LUBRICATION

Wire rope lubrication

There are many questions coming from the field about lubrication on steel ropes.

- Why?
- When?
- How much?
- By which method?
- What type of lubricant?

the answers of such questions are given below.

Why?

Timely lubrication will have a positive effect on the service life of the rope, as well as the protection of other parts of the equipment. During the manufacturing process, steel wire ropes are lubricated in guidance of certain procedures. By lubrication, ropes are protected against corrosion and wear for a limited period of time. However, in later times, the wires, which are the moving parts in the ropes, especially at friction and bending points, will contact each other more. One of the methods of improving these contact conditions is lubrication. If lubrication is not possible for operational reasons, it should be known that the service life of the wire rope will be shortened.

When?

Steel ropes should be lubricated at the periods determined by the enterprises' experiences by taking into consideration place of use, working environments, environmental factors, rope structure and operational reasons. These periods will vary in each sector and may differ in enterprises that are in different locations for the same sector. The important thing here is that the enterprise determines its lubrication period according to its own conditions after the inspections.

How much?

As it is known, the number of external wire breaks should be determined in steel ropes. In order for this determination to be made appropriately, the outer surfaces of steel ropes should not be completely coated with lubricant. Otherwise, you will have no chance of performing visual examinations. Over lubricating does not mean it is an efficient and a proper way of lubrication. If more professional lubrication is required, this can be controlled by lubricators.

By which method?

Many different methods have been applied from past to the present to lubricate ropes and many of these applications are still being used nowadays.

These applications;

- Brush (The most common lubrication method).
- Drip feeding (Infinite systems in terms of continuity can be preferred. For example cable car systems).
- Portable pressurised spray (Depending on operating conditions may be preferable).
- High pressure (Continuous cleaning of the rope is an ideal system for the removal of moisture, residual lubricant and debris) lubricant penetration into the finest cavities can only be guaranteed if pressurized lubrication is performed.
- Dipping (The application in the fishing industry may be more appropriate).
- Cloth (Can be considered a primitive method).
- Felt (It can be applied between the rope and the drum, but it will have less effect on multilayer spoolings) can be listed.

What type of lubricant?

The lubricant to be used for re - lubrication must be identical with the lubricant used by the manufacturer and should not react with the previous lubricant. It is expected that the lubricant can penetrate into the core when needed and create a film layer outside the rope. Otherwise, the lubrication will not be successful and the lubricant will not reach the strands and the core and will not prevent friction. For such applications, molybdenum sulphur based lubricants are preferred. However, it is useful to consult the manufacturer of the rope for the choice of lubricant, depending on the risk of the purpose of the rope.

What are the types of lubrication?

The following table contains the types of lubrication and the stripping methods. This process can be applied during the rope production.

Lubricating Types	Lubrication method		Rope Type	Instructions
Lubricant free	No lubrication	Galvanised strands and ropes	Galvanised ropes	Grease lubricant ree
A 1 (dry)	Closing	No lubrication applied	Galvanised ropes	Dry - looking surface. Rust preventive lubricantss should be used in storage.
	Stranding	Less lubricant application good stripping		
	Cores	Loose stripping		
A 2	Closing	No lubrication applied	Galvanised and ungalvanised ropes	Less lubricant impression when touched Oil based greases are used.
	Demetleme	Less lubricant application good stripping		
	Cores	More lubrication than the strands no stripping applied.		
A 3	Closing	No lubrication applied	Galvanised and ungalvanised ropes	General practise in ungalvanised ropes. Sticky and greasy impression when touched
	Stranding	More lubrication no stripping applied		
	Coreler	Heavy lubrication and stripping		
B	Closing	No lubrication applied	Ungalvanised ropes	Applicable for special purpose and long - term storage conditions. Black asphalt based greases are used.
	Stranding	Less lubricant application good stripping		
	Cores	More lubrication than the strands no stripping applied.		
C	Closing	No lubrication applied	Ungalvanised ropes	The greases used are medium hard density. Black asphalt based greases are used.
	Stranding	Heavy lubrication		
	Cores	Heavy lubrication no stripping		
D	Closing	Heavy lubrication no stripping	Ungalvanised ropes	Suitable for maximum corrosion protection and long term storage conditions. Black asphalt based greases are used.
	Stranding	Heavy lubrication		
	Cores	Heavy lubrication no stripping		

The result of lack of lubrication

Failure to perform of required lubrication will cause lack of performance in the ropes and the worst scenario will occur is the unpredictable internal corrosion. Do not forget that 80% of the wires that form the rope are located in the inner part that we can not see. As a result of internal corrosion, wire breaks in the rope will be seen as shown in the figure.

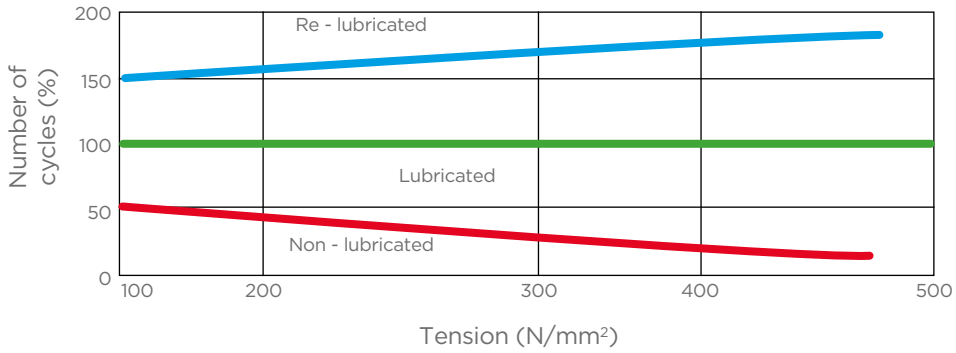
What are the known misunderstandings?

It is misconception that galvanised ropes do not need to be re - lubricated or should be produced without any slippery compound. A lubricant is required to reduce friction when the metal slips on the metal and rubs against it (the wires slide towards each other when the wires are bent over a pulley). No one accepts the idea of galvanizing the pistons of a vehicle engine and then using it without any engine lubricant. The same principle applies for the steel wire ropes

It is assumed that galvanized or stainless ropes will not get rusted. However, these applications only offer anti - corrosive properties. Excessive re - lubrication does not solve corrosion problems in the inner part of the rope. Lubricants used in re-lubrication hardly reach the inner parts of the rope, so, heavy lubrication should be avoided. Excessive and improper lubrication leads to the accumulation of foreign particules on the surface of the rope. This can result in damage on ropes, drums and pulleys caused by wear. The large amount of lubricant remaining on the rope surface makes it difficult to detect wire breaks. It causes difficulty to detect the actual condition of the rope to be taken out of service. There is a misperception that all plastic - filled ropes will prevent the leakage of lubricant from the core evenly. The reflection of this situation will only be proportional to the quality of the plastic material directly. The higher the quality of the plastic filling material, the longer the wear time will be, and the longer the lubricant will be kept.

What are the benefits of lubrication to the rope life?

Steel wire ropes should be lubricated at regular intervals according to their use, especially in areas where the steel wire ropes are exposed to bending. If re-lubrication is not possible due to the operational reasons, it should be known that rope life will be shortened and inspection periods should be adjusted accordingly.



What are the benefits of lubrication?

- Delays the wear of metal due to friction.
- Recovers the lubricant lost during the work.
- Protects the resistance of internal and external wires against corrosion.
- Ensures that the wires do not lose their strength due to wear.
- Prevents the formation of notches in the inner wires in case of damages due to bending.

Wire rope lubricator

- The basic of rope lubricator is based on the principle of stripping of the old lubricant of the rope and lubricating with the new lubricant by means of a high pressure spraying method.
- Lubrication must be applied before the wire breaks occur. If broken wires are formed, the gaskets on the rope lubricator will wear out faster.
- Different size of gaskets will be required for each rope diameter. Therefore, the determination of the diameter of the rope is important.
- Semi - liquid and soft lubricants compatible with low and high ambient temperatures can be used.
- It can be used in all types and sizes from 4 mm to 76 mm. Special production - based lubricators are used for larger ropes.
- Gaskets can be used up to a rope length of 3.000 - 4.000 meters (9.000 - 12.000 feet) depending on the condition of the rope.
- Lubricant consumption may differ for various rope diameters and constructions.