

Selection Of Lubrication

■ Lubrication of chain depends on the working environment, temperature, chain speed and so on.

1. Influence of working environment

For open drive chains such as combine chains & swather chain, grease lubrication is recommended.

For closed drive chains such as walking tractor chain & transmission case, oil lubrication is recommended.

2. Influence of temperature

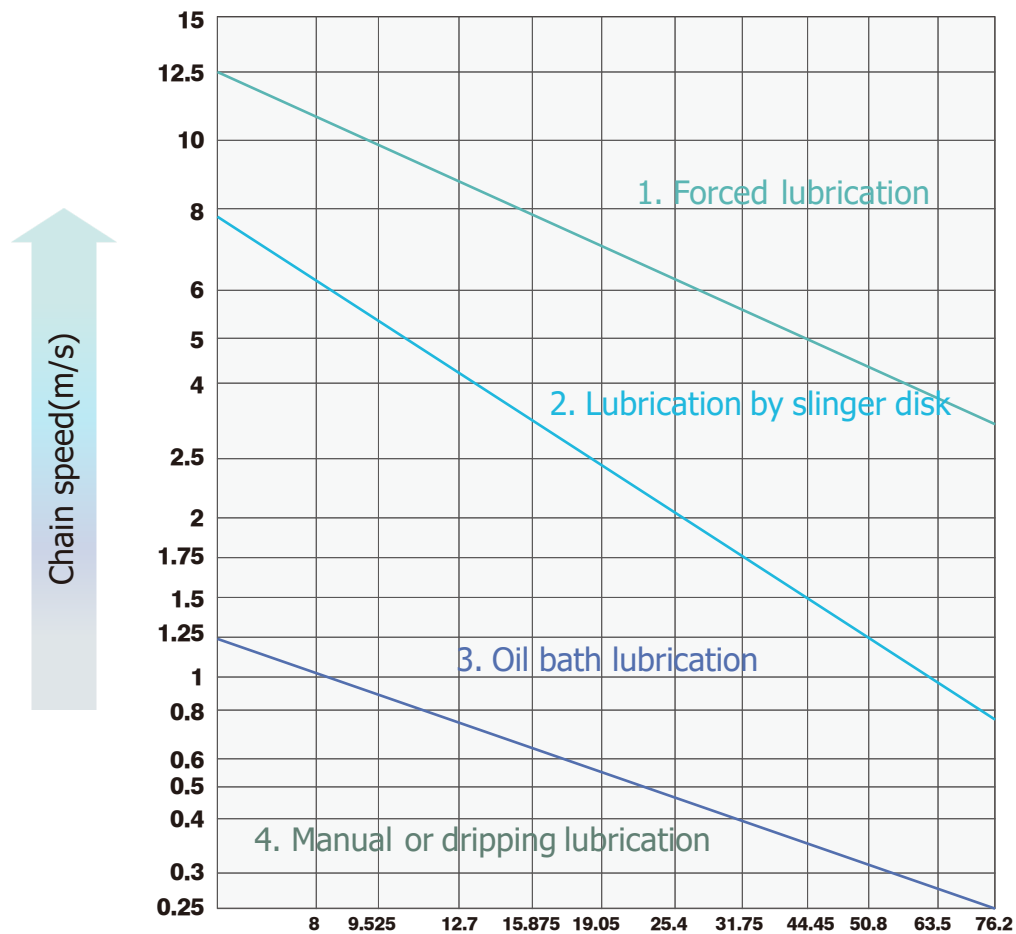
Applications in the temperature range of -5°C to +60°C is recommended.

In winter, a lower viscosity oil is recommended. In summer, higher viscosity oil is recommended.

3. Influence of chain speed

The lubrication method is dependent on the chain speed.

Refer to the following chart for details:



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Wear is mainly caused by bearing pressure, angle-sliding movements of the pins and rotation of the rollers etc.. Effective lubrication of the chain hinges is utmost important for reducing wear, power loss and noise etc. effectively.

Curve 1:

Without lubrication - Chain would be worn out and destroyed within a very short time.

Curve 2:

Optimum initial lubrication only - High wear would occur within a short time after the lubricant has been used up.

Curve 3:

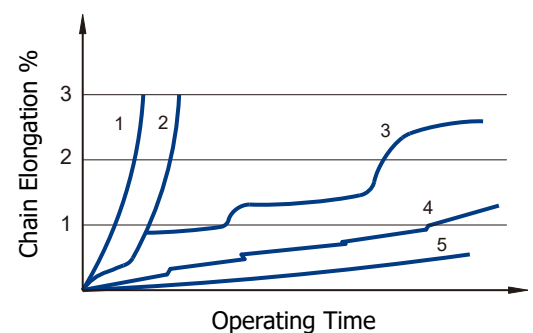
Manual lubrication - Intermittent dry rub frequently occurs, especially when regular periodical relubrication is not well implemented.

Curve 4:

Incorrect lubrication - Uneven chain wear results from incorrect lubrication.

Curve 5:

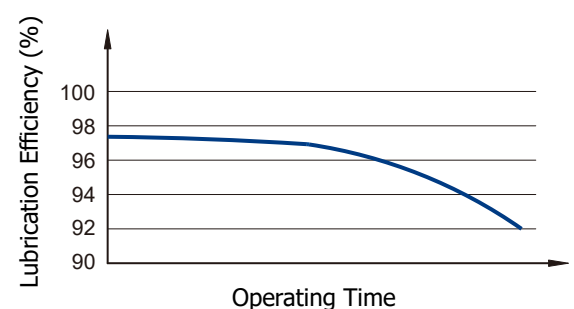
Correct lubrication - The right lubrication is critical to obtain an optimum service life.



■ Lubrication and efficiency

Relubrication shall be done before discoloration of the rub surface which indicates the lubrication failure of the former lubrication. The specific lubrication intervals shall be determined by tests based on specific conditions and running conditions.

The right graph shows the efficiency of lubrication decrease with operating time.

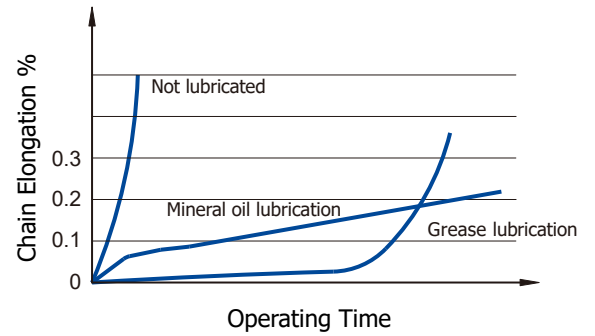


Selection Of Lubrication

■ Lubricant

First of all, the selection of an appropriate lubricant depends on the type of lubrication.

Just as the right diagram shows, low viscosity mineral oils are particularly suitable for chain drives.

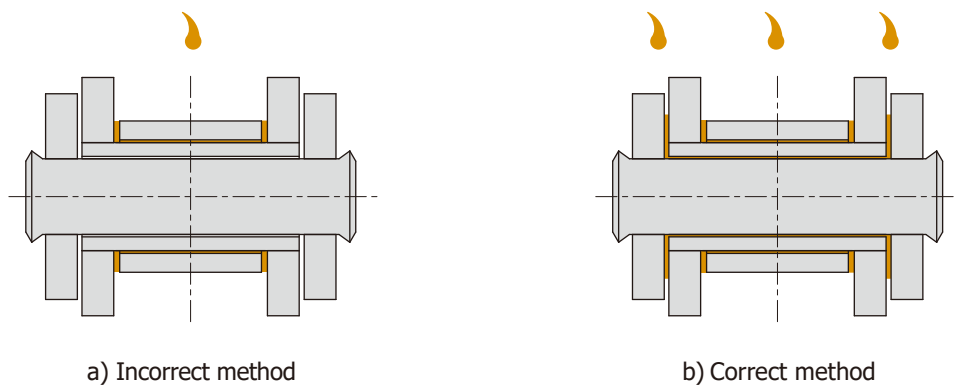


■ Recommended Viscosity

Ambient temperature °C	Viscosity of lubricant
-5°C ~ +25°C	N100 (ISO VG 100)
+25°C ~ +45°C	N150 (ISO VG 150)
+45°C ~ +60°C	N220 (ISO VG 220)

For higher temperatures (e.g. Furnace chains) or severe operating conditions, mud spattering open-type or heavy-duty low speed chains, graphite or molybdenum disulfide (MoS₂) applied either as additive or spray will improve lubrication performance. Low-viscosity or the grease products with a drop point of 70°C are also suitable for manual lubrication. Liquidized grease may be sprayed on the chains in special conditions and chains can start running immediately after the evaporation of the volatile carrier substance.

No matter which kind of lubricants and lubrication methods chosen, the most important issue is to ensure the lubricant flow into evenly (between pin and bush, between bush and roller).



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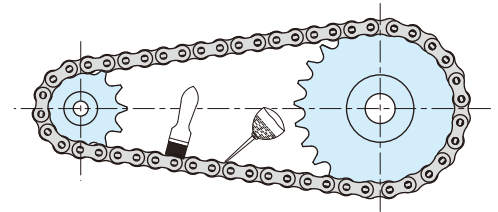
■ Selection of lubrication method

Normally, there are five lubrication methods as listed below:

1. Manual lubrication

This type of lubrication is implemented by means of oil can and brush, which makes adding lubricant into the gap between outer and inner link plate not safe. Therefore manual lubrication is only suitable for chains with occasional operation or for those secondary drives and low chain speeds. Sufficient lubrication should take place at least once a day (if possible once every 8 running hours).

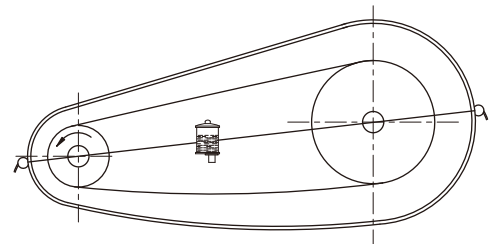
Lubricant colouration should be avoided as far as possible.



2. Drip lubrication

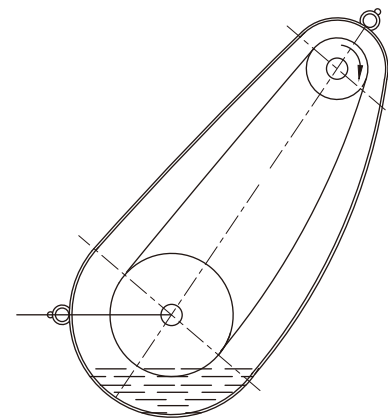
Drip lubrication by means of wick oilers, needle oilers or drip oilers is only suitable for low bearing pressure drives.

Lubricant colouration should be avoided as far as possible.



3. Oil bath lubrication (submerged lubrication)

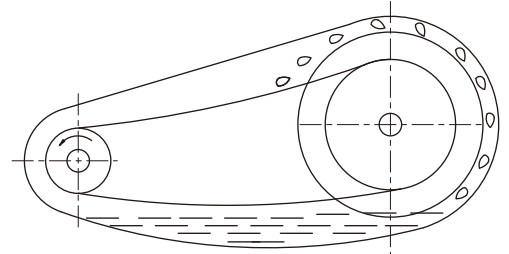
There is just enough oil in a proper chain box for preventing the worn and elongated Chain from knocking against the casing wall and to allow the chain plates to submerge into the bath up to the rollers or the bushings respectively. Immersion should not be too deep or too shallow. Too shallow immersion lubrication is not reliable. Too deep immersion may cause the oil to heat up and lead to untimely oxidation.



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4. Oil-ring lubrication (splash lubrication)

With this type of lubrication, the chain operates above oil level. A disk submerging into the lower oil level, the depth is about 12.7mm-25.4mm, Peripheral velocity between min. 3m/s and max. 40m/s, normally not bigger than 12.5m/s, centrifuges oil against the casing walls from where it continuously runs down onto the chain via drip rails. The disk should be mounted on both sides of sprocket when the chain width above 127mm.



5. Force feed lubrication (pressure lubrication)

This type of lubrication is suitable for high-speed and heavy-duty type drives. Force feed lubrication is carried out to realize the circulating cooling of chains by means of oil pump and oil feeding pipe. The spray nozzles should be situated near the gearing places of chain and sprocket, and the nozzle number should be one more than the number of chain strands (aim at the gap of each row link plate).

