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Detailed Information

Oozing value.

Speciality lubricants for sintered metal bearings





The right lubricant for every sintered bearing

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In electric motors or fans, sintered metal plain bearings are often preferred over rolling bearings or plastic plain bearings. Sintered bearings offer many operational benefits such as smooth running, maintenance-free operation, long service life and good overall economy.

Every passenger car contains a substantial number of electric motors, supported by two sintered metal bearings each. Sintered metal bearings are also widely used in fans, household appliances and power tools. Because of the wide range of applications it is important to ensure that the bearing lubricant fulfils the operational requirements of the component in each case. In addition to the specific bearing design requirements it is important that sintered metal bearings are impregnated with a high-quality lubricant to ensure reliable bearing function and longest service life.

Klüber Lubrication offers a wide choice of lubricants for sintered metal bearings to meet all operational requirements. Among this range are universal lubricants for a wide range of applications as well as niche products for extreme requirements.

Klüber Lubrication has subjected these products to comprehensive testing under conditions typical of sintered bearing applications.

Each lubricant option, therefore, will provide particular benefits for individual application conditions, such as: High-speed suitability with lowest self-generated temperature increase, combined with lowest start-up wear characteristics and high thermal stability, thus improving the lubricant's ageing resistance and prolonging bearing service life. Good low-temperature stability preventing squeaking noise, thus ensuring lowest drive power in micro motors.

Oil or fluid: that is the question

We have developed both, oils and fluids for the impregnation of sintered metal bearings. Impregnating oils are often recommended for applications at constant rotational speeds. Impregnating fluids are generally the lubricant of choice when more problematic friction conditions are to be dealt with, e.g. mixed friction, as may occur in applications with very high or very low peripheral speeds or frequent changes in the direction of rotation. Fluids normally lead to a longer service life of the sintered bearing and they also enable smoother running. Experience has also shown that the noise behaviour of fluids is better than that of oils.

Additional lubrication for longer bearing life

For applications with particularly taxing requirements, additional lubrication by means of MIKROZELLA may be advisable. MIKROZELLA is a plastic gel-like reservoir which can increase bearing life significantly.

Individual consulting

Klüber Lubrication can analyse your application and consult with you in lubricant selection. Considering the numerous factors influencing the operation of sintered bearings, such consulting is indispensable. In cases where the right lubricant has not yet been developed, Klüber can adjust the oil type, viscosity or additive content of existing products so that they match your application.

In the following charts you will find a selection of our most frequently used special products for sintered metal plain bearings. Please do not hesitate to consult with our experts to determine the right lubricant for your application and to find out what scope for improvement it can provide.

Initial and lifetime lubrication with oils



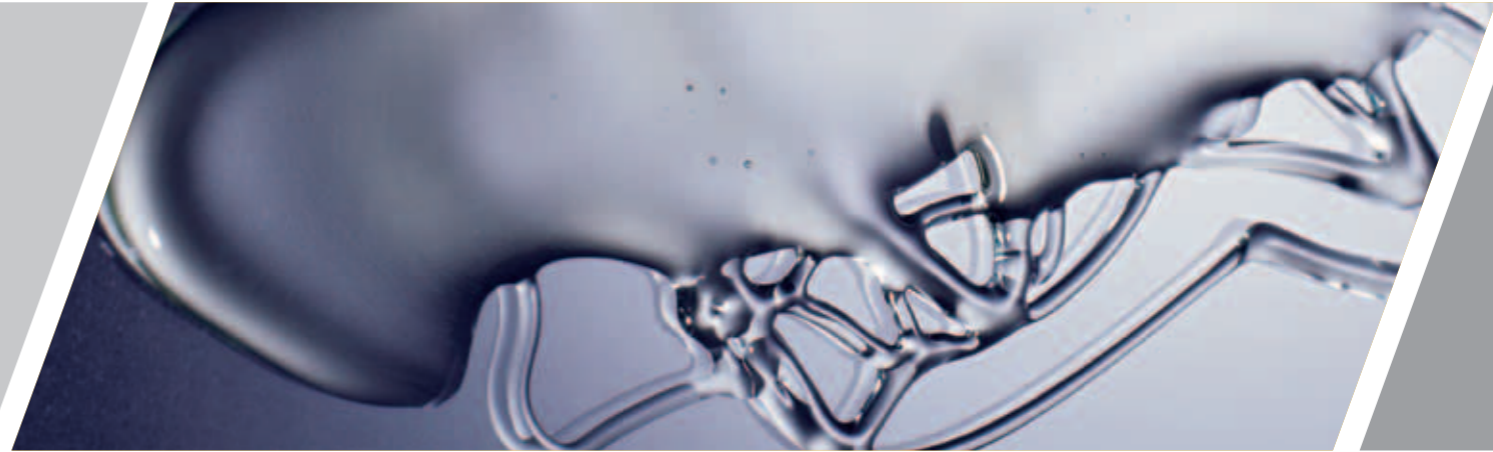
Solutions for ...	Upper service temperature	Lower service temperature	Chemical composition/ Oil type	Lubricant	Benefits/Description
Universal solutions for normal temperatures	150 °C 302 °F	down to -50 °C down to -58 °F	synthetic hydrocarbon	CONSTANT OY K oil series	<ul style="list-style-type: none"> - Good compatibility with plastics. - Good corrosion protection, especially when exposed to humidity. - Very good compatibility with all sintered metal materials. - Longer bearing life possible by additional lubrication with MIKROZELLA G OY K in the respective base oil viscosity. - Product available in different oil viscosities (from ISO VG 32 to 390).
	150 °C 302 °F	down to -45 °C down to -49 °F	ester oil/ synthetic hydrocarbon	Klübersynth DB 2 oil series	<ul style="list-style-type: none"> - Good viscosity-temperature behaviour and smooth running over the entire temperature range. - Good corrosion protection. - Longer life due to long-term thermal stability. - Longer bearing life possible by additional lubrication with MIKROZELLA GDB 2 in the respective base oil viscosity. - Product available in different oil viscosities (from ISO VG 18 to 68).
Special solutions for particularly high service temperatures	180 °C 356 °F	-50 °C -58 °F	silicone oil	Klüberbeta DB 7-68	<ul style="list-style-type: none"> - Wide service temperature range due the very high viscosity index. - Good viscosity-temperature behaviour, even under changing operating conditions. - Long bearing life due to high oxidation resistance. - Longer bearing life possible by additional lubrication with MIKROZELLA DB 47-62. - The product should not be used for components that are to be spray painted (automotive industry) due to spreading risks!
	220 °C 428 °F	-50 °C -58 °F	silicone oil	UNISILKON TK 055	<ul style="list-style-type: none"> - For both very high and low temperatures. - Long-term operational reliability due to high oxidation stability. - Good viscosity-temperature behaviour and very uniform running over the entire temperature range. - Good corrosion protection under conditions of high humidity. - Longer bearing life possible by additional lubrication with MIKROZELLA GTK 055. - The product should not be used for components that are to be spray painted (automotive industry) due to spreading risks!
	up to 230 °C up to 446 °F	-25 °C -13 °F	perfluorinated polyether (PFPE)	Klüberalfa DH 3 oil series	<ul style="list-style-type: none"> - The product is compatible with paints. It can be used for high-temperature applications in the automotive industry. - Chemically inert, therefore compatible with common elastomer materials. - High viscosity stability over a wide temperature range. - Good compatibility with all sintered metal materials. - Product available in different oil viscosities.
Special solutions for particularly low service temperatures	100 °C 212 °F	-65 °C -85 °F	ester oil	ISOFLEX PDP oil series	<ul style="list-style-type: none"> - Reliable operation of micro-motors with low driving power due to low friction torque. - Reduced starting torque due to very good low-temperature behaviour. - Good corrosion protection, particularly under conditions of high humidity. - Product not recommended for non-ferrous sintered metal bearings. - Compatibility with plastics and elastomer materials should be checked in each case. - Product available in different oil viscosities.

Initial and lifetime lubrication with fluids



Solutions for ...	Upper service temperature	Lower service temperature	Chemical composition/ Oil type	Lubricant	Benefits/Description
Universal solutions for normal temperatures	100 °C 212 °F	-10 °C 14 °F	mineral oil	CONSTANT GL 2000	<ul style="list-style-type: none"> - Especially for sintered iron and all other sintered metal alloys. - Suitable for a wide range of different operating conditions due to good corrosion protection, especially under conditions of high humidity. - Longer bearing life possible by additional lubrication with MIKROZELLA G 8 OY K.
	140 °C 284 °F	-40 °C -40 °F	synthetic hydrocarbon	CONSTANT GLY 2100	<ul style="list-style-type: none"> - Good compatibility with elastomers. - Improved ageing stability due to less internally generated heat both at low and high temperatures. - Longer bearing life possible compared to CONSTANT GL 2000 due to good ageing resistance and high thermal stability. - Longer bearing life possible by additional lubrication with MIKROZELLA G 8 OY K.
	150 °C 302 °F	-40 °C -40 °F	ester oil/ synthetic hydrocarbon oil	Klüberfluid DHL 2-2100	<ul style="list-style-type: none"> - Higher wear protection compared to CONSTANT GL 2000 and CONSTANT GLY 2100. - Reliable operation of micro-motors with low driving power due to lowest friction torque. - Improved ageing stability due to less internally generated heat at high speeds. - Longer bearing life possible by additional lubrication with MIKROZELLA GDB 2-68. - Compatibility with plastics has to be checked in each individual case.
Special solutions for particularly high temperatures	200 °C 392 °F	-40 °C -40 °F	silicone oil	Klüberfluid DH 7-2000	<ul style="list-style-type: none"> - Impregnating fluid for very high service temperatures. - Longer bearing life possible by additional lubrication with MIKROZELLA GTK 055. - The product should not be used for components that are to be spray painted (automotive industry) due to spreading risks!
Special solutions for particularly low temperatures	120 °C 248 °F	-40 °C -40 °F	mineral oil/ ester oil	ISOFLEX PDB 38 CX 2000	<ul style="list-style-type: none"> - Dynamically light for particularly low temperatures. - Noise-damping effect. - Homogeneous impregnating fluid for low start-up and running torques.

Additional lubrication



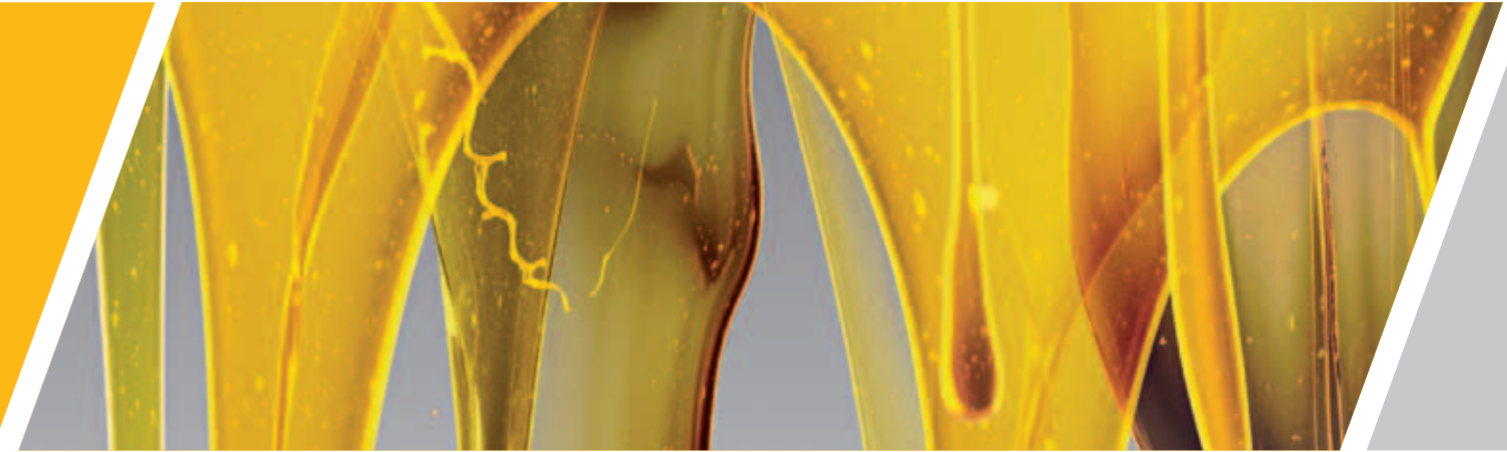
Additional lubrication	Upper service temperature	Lower service temperature	Additional lubricant	Chemical composition/ oil type	Benefits/Description
CONSTANT OY K CONSTANT GL 2000 CONSTANT GLY 2100	150 °C 302 °F	-50 °C -58 °F	MIKROZELLA G OY K series	synthetic hydrocarbon/ silicate	Additional lubrication with MIKROZELLA products significantly increases the life of porous sintered metal bearings. MIKROZELLA is a plastic gel-like oil reservoir which replaces felt lubrication or depot greases. The oil release characteristics of MIKROZELLA have been specifically tuned to meet the requirements of sintered metal bearing lubrication. The service temperature ranges of the additional lubricants have been adjusted to those of the products used for initial lubrication.
Klübersynth DB 2 Klüberfluid DHL 2-2100	150 °C 302 °F	-40 °C -40 °F	MIKROZELLA GDB 2 series	ester oil/synthetic hydrocarbon/silicate	
Klüberbeta DB 7-68 Klüberfluid DH 7-2000	180 °C 356 °F	-50 °C -58 °F	MIKROZELLA DB 47-62	silicone oil/ special lithium soap	
UNISILKON TK 055	200 °C 392 °F	-50 °C -58 °F	MIKROZELLA GTK 055	silicone oil/ special lithium soap	

On the intention of this product selection brochure

The intention of this product selection brochure is to provide a logical guide through the Klüber Lubrication specialised product range. The structure of the brochure considers firstly the various application requirements and then leads you toward selection of the appropriate lubricant solution.

Whenever products appear to have similar properties, we highlight the differences in grey in the respective fields to assist with the final product selection. Should you not find a lubricant "tailored" exactly to your requirements we recommend contact with your local Klüber Lubrication representative, who will be able to offer additional assistance with product selection from our extensive lubricant portfolio.

We generally recommend to consult our lubrication experts prior to selecting a lubricant.



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Klüber Lubrication – your global specialist

Innovative tribological solutions are our passion. Through personal contact and consultation, we help our customers to be successful worldwide, in all industries and markets. With our ambitious technical concepts and experienced, competent staff we have been fulfilling increasingly demanding requirements by manufacturing efficient high-performance lubricants for more than 80 years.



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