SKF Dry Lubrication Systems for conveyors

- Autonomous system for up to 200 lubrication points
- Lubrication of the conveyor chain surfaces and guides
- Intermittent lubrication controlled and monitored by an integrated control unit
- PTFE-based dry film lubricant, no water or soluble lubricants
The SKF Dry Lubrication Systems, using a special lubricant, have been developed to lubricate conveyor chain surfaces, as well as chain guides, for the transport of products in bottling and packaging unit.

The association of this special lubricant and the SKF Dry Lubrication System replace the classic wet lubrication systems. This lubricant, suitable for the food and beverage industry, leaves a dry film on the chain surfaces and guides for a better sliding quality.

The aim of the SKF Dry Lubrication Systems is to deliver automatically and precisely the right quantity at the right friction point (chain surface or guides) from a central unit, which can feed up to 200 lubrication points in accordance with the production process.

The central unit supplies the lubricant to the volumetric distributors via the primary circuits.

It comprises the pneumatically driven pump unit and the lubricant reservoir. A control unit is integrated in the central unit. It controls and monitors the whole lubrication system.
The lubrication of the chain guides

The preset piston distributors feed the chain guides with lubricant. They deliver intermittently a metered volume of lubricant via a secondary line to lubrication screws, which are inserted into the guide.

The lubrication of the chain surfaces

The piston distributors, with adjustable metered volume, feed the chain surfaces with lubricant. They deliver intermittently a metered volume of lubricant via a secondary line to lubrication plates, which are located under the chain at the end of the return strand. The chain surface sliding on the lubrication plate will be coated with lubricant.
Central unit

This stainless steel central unit comprises all the components necessary to supply the lubrication circuits:

- Pneumatically driven piston pump unit to feed the lubrication lines with lubricant
- Two lubricant outlets (circuit for the lubrication of the chain surfaces and circuit for the lubrication of the chain guides)
- Reservoir with an useful capacity of 10 liters with sight glass to check the lubricant level and agitator
- Regulator-filter and manometer outside the central unit of the pressurized air supply
- Integrated control unit with LCD display and keyboard. This allows the user to program the lubrication parameters on the control unit and to monitor the system.
- Light signal displays the status of the lubrication cycle. The user can get more detailed information from the control unit display.
- Lubricant pressure is monitored at the pump outlet using a pressure switch and manometer.
- Intermediate lubrication switch to launch an additional lubrication cycle at any time.
### Technical data

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of lubrication points</td>
<td>max. 200</td>
</tr>
<tr>
<td>Circuit length</td>
<td>max. 200 m for each circuit</td>
</tr>
<tr>
<td>Air inlet pressure</td>
<td>4 to 10 bars</td>
</tr>
<tr>
<td>Air inlet pressure set at</td>
<td>5 bars</td>
</tr>
<tr>
<td>Air consumption</td>
<td>2 Nl/min</td>
</tr>
<tr>
<td>Pump flow rate</td>
<td>20 cm³/stroke</td>
</tr>
<tr>
<td>Pump working frequency</td>
<td>1 stroke/5 s</td>
</tr>
<tr>
<td>Pump pressure ratio</td>
<td>1:4</td>
</tr>
<tr>
<td>SKF Lubricant</td>
<td>LDT5 1</td>
</tr>
<tr>
<td>Other lubricants</td>
<td>please, consult us</td>
</tr>
<tr>
<td>Reservoir capacity</td>
<td>total 13 l, useful 10 l</td>
</tr>
<tr>
<td>Service temperature</td>
<td>0 to 50 °C</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>88 to 250 V AC</td>
</tr>
<tr>
<td>Frequency</td>
<td>47 to 63 Hz</td>
</tr>
<tr>
<td>Current max.</td>
<td>1 A</td>
</tr>
<tr>
<td>Protection</td>
<td>IP54</td>
</tr>
</tbody>
</table>

### Order information

**LS central unit**
- **Order No.** LS1200+1ES

See important product usage information on the back cover. See operating instruction 951-130-461.

### Material of the components

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
<th>Seals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabinet</td>
<td>stainless steel 304</td>
<td></td>
</tr>
<tr>
<td>Pump</td>
<td>stainless steel 303, seals FKM</td>
<td></td>
</tr>
<tr>
<td>Solenoid valve circuit 2</td>
<td>stainless steel 303, seals FKM</td>
<td></td>
</tr>
<tr>
<td>Solenoid valve, relief</td>
<td>stainless steel 316L, seals FKM</td>
<td></td>
</tr>
<tr>
<td>Manometer</td>
<td>stainless steel 304L</td>
<td></td>
</tr>
<tr>
<td>Lubricant pressure switch</td>
<td>stainless steel 303, seals FKM</td>
<td></td>
</tr>
</tbody>
</table>
**Function**

A pneumatically driven piston pump supplies lubricant to the lubrication circuits. The pressurized air comes from the user network and is regulated (R1) at 5 bars and filtered (FI) before entering into the central unit. The pump sucks the lubricant from the reservoir, which is under the central unit. An agitator (AG) is regularly actuated to ensure the homogeneity of the lubricant.

At the beginning of the lubrication cycle (the length is adjustable) the control unit launches a lubrication phase. The pneumatic pump (P) is actuated via the solenoid valve (Y2). It has a working frequency of 1 stroke/5 s for a flow rate of 20 cm³/stroke. It delivers lubricant to the first circuit (C1), for the lubrication of the chain surfaces. The relief solenoid valve (Y1) is closed to prevent the lubricant to flow back to the reservoir.

When the operating pressure of 12 bars has been reached at the pump outlet, the pressure switch SPO is activated. The pump keeps running during a preset time (holding time, set at 60 s) to be sure to reach the optimal lubrication pressure (ca. 20 bars) over the whole circuit. Manometers (MA2) are mounted at the end of the circuit, before the last distributors, to check the pressure build-up in each circuit.

When the holding time has elapsed, the pump is switched off. The relief solenoid valve Y1 is opened and the pressure in the circuit begins to relieve.

The lubrication of the chain guides is performed with the second circuit (C2), which operating frequency depends on the operation of the first circuit. When the first circuit has carried out n lubrication cycles (adjustable), the control unit opens a solenoid valve (Y3). The pump is now supplying lubricant to both circuits.
Integrated control unit
The central unit has an integrated control unit. The user can set the lubrication parameters according to his needs.

This control unit is very easy to use. The user can see on the LCD display the evolution of the lubrication cycles and eventually read the warning and failure messages. The control unit has nine keys to adjust and navigate between the parameters.

- Independent control of the lubrication cycles for the lubrication of the chain surfaces and chain guides.
- Real time display of the evolution of the lubrication cycle
- Selection of 1 or 2 lubrication circuits
- Lubricant level monitoring
- Lubricant pressure monitoring
- Four languages available for the standard version (English, French, German and Spanish)
- Password protected parameters

Lubrication parameters

Lubrication cycle time
The lubrication cycle time is the time between two starts of lubrication cycles.

The lubrication cycle comprises:
- The lubrication phase: the pump is running and a metered quantity of lubricant is delivered to every lubrication point.
- The lubrication phase: the pump is not running.

Lubrication cycle time \( T_c \)

\[ 5 \text{ min} < T_c < 99 \text{ h 59} \]

Lubrication frequency
The lubrication circuit 2 is dedicated to the lubrication of the chain guides. Generally the guides don’t need to be lubricated as often as the chain surfaces. Therefore the lubrication of circuit 2 can be carried out once every \( n \) lubrication cycles of circuit 1.

Lubrication frequency of circuit 2 \( n \)

\[ 1 < n < 99 \]
The volumetric piston distributors LS21.. meter and deliver the lubricant to the lubrication plate for the conveyor chain surfaces.

- **Volumetric metered volume adjustable** from 0,025 to 0,5 cm\(^3\) per cycle independently of the viscosity and back-pressures
- Connection with quick-release connector
- **Stainless steel** (except the connector for tube Ø 8 and Ø 4)

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**LS21..**

1) Quick connector for tube Ø 4
2) Adjustable metering unit
3) Manifold
4) Quick connector for tube Ø 8
5) Adjusting screw of the metering unit
### Technical data

**LS21..**
- **Number of outlet(s)**: 1 to 5
- **Metering unit**: adjustable flow rate 0.025 to 0.5 cm³/stroke
- **Inlet pressure**: 12 to 20 bars
- **Outlet pressure**: ca. 12 to 20 bars
- **Service temperature**: 0 °C to 50 °C
- **Working frequency**: ≤ 1 stroke/2 s
- **Lubricant SKF**: LDTS 1
- **Other lubricants**: please, consult us
- **Manifold**: quick-release connector for tube Ø 8
- **Metering unit outlet**: quick-release connector for tube Ø 4

**Material**
- **Metering unit**: stainless steel 303
- **Manifold**: stainless steel 303
- **Connector for tubes Ø 4 and Ø 8**: high phosphorus FDA chem. nickel-plated brass

### Order information

### Adjustable distributor

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Outlet(s)</th>
<th>Size A</th>
<th>Size B</th>
<th>Size C</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS2110</td>
<td>1</td>
<td>-</td>
<td>50</td>
<td>89</td>
</tr>
<tr>
<td>LS2120</td>
<td>2</td>
<td>-</td>
<td>65</td>
<td>104</td>
</tr>
<tr>
<td>LS2130</td>
<td>3</td>
<td>25</td>
<td>90</td>
<td>129</td>
</tr>
<tr>
<td>LS2140</td>
<td>4</td>
<td>50</td>
<td>115</td>
<td>154</td>
</tr>
<tr>
<td>LS2150</td>
<td>5</td>
<td>75</td>
<td>140</td>
<td>179</td>
</tr>
</tbody>
</table>

### Adjustment of the metering rate of the distributor LS21..

- Remove the secondary line (1) (quick-release connector)
- Insert the adjustment screwdriver (2) into the metering unit outlet
- Set the metering unit to the minimal flow rate (25 mm³ per stroke), therefore turn the screwdriver clockwise till stop
- Adjust the flow rate according to your needs turning the screwdriver counter-clockwise (3). A full turn of the screwdriver corresponds to a flow rate of 25 mm³ per stroke.
- Reconnect the secondary line to the distributor outlet
The volumetric piston distributors LS22.. meter and deliver the lubricant to the lubrication screw for the conveyor chain guides.

- **Preset volumetric metered volume** of 0.010 cm³ per cycle independently of the viscosity and back-pressures
- Connection with **quick-release connector**
- **Stainless steel** (except the connector for tube Ø 8 and Ø 4)
SKF Dry Lubrication Systems for conveyors

### Technical data

<table>
<thead>
<tr>
<th>LS22..</th>
<th>Number of outlet(s)</th>
<th>1 to 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metering unit</td>
<td>0.010 cm³ per stroke and outlet</td>
<td></td>
</tr>
<tr>
<td>Inlet pressure</td>
<td>12 to 20 bars</td>
<td></td>
</tr>
<tr>
<td>Outlet pressure</td>
<td>ca. 12 to 20 bars</td>
<td></td>
</tr>
<tr>
<td>Service temperature</td>
<td>0 °C to 50 °C</td>
<td></td>
</tr>
<tr>
<td>Working frequency</td>
<td>≤ 1 stroke/2 s</td>
<td></td>
</tr>
<tr>
<td>Lubricant SKF</td>
<td>LDTS 1</td>
<td></td>
</tr>
<tr>
<td>Other lubricants</td>
<td>please, consult us</td>
<td></td>
</tr>
<tr>
<td>Manifold</td>
<td>quick-release connector for tube Ø 8</td>
<td></td>
</tr>
<tr>
<td>Metering unit outlet</td>
<td>quick-release connector for tube Ø 4</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>stainless steel 303</td>
<td></td>
</tr>
<tr>
<td>Metering unit</td>
<td>stainless steel 303</td>
<td></td>
</tr>
<tr>
<td>Manifold</td>
<td>stainless steel 303</td>
<td></td>
</tr>
<tr>
<td>Connector for tubes Ø 4 and Ø 8</td>
<td>high phosphorus FDA chem. nickel-plated brass</td>
<td></td>
</tr>
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</table>

### Order information

<table>
<thead>
<tr>
<th>Order information</th>
<th>Volumetric distributor LS22..</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No.</td>
<td>Outlet(s)</td>
</tr>
<tr>
<td>LS2210</td>
<td>1</td>
</tr>
<tr>
<td>LS2220</td>
<td>2</td>
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<tr>
<td>LS2230</td>
<td>3</td>
</tr>
<tr>
<td>LS2240</td>
<td>4</td>
</tr>
<tr>
<td>LS2250</td>
<td>5</td>
</tr>
</tbody>
</table>
Lubrication plate

The lubrication plate is designed for the lubrication by coating of the chain surfaces.

The lubrication plate is located under the chain, at the end of the return side. It is fed lubricant by a distributor LS21.., which meters the volume of lubricant. The chain surface sliding on the lubrication plate will be coated with lubricant.

The lubrication plate can either be mounted on a conveyor with rollers or serpentines. It is fastened with plastic collars.

Order information

Lubrication plate, complete
size A = 500 mm, delivered with elbow quick-release connector for tube Ø 4 and clamp collars
Order No. ...................................... LS3110
size A = 800 mm, delivered with elbow quick-release connector for tube Ø 4 and clamp collars
Order No. ...................................... LS3210

Components
Lubrication plate .................................. 500 or 800 mm, polyethylene
Clamp collar ...................................... polyamide
Quick-release connector ......................... elbow, for tube Ø 4

Lubrication plate on rollers

1) Lubricant outlet
2) Chain
3) Lubrication plate
4) Conveyor roller
5) Clamp collar
6) Quick-release connector

Lubrication plate on serpentine

1) Lubricant outlet
2) Chain
3) Lubrication plate
4) Serpentine
5) Clamp collar
6) Quick-release connector
LS lubrication screw

The chain guides are lubricated with **lubrication screws**, which are directly inserted at the beginning of the carrying side of the chain. The lubrication screws are fed in lubricant by the distributor LS22... with preset metering rate.

The secondary lines are connected with elbow or straight quick-release connector.

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**Order information**

**LS lubrication screw, complete**
with elbow quick-release connector for tube Ø 4,
Order No. .................................... LS4100

**Components**
Lubrication screw .................. M6×50, stainless steel 303
Washer ................................. Ø 6, stainless steel 304
Nut .......................................... M6, stainless steel 304
Quick-release connector .......... elbow, for tube Ø 4

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**Order information**

**LS lubrication screw, complete**
with straight quick-release connector for tube Ø 4,
Order No. .................................... LS4110

**Components**
Lubrication screw .................. M6×50, stainless steel 303
Washer ................................. Ø 6, stainless steel 304
Nut .......................................... M6, stainless steel 304
Quick-release connector .......... straight, for tube Ø 4

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**Note!**
The guides of the chain have to be previously drilled before fitting the lubrication screws.
### Fittings and Accessories

#### Fittings and accessories for the distributors

**Plug**
To plug an unused outlet of the distributor manifold (when a metering unit is removed).

Order No. ............ LS5050

<table>
<thead>
<tr>
<th>Plug</th>
<th>Connection</th>
<th>M10-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seal</td>
<td>NBR</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>stainless steel 316</td>
<td></td>
</tr>
<tr>
<td>Pressure max.</td>
<td>400 bars</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>~20 °C to +120 °C</td>
<td></td>
</tr>
</tbody>
</table>

![LS5050](image)

**Plug**
Plug for the distributor manifold, which is at the end of the circuit.

Order No. ............ LS5051

<table>
<thead>
<tr>
<th>Plug</th>
<th>Connection</th>
<th>G 1/4”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seal</td>
<td>NBR</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>stainless steel 316</td>
<td></td>
</tr>
<tr>
<td>Pressure max.</td>
<td>400 bars</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>~20 °C to +120 °C</td>
<td></td>
</tr>
</tbody>
</table>

![LS5051](image)

**Union**
This union makes possible to connect two distributors together. This union is inserted into the quick-release connector of the other manifold.

Order No. ............ LS5014

<table>
<thead>
<tr>
<th>Union</th>
<th>Material</th>
<th>high phosphorus FDA chemical nickel-plated brass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure max.</td>
<td>20 bars</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>~20 °C to +120 °C</td>
<td></td>
</tr>
</tbody>
</table>

![LS5014](image)

**Mounting kit**
For mounting the distributors on the conveyor frame. The kit comprises 25 pieces of: screw, washer and nut.

Order No. ............ LS5019

<table>
<thead>
<tr>
<th>Mounting kit</th>
<th>Screw, washer and nut.</th>
<th>stainless steel 304</th>
</tr>
</thead>
</table>

![LS5019](image)

**Elbow quick-release connector**
For the connection of a primary line to a distributor. It replaces a straight quick-release connector.

Order No. ............ LS5019

<table>
<thead>
<tr>
<th>Elbow quick-release connector</th>
<th>Connection</th>
<th>G 1/4 for tube Ø 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>high phosphorus FDA chemical nickel-plated brass</td>
<td></td>
</tr>
<tr>
<td>Pressure max.</td>
<td>20 bars</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>~20 °C to +120 °C</td>
<td></td>
</tr>
</tbody>
</table>

![LS5019](image)
Lubrication lines

Primary lines
Tube 5.5×8, green
Order No. LS5041*
Tube 5.5×8, white
Order No. LS5042*

Secondary lines
Tube 2.5×4, neutral
Order No. LS5040*

Tee
Quick-release Tee connector for tube Ø 8 (primary circuit)
Order No. LS5015

Union
Union for tube Ø 8 (primary circuit)
Order No. LS5017
Elbow union for tube Ø 8
Order No. LS5018

Mounting clips
Mounting of the primary circuits along the conveyor frame.
Clip for two circuit
Order No. LS5091
Clip for one circuit
Order No. LS5093
Fixing kit see LS5102

Primary line tube
Material: polyamide 12
Pressure max.: 49 bars at 20 °C
Temperature: -10 °C to +50 °C
Color: green or black

Secondary line tube
Material: polyamide 12
Pressure max.: 30 bars at 20 °C
Temperature: -10 °C to +50 °C
Color: neutral

Tee
Material: high phosphorus FDA chemical nickel-plated brass
Pressure max.: 20 bars
Temperature: -20 °C to +120 °C

Union
Connection: for tube Ø8
Material: high phosphorus FDA chemical nickel-plated brass
Pressure max.: 20 bars
Temperature: -20 °C to +120 °C

Mounting clips
Clip
Material: polypropylene

Note!
SKF recommends to distinguish the two primary circuits (for distributors LS21.. and LS22..) using two different colors of tube.
Identification rings
Rings to identify the secondary lines.
Bag: 100 rings 5 colors (orange, red, green, black, yellow)
Order No. ............ LS5094

Plastic collars
For primary and secondary lines.
100 pieces in one bag.
Order No. ............ LS5090

Tube bushing
To let the secondary lines through the conveyor frame
Tube bushing for 1 to 8 tubes
Order No. ............ LS5092

Tube cutter
For Rilsan tube Ø 4 to Ø 12
Order No. ............ LS5096

Screwdriver
To adjust the metering rate of the adjustable distributors (LS21..)
Order No. ............ LS5095
Manometer
SKF recommends putting a manometer at the end of the primary circuit to check the pressure build-up.

Manometer complete, with manometer, manifold and quick-release couplings for inlet and outlet, fixing screw, nut and washer.

Order No. ................. LS5210

Tripod
Tripod for the central unit. The central unit is fastened with two mounting flanges. It is possible to fasten the tripod to the conveyor frame with a third bar to ensure the stability.

The tripod is delivered with the mounting bars for the central unit and the conveyor frame.

Order No. ................. LS1090
SKF Dry Lubrication Systems for conveyors

LDTS 1
SKF Dry Film Lubricant

SKF Dry Film Lubricant LDTS 1 is specially developed for automatic lubrication of flat top chains conveyors in the beverage processing industry. The lubricant consists of synthetic oil and is doped with PTFE as solid lubricant. LDTS 1 is NSF* H1** certified for use where incidental contact with food cannot be excluded.

- NSF H1 certified
- Recommended for conveyors using plastic chains
- Excellent lubricating properties

Typical applications:

- Conveyors in bottling lines
- Applications for the following packaging types:
  - Carton packs
  - Cans
  - PET bottles

* NSF – National Sanitation Foundation
** H1 – Incidental Contact with Food

Technical data

<table>
<thead>
<tr>
<th>Designations</th>
<th>LDTS 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>SKF Dry Film Lubricant</td>
</tr>
<tr>
<td>Composition</td>
<td>Mineral oils, hydrocarbons, additives, PTFE</td>
</tr>
<tr>
<td>Color</td>
<td>White</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-5 to +60 °C (23 to 140 °F)</td>
</tr>
<tr>
<td>Viscosity at 40 °C/104 °F</td>
<td>ca. 11 mm²/s</td>
</tr>
<tr>
<td>Pour point, °C</td>
<td>&lt; 0</td>
</tr>
<tr>
<td>Density (20 °C/68 °F)</td>
<td>ca. 843 kg/m³</td>
</tr>
<tr>
<td>Flash point of the preparation</td>
<td>ca. 100 °C</td>
</tr>
<tr>
<td>Flash point after evaporation of the solvent</td>
<td>&gt; 170 °C</td>
</tr>
<tr>
<td>NSF registration</td>
<td>H1 (registration no: 139739)</td>
</tr>
<tr>
<td>Available pack size</td>
<td>5 liter can</td>
</tr>
</tbody>
</table>
Important product usage information
All products from SKF may be used only for their intended purpose as described in this brochure and in any instructions. If operating instructions are supplied with the products, they must be read and followed.

Not all lubricants are suitable for use in centralized lubrication systems. SKF does offer an inspection service to test customer supplied lubricant to determine if it can be used in a centralized system. SKF lubrication systems or their components are not approved for use with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1013 mbars) by more than 0.5 bar at their maximum permissible temperature.

Hazardous materials of any kind, especially the materials classified as hazardous by European Community Directive EC 67/548/EEC, Article 2, Par. 2, may only be used to fill SKF centralized lubrication systems and components and delivered and/or distributed with the same after consulting with and receiving written approval from SKF.