

“Haggie Hints”



by George Delorme
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Haggie North America - Meeting your hoisting needs!

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Lubrication - corrosion protection, reduce internal friction or wear protection?

Wire rope has often been described as being a “machine” and as such, requires occasional lubrication. It is commonly thought that the field dressing of a rope will:-

- Reduce the internal friction between wires and strand
- Slow the onset of corrosion
- Help protect the outer wires against wear.

DISCUSSION:

Looking critically and objectively at the whole subject and in actual shaft conditions with ropes working on a conventional drum hoist, we find that either corrosion or heavy wear are the most common reasons for retirement. In this scenario, stranded hoist ropes rarely reach their fatigue limit, so it could be argued that we should not concentrate in attempting to reduce the internal friction when other factors are much more pertinent.

To further focus on achieving the maximum benefit of lubrication, we should discuss the other two reasons for lubrication.

CORROSION

Years ago, before EM testing was so widely accepted, we often judged the condition of a rope by the external appearance. We used thick, black, asphalt based lubricants that offered the best protection to external "wear" but, as was later indicated by EM testing, the inside often suffered from internal corrosion.

We then moved to oils and/or greases in an attempt to penetrate the rope's interior but in the end, we did not improve rope life. While these lubricants did a minimally better job at protecting the interior, it was still not the answer.

After many years of experimenting with different lubricants and still removing ropes from service prematurely because of corrosion, (primarily internal), we started to test ropes with drawn galvanized coated wires. It was known that not only should galvanizing offer superior protection against internal corrosion but because of the nature of the coating, also reduce inter wire/strand friction. These tests with galvanized ropes did prove to be successful in reducing the effects of corrosion.

In addition, we had previously noticed that ropes manufactured with synthetic cores had completely wiped dry the underside of the strand making contact with the core and found that these contact points had early internal corrosion. As a result, we re-introduced natural fiber cores which contain approximately 12% to 15% by weight of lubrication and have the ability to seep some of this material. It should be noted that while the fiber core helps internal corrosion in all situations, the protection offered by galvanized coated wires starts to fall off when the pH of the shaft water is lower than 3.0 or higher than 12.

SURFACE WEAR

It is well known that external wear will occur on drum hoists especially those with multiple layers of spooling. Our inspection of the ropes having the galvanized wires and natural fiber core led us to the conclusion that the rope's interior was being so well protected that we could forget about trying to penetrate lubricant into the rope and focus solely on protecting the exterior against wear.

To help in this endeavor, we returned to the asphalt based "open gear" field dressings. Some mines however, still prefer to use a good quality grease type but in any case, the manufacturing "lay-up" lubrication should be compatible with whatever field dressing is chosen.

With this approach, we are only putting lubricant on the surface so a wide variety of application methods can be used i.e. from a simple box to the more sophisticated injector type.

CONCLUSION:

In most situations, we find that the combination of a natural fiber core and galvanized coated wires allow us to focus solely on protecting the rope's exterior against wear and thus optimizing rope life. At mines where internal corrosion had played a part in rope removal, it is not uncommon now to double the previous rope life.