

The ship OSA Sampson, equipped with the world's largest off-shore rotary crane, near Rostock, Germany, in April 2010. The 1,600-ton crane was built by Liebherr.



By  
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# An OEM

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## IN THE

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# Lubricant Business

### Liebherr Supplies Fluids for its Own Machines

*Editor's note: Liebherr Group is one of the world's largest manufacturers of construction machinery, including cranes, earth-moving equipment and trucks. A few years ago, the company entered the lubricants business, offering oils, fluids and greases for use in the machines it sells.*

*Such programs generally are not welcomed by lubricant marketers, which would prefer the opportunity to supply those lubricants themselves. In this article, the company, which is based in Bulle, Switzerland, offers its rationale for deciding to enter the lubes business. It also provides insight about the things that construction equipment operators want from lubricants.*

In 2004 Liebherr decided to launch its own lubricant portfolio for all of its earthmoving and mobile machines. In 2006 the first products were introduced to the market in Germany with the intention of eventually providing Liebherr lubricants as original spare parts to customers all over the world.

Since 2007 all new earthmoving and industrial machines made by Liebherr are factory filled with Liebherr engine oils, hydraulic fluids, transmission fluids and axle lubricants, as well as Liebherr coolant. All Liebherr lubricants were specially developed for the application segments and demands of Liebherr machines and tested and approved in collaboration with the engineering departments of the group's manufacturing companies to maximize component life and performance.

Liebherr took these steps as part of an

effort to ensure that the company meets rising customer demands in the global market. We view Liebherr lubricants as a liquid machine component, and by controlling their production ourselves, we can bring about synergies in their reactions with other components. As a consequence, we are in a position to safeguard customer interests, sustain competitiveness and respect environmental concerns.

Environmental concerns for us mean long service life for the machines, low requirements for spare parts and thus optimized use of raw materials. Using less raw materials results in lower carbon dioxide emissions and lower energy needs over the whole life cycle.

#### Customizing Lubricants

Individual Liebherr lubricants are adapted to the components and construction



Liebherr machines working on a gas pipeline in Saxony, Germany.

## // We view Liebherr lubricants as a liquid machine component."

parts of Liebherr machines. Heavy-duty diesel engine oils for off-road vehicles serve as an example. Beginning in 2011, the European Union will require off-road heavy-duty diesel equipment to be equipped with both exhaust gas recirculation (EGR) and diesel particulate filters (DPF). These require a special motor oil that has lower ash content and does not include specific additives that might poison the catalytic converter.

By making the motor oil one of the components considered in the development of these engines, Liebherr was able to ensure that its lubricants – low ash 10W-40 and 5W-30 oils – were compatible with its aftertreatment systems. But it was also able to make them compatible with selective catalytic reduction, which

will become an additional aftertreatment requirement in 2014. This shows how providing our own lubricants allows us to avoid the need for frequent technological changes as regulations evolve.

With our own lubricants we can guarantee lubricant quality, and we can offer equipment warranties because we know the lubricant will perform properly and protect the equipment. This is not the case with lubricants made by other companies. It is not possible for Liebherr to test all lubricants which are available on the market.

We often observe the same brand of lubricant having variations in quality in different countries, though it is worth noting that they may still meet the same specification, also due to broad definitions of specifications and standards of qualities. Only with our own lubricants we can be secure that always the "right" lubricant is filled.

### Customer Demands

Customers using Liebherr's machines have many demands that involve lubricants. Some of those demands can be categorized as follows.

To meet their expectations for equipment performance customers want:

- outstanding precision and smooth controllability;

- fast response from machines and attachments;
- excellent cold-start performance;
- reduced warm up phase.

In the interest of operating safety, they want:

- the correct lubricant to always be installed in their machines;
- guaranteed quality;
- qualified service;
- an insured warranty.

To ensure component durability they expect:

- excellent lubrication performance;
- superior corrosion protection;
- maximum wear protection.

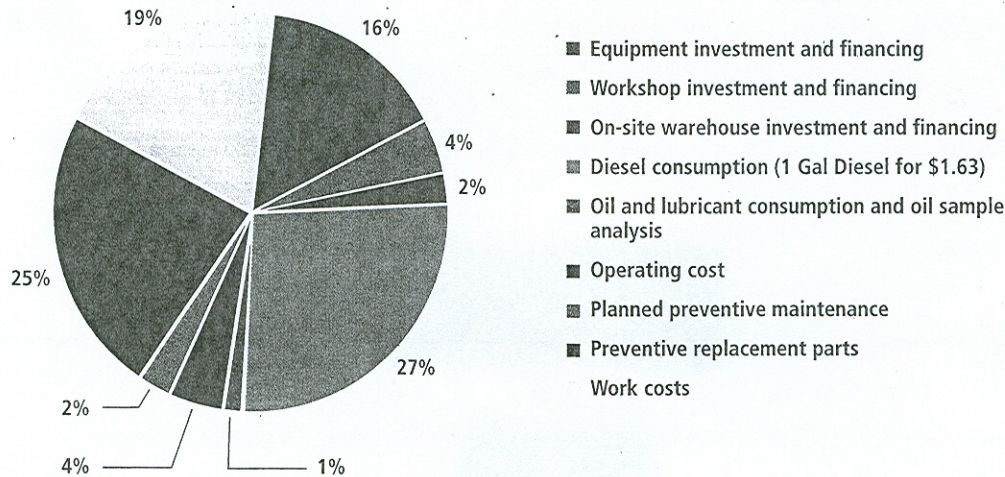
To help minimize costs and environmental impact they prefer:

- long operating intervals;
- reduced fuel consumption;
- reduced operating costs;
- lubricants that are biodegradable.

Operators of construction equipment want to reduce life-cycle costs. The purchase price of lubricants for the machine is certainly one factor, but it only accounts for 1 percent of the total life-cycle cost. The actual purchase of the lubricant allows little opportunity for

*Continued on page 26*

## Life-cycle Cost of Construction Machinery



Source: Liebherr Group, citing VDMA

savings. For example, the largest mobile excavators have hydraulic tanks that hold 300 liters of hydraulic fluid. If the operator chooses a fluid that is 50 cents per liter cheaper, he will save just €150.

On the other hand, lubricants can have a large influence on areas that involve much more expense, such as fuel consumption, replacement of parts, maintenance and service. Diesel consumption alone is 27 percent of the total cost of a construction machine. In an independent test of wheel excavators, Liebherr Hydraulic Plus hydraulic fluid reduced fuel consumption by 4.8 percent compared to a mineral oil based product. The savings from that much improvement in fuel economy would exceed the total cost of lubricants for the machine.

### Lubricants as Liquid Components

The construction industry has seen rapid evolution in component and controls technology with shifts toward compact design in combination with tight tolerance requirements. At the same time, the market has demanded increasingly higher performance under very difficult operating conditions. This has resulted in trends such as smaller oil volumes, longer oil change intervals, lifetime filling and stricter standards for pollution emissions.

These trends have narrowed the window in which lubricants may perform even while raising the level of perfor-

mance that is needed. In Liebherr's view, it is more important than ever to ensure lubricants meet the requirements of machinery. Liebherr examines the characteristics of lubricants in detail in order to achieve a higher performance level. Lubes do indeed become liquid components of the equipment!

It may seem contradictory, but at the same time, customers want flexibility insofar that they would like to reduce the number of lubricants that they stock. It was our aim to drastically reduce the range of lubricants and fluids that Liebherr customers need to use. Because we were able to focus only on the needs of our own equipment, we succeeded in developing a single lubricant technology for all construction machines.

### A Lubricant Portfolio

Liebherr now offers the following types of lubricants.

**Motor oils** – Liebherr diesel engine oils were designed specially for use in construction machines in order to meet the extreme conditions to which they are subjected. They are also compatible with other construction machinery and commercial vehicles depending on manufacturer specifications.

Liebherr's motor oils offer long oil change intervals – up to 500 hours – in Liebherr machines. Our motor oils will help machines achieve long service life, though this outcome depends also on

competent, appropriate maintenance.

### Axle oils and transmission fluids

– These lubricants have been specially developed for components subject to high friction and shearing forces faced by construction equipment. The use of high-quality base oils and well-mixed additives guarantee high resistance to friction and wear and thus ensure long life of the components even in heavy-duty applications.

**Hydraulic fluids** – Liebherr offers two hydraulic fluids, Hydraulic Plus and Hydraulic Plus Arctic, either of which is suited for use in the hydraulic system of any of the company's machines. Both are formulated with polyalphaolefin base stocks. During formulation, the main goal was to develop a fluid that would enable long drain intervals, and indeed the products do offer that, when used in conjunction with oil analysis and maintenance.

Once formulation finished, however, we also subjected these fluids to one of the industry's primary tests of biodegradability – CEC-L-33-A-93 – and found that they passed. As a result, the company also offers them for use in environmentally sensitive applications, such as machines used in marine or forestry environments.

**Grease** – Grease is an important element in the proper lubrication of numerous construction machines, so it was an

*Continued on page 29*

obvious decision for Liebherr to supply greases. Besides offering greases that meet all practical lubrication requirements, the company supplies them in packages that ease the process of applying them. By consolidating the number of greases Liebherr also reduced storage space required of customers.

**Special lubricants** – Some of our machines require special types of lubricants, and Liebherr offers these, too. One example is Meisselpaste, a paste equipped with metal powder and solid substances for the lubrication of plug-in tools and wear bushings on hydraulic and pneumatic hammers. Another example is Liebherr Spezial Schraubenpaste, also a paste, which is used with high-tensile, prestressed screw connec-

tions on Liebherr cranes. This product provides constant and reproducible friction characteristics that are important for such fasteners.

Since introducing its lubricants in Germany five years ago, our program has grown to offer them wherever Liebherr construction equipment is sold. The company has a rapid distribution system that quickly delivers these products around the world. □

*This article is based on a presentation written by Klaus Langendorf and József Rébel and presented by Maximilian Baur at the OilDoc conference in Rosenheim, Germany, in February. Langendorf is with Liebherr Hydraulikbagger GmbH in Kirchdorf, Germany. Rébel is with Liebherr Machines in Bulle, Switzerland.*

## Tell Us More...

*Lubes'n'Greases* posed some additional questions to Liebherr Lubricants. Responses came from Klaus Langendorf, of the Test Department in Liebherr Hydraulikbagger GmbH, a subsidiary offering excavation equipment.

**Q:** Where are Liebherr lubricants blended?

**A:** Liebherr has a preferred supplier for its lubricants, which has its production facilities in Germany.

**Q:** Who formulates the lubricants?

**A:** A group of Liebherr experts is in charge to adapt the lubricants to the requirements of Liebherr machines.

**Q:** Did the company hire people with special expertise when it decided to enter the lubricants business?

**A:** Yes, this is necessary to keep up with changing specifications.

**Q:** Are the lubricants a source of profits for the company?

**A:** Liebherr considers lubricants as construction elements.

**Q:** What benefits has Liebherr seen from this program? Have there been any negative impacts?

**A:** Liebherr views this program as a success, because it gives us the opportunity to optimize the system lubricant and lubricated parts with respect to cost effectiveness and product consistency. Besides the high effort to establish and to maintain the product range, we have seen no negative impacts.

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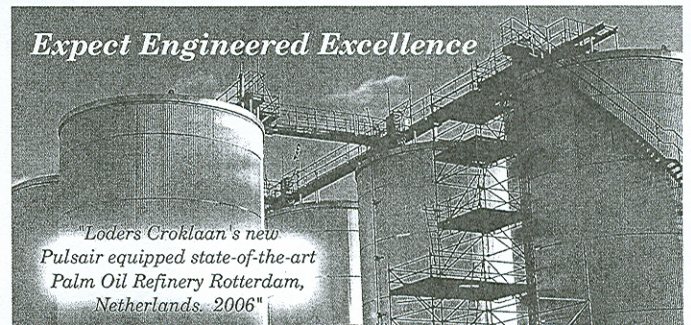
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