Fan upgrade service
Europe: lubrication systems

SKF Industrial Fans
Lubrication System Terms

Total-loss lubrication systems (typ grease lubrication systems):
The lubricant is fed to the friction points only once. It passes through the friction points and is not automatically collected nor used again. Continuous or intermittent lubrication.

Circulating lubrication systems:
Filtered, temperature controlled oil is pumped through the friction points and returned back to the reservoir via the return lines. As long as the lubricated machinery operates the oil is circulated.
Lubrication: Grease vs Oil

Pros and cons with grease:
+ Easy to retain in the housing
+ Good sealing function in labyrinths
+ Less costly lubrication system

- Cannot be re-circulated ("reused")
- Cannot be filtered and cooled
- Cannot be cleaned
- Limited temperature range
- Leakage of used grease

Pros and cons with oil:
+ Wide operating temperature range
+ Can be re-circulated ("reused")
+ Can be filtered and cooled
+ Long bearing service life
+ Most effective lubrication

- More costly lubrication system
- More complicated seals
Centralized grease lubrication system

Centralized grease lubrication systems are used for:

- **Improved reliability**
  - Correct lubrication at correct intervals
  - Reduce contamination

- **Reduced costs**
  - Reduce failures and downtime
  - Reduce lubrication costs

- **Improved safety**
  - Reduce exposure to dangerous locations

- **Environmental reasons:**
  - Reduce lubricant use and spillage
SKF centralized grease lubrication systems for fans

SKF recommends the following systems:

- **Progressive type system:**
  - Applications requiring more lubricant and using system 24 causes too much service work
  - Bundle of 1-3 small fans close to each other
  - No adjustment required (individual points)

- **Dual line system:**
  - When lubrication point need be individually adjusted after the installation
  - For large areas with several fans
  - For colder environment with potentially long piping runs
Centralized Lubrication Systems

Progressive systems

How system works:

- The system consists of a pump, a progressive feeder and a control unit.
- The amount of lubricant delivered by the pump is divided up by the progressive feeder and fed to the lube points.
- The lubricant is metered out via pistons.
- Each piston can discharge its lubricant only after the preceding one has discharged its.
  --> simple monitoring of lubricant delivery
Progressive type system

Electrically operated pump with a self contained reservoir and controller
Benefits of progressive systems

• Dual line system is most reliable: Compatible with most greases (progressive lube systems more sensitive to separation)
• Dosing modules are adjustable
• Dosing modules have visual indications with sensors (LG-Ind) and wide adjustable operating range
• Central alarms (visual, cellular, DCS) systems available
• Monitoring can be accomplished via GSM capability
• Compact, easy to install unit
• Heated reservoir (standard) and lines (heat trace)
Centralized Lubrication Systems

Dual-line systems

How system works:

- The two main lines are alternately pressurized.
- The metering valves operate by the pressure generated by the pump.
- There is a control and metering piston in each metering valve (no springs required).
- One metering valve can serve two lubrication points.
Dual line systems, operation principle
Small dual line systems; SKF Multilube

Video

Self contained pump with a controller and monitoring features

Adjustable dosing modules, sized per individual bearing needs. Dosing modules and bolted onto manifolds that are installed within 5-6 meters from the points
Large size dual-line system; SKF Safegrease 2

- Lubricant pumped directly from standard oil refinery barrel
- Controller and monitoring
- Adjustable dosing modules
- Options:
  - multi-channel capability
  - electronic dosing module operation monitoring
Benefits of a dual line systems

- Dual line system is most reliable grease lubrication systems
- Compatible with most greases (progressive lube systems more sensitive to separation)
- Dosing modules are adjustable and have visual indicators
- Dosing Modules can be equipped with el monitoring sensors (LG-Ind)
- Central alarms (visual, cellular, DCS) systems available
- Monitoring can be accomplished via GSM capability
- Systems can be easily expanded by added new dosing modules and nec piping
SKF circulating oil lubrication
Value proposition and solution

Reduce total cost of ownership by increasing reliability and lowering maintenance costs, by a unique combination of bearing units and dedicated lubrication systems.

The SKF solution consists of
• self-aligning bearing system
• standard SAF, SNL or SONL housings and seals.
• lubrication systems
Technical impact

Current Situation

105 °C Bearing temp. (°C)

Value for Customer

Fan speed (rpm)

75°C

Circulating lubricating oil system
(cooling and filtering system)
Circulating lubrication systems

How they work

- Conditioned (de-aerated, dried, filtered, cooled) oil is circulated through the lubrication points.
- The purpose of the system is to lubricate and very often to cool the lube point.
Circulating lubrication systems

System piping:
- Flowmeters
- System piping
- Pressure piping
- Return piping

Pumping skid:
- Reservoir with heater
- Pumps
- Heater
- Filter
- Cooler
- Flowmeters
SM-100 Oil Circulation Unit
SM-100 Oil Circulation Unit: Features

**Versatile, modular design**

- One or two pumps
- With or without air cooler
- With or without power supply unit with frequency converters
- With or without stand alone control system
- Unique filter cartridge manifold with manual by-pass and pressure relief valves plus instrumentation
- Above cartridge will eliminate several interconnecting pipes, fittings and hoses and potential other maintenance and leakage points

**Installation options**

- Digital or variable orifice flow meters
- Customized piping engineering and material package
- Installation and start up service
- Optional system piping heating in cold conditions
SM-100 Oil Circulation Unit: Benefits

- Complete compact size oil circulating lube system with all necessary functions and options
- Easy to locate and install
- Easy to start-up and use
- Easy to maintain (minimal number of interconnecting pipes, fitting etc)
- No water needed for cooling, No danger of oil leaking to water, No waste water or danger of frozen water lines
- Optional variable frequency drive (VFD) speed controllers for cooling and pumping reducing component and oil wear and considerably saving energy
SM-100 Oil Circulation Unit
Technical specification

- Tank volume: 100 liters
- Operating pressure: max. 10 bar
- Oil flow range: 2-7 l/min
- Oil viscosity in operating conditions: 30-1000 CSt
- Oil filtering rate: 5 microns
- ΔP switch (alarm at 2 bar and automatic by-pass at 3 bar)
- Manual by pass valve for on run filter change
- Visual level monitoring with low level switch
- Thermostat controlled heater of oil tank, ΔT 30 deg C/6h
- Outgoing oil temperature and pressure readings
- Variable frequency drive (VFD) air cooler of oil, 4 kW ΔT40 deg C
- Variable frequency drive (VFD) motors for pressure control
- PLC based control unit with main switch, fuse, indication lights, automatic pump change switch and alarm indicators for pressure tank temperature, dirty filter, low level
- Standard power supply 400VAC/50Hz
SM-100 Oil Circulation Unit, system alternatives

OPTIONS

Flow meters, piping materials, installation services
Oil circulation for SRB in SONL...

Size range: 517 through 534+540
2 15/16 to 5 7/16

Example designation
SONL 217-517
Seal TSO 517 or TSO 517/2.15/16

Variants: C3, K7, special drillings
Drain holes: G ¾”
Oil circulation for CARB in SONL...RA

Size range: 517 through 532 + 540 2 15/16 to 5 7/16

Example designation
SONL 217-517 RA
Seal TSO 517 or TSO 517/2.15/16

Variants: C3, K7, special drillings
Drain holes G3/4”
Oil circulation for SRB in SNL...TURT

Housing and seals supplied only as a unit
Unit range: size 34 – 96
Example designations
SNL 3136 TURT
SNL 3036 TURT
Seal type: oil seal TSD..U
Variants: C3, K7, inch
special drillings
Oil circulation for CARB in SNL...TURA

Housing and seals supplied only as a unit

Unit range: size 34 – 96 for 31 series
size 36 – 96 for 30 series

Example designations
SNL 3136 TURA
SNL 3036 TURA

Seal type: oil seal TSD..U

Variants: C3, K7, inch sizes,
special drillings
SF05/10/15 Oil Flowmeter
Safeflow features and benefits

Solid, One Piece Aluminium Body

- Does not leak
- Makes installation easy
- No interconnecting fittings
- Total installation cost lower
- Compact
- Easier to monitor
- Easier to build a panel around
- Treads do not strip
- Body will not change due to environment
Oil flow calculation program

- An oil flow calculation program will be available.
- In the meantime will Galaxy BeaTemp be the calculation tool to determine the required oil flow.
Solution summary
Heat, the limiting factor
SKF solution summary

- SNL Housing, grease lubrication and low friction seals
- Automatic grease lubrication systems
- Oil bath lubrication, SONL
- Circulating oil lubrication system
- Engineering service,
  - e.g. Cooling disc, Galaxy, BeaTemp
- Lubricant selection,
- SYSTEM 24
  - The appropriate grease, amount and method
Sales promotion material

Brochure publication number 6597

SKF fan upgrade services
One source for a full range of solutions, from unique bearing arrangements to circulating oil lubrication systems