

## Lubricants for Wire Ropes – New Product Trends

by:

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### Introduction:

Wire ropes are employed in industrial fields including mining, forestry, and shipping; and on applications such as building elevators (lifts), construction cranes, and suspension bridges. They offer flexible energy transmission with surprisingly high weight to power ratio. They also handle a wide array of load types including high stress loads, high speed loads, shock, jerky, and rapid accelerating or decelerating loads. They are used in hot, cold, dry, humid or submerged in water. Yet, many users choose to ignore them. The lifespan of a wire rope can be dramatically increased when it is coated with a lubricant. The variability in their use dictates the desired lubricant properties. Today, new legislative environmental guidelines are driving users to give consideration not only the wire rope typical lubricants that lubricate and protect, but that are also considerate to the environment.



### Wire Ropes:

A rope is a series of braided or twisted strands combined to provide extra strength. A rope made mostly of steel strands is often called a cable or wire rope. Typically, the name wire rope is used when it is greater than 9.5 mm (3/8 inch) in diameter.

Wire ropes are graded based on their tensile strength ranging from 1570 N/mm<sup>2</sup> to as high as 1770 N/mm<sup>2</sup>. Wire ropes are classified by size and length, grade of steel, lay, number of strands, and the number of wires in each strand. As depicted in Figure 1, the rope consists of several wire strands wrapped around a core in a spiral patch. The core could be metal or fiber in a way that would allow flexibility and freedom of movement for the entire rope while providing the support for the rope structure. Each of the strands are similarly formed of individual wire rods braided around a center wire rod.

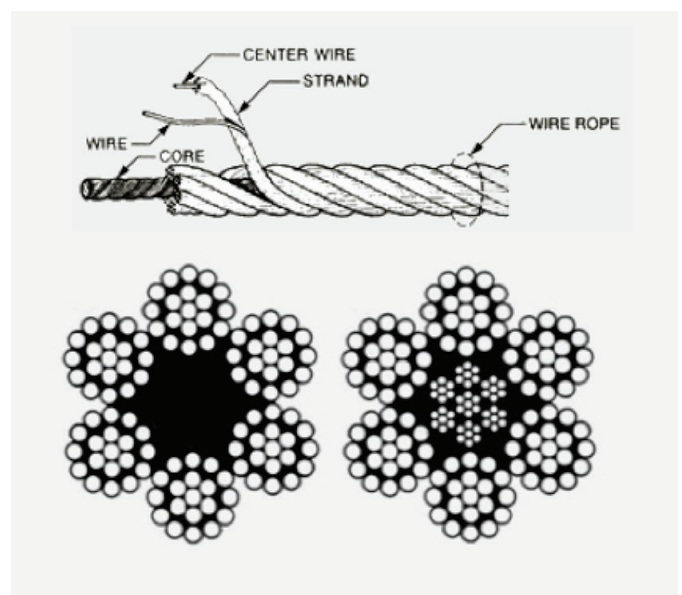


Figure 1. Structure of a typical wire rope; Bottom: Cutaway sections of wire ropes with fiber and metal cores

### Wire Rope Lubricants:

At a high level there are two general categories of wire rope lubricants. The first category of lubricants is used during the manufacturing of wire ropes. Those are typically high viscosity lubricants that are embedded into the wire rope strands and