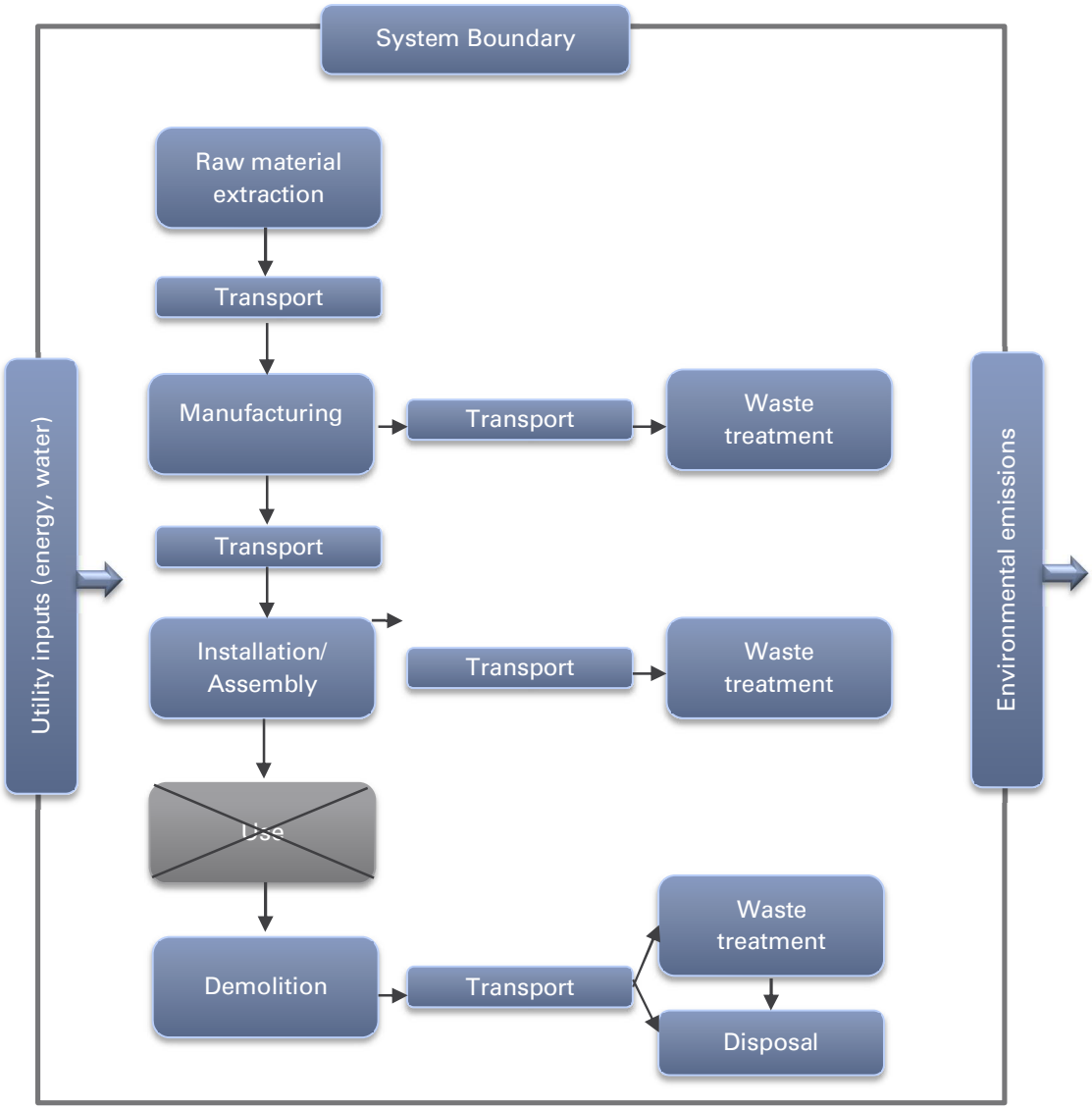
This EPD does not cover the use phase.

Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

The impacts of demolition are assumed zero, as the consumption of energy and natural resources in disassembling the end-of-life product is negligible.

As the product in this EPD is applied on metal surfaces, it is considered to follow the metal object to waste treatment at its end-of-life, treated in the nearest recycling / treatment facility. Based on Statistics Finland, 99,66% of metal waste is recycled or incinerated and 0,34% is disposed on landfills. As a part of the metal waste treatment process, the paint is assumed to be burned away. Thus, in the end-of-life scenario for the paint, 99,66% is incinerated and 0,34% is disposed on sanitary landfill.



MANUFACTURING PROCESS

The manufacturing process of the paint consists two phases. The first step is the production of the paint batch, and second is the packaging of the product. In the millbase, part of the binder and solvents are dispersed with the powder type ingredients (pigments, fillers and thickeners) with the help of selected additives. Well-designed millbase has a smooth paste like consistency. Targeted fineness of the grind is achieved in this step. In the letdown phase, the rest of the ingredients are added, and paint is mixed homogeneous. If needed, tinting pastes can also be added in this step. After the manufacturing process, the paint goes through the quality control before the filling into the desired can sizes. Cans are loaded into the pallets and transferred to a warehouse.

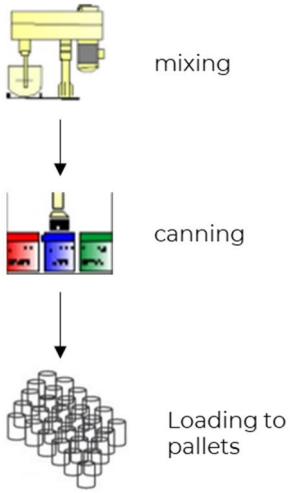


Figure 1. Epoxy paint manufacturing process

LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	2021

DECLARED AND FUNCTIONAL UNIT

Declared unit	kg
Mass per declared unit	1 kg
Functional unit	not defined
Reference service life	dependent on use case

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	0.01518

SYSTEM BOUNDARY

This EPD covers the cradle to gate with modules scope with the following modules; A1 (Raw material supply), A2 (Transport), A3 (Manufacturing), A4 (Transport), A5 (Assembly) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary is included.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x	x	x
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and the applied PCR. The study does not exclude any hazardous materials or substances.

The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

Construction of the production facility and equipment are excluded from the analysis, as their impacts per produced declared unit during the factory and equipment lifetime are considered negligible. Commuting of employees at the facility and similar supporting activities, such as household waste of social activities, are also excluded.

Some raw materials contain bio-based components, but their share is very small and biogenic carbon analysis for the product is excluded.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation.

In this study, as per EN 15804, allocation is conducted in the following order;

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

A3 Manufacturing:

Data collected for energy and water are allocated, since data was only available at the factory level. The values for 1 kg are calculated by considering the annual production volumes of all products from the factory.

A4 Distribution:

Delivery distances and volumes were available at plant level, and thus same weighted A4 kilometers were utilized for the different products. Weighting of delivery kilometres was done based on delivery volumes.

A5 Application:

Minor losses were assumed to occur during application. Wooden pallets used in transportation were assumed to be reused multiple

times before incineration for energy. Plastic wrap and metal cans were assumed to be recycled.

C2 Transport at end-of-life

As the exact locations of application are unknown, the transported distance is an estimated distance to the nearest recycling facility (50 km) and transportation method lorry, which is the most common.

Allocation used in Ecoinvent 3.6 environmental data sources follows the methodology 'allocation, cut-off by classification'. This methodology is in line with the requirements of the EN 15804 - standard.

AVERAGES AND VARIABILITY

This EPD covers four different products, where the difference in GWP total between product with lowest and highest impacts is less than 10%.

All products are offered in metal cans, with sizes ranging from 4L to 20L. In addition one product is offered in a 200L metal drum. The mass of metal packaging has been averaged for each product based on packaged amounts.

The averaged product of this EPD was calculated as a weighted average based on yearly production volumes.

ENVIRONMENTAL IMPACT DATA

Note: additional environmental impact data may be presented in annexes.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total	kg CO2e	2,02E0	7,34E-1	4,05E-1	3,16E0	1,72E-2	4,10E-1	MND	MND	MND	MND	MND	MND	MND	0E0	4,01E-3	0E0	3,49E0	-1,08E-1
GWP – fossil	kg CO2e	2,01E0	7,34E-1	4,29E-1	3,17E0	1,74E-2	3,47E-1	MND	MND	MND	MND	MND	MND	MND	0E0	4,01E-3	0E0	3,40E0	-1,06E-1
GWP – biogenic	kg CO2e	5,68E-3	1,14E-4	2,79E-2	3,37E-2	1,26E-5	6,36E-2	MND	MND	MND	MND	MND	MND	MND	0E0	2,91E-6	0E0	9,03E-2	4,56E-4
GWP – LULUC	kg CO2e	1,18E-2	4,35E-4	3,81E-4	1,26E-2	5,23E-6	6,36E-4	MND	MND	MND	MND	MND	MND	MND	0E0	1,21E-6	0E0	1,22E-4	-1,77E-5
Ozone depletion pot.	kg CFC-11e	2,53E-7	1,50E-7	3,28E-8	4,36E-7	4,09E-9	2,36E-8	MND	MND	MND	MND	MND	MND	MND	0E0	9,42E-10	0E0	4,99E-8	-3,19E-9
Acidification potential	mol H+e	1,24E-2	2,25E-2	3,72E-3	3,86E-2	7,30E-5	2,19E-3	MND	MND	MND	MND	MND	MND	MND	0E0	1,68E-5	0E0	7,68E-3	-5,16E-4
EP-freshwater3)	kg Pe	3,10E-3	3,30E-6	3,63E-5	3,14E-3	1,41E-7	1,60E-4	MND	MND	MND	MND	MND	MND	MND	0E0	3,26E-8	0E0	4,73E-5	-6,25E-6
EP-marine	kg Ne	1,93E-3	5,63E-3	4,86E-4	8,05E-3	2,20E-5	4,13E-4	MND	MND	MND	MND	MND	MND	MND	0E0	5,07E-6	0E0	6,39E-4	-9,97E-5
EP-terrestrial	mol Ne	2,02E-2	6,26E-2	5,87E-3	8,87E-2	2,43E-4	4,69E-3	MND	MND	MND	MND	MND	MND	MND	0E0	5,60E-5	0E0	9,35E-3	-1,13E-3
POCP ("smog")	kg NMVOCe	8,78E-3	1,62E-2	8,11E-3	3,31E-2	7,81E-5	2,04E-1	MND	MND	MND	MND	MND	MND	MND	0E0	1,80E-5	0E0	5,85E-3	-5,46E-4
ADP-minerals & metals	kg Sbe	2,63E-4	5,46E-6	1,71E-5	2,86E-4	2,97E-7	1,43E-5	MND	MND	MND	MND	MND	MND	MND	0E0	6,84E-8	0E0	1,90E-6	-1,89E-6
ADP-fossil resources	MJ	4,54E1	9,53E0	6,16E0	6,11E1	2,70E-1	3,45E0	MND	MND	MND	MND	MND	MND	MND	0E0	6,24E-2	0E0	1,06E1	-9,16E-1
Water use2)	m3e depr.	4,63E-1	1,97E-2	3,47E-1	8,30E-1	1,01E-3	4,43E-2	MND	MND	MND	MND	MND	MND	MND	0E0	2,32E-4	0E0	5,52E-2	-4,95E-2

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential.
2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.
3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO_4e.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	3,28E-8	2,54E-8	3,03E-8	8,85E-8	1,57E-9	8,09E-9	MND	MND	MND	MND	MND	MND	MND	0E0	3,63E-10	0E0	6,67E-8	-7,92E-9
Ionizing radiation5)	kBq U235e	2,58E-2	4,10E-2	6,32E-2	1,30E-1	1,18E-3	7,13E-3	MND	MND	MND	MND	MND	MND	MND	0E0	2,73E-4	0E0	1,47E-2	3,92E-4
Ecotoxicity (freshwater)	CTUe	3,60E1	5,97E0	2,81E1	7,01E1	2,07E-1	5,69E0	MND	MND	MND	MND	MND	MND	MND	0E0	4,77E-2	0E0	4,04E1	-6E0
Human toxicity, cancer	CTUh	9,09E-8	3,73E-10	2,19E-9	9,35E-8	5,28E-12	5,03E-9	MND	MND	MND	MND	MND	MND	MND	0E0	1,22E-12	0E0	6,47E-9	-5,3E-10
Human tox. non-cancer	CTUh	1,58E-6	5,04E-9	4,15E-8	1,63E-6	2,45E-10	8,65E-8	MND	MND	MND	MND	MND	MND	MND	0E0	5,65E-11	0E0	9,72E-8	1,4E-8
SQP	-	1,71E0	1,48E0	1,12E0	4,31E0	4,08E-1	3,13E-1	MND	MND	MND	MND	MND	MND	MND	0E0	9,41E-2	0E0	1,26E0	-2,52E-1

4) SQP = Land use related impacts/soil quality.
5) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy	MJ	7,87E-1	6,52E-2	1,09E0	1,94E0	3,40E-3	1,09E-1	MND	MND	MND	MND	MND	MND	MND	0E0	7,85E-4	0E0	2,46E-1	-8,28E-2
Renew. PER as material	MJ	0E0	0E0	5,30E-1	5,30E-1	0E0	5,34E-1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	7,87E-1	6,52E-2	1,62E0	2,47E0	3,40E-3	4,41E-1	MND	MND	MND	MND	MND	MND	MND	0E0	7,85E-4	0E0	2,46E-1	-8,28E-2
Non-re. PER as energy	MJ	1,30E1	9,53E0	6,10E0	2,86E1	2,70E-1	1,95E0	MND	MND	MND	MND	MND	MND	MND	0E0	6,24E-2	0E0	1,06E1	-8,56E-1
Non-re. PER as material	MJ	3,37E0	0E0	5,22E-2	3,42E0	0E0	6,56E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	3,34E0	-2,6E-4
Total use of non-re. PER	MJ	1,63E1	9,53E0	6,05E0	3,19E1	2,70E-1	1,89E0	MND	MND	MND	MND	MND	MND	MND	0E0	6,24E-2	0E0	7,97E0	-8,56E-1
Secondary materials	kg	3,53E-3	0E0	1,10E-1	1,14E-1	0E0	5,67E-3	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	4,75E-2
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m3	4,58E-3	9,62E-4	6,10E-3	1,16E-2	5,63E-5	8,72E-4	MND	MND	MND	MND	MND	MND	MND	0E0	1,30E-5	0E0	5,36E-3	-7,24E-4

6) PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	5,72E-2	1,02E-2	9,32E-2	1,61E-1	2,63E-4	2,53E-2	MND	MND	MND	MND	MND	MND	MND	0E0	6,06E-5	0E0	3,08E-1	-4,04E-2
Non-hazardous waste	kg	1,35E0	2,08E-1	1,85E0	3,41E0	2,91E-2	2,03E-1	MND	MND	MND	MND	MND	MND	MND	0E0	6,70E-3	0E0	5,75E-1	-3,39E-1
Radioactive waste	kg	2,21E-5	6,69E-5	3,43E-5	1,23E-4	1,86E-6	7,26E-6	MND	MND	MND	MND	MND	MND	MND	0E0	4,28E-7	0E0	2,10E-5	4,64E-9

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	3,06E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	5,79E-2	5,79E-2	0E0	1,81E-1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for energy	kg	0E0	0E0	0E0	0E0	0E0	1,20E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total	kg CO2e	2,02E0	7,34E-1	4,05E-1	3,16E0	1,72E-2	4,10E-1	MND	MND	MND	MND	MND	MND	MND	0E0	4,01E-3	0E0	3,49E0	-1,08E-1
ADP-minerals & metals	kg Sbe	2,63E-4	5,46E-6	1,71E-5	2,86E-4	2,97E-7	1,43E-5	MND	MND	MND	MND	MND	MND	MND	0E0	6,84E-8	0E0	1,90E-6	-1,89E-6
ADP-fossil	MJ	4,54E1	9,53E0	6,16E0	6,11E1	2,70E-1	3,45E0	MND	MND	MND	MND	MND	MND	MND	0E0	6,24E-2	0E0	1,06E1	-9,16E-1
Water use	m3e depr.	4,63E-1	1,97E-2	3,47E-1	8,30E-1	1,01E-3	4,43E-2	MND	MND	MND	MND	MND	MND	MND	0E0	2,32E-4	0E0	5,52E-2	-4,95E-2
Secondary materials	kg	4,60E-4	0E0	8,65E-3	9,11E-3	0E0	4,50E-4	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	4,75E-2
Biog. C in product	kg C	N/A	N/A	0E0	0E0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biog. C in packaging	kg C	N/A	N/A	1,52E-2	1,52E-2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

7) Biog. C in product = Biogenic carbon content in product

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity, Finland (Statistics Finland)
Electricity CO2e / kWh	0.15
District heating data source and quality	District heat: LCA study for country specific district heating based on IEA, OneClickLCA 2022.
District heating CO2e / kWh	0.12

Transport scenario documentation (A4)

Scenario parameter	Value
Specific transport CO2e emissions, kg CO2e / tkm	0.0901
Average transport distance, km	170
Capacity utilization (including empty return) %	100
Bulk density of transported products	1443
Volume capacity utilization factor	<1

Assembly scenario documentation (A5)

Scenario parameter	Value*
Water use	-
Other material resource use	-
Energy use, data source and quality	-
Installation waste at the building site before waste processing	0,159 kg
Leftover paint in cans / application loss	*0,050 kg*
Metal packaging	*0,073 kg*
Plastic wrap	*0,001 kg*
Wooden pallets	*0,035 kg*
Materials to recycling or other use after waste processing at the building site	0,109 kg
Metal packaging to recycling	*0,073 kg*
Plastic wrap to recycling	*0,001 kg*
Wooden pallets to reuse	*0,030 kg*
Wooden pallets to energy recovery	*0,005 kg*
Direct emissions to air, soil, and water	VOC during painting 0,203 kg (conservative). It is assumed that proper protection around painted area prevents contamination to soil and water.

End of life scenario documentation

Scenario parameter	Value
Collection process – kg collected separately	0
Collection process – kg collected with mixed waste	0,816
Recovery process – kg for re-use	0
Recovery process – kg for recycling	0
Recovery process – kg for energy recovery	0
Disposal (total) – kg for final deposition	0,816
Scenario assumptions e.g. transportation	Transportation 50 km, lorry. Treatment for recycling allocated on metal object. 99,66% of metal recycled (paint incineration), rest to landfill.

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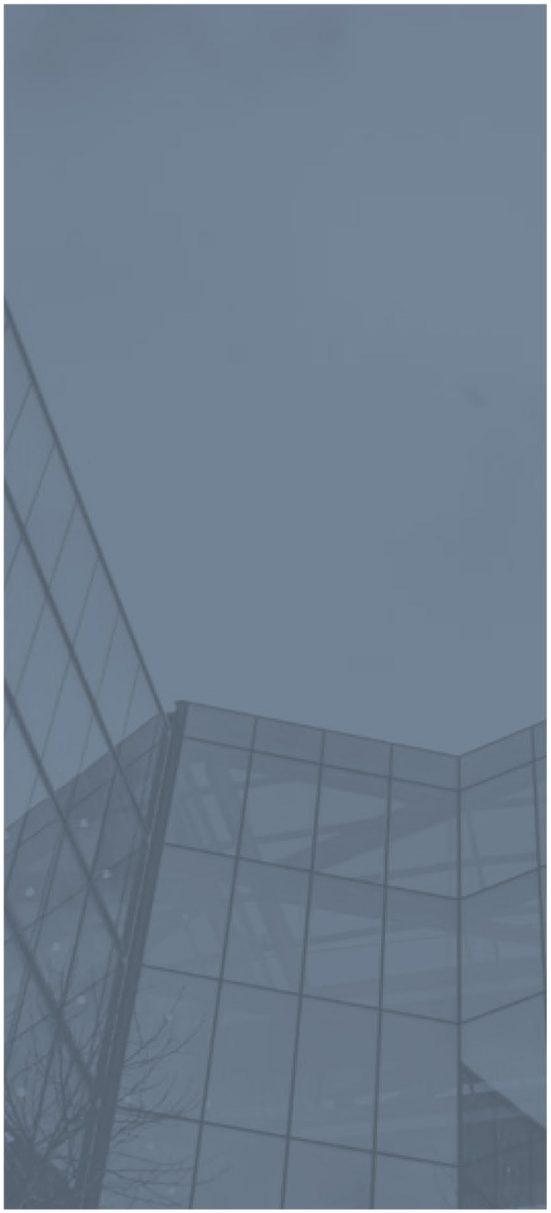
RTS PCR (English version, 26.8.2020)

Nor-Maali Epoxy paints LCA background report 27.04.2023



ABOUT THE MANUFACTURER

Nor-Maali offers a reliable range of industrial coatings for professionals. The product range includes anti-corrosion protective coatings for metal surfaces with water-borne and high-solid solvent-based alternatives. In addition, Nor-Maali produces CE-certified concrete floor products.

EPD AUTHOR AND CONTRIBUTORS

Manufacturer	Nor-Maali Oy
EPD author	Kirsi Wolczkiewicz, Laila Huovinen-Manu, Inkeri Seppälä / Sweco Finland Oy
EPD verifier	Anni Viitala / Granlund Oy
EPD program operator	The Building Information Foundation RTS sr
Background data	This EPD is based on Ecoinvent 3.6 (cut-off) and One Click LCA databases.
LCA software	The LCA and EPD have been created using One Click LCA Pre-Verified EPD Generator for Paints and coatings

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with EN 15804, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The background report (project report) for this EPD

Why does verification transparency matter? Read more online.

VERIFICATION OVERVIEW

Following independent third party has verified this specific EPD:

EPD verification information	Answer
Independent EPD verifier	Anni Viitala, Granlund Oy
EPD verification started on	01/2023
EPD verification completed on	05.05.2023
Supply-chain specific data %	
Approver of the EPD verifier	The Building Information Foundation

Author & tool verification	Answer
EPD author	Kirsi Wolczkiewicz, Laila Huovinen-Manu, Inkeri Seppälä / Sweco Finland Oy
EPD author training completion	
EPD Generator module	Paints and coatings
Independent software verifier	
Software verification date	

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of

- the data collected and used in the LCA calculations,
- the way the LCA-based calculations have been carried out,
- the presentation of environmental data in the EPD, and
- other additional environmental information, as present

with respect to the procedural and methodological requirements in ISO 14025:2010 and EN 15804:2012+A2:2019.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Signature

Anni Viitala

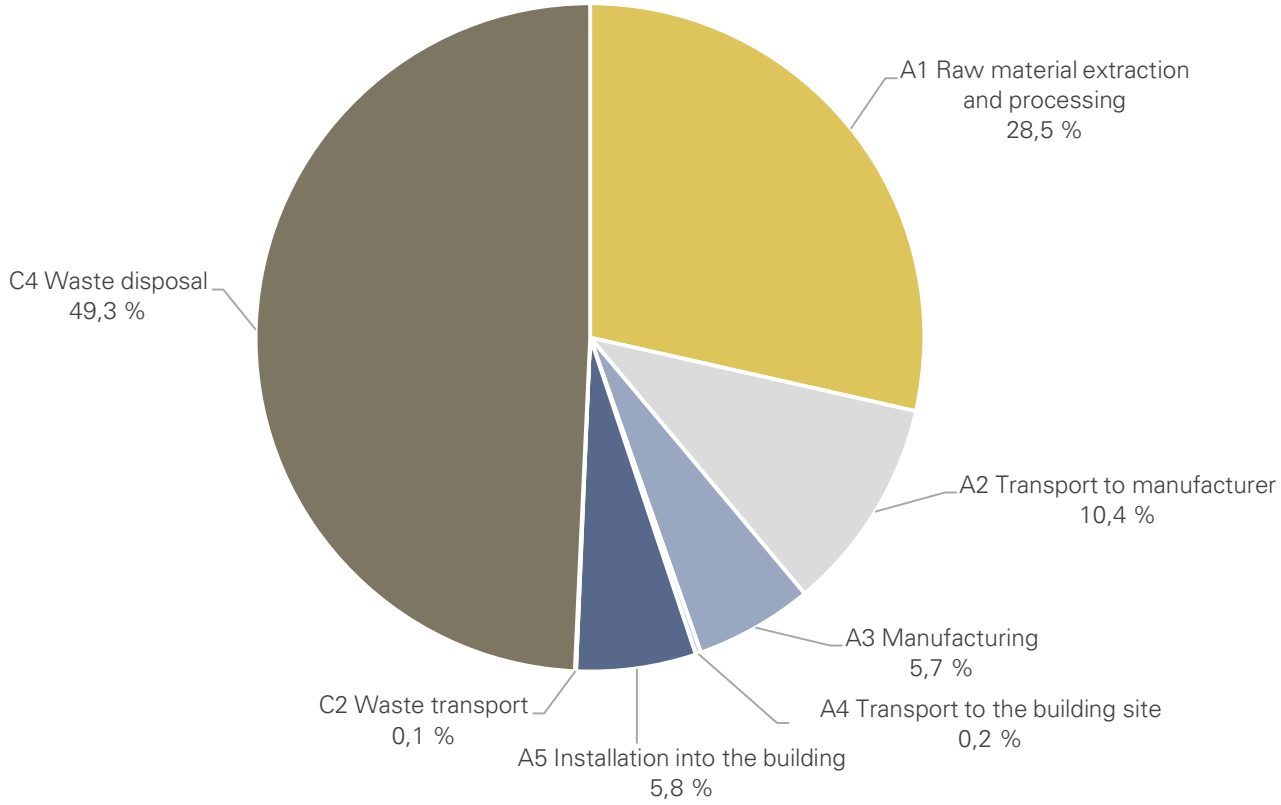
Anna Malin (verifier assistant)

ANNEX 1: ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO2e	1,98E0	7,29E-1	4,22E-1	3,13E0	1,72E-2	3,42E-1	MND	MND	MND	MND	MND	MND	MND	0E0	3,97E-3	0E0	3,35E0	-1,01E-1
Ozone depletion Pot.	kg CFC-11e	3,21E-7	1,18E-7	3,04E-8	4,69E-7	3,25E-9	2,53E-8	MND	MND	MND	MND	MND	MND	MND	0E0	7,49E-10	0E0	4,41E-8	-2,77E-9
Acidification	kg SO2e	1,23E-2	1,79E-2	3,14E-3	3,33E-2	3,54E-5	1,92E-3	MND	MND	MND	MND	MND	MND	MND	0E0	8,16E-6	0E0	6,62E-3	-4,27E-4
Eutrophication	kg PO43e	4,25E-3	2,03E-3	1,51E-3	7,79E-3	7,14E-6	4,69E-4	MND	MND	MND	MND	MND	MND	MND	0E0	1,65E-6	0E0	1,74E-3	-2,86E-4
POCP (“smog”)	kg C2H4e	1,58E-3	4,64E-4	2,13E-4	2,26E-3	2,24E-6	2,45E-4	MND	MND	MND	MND	MND	MND	MND	0E0	5,17E-7	0E0	2,39E-3	-6,93E-5
ADP-elements	kg Sbe	2,63E-4	5,46E-6	1,71E-5	2,86E-4	2,97E-7	1,43E-5	MND	MND	MND	MND	MND	MND	MND	0E0	6,84E-8	0E0	1,90E-6	-1,89E-6
ADP-fossil	MJ	4,54E1	9,53E0	6,16E0	6,11E1	2,70E-1	3,45E0	MND	MND	MND	MND	MND	MND	MND	0E0	6,24E-2	0E0	1,06E1	-9,16E-1

ANNEX 2: LIFE-CYCLE ASSESSMENT RESULT VISUALIZATION

Global warming potential total kg CO_2e – Life cycle stages



Life-cycle impacts by stage as stacked columns