OKS®

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: 2008), environment (ISO 14001: 2004) and work protection (OHSAS 18001: 2007).

**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 Specialities (FCS) division for the further development of new products and markets to ensure the continued dynamic growth of our company in the future.

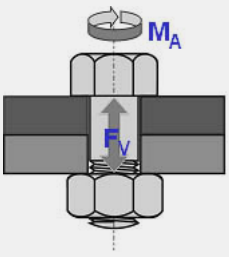
**OKS – Partner to Trade**
Our speciality lubricants and chemotechnical maintenance products are sold exclusively via the technical and mineral oil trades. The consistent strategy of "sales only via trade", the smooth processing of orders and our comprehensive technical service make us one of the preferred 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 antifriction 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.

**OKS Spezialschmierstoffe GmbH**
Ganghoferstraße 47
D-82216 Maisach
Phone +49 (0) 8142 3051-500
Fax +49 (0) 8142 3051-599

info@oks-germany.com
**www.oks-germany.com**

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For a world in motion

# **OKS** PASTES FOR SCREW LUBRICATION



| Product | Designation | Technical Data | Colour, Main Components | Characterisation | Examples of use |
|---|---|---|---|---|---|
| **OKS 217** | High-Temperature Paste, high purity | • Operating temperature: –40 °C to +1,400 °C<br>• Thread friction (M10/8.8): μ = 0.10<br>• Breakaway torque < 2.0 Nm x tightening torque | • black-grey<br>• semi-synthetic oil | • Assembly lubrication of screw threaded connection made of high-strength steel, at high temperatures in aggressive environment<br>• Optimum ratio of screw tightening torque to achievable pre-tension<br>• No seizing and no rusting on and no reaction with metals<br>• For use in the chemical industry | • Gas and steam turbines<br>• Combustion engines, screwed connections at pipe fittings, flange joints and fittings in superheated steam lines<br>• Exhaust pipe and combustion chamber screwed connections |
| **OKS 235**<br>**OKS 2351** | Aluminium Paste, Anti-Seize Paste | • Operating temperature: –40 °C to +1,100 °C<br>• Thread friction (M10/8.8): μ = 0.12<br>• Breakaway torque < 2.0 Nm x tightening torque | • metallic silver<br>• aluminium powder<br>• other solid lubricants<br>• synthetic oil<br>• inorganic thickener | • Lubricating and separating paste for assembling screw and bolt threaded connections that are subjected to high temperatures and corrosive influences<br>• Optimum ratio of screw tightening torque to achievable pre-tension<br>• Prevents burning together or rusting on and avoids seizing | • Screw connections, fittings, flange and plug-in connections<br>• 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**<br>**OKS 241** | Antiseize Paste (Copper Paste) | • Operating temperature: –30 °C to +200 °C/+1,100 °C<br>• Thread friction (M10/8.8): μ = 0.09<br>• Breakaway torque < 2.5 Nm x tightening torque | • copper brown<br>• copper powder<br>• $MoS_2$<br>• other solid lubricants<br>• synthetic oil<br>• inorganic thickener | • For assembling screw threaded connections subjected to high temperatures and corrosive influences<br>• Prevents burning together or rusting on<br>• Optimum ratio of screw tightening torque to achievable pre-tension<br>• Anti-seize paste for reliable, non-destructive dismantling | • 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**<br>**OKS 2501**<br>NSF<br>$Mo_x$-Active | White Allround Paste, metal-free | • Operating temperature: –40 °C to +200 °C/+1,400 °C (lubrication/separation)<br>• Thread friction (M10/8.8): μ = 0.12<br>• Thread friction (V2A M10 x 50–70): μ = 0.15<br>• Breakaway torque < 2.7 Nm x tightening torque<br>• NSF H2 Reg. No. 131379 (OKS 250) | • white<br>• white solid lubricants<br>• $Mo_x$-Active<br>• synthetic oil<br>• polycarbamide | • For screws, bolts and sliding surfaces subjected to high pressures and temperatures<br>• Optimum ratio of tightening torque to achievable pre-tension<br>• Metal-free excellent corrosion protection<br>• Universal high-temperature paste<br>• For stainless-steel connections | • Screw and plug-in connections made of steel or non-ferrous metals<br>• Combustion engines and turbines<br>• Corrosion protection at screws, bolts, flanges spindles and fits |
| **OKS 252**<br>NSF | White High-Temperature Paste for Food Processing Technology | • Operating temperature: –30 °C to +160 °C/+1,200 °C (lubrication/separation)<br>• Thread friction (M10/8.8): μ = 0.15<br>• Thread friction (V2A M10 x 50–70): μ = 0.15<br>• Breakaway torque < 3.2 Nm x tightening torque<br>• NSF H1 Reg. No. 135748 | • light grey<br>• white solid lubricants<br>• polyglycol<br>• silicate | • Lubrication of screws, bolts and sliding surfaces that are subjected to high pressures, high temperatures at low speeds or oscillating movements<br>• Prevents seizing and rusting on<br>• Metal-free and highly adhesive<br>• Universal high-temperature assembly paste | • Screw and plug-in connections made of steel or non-ferrous metals<br>• Screws, bolts, flanges, fits in food processing technology<br>• Separation of temperature-stressed threaded connections |

# **OKS** OILS AND SLIDING FILMS FOR SCREW LUBRICATION



| Product | Designation | Technical Data | Colour, Main Components | Characterisation | Examples of use |
|---|---|---|---|---|---|
| **OKS 600**<br>**OKS 601**<br>  | Multi Oil<br><br>DIN 51 502: C 3 | • Operating temperature: -30 °C to +60 °C / 150 °C (After evaporation of the solvent)<br>• Base oil viscosity (40 °C): ca. 3 mm²/s<br>• Salt spray test (DIN EN ISO 9227) > 50 h | • brownish transparent<br>• mineral oil | • Low-viscosity multipurpose oil<br>• Excellent creep properties<br>• Excellent corrosion protection<br>• Dismantling rusted-in parts<br>• Good lubricating properties<br>• Displaces moisture<br>• For cleaning and care of metal surfaces | • Cleaning, lubrication, maintenance and dismantling of seized or rusted-in parts such as screws, bolts, chain links, joints, levers, springs, valves, hinges or locks,<br>• Protection of electlical contacts<br>• Industrial maintenance and in the workshop field |
| **OKS 640**<br>**OKS 641**<br>  | Maintenance Oil | • Operating temperature: -30 °C to +60 °C / 150 °C (After evaporation of the solvent)<br>• Viscosity (40 °C): 3 mm²/s<br>• Salt spray test: > 100 h | • brown<br>• mineral oil<br>• solvent | • Maintenance oil for dismantling, lubrication and care of machine elements and metal surfaces<br>• Good cleaning action<br>• Temporary protection against corrosion<br>• Displaces moisture | • Dismantling of seized or sticky components or machine elements<br>• Locks, hinges, bolts, bushings, cranks, linkages, valves, slide rails, cable pulls, shafts<br>• Industrial maintenance and in the workshop field |
| **OKS 1300**<br>**OKS 1301** | Sliding Film, colourless | • Operating temperature: –60 °C to +100 °C<br>• Thread friction (M10/8.8): μ = 0.08 – 0.10 | • colourless<br>• UV indicator (OKS 1300)<br>• silicone wax<br>• solvent | • Thread coating<br>• Sliding film for plastic, wood and metal<br>• Verifiable with UV indicator<br>• Prevents seizing<br>• For all screw materials<br>• Broad range of uses, in particular for precoating small and mass-produced parts | • For assembly of axial face seals<br>• 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 | • Operating temperature: > +60 °C<br>• Thread friction (M10/8.8): μ = 0.08 – 0.14 (depending on concentration and surface) | • milky-white<br>• UV indicator, corrosion protection inhibitor<br>• synthetic wax<br>• water<br>• isopropanol | • Thread coating, for controlled assembly<br>• Dry sliding film fast to handling<br>• Verifiable with UV indicator<br>• Can be diluted with water in a ratio of up to 1:5<br>• Controlled friction coefficients<br>• Economic precoating | • Coating of threads with galvanised surfaces and VA and Al threads |
| **OKS 1750** | Sliding film for wood screws, water-based concentrate | • Operating temperature: > +70 °C<br>• Thread friction (M10/8.8): μ = 0.08 – 0.14 (depending on concentration and surface) | • yellowish<br>• UV indicator, corrosion protection inhibitor<br>• synthetic wax<br>• water<br>• isopropanol | • Dry film fast to handling<br>• Verifiable with UV indicator<br>• Can be diluted with water in a ratio of up to 1:5<br>• Controlled friction coefficients | • Coating of threads with galvanised surfaces, e.g. chipboard screws |
| **OKS 1765** | Sliding film for thread-cutting screws, water-based concentrate | • Operating temperature: > +70 °C<br>• Thread friction (M10/8.8): μ = 0.06 – 0.15 (depending on concentration and surface) | • milky-white<br>• corrosion protection inhibitor<br>• synthetic wax<br>• water<br>• isopropanol | • Dry film fast to handling<br>• Verifiable with UV indicator<br>• No cold welding<br>• Can be diluted with water in a ratio of up to 1:5<br>• Controlled friction coefficients | • Coating of thread-cutting screws made of aluminium alloys, high-alloy steels, galvanised and austenitic steels |