



Technical Brief

Recommended Greases for Gear and Wire-Rope Applications

This brief discusses the problems associated with asphaltic lubricants in gear and wire-rope applications and how the latest grease technology overcomes these problems, providing better efficiency and performance. It also explains the reasons Gulf Oil Marine Greases: GulfSea Hyperbar CS2 and GulfSea Hyperbar Super CS, are recommended for the respective applications.

Gear Application

Asphaltic lubricants were once a popular choice for open gear application when there were not many alternative products available. Asphaltic based lubricants come with benefits such as, their adhesiveness onto surfaces after the solvents evaporate off, but they also have many downsides.

Problems with Asphaltic lubricants

- × Because of their heavy nature, asphaltic lubricants tend to create more build-up in the root of the gear teeth if not managed properly. Once the lubricant dries up, it hardens. So when the gear is moving, the build-up either cracks or creates stress at the uneven areas when in operations.
- × The gears are designed primarily to carry the load at the pitch line on both the pinion and the girth gear. When this alignment is interfered with, the load begins to get carried in the addendum, or the portion of the gear tooth above the pitch line, which is not designed to carry the load. Subsurface cracks and fatigue can emerge, and in the worst cases, the teeth can break.
- × At high temperatures, asphaltic lubricants tend to oxidize and fall off the gear surfaces easily.
- × Due to the adhesive nature of the asphalt, asphaltic-type open gear lubricants attract dust, dirt and other contaminants, which can become abrasive wear particles during the meshing action of the gears.
- × Difficult to clean up as solvents are required to remove the dried asphaltic lubricant.
- × Certain solvents pose health and safety risks.
- × Because solvent evaporation may potentially create a flammable atmosphere, special attention to storage is required. Similarly, working with these in confined spaces will require special care to prevent any potential health, safety and flammable atmosphere consequences.

Gulf Oil Marine's latest grease technology overcomes these problems and provides better efficiency and performance compared to asphaltic based lubricants.

Recommended Grease: **GulfSea Hyperbar CS2**

- ✓ GulfSea Hyperbar CS2 provides better gear protection by creating a tacky protective film over the gear teeth that reduces dust and dirt accumulation on the gearing.
- ✓ The formulation of grease-type lubricants inhibit buildup in the root of the gear teeth, avoiding the clearance issues and pinion jacking that asphaltic lubricants can cause.

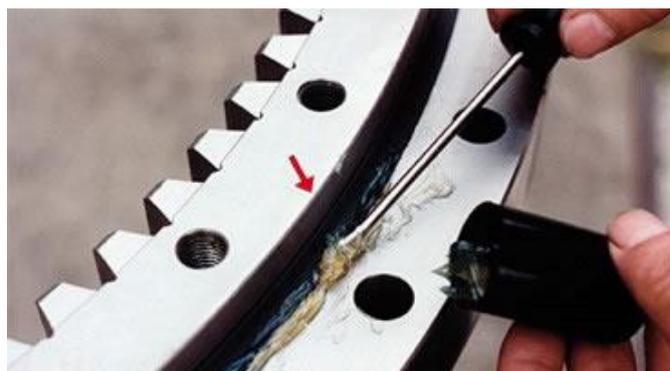
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- ✓ Outstanding extreme pressure properties extend bearing life under shock-load conditions.
- ✓ Good adhesive property ensures that the grease stays in place for longer relubrication intervals.
- ✓ Excellent corrosion protection and resistance to water washout resulting in improved component protection and equipment life.

Grease Sampling for Slewing Bearing

The problem with grease analysis, however, is the integrity of the sample. Slewing bearings may never fully rotate because of crane location and its relationship to other fixed structures. To maintain confidence in the condition of race and roller, one must consider the loaded sectors and samples taken from more than one point. The procedure to acquire a representative sample involves pumping in new grease to displace the final sample where certain bearings are designed with sampling ports allow for the insertion of designed tubes for grease analysis. If this is not available, the sample must be taken from the expelled grease where the sampling areas are prepared beforehand by cleaning off old grease and contamination. For more detailed information you may refer to our technical bulletin on “**Grease Sampling Procedure**”.



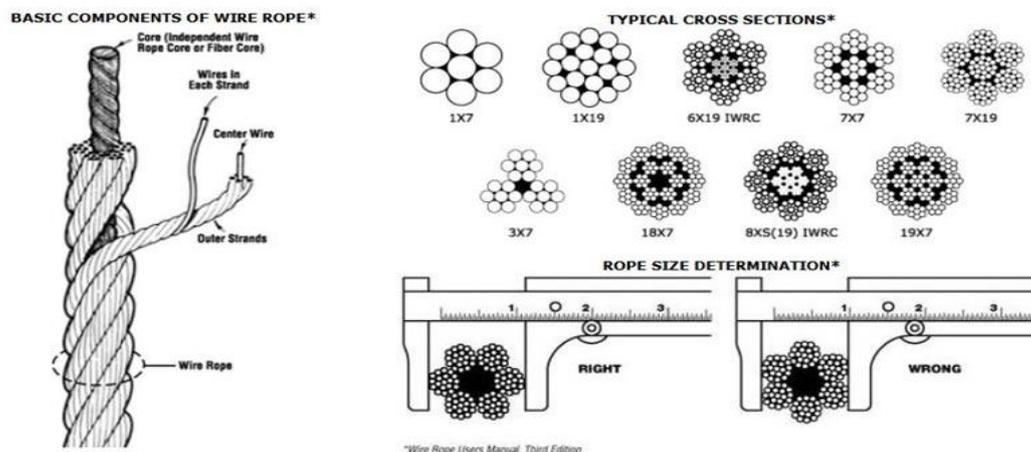
The picture on the left courtesy of MACHINERY LUBRICATION and on the right courtesy of THYSSENKRUPP

Wire-rope Application

A wire rope comprises continuous wire strands wound around a central core. Wire ropes have several applications. When used on deck, they will be exposed to unfavorable ambient environments such as, sea water, diurnal temperature variation, dusty and abrasive dirt and are subject to heavy loads and high pressure. These aggressive conditions will lead to external and internal damages.

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The application of suitable wire-rope lubricants/greases will minimise those damages. An effective wire-rope lubricant/ grease must serve two critical functions:

1. To reduce friction as the individual wires move over each other.
2. To provide corrosion protection and lubrication in the core and inside wires, and on the exterior surfaces.

While Asphaltic lubricants can be used for wire-rope applications, they come with many problems:

- × Solvent-based products constantly change viscosity during the application due to evaporation, and therefore have possible penetration problems of their own during application.
- × At high temperatures, asphaltic lubricants tend to oxidize and fall off easily.
- × Due to the adhesive nature of the asphalt, it attracts dust, dirt and other contaminants, which can become abrasive wear particles.
- × Difficult to clean up as solvents are needed to remove the dried Asphaltic lubricant

Gulf Oil Marine's newest grease technology overcomes these problems, providing superior performance compared to Asphaltic based lubricants.

Recommended Grease: **GulfSea Hyperbar Super CS**

- ✓ GulfSea Hyperbar Super CS is specially designed wire rope lubrication and composed of semi-synthetic base fluid and calcium sulfonate complex soap.
- ✓ This thickener increases its inherent EP/AW capacity and has excellent corrosion protection properties.
- ✓ When applied properly, GulfSea Hyperbar Super CS can adhere firmly on the surface of the wire rope to reduce the external wear and mechanical damage. In addition, it also penetrates into the rope core and minimizes the breakage of wire threads due to rusting.

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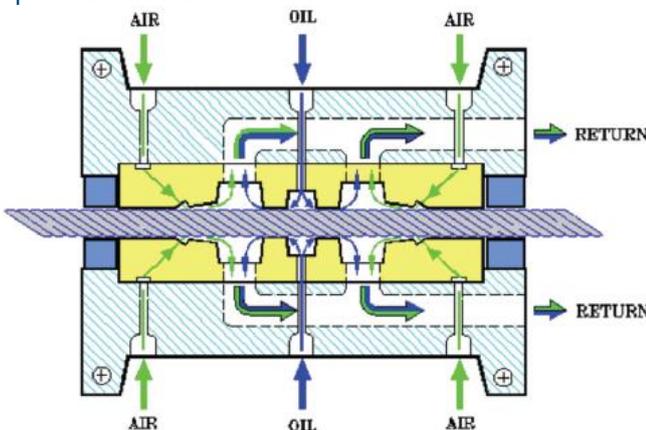
Effective Wire Rope Lubrication

Wire rope lubrication through manual greasing is a time-consuming, dirty and inefficient job. In addition, it is unreliable because manual greasing does not allow effective lubrication penetrating to the rope core.



Wire ropes failure due to non-penetration of the grease to the inner core

Wire rope lubricators are designed to lubricate deep into the strings and core of the wire rope under high pressure, to reduce internal friction and heat generation due to insufficient lubrication. An effective wire rope lubrication system applies the right amount of lubricant, distributes it evenly, eliminating over-lubrication/wastage. Some applicators include a groove clearer which removes dirt and used grease from the wire rope before it passes through the lubricator, further improving the penetration of new grease and enhancing corrosion protection to extend the wire rope's service life.



The above are examples of a wire rope lubricators to ensure proper and effective lubrication on wire ropes (picture on the left courtesy of Viper WRL Pty Ltd and on the right courtesy of SKF)

[Updated on October 2019]