

Spotlight on Biobased Lubricants

ENTERING AN IMPORTANT PHASE FOR GREENER, MORE SUSTAINABLE LUBRICANTS

One are the days when biobased lubricants were considered niche products and perhaps overlooked because of their pricing, durability and performance.

Today's formulations are robust, effective, more affordable and likely to see continued gains in terms of market share over the coming years.

This comparatively small but growing segment not only offers excellent environmental credentials but is more than capable of meeting the requirements of complex and demanding applications.

"The early versions of biobased products tended to be those where you had to give something up in terms of performance. That's no longer the case," Bill Downey, senior vice president, business development at Novvi, said. "The biggest and most important change in biobased

lubricants is that they now have better performance, are more cost effective for top-tier applications and are more widely available," he added.

Sustainable, non-toxic and biodegradable, this broad range of products can often outperform conventional chemistries and are used for gear oils, compressor oils, hydraulic fluids and metalworking fluids.

Biobased lubricants are typically reserved for industrial, marine and food applications. They can also be used in environmentally sensitive areas.

Another new area of interest, Downey added, is top-tier engine oils, which could never previously have been biobased.

"In the past, they just couldn't do the job; they didn't have the right oxidation stability, they couldn't deliver the frictional characteristics that were required, and they didn't

have the low-temperature properties," Downey said. "Now we believe top-tier engine oils can be part of that biobased offering, with a low carbon footprint as well."

The electric vehicle market is another important area tipped to be a significant outlet in the coming years, particularly as interest in e-mobility accelerates.

Although there remain concerns about the lack of engine oil in electric vehicles and the effect this may have on the wider lubricants market, there will undoubtedly still be plenty of opportunities. Future vehicle designs will require fluids to cool the batteries, insulate and protect motors, as well as provide traditional lubrication.

Today's biobased products are proving themselves more than capable of fulfilling these requirements.

In terms of pricing, biobased lubricants may never compete with Group I, II or even Group III base oils, but they are proving competitive in terms of synthetic esters, polyalphaolefins and other synthetic base oils.

"Biobased lubricants are not the novelty product they once were but work every bit as well as other lubes," said Mark Miller, CEO of Biosynthetic Technologies, a producer of biobased synthetic compounds called estolides, which are made from organic fatty acids found in bio-derived oils.

"We've now solved the major problems of conventional biobased base oils," Miller said. "The two main weaknesses were oxidative and hydrolytic stability, which tend to break down

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or shorten the life of the oil. These products are now very durable and we've got data and testing that shows they're every bit as good as polyalphaolefins or Group III base oils—and are better than they are in many ways as well."

He continued, "If you're a lube manufacturer, it's now very easy to replace petroleum ingredients with something much more environmentally friendly like vegetable oil, synthetic

esters or estolides."

And momentum is clearly building.

Sustainability has become a key driver for the majority of industry players, climbing to the top of their strategic agendas. Heightened environmental awareness, fueled by high profile initiatives such as the United Nations' Sustainable Development Goals and the Paris Agreement on climate change, have certainly helped put biobased prod-

ucts and environmentally acceptable lubricants in the spotlight in recent years.

"Sustainability has become a much bigger issue than virtually anything else right now," Miller said. "There's no doubt in my mind that this is the moment in time where environmentally friendly lubricants are really coming into the light. The fact is companies that have sustainability perspectives, projects and programs are actually more

profitable and offer real shareholder value."

He continued, "Major companies are declaring carbon neutrality and buying offset credits, but they've also said that they're going to start doing it organically by creating more sustainable alternatives internally. We're seeing a lot of the larger players starting to do this."

This focus on environmental, social and governance metrics at a corpo-

Esters Key to Unlocking Greener Potential



ZSCHIMMER & SCHWARZ

For even the most challenging of conditions and criteria, esters offer the perfect blend of performance and sustainability.

Drawing on decades of experience developing biobased esters for lubricants, Zschimmer & Schwarz offers innovative products that excel in applications needing oxidation stability, good lubricity, high flash points, and a broad operating temperature range.

Environmentally friendly, biodegradable and non-toxic, the versatility and unique characteristics of esters make them ideal for formulators who do not want to compromise on performance.

"We utilize a wide variety of biobased building blocks and can put them together to create optimized products for our customers," says Doug Placek, Z&S Global Director Lubricants Division.

Using its toolkit of biobased raw materials, Zschimmer & Schwarz can combine and customize products to create tailor-made solutions that suit the specific needs of almost any application, whether industrial, automotive, aviation or marine.

Bioderived fatty acids and alcohols are available in chain lengths from C5 to C22, as well as dimer/trimer acids up to C54. Combining these acids with a natural, partly renewable or synthetic polyol alcohol delivers esters with high bio-content and low water toxicity. Standard products are available with viscosity from 10 to 3,000 cSt at 40°C.

The business boasts an ever-expanding portfolio and the industry's broadest range of synthetic esters based on sustainable and renewable raw materials.

"With so many corporate and government initiatives targeting renewable technology, we anticipate the growing use of Environmentally Acceptable Lubricants and we are prepared with a wide range of options," adds Placek.

New requirements, such as those posed by the transition to electric vehicles, will provide plenty of exciting opportunities.

Natural and synthetic esters offer optimal performance and are capable of outperforming conventional petro-

leum-derived lubricants. Zschimmer & Schwarz products are widely used in hydraulic fluids, compressor oils and metalworking fluids.

"With everybody working toward carbon neutrality targets and ESG ratings, the shift to biobased will only continue and more people will embrace it," he says. "Our message is that if you need a greener solution, there are already proven solutions available that match or exceed the performance of mineral oils. Zschimmer & Schwarz offers formulators all the components that they will need tomorrow."

The market is increasingly demanding long-lasting, sustainable, high performance products—and its range of biobased, biodegradable esters deliver best-in-class performance and meet the highest industry standards (Ecolabel, LuSC, Blue Angel, VGP, VIDA, USDA BioPreferred). ♦

To find out more about the Z&S range of biobased esters, visit www.zslubes.com

rate and investment level is one of the newer—and primary—drivers that is really starting to resonate with users.

“Everybody is now looking at their sustainability profile, their carbon footprint, and health and environmental issues,” Miller said, “and I think they’re realizing that biobased lubricants can be a very easy fix and a key part of their plans.”

This shift in awareness

and attitude has been compounded by the ongoing COVID-19 pandemic, which has also encouraged companies to take a step back and reassess the effectiveness and efficiency of their operations, their energy usage and the composition of their products.

“Concerns about the COVID-19 pandemic have accelerated interest in businesses making sure their operations’ emissions footprint is lower,” Downey

added. “Businesses are getting far more sophisticated and spending much more time thinking about this as a business driver.”

“Low carbon footprints are not a fad or trend that is going to disappear. It’s clear that there’s no turning back. Novvi has seen more growth in the last year than we have in all years prior,” he noted. “I’ve had more conversations with blenders, base oil suppliers and additive suppliers about

lifecycle analysis and low carbon footprint than ever before. This trend is definitely here to stay; it is now fundamental to business and offers many new exciting opportunities.” ♦

In this Spotlight, Evonik and Zschimmer & Schwarz discuss their sustainability strategies.



Evonik Oil Additives Gears Up for Sustainability Transition

As the lubricants sector focuses on a more sustainable future, Evonik’s Oil Additives business is determined to drive this transition forward.

Its developed strategy aims to minimize its own footprint by simultaneously maximizing the use-phase benefits of its products, so more sustainable working practices can be achieved across industries utilizing lubricants.

As part of the World Business Council for Sustainable Development (WBCSD), a global, CEO-led organization of over 200 leading businesses and partners working together to accelerate the transition to a sustainable world, Evonik has co-developed the Portfolio Sustainability Assessment framework together with peer companies. This framework enables a comprehensive view on the sustainability performance of its entire portfolio.

By building a new framework spe-

cific to the unique requirements of the chemical industry, the business wants to assess and enhance the sustainability performance of its products and those of its customers.

By adopting a holistic approach, Evonik aims to increase transparency, phase out inefficient products and foster growth through the development of a more sustainable portfolio.

The business is already making good progress in achieving its goal to cut its specific carbon footprint by 30% by 2025. At the end of 2020, Oil Additives had already converted to green electricity across all its production sites.

In 2021, it purchased compensation certificates, adhering to the Gold Standard, that support windfarms in

each region with production facilities to help offset today’s unavoidable gate-to-gate emissions. Investment in these compensation certificates will be used as a short-term lever together with a long-term plan to minimize any remaining, unavoidable carbon emissions of production sites.

On the raw material side, Evonik is engaging with suppliers to reduce the impact of its raw materials as well as sourcing 100% RSPO-certified sustainable natural alcohols where available and commercially viable.

Evonik Oil Additives wants to play a key role in implementing change in the lubricants industry—not alone but as a partner—by working alongside the entire value chain to create possibilities for a sustainable world. ♦

Find out more about Evonik’s oil additives business and its sustainability strategy at <https://oil-additives.evonik.com/en/about/sustainability>