

Elevator Rope Lubrication

Lubrication is necessary for the proper maintenance of any machine. As a machine, an operating wire rope must also have a lubrication maintenance program to ensure it is functioning properly.

Every wire rope application requires a different lubricant. Applied during manufacturing, lubricants are selected on the basis of rope service requirements. For example, ropes for heavy-duty stripping shovels have a relatively short service life and need a lubricant suitable to the abrasive conditions under which the wire ropes operate. Elevator hoist ropes, on the other hand, have a relatively long service life and need a lubricant that: (1) retains its chemical and physical properties for a period of several years, and (2) does not materially affect the traction design relationship.

Lubrication During Manufacturing

In the manufacture of Bethlehem Elevator Rope, the lubricant is applied to individual wires during the stranding operation. The lubricant amount is then regulated on the finished strand by a special wiping process. This process determines the lubricant content of the strand.

The quality of the lubricant in a wire rope is just as important as the quality of other rope components (wire and core). This is especially true of elevator ropes because of their relatively long service lives. When an elevator hoist rope is in operation, each wire is in contact (over its entire length) with other wires, sheaves and drums. The strands also move with respect to each other and with the core. The need for a lubricating film between all of these components is necessary to minimize wear between the wires, strands and the fiber core.

Some believe that the fiber core's major role is to continuously provide lubrication to the elevator rope. In fact, the core's most important functions are to provide support to the strands and contribute elasticity to the rope. During core manufacturing, lubricant penetrates the core, but eventually the lubricant breaks down. Since the factory-applied lubricant is gradually dispersed during the operating life of the hoist rope, and understanding that the fiber core is not a lubricant reservoir, elevator hoist ropes need to be field lubricated during their service life.

Field Lubrication

Field lubrication is necessary to:

- minimize wear between ropes and sheaves,
- reduce friction between the wires,
- minimize corrosion due to atmospheric and/or operating conditions,
- help reduce bending fatigue by allowing movement between the wires and strands.

The proper field lubricant must be used so the traction relationship between the hoist ropes and the drive drums is not adversely affected. The lubricant should also be compatible with the strand and core lubricants, and have good rope penetrating properties.

A lubricant meeting these requirements is a light viscosity Spindle oil. It should have a Saybolt Seconds Universal (SSU) viscosity of 34 to 38 seconds at 210° F. This lubricant is readily available and inexpensive. Spindle oil not only lubricates, but also assists in keeping the hoist ropes clean. Spindle oil is best applied with a felt pad, wick-type lubricator. This device can be mounted on the bedplate and is easily moved from one machine to another. The Spindle oil can also be sparingly applied with a brush, if necessary.



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Hoist rope slippage during acceleration or deceleration may be an indication of excessive lubrication. To determine if the lubricant is reducing the traction and causing slippage, watch the hoist ropes as they pass around the driving sheave during operation. Some rope creepage is normal; slippage is not.

WW does not recommend the use of solvent cut-back lubricants. Solvent cut-backs tend to dilute the strand and core lubricants, which result in lubricant throw-off and ultimate dryness of the hoist rope.

Do not lubricate governor ropes after installation. The lubricant may interfere with the governor jaw's ability to stop the governor rope and apply the safety. Lubrication may also reduce the traction between the governor rope and sheave, and prevent proper functioning of the speed governor.

Lubrication Frequency

The amount of lubricant used and the frequency of field lubrication should be determined by maintenance personnel. The amount and frequency of lubrication depends on such factors as atmospheric and climatic conditions, rope speed and the type of elevator service.

A good rule of thumb to follow is to check for a film of lubricant in the drive sheave grooves. With the machine out of service, carefully wipe the groove with your finger. If the groove is dry, field lubrication is required.

Rope Cleaning

WW does not recommend the use of a solvent to clean elevator hoist ropes. Solvents dilute the lubricant within the strands of the elevator hoist rope. The diluted lubricant

bleeds from the elevator hoist rope and is thrown off during operation. Not only does the solvent counteract the lubricant, the throw-off results in a dirty machine room and may harm the rotor or other electrical components.

We do recommend a regular cleaning program. Elevator hoist ropes need to be cleaned because of the build-up of dirt, lint, etc., picked up in the atmosphere of the shaft. If cleaned on a regular basis, the hoist ropes will not require the harsh processes needed to remove the dirt and lint which have accumulated over the months. This also eliminates the need for disposal of controlled or hazardous waste cleaning materials.

Instead, continuous light cleaning can be done. Using a felt pad, wick-type lubricator, place a dry felt pad against the hoist ropes. As the elevator operates, the hoist ropes are cleaned. Another method is to attach a section of natural fiber carpeting at the top of the machine so the hoist ropes are wiped as they operate. (Check local fire codes before using this method.)

In the event a hoist rope is overlubricated, the methods discussed above may be used to remove the excess lubricant.

The frequency of rope cleaning, like lubrication, should also be determined by maintenance personnel.

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