

Worldwide

Synthetic lubricants reach new heights

by R. David Whitby

Over the last 30 years, the market share of synthetic and high-performance lubricants in Western Europe has grown steadily, from a niche segment of some industrial applications to a mainstream segment of the whole lubricants industry. It has now become impossible to discuss the global lubricants business without including a discussion of synthetic lubricants.

The first commercially used synthetic lubricants were silicones, developed by Dow Corning and General Electric in 1943. Then followed polyalkylene glycols in 1945 (developed by Union Carbide), diesters in 1951, phosphate esters in 1953 and polyol esters in 1963. Many of the early applications for synthetic fluids were in U.S. military equipment, notably gas turbines, hydraulic systems and instruments. Demanding service conditions required higher levels of performance than were possible using mineral oils, even with performance-enhancing additives.

Agip launched a part-synthetic motor oil, Sint 2000, in Italy in 1969, and Amsoil Corp. followed with the first API-rated fully synthetic engine oil in the U.S. in 1972. Mobil 1 was marketed as the first worldwide fully synthetic engine oil in 1977. When it was launched, Mobil claimed that the oil improved fuel economy, reduced oil consumption, allowed faster cold-weather starting, kept engines cleaner and provided better engine protection.

Synthetic and part-synthetic lubricants are now used in more than 70 different applications such as gasoline and diesel engines, aviation and industrial gas turbines, automotive

and industrial gear and transmission systems, air compressors, natural gas compressors, refrigerator compressors and hydraulic systems. In some applications, only synthetic fluids are used, primarily due to some performance limitation demonstrated by conventional mineral oils. In other markets, synthetic fluids are used for the demanding, high-performance applications in which the properties of mineral oils are inadequate.

While the higher cost of synthetic oils and greases was perceived as a barrier to their wider use, it is now more generally accepted that the performance benefits provided often outweigh the higher cost. This is particularly so in applications for which longer operating lifetimes, wider operating temperature range, better lubricity, lower volatility, better biodegradability or lower toxicity are important factors.

In Western Europe, high-performance lubricants include part-synthetic oils and greases and lubricants formulated using very high viscosity index (VHVI, API Group III) base oils. Although Group III-based lubricants can be described as "synthetic" in North America and many other regions and countries, they cannot be so described in Germany. This is due to a German court ruling made in 1990.

The growth of synthetic and high-performance lubricants in Western Europe is such that, in 2002, they accounted for around 29.2% of the total market. (Fully synthetic lubricants accounted for around 7.8% of the market and part-synthetic lubricants accounted for another 21.4%). These market shares are much high-



er than in all other global regions, but the growth of synthetic and part-synthetic oils and greases has now started to increase in North America, Central Europe, Australia and parts of Asia.

However, the synthetic lubricants segment of the business remains tough and competitive. It is no longer a pioneering industry, since numerous examples exist of the cost-effectiveness of high-performance oils and greases. Many end-user customers and OEMs (original equipment manufacturers) have accepted synthetic lubricants as having inherently better performances and lower total costs than conventional mineral oils. The lower total costs are often derived from longer equipment operating lifetimes, reduced system maintenance and downtime, higher equipment productivity, improved energy efficiency and reduced wastage and disposal costs.

As know-how, experience and confidence with synthetic lubricants has grown, market-driven companies such as BP/Castrol, ExxonMobil, Shell, Fuchs, Quaker Chemicals, Uniqema, Dow Chemical and others have become increasingly supportive of the benefits and marketing opportunities of synthetic or part-synthetic products. This has led to a wider range of new uses and more products becoming available. <<

David Whitby is chief executive of Pathmaster Marketing Ltd. in Surrey, England. You can contact him at pathmaster@dial.pipex.com.