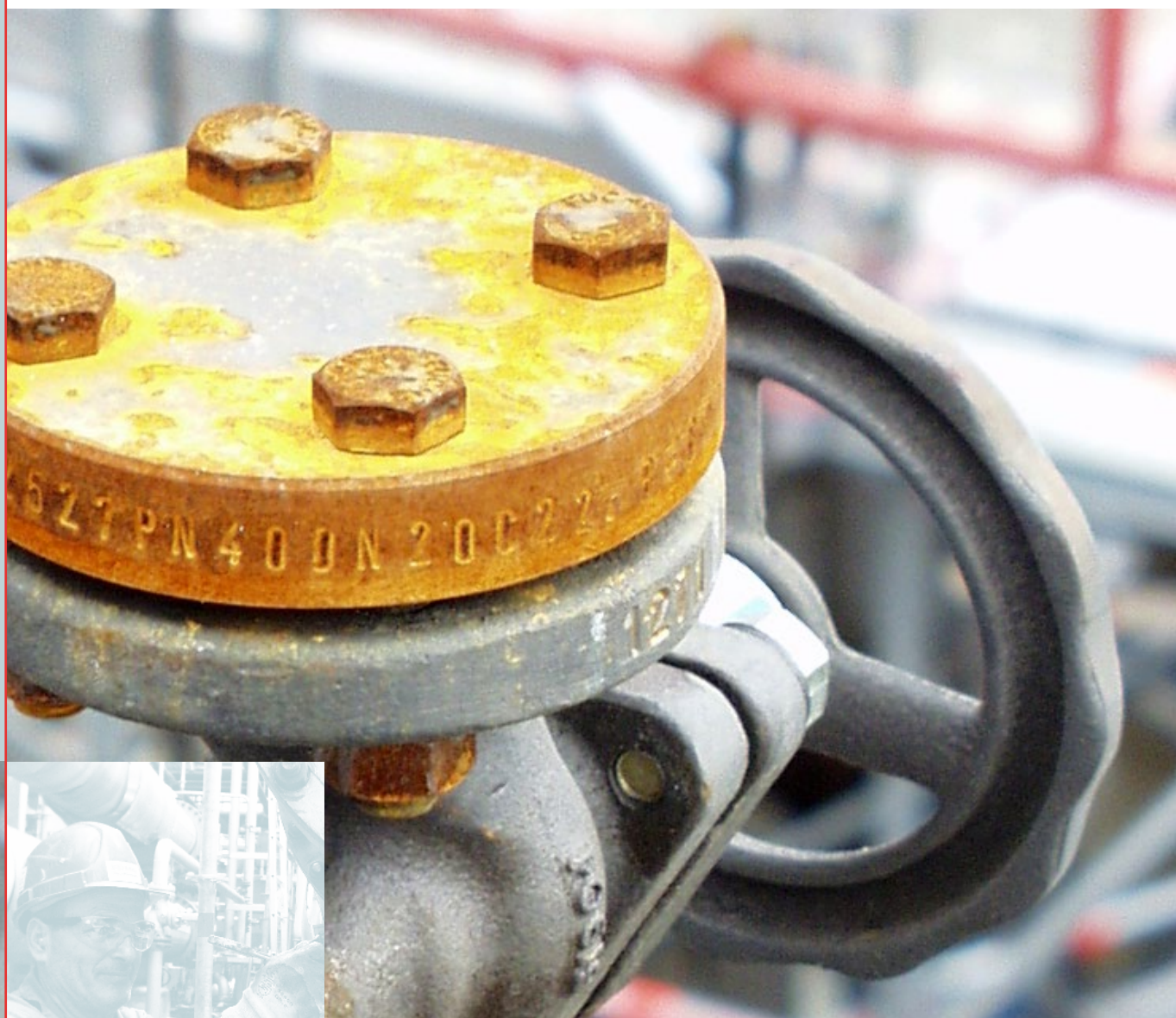




OKS Speciality Lubricants

***Examples of use for
screw lubrication***

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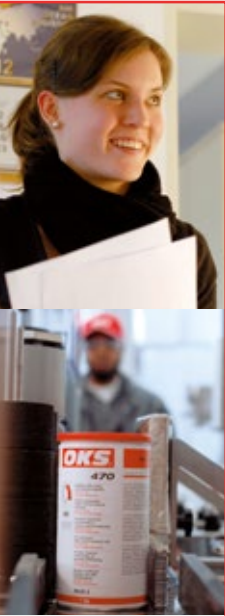
***INNOVATIVE PRODUCTS FOR
MAINTENANCE, REPAIR AND OPERATION***

Speciality Lubricants
Maintenance Products

40 YEARS OF TRIBOLOGICAL EXPERTISE

AVAILABLE WORLDWIDE

OKS – your professional partner for chemotechnical special products



The OKS brand stands for high-performance products for reducing friction, wear and corrosion. Our products are used in all the areas of production and maintenance technology in which the performance limits of classic lubricants are exceeded.

Quality – Made in Germany

The continued success of OKS for 40 years is decisively characterised by the high quality and reliability of our products, as well as the fast implementation of customer requirements through innovative solutions.

The products developed by OKS engineers and technicians are produced under strict quality requirements in Maisach, Germany, our company's headquarters. From here just-in-time sales are carried out worldwide, supported by the modern logistics centre.

The high OKS quality standard is proven by our certification by the TÜV SÜD Management Service GmbH in the fields of quality (ISO 9001: 2015), environment (ISO 14001: 2015) and work protection (ISO 45001: 2018).



www.tuev-sued.de/ms-zert

A company of the Freudenberg Group

Since 2003 OKS Spezialschmierstoffe GmbH has been part of the international Freudenberg Group, with headquarters in Weinheim, Germany. We utilize the comprehensive know-how and the innovative power of the Freudenberg Chemical Specialties (FCS) division for the further development of new products and markets to ensure the continued dynamic growth of our company in the future.

OKS – Partner to Trade

Our speciality lubricants and chemotechnical maintenance products are sold via the technical and mineral oil trades. The consistent strategy of "sales via trade", the smooth processing of orders and our comprehensive technical service make us one of the preferred partners for demanding customers the worldwide.

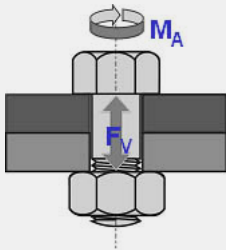


Screw lubrication ensures reliability and cost advantages

Function of a screw

Screws are used to fasten components and machine elements that can be loosened again.

A screwed connection is based on the conversion of a defined tightening torque (M_A) via the screw head to the nut or inner thread into a pre-tensioning force (clamping force F_V) in the screw shaft with which the parts to be connected are compressed. The clamping force generates the frictional adhesion of the screw in the thread. Only if the clamping force is sufficiently large, is the screwed connection of the component secure.



The frictional resistances in the thread and under the screw head impair the conversion of the tightening torque (M_A) to the pre-tensioning force (F_V). Therefore only approx. 10 % of the tightening torque is actually converted into the pre-tensioning of the screw. The corresponding coefficient of friction of the screwed connection depends in particular on the material and the surface of the thread and the screw. The size of the screws does not have any influence.

Use of lubricants in screw lubrication

In industrial mounting it is of particular importance to achieve a defined clamping force. Through the use of special screw lubricants the required coefficient of friction of the screwed connection can be "set" correspondingly, thus ensuring a secure connection.

Dismantling of a screwed connection should be possible without any problems in reality. However, this is usually not the case, because screws may corrode into a "permanent lock" in particular at long periods of use and aggressive conditions of use. The use of special lubricants prevents corrosion and seizing of the screwed connection and notably reduces the time required and the costs involved to loosen these connections, for example during the inspection of supply lines, fittings and machines.

Choosing the right screw lubricant thus not only ensures the reliability of a screwed connection, but also facilitates dismantling later on – including corresponding cost advantages.

OKS lubricants for screw lubrication

The reliability of a screwed connection and its trouble-free dismantling place high requirements on the lubricants, such as pastes, oils or anti-friction lacquer, used to this purpose. In addition to an optimum coefficient of friction and excellent corrosion protection, properties such as water and chemical resistance, suitability for food processing technology, compatibility to plastic, environmental compatibility, work safety and user friendliness have to be fulfilled.

Experts from a wide range of different disciplines work in our laboratories with state-of-the-art systems and test equipment in order to develop lubricants that fulfil these requirements optimally.

Use our specialists' know-how.
Put us to the test.





Over 150 high-performance products
from one supplier

www.oks-germany.com



- ❑ **Pastes** for easy assembly and dismantling
- ❑ **Oils** with high-performance additives for reliable lubrication
- ❑ **Greases** for long-term lubrication under critical operation conditions
- ❑ **Dry lubricants** – the alternative for special application cases
- ❑ **Corrosion protection** for reliable preservation during storage and shipping
- ❑ **Maintenance products** for ongoing service
- ❑ **Cleaners** for thorough removal of soiling and lubricant residues

For your company's individual lubrication requirements please contact OKS.

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Product	Designation	Technical Data	Colour, Main Components	Characterisation	Examples of use
OKS 217	High-Temperature Paste, high purity	<ul style="list-style-type: none"> Operating temperature: -40 °C to +1,400 °C Thread friction (M10/8.8): μ total = 0.10 Breakaway torque < 2.0 Nm x tightening torque 	<ul style="list-style-type: none"> black-grey semi-synthetic oil 	<ul style="list-style-type: none"> Assembly lubrication of screw threaded connection made of high-strength steel, at high temperatures in aggressive environment Optimum ratio of screw tightening torque to achievable pre-tension No seizing and no rusting on and no reaction with metals For use in the chemical industry 	<ul style="list-style-type: none"> Gas and steam turbines Combustion engines, screwed connections at pipe fittings, flange joints and fittings in superheated steam lines Exhaust pipe and combustion chamber screwed connections
OKS 235 OKS 2351	Aluminium Paste, Anti-Seize Paste	<ul style="list-style-type: none"> Operating temperature: -40 °C to +1,100 °C Thread friction (M10/8.8): μ total = 0.12 Breakaway torque < 2.0 Nm x tightening torque 	<ul style="list-style-type: none"> metallic silver aluminium powder other solid lubricants synthetic oil inorganic thickener 	<ul style="list-style-type: none"> Lubricating and separating paste for assembling screw and bolt threaded connections that are subjected to high temperatures and corrosive influences Optimum ratio of screw tightening torque to achievable pre-tension Prevents burning together or rusting on and avoids seizing 	<ul style="list-style-type: none"> Screw connections, fittings, flange and plug-in connections Ovens, boilers, burners, engines in the chemical and petrochemical industry shipping and offshore sectors, in power and heating plants, glassworks and iron and steel works
OKS 240 OKS 241	Antiseize Paste (Copper Paste)	<ul style="list-style-type: none"> Operating temperature: -30 °C to +200 °C/+1,100 °C Thread friction (M10/8.8): μ total = 0.09 Breakaway torque < 2.5 Nm x tightening torque 	<ul style="list-style-type: none"> copper brown copper powder MoS₂ other solid lubricants synthetic oil inorganic thickener 	<ul style="list-style-type: none"> For assembling screw threaded connections subjected to high temperatures and corrosive influences Prevents burning together or rusting on Optimum ratio of screw tightening torque to achievable pre-tension Anti-seize paste for reliable, non-destructive dismantling 	<ul style="list-style-type: none"> Combustion engines, threads on pipe fittings, flange joints and fittings of superheated steam lines, exhaust pipe and combustion chamber screwed connections, gas and oil burner mounting bolts
OKS 245	Copper Paste with High Corrosion Protection	<ul style="list-style-type: none"> Operating temp.: -30 °C to +100 °C/+1,100 °C (lubrication/separation) Four-ball test rig (welding load): 3,400 N Thread friction (M10/8.8): μ total = 0.14 	<ul style="list-style-type: none"> copper-coloured copper powder EP additives AW additives mineral oil thickener: organic, inorganic 	<ul style="list-style-type: none"> For screws, bolts and sliding surfaces subjected to high temperatures, water or sea water Prevents burning together and rusting on Prevents seizing during assembly Highly adhesive, excellent corrosion protection Suitable for brake systems No classification according to (EG) No. 1272/2008 	<ul style="list-style-type: none"> For mounting screwed connections, e.g. at combustion engines threads on pipe fittings, flange joints and fittings of superheated steam lines exhaust pipe and combustion chamber screwed connections gas and oil burner mounting bolts
OKS 250 OKS 2501  	White Allround Paste, metal-free	<ul style="list-style-type: none"> Operating temperature: -40 °C to +200 °C/+1,400 °C (lubrication/separation) Thread friction (M10/8.8): μ total = 0.12 Thread friction (V2A M10 x 50-70): μ total = 0.15 Breakaway torque < 2.7 Nm x tightening torque NSF H2 Reg. No. 131379 (OKS 250) 	<ul style="list-style-type: none"> white white solid lubricants Mo_x-Active synthetic oil polycarbamide 	<ul style="list-style-type: none"> For screws, bolts and sliding surfaces subjected to high pressures and temperatures Optimum ratio of tightening torque to achievable pre-tension Metal-free excellent corrosion protection Universal high-temperature paste For stainless-steel connections 	<ul style="list-style-type: none"> Screw and plug-in connections made of steel or non-ferrous metals Combustion engines and turbines Corrosion protection at screws, bolts, flanges spindles and fits
OKS 252 	White High-Temperature Paste for Food Processing Technology	<ul style="list-style-type: none"> Operating temperature: -30 °C to +160 °C/+1,200 °C (lubrication/separation) Thread friction (M10/8.8): μ total = 0.15 Thread friction (V2A M10 x 50-70): μ total = 0.15 Breakaway torque < 3.2 Nm x tightening torque NSF H1 Reg. No. 135748 	<ul style="list-style-type: none"> light grey white solid lubricants polyglycol silicate 	<ul style="list-style-type: none"> Lubrication of screws, bolts and sliding surfaces that are subjected to high pressures, high temperatures at low speeds or oscillating movements Prevents seizing and rusting on Metal-free and highly adhesive Universal high-temperature assembly paste 	<ul style="list-style-type: none"> Screw and plug-in connections made of steel or non-ferrous metals Screws, bolts, flanges, fits in food processing technology Separation of temperature-stressed threaded connections
OKS 255	Ceramic paste	<ul style="list-style-type: none"> Operating temperature: -30 °C to +100 °C/+1,400 °C (lubrication/separation) Four-ball test rig (welding load): 3,400 N Thread friction (M10/8.8): μ total = 0.13 	<ul style="list-style-type: none"> white mineral oil white solid lubricants EP-additives AW-additives 	<ul style="list-style-type: none"> No classification marks according to (EG) No. 1272/2008 Metal-free Good pressure absorption capacity Prevents burning-on and cold welding Prolonged lubrication effect 	<ul style="list-style-type: none"> Lubrication of all kinds of highly stressed sliding surfaces, especially at low slip speeds or with oscillating movements Surface separation of temperature-stressed threaded connections For stainless-steel connections



Product	Designation	Technical Data	Colour, Main Components	Characterisation	Examples of use
OKS 600 OKS 601 	Multi Oil analog DIN 51 502: CL 3	<ul style="list-style-type: none"> Operating temperature: -30 °C to +60 °C / 150 °C (After evaporation of the solvent) Base oil viscosity (40 °C): ca. 3 mm²/s Salt spray test (DIN EN ISO 9227) > 50 h 	<ul style="list-style-type: none"> brownish transparent mineral oil 	<ul style="list-style-type: none"> Low-viscosity multipurpose oil Excellent creep properties Excellent corrosion protection Dismantling rusted-in parts Good lubricating properties Displaces moisture For cleaning and care of metal surfaces 	<ul style="list-style-type: none"> Cleaning, lubrication, maintenance and dismantling of seized or rusted-in parts such as screws, bolts, chain links, joints, levers, springs, valves, hinges or locks, Protection of electrical contacts Industrial maintenance and in the workshop field
OKS 641 	Maintenance Oil	<ul style="list-style-type: none"> Operating temperature: -30 °C to +60 °C / 150 °C (After evaporation of the solvent) Viscosity (40 °C): 3 mm²/s Salt spray test: > 100 h 	<ul style="list-style-type: none"> brown mineral oil solvent 	<ul style="list-style-type: none"> Maintenance oil for dismantling, lubrication and care of machine elements and metal surfaces Good cleaning action Temporary protection against corrosion Displaces moisture 	<ul style="list-style-type: none"> Dismantling of seized or sticky components or machine elements Locks, hinges, bolts, bushings, cranks, linkages, valves, slide rails, cable pulls, shafts Industrial maintenance and in the workshop field
OKS 1300 OKS 1301	Sliding Film, colourless	<ul style="list-style-type: none"> Operating temperature: -60 °C to +100 °C Thread friction (M10/8.8): μ total = 0.08 – 0.10 	<ul style="list-style-type: none"> colourless UV indicator (OKS 1300) silicone wax solvent 	<ul style="list-style-type: none"> Thread coating Sliding film for plastic, wood and metal Verifiable with UV indicator Prevents seizing For all screw materials Broad range of uses, in particular for precoating small and mass-produced parts 	<ul style="list-style-type: none"> For assembly of axial face seals Dry sliding film for needle guides and gear rods of textile machines or cutting knives of paper processing machines
OKS 1710	Sliding Film for screws, water-based concentrate	<ul style="list-style-type: none"> Operating temperature: > +60 °C Thread friction (M10/8.8): μ total = 0.08 – 0.14 (depending on concentration and surface) 	<ul style="list-style-type: none"> milky-white UV indicator, corrosion protection inhibitor synthetic wax water isopropanol 	<ul style="list-style-type: none"> Thread coating, for controlled assembly Dry sliding film fast to handling Verifiable with UV indicator Can be diluted with water in a ratio of up to 1:5 Controlled friction coefficients Economic precoating 	<ul style="list-style-type: none"> Coating of threads with galvanised surfaces and VA and Al threads
OKS 1750	Sliding film for wood screws, water-based concentrate	<ul style="list-style-type: none"> Operating temperature: > +70 °C Thread friction (M10/8.8): μ total = 0.08 – 0.14 (depending on concentration and surface) 	<ul style="list-style-type: none"> yellowish UV indicator, corrosion protection inhibitor synthetic wax water isopropanol 	<ul style="list-style-type: none"> Dry film fast to handling Verifiable with UV indicator Can be diluted with water in a ratio of up to 1:5 Controlled friction coefficients 	<ul style="list-style-type: none"> Coating of threads with galvanised surfaces, e.g. chipboard screws
OKS 1765	Sliding film for thread-cutting screws, water-based concentrate	<ul style="list-style-type: none"> Operating temperature: > +70 °C Thread friction (M10/8.8): μ total = 0.06 – 0.15 (depending on concentration and surface) 	<ul style="list-style-type: none"> milky-white corrosion protection inhibitor synthetic wax water isopropanol 	<ul style="list-style-type: none"> Dry film fast to handling Verifiable with UV indicator No cold welding Can be diluted with water in a ratio of up to 1:5 Controlled friction coefficients 	<ul style="list-style-type: none"> Coating of thread-cutting screws made of aluminium alloys, high-alloy steels, galvanised and austenitic steels