



# Anti-Seize

High-performance assembly pastes and sprays

Reliable protection against

- Corrosion
- Wear
- Seizure



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All kinds of influencing factors, such as moisture and friction, lead to damage due to corrosion, seizure, and wear on machines and installations. Extensive repair and maintenance work at considerable cost are the result.

Especially under critical conditions of application, such as:

- High operation temperatures
  - High pressure loads
  - Outdoor weather conditions
  - Aggressive chemicals
  - The influence of other media
- such consequences frequently occur.

The safe protection of work pieces and structures made of steel and other metals is thus absolutely necessary for the rational and economic operation of technical installations.



WEICON Anti-Seize assembly pastes are especially developed for these requirements. They are used as protecting and separating agents, as well as lubricants, for highly stressed parts, especially at high temperatures. Optimally balanced solids contents as well as selected additives permit a wide range of applications, especially in this area.

Conventional separating agents or lubricants such as mineral oils and greases often cannot provide sufficient lubrication and protection in difficult industrial environments.

The basic components in WEICON Anti-Seize are made of synthetic oils, which have a considerably lower sulphur content than products containing mineral oil. A residue-free vaporisation of the oil at temperatures between +200°C and +250°C is thus possible. This is particularly important in the case of stainless steels (e.g. for VA material) to prevent stress-corrosion cracking.



Lubrication of the threaded spindles of a wire roll press

Due to the special formulation and the very fine grinding of the solids contained in WEICON Anti-Seize, irregularities in the surface being protected are completely filled – even to a layer thickness of only 12 µm. Only a perfectly sealed surface guarantees a reliable protection against corrosion. An additional sealing effect thus results for special applications, such as flange connections.

WEICON Anti-Seize provides protection against the following:

- Corrosion – seizure - wear
- Stick-slip phenomena
- Oxidation and fretting corrosion
- Electrolytic reactions (“cold welding”)

WEICON Anti-Seize is free of sulphurous additives and halogens, well-adherent and abrasion-proof, and resistant against hot, cold, and salt water. The extremely low friction coefficient also permits easy disassembly from machines and installations.

In addition, WEICON Anti-Seize assembly pastes are excellent lubricants for statically high-stressed parts and for slowly rotating installations, as long as corresponding relubrication intervals are observed.

With its dual function as a lubricant and corrosion protection agent, WEICON Anti-Seize thus becomes a rationalisation factor, both in terms of saving time and reducing costs.

WEICON Anti-Seize is used sparingly. At a layer thickness of 0,01 mm, 1 kg suffices to cover a surface area of approximately 45 m<sup>2</sup>.

Three product variants are available for various areas of application.

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## Anti-Seize Standard Grade

WEICON Anti-Seize Standard Grade consists of selected, finely ground, metallic solid lubricants and a high-quality synthetic oil mixture.

This combination has been proven worldwide for many decades in a number of applications with materials made of steel, iron, or cast iron in all industrial areas.

### Properties:

- Temperature range: -180°C to +1,200°C
- Colour: anthracite
- Basic oil: synthetic oil mixture
- Solid lubricants: various metallic powders
- NLGI Class: 1
- Corresponds to MIL 907 D



Assembly aid for screw connections

## Anti-Seize Special Nickel Grade

Special requirements are made on assembly pastes in steel mills and cement works, but also in power plants and in the entire chemical industry. In these areas, extreme temperatures, aggressive chemicals, caustic agents, and acids require special product properties.

The high nickel content in WEICON Anti-Seize Special Nickel Grade provides special protection against corrodent, caustic solvents that contain diluted hydrochloric, sulphuric, or nitric acid.

### Properties:

- Temperature range: -30°C to +1,450°C
- Colour: anthracite
- Basic oil: synthetic oil
- Solid lubricants: nickel and other metallic powders
- NLGI class: 1

## Anti-Seize High-Tech

Nowadays, increasingly high alloy steels and light and nonferrous metals are being used. When metalliferous assembly pastes are used, unwanted interactions between the paste and the material cannot be ruled out.

WEICON Anti-Seize High-Tech is metal-free\* and can be used with any material. In case of certain metal combinations, it offers optimum protection against electrolytic reactions (cold welding).

WEICON Anti-Seize High-Tech is particularly suited if

- metalliferous pastes could cause electrolytic reactions.
- nickeliferous products should not or may not be used for health reasons.
- dark, metalliferous products should not or may not be used for optical reasons.

\* Under 0.1%



Prevents electrolytic reactions for various metal alloys

### Properties:

- Temperature range: -40°C to +1,400°C
- Colour: white
- Basic oil: Medicinal oil
- Solid lubricants: Minerals
- NLGI class: 0-1
- Corresponds to: MIL 907 D



Separation and sealing of a roller bearing



## Application examples from various branches

Weicon Anti-Seize solves basic problems and is thus not bound to certain branches. Corrosion, seizure, and wear are typical damages that can occur anywhere.

### Wastewater engineering

Seals and glands, filter presses, aerators, stop valves, rotating parts on sluices.

### Automotive industry

Battery poles and connections, springs, suspensions, exhaust fittings and seals, spark plugs, screw connections in chassis and body, brake cams and pins, wheel bolts and nuts, driving wheels and chains, hose connections, engine suspensions, injection nozzles, cylinder head screws.

### Construction machines

Hydraulic cylinders, splined shafts, toothed wheels, track bearings, brake cams and bolts, rocker shafts.

### Mining

Slides and guiding rails, drilling equipment, fans, drag chains, excavating machines, bolts for intermediate gears and drawing engines.

### Chemical industry

Flange and pipe joints, valve spindles, heat exchanger joints, compressors, and mixing plants.

### Maintenance of plants

Cleaning machines, shafts and arbours, toothed wheels, chain joints, cranes and elevators.

### Power plants

Flange gaskets, e.g. on steam turbines, furnace screws, slag fans, air and injection nozzles, burner nozzles and fastening bolts, preheating chambers, filtering installations, steam generators and turbines.



Seal on tube nest of exhaust heat changer



Lubrication of a bolt guide

### Plastic industry

Heating cartridges, laminating machines, extruders, moulds, waste disposal machines, conveyor belts.

### Agriculture

Irrigation plants, conveyor belts, wind mill rotors, shackles, power take-off shafts, filling equipment, couplings, e.g. trailer couplings.

### Trucks

Rubber bushes, brake shoes, anchor pins, pneumatic cylinder parts, disk brake systems, spring retentions, splined shafts, stud bolts, cylinder head gaskets, track rod bearings, couplings.

### Metalworking

Cutting and punching tools, sliding shears, gearbox housings, conveying chains, bearing shells, injection moulds, grinding and polishing machines, machine tools, hydraulic screw connections.

### Engine building

Metal gaskets, cylinder head screws, turbochargers, valve guides, injection nozzles, hydraulic screw connections.

### Oil industry

Drilling rigs, off-shore installations, oil extraction plants and pumping stations, oil refineries.

### Paper and textile mills

Link chains, spools and reels, steam valves, beater drums and axles, pump installations.

### Heavy industry

Plug-in chains for conveyor plants, transmissions, valve stems and spindles, compressors, glands, cranes, press machine parts, wedgings.

### Shipping

Stud bolts in motors, seals (e.g. in water pumps), threaded spindles, bearing casings, hatches, cranes and winches, masts, sheet and anchor winches, shroud spanner, slides, and shackles.

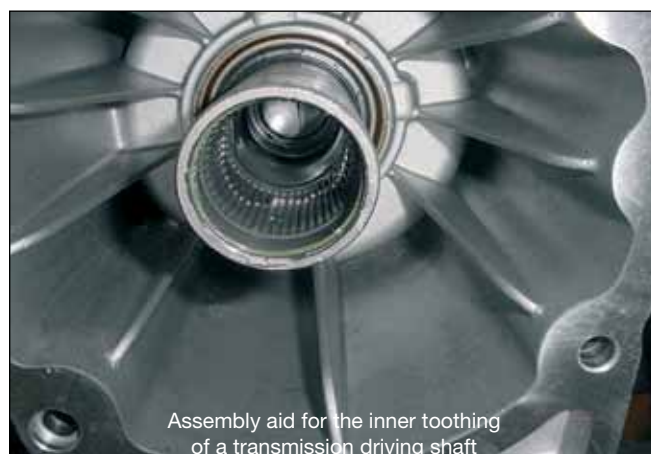
# Technical Data

Product		Anti-Seize Standard Grade	Anti-Seize High-Tech	Anti-Seize Special Nickel Grade
Properties				
Consistency assignment (DIN 51818):		NLGI Class 1	NLGI Class 0-1	NLGI Class 1
Basic oil:		Synthetic oil mixture	Medicinal oil	Synthetic oil
Colour:		anthracite	white	anthracite
OFW device (ball / plate, 450 N, 1000 µm, 50 Hz, 2 h)	Coefficient of friction:	0.13	0.10 to 0.13	0.16
Coefficient of friction (pretension 30 kN, tightening torque $M_a$ 60,5 Nm according to DIN 946)	Total $\mu$ :	0.14	0.13	0.15
	Thread $\mu$ :	0.13	0.11	0.14
	on upside down side $\mu$ :	0.15	0.14	0.16
VKA test (DIN 51350)	Goods load:	4200 N	3600 N	--
	Welding load:	4400 N	3800 N	2000 N
	Spherical cap value (1 min / 1000 N):	0.5 mm	0.7 mm	0.6 mm
Worked penetration (DIN ISO 2137):		310 to 340	310 to 340	310 to 340
Sulphur content (DIN 51400):		< 0.1 %	< 0.1 %	< 0.1 %
Water resistance (DIN 51807):		0 - 90	1 - 90	1 - 90
Temperature resistance:		-180°C to +1200°C	-40°C to +1400°C	-30°C to +1450°C
Pressure load:		230 N/mm <sup>2</sup>	230 N/mm <sup>2</sup>	230 N/mm <sup>2</sup>
Density at +20°C (DIN 51757):		1.16 g/cm <sup>3</sup>	1.42 g/cm <sup>3</sup>	1.30 g/cm <sup>3</sup>
Salt spray test (DIN 50017):*		> 170 hours	> 170 hours	> 170 hours
Thermal conductivity:		0.3 W/m·K	0.7 W/m·K	Values were not determined
Dielectric strength:		0.47 kV/mm	< 0.40 kV/mm	
Specific resistance :		1.2 x 10 <sup>15</sup> Ω/cm	1.0 x 10 <sup>15</sup> Ω/cm	

\* Salt spray test performed in Kesternich, based on DIN 50017; 168 hours at +35°C, 5% NaCl solution; Spraying cycle = salt spray for 30 minutes, 30-minute break, layer thickness: 50 µm. For all test sheets, neither rust under the edges nor other damage due to corrosion was determined.

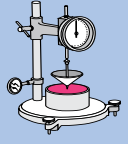
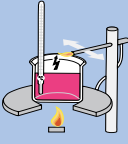
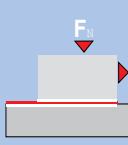
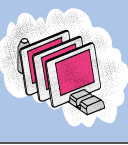
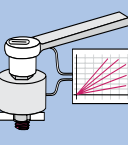



Assembly aid for screwed bolts



Assembly aid for the inner toothings of a transmission driving shaft

# A-Z of Tribology Concepts

Basic oil	Carrier fluid for pastes, greases, and oils.	
Boundary friction	Arises if the lubricating film is penetrated or destroyed during the friction action. The material pairs come into contact due to friction conditions, such as pressure or speed. The boundary friction area cannot be avoided before the formation of a supporting lubricating film when starting and stopping or when changing the direction of rotation.	
Consistency assignment	The consistency of a lubricating grease is measured in accordance with DIN ISO 2137 with a penetrometer, whereby the grease is worked prior to the measurement in order to imitate the stress in a bearing. The penetration depth of a cone permits the assignment to a consistency class according to NLGI (National Lubricating Grease Institute) in accordance with DIN 51818.	
Corroders	Arise when the lubricating film is penetrated and surface roughness peaks thus weld together.	
Differences between: - Oil - Grease - Paste	<b>Oil:</b> Liquid lubricant made from one or more types of oil for rapidly moving parts with relatively low surface pressures. <b>Grease:</b> Mass of oil and thickener (soap matrix). The oil stored in the thickener is separated by means of pressure and dynamics. In the stationary phase, the thickener absorbs the oil once again. For medium to fast moving parts with higher surface pressure. <b>Paste:</b> Very high-viscous mass of solid lubricants, carrier oil, and thickener for static and slow moving parts subject to a high level of stress with an extremely high surface pressure.	
Flash point	In the case of combustible fluids, the flash point is a measured quantity that makes it possible to estimate the fire risk. Depending on the product type and the level of the expected flash point, the most common measuring methods are with a closed (according to DIN 51755) or open (according to DIN ISO 2592) cup.	
Friction	Friction is the mechanical resistance against the relative movement of two surfaces. Friction is unwanted in the area of lubrication technology as energy losses, friction heat, and wear are linked to it. During the movement of material pairs against each other, a distinction is made between the following friction states: <b>Dry friction</b> – boundary friction (starting friction, solid-to-solid friction, visible surface friction) <b>Semi-fluid friction</b> – mixed friction (from boundary friction to fluid friction) <b>Fluid friction</b> – liquid friction (hydrodynamic friction)	
Friction figure or coefficient of friction $\mu$	The formula (based on Coulomb) friction $\mu = FR$ (frictional force = tensile force) is used to determine the friction. FN (normal force = weight). The types of friction can be divided up into sliding friction, boring friction, rolling friction, and combined sliding and rolling friction. $\mu$ = coefficient of friction.	
Frictional corrosion	Corrosion that arises at fits subject to oscillations with micro-frictional movements. Immediate formation of rust on rubbed-off steel particles.	
Oxidation	Oxidation is a combustion process. The addition of oxygen to certain elements or molecules occurs in this process. In the case of hydrocarbons, jellification, the formation of lacquer, polymers, corrosive radicals, and so on arise.	
Penetration	Measured quantity for the determination of the consistency (ductility) of lubricating greases. In the case of lubricating greases, it is the distance that a cone of certain dimensions penetrates vertically into the sample to be investigated under stipulated conditions (DIN ISO 2137 or DIN 51 804). <b>Static penetration:</b> Penetration of lubricating grease sample that was not pre-treated in the grease shaper, measured at +25°C. <b>Worked penetration:</b> By the term worked penetration, we mean the cone penetration, which is determined immediately following the treatment of the sample with 60 double cycles within a minute in the grease shaper at +25°C.	
Salt spray test	The salt spray test simulates a salty climate in accordance with DIN 50017, whereby coated metal plates are exposed to a defined salt spray. The number of hours that pass until traces of rust arise is monitored.	
Solid lubricant	Generally only used and required for lubrication tasks under extreme conditions (e.g. during operation in mixed friction areas). The most well-known ones are graphite, molybdenum sulphide, various plastics (e.g. PTFE), heavy metal sulphides, etc. The solid lubricants are determined according to DIN 51 831 and DIN 51 832.	
SRV test (OFW test = oscillating friction wear)	Test of the effectiveness of assembly pastes in regard to the coefficient of friction, wear, and frictional corrosion (tribocorrosion). An upper test specimen is oscillated on a lower test specimen that usually has a round, lapped, or ground surface. A few grams of mounting paste is applied between these test specimens.	
Stick slip	Stick slip arises if the lubricant does not have a sufficient separation grade as the initial friction is higher than the motional friction.	
Synthetic oils	In contrast with natural oils, such as mineral, vegetable, and animal oils, these oils are gained by means of chemical processes. In this way, specific advantages can be gained such as the low tendency to coke, a low pour point, good resistance to chemicals, an often excellent viscosity temperature behaviour. Synthetic hydrocarbons, esters, polyglycols, fluorinated oils, and silicon oils, for example, are used as lubricants.	
Thread friction	Thread friction is determined on a screw test stand. According to DIN 946, you obtain the coefficient of friction $\mu$ of a screw connection when tightening screws and nuts. The thread dimension, material, and type of surface must be specified.	
VKA	VKA is the abbreviation for "Vierkugelapparat" or a four-ball tester for luboils, by means of which the welding load and wear is measured in the event of punctual contact. DIN 51350 describes the test process. The welding load [N] is the applied load at which the individual balls are welded together. The wear characteristic [mm] is the average diameter of the spherical caps which is formed at a constant load following a defined testing time. Spherical cap value = depth of wear on the surface of the ball.	
Water resistance	There is a static and a dynamic test to test the behaviour of lubricating greases towards water. It is investigated how the water influences the lubricating grease at various temperatures (DIN 51 807).	

## WEICON Anti-Seize products and their behaviour vis-à-vis sealing materials (elastomers)

Elastomers \ Product	Anti-Seize Standard Grade	Anti-Seize High-Tech	Anti-Seize Nickel Grade
ACM - Acrylate rubber	++	++	0
CR - Chloroprene rubber	+	+	--
CSM - Chlorosulfonated PE rubber	++	++	--
EPDM - Ethylene propylene diene rubber	--	--	--
FKM - Fluorocacoutchoc	++	++	++
NBR - Nitrile butadiene rubber	++	++	+
NR - Natural rubber	--	--	--
SBR - Styrene butadiene rubber	--	--	--
SQM/MVQ - Silicone rubber	++	++	++

++ resistant + resistant to a limited extent 0 not tested, preliminary trials or resistance tests are recommended -- not resistant

## WEICON Anti-Seize products and their behaviour vis-à-vis polymer materials

Polymers \ Product	Anti-Seize Standard Grade	Anti-Seize High-Tech	Anti-Seize Nickel Grade
ABS - ABS copolymeride	++	++	--
CA - Cellulose acetate	++	++	--
EPS - Expanded polystyrene	++	++	0
PA - Polyamide	++	++	++
PC - Polycarbonate	--	--	--
PE - Polyethylene	++	++	++
PE-UHMW - Polyethylene with ultra high molar weight	++	++	++
PE-LD - Polyethylene with low density	+	+	+
PET - Polyethyleneterephthalate	++	++	0
POM - Polyoxymethylene	++	++	+
PP - Polypropylene	++	++	+
PPO - Polyphenylene oxide	++	++	--
PS - Polystyrene	+	+	--
PTFE - Polytetrafluor ethylene	++	++	++
PUR - Polyurethane	+	+	--
PVC - Polyvinylchloride	++	++	--

++ resistant + resistant to a limited extent 0 not tested, preliminary trials or resistance tests are recommended -- not resistant

The specified resistance levels are based on laboratory tests and literature notices. A guarantee cannot be provided due to the large number of raw materials used on the one hand and the complex chemical and morphological structure of the polymers on the other. In critical application cases, we recommend that you carry out tests and/or consult with our application technology department.





# Anti-Seize

## High-performance assembly pastes and sprays

### Reliable protection against

- Corrosion
- Wear
- Seizure



Protection of all metal connections in high-temperature areas



As a separating agent between the calliper and the brake lining



Assembly aid for the outer toothings of a transmission driving shaft



Lubrication of a power take-off coupling

Any product specifications and recommendations given herein must not be seen as guaranteed product characteristics. They are based on our laboratory tests and on practical experience. Since individual application conditions are beyond our knowledge, control and responsibility, this information is provided without any obligation. We do warrant the continuous high quality of our products based on defects in accordance with and subject to our General Sales Conditions. However, our adequate laboratory and practical tests to find out if the product in question meets the requested properties are recommended. A claim cannot be derived from them. The user bears the only responsibility for non-appropriate or other than specified applications.

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