

Lubrication Checkup: Wire-Rope Concerns

Written by Dr. Lube, AKA Ken Bannister
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Symptom: "In a recent annual safety inspection of wire ropes, I was surprised to find a number of them failed due to rusting from the inside out. All of our wire ropes are on a regular lubrication PM. Can you suggest how to address this issue in the future?"

Diagnosis: Your type of wire-rope failure is all too common and largely attributable to use of the wrong lubricant and/or incorrect application frequency (PM schedule). Choosing the right product and application frequency will depend on the rope's function. Wire ropes on derricks and cranes on ships, marine docks, oil rigs or in chemical environments typically fail due to corrosion. Those used in mining and subjected to heavy wear typically fail due to abrasion. Wire ropes for suspension lifting and friction windings bend as they work over their pulley sheaves; they typically fail due to a combination of fatigue and corrosion.

Prescription: Rope dressing (or lubricant) can be packaged and applied by aerosol spray cans, manually by oilcan and wipe rag or mechanically by drip oil or spray systems. Consult with your lubricant supplier regarding the correct application method for a recommended product.

Wire-rope lubricants must contain anti-corrosion properties; be able to "creep" through the strands into the center of the rope and displace moisture; and facilitate the adjustment of individual strands as they rub over one another to equalize stress under bending and load conditions. In most cases, petroleum-based products are preferred. They provide up to a 300% increase in fatigue life over non-lubricated applications. The exception is standing ropes used for guy wires or pendant ropes: They're usually coated with a bituminous base lubricant.

Where abrasion and heavy wear are factors, lubricants may contain anti-wear additives along with agents that allow the lube to "stick." In such applications, lubricants are usually applied on a weekly basis. Where fatigue and corrosion are issues, lubricants usually contain a solvent that allows the product to penetrate the wire core. (For ropes that work over sheaves, the ideal lubrication point is as the rope passes over the sheave, when the wire strands work through the bend and open slightly, allowing the lubricant to work through the strands more easily.)

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When determining application frequency, factors such as lubricant type, application method, hours/duration of operation, environment and consequence of failure must be taken into account for individual ropes. To determine initial frequency, I strongly recommend working with a lubrication application specialist and your lubricant manufacturer. **MT**

*Lube questions? Ask Dr. Lube, aka Ken Bannister, author of the book *Lubrication for Industry* and the *Lubrication* section of the 28th edition *Machinery's Handbook*. He's also a contributing editor for *Maintenance Technology and Lubrication Management & Technology*. E-mail: doctorlube@atpnetwork.com*