Hydro Lubricants

Is the future water-based?

Matthias Pfadt, Manager Application Engineering at Klüber Lubrication

Talk to anyone concerned with lubricants and they will tell you that water-based lubricants are nothing new. Already water-containing lubricants are well-established and widely used in the metalworking fluid sector for quenching and cooling, although they are less widely used as cutting fluids where neat oils are required.

In terms of gear lubricants the situation is very different. Traditional hydrocarbon-based mineral and synthetic lubricants are very much the norm. Recent trends towards smaller sump sizes, higher power to output ratios and higher operating temperatures mean that only an oil-based lubricant will meet the challenges of today’s performance gear boxes. Or does it?

At the 21st International Tribology Colloquium held at the Technical Academy in Esslingen, Klüber Lubrication talked about their work in developing a Hydro Lubricant for industrial gear box applications.

For regulators in their drive towards carbon-neutral economies then water-based lubricants hold a great attraction. Although these sustainable lubricants will still require a comprehensive additive package to perform effectively in industrial applications, they can help to reduce the economy’s reliance on mineral oil as it becomes a scarce resource globally over the next few decades.

Like most lubricants those that are water-based will not be capable of simply being poured down the drain at the end of their useful life. They will still contain wear metal particles, harmful acids. Careful handling of these type of lubricants will still be required after use and, who knows, perhaps even eventual re-refining.

Needless to say that water is a resource that is widely available on the planet. But is it the wrong type of water? Most sixth form scientists will know of the corrosive effect that salt has on metal. Without the necessary treatments then using salt water as a base for Hydro Lubricants will create more corrosive properties within the industrial gear box that could counter any operational benefit from using these new type of lubricants in place of more traditional gear oil. Certainly water needs to be treated as a base fluid if these new type of lubricants are going to work effectively. It needs to be purified and distilled in order to carry the additive package effectively to the tribological contacts of the gear box where lubrication is most required.

Speaking at the colloquium, Klüber Lubrication Manager Application Engineering Matthias Pfadt demonstrated key areas where Hydro Lubricants had been tested against more conventional lubricants and been found to meet the challenges in providing no loss of performance in application.

“Latest test results highlight that the Hydro Lubricant can offer a more sustainable solution without compromising the high performance and that the Hydro Lubricant has a great potential in a wide range of industrial applications that particularly demand for huge energy savings”, summarises Pfadt.

Within a pressurised gear box there should be no reason why the boiling point of water cannot be raised above 100 degrees centigrade, like a form of pressure cooker, or having the addition of a non-volatile substance which perhaps isn’t salt. At this point then Hydro Lubricants could come into their own.