



CWRM Holdings

“CARING FOR OUR ENVIRONMENT”



ROPE LUBRICATION SYSTEMS - ROPES IMMERSSED IN WATER

Patent Pending

Introduction

Since 1994, **CWRM Holdings** have developed a Wire Rope Maintenance Programme aimed specifically at *improving* Steel Wire Rope Life, reducing down-time due to rope outages and creating a substantially *cleaner environment* in line with the **ISO 14001 Standards**. The basis of this programme is to apply a *fully bio-degradable*, high quality, *thin film penetrating wire rope lubricating oil* to the ropes in *small regular quantities, more frequently*, rather than greater quantities spasmodically or not at all. This approach complies with the accepted principles of the American Iron and Steel Institute.

The Rope Maintenance Programme

Corrosion normally takes place when the rope is wet and allowed to dry in the presence of oxygen. On a typical winch, the wet rope is reeled onto the drum and salt water filters down to the dead layers and penetrates the rope. After a time, corrosion sets in, normally starting from the core, up to a point when the rope fails.

Past experience has proven that ropes lubricated with oil last considerably longer than un-lubricated ropes or even when they are covered with a sealing compound, such as grease. Please refer to the attached “*Thin Film Wire Rope Lubrication*” document.

The basis of the Programme is to protect the complete rope and the lubrication system provides the following two functions, viz.

- a) Automatic application of the main body of rope and
- b) Manual lubrication of the dead turns on the drum.

a) Automatic Application.

In this case, the lubricant is applied automatically by using spray nozzles that are mounted just below the sheave facilitating maximum lubrication to the rope as it is hoisted out of the water. To economize, the lubricant is only applied when the rope is hoisted and in motion. Besides having a much higher affinity to metal than water, the oil also has the ability to penetrate the rope, thereby displacing the water and preventing oxygen to react and causing corrosion.

The control logics of the system provides a lubrication interval adjustment from every hoisting cycle up to a suitable practical interval, depending on the surrounding conditions, i.e. always ensuring that the rope is covered with the protective oil.

b) Manual Application.

Initially and as a regular rope maintenance function, the lubricating oil must be manually applied to the rope that never or very seldom leaves the drum by spraying the rope on the drum while it is turning. This should be done on a regular basis to ensure that water does not settle on and within the lower turns of the rope and thereby causing corrosion.

System Details

A. Power Pack

The Power Pack consists of a gear pump and either a stainless steel or replaceable PVC oil reservoir. The system pressure is adjusted by a suitable control valve and an in-line oil filter is fitted to prevent any solid particles entering and damaging the pump.

B. Electrical Controls

The Automatic Lubrication System is controlled by a Programmable Logic Controller (PLC) with the following functions: -

a. Motion Proximities.

These proximities provide the following functions: -

- * They sense that the rope is in motion.
- * The direction it travels.
- * To ensure that oil is only applied when the rope is in motion.
- * The position of the rope at any given time measured in pulses.
- * Counts the number of times the rope has been lifted.

b. Oil Reservoir Sensor.

This sensor will stop the system when the reservoir is empty and trigger a rotary alarm light.

c. Operator Control Pad.

The Operators Control Pad complete with screen mounted on the electrical control board, is an operators communication system with the PLC. It can be used by an authorized person to modify cycle settings within the PLC and provide visual identification of an Alarm indication of the system.

✂ \ Lubrication Spray Nozzles

Suitable spray nozzles are gauged and placed in suitable positions to provide optimal lubrication and minimize overspray.

✂ \ Reservoir Filling System (Optional)

The lubricating oil supplied in 200-litre or 46 gallon drums.

This is an additional pump set fitted to the reservoir or operating in conjunction with the Automatic Lubrication System, which has a flexible hose and charges the tank via a filter and flow switch. The flow switch is interconnected to the filling pump motor and will trip the motor when there is no more oil in the drum.

Benefits of using Oil

The benefits of using Wire Rope Lubricating Oils can be enumerated as follows: -

- a. They have a greater affinity to metal surfaces than water and will displace water on contact.
- b. They have the ability to penetrate and protect the ropes from wear and corrosion internally and externally.
- c. Oils are easy to apply and water cannot adhere to the rope.
- d. With no water and oxygen present, corrosion is reduced substantially.
- e. When applied correctly, oils will not fling off.
- f. Fully bio-degradable oils are available.