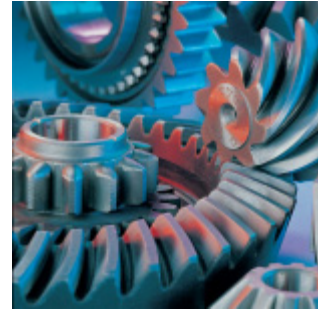




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## **Gear Oil Selection**

By Mario DiBartolomeo

*Choosing the correct type of lubricant - whether conventional, synthetic or semi-synthetic - is often overlooked and yet critical in the design and maintenance of modern gear boxes. Taking the time to understand some of the advantages and disadvantages of each type can pay large dividends in the end.*

The most crucial design and maintenance consideration once a gearbox is selected is what lubrication should be specified. Yet it is often overlooked or downplayed in the process. The proper selection of lubrication can add thousands of hours of extra life to a gearbox - while optimizing power consumption, improving output efficiency, lowering heat and noise, decreasing downtime, improving a gearbox's ability to withstand shock loads, and countless other tangible cost benefits. Then why is the lubricant often picked as an afterthought, with little serious design consideration? Likely due to the lack of concrete information available about the various gear oil options.

Gear Oils can be grouped into three main categories: conventional, synthetic, and semi-synthetic.

When short-term cost is the only consideration, **conventional oils** often fill the bill. But more often than not, huge operating cost saving opportunities can be had by putting a little time into selecting a more sophisticated solution. Conventional gear oils use a very cheaply refined mineral oil, usually with a simple, inexpensive version of additives for extreme pressure (EP) and/or anti-rust and oxidation (R&O). These products tend to break down quickly, providing questionable equipment protection and requiring frequent change intervals to remain effective. The sludge and wax build-up of these less-refined base oils can also impede efficiency over time and cause the need for flushing out of equipment.

**Synthetic oils** are a much more interesting option for effective lubrication. The uniform molecular structure of these lab-produced base oils gives them superior performance on a number of dimensions, such as consistency of viscosity over wide temperature ranges and superior film strength to low-refined mineral oils. There are a number of different synthetic bases which do need to be understood for material compatibility within your specific application, but synthetics offer many advantages that would warrant investigation.

**Semi-synthetic gear oils** combine synthetic and mineral base oils in a blended product. While this super-refining adds some cost over conventional mineral oils, it removes the vast majority of impurities, waxes and inconsistencies that plague conventional oils. Many of the studies that compare synthetic base oils to mineral oils ignore highly-refined mineral oils and additive packages, which add a whole new level of performance to these products. Semi-synthetics offer a base oil that is highly receptive to additives of many types – which allows these oils to perform at or near the level of synthetics without the concerns of material or chemical compatibility, or toxicity, that some synthetic bases can generate.

Universally, the cost of a conventional, synthetic, or semi-synthetic gear oil is dependent upon the quality of the ingredients and the care taken in the manufacturing process. These are the main reasons why one product listing the same contents as another can perform better or be more expensive. Lubricant manufacturing is a chemical engineering process that is an art and science unto itself. As is the case with many products, you usually get what you pay for. Before dismissing a higher cost alternative, investigate the content and quality of the product ingredients and the manufacturing process. Also, consider putting it to a test in your operating conditions. You may be surprised at the performance differences you experience.

Some of the “hidden” costs that can result from not taking the time to choose the optimum lubricant are: increased equipment failures and downtime, excessive warranty claims, shorter lubricant change intervals, higher maintenance costs, increased component wear, shortened machine life, increased power consumption, increased heat buildup, increased noise and vibration, and lower power transmission efficiency, to name a few.

In the end, you must decide what you are hoping to achieve with the selection of a gearbox lubricant. In this day of smart competition, taking the time to make the right lubricant decision will pay off in the long run. Find a good company to work with that can assist you with ideas and information about a variety of options and considerations. You'll be glad you did!

For more information, call 1-800-361-9458  
or visit [www.davley-darmex.com](http://www.davley-darmex.com).

