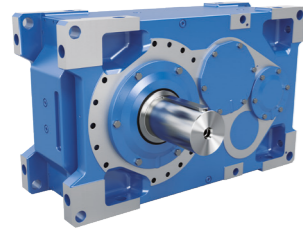


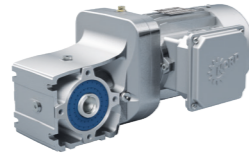
Surface protection for NORD drive solutions

Coating, nsd tupH, Powder coating





Industrial gear units



Geared motors



Frequency inverters and motor starters

- ▶ Headquarters and technology centre in Bargteheide near Hamburg.
- ▶ Innovative drive solutions for more than 100 branches of industry.
- ▶ 7 production locations with cutting edge technology produce gear units, motors and drive electronics for complete drive systems from a single source.
- ▶ NORD has 51 subsidiaries in 36 countries and further sales partners in more than 50 countries, providing local stocks, assembly centres, technical support and customer service.
- ▶ More than 4,000 employees throughout the world create customised solutions.



Headquarters in Bargteheide

Motor production

Production and assembly

Motor mounting

Gear unit production

Inverter production

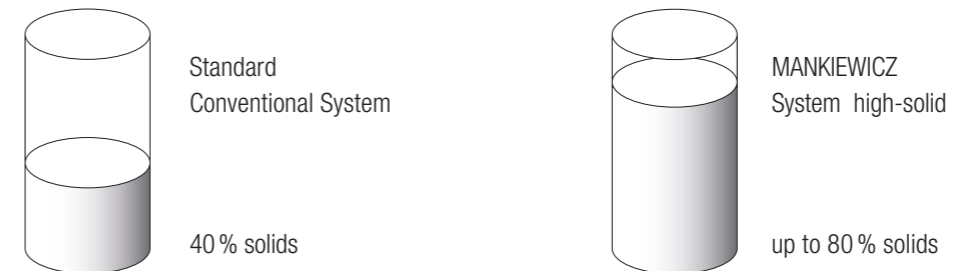
Less solvents and greater efficiency

We use the latest generation of high-solid paints, which reduces the emission of solvents far below the legally required limits. By complying with the VOC balance we make an important contribution to protecting the environment. High solid-paints contain a high proportion of solid material up to 80 % – and with a low solvent content of only approximately 20 %, contribute considerably less environmental pollution than other industrial paints. The high-solid paints which we use combine the emission benefits of hydro paints with the functionality of solvent-based coating materials. In addition, the lower solvent proportion allows very short drying times in production – a decisive advantage over water-based paint systems. The substrates materials for water-based paint systems have to be cleaned and de-greased with solvents before they are painted. Ultimately, our customers benefit from faster production and delivery times.

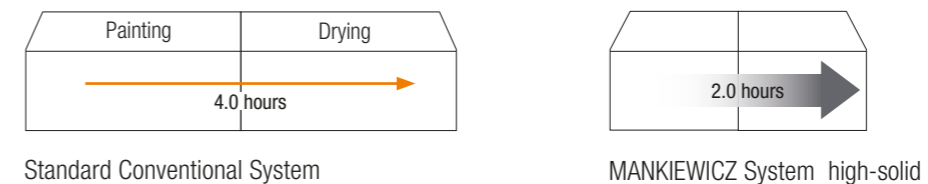
Energy efficiency as corporate philosophy

NORD drive solutions are especially valued for their great energy efficiency. We also use the same optimisation standards for production in our factories.

Solvent reduction



Process optimisation



Optimum protection for every application – our coating systems have been successfully tested by an independent laboratory:

- ▶ Cross cut test according to DIN EN ISO 2409 to test the adhesion of the paint system
- ▶ Salt spray test according to DIN EN ISO 9227 to test corrosion resistance
- ▶ Evaluation of degree of delamination according to DIN EN ISO 4628-8

Coating / Field of Application	Class**	Structure	Coating Thickness*
Basic Basic+ Indoor installation Previously F2	C2		50 – 90 µm
NORD Severe Duty 2 NORD Severe Duty 2+ Indoor installation and protected outdoor installation (i.e. open, unheated halls) Previously F3.0	C2		110 – 150 µm
NORD Severe Duty 3 NORD Severe Duty 3+ Outdoor installation, city, and industrial atmosphere with low contamination Previously F3.1	C3		160 – 200 µm
NORD Severe Chem Duty 3 Normal chemical contamination Previously F3.4	C3		100 – 140 µm
NORD Severe Food Duty 3 NORD Severe Food Duty 3+ Food packaging areas Previously F3.5	C3		100 – 140 µm
NORD Severe Duty 4 NORD Severe Duty 4+ Outdoor installation, city, and industrial atmosphere with moderate contamination Previously F3.2	C4		220 – 260 µm
NORD Severe Duty 5 NORD Severe Duty 5+ Outdoor installation, city, and industrial atmosphere with high contamination Previously F3.3	C5		200 – 240 µm

A Optional clear coat (+ variants)
Coating Thickness + 25 µm

Z Levelling of contour recesses and gaps with polyurethane-based sealant possible for NSD2, NSD3 and NSD4, included in NSD5

T 2-Component Polyurethane Top Coat
E 2-Component EP Zinc Phosphate Primer
P 2-Component Polyurethane Primer
D Single Component Dip Primer (for cast-iron units only)

** Comparable to DIN EN ISO 12944-2 classification of ambient conditions
* Protocol of the coating thickness based on ISO 19840 available on request

Global quality to reinforce your corporate identity

Throughout the world, NORD DRIVESYSTEMS offers you a uniform series of standard colours as well as preferred colors. In addition, we also implement individual solutions according to your specifications, which optimally match the corporate design and branding of your company. Standard colours are held in stock in our painting facilities throughout the world and are therefore always available:

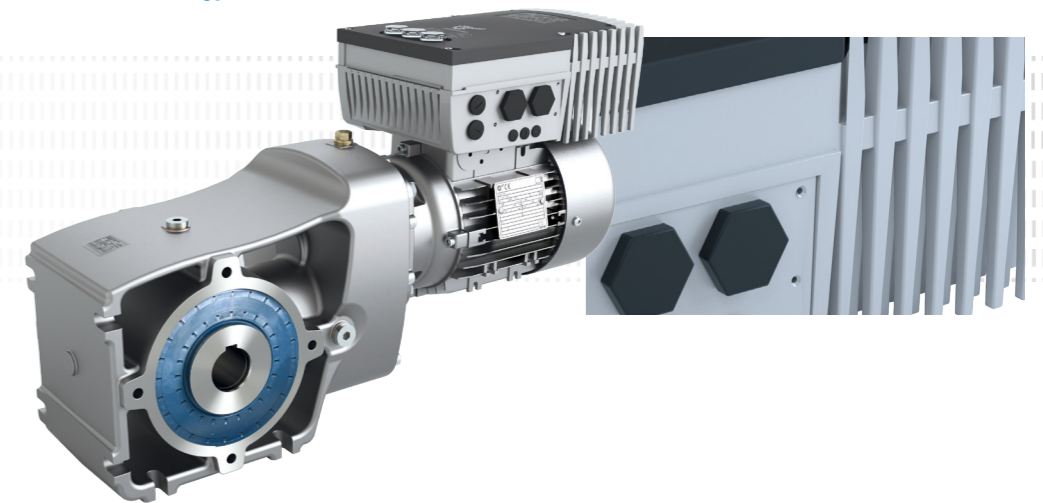
- ▶ RAL 7031 Blue-Gray
- ▶ RAL 5010 Blue

More options include:

- ▶ RAL 9007C Gray Aluminum / Stainless Steel Gray
- ▶ RAL 9003 Signal White
- ▶ RAL 5009 Azure Blue
- ▶ Special colours according to RAL, BS, Munsell and Pantone

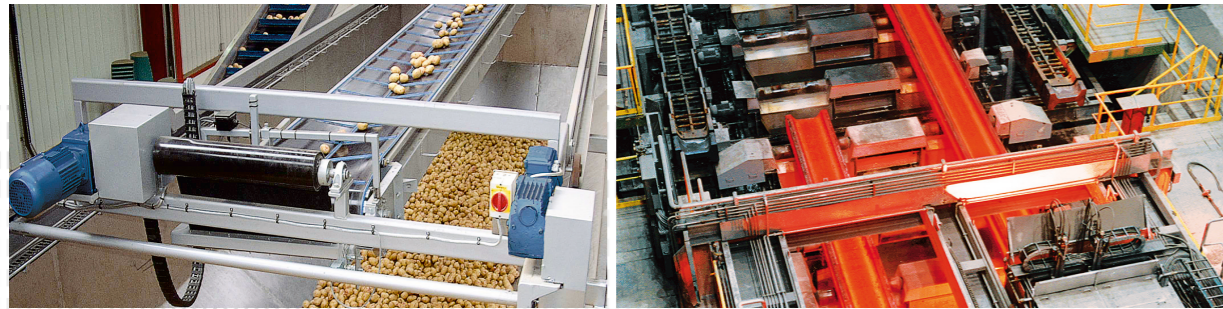
Powder coating für decentralised drive technology

Environmentally friendly high performance coatings for SK 200E series decentralised variable frequency drives with IP66 protection class



Because of their extremely robust and durable properties, powder coatings are very suitable for the electrical industry. Surfaces which are treated in this way are resistant to impact, scratches and wear. They are resistant to weather and chemicals and are even more robust than conventional NORD paints. In the electrical industry, the anti-static properties of electrically conducting powder paints are relevant for the prevention of static charging of the drive units. Potential interference is eliminated and down time probability is minimised. The subject of environmental protection is becoming increasingly important in the field of surface coatings. Powder coating does not use solvents, but rather dry powder, which is melted onto the workpiece in a kiln.

Surface protection for NORD drive solutions



The paint systems used by NORD DRIVESYSTEMS are resistant to chemicals. They have been tested for their resistance to all common substances which could have a negative environmental effect. After full drying of the paint system, NORD paints are food-safe and fulfil the NSF/ANSI 51-2009e test criteria. No further top coats are required. NORD's environmental protection extends beyond paint coatings and surface treatments. All NORD motors and speed reducers are constructed to provide a high degree of protection against wet and severe conditions. A variety of standard and optional features are available to help your NORD gear unit endure the harshest environmental conditions.

Standard Gear Unit Features

- ▶ UNICASE housing design
- ▶ AUTOVENT breather
- ▶ Factory primer on all cast-iron components
- ▶ Corrosion-resistant nameplate

Optional Gear Unit Features

- ▶ Stainless steel output shafts
- ▶ Stainless steel hardware
- ▶ Custom venting solutions – stainless steel, filtered vents

Standard Motor Features

- ▶ Shaft lip seals on both ends of the motor shaft
- ▶ Sealed stator to endbell connections to exclude moisture
- ▶ Moisture-resistant varnish dipped windings
- ▶ Double coated magnetic wire insulation
- ▶ Conduit box sealed with gaskets
- ▶ Corrosion-resistant alloy materials
- ▶ Tropical protection – inorganic insulating components

Optional Motor Features

- ▶ IP66 enclosure protection (IP55 standard)
- ▶ Condensation drain holes (KB or KBO)
- ▶ Resin-sealed terminal box (KKV)
- ▶ Epoxy-dipped motor windings (ICP)
- ▶ Drip covers – canopy cover or double fan cover (RD or RDD)
- ▶ Totally Enclosed Non-Ventilated (TENV)
- ▶ Space Heaters (SH)
- ▶ Brake protection options
 - ▶ Stainless steel brake plate (RG)
 - ▶ Rubber dust boot with stainless brake plate (SR)
 - ▶ IP66 Sealed Brake
 - ▶ Sealed brake rectifiers



NORD geared motors with nsd tupH are the optimal choice for use in challenging environmental conditions:

- ▶ Easy to clean surfaces
- ▶ Resistant to acids and alkalis (wide pH range)
- ▶ No spreading of corrosion, even if damaged
- ▶ No flaking
- ▶ Corrosion resistant, prevents contact corrosion
- ▶ Alternative to stainless steel
- ▶ Complies with FDA Title 21 CFR 175.300
- ▶ Free from chromates

The complete solution for extreme conditions:

- ▶ Surface-treated housing components
- ▶ DIN and standard components made from stainless steel
- ▶ Wash-down housing (gear unit and motor)
- ▶ Stainless steel shafts
- ▶ Special shaft sealing rings
- ▶ Food grade oil

Sealed Surface Conversion System

nsd tupH for extreme requirements:

- ▶ Food and beverage industry
- ▶ Dairies
- ▶ Pharmaceutical industry
- ▶ Water and sewage plants
- ▶ Car washes
- ▶ Offshore and coastal areas
- ▶ Chemical cleaning (Wash-down, wide pH range)

Tests performed on surface-treated aluminum housing components:

- ▶ ASTM D714 Blister formation
- ▶ ASTM D610-08 Corrosion
- ▶ ASTM D1654-08 Scratching
- ▶ ASTM B117-09 Salt spray test
- ▶ ASTM D3170 Gravelometer test
- ▶ DIN EN ISO 9227 Salt spray mist test
- ▶ DIN EN ISO 2409 Cross-cut test

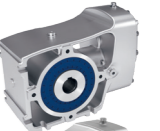


NORD smooth motor with nsd tupH

Products available with nsd tupH:



NORBLOC.1® helical gear units (up to Size 6)



NORBLOC.1® 2-stage bevel gear units



UNIVERSAL SMI worm gear units



Smooth motors



Frequency inverters SK 180E



Motor starters SK 135E

EN

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