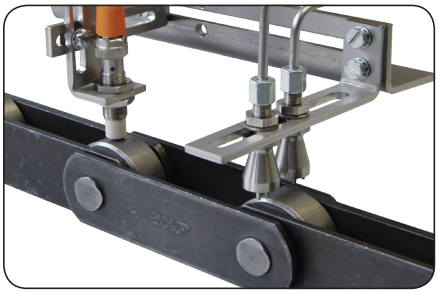
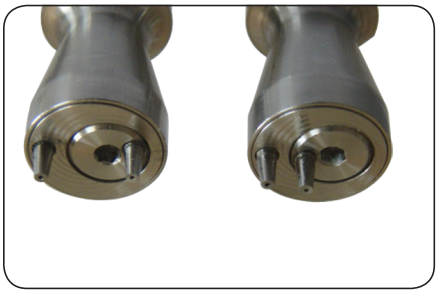
SKF ChainLube

Airless oil projection system for conveyor roller chain lubrication in food processing

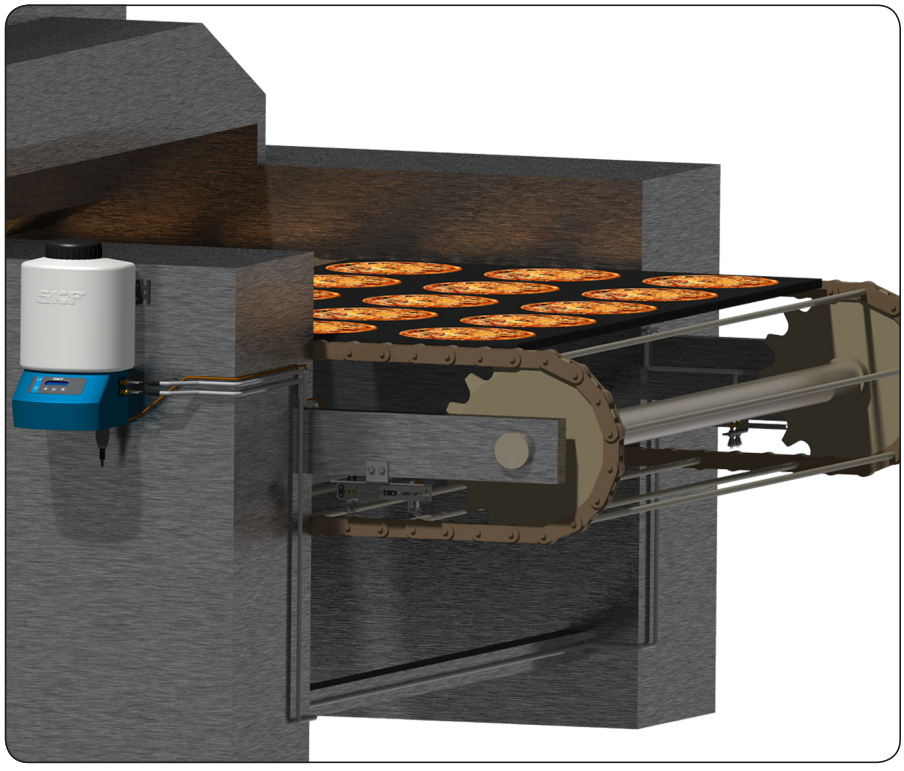




SKF ChainLube, oil projection system CLK

The SKF ChainLube airless oil projection system CLK, is a food-safe, reliable, easy-to-use solution for accurate, automatic roller chain lubrication.

The system includes a central unit that precisely delivers a metered volume of lubricant to the points of friction of each chain link whilst the chain is in operation. A control unit is preset to the preferred timing for lubricant application. Airless projection nozzles have no mechanical contact with the chains thus minimizing applicator wear and dirt accumulation. The main components are resistant to corrosion and suitable for a wide range of temperatures. All of these features make this solution suitable for the particular requirements of the Food and Beverage industry.



Advantages

- Helps prevent foreign body ingress, thereby helping producers support the HACCP* process in producing safe food
- Reduces maintenance costs (lubricants and lubrication tasks compared to manual lubrication)
- Eliminates risk of lubrication points being missed through human error
- Improves productivity by eliminating unplanned downtimes
- Longer service life resulting from reduced chain wear
- Reduces energy consumption through decreased friction
- Enhances operator safety by reducing intervention for maintenance
- Better cleanliness by reducing excess lubricant

Field of applications

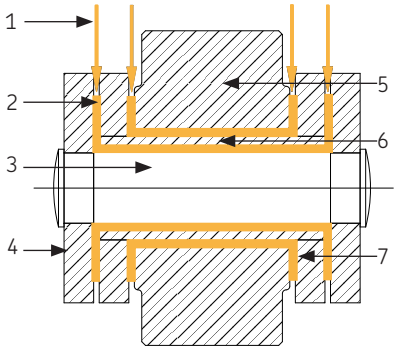
- Baking ovens, proofers, dryers in e.g. bakery plants or cereals processing
- Freezers in ice-cream and frozen food processing
- Conveyors for calibration, washing, cooking, pasteurization, etc. in fruits and vegetables processing
- Dryers, smoke houses and conveyors in meat processing
- Handling conveyors

* Hazard Analysis Critical Control Point

Oil lubrication for chain roller

Friction point
Chains have many friction points which need to be lubricated. This example shows the cross-section view of a roller chain with the different components and friction points. The lubricant flows through the different friction points by capillarity.

Capillarity
When the lubricant reaches the lubrication point, it penetrates by capillarity through the different components of the chain. A lubricant film is built up between the friction points. The aim of the film is to avoid direct surface contact, thus reducing wear and tear, noise emission and energy consumption.



1 lubricant
2 lubricant film
3 pin
4 outside link plate
5 roller
6 sleeve
7 inside link plate

Chain Speed
The CLK lubrication system has been designed for the lubrication of conveyor roller chains with a maximum speed of 3 pitches/s.

Operating temperature
The operating temperature of the lubrication system depends on the lubricant. Please consult the lubricant supplier to confirm that the lubricant meets the temperature requirements of the application.

Central unit

The compact central unit, with the protection class IP65, consists of three main elements:

Oil reservoir
The oil reservoir has a capacity of 7,5 litres. The HDPE (high-density polyethylene) translucent material makes a visual oil level check possible. Additionnaly, an electric level switch signals the minimum level directly on the central unit (LED and message on the control unit display), and is available for remote signal to the machine PLC.

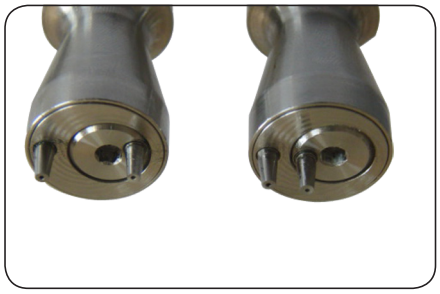
Volumetric piston pump
The volumetric piston pump delivers a precise amount of oil through four outlets which are connected to 4 mm tubes up to the nozzles. Oil delivery is cyclical and synchronized with the chain pitches for all outlets during the lubrication phase.

Control unit
The system works automatically with a succession of lubrication phases and stand-by phases – easily programmable by application. A 2x16 characters front display indicates status of the system and shows set parameters. Four push buttons are used to change lubrication parameters and give access to different displays.

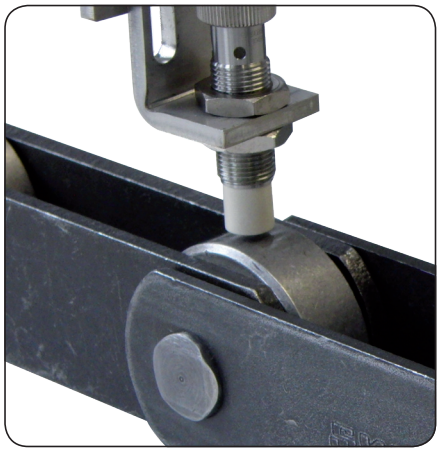
Double projection nozzles

The oil lubrication system CLK uses double projection nozzles to project the lubricant on the lubrication points.

The nozzles are simple to install and the distance between the two oil jets can be easily adjusted (using just an Allen spanner) for a precise projection on the chain rollers. The adjustable distance between the two jets is from 4,5 mm to 10 mm.



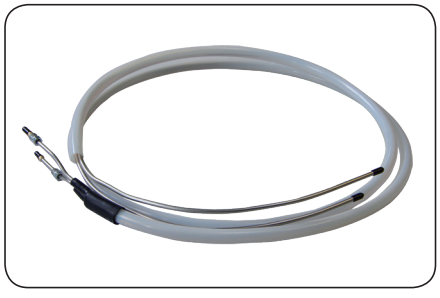
- Operating temperature: –25 to +220 °C
- Standby temperature: –40 to +220 °C
- Outflow capacity: 60 mm^3/stroke per outlet
- Stainless steel execution
- Lubricant: oil with a viscosity of 100 mm^2/s at the nozzle – measured at projection temperature



Chain roller sensor

The chain roller sensor – an inductive proximity switch – delivers an electrical signal to the control unit each time a chain roller is passing in front. This signal is used to control the volumetric piston pump when the system is in lubrication phase.

The sensor must be placed at a maximum distance of 5 mm from the object (roller) to be detected (without any mechanical contact).



Tubing

The metered lubricant quantity is delivered from the central unit to every nozzle through stainless steel tubes. Two stainless steel tubes are held in a PTFE tube to facilitate the installation and manipulation tasks. The tubes are connected to the central unit and nozzles with solderless tube unions with cutting-sleeves.

- Outside diameter 4 mm
- Length 2,5 and 5 m
- Stainless steel execution
- Temperature range: –25 to +220 °C

Automatic lubrication

The lubrication system CLK has an integrated control unit. This user -friendly control unit allows the user to set a lubrication program according to his needs. The automatic lubrication process can be intermittent , semi automatic or continuous.

Intermittent lubrication

A lubrication cycle consists of a lubrication phase, during which the lubrication points are lubricated, followed by a pause phase. There are two parameters to be set: the duration of the lubrication cycle in time and the number of chain roller to be lubricated during the lubrication phase. The length of the pause phase depends on the total number of lubrication points and the duration of the lubrication cycle.

Semi automatic lubrication

The user manually triggers the lubrication phase. This phase corresponds to the number of lubrication points set by the user. Once the last point has been lubricated, the lubrication phase is done and the system stops. The user can trigger another lubrication phase whenever necessary.

Continuous lubrication

All lubrication points are continuously lubricated as long as the chain is running and the lubrication system is powered.

The control unit also allows the user to monitor the level of lubricant in the reservoir and the proper functioning of the proximity switch. This latest function is only available for proximity switches approved by SKF.

Control unit for SKF chain lubrication system CLK

- *2 × 16 character display*
- *4 push-buttons*
- *1 failure signal LED*

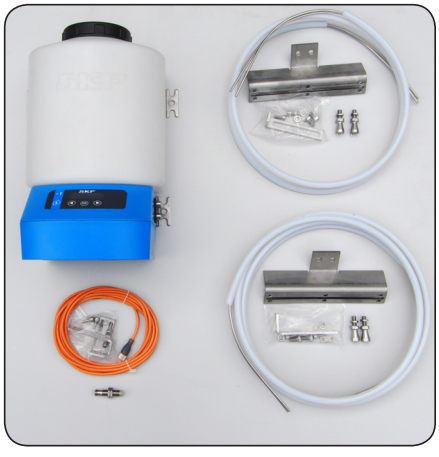
Kit

The oil lubrication system CLK is offered as a comprehensive kit. The kit gives the user all the components necessary to set up his centralized lubrication system, i.e the central unit, the nozzles, the proximity switch and all accessories and fittings.

Oil lubrication system order information

Kit No.	Description of the kit
CLK-460R-100	1 × central unit, 4 outlets, flow rate per outlet 60 mm^3/stroke, operating voltage 230 V AC, 50 Hz 1 × long tube set[1)] 1 × short tube set[1)] 2 × nozzle set[1)] 1 × proximity switch set[1)] 1 × tube cutter

1) For more detailed information on the different sets, please see the Technical data



Technical data

Central unit

Flow rate	60 mm^3/stroke and outlet
Lubricant	mineral or synthetic oil without solid additives
Viscosity	< 100 m^2/s (cSt) at projection temperature
Delivery pressure	< 100 bars
Operating frequency	< 3 strokes/s
Cycle life	20 × 10^6 cycles max.
Operating temperature	0 to 60 °C
Operating voltage	110 / 220 V AC, 50/60 Hz
Protection	IP65
Reservoir capacity	7,5 l (useful capacity)
Level monitoring	min. level switch
Material, reservoir	PEhd
Material, housing	ABS
Weight	ca. 12 kg (full reservoir)
Noise emission	< 80 dB

The central unit responds to the requirements of the following major standards

IEC 61010-01 : 03/2001	Safety compliance
IEC 61010-01 : 2010	Safety compliance
EN 61000-6-4 : 2007/A1: 2011	Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments
NF EN 60529 (2000)	Degrees of protection provided by enclosures

Set

Nozzle set

Type	two head projection nozzle
Volume	60 mm^3
Projection distance	5 to 50 mm
Lubricant	mineral or synthetic oil with a max. viscosity < 100 mm^2/s (cSt) at projection temperature
Operating temperature	–25 to +220 °C
Standby temperature	–40 to +220 °C
Lubricant inlet	for metallic tube Ø 4 mm, max. length 5 m
Weight	ca. 50 g
Material	stainless steel 304, FPM seal for the check valve
Number of nozzles	2
Accessories	holder and fittings

Proximity switch set

Proximity switch type	3 wires DC PNP
Output function	NO, normally open
Operating voltage	10 to 36 V DC
Sensing range	5 mm
Protection	IP68
Operating temperature (sensor)	0 to 100 °C
Cable length	5 m
Accessories	holder and fittings

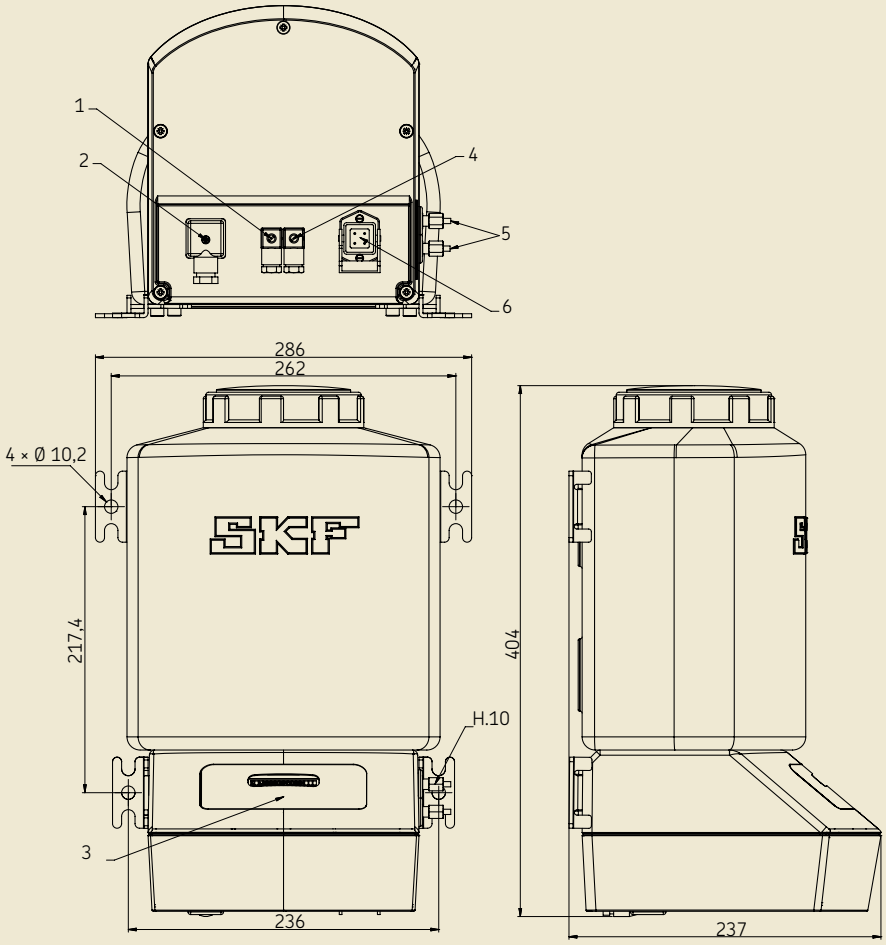
Long tube set

Diameter	4 mm – thin wall
Length	5 m
Material	stainless steel 316L annealed under PTFE holding tube
Number of tubes	2

Short tube set

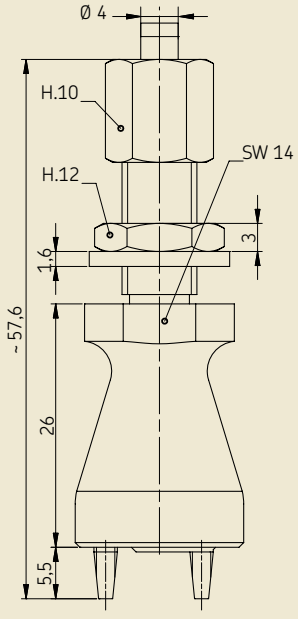
Diameter	4 mm – thin wall
Length	2,5 m
Material	stainless steel 316L annealed under PTFE holding tube
Number of tubes	2

Central unit

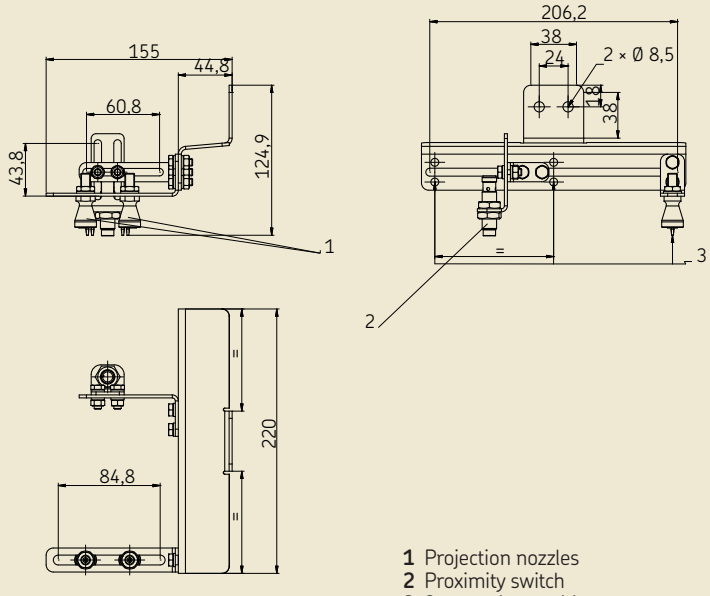


1 Level switch connector (according to the model)
2 Failure output connector
3 Control panel
4 Inductive proximity switch connector
5 4 outputs for stainless steel tube OD 4 mm
6 Power suppply connector

Stainless steel projection nozzle AC-A-420



Stainless steel support for nozzles and proximity switch



1 Projection nozzles
2 Proximity switch
3 3 mounting positions

SKF food grade chain oils for food and beverage industry

SKF chain oils were specifically developed for food and beverage applications where high temperatures, low temperatures and high humidity are the main critical parameters for the right product selection. The whole range is NSF, H1 approved, therefore fit for food and beverage and pharmaceutical industry.

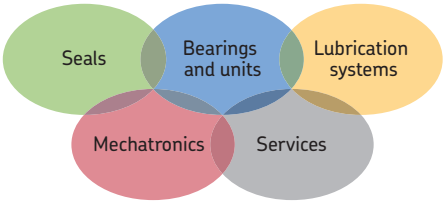
High temperature performance chain oil LFFT 220 is mainly for use in bakery ovens or other equipment subjected to high temperatures. It provides good wear protection and low evaporation losses at elevated temperatures along with excellent oxidation resistance. SKF LFFT 220 is the right choice for such applications due to its formulation and synthetic base.

Chain oil LHFP 150 excels in medium to low temperature applications such as beverage or confectionery industries. The formulation is based on a synthetic oil and the product provides good corrosion and wear protection together with good aging and oxidation stability.

High moisture chain oil LFFM 80 exhibits particularly good performance in high moisture environments such as in proofers and pasta driers as well as in applications where condensation might occur. This low viscosity semi-synthetic base oil prevents residue build-up on the chains and offers good wear and corrosion protection.

Technical data

Designation	LHFP 150	LFFM 80	LFFT 220
Description	food grade (NSF H1) oil	food grade (NSF H1) oil	food grade (NSF H1) oil
Specific gravity	0,85	0,89	0,95
Colour	colourless	white	yellow
Base oil type	synthetic ester	semi synthetic (mineral/ester)	synthetic ester
Operating temperature range	–30 to +120 °C *(–22 to +148 °F)*	–30 to +120 °C *(–22 to +148 °F)*	0 to 250 °C *(32 to +482 °F)*
Base oil viscosity			
40 °C *(104 °F)*, mm²/s	ISO VG 150	approx. 80	ISO VG 220
100 °C *(212 °F)*, mm²/s	approx. 19	approx. 10	approx. 17
Flash point	> 200 °C *(392 °F)*	> 200 °C *(392 °F)*	> 250 °C *(482 °F)*
NSF approval	H1 (No.: 136858)	H1 (No.: 146767)	H1 (No.: 146768)
Pack sizes			
Can 5 litres	LHFP150/5	LFFM 80/5	LFFT 220/5



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

Important information on product usage

All products from SKF may be used only for their intended purpose as described in this brochure and the operating instructions. If operating instructions are supplied together with the products, they must be read and followed.

Not all lubricants can be fed using centralized lubrication systems. SKF can, on request, inspect the feedability of the lubricant selected by the user in centralized lubrication systems. Lubrication systems and their components manufactured by SKF are not approved for use in conjunction with gases, liquefied gases, pressurized gases in solution, vapors or such fluids whose vapor pressure exceeds normal atmospheric pressure (1 013 mbar) by more than 0,5 bar at their maximum permissible temperature.

In particular, we call your attention to the fact that hazardous materials of any kind, especially the materials classified as hazardous by EC Directive 67/548/EEC, Article 2, Para. 2, may only be filled into SKF centralized lubrication systems and components and delivered and/or distributed with the same after consultation with and written approval from SKF.

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