

Heat-bodied Oils make Good Industrial Lubricants

Petroleum-based industrial lubricants present undesirable environmental and health effects, including toxicity to wildlife and humans, as well as poor biodegradability. Therefore, there is a growing interest in developing bio-based lubricants that are comparable to petroleum-based products and that are as good or better in performance and cost. Vegetable oil lubricants not only pose less of an environmental and health risk, they also have been shown to possess properties that make them suitable for industrial lubricant applications, including excellent anti-wear properties, high viscosity, low traction, and others. However, they also have some drawbacks, including low oxidation stability, poor cold flow performance, and poor hydrolytic stability. One solution to these problems is the development of heat-bodied oils, which are made by thermal treatment of vegetable oils under inert atmospheres to produce higher molecular weight oils.

A group of researchers, including ISTC's Dr. B.K. Sharma, John Scott, and postdoctoral researcher Bidhya Kunwar, investigated the film-forming properties of heat-bodied oils synthesized from soybean oil (SBO). They found that heat-bodied oils displayed higher density and viscosity than the original SBO, but slightly lower viscosity index (VI) values than SBO. However, the VI values were still much higher than other base oils. The heat-bodied oils also displayed film thickness properties typical of lubricating oils. The group concluded that the heat-bodilyng process provides access to bio-based oils with properties that rival traditional lubricants.



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- B.K. Sharma
- John Scott
- Bidhya Kunwar

Publications

Elastohydrodynamic Properties of Biobased Heat-Bodied Oils



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