ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	nora systems GmbH
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-NOR-20240470-IBA1-EN
Issue date	05.12.2024
Valid to	04.12.2029

noraplan® 913 2 mm

nora systems GmbH

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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1. General Information

nora systems GmbH

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-NOR-20240470-IBA1-EN

This declaration is based on the product category rules:

Floor coverings, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

05.12.2024

Valid to

04.12.2029

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

noraplan® 913 2 mm

Owner of the declaration

nora systems GmbH
Höhnerweg 2-4
69469 Weinheim
Germany

Declared product / declared unit

1 m² resilient floor covering (A1-A3: 1 m² produced, A1-A5: 1 m² installed).

Scope:

Product line noraplan® 913 with a thickness of 2 mm.
Rubber floor coverings continuously vulcanised in sheets in various colours and designs.
This declaration is an Environmental Product Declaration according to ISO 14025 describing the specific environmental performance of the mentioned construction products produced in Weinheim/Bergstraße Germany.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally

Dr. Niels Jungbluth,
(Independent verifier)

2. Product

2.1 Product description/Product definition

In this Environmental Product Declaration (EPD), resilient rubber floor coverings of the product line noraplan® 913 with different designs and surface structures are modelled.
Specific characteristics of the noraplan® 913 coverings are:

- manufacturing method: continuously vulcanized rubber floor coverings in sheets
- covering structure: single-layered
- no addition of PVC, chlorine-containing polymers and phthalate plasticizers
- permanently resilient
- suitable for high traffic areas
- no coating needed
- highly fire retardant
- no welding required
- high resistance against chemicals and surface as well as hand disinfectants according to the *VAH* and *RKI* lists

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) *Regulation (EU) No. 305/2011 (CPR)* applies. The product needs a declaration of performance taking into consideration *EN 4041:2018-05, Resilient, textile, laminate and modular multilayer floor coverings - Essential characteristics* and the CE-marking.
For the application and use the respective national provisions apply.

2.2 Application

noraplan® 913 can be used in various application areas as in Healthcare, Education, Industry, Public Buildings or Shops and Stores. For use and application the respective national provisions apply.
Floor coverings are classified according to *DIN EN ISO 10874*.
Floor coverings for high performance professional use:

2.3 Technical Data

Excerpt of technical data sheets: (available at www.nora.com)

Constructional data

Name	Value	Unit
Product thickness EN ISO 24346	2	mm
Grammage	3360	g/m^2
Product Form	sheets and tiles	-
Type of manufacture	continuously	-
Abrasion restistance at 5 N load ISO 4649 (Method A)	150	mm^3
Hardness ISO 48-4	92	Shore A
Improvement in footfall sound ISO 10140-3	6	dB
Anti-slip resistance DIN EN 16165 structured surface	R10	
Anti-slip resistance DIN EN 16165 smooth surface	R9	

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN 14041:2018-05 Resilient, textile, laminate and modular multilayer floor coverings - Essential characteristics.*

2.4 Delivery status

The delivery takes place in rolls of 1.22 m width and different lengths, or as tiles of 610 x 610 mm, loose on pallets.
The backs of the coverings are sanded and have arrows indicating the installation direction.
The product is available with an factory-fitted adhesive backing for clean, safe and fast installation.

2.5 Base materials/Ancillary materials

Simplified formulation of noraplan® 913

noraplan® 913 contains 12% of biobased raw materials.

Name	Value	Unit
natural and synthetic rubber (only PEFC certified natural rubber)	27	%
Mineral fillers	53	%
Colour pigments	11	%
Auxiliary substances and vulcanisation system	9	%

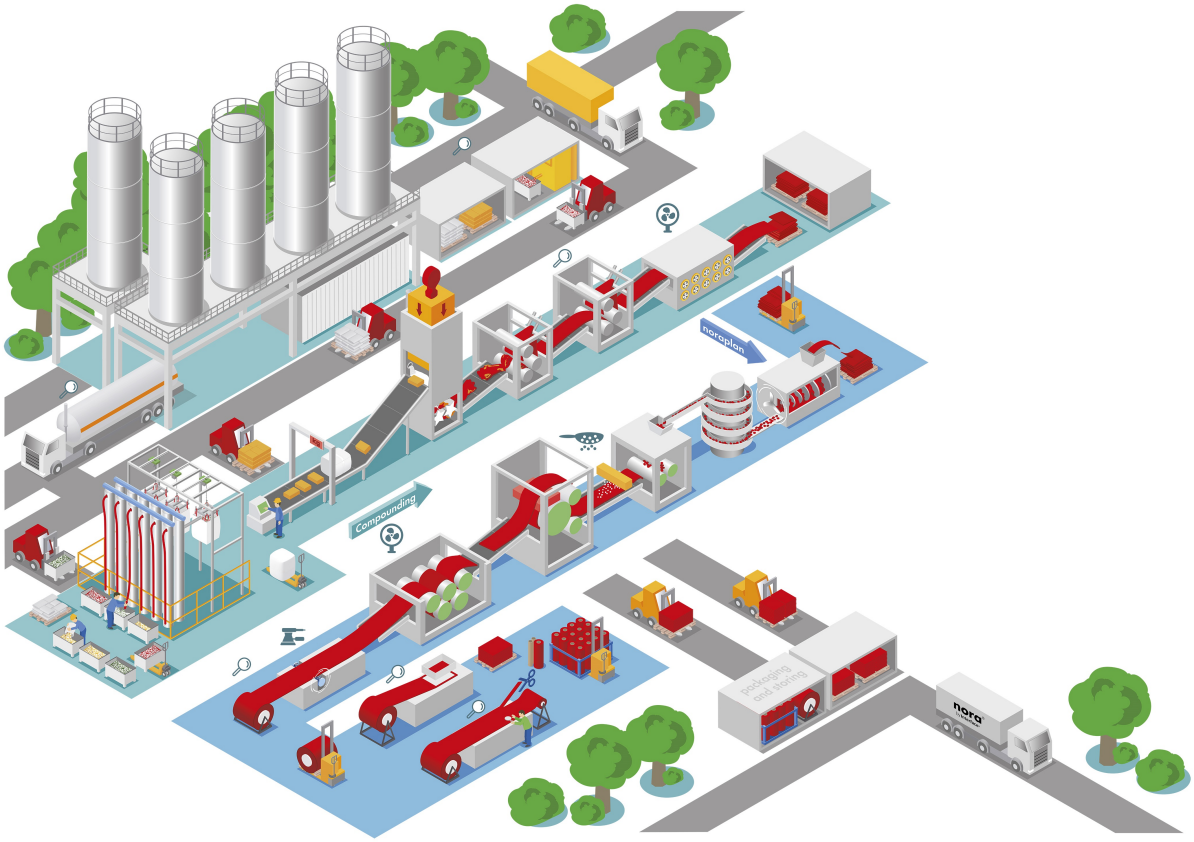
nora® only uses PEFC certified natural rubber.
The auxiliary substances used are waxes and antioxidants; the vulcanisation system is based on sulphur as cross linking agent, vulcanisation accelerators and zinc compounds.

The declared formulation is compliant with the REACH regulation, and does not contain substances listed on the Candidate List (date: 23.01.2024)

1) 'This product contains substances listed in the candidate list (date: 23.01.2024) exceeding 0.1 percentage by mass: NO'.
2) This product contains other CMR substances in categories 1A or 1B which are not in the candidate list, exceeding 0.1 percentage by max: NO.'

2.6 Manufacture

The production stages are weighing, mixing, and stretching of the unvulcanised blanks on a calender. The following vulcanisation is continuously executed on production lines with steam heated drum or double belt presses, where under high pressure and at a temperature of approximately 180°C sheets of 1.22 m width are produced. After the vulcanising machine, the sheets are backside sanded and either wound into rolls or, for tiles, cut to length and die-cut. The mass per unit area is 3.36 kg/m².



nora systems GmbH purchases the total electrical energy for production and administration at the site Weinheim from renewable energy sources. Respective evidence has been approved by the verifier.
Thermal energy is generated centrally and in heating boilers from natural gas.

Our quality and energy management is certified according to *DIN EN ISO 9001* and *DIN EN ISO 50001*.

2.7 Environment and health during manufacturing

All German occupational exposure limit values for chemicals are consistently met, or rather, considerably under-run.

In the high noise identified areas of heavy machines, hearing protection is used. The lifting of loads (raw materials) is facilitated in many ways through appropriate lifting assistances.

Since 2000, environmental management system from the nora systems GmbH (existing since 1996) is certified in acordance to *DIN EN ISO 14001 Environmental management systems*.

2.8 Product processing/Installation

The installation of the floor covering is based on the technical regulations of *DIN 18365 Flooring works*. Suitable subfloors are made of screed according *DIN 18353*, hard poured asphalt according to *DIN 18354 Asphalt flooring work, chipboards, plywood*, etc..

Before installing rubber floor coverings, the subfloor generally has to be levelled.
The application of the adhesives over the entire surface is done in accordance with the installation recommendations of the nora systems GmbH, using adhesives and further auxiliary material approved and available e.g. at www.nora.com.When selecting the installation materials the requirements of the basic award criteria of the Blue Angel – 'Low-Emission Floor Covering Adhesive and other Installation Materials' (*DE-UZ 113*) should be observed, alternatively GEV-EMICODE EC1^{plus}. These specifications ensure excellent health protection due to minimized emissions.
In addition, the instructions of the laying material manufacturers are generally to be followed. When working with laying auxiliary material, the latest version of the German standard *TRGS 610* is to be complied with. Offcuts should be used for energy recovery.
Initial cleaning and initial polishing may only be carried out after the bonding phase of the adhesive, i.e. at the earliest 48 hours after installation.

2.9 Packaging

The sheet material is wrapped on cardboard cores made of recycled cardboard (the cardboard cores are taken back and re-used). The outer packaging is made of recyclable paper. The individual rolls are assembled vertically on wooden pallets and sealed in recyclable polyethylene foil.

2.10 Condition of use

Because of their dense and closed surface and the 'nora cleanguard ' finish, noraplan® 913 floor coverings don't need to be coated over the entire life cycle.
The floorings are permanently resilient, they remain dimensionally stable when bonded and have good ergonomic properties.

2.11 Environment and health during use

Because of their dense surface, noraplan® 913 rubber floor coverings don't have to be coated during the entire life cycle and can be cleaned easily only with water.
noraplan® 913 complies with the following environmental standards:

- Blue Angel *DE-UZ 120* for resilient floor coverings
- Cradle to Cradle Silver level
- Finnish *M1 - Emission Classification* of Building Materials

- Indoor Air Comfort Gold (combining most relevant European emission specifications)
- German *AgBB emission scheme*

2.12 Reference service life

A calculation of the reference service life according to ISO 15686 is not possible. According to manufacturers' estimation a technical service life of 40 years is possible. This estimated service life time of 40 years has been proven in project references.
Due to their very high abrasion resistance and their single-layer structure (rubber through and through), the floor coverings hardly wear down even when extensively used. When used in the designated areas of application and under the usage conditions commonly associated, they stay fully functional and visually appealing during the indicated useful life.
Description of the influences on the ageing of the product when applied in accordance with the rules of technology.

2.13 Extraordinary effects

Fire

noraplan® 913 is according *DIN EN 13501-1* hardly inflammable (bonded Bfl -s1) and toxicologically safe in the event of fire according to *DIN 53436-1* und *DIN 53436-2*.

Fire Resistance

Name	Value
Building material class bonded	Bfl
Smoke gas development	s1

Water

noraplan® 913 is resistant to water exposure to the extent to what is typical for indoor use. Not suitable for real wet areas e.g. showers, wading pools, etc..

Mechanical destruction

Not relevant.

2.14 Re-use phase

For noraplan® rubber floor coverings there are basically the following options for a re-use phase:

- Material recycling (e.g. granulating and processing into landing mats, industrial or stable mats, and coverings of sports areas or silent asphalt)
- Thermal recycling (e.g. use as substitute fuel in thermal power plants)
- full material and thermal recycling for energy recovery in the cement industry. Use of stored thermal energy as well as use of mineral filler as raw material.

2.15 Disposal

The manufacturer recommends introducing the products after their use stage into thermal recycling (secondary fuel for waste incineration) or utilization as secondary fuel and secondary raw material (mineral fillers) in the cement industry (material and thermal recycling). *EWC-number*: e.g.17 02 03.

2.16 Further information

www.nora.com

3. LCA: Calculation rules

3.1 Declared Unit

The reference unit is 1 m² of floor covering. The values of module A1-A3 refer to 1 m² produced. This EPD represents a product declaration, i.e. the production and disposal of off-cuts during installation stage are assigned to module A5. The combined modules A1- A3, A4 and A5 refer to a reference unit of 1 m² installed.
The material for subfloor preparation and adhesive bonding, needed during installation, is not considered. Information on the complete floor structure can be found in Environmental Product Declarations based to the IBU-PCR 'Dispersion adhesives and primers for floor coverings' and 'Mineral factory-made mortar'.

Declared unit

Name	Value	Unit
Declared unit	1	m^2
Grammage	3.36	kg/m^2
Layer thickness	2	mm

3.2 System boundary

Type of EPD: from cradle to gate with options.
The analysis of the product life cycle includes the following stages:

- Production stage A1-A3: Consideration of production of the basic materials and the manufacturing of the floor covering incl. packaging material (input of waste paper forpaper/cardboard production).
- Transport A4: Assumption for the transport of the products to the construction site.
- Installation A5: Production, transport and incineration of the off-cut material, incineration of off-cut material (gained energy is declared in D as avoided environmental burden), disposal of the packaging (incineration of PE film). The pretreatment of the underground surface (prime coat, levelling compound, adhesive) is not considered. This treatment depends on the building and the application and need to be specified for the particular case.
- Use stage B2: Scenario for maintenance/cleaning according to the manufacturer's recommendation (see 4.)
- End-of-Life stage C1, C2, C3: Scenario for the incineration of the floor covering incl. removal from the building and transport to the waste incineration plant (gained energy is declared in D as avoided environmental burden). Module C4 is declared 0 because the EOL scenario does not include landfilling.
- Benefits for the next product system D: Extraction for electrical and thermal energy from the waste incineration process of the product, the off-cuts and the packaging material.

Contributions of waste flows are considered in the modules where they occur.
For the environmental impact, the use of green electricity was calculated taking into account the residual electricity mix for the remaining electricity. The proportion of the total electricity

requirement covered by green electricity is 100%.

3.3 Estimates and assumptions

The datasets for the upstream chain of the basic material production are taken from the *MLC Database* form Sphera. Inventories of some materials are not completely available and so are partly approximated by datasets on similar chemicals or estimated by consolidation of existing datasets and literature research.

The assumptions about the cleaning scenario are described in chapter 4. scenarios.

3.4 Cut-off criteria

All data from the production data acquisition, i.e. on all raw material used as per formulation, are considered. The information available for one auxiliary material is not sufficient for generating an approximation of the supply chain. The mass proportion is below 1%; a particular risk while producing this substances is not known.

Transport expenditures are taken into account for all essential basic materials, the dispatch of the products and the end-of-life scenario.
Transport processes for packaging materials are neglected.
With the LCA calculation, the production waste resulting directly from production, the electrical and thermal energy needed, and the packaging materials, are taken into account.
Machines, facilities and infrastructure used in the manufacture are ignored.
Thus, no input or output flows are neglected, which may contribute to the impact assessment significantly.

3.5 Background data

For life cycle modelling of the considered products, the *MLC FE Software* System for Life Cycle Engineering, developed by Sphera Solutions GmbH, is used. Upstream data specific information that is not available are taken from the *MLC 2023.2 database*.

3.6 Data quality

Datasets were, if available, taken from the above mentioned *MLC 2023.2* database.
Further datasets on the upstream chain of the basic material production are approximated with datasets on similar chemicals or are estimated by consolidation of existing datasets and literature information.
The data quality can be described as good.

3.7 Period under review

The collection of manufacturing data from 2022 serves as the data basis.

3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Europe

3.9 Allocation

Allocation of upstream data:
For all refinery products, allocation by mass and net calorific value has been applied. The manufacturing route of every refinery product is modelled and the product-specific effort associated with their production is calculated. For other materials' inventory used in the production process calculation the most suitable allocation rules are applied. Further information can be found in the corresponding published documentation (https://lcadatabase.sphera.com/).
Allocation in the foreground data:
The production process does not deliver any coproducts. The applied software model does not contain any allocation. The total production of nora systems GmbH includes further products besides the declared product family. The values for thermal and electrical energy as well as for operating materials are assigned respectively while data collection on the site. Allocation keys are mass, area, pieces or retention time in the plant.
Allocation for waste materials:
Production waste is fed into an energy recovery process. The Corresponding burden are declared; Energy gains from production waste are not taken into account. The calculation of emissions from the waste incineration plant follows a partial stream consideration for the combustion process, according to the specific composition of the incinerated material. A waste incineration plant with an R1-value higher than 0.6 is assumed. The environmental burdens of the incineration process of installation off-cut and the product in the end-of-life scenario are assigned to the system (A5, C3); resulting energy gain for thermal and electrical energy are declared in module D. The avoided environmental burdens are considered according to European average data for electrical and thermal energy generated from natural gas.

3.10 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. As database for background data the *MLC database 2023.2* is applied.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	0.39	kg C
Biogenic carbon content in accompanying packaging	0.02	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg CO_2.

Transport to the construction site (A4)

Name	Value	Unit
Litres of fuel (truck)	0.0025	l/100km
Transport distance (truck)	1000	km
Capacity utilisation (including empty runs) (truck)	61	%
Litres of fuel (boat)	0,0003	l/100km
Transport distance (boat)	500	km
Capacity utilisation (including empty runs) (boat)	70	%

Installation in the building (A5)

Name	Value	Unit
Material loss	0.168	kg
Output substances following waste treatment on site	0.168	kg
Dust in the air	-	kg

Maintenance (B2)

Cleaning of the floor covering depends on the use of the premises. A kind of 'average' cleaning scenario is assumed following the recommendation of the manufacturer.

1x yearly:
machine intensive cleaning with 250 ml/m² cleaning solution (5% solution); use of single disc machine (1,1 kW, 0,5 h/100 m²) and wet vacuum cleaner (1,0 kW, 0,25 h/100 m²);

2x weekly:
manual cleaning with 80 ml/m² cleaning solution (0,5% solution);

Resulting in the following amounts per 1 year:

Name	Value	Unit
Maintenance cycle	104	Number/RSL
Water consumption	8,526	l/m^2
Auxiliary	0,054	l/m^2
Electricity consumption	0,029	MJ/m^2

Reference service life

Name	Value	Unit
Life Span (according to BBSR)	20	a
Life Span according to the manufacturer	40	a

End of Life (C1-C4)

Name	Value	Unit
Energy recovery	3.36	kg

5. LCA: Results

The indicator values for module B2 'Maintenance' refer to a period of 1 year.
The characterization factors of the *JRC publication* according to *EF 3.1/EN 15804+A2* are applied.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the 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	MND	X	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m2 noraplan® 913 2 mm

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	4.44E+00	2.28E-01	3.86E-01	9.77E-02	3.25E-02	9.9E-03	2.5E+00	0	-8.5E-01
GWP-fossil	kg CO_2 eq	5.58E+00	2.26E-01	4.4E-01	9.3E-02	3.23E-02	9.78E-03	1.06E+00	0	-8.46E-01
GWP-biogenic	kg CO_2 eq	-1.68E+00	4.76E-04	-8.11E-02	4.7E-03	2.8E-04	2.24E-05	1.44E+00	0	-3.88E-03
GWP-luluc	kg CO_2 eq	5.41E-01	1.83E-03	2.76E-02	1.54E-06	3.51E-06	9.17E-05	1.32E-05	0	-5.53E-05
ODP	kg CFC11 eq	1.46E-08	2.78E-14	7.45E-10	8.11E-12	5.95E-13	1.29E-15	1.62E-13	0	-6.69E-12
AP	mol H^+ eq	3.74E-02	1.71E-03	2E-03	2.94E-04	6.89E-05	3.2E-05	2.41E-04	0	-1.06E-03
EP-freshwater	kg P eq	6.95E-04	7.31E-07	3.54E-05	5.61E-06	1.2E-07	3.62E-08	6.92E-08	0	-1.38E-06
EP-marine	kg N eq	7.01E-03	5.41E-04	3.88E-04	7.23E-05	1.65E-05	1.45E-05	6.28E-05	0	-3.1E-04
EP-terrestrial	mol N eq	9.46E-02	6.01E-03	5.18E-03	5.59E-04	1.72E-04	1.63E-04	1.14E-03	0	-3.32E-03
POCP	kg NMVOC eq	2.09E-02	1.29E-03	1.14E-03	2.95E-04	4.4E-05	2.89E-05	1.79E-04	0	-8.63E-04
ADPE	kg Sb eq	1.44E-04	1.34E-08	7.35E-06	1.65E-08	4.99E-09	6.57E-10	1.57E-09	0	-6.11E-08
ADPF	MJ	1.1E+02	3.06E+00	5.78E+00	2.33E+00	6.79E-01	1.35E-01	4E-01	0	-1.56E+01
WDP	m^3 world eq deprived	1.31E+01	2.44E-03	6.8E-01	1.6E-02	7.19E-03	1.2E-04	2.14E-01	0	-8.1E-02

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m2 noraplan® 913 2 mm

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
PERE	MJ	1.67E+01	1.98E-01	1.86E+00	1.07E-01	4.06E-01	9.82E-03	1.71E+01	0	-4.57E+00
PERM	MJ	1.72E+01	0	-1.24E-01	0	0	0	-1.7E+01	0	0
PERT	MJ	3.38E+01	1.98E-01	1.74E+00	1.07E-01	4.06E-01	9.82E-03	1.03E-01	0	-4.57E+00
PENRE	MJ	8.59E+01	3.08E+00	5.87E+00	2.33E+00	6.79E-01	1.35E-01	2.46E+01	0	-1.56E+01
PENRM	MJ	2.43E+01	0	-8.8E-02	0	0	0	-2.42E+01	0	0
PENRT	MJ	1.1E+02	3.08E+00	5.78E+00	2.33E+00	6.79E-01	1.35E-01	4E-01	0	-1.56E+01
SM	kg	2.6E-02	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
FW	m^3	1.55E+00	2.17E-04	7.91E-02	3.92E-04	3.28E-04	1.08E-05	5.02E-03	0	-3.7E-03

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 excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m2 noraplan® 913 2 mm

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
HWD	kg	8.75E-06	9.56E-12	4.45E-07	1.24E-04	-5.31E-11	4.19E-13	7.1E-12	0	-8.25E-10
NHWD	kg	2.37E+00	4.46E-04	1.25E-01	8.92E-03	4.97E-04	2.06E-05	7.5E-02	0	-7.73E-03
RWD	kg	1.2E-03	5.5E-06	6.26E-05	4.89E-05	1.08E-04	2.53E-07	2.25E-05	0	-1.21E-03
CRU	kg	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	2E-02	0	0	0	3.8E+00	0	0
EET	MJ	0	0	3.57E-02	0	0	0	6.8E+00	0	0

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; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:
1 m2 noraplan® 913 2 mm

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
PM	Disease incidence	4.56E-07	2.26E-08	2.45E-08	3.81E-09	5.8E-10	1.97E-10	2.29E-09	0	-9.01E-09
IR	kBq U235 eq	1.47E-01	8.18E-04	7.73E-03	3.69E-02	1.8E-02	3.78E-05	3.59E-03	0	-2.02E-01
ETP-fw	CTUe	8.37E+01	2.19E+00	4.38E+00	5.21E-01	1.89E-01	9.66E-02	1.89E-01	0	-2.19E+00
HTP-c	CTUh	3.31E-09	4.39E-11	1.71E-10	3.66E-11	9.99E-12	1.96E-12	1.55E-11	0	-1.73E-10
HTP-nc	CTUh	1.91E-07	1.9E-09	9.82E-09	3.04E-09	1.59E-10	8.72E-11	2.81E-10	0	-4.25E-09
SQP	SQP	5.12E+02	1.13E+00	2.61E+01	3.51E-02	2.66E-01	5.64E-02	1.27E-01	0	-3E+00

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. 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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

6. LCA: Interpretation

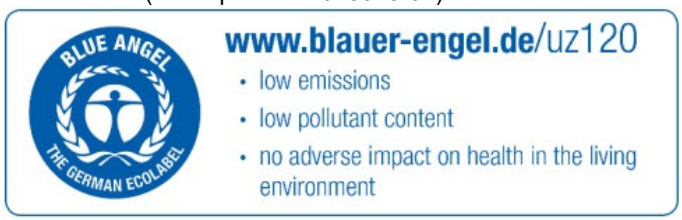
The environmental impact of the life cycle of nora floor coverings is mainly determined by the production of the basic materials (A1). The impact of the manufacturing at nora system referring to the category GWP is significant; else the influence on the total production phase is low. Beside, the maintenance referring to the total use stage is an important factor. The calculation depends strongly on the assumption for the cleaning scenario. The negative values in module D describe the energy gain of the incineration of packaging material (A5), the off-cuts of the installation (A5) and the product in the end-of-life scenario (C3).

This EPD is an update of the EPD from the year 2018. The results are tending to be lower. This is based on various factors: - updated and new generated background data - increase of the production yield at nora systems. Compared to the GPW of the EPD from the year 2018, a significant reduction in module A1-A3 could be achieved, due tothe above mentioned reasons.

7. Requisite evidence

7.1 VOC emissions - Germany

noraplan® 913 has been audited for emissions at the approved test house Eurofins Product Testing A/S, Galten, Denmark(test report no. 392-2023-00095901_A_EN) and at SGS Institut Fresenius GmbH, Taunusstein in respect to volatile N-nitrosamines (test report no. 2028015-01).



The product complies with the Basic Award Criteria for the Blauer Engel DE-UZ 120 for resilient floor coverings with the following requirements on emissions:

Compound or Substance	3rd Day	Final Value (28th Day)
Total organic compounds within the retention range C_6 – C_{16} (TVOC)	< 1000 µg/m³	< 300 µg/m³
Total organic compounds within the retention range > C_{16} – C_{22} (TSVOC)	-	< 30 µg/m³
Carcinogenic substances[22]	< 10 µg/m³ **total**	< 1 µg/m³ **per single value**
Total VOC without LCI[23]	-	< 100 µg/m³
R value[24]	-	< 1
Formaldehyde	-	< 60 µg/m³ (0.05 ppm)

7.2 VOC emissions - Finnland

noraplan® 913 floorcoverings comply also with the *Finnish M1* - Emission Classification of BuildingMaterials (tested by Työterveyslaitos, Helsinki, Finland, test report no.:329274)

7.3 VOC emissions - IRK

Additionally, the following relevant values are met, derived from the guideline's values for indoor air, according to the German Indoor Air Hygiene Commission (IRK):

- styrene ≤ 30 µg/m³
- naphthaline ≤ 2 µg/m³

8. References

AgBB-Scheme
AgBB-Scheme: Health-related Evaluation of Emissions of Volatile Organic Compounds (VVOC, VOC and SVOC) from Building Products, 2015

RKI
List of disinfectants and processes tested and recognized by the Robert Koch Institute. As of: October 31, 2017 (17th edition)

VAH
VAH disinfectant list 2023; Association for Applied Hygiene e.V.; 2023

CPR
Regulation (EU) No 305/2011 of the European parliament and of the council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

DE-UZ 113
DE-UZ 113: Award Criteria Blue Angel: Low-Emission Floor-covering adhesives

DE-UZ 120
DE-UZ 120: Award Criteria Blue Angel: Elastic Floor Covering

DIN EN 16165:
DIN EN 16165:2023-02: Testing of floor coverings - Determination of the anti-slip property - Workrooms and fields of activities with slip danger - Walking method - Ramp test

DIN EN 1817
DIN EN 1817:2020-07: Determination of slip resistance of pedestrian surfaces - Methods of evaluation;

DIN EN 13501-1
DIN EN 13501-1:2019-05: Fire classification of construction products and building elements - Part
1: Classification using data from reaction to fire tests

DIN EN 14041
DIN EN 14041:2018-05: Resilient, textile, laminate and modular multilayer floor coverings - Essential characteristics

DIN EN 14521
DIN EN 14521:2004-09: Resilient floor coverings - Specification for smooth rubber floor coverings with or without foam backing with a decorative layer

DIN EN ISO 14001
DIN EN ISO 14001: 2016-03: Environmental management systems - Requirements with guidance for use

EN 15804
EN 15804+A2:2012+A2:2019+Ac:2021: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

EN 16810
EN 16810:2017-08: Resilient, textile and laminate floor coverings – Environmental product declarations – product category rules

EN ISO 10140-3
DIN EN ISO 10140-3:2021-09: Acoustics - Laboratory measurement of sound insulation of building elements - Part 3: Measurement of impact sound insulation

EN ISO 10874
DIN EN ISO 10874:2021-04: Resilient, textile and laminate floor coverings - Classification

EN ISO 14040
DIN EN ISO 14040:2021-02: Environmental management - Life cycle assessment - Principles and framework

EN ISO 14044
DIN EN ISO 14044: 2021-02: Environmental management - Life cycle assessment - Requirements and guidelines

EN ISO 24346
DIN EN ISO 24346:2012-04: Resilient floor coverings - Determination of overall thickness

EN ISO 23997
DIN EN ISO 23997:2012-04: Resilient floor coverings - Determination of mass per unit area

MLC DB
MLC database for life cycle engineering, Sphera Solutions GmbH, Leinfelden-Echterdingen, database version 2023.2

GHG
Product Life Cycle Accounting and Reporting Standard, Greenhous Gas Protocol, Word Resource Institute and World Business Council for Sustainable Development, September 2011

ISO 4649
DIN ISO 4649:2021-06: Rubber, vulcanized or thermoplastic - Determination of abrasion resistance using a rotating cylindrical drum device

ISO 7619
DIN ISO 7619:2012-02: Rubber, vulcanized or thermoplastic - Determination of indentation hardness - Part 1: Durometer method (Shore hardness)

ISO 9001
ISO 9001:2015-11: Quality management systems – Requirements

ISO 50001
ISO 50001:2018-12: Energy management systems - Requirements with guidance for use

ISO 14025
DIN EN ISO 14025:2011-10: Environmental labels and declarations – Type III environmental declarations – Principles and procedures

ISO 15686
ISO 15686-1:2011-05: Buildings and constructed assets - Service life planning

M1 Classification
M1: Emission classification of building materials: general instructions, Rakennustieto, Finland

PCR part A
Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report, version 1.3, IBU, 2022

PCR part B

Part B: Requirements on the EPD for Floor coverings, version 08-2021, IBU

REACH
Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

TRGS 610
TRGS 610:2011-01: Substitutes, substitution of working methods for solvent based primer and adhesives for floorings

PEF
Product Environmental Footprint Category Rules Guidance, version 6.3 – May 2018AgBB-Scheme

EWC Code
Regulation on the European Waste List (European Waste Code - EWC)

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