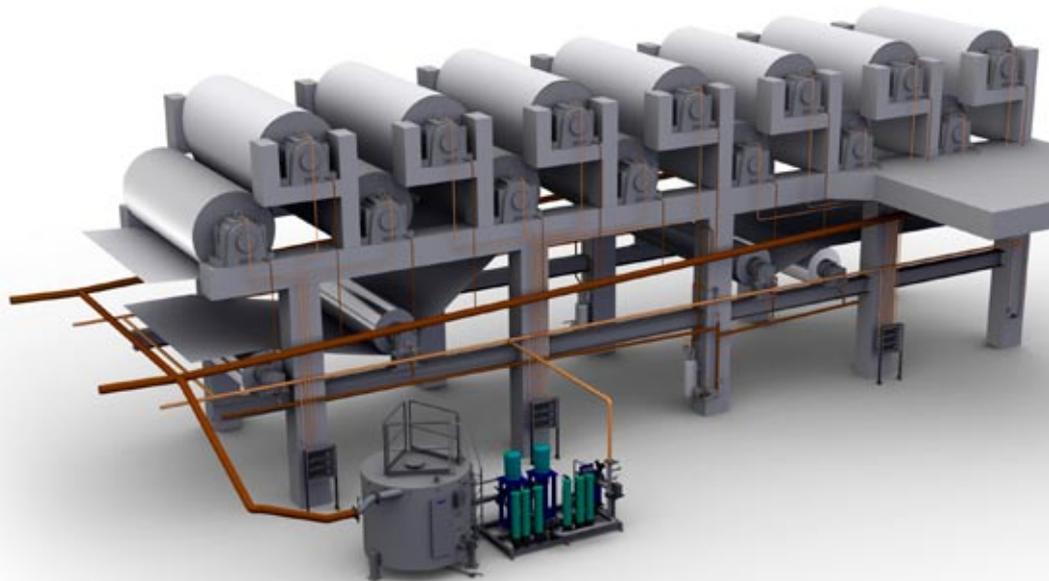


SKF Flowline

Circulating oil lubrication system



A circulating lubrication revolution

In the heavy industry, it is critical that the lubrication system must be able to deliver the right amount of cool and clean oil to the lubrication points; therefore, circulating oil lubrication systems are used.

Furthermore, the system has to work at high temperatures and eliminate contaminants such as abraded particles, oxidised particles, water, and air bubbles.

In traditional systems, less than half of the oil is in effective circulation. There has been no detailed research of oil reservoirs; therefore, large size reservoirs have typically been used. However, this results in inefficient air and water separation.



Corrects deficiencies

SKF Flowline's primary innovation is in the oil reservoir itself. SKF arrived at the solution by looking at the problem as a whole and developing a solution for the entire system.

Solves problems

The SKF Flowline oil reservoir's revolutionary construction solves the problems of oil circulation and quality:

- The reservoir's operation efficiency is over 90%.
- A superior removal of air bubbles and water.
- Reservoir volume is only 1/3 to 1/2 of that previously required.
- Saves energy and oil by using the variable frequency AC-drive.

Benefits on all levels

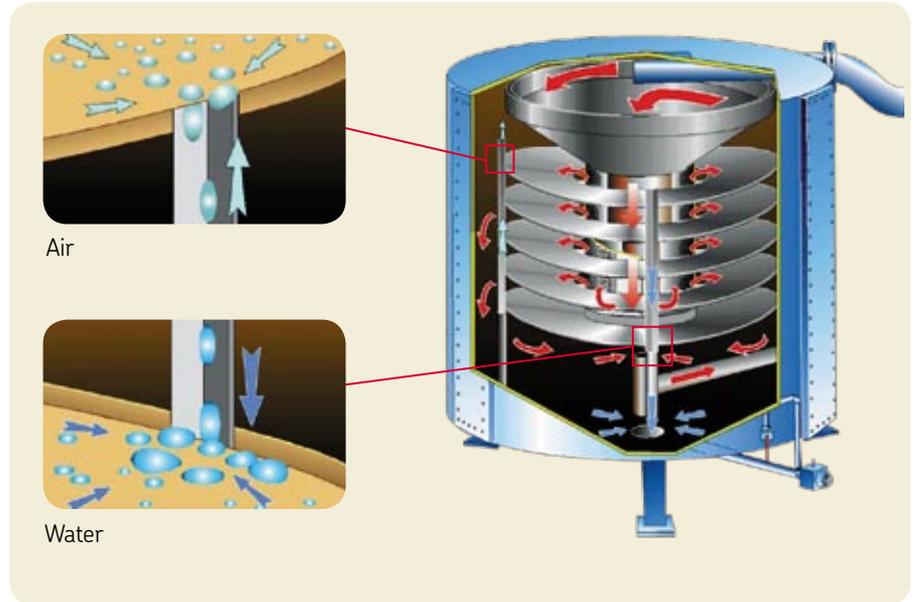
The benefits are evident on all levels:

- Optimal lubrication at every point.
- Improved utilisation ratio of the oil in the system.
- Substantial decrease in damages.
- Increased reliability.
- Lower maintenance costs.
- Improved environmental safety.
- Improved quality in the final product.

A superior solution

SKF Flowline – a superior solution compared to traditional circulation lubrication systems. Smaller oil reservoir (e.g., 3 000 l instead of the earlier 6 000 l), leading to greater efficiency and better lubrication.

- Oil reservoir efficiency rises over 90% (traditional model below 40%).
- More effective removal of water from the lubricating oil.
- More effective removal of air from the lubricating oil.
- Notable improvement in the retention time of the oil in circulation.



The figure reveals how efficiently the new SKF Flowline system separates and eliminates air and water bubbles in the oil.

SKF Flowline Centre

Designation	Flow capacity l/min	Flowline reservoir	
		gallon/min	litre gallon
SKF Flowline 300	0–30	0–8	300 79
SKF Flowline 1 000	30–100	8–26	1 000 264
SKF Flowline 3 000	100–300	26–79	3 000 792
SKF Flowline 6 000	300–600	79–158	6 000 1 585
SKF Flowline 9 000	600–900	158–238	9 000 2 377
SKF Flowline 2 x 6 000	600–1 300	158–345	2 x 6 000 2 x 1 585

Normally operating pressure is 4 to 6 bar
Max. pressure 10 bar

Comparison of SKF Flowline and traditional reservoir technology

	Size	Efficiency	Water separation	Air separation	Retention time
SKF Flowline					
Traditional					

SKF Flowline pumping unit



Every aspect has been thought out and researched

The compact and modular SKF Flowline Circulation Lubrication System Product family consists of the following components

- SKF Flowline Pumping Centre
- SKF Flowline Monitor
- SKF Flowline Sump
- SKF Flowline Control

The complete system delivery consists also of

- piping
- engineering
- installation
- system start-up/training
- documentation.

These components are used for new circulating oil lubrication projects and it is possible to upgrade older, still operational circulating oil lubrication systems to the SKF Flowline level of function and quality. All components of the SKF Flowline system support each other and represent the newest development in technology.

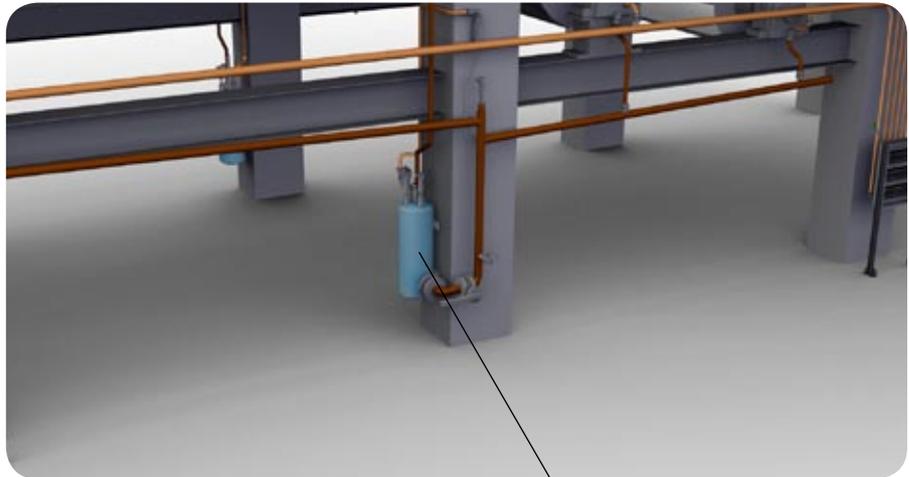
SKF Flowline Control

- Flexible modular construction.
- Automatic start-up mode.
- Interface between unit and options such as SKF Flowline Vac and sump units is easily accessible.
- External communication with other process control systems through the bus protocol or ethernet.
- Clear graphic display panel.

SKF Flowline Sump pneumatic intermediate tank

Pumping capacity

0–15 l/min (0–30 pints/min)

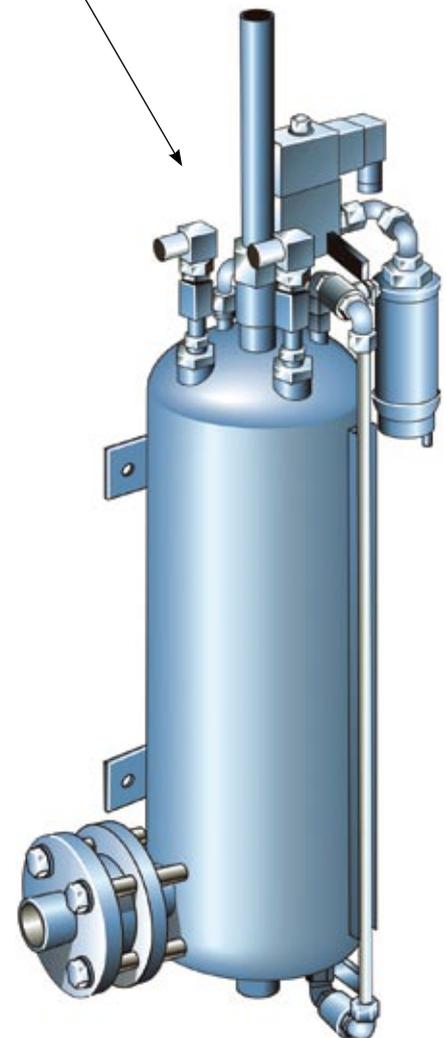


SKF Flowline Sump installation

SKF Flowline Sump pneumatic intermediate tank

Enables splitting of return piping into smaller and more cost-effective groups without trespassing machine lines and/or walkways.

- Reliable operation.
- Saves space.
- Advantageous.
- Independent.
- No pumps or motors.



SKF Flowline Sump

SKF Flowline monitor – oil flow rate monitoring system

The SKF Flowline monitor flow rate monitoring system introduces a new digital dimension for measuring and controlling circulating oil lubrication system flow rates. SKF Flowline flowmeters operate individually, can be programmed and adjusted separately.

They can be connected to a centralised control system. SKF Flowline’s user friendly visual design allows operators to see the flow rate status of each individual lubrication point from the SKF Flowline monitor.

Advantages of the SKF Flowline monitor

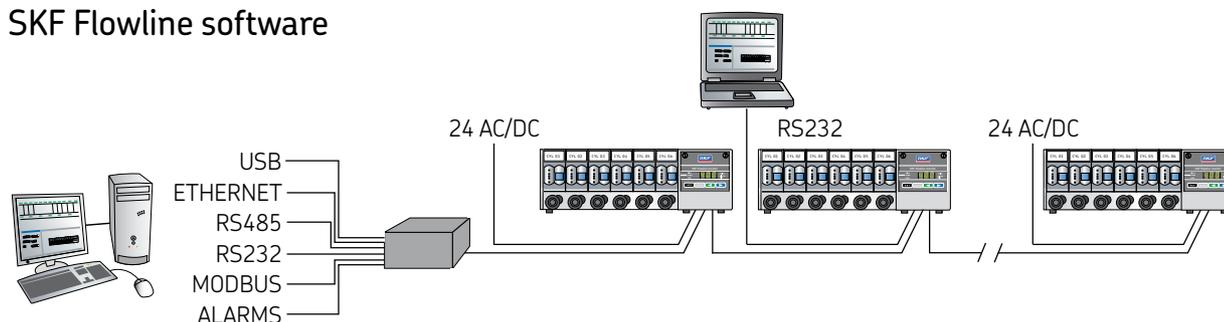
- Easily adjustable, even for small amounts of flow.
- Wide adjustment range.
- Adjustable values are easily visible.
- Practical and visual LED-indicator system.
- Clear digital display.
- Electronic temperature measurement.
- Temperature compensated flow rate measurements.
- Modern design.



SKF Flowline monitor oil flowmetering

Designation	Flow rate 220 cSt (1 000 SSU)	Number of meters	Connections Inlet threads inch	Outlet threads inch
FL15-XX	0,05–15,0 l/min (0,1–30,0 pints/min)	2, 4, 6, 8, 10	R1 (NPT 1)	R 1/2 (NPT 1/2)
FL50-XX	5,0–50,0 l/min (10,0–100,0 pints/min)	1	R 1 (NPT 1)	R 1 (NPT 1)

SKF Flowline software



SKF Flowline – the circulation lubrication

SKF is the world's leading manufacturer of automatic lubrication for demanding applications in the heavy industry.

When a company relies on SKF's lubrication systems expertise, it can then concentrate 100% on its core business. A SKF partnership agreement is the most comprehensive

form of co-operation between SKF and our customers. With this overall agreement, the responsibility for the maintenance of the lubrication systems falls heavily on SKF.



Automatic lubrication and life cycle profits

Linking automatic circulating oil lubrication systems to the whole mill's LCC/LCP* analysis gives a graphic example of how effective maintenance is in direct proportion to an early profit on the life cycle of production equipment. Instead of analysing the costs of maintenance, it's important to take into consideration the earnings lost by breakdowns that interrupt production.

A results-oriented LCC/LCP* examination aims to reduce maintenance costs in the long run; therefore, achieving a considerable improvement in the efficiency of production machinery. It is worth taking the LCC/LCP* perspective into consideration at the earliest possible moment – when you first start planning your project.

*LCC (Life Cycle Costs); LCP (Life Cycle Profits)

on system that increases uptime



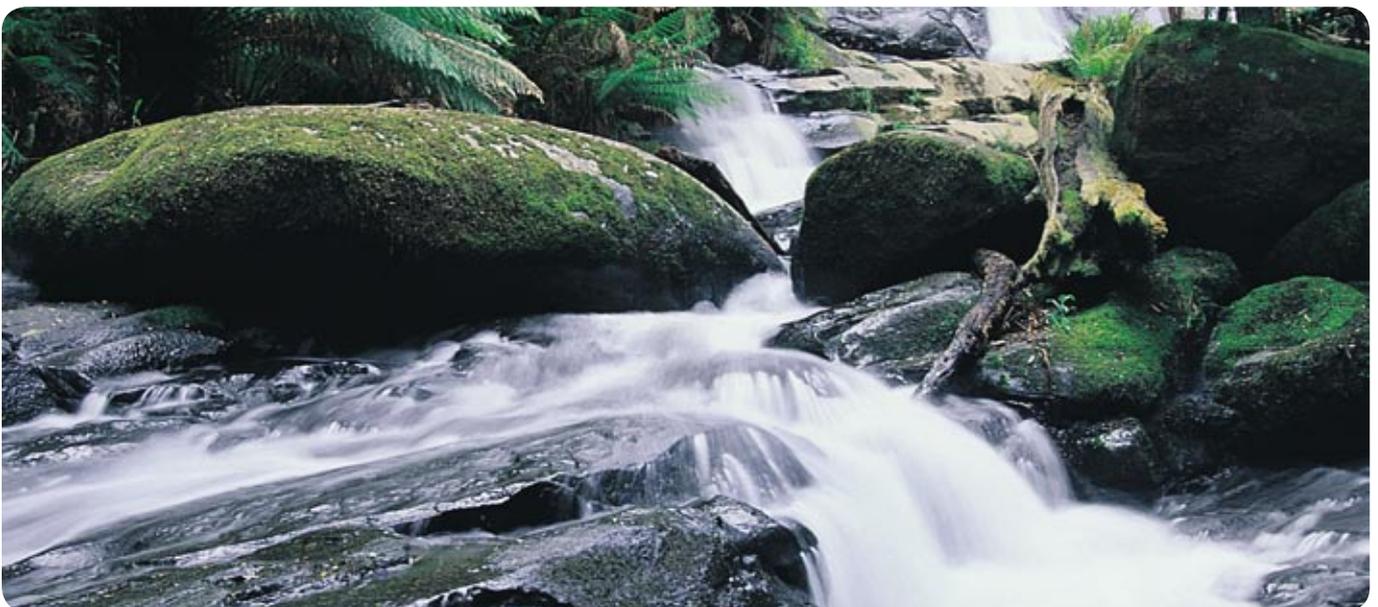
Innovative product development is at the core of SKF's philosophy

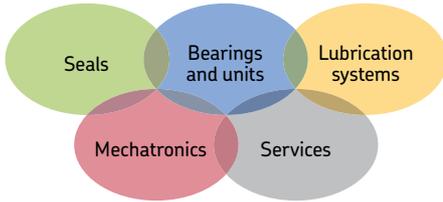
As a manufacturer of lubrication systems, SKF is continuously striving to develop new, innovative solutions to help maximize customers' production and uptime.

The development project launched by SKF, the SKF Flowline system, demanded a great amount of practical knowledge of lubrication, genuine innovation and persistent research and testing. SKF's practical know-how has been supported by a powerful re-

searcher in the process industry – the department of hydraulics at the Tampere University of Technology.

With good reason, SKF Flowline may be considered one of the most significant improvements in the history of lubrication equipment for the demanding maintenance requirements in the heavy industry.





The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over 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 systems.

A global presence provides SKF customers uniform quality standards and universal product availability.

SKF Lubrication Solutions

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