Your processes on safe flooring

nora® flooring systems for cleanrooms

nora®
by Interface®

Safety for your processes – from the ground up

Cleanroom suitability

nora flooring systems have been certified by independent institutes with regard to their suitability for cleanrooms and GMP areas. With their low particle emission behaviour and their high resistance to biological contamination, chemicals and disinfectants, nora flooring is the ideal solution for cleanrooms.

Cleanliness suitability

In the context of suitability in the different application areas, we guide and support you with personalised consulting tailored to your project: The application relevant parameters of the process environment are coordinated with your project. The assessment of the influence of different process media and the disinfectants used complete the nora service offer.

All-round safety with nora flooring systems

Application
- Permanent elasticity to protect against falling objects
- Ergonomic – for high walking and standing comfort
- Resistant even at high loads
- Discharge capability / ESD protection with 10 years warranty*

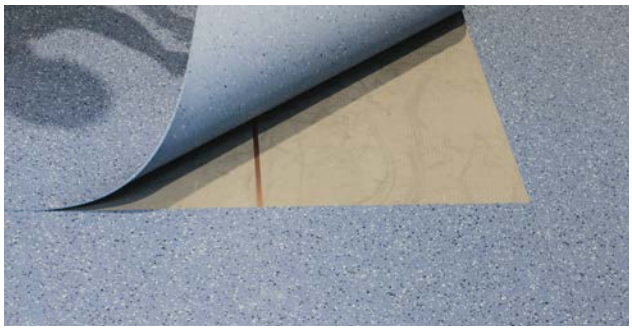
Hygiene:
- Easily disinfected
- Hygienic solutions for frames, pipes, drains
- Homogeneous and free of coating

Maintenance:
- Quick refurbishment of stressed surfaces with nora nTx or nora dryfix™ ed (<1 day possible)
- Conversion of small areas to different processes possible
- nora one®: a complete flooring system with a single warranty made in Germany

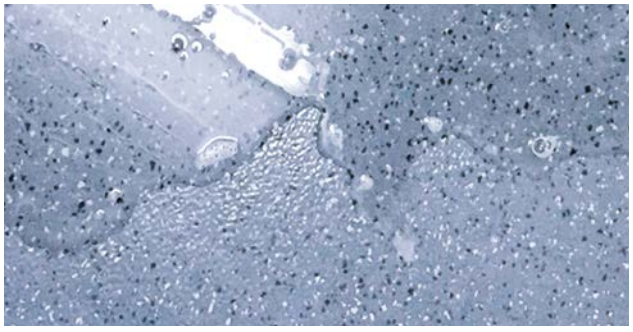
*on the electrostatic properties as stated in our warranty conditions (to be requested at nora systems).

Advantages:

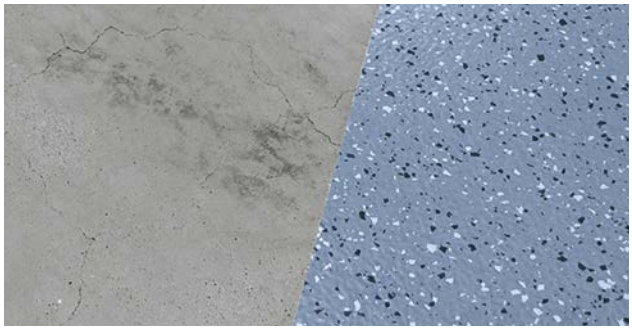
Extremely robust and impact resistant surface



Modular installation allows maintenance even when operational



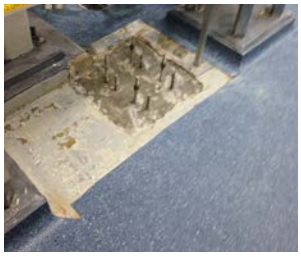
nora floorings are tested for media compatibility



Installation with nora nTx on existing subfloors

Flexible solutions for a smooth operation

Have your processes changed? Do you need to change your equipment configuration? nora flooring system gives you flexible solutions.



Adaptation to changed processes

Changes or expansions to the production process usually also entail structural changes. Thanks to the modular installation possibility of nora floorings, surfaces can easily be adapted to the new processes.

Refurbishment of surfaces

Highly stressed surfaces can be refurbished – without the need for complex replacement of the entire flooring.

Hygienic connections of installations

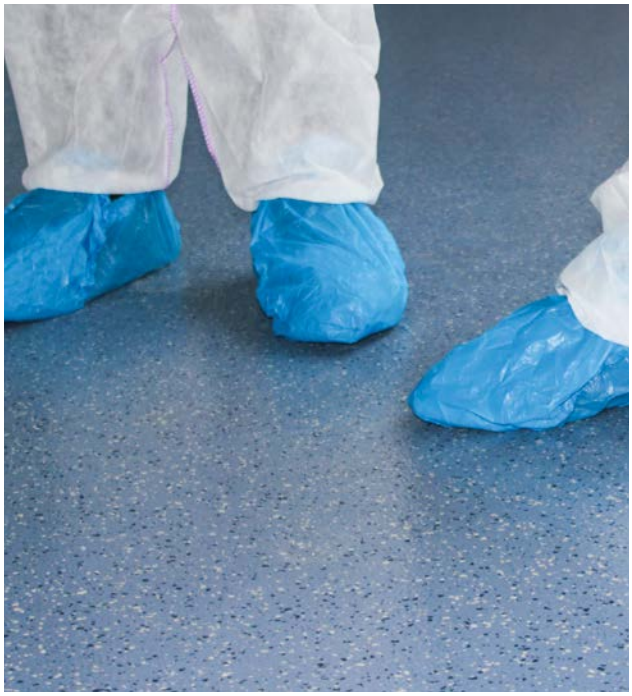
nora floorings can be applied in various ways to vertical installations or recesses. A variety of configurations are available for connections to frames, pipes, drains or other installations.

Comfort and safety for your employees

A safe, comfortable work environment contributes significantly to the health and wellbeing of your employees. nora flooring systems create a positive working environment through their health tolerance, permanent resilience and a large range of colours.

Highest ergonomic comfort

The permanently elastic material rubber offers high walking and standing comfort, making it easier on the back and joints. The body thus suffers much less fatigue than on hard floors even after prolonged standing.



Low emissions for good indoor air

nora floors are free of PVC, other halogenated polymers and phthalate plasticizers and contribute to healthy indoor air. This has been recognised with the award of the eco-label "The Blue Angel" (DE-UZ 120) as well as many other major international environmental certificates.

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nora® one — a fully certified flooring system

nora one provides the best possible solution for semi-wet bonding of rubber floor coverings.

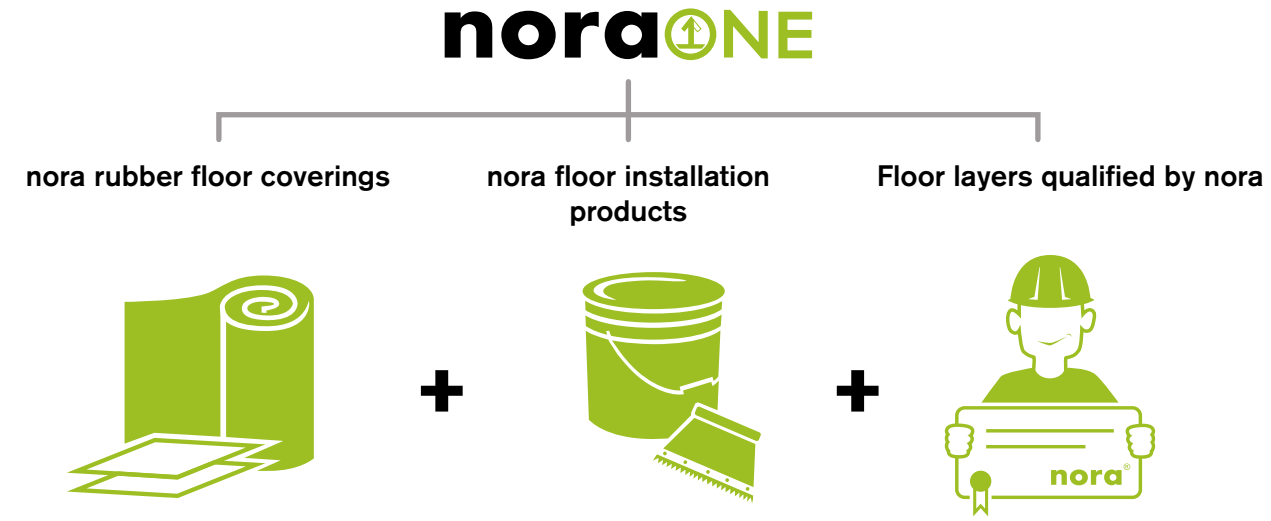
The combination of low-emission nora floors with suitable floor installation products and flooring installers specially trained by nora form a certified complete system.

This low-emission complete system is certified in line with Indoor Air Comfort GOLD. This eliminates harmful interactions between the separate elements. The individual components have also been awarded the Emicode EC1PLUS certificate.

nora also provides an extended warranty period of eight years on this coordinated complete system.

Details of the certified products are available at www.nora.com or upon request

Overview of system components:



Your benefits at a glance

- A reliable system
- A cooperative partnership
- A secure investment
- Healthy indoor air

Further information can be found in our nora one brochure and at www.nora.com.

nora floorings for GMP and ISO

- **Particle emission characteristics:** to ISO Class 3 / GMP Class A
- **Outgassing characteristics:** to ISO AMC Class 6.8
- **Body voltage generation / walk test:** < 10 V
- High **resistance to biological contamination**
- High r**esistance to disinfectants and chemicals**
- High **walking and standing comfort** thanks to permanent elasticity
- Excellent **fire protection properties**
- Extremely leakproof and closed surface **without coatings**
- **Free of PVC**, phthalate plasticizers and chlorine-containing polymers
- Certified with **numerous eco-labels**
- **Guaranteed ESD protection:** 10 year warranty on the electrostatic properties
- **An extensive accessory collection** for hygienic connections

Parameter	Testing standard	Requirements	Average test values of the current production		
			noraplan® sentica ed noraplan® signa ed*	norament® 928 grano ed	norament® 926 grano
CE compliance	**EN 14041**		← Manufacturer: nora systems GmbH, D-69469 Weinheim →		
DoP-No.	EN 14401		0001	0005	0021
Thermal conductivity	EN 10456	λ = 0,17 W/(m·K)	← Fulfilled →		
Dynamic coefficient of friction	EN 13893	DS	← Fulfilled →		
Electrical behaviour	EN 1081	ed = ≤10^9 Ohm	← Fulfilled →		-
		ec = ≤10^6 Ohm	-	-	-
Fire Class	EN 13501-1	Not bonded	C_{fl}-s1	C_{fl}-s1, bonded	C_{fl}-s1
Fire Class	EN 13501-1	Bonded on mineral subfloor	B_{fl}-s1	C_{fl}-s1	B_{fl}-s1
Electrical behaviour[4]					
Resistance to earth	EN 1081		10^6 – 9 x 10^7 Ω	10^6 – 9 x 10^7 Ω	-
Resistance to EPA ground	ESD STM 7.1 / IEC 61340-4-1	Measuring the installed floor at 23 °C (± 2 °C) and ≥25 % r.h.	10^6 – 9 x 10^7 Ω	10^6 – 9 x 10^7 Ω	-
		Measuring the installed floor at 23 °C (± 2 °C) and < 25 % r.h., installed on an appropriate subfloor build up	10^6 – 10^9 Ω[5]	10^6 – 10^9 Ω[5]	-
Operator system – Resistance to ground	ESD STM 97.1 / IEC 61340-4-5	For the system ground flooring/conductive footwear (R <5 x 10^6 Ω) measuring the installed floor at 23 °C (± 2 °C) and ≥25 % r.h.	≤3,5 x 10^7 Ω	≤3,5 x 10^7 Ω	-
Body voltage generation	ESD STM 97.2 / IEC 61340-4-5	Tested with defined conductive footwear at 23°C and 12 % r.h.	← <10 V →		-
Electrical propensity when walked upon	EN 1815		-	-	Antistatic, charging in case of rubber soles <2 kV
Insulation resistance	VDE 0100-600		2 mm ≥5 x 10^4 Ω 3 mm ≥1 x 10^5 Ω	≥1 x 10^5 Ω	-
Electrical insulation properties	EN 1081 R1		-	-	>10^9 Ω

Required material properties according to ISO 14644-4 and EG-GMP guidelines

Our floor coverings are tested by independent testing institutes. An extract of the results can be found in the following table. We will be pleased to provide you with the relevant results for your specific project on request.

Parameter	Testing standard	Requirements	Average test values of the current production		
			noraplan® sentica ed noraplan® signa ed*	norament® 928 grano ed	norament® 926 grano
Smooth, leakproof, nonporous surface			← Extremely leakproof and closed surface without coatings →		
High abrasion resistance or low particle emissions characteristic	VDI 2083-17	Air Purity Class according to ISO 14644-1	up to ISO 3	up to ISO 4	up to ISO 5
		GMP Class according to EU-GMP Annex 1, in operation	A	A	A
Biological Resistance	ISO 846	Overall result	ISO / CSM: 1/very good	ISO / CSM: 0/excellent	ISO / CSM: 1/very good
	ISO 846, Methode A	Biological resistance to fungi	ISO / CSM: 0/excellent	ISO / CSM: 0/excellent	ISO / CSM: 1/very good
	ISO 846, Methode C	Biological resistance to bacteria	ISO / CSM: 1/very good	ISO / CSM: 0/excellent	ISO / CSM: 1/very good
Outgassing characteristics (TVOC at 23°C / 90°C)	VDI 2083-17	ISO AMC Class according to ISO 14644-8	ISO -6.3	ISO -6.2	ISO -6.8
Cleaning and disinfection properties			nora flooring systems are resistant to surface disinfectants from the list of the Disinfectants Commission of the Association for Applied Hygiene (VAH) and the Robert Koch Institute (RKI) and are to be safely treated with a correctly performed wipe disinfection.[1)]		
Chemical resistance	EN ISO 26987		← Resistant depending on concentration and exposure time[2)] →		
	ISO 4628-1/ VDI 2083-17	overall[3)]	1/very good	0/excellent	0/excellent
Slip resistance	DIN EN 16165	According to DGUV 108-003	R9	R9	R9
Toxicity of the fumes	DIN 53436		Escaping carbonisation gases are toxicologically harmless.		

* noraplan® mega ed and noraplan® sentica ed has been tested. Due to identical manufacturing processes and ingredients, results should be identical to those of noraplan® signa ed

[1)] Disinfectability confirmed by the Heidelberg University Hospital, Department of Infectious Diseases (Prof. Dr. med. U. Frank) or by the Institute for Medical Microbiology and Hospital Hygiene at the University of Marburg (Prof. Dr. R. Mutters). Test certificates can be requested if necessary.

[2)] In the case of increased exposure to oils, greases, acids, alkalis and other aggressive chemicals, consultation with us is required.

[3)] Detailed information on request.

[4)] The stated values apply to the installation in accordance with our recommendations for electrostatic dissipative or electrostatic conductive nora flooring systems while taking into account the information given by the adhesive manufacturers. According to DIN EN ISO 22637, the adhesive used must permanently maintain a resistance of R <3 x 10^5 Ω.

[5)] If extremely low humidity values (< 25 % relative air humidity (= r.h.)) are expected for a longer period, please contact nora systems GmbH, Technical Service, for advice.

We reserve the right to alter production-related colour variations as well as technical changes which serve to improve the products.

Cover picture: © Dirk Wilhelmy

Contact details, local offices, authorized distributors and further information can be found at www.nora.com.

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