

Intelligent Drivesystems, Worldwide Services



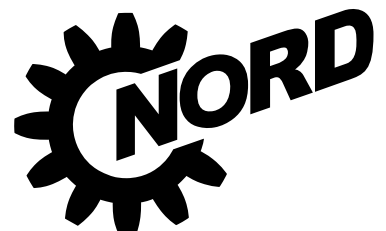
nsd **tupH**

Sealed Surface Conversion System

EN

**SURFACE AND CORROSION
PROTECTION**

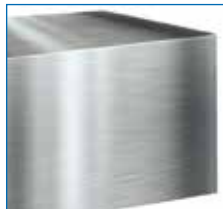
The alternative to stainless steel



DRIVESYSTEMS

NORD SOLUTION FOR DEMANDING REQUIREMENTS

Protect your drive solution against extreme conditions:



Cover

- Additional costs
- Time consuming installation and maintenance



Painted

- Flaking, blistering
- Corrosion
- Reduced lifetime



Stainless steel

- Expensive
- Thermally stressed



nsd tupH

- No corrosion
- Easy to clean
- Cooler surfaces

- Wash-down process with intense detergents are continuously evolving; expanding the requirements for hygienic design and corrosion resistance.
- The standards for all food, chemical and pharmaceutical industries require intense severe washing and sanitisation processes.
- To prevent deterioration of materials affected by cleansing and sanitising agents, design and coating of machines used in such applications must be smooth and ensure the maximum clean ability in manual or automatic cleaning cycles.

nsd tupH answers these requirements by adopting geared motors that are equipped with a highly protected surface conversion system, featuring resistance and adhesion limiting characteristics that far exceed those obtained through the usual painting cycles.

NORD DRIVESYSTEMS has studied new important solutions (concerning materials, treatments and machining) for motor and gear reducer surfaces and components, offering a protection package with an outstanding resistance to chemical action typical of washing plants in the food, chemical and pharmaceutical industries.

nsd tupH

Sealed Surface Conversion System

nsd tupH from NORD DRIVESYSTEMS is the perfect solution for severe duty applications and for extreme conditions.

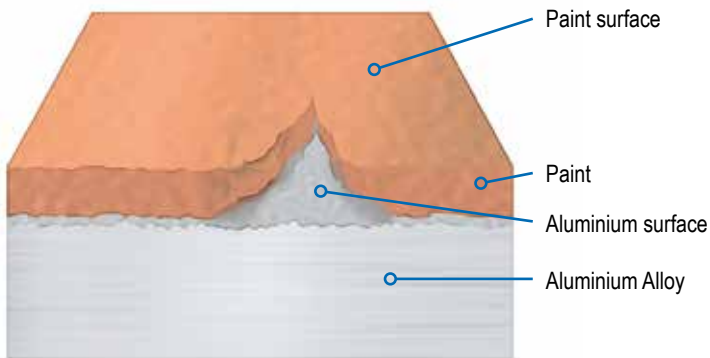
- Food & beverage industry, Especially dairies, meat, poultry and seafood plants, bakeries
- Pharmaceutical industry
- Water and sewage plants
- Car wash equipment
- Offshore and coastal areas

nsd tupH from NORD DRIVESYSTEMS is an alternative both to multi-layer paints and to stainless steel in high corrosion environments.

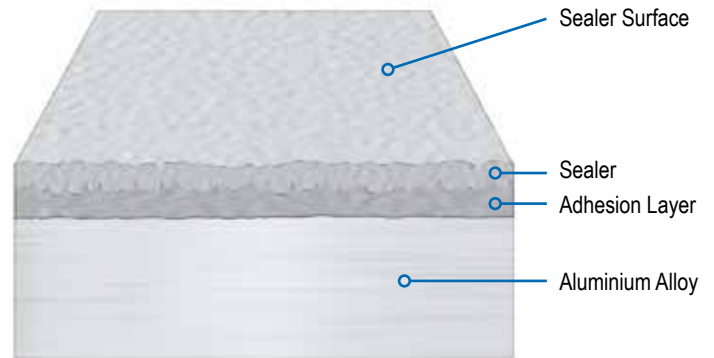
- Conforms to FDA Title 21 CFR 175.300
- Easy to clean surfaces
- Resistant to acids and alkalis (wide pH range)
- No infiltration of corrosion, even in case of damage
- Cannot flake
- Corrosion-resistant – prevents contact corrosion
- Free from chromates

SEALED SURFACE CONVERSION SYSTEM

HOW IT WORKS



Paint is only applied to the surface and may even cover any porosity. Because paint does not form a permanent bond with the material, it may flake off, even with moderate use.



The nsd tupH-process has a base layer, which forms a permanent bond with the surface of the aluminium and ensures a strong base for the bonding of the surface coating. This combination offers extreme resistance and is a harder surface than untreated aluminium alloy.



Painted gear motor after 12 months of use

nsd tupH treated gear motor after 12 months of use



TESTS PERFORMED WITH TREATED NORD DRIVE SOLUTIONS

General surface test with following evaluation standards

- Blistering per ASTM D714
- Corrosion per ASTM D610-08
- Scribe per ASTM D1654-08 acc. to DIN EN ISO 2409
- Salt Spray Test per ASTM B117-09 acc. to DIN EN ISO 9227
- Gravelometer Test per ASTM D3170

Food Industry Sanitation Test

- Test developed in cooperation with Ecolab using exact chemicals used in industry
- Test period: 1 year (300 cycles) with dry time between cycles

Extensive tests

Test procedure for each chemical:



Sprinkling of the products with hot water at 38 – 45°C.



Foaming of the products with cleaning agents as well as 1.56% acid.



Soaking time of 10 – 30 min. for each cleaning cycle.



Spraying with hot water at 38 – 45°C under high pressure. Spraying with cleaning agents with 0.26% concentration.

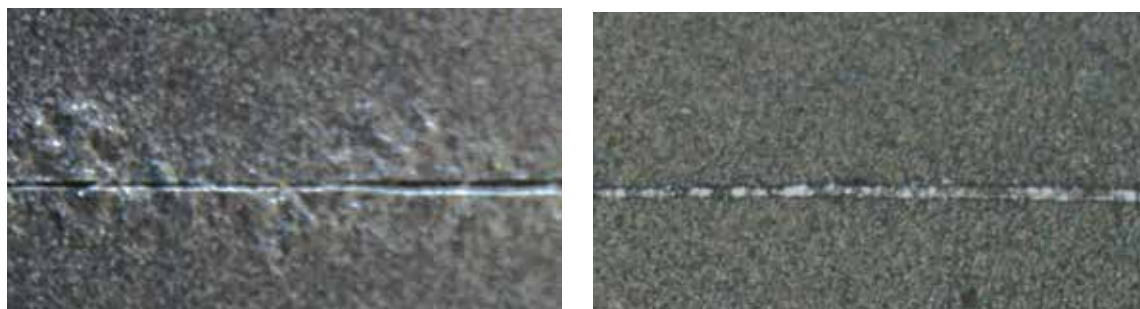
Test components

Component	Other names	Max. tested contend
Acetic acid	Vinegar	30.0 %
Alcohols, ethoxylated	Nonionic Surfactants	5.0 %
Hydrogen peroxide		6.9 %
Methanesulfonic acid		5.0 %
Octanoic acid	Caprylic acid	3.3 %
Peracetic acid	Peroxyacetic acid	4.4 %
Phosphoric acid		27.0 %
Secondary Alkanesulphonates	Surfactants	5.0 %
Sodium hydroxide	Caustic soda, Lye, Sodium Hydrate	15.0 %
Sodium hydrochlorite	Bleach, Chloride of soda	3.0 %

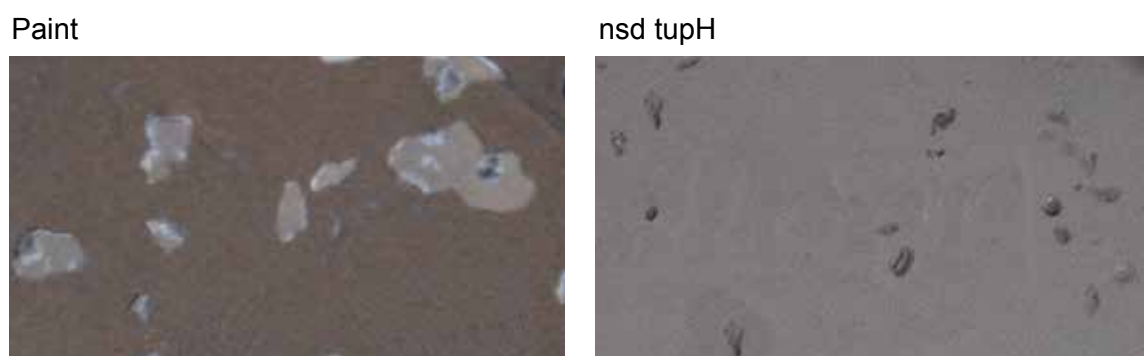


The chemicals you use are not on the list? Get in contact with us via food@nord.com or via phone (back cover). More chemicals may be tested in the meantime and customer experience is constantly growing. Be part of it and share your findings!

Paint nsd tupH Typical test results



Spreading of corrosion in the region of a scratch test on conventional paint and nsd tupH treated surface.



Gravelometer test for flaking resistance on a painted and nsd tupH treated surface according to ASTM B3179.



The nsd tupH surface treatment gives aluminum drives a smooth, permanently corrosion-resistant surface ideally suited to process industry applications.

CORROSION RESISTANT ALUMINIUM HOUSINGS

ADVANTAGES AND FEATURES

Advantages of aluminium alloy

- Painting can often be dispensed with
- Corrosion resistance for many applications
- Good heat conductivity (lower temperature)
- Easy to clean

Features of aluminium alloy

- Light weight
- Smooth surfaces

Modern gear units have to be robust, compact, powerful, economical and lightweight. The fact that aluminium is lightweight is an advantage because weight influences cost, especially if the gear unit itself is a load that needs to move as part of an automated positioning system. Because of this, in many fields aluminium alloy has become a common material choice for gear unit housings.

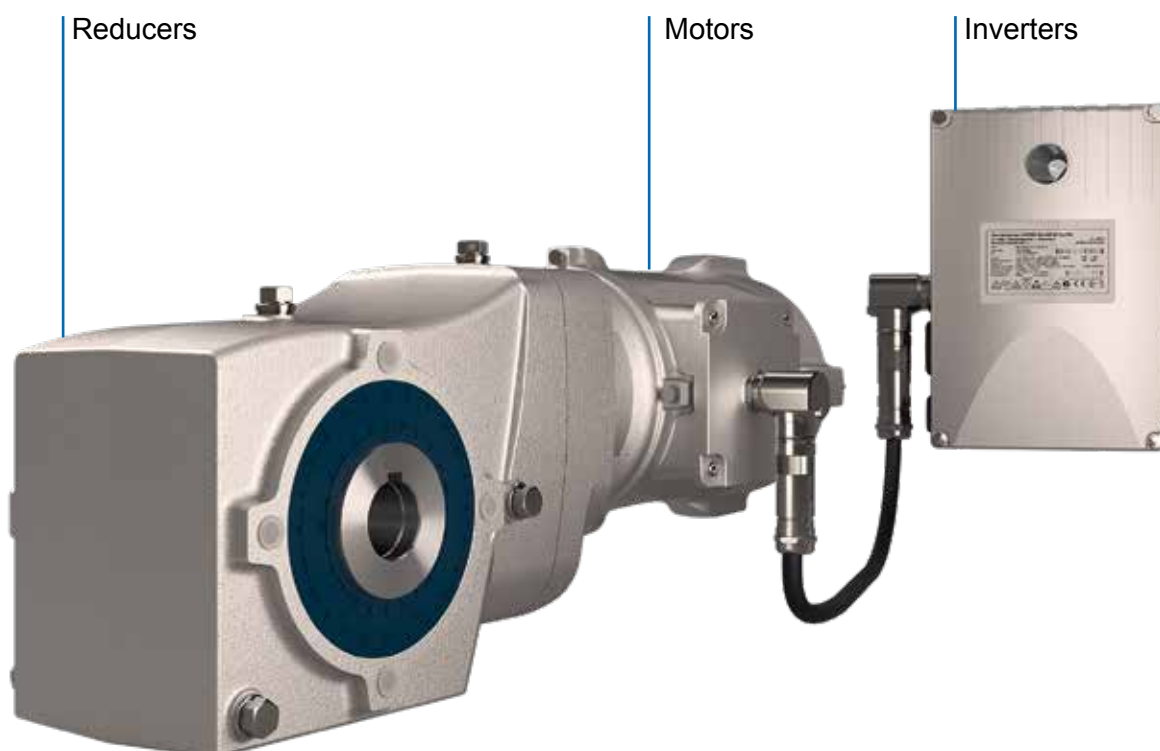
NORD DRIVESYSTEMS enhances many of the optimal advantages provided by aluminium alloy for its gear unit housings. The material also has a certain amount of inherent corrosion resistance, and does not require painting. At the very least, a housing made from aluminium is a much better heat conductor than one made of cast iron. The lower operating temperatures made possible by this are beneficial for the internal components used in the gear unit, providing a longer service life.

Advantages of NORD aluminium housings

- Smooth surface, especially for applications in demanding ambient conditions
- Motors available in sizes 80, 90, 100 for the main application areas
- Reducers, motors and decentralised electronic drives are made from aluminium with optional nsd tupH surface conversion and have the major advantages of stainless steel drives and none of the disadvantages
- Reducers, motors and decentralised electronic drives are based on the NORD modular construction system and therefore offer maximum flexibility

Features of NORD aluminium housings

- Aluminium housing available for reducers, smooth motors and smooth decentralized electronic products
- Easy to clean due to smooth surface (wash-down fluids always run off)
- Increased corrosion protection is optionally available by the means of nsd tupH



Optimal for use in extreme ambient conditions thanks to smooth motors and **nsd tupH**

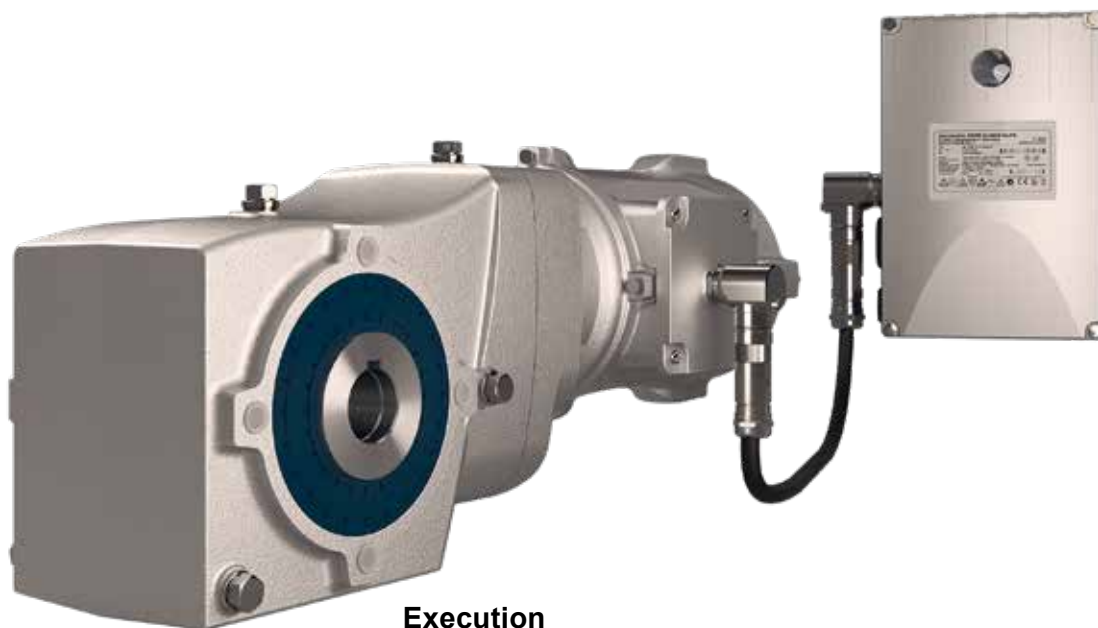
APPLICATION	Easy to clean	Resistant to chemicals	Damp environments	Permanently aggressive or corrosive	No transport of bacteria	Quiet running	Low weight
Offshore / coastal areas			✓ nsd tupH	✓ nsd tupH		No fan	
Beverage / food industry	✓	✓ nsd tupH	✓ nsd tupH		✓		✓
Dairies	✓	✓ nsd tupH	✓ nsd tupH		✓		✓
Pharmaceuticals	✓	✓ nsd tupH	✓ nsd tupH		✓	✓	✓
Water / sewage plants	✓	✓ nsd tupH	✓ nsd tupH	✓ nsd tupH			✓
Car wash	✓	✓ nsd tupH	✓ nsd tupH	✓ nsd tupH			
Chemicals	✓	✓	✓	✓			✓

Letter of compliance with
FDA Title 21 CFR 175.300



COMPLETE SOLUTIONS FOR EXTREME CONDITIONS

Complete
drive solutions



Execution

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

Frequency
inverters and
motor starters

Decentralised frequency inverter NORDAC BASE SK 180E



- ✓ Stand-alone operation
- ✓ 4 parameter sets (which can be switched online)
- ✓ Sensorless current vector control (ISD control)

Sizes	2
Voltage	1~ 110 – 120 V 1~ 200 – 240 V 3~ 200 – 240 V 3~ 380 – 500 V
Power	0.25 – 2.2 kW

Motor starter NORDAC START SK 135E



- ✓ Integrated electronic brake rectifier
- ✓ Consistent parameter structure
- ✓ Reversing starter with soft start function

Sizes	2
Voltage	3~ 200 – 240 V 3~ 380 – 500 V
Power	0.12 – 3 kW or up to 7.5 kW

Smooth Motors



- ✓ Sizes 80, 90, 100
- ✓ IP66 / IP69K (optional)
- ✓ Aluminium alloy motor
- ✓ Optional: nsd tupH surface treatment



Power	0.37 – 2.2 kW
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Motors

NORDBLOC.1® Helical Gear Units (Catalogue G1012)



- ✓ Foot or flange-mounted
- ✓ Die-cast aluminium alloy housing
- ✓ Unicase housing
- ✓ Industry standard dimensions

Sizes	13
Power	0.12 – 37 kW
Torque	30 – 3 300 Nm
Ratio	1.07:1 – 456.77:1

Gear units

NORDBLOC.1® 2-stage bevel gear units (Catalogue G1014)



- ✓ Foot mounted, flange mounted or hollow shaft mounted
- ✓ Hollow or solid shaft
- ✓ Unicase aluminium alloy housing

Sizes	6
Power	0.12 – 9.2 kW
Torque	50 – 660 Nm
Ratio	3.03:1 – 70:1

UNIVERSAL SMI worm gear units (Catalogue G1035)



- ✓ Smooth surfaces
- ✓ Life-long lubrication
- ✓ IEC version
- ✓ Unicase aluminium alloy housing

Sizes	5
Power	0.12 – 4.0 kW
Torque	21 – 427 Nm
Ratio	5.00:1 – 3 000.00:1

NORD DRIVESYSTEMS

COMPLETE DRIVE SYSTEMS FROM A SINGLE SOURCE

DER ANTRIEB

■ Reliable ■ Versatile ■ Global



Gear Unit

- Strong bearings
- Low noise
- High power density

Motor

- High efficiency
- Global Standards
- All operating conditions

Drive Electronic

- Compact design
- Easy commissioning
- Scalable functionality

Wide power range – Versatile system solutions – High system efficiency



Headquarters and Technology Centre
in Bargteheide, close to Hamburg

Mechanical products	Electrical products	Electronical products
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Gear units



Motors



Inverters, motors starters and field distribution systems



Innovative drive solutions
for more than 100 branches of industry



Gear unit production



Motor production



Inverter production

7 state-of-the-art production plants produce gear units, motors and inverters also for complete drive solutions from a single source.



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Subsidiaries and sales partners in 98 countries on 5 continents provide local stocks, assembly, production, technical support and customer service.



More than 3,600 employees throughout the world create customer oriented solutions.

**Need samples of nsd tupH for testing?
Send a request to food@nord.com or call below number.**

NORD DRIVESYSTEMS Group

Headquarters and Technology Centre
in Bargteheide, close to Hamburg

Innovative drive solutions
for more than 100 branches of industry

Mechanical products
parallel shaft, helical gear, bevel gear and worm gear units

Electrical products
IE2/IE3/IE4 motors

Electronic products
centralised and decentralised frequency inverters,
motor starters and field distribution systems

7 state-of-the-art production plants
for all drive components

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