



YOUR PROCESSES ON SAFE FLOORING  
nora<sup>®</sup> flooring systems for cleanrooms

**nora**<sup>®</sup>  
by Interface<sup>®</sup>

# Safety for your processes – from the ground up

## Cleanroom suitability

nora® flooring systems were tested by Fraunhofer IPA, which certified their eligibility for GMP A as well as under ISO 14644-1 to Class 3. With 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.



© Tim Schoon

## 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

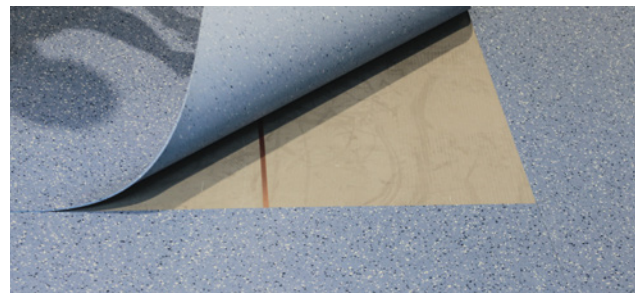
### Maintenance:

- Quick refurbishment of stressed surfaces, depending on the process, even when operational (<1 day possible)
- Conversion of small areas to different processes possible
- nora one®: a complete flooring system with a single warranty made in Germany

## Advantages:



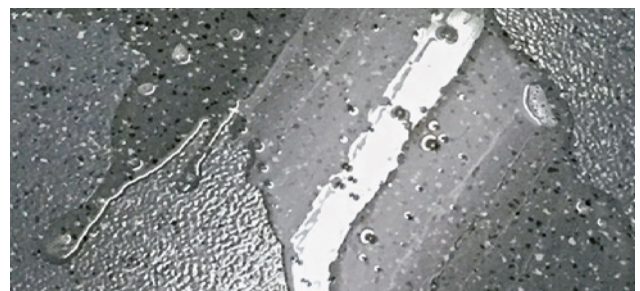
Extremely robust and impact resistant surface



Modular installation allows maintenance even when operational



Natural rubber as a homogeneous material makes extra coating redundant



nora floorings are tested for media compatibility



# Flexible solutions for a smooth operation

Have your processes changed? Do you need to change your equipment configuration? Would you like to refurbish highly stressed areas during operation? 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 are made of natural rubber to create a positive working environment through their health tolerance, permanent resilience and a large range of colours.

## Highest ergonomic comfort

The permanently elastic material – natural 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 phthalate plasticizers and halogens and contribute to healthy indoor air. This has been recognised with the award of the eco-label "The Blue Angel" (RAL-UZ 120 or 113) as well as many other major international environmental certificates.



# nora one<sup>®</sup> – 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.

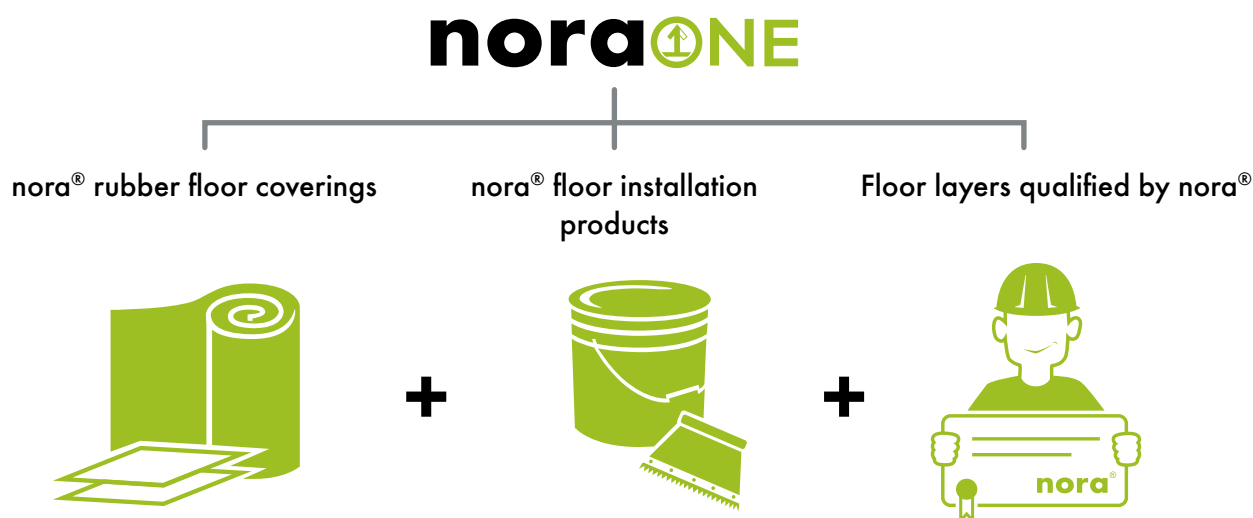
This low-emission complete system is certified in line with Indoor Air Comfort GOLD. This eliminates harmful interactions between the separate elements. The individual components have also been awarded the Emission EC1+ certificate.

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](http://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<sup>®</sup> brochure and at [www.nora.com](http://www.nora.com).

# nora<sup>®</sup> 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 **resistance 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 PVCs**, phthalate plasticizers and halogens
- Certified **environmental sustainability**
- **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 <sup>®</sup> sentica ed noraplan <sup>®</sup> signa ed*	norament <sup>®</sup> 928 grano ed	norament <sup>®</sup> 926 grano
<b>CE compliance</b>	<b>EN 14 041</b>		Manufacturer: nora systems GmbH, D-69469 Weinheim		
DoP-No.	EN 14 401		0001	0005	0021
Thermal conductivity	EN 10456	$\lambda = 0,17 \text{ W}/(\text{m}\cdot\text{K})$	Fulfilled		
Dynamic coefficient of friction	EN 13 893	DS	Suitable for underfloor heating systems		
Electrical characteristics	EN 1081	ed = $\leq 10^9 \text{ Ohm}$	Fulfilled		
		ec = $\leq 10^9 \text{ Ohm}$	-	-	-
Fire Class	EN 13 501-1	Unbonded	C <sub>fl</sub> s1	C <sub>fl</sub> s1, bonded	C <sub>fl</sub> s1
Fire Class	EN 13 501-1	Bonded on mineral supporting base	B <sub>fl</sub> s1	C <sub>fl</sub> s1	B <sub>fl</sub> s1
<b>Electrical measurements<sup>4)</sup></b>					
Earth resistance	EN 1081		$10^4 - 9 \times 10^7 \Omega$	$10^4 - 9 \times 10^7 \Omega$	-
Resistance to EPA earth	ESD STM 7.1 / IEC 61340-4-1	In the installed state at 23 °C ( $\pm 2 \text{ }^\circ\text{C}$ ) and $\geq 25 \text{ \% r.h.}$	$10^4 - 9 \times 10^7 \Omega$	$10^4 - 9 \times 10^7 \Omega$	-
		In the installed state at 23 °C ( $\pm 2 \text{ }^\circ\text{C}$ ) and <25 % r.h. and a suitable system configuration	$10^6 - 10^9 \Omega^{5)}$	$10^6 - 10^9 \Omega^{5)}$	-
Earth resistance or resistance to EPA earth	ESD STM 97.1 / IEC 61340-4-5	For the system ground flooring / conductive footwear (R < 5 x 10 <sup>6</sup> $\Omega$ ) in the installed state at 23 °C ( $\pm 2 \text{ }^\circ\text{C}$ ) and $\geq 25 \text{ \% r.h.}$	$\leq 3,5 \times 10^7 \Omega$	$\leq 3,5 \times 10^7 \Omega$	-
Body voltage generation Chargeability	ESD STM 97.2 / IEC 61340-4-5	Tested with defined ESD footwear at 21 °C and 20 % 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 $\geq 5 \times 10^4 \Omega$ 3 mm $\geq 1 \times 10^5 \Omega$	$\geq 1 \times 10^5 \Omega$	-
Electrical insulation properties	IEC 60 093, VDEE 0303 T.30		-	-	$>10^{10} \Omega$



[www.blauer-engel.de/uz120](http://www.blauer-engel.de/uz120)



Deutsche Gesellschaft für Nachhaltiges Bauen e.V.  
German Sustainable Building Council



## 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	3	4	5
		GMP Class according to EU-GMP Annex 1, in operation	A	A	A
Biological Resistance  Microbial metabolic potential	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  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
		Amine	Not detectable	3.4 x 10E-5 g/m²s	Not detectable
		Organophosphate	Not detectable	Not detectable	Not detectable
		Siloxane	Not detectable	Not detectable	Not detectable
		Phthalates	Not detectable	Not detectable	Not detectable
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. <sup>1)</sup>		
Resistance to chemicals and corrosion	EN ISO 26 987		← Resistant depending on concentration and exposure time <sup>2)</sup> →		
	ISO 4628-1/ VDI 2083-17	overall <sup>3)</sup>	1/very good	0/excellent	0/excellent
Slip resistance	DIN 51 130		R9	R9	R9
Toxicity of the fumes	DIN 53 436		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

<sup>1)</sup> 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.

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

<sup>3)</sup> Detailed information on request.

<sup>4)</sup> 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 EN 13 415, the adhesive used must permanently maintain a resistance of  $R < 3 \times 10^5 \Omega$ .

<sup>5)</sup> If prolonged extremely low humidity values (<25 % r.h.) are expected, please consult with nora systems GmbH.

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

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**Publisher**

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