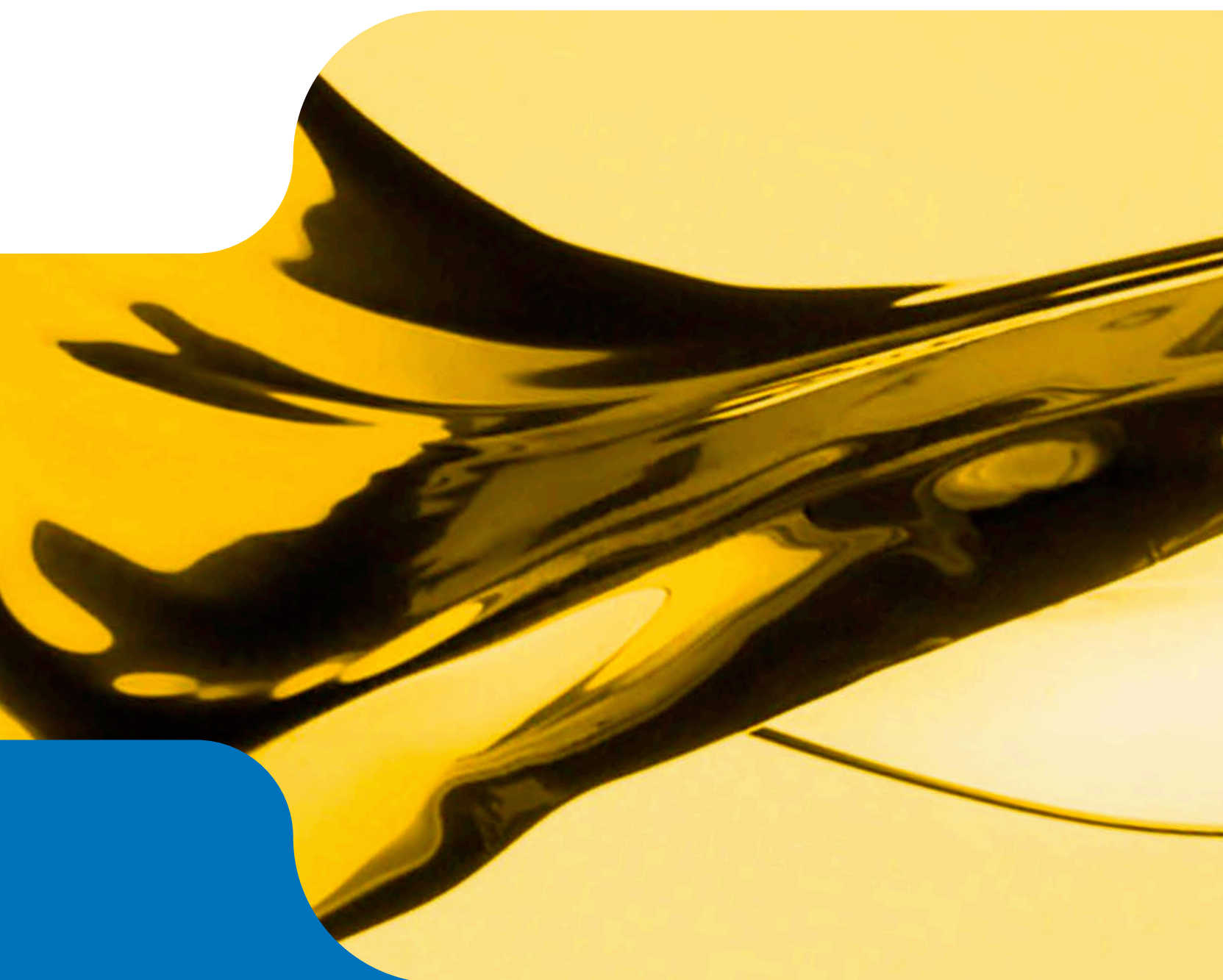




Lubrication solutions from SKF

Helping your business run more smoothly



The Power of Knowledge Engineering

Discover what SKF lubrication



solutions can mean for your business

The true potential of lubrication is often overlooked. This applies across industries and in countless applications, from machine tools and off-highway to pulp & paper and wind turbines. What if the right lubrication solution opened up new opportunities to improve profitability by reducing costs and boosting reliability? What if it allowed you to design a machine that offers your customers more value, while being more cost-effective to manufacture? With the right lubrication partner, it just might.

Keeping you at the forefront

SKF has more than 100 years of experience with rotating equipment. We understand the challenges and know how to meet them. Now more than ever, the right lubrication solution involves the capability to integrate technologies and combine knowledge and experience in the areas of bearings, seals, services, mechatronics and lubrication systems.

What's more, SKF has pursued advanced research and development in tribology, the combination of friction, wear and lubrication science. As we see it, knowledge is a key success factor – and we're looking forward to sharing it with you.

Meeting your exact requirements

At SKF, we have the commitment and the global resources to support the unique requirements of your operation.

We can now offer a complete range of lubrications solutions, from specialized lubricants and manual lubricators to the most innovative automatic and centralized lubrication systems on the market. Not to mention a growing range of services, including oil analysis, installation assistance and training. Working together with SKF, you can rely on receiving the right lubricant, in the right amount, with the right lubrication system, at the right lubrication point. Wherever your machine runs.



Optimizing your designs

Even small design improvements can make a big difference. The fact is that the earlier you involve SKF as an engineering partner in the planning and design process, the bigger the benefits. SKF application engineers can work with your team to optimize designs for long life and reliability.



With SKF, you will be better able to offer your customers a more compact, energy efficient and cost-effective solution that is also easy to use and maintain. Equally important, we can work together to develop designs that help reduce the time and cost of production providing a sharper competitive advantage.

Sustainability at work

When you partner with SKF, you are doing both the environment and the workplace a favour. An SKF lubrication solution is designed to optimize the amount of lubricant required in the first place. Less lubricant is better for the environment. What's more, an optimally lubricated machine is a more energy efficient machine. You can also expect minimal leakage and less friction, resulting in reduced noise levels. All in all, you can rely on an SKF solution to contribute to a safer, healthier work environment.

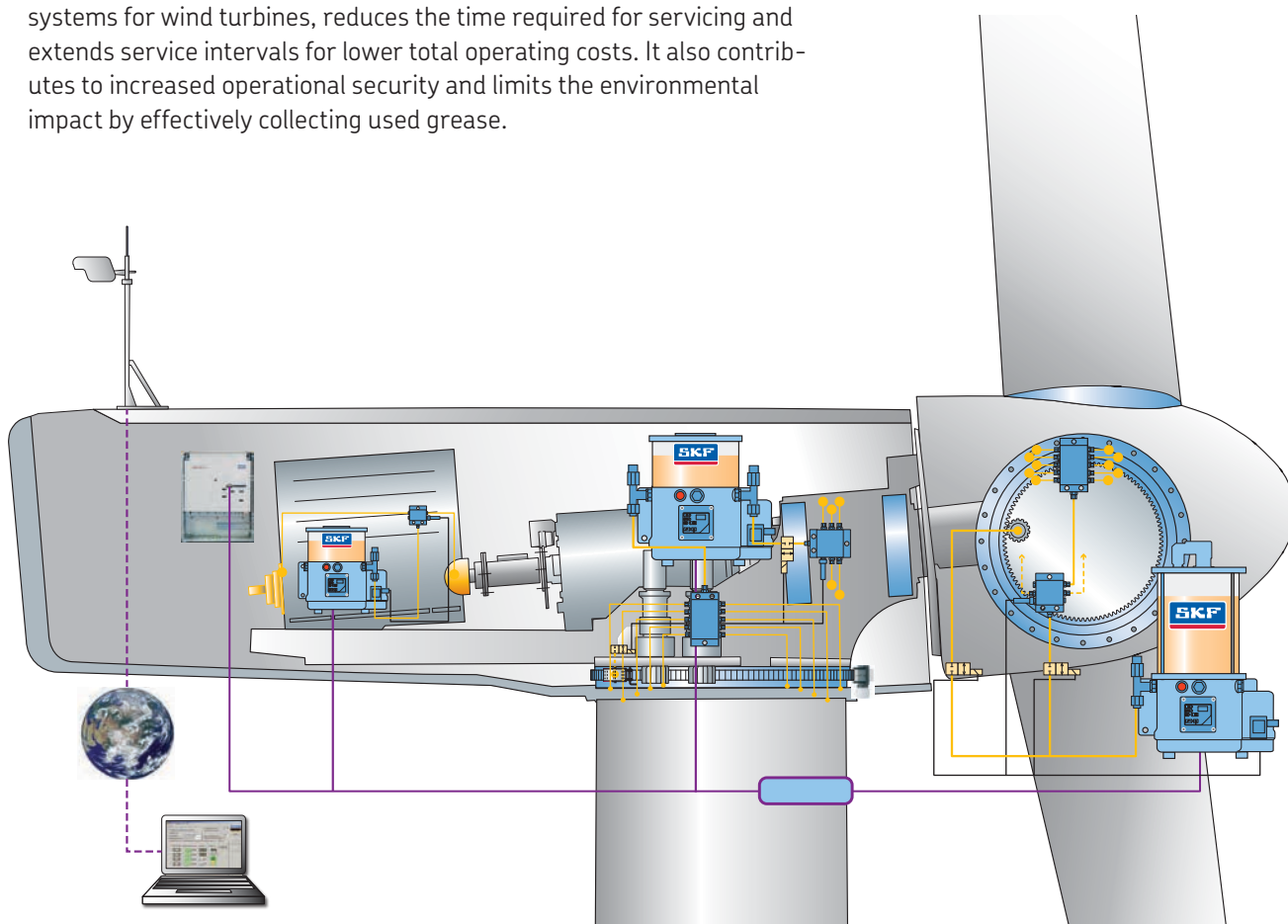


SKF solutions engineered to your

At SKF, we apply the power of knowledge engineering to meet your specific lubrication requirements. You can look forward to a cost-effective lubrication solution designed for high reliability and improved energy efficiency. By identifying ways to extend both machine uptime and service intervals, we can help reduce maintenance and operating costs, while helping lower handling costs from greater ease of use. We can show you how. Let's discuss your specific lubrication demands and opportunities – and calculate your return on investment.

Extending service intervals

According to industry averages, 10% of turbine servicing time is spent on relubrication. The SKF WindLub, centralized automatic lubrication systems for wind turbines, reduces the time required for servicing and extends service intervals for lower total operating costs. It also contributes to increased operational security and limits the environmental impact by effectively collecting used grease.



Reducing oil requirements

Pulp and paper machines need huge amounts of oil. The SKF Flowline Pumping Unit for circulating lubrication systems can reduce the amount of oil required by up to 50%. High operational efficiency and superior separation of air bubbles and water mean better oil condition with less oil, while helping to reduce energy and cooling water consumption.



Improving machine availability

Construction machines must offer high reliability despite harsh operating conditions and complex designs with numerous, hard-to-reach lubrication points. An SKF Centralized Lubrication System with specially developed piston pumps from the KFG series supplies the right amount of grease during every lubrication cycle while the bearings are in motion. This helps improve lubrication efficiency, reducing service and repair costs by up to 25%, and increasing machine availability.



reality

Boosting machine tool efficiency

When it comes to machine tools, reliability, precision and efficiency are crucial. To help meet these demands, SKF has developed centralized, multi-point lubrication systems that help machines run more smoothly, while also extending the service life of linear guides and bearings.

In addition, SKF LubriLean minimal quantity lubrication systems for machining processes can help reduce overall production time by up to 30% and significantly increase tool life.

What is more, SKF lubrication solutions contribute to a more precise cutting process, better surface quality and a more environmentally friendly workplace.

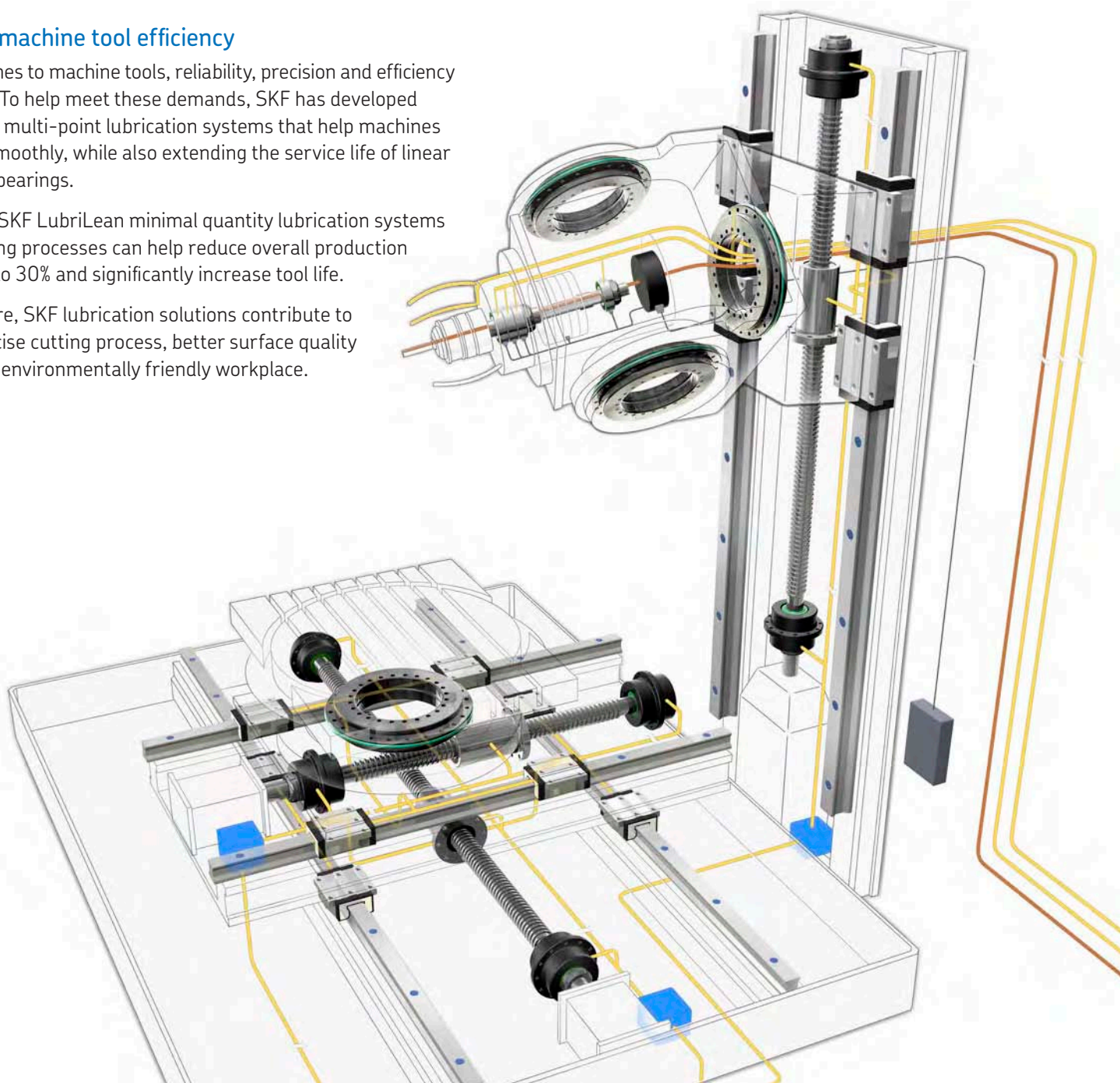


Photo by courtesy of Krones Inc.

Less water, less lubricant

The beverage industry uses high volumes of water and lubricant mixture. At one plant, the SKF Dry Lubrication System for Conveyors had reportedly saved more than 1 000 m³ of water per production line annually. It also reduced the amount of lubricant needed by 95%.

Less risk of lubricant leakage on the floor contributes to a safer working environment.



Reducing operating costs

Large 2-stroke crosshead diesel engines on container vessels, oil & gas tankers and bulk carriers require huge amounts of lubricating oil, resulting in high operating costs and emissions. To meet this challenge, SKF has developed the fully electronically controlled SKF Cylinder Lubrication System CLU 4. It offers efficient, load-dependent lubrication of the cylinders, reducing lubricating oil consumption by one-third, while cutting costs and harmful emissions.



SKF Lubricants – setting the standard

SKF's vast experience developing rolling bearings forms the platform for a special range of greases and oils that reflects decades of research and development across many industries. Each individual lubricant is carefully formulated to meet a specific field of application.

The right lubricant for your application

The extensive line of SKF lubricants includes general purpose industrial and automotive bearing grease, suitable for a wide range of applications from agricultural equipment and automotive wheel bearings to industrial fans, conveyors and much more.

Special lubricants have also been developed to meet high load conditions and extreme operating pressures and temperatures.

This includes premium quality grease that can handle high temperatures in applications where high performance is essential, such as electric motors, industrial fans and water pumps.

SKF also offers grease that has been specially developed for applications that involve continuous high loads, vibration and high temperatures. Heavy industries, such as pulp & paper and metal-working, is a good example.

The range of SKF lubricants also includes food compatible bearing grease, biodegradable bearing grease and lubricants developed for the specific conditions of railway axleboxes, wind turbines main bearing, chain applications – just to name a few.

SKF Automatic Lubricators

Precise amounts, right intervals, no contaminants

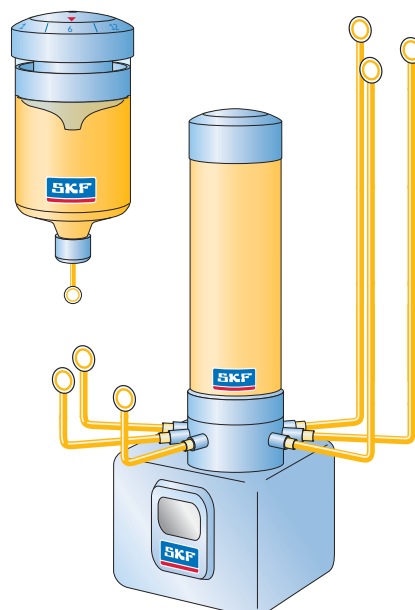
Using the right bearing grease for the right application is critical to bearing performance. It is equally important to make sure that the correct quantity of grease is injected at the right intervals.

Over-greasing can have detrimental effects on the life of a bearing and will contribute to machine downtime and early failure. To meet these challenges, SKF has developed around-the-clock solutions that provide the precise amount of contaminant-free grease, with minimal risk of over- or under-lubricating. With SKF automatic lubricators, you get reliable time- and labor-saving alternatives to manual lubrication.

Extreme ease of use

SKF automatic lubricator solutions and manual lubrication equipment are designed for ease of use so that you can easily control the amount of grease used in each application. You can also feel confident that the grease is free of contaminants. With SKF automatic lubricators such as SYSTEM 24 or SYSTEM MultiPoint, the correct amount of grease can be applied 24 hours per day, 7 days per week, 52 weeks per year, if required. All you have to do is set the automatic timer.

SYSTEM 24 Single point automatic lubricator and SYSTEM MultiPoint automatic lubricator.





Thousands of lubrication needs, one

When it comes to meeting the specific lubrication requirements of your application or process, we've got you covered. With SKF, you can rely on optimized lubrication solutions – from quality lubricants and lubricators to state-of-the-art centralized lubrication systems. All of this and the engineering knowledge that comes with it – from a single, reliable source.

SKF MonoFlex

Single-line lubrication systems designed for oil, semi-fluid grease and hard grease NLGI grades 000 to 2.

SKF MonoFlex systems are mainly designed for small to medium-sized machines used in a range of industries, such as machine tool, printing, textile and construction.

Lubricant volumes ranging from 0,01 to 2,5 cc are dispensed to the individual lubrication point on each lube pulse. One piston metering valve per lubrication point makes sure the right amount of lubricant is delivered, regardless of any changes in viscosity or back pressure. SKF MonoFlex systems are designed for pressures ranging from 16 to 315 bars and venting pressures from 2 to 70 bars. The parallel set-up of the single line metering valves enables a simple, and reliable system design and installation. You can also look forward to scalable system planning, since SKF MonoFlex single-line lubrication systems feature a modular design.

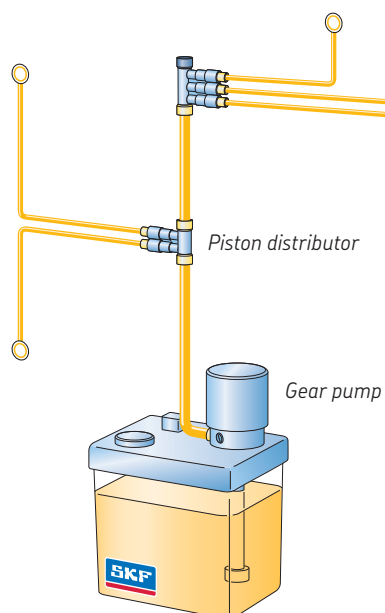
SKF DuoFlex

Dual-line lubrication systems designed for oil, semi-fluid grease and hard grease NLGI grades 000 to 3.

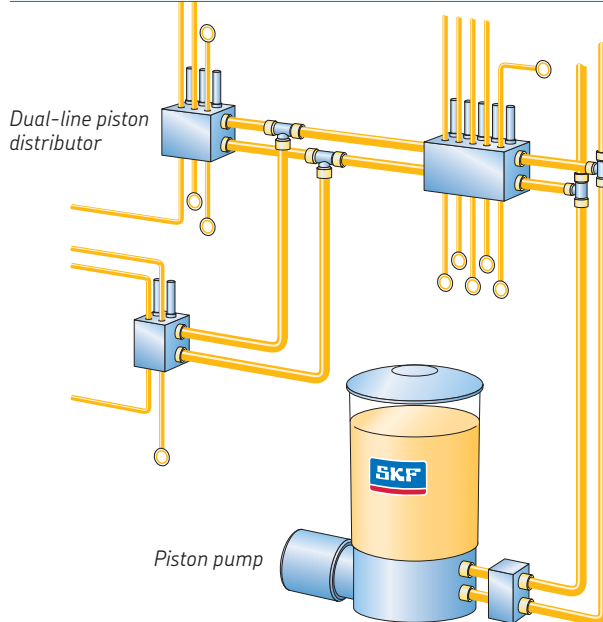
SKF DuoFlex systems are designed for medium-sized or large machines with a large number of lubrication points, long lines and harsh operating conditions. Applications include heavy industry, metal working plants, pulp and paper, mining, mineral processing and cement factories, deck cranes, power plants and more.

The system requires two main lines that are alternately supplied with lubricant. SKF DuoFlex systems are very reliable when using hard greases and when the distance to the pumping unit is long – up to 100 m or more. They also offer great flexibility when it comes to adjusting the metered quantity to the requirements of the specific lubrication point. In addition, the parallel set-up of the dual line metering valves allows for a simple and easy system design. SKF DuoFlex dual-line lubrication systems can supply more than 1 000 lubrication points from a single pump unit source, resulting in high lubricating reliability with pressures of up to 400 bars.

SKF MonoFlex – Single-line lubrication systems designed for oil, semi-fluid grease and hard grease. The system shown below is for oil or semi-fluid grease.



SKF DuoFlex – Dual-line lubrication systems designed for oil, semi-fluid grease and hard grease. The system shown below is for hard grease.





source of lubrication expertise

SKF ProFlex

Progressive lubrication systems designed for oil, semi-fluid grease and hard grease NLGI grades 000 to 2.

SKF ProFlex systems are designed for small and medium-sized machines. They are used, for example, in the printing industry, construction machines, industrial presses and wind turbines.

A feed pump or flow limiter supplies lubricant to the distributor that serves each outlet progressively, with a defined amount of lubricant. Each distributor outlet can also serve a secondary distributor that divides the amount into smaller portions for progressive delivery to their outlets. To control the system's function, only one metering piston has to be controlled on a frequency basis.

SKF ProFlex progressive lubrication systems are designed for up to 150 lubrication points with grease or oil. In combination with parallel flow limiters, they can serve up to 1 000 lubrication points or even more with oil. SKF ProFlex includes a wide range of progressive distributors based on a block, segmental or modular design with 2 to 20 outlets, flow rates of 0,01 cc to 6 000 cc/min. and system pressures as high as 300 bars.

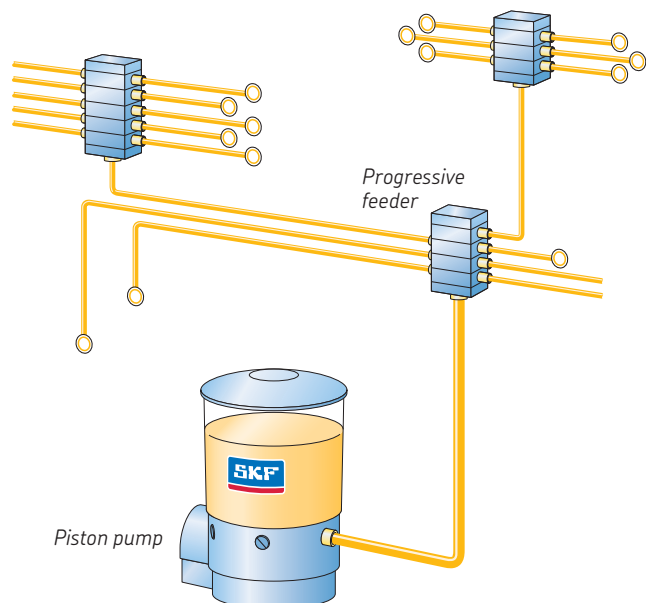
SKF MultiFlex

Multi-line lubrication systems designed for oil, semi-fluid grease and hard grease NLGI grades 000 to 3.

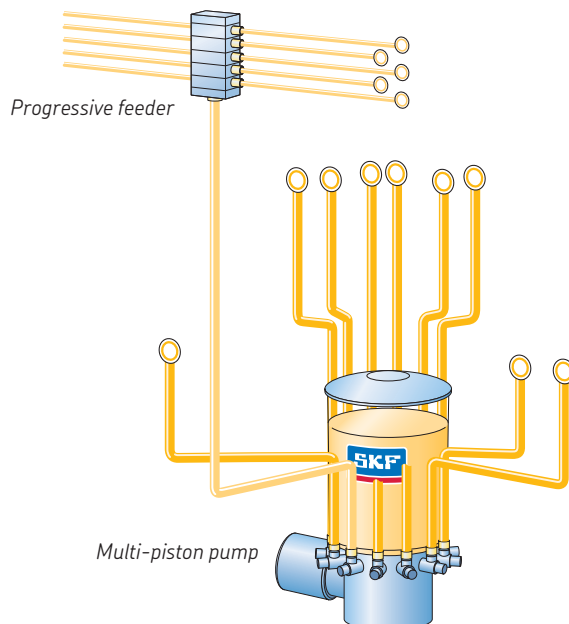
SKF MultiFlex systems are designed for automatic re-lubrication as well as small circulating oil systems on applications in the machine-tool industry, oil and gas, and heavy industry – just to name a few examples.

Multi-outlet pumps supply the lubricant directly to the lube point without the use of extra metering valves. Each lubrication point thus has its own pumping element. The system design is simple, accurate and reliable. SKF MultiFlex systems include a wide range of multi-outlet pumps from 1 to 32 outlets, and are able to withstand system pressures as high as 4 000 bars.

SKF ProFlex – Progressive lubrication systems designed for oil, semi-fluid grease and hard grease. The system shown below is for hard grease.



SKF MultiFlex – Multi-line lubrication systems designed for oil, semi-fluid grease and hard grease. The system shown below is for hard grease.





SKF CircOil

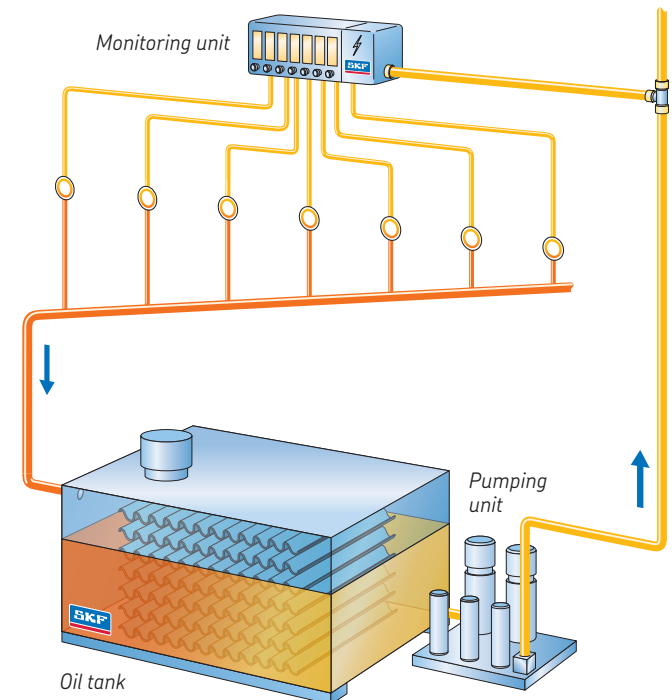
Circulating oil lubrication systems

SKF CircOil systems are designed primarily for circulating oil lubrication to not only lubricate but also to cool highly stressed bearings in nearly every size of machine used in the pulp & paper sector and heavy industry. They also efficiently remove dirt, water and air particles.

An oil supply system delivers the lubricant to the throttle valves with individual adjustment settings. The actual feed rates can be controlled visually or electronically. Monitoring systems with a flow rate read-out function and individual warning levels are available for a more predictive maintenance approach.

SKF CircOil systems include a wide range of tailor-made and turn-key solutions for flow rates from 0,1 to 3 000 l/min. This solution includes the SKF Streamline Pumping Unit, with a tank capacity as high as 40 000 liters, and innovative oil reservoirs such as the SKF Streamline Pumping Unit that helps reduce oil consumption dramatically. SKF CircOil systems are easy to service. In addition, they feature a modular design and can be easily combined.

SKF CircOil – Circulating oil lubrication systems



SKF Oil+Air

Oil and Air lubrication systems

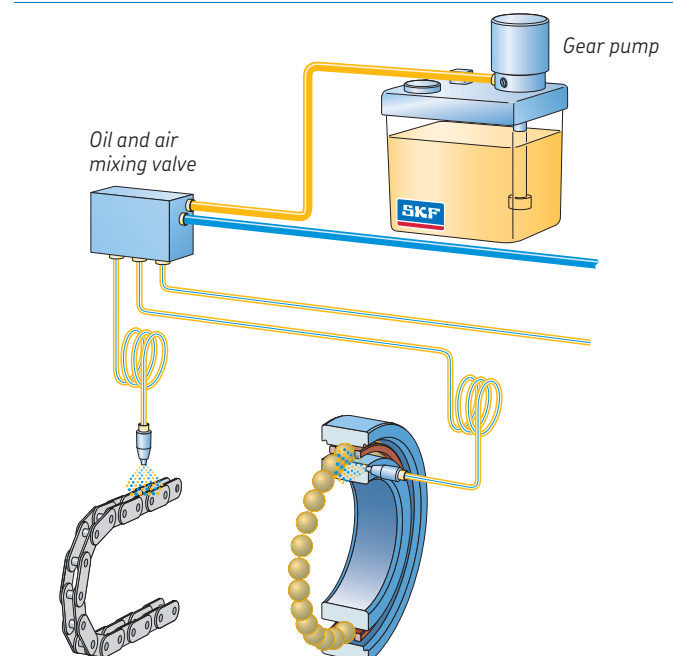
SKF Oil+Air lubrication systems are designed primarily for high speed bearings, chains and special applications in the steel industry.

A pump, progressive feeder or single line distributor injects a small metered amount of oil into a mixing valve. The air flow is set to a minimum. The oil moves slowly to the lubrication point and provides the bearing or chain with a small, continuous stream of oil and air. This means that the bearing housing is under a slight overpressure, which keeps dirt away from the sensitive bearings.

This concept creates no oil mist or oil fog, making it environmentally friendly as well.

SKF Oil+Air lubrication systems can be tailor-made and apply leading oil-streak sensor technology.

SKF Oil+Air – Oil and Air lubrication systems





Lubrication services – with a global commitment

Your success is our success. At SKF, we are determined to support you and your operation in every way possible. This means having the capability, the resources and the commitment to go the extra mile so that you can realize the true potential of lubrication.

Making the difference

Having the right lubrication partner can often be an important success factor. With SKF, you can rely on our engineers to provide leading technical support and services – when, where and how you need it. Our approach is to provide the best possible assistance for your specific requirements and challenges.



The wide and growing range of SKF lubrication services includes:

- **Client Need Analysis**
- **Audits and lubrication consultancy**
- **Return on investment calculations**
- **Installation and start-up of centralized lubrication systems**
- **Service of the existing centralized lubrication systems**
- **Oil Analysis**
- **Lubricant test to determine suitability for a centralized lubrication system**
- **Training**

Lubrication software support

Applying the right lubricant in the right amount and at the right time, even in manual relubrication procedures, is crucial. To support you, SKF has developed software solutions like Lube Select, which can assist you in determining the most suitable grease for your bearings and working conditions. Another example is DialSet.

It helps you establish the optimal relubrication interval and lubricant quantity for your application. You can of course also use it to determine the proper setting for your automatic lubrication systems – quickly and easily.

What is more, SKF Centralized Lubrication Systems can be easily integrated with condition monitoring solutions, providing operators with a complete overview of the lubrication system, including pump status and lubricant levels. For example, the SKF WindCon online condition monitoring system can be enhanced with WindLub – SKF's centralized automatic lubrication system for wind turbines. SKF has also developed VisioLub, a condition monitoring software for the lubrication system of

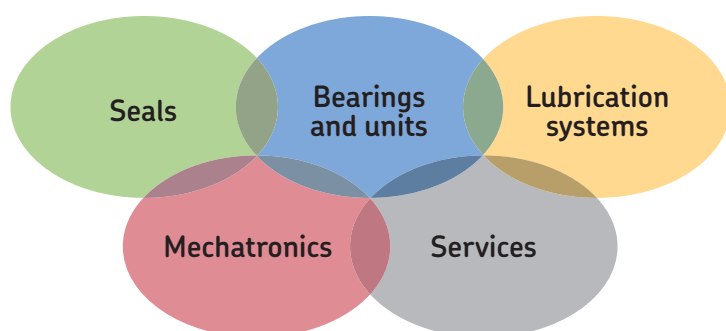
chain applications. This supports a proactive approach to maintenance that can help reduce operating costs.

Available for you – around the world

Product availability and reliability are crucial. From off-highway and machine tools to wind turbines and pulp and paper mills, time is money. When you choose SKF, you get a stable and secure global partner that is committed to supporting the success and efficiency of your operation. This means that you can expect the right SKF solution when you need it – wherever you are. Our lubrication applications centres, located on every continent, and our dedicated distributor network make it possible.

To discover how your operation can realize the true potential of lubrication, please contact your local SKF representative or visit skf.com/lubrication

*See inserts for more details about
lubrication solutions from SKF or visit
www.skf.com/lubrication.*



The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over more than 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry worldwide. These five competence areas include bearings and units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and asset management services. A global presence provides SKF customers uniform quality standards and worldwide product availability.

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