

UE NEWS HEALTH AND SAFETY

Protecting Your Life: Wires and Ropes.

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WHEN A SLING OR HOIST BREAKS under a load, the chance of serious injury and loss of life is great. So special precautions need to be taken to protect the integrity of the wire ropes and metal chains used in these devices.

In the past, fiber ropes were often used for lifting and moving relatively light industrial loads. But they deteriorate when exposed to acids and caustics or their vapors, especially under hot, humid conditions. As a result, wire rope or metal chains are now the materials of choice for hoists and slings.

Wire rope, for example, has greater strength for the same diameter and weight than fiber. Its strength is the same under wet and dry conditions. It does not stretch or shrink when weather conditions change, and it is far more resistant to chemical attack than fibers.

Wire ropes usually consist of six strands of 19 wires each (6x19 classification) or six strands of 37 wire each (6x37), all wrapped around a core, usually a specially treated, independent wire rope core (IWRC).

Here are some common causes of deterioration of wire ropes:

- Corrosion, particularly of the interior core wire, caused by pitting due to acid and water damage. This is hard to detect and highly dangerous. Regular cleaning of the wire with a compressed air or steam jet is important, followed by regular lubrication of the dry wire (if the core is wet the lubricant will trap the moisture). The lubricant should be dripped or sprayed on, either monthly, quarterly or semiannually, depending on use.
- Wear, on the crown or outside wires.
- Kinks, caused by improper installation or hoisting with slack in the ropes. This causes visible, permanent damage on the surface, including so-called "bird caging."
- Wire fatigue, usually caused by excessive bending through small radius turns, vibration, pounding and/or excessive twisting under load. Indicated by square, fracture-like breaks of the outer wire.

With fiber ropes, which are much more sensitive to acid damage, you can unwind the rope and inspect the inner fibers for damage. Inner threads should be sharp, clean and unspotted. These inner fibers are especially sensitive to overload situations, which are indicated by frequent, visible

breaks (the greater the overload damage, the more frequent the breaks).

The OSHA standard for slings (CFR1910.184) requires that all slings, whether fiber, wire rope or chain, be inspected "each day before being used" by a "competent person designated by the employer." So occasional inspections are not enough; a person must be designated, and presumably trained, to do this. Our locals will of course put in their say about who this designated person is.

Furthermore, "damaged or defective slings shall be immediately removed from service." (our emphasis) The standard is specific about what constitutes a defective sling. Wire rope slings should be removed if any of these conditions are present: Ten randomly distributed broken wires in one rope lay, or five broken wires in one strand in one rope lay; wear or scraping of one-third the original diameter of outside individual wires; kinking, crushing, bird caging or any other damage resulting in distortion of the wire rope structure; evidence of heat damage; end attachments that are cracked, deformed or worn; hooks that have been opened more than 15 percent of the normal throat opening measured at the narrowest point or twisted more than 10 degrees from the plane of the unbent hook; corrosion of the rope or end attachments.

The first conditions give us an especially clear basis for deciding when a wire rope has seen better days. A designated member of the union health and safety committee should routinely monitor the condition of the wire to check if there are 10 or more random breaks in one helical turn of the wire ("one rope lay") or 5 or more in one single wire strand. If your employer is not in compliance with the 1910.184 standard, the local can raise this in a meeting between the union health and safety committee and management. If you don't have a local committee, or if management doesn't listen, consider filling a grievance under your contract — either under one of your safety and health clauses, or under the general clause in most contracts that union and management agree to comply with all U.S. laws and regulations.

But however you handle it, don't go to OSHA until you have done everything possible in the plant, including educating the membership to these dangers. If you call in OSHA too soon, without educating or mobilizing your membership, the OSHA inspector may just give the company a slap on the wrist, or even worse, treat the problem as "minor." The sad fact is that today you have more bargaining leverage with management by citing the violation to them yourselves, than by actually calling OSHA in.

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