

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)
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Issue date	05.12.2024
Valid to	04.12.2029

noracare®
nora systems GmbH

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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-20240469-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.)

noracare[®]

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 noracare[®]
Thermoplastic elastomere floor coverings continuously produced 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 thermoplastic elastomer floor coverings of the product line noracare[®] with different designs are modelled.

Specific characteristics of the noracare[®] coverings are:

- covering structure: multi-layered
- no addition of PVC, chlorine-containing polymers and phthalate plasticizers
- very low emissions for good indoor air quality
- no welding required
- easy and hygienic maintenance
- highest resistance to surface and hand disinfectants according to the *VAH* and *RKI* lists
- high resistance to chemicals
- high stain resistance, even against medical media

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

noracare[®] 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 in domestic and 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	3500	g/m ²
Product Form	Sheets	-
Type of manufacture	continuously	-
Abrasion resistance ar 5 N load ISO 4649 (Method A)	100	mm ³
Hardness ISO 48-4	96	Shore A
Improvement in footfall sound ISO 10140-3	5	dB
Anti-slip resistance DIN EN 16165	R10	

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 as rolls of 1.22 m width and different lengths.

The backs of the coverings are sanded and have arrows indicating the installation direction.

2.5 Base materials/Ancillary materials

Simplified formulation of noracare[®]

Name	Value	Unit
Elastomers (Thermoplastic elastomers; PEFC certified natural rubber and synthetic rubber)	24	%
Mineral fillers	62	%
Colour pigments	3	%
Auxiliary substances	1	%
Post-production recycling material	10	%

nora systems GmbH only uses PEFC-certified natural rubber. Waxes and anti-aging agents are used as additives.

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.'

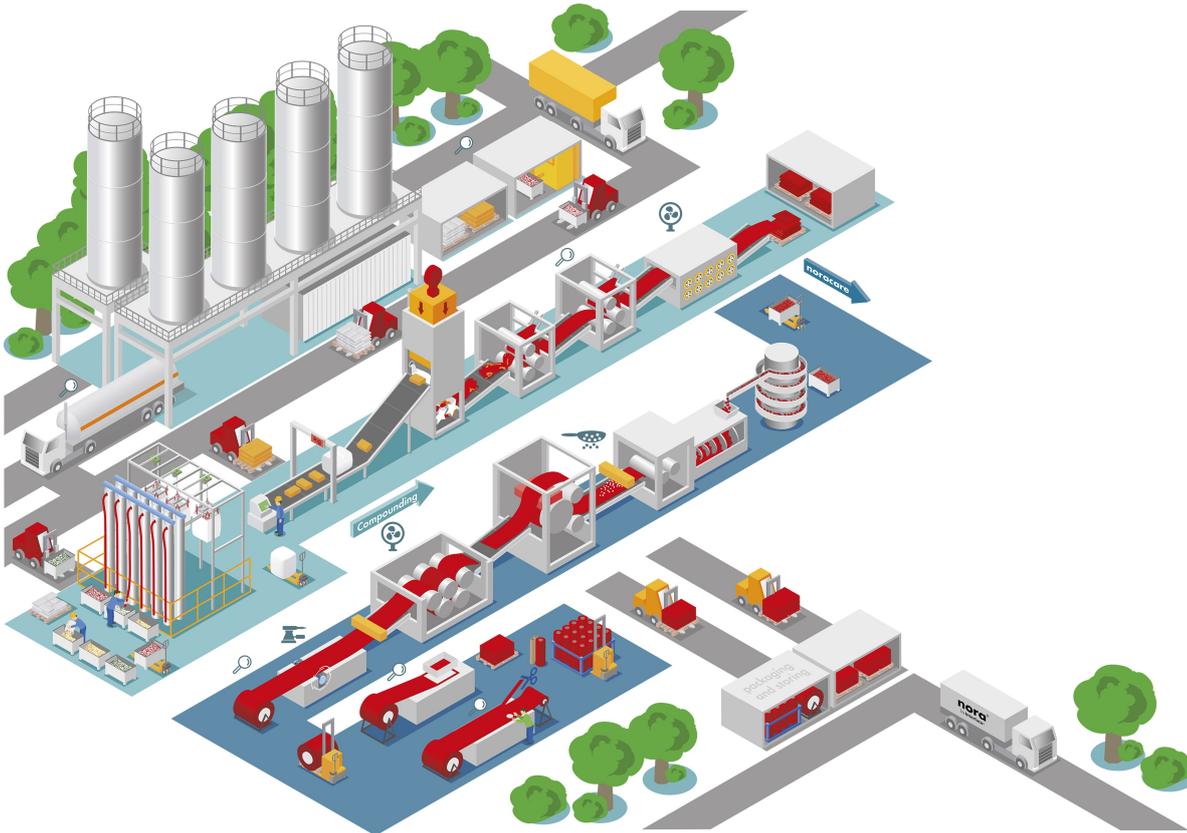
2.6 Manufacture

The production stages are weighing, mixing, and granulating. The granulates are continuously molded into sheets. The surface is refined and the backside is sanded.

The sheets are wound into rolls. The mass per unit area is 3.5 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.

Production waste and the remaining materials from edge trimming are recycled into the production process.

Since 2000, the environmental management system (existing since 1996) is certified in accordance 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 EC1plus. 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.

Any offcuts during installation can be recycled back into the production loop via the nora[®] take-back program.

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 noracare[®] floor coverings do need to be coated over the entire life cycle and are easy to clean.

2.11 Environment and health during use

noracare[®] complies with the following environmental standards:

- Blue Angel DE-UZ 120 for resilient floor coverings
- Cradle to Cradle Silver and **Gold** level (depending on colour)
- Finnish M1 - Emission Classification of Building Materials
- German *AgBB emission scheme*
- Indoor Air Comfort Gold (combining most relevant European emission specifications)



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 35 years is possible.

2.13 Extraordinary effects

Fire

noracare[®] is according DIN EN 13501-1 hardly inflammable (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

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

noracare[®] floor coverings are fully recyclable. At their end of life noracare[®] floor coverings can be sent back to nora[®] and recycled 100% into the production process.

If a disposal is necessary there are the following options:

- 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 returning the products to the manufacturer after the use phase in order to recycle them to the material loop.

Is a disposal necessary nora systems[®] recommends 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). EAK-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	3.5	kg/m ²
Thickness	2	mm

Other declared units are allowed if the conversion is shown transparently.

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 for paper/cardboard production).

- Transport A4: Assumption for the transport of the products to the construction site.
- Installation A5: Production and transport of the off-cut material, burden free output of off-cuts due to respective take-back program, 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

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.

3.4 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 Datenbank 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 burden of the incineration of the product in the end-of-life scenario are assigned to the product system (c3); resulting energy gain for thermal and electrical energy are considered by average European grid mix for the generation of electricity and thermal energy 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	0.07	kg C
Biogenic carbon content in accompanying packaging	0.02	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg CO₂.

Name	Value	Unit
Litres of fuel (truck)	0.0025	l/100km
Transport distance (truck)	1000	km
Capacity utilisation (including empty runs) (truck)	-	%
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)

Transport to the construction site (A4)

Name	Value	Unit
Material loss	0.175	kg
Output substances following waste treatment on site	0.175	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
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 manufacturer)	35	a

End of Life (C1-C4)

Name	Value	Unit
Energy recovery	3.5	kg

Theoretically, the product can be completely recycled to the production loop. However, the product is currently new so there are no references yet.

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 noracare®

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq	3.75E+00	2.49E-01	2.14E-01	9.77E-02	3.25E-02	1.08E-02	2.14E+00	0	-5.55E-01
GWP-fossil	kg CO ₂ eq	3.98E+00	2.46E-01	2.21E-01	9.3E-02	3.23E-02	1.06E-02	1.87E+00	0	-5.53E-01
GWP-biogenic	kg CO ₂ eq	-2.9E-01	5.18E-04	-1.05E-02	4.7E-03	2.8E-04	2.44E-05	2.68E-01	0	-2.54E-03
GWP-luluc	kg CO ₂ eq	5.38E-02	2E-03	2.83E-03	1.54E-06	3.51E-06	9.98E-05	1.13E-05	0	-3.61E-05
ODP	kg CFC11 eq	1.86E-09	3.03E-14	9.43E-11	8.11E-12	5.95E-13	1.4E-15	1.39E-13	0	-4.37E-12
AP	mol H ⁺ eq	1.48E-02	1.86E-03	8.49E-04	2.94E-04	6.89E-05	3.48E-05	2.07E-04	0	-6.94E-04
EP-freshwater	kg P eq	1.02E-04	7.96E-07	5.2E-06	5.61E-06	1.2E-07	3.94E-08	5.93E-08	0	-9.01E-07
EP-marine	kg N eq	3.5E-03	5.89E-04	2.08E-04	7.23E-05	1.65E-05	1.58E-05	5.39E-05	0	-2.03E-04
EP-terrestrial	mol N eq	3.93E-02	6.54E-03	2.34E-03	5.59E-04	1.72E-04	1.77E-04	9.76E-04	0	-2.17E-03
POCP	kg NMVOC eq	1.8E-02	1.41E-03	9.88E-04	2.95E-04	4.4E-05	3.14E-05	1.53E-04	0	-5.64E-04
ADPE	kg Sb eq	3.73E-05	1.46E-08	1.89E-06	1.65E-08	4.99E-09	7.15E-10	1.35E-09	0	-3.99E-08
ADPF	MJ	1.01E+02	3.34E+00	5.28E+00	2.33E+00	6.79E-01	1.47E-01	3.43E-01	0	-1.02E+01
WDP	m ³ world eq deprived	3.75E+00	2.66E-03	1.92E-01	1.6E-02	7.19E-03	1.3E-04	1.84E-01	0	-5.29E-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 noracare®

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
PERE	MJ	2.27E+01	2.15E-01	1.46E+00	1.07E-01	4.06E-01	1.07E-02	3.43E+00	0	-2.98E+00
PERM	MJ	3.47E+00	0	-1.24E-01	0	0	0	-3.35E+00	0	0
PERT	MJ	2.62E+01	2.15E-01	1.34E+00	1.07E-01	4.06E-01	1.07E-02	8.8E-02	0	-2.98E+00
PENRE	MJ	6.86E+01	3.35E+00	5.37E+00	2.33E+00	6.79E-01	1.47E-01	3.24E+01	0	-1.02E+01
PENRM	MJ	3.21E+01	0	-8.8E-02	0	0	0	-3.2E+01	0	0
PENRT	MJ	1.01E+02	3.35E+00	5.28E+00	2.33E+00	6.79E-01	1.47E-01	3.43E-01	0	-1.02E+01
SM	kg	5.36E-01	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	2.49E-01	2.36E-04	1.27E-02	3.92E-04	3.28E-04	1.17E-05	4.31E-03	0	-2.42E-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 noracare®

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
HWD	kg	2.83E-05	1.44E-06	1.24E-04	-5.31E-11	4.56E-13	6.09E-12	0	0	-5.39E-10
NHWD	kg	1.28E+00	6.52E-02	8.92E-03	4.97E-04	2.25E-05	6.44E-02	0	0	-5.05E-03
RWD	kg	1.29E-03	6.61E-05	4.89E-05	1.08E-04	2.76E-07	1.93E-05	0	0	-7.92E-04
CRU	kg	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0.1828725	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	2.61E+00	0	0
EET	MJ	0	0	3.57E-02	0	0	0	4.68E+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 noracare[®]**

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
PM	Disease incidence	1.89E-07	2.46E-08	1.08E-08	3.81E-09	5.8E-10	2.15E-10	1.96E-09	0	-5.88E-09
IR	kBq U235 eq	1.73E-01	8.9E-04	8.83E-03	3.69E-02	1.8E-02	4.11E-05	3.08E-03	0	-1.32E-01
ETP-fw	CTUe	4.98E+01	2.39E+00	2.65E+00	5.21E-01	1.89E-01	1.05E-01	1.62E-01	0	-1.43E+00
HTP-c	CTUh	1.49E-09	4.78E-11	7.83E-11	3.66E-11	9.99E-12	2.13E-12	1.33E-11	0	-1.13E-10
HTP-nc	CTUh	5.15E-08	2.06E-09	2.72E-09	3.04E-09	1.59E-10	9.5E-11	2.41E-10	0	-2.78E-09
SQP	SQP	8.82E+01	1.23E+00	4.54E+00	3.51E-02	2.66E-01	6.14E-02	1.09E-01	0	-1.96E+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) and the product in

the end-of-life scenario (C3).

This EPD is an update of the EPD from the year 2019. 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 2019, a significant reduction in module A1-A3 could be achieved, due to the above mentioned reasons.

7. Requisite evidence

7.1 VOC emissions - Germany

noracare[®] has been audited for emissions at the approved test house Eurofins Product Testing A/S, Galten, Denmark (test report no. 392-2023-00508301_A_EN) and at DIK Prüfgesellschaft mbH, Hannover in respect to volatile N-nitrosamines (test report no. G18N0712).

Compound or Substance	3rd Day	Final Value (28th Day)
Total organic compounds within the retention range C ₆ – C ₁₆ (TVOC)	< 1000 µg/m ³	< 300 µg/m ³
Total organic compounds within the retention range > C ₁₆ – C ₂₂ (TSVOC)	-	< 30 µg/m ³
Carcinogenic substances ²²	< 10 µg/m ³ total	< 1 µg/m ³ per single value
Total VOC without LCI ²³	-	< 100 µg/m ³
R value ²⁴	-	< 1
Formaldehyde	-	< 60 µg/m ³ (0.05 ppm)



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- low emissions
- low pollutant content
- no adverse impact on health in the living environment

7.2 VOC emissions - Finland

noracare[®] floorcoverings comply also with the Finnish M1 - Emission Classification of Building Materials (tested by Työterveyslaitos, Helsinki, Finland, test report no.:392319)



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:

the guideline's values for indoor air, according to the German Indoor Air Hygiene Commission (IRK):
styrene ≤ 30 µg/m³
naphthaline ≤ 2 µg/m³

7.3 VOC emissions - IRK

Additionally, the following relevant values are met, derived from

8. References

AgBB-Scheme

AgBB-Scheme: Health-related Evaluation of Emissions of Volatile Organic Compounds (VOC, 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, Greenhouse Gas Protocol, World 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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