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October 12, 2011

## Europe's Diesel Oils Headed for Change

By Boris Kamchev

Europe's heavy-duty engine oils will have to deliver increased fuel economy and durability under severe conditions, while also meeting stricter emissions mandates driven by a global focus on air quality. All these needs will have long-felt impacts on viscosity grade recommendations, additive content and base oil supply, says an official with Lubrizol.

New regulations are expected to shift heavy-duty engine oils toward lower viscosity grades, possibly as low as SAE 5W-30, David Lancaster, Lubrizol's regional marketing manager, EMEA, told the recent ACI European Base Oils and Lubricants meeting in Krakow, Poland. Today, the key heavy-duty oils in Europe are SAE 10W-40s meeting the ACEA E6 quality level and 10W-30s meeting ACEA E9, in both fully synthetic and half-synthetic blends, according to market research that he outlined.

These oils comply with Euro V, the continent's current vehicle emissions standard which became mandatory for heavy-duty trucks in October 2008 and for all passenger cars by late 2010. "Both ACEA specifications align with the upcoming Euro VI heavy-duty emission standard expected to be introduced in early 2013, too," Lancaster, who is based with the additive manufacturer in Derby, England, told the conference on Sept. 21.

Both categories also are helping to change Europe's base oil profile. "E9 and E6 will result in greater demand for API Groups II and III base oils, as increase of the former -- unheard of in Europe only four years ago -- and the latter is now taking place," he said. Greater use of Group IV polyalphaolefins is also expected, with the imminent decline of Group I base oil in this application.

Next year, Group II and III will see 12 percent and 42 percent shares of Europe's diesel engine oil market, respectively, while Group IV could reach 6 percent, he indicated. Group I, which enjoyed a nearly 70 percent market share in 2008 before Euro V was implemented, may garner only 40 percent, and continue to fade. That includes both heavy-duty and passenger car diesel applications.

Additives also are going to evolve as ACEA E9 and E6 gain ground. E9, issued in 2008, is a cost-effective grade with mid-levels of sulfated ash, phosphorus and sulfur (SAPS), intended to be compatible with diesel particulate filters in mid-drain interval applications. The E6 grade defines high performing low-SAPS oils for long drain interval applications, and will continue to increase in demand, Lancaster observed.

These heavy-duty grades have roughly half the ash content of E7 oils, so they minimize ash buildup to reduce DPF blocking. "This characteristic delivers fuel economy benefit and the test results in ash buildup using E6 grade oil are better than using E7 grade oil," Lancaster said. "Significant differentiation in the amount of ash collected in the filter is observed when using low- and high-ash-containing engine oils."

These oil grades also contribute to enhanced environmental performance and enable vehicles to move in low-emission zones, such as the one that London authorities established in its most congested areas. "While driving from Heathrow airport to the center of London, drivers are faced with a big sign that says 'You are now entering a low-emission zone.' The vehicle registration plate is actually photographed," Lancaster noted, "and if it shows the authorities that the vehicle is not meeting the latest Euro emission standards, the driver has to pay a penalty, which is about 50 pounds per day for heavy-duty vehicles entering London."

Similar low-emission zones and incentives will likely be extended to various cities in Great Britain, he said. According to the World Health Organization, up to 600,000 deaths a year are associated with airborne particulate matter. "Direct and indirect effects of particulates and oxides of carbon, nitrogen and sulfur are affecting the global environment."

Meanwhile, vehicle population continues to grow, adding urgency to the issue. In 15 years the world's vehicle population is expected to double from where it was in 2005, he continued. "The

number of cars introduced on the Chinese roads, for example, is somewhere around 600,000 units per month."

In 2011, Lubrizol conducted a survey into the heavy-duty vehicles and engine oils used in France, Italy, Germany, Poland, Hungary and Romania. "The results have shown that 51 percent of the lubricants sold for on-highway use are 10W-40 grade," Lancaster said.

Currently Eastern Europe has a much smaller commercial vehicle park than Western Europe across all vehicle sizes, the survey found. "For example France, Germany and Italy have around 7.5 million small (3.5 ton) commercial vehicles in total, while in Romania, Hungary and Poland this number totals to around 750,000," he said.

In mid-size vehicles (in the 3.5 to 16 ton range), the three Western countries led with 1.5 million units while the Eastern ones had only 220,000. For vehicles above 16 ton, the survey found around 1 million in France, Italy and Germany, and around 150,000 in Poland, Hungary and Romania.

Usage of heavy-duty low SAPS E6 oils in these six countries averaged 22 percent, according to the survey, and also varied by region. "Although the three Western European countries are using more E6 grade lubes (26 percent), their three Eastern European counterparts are using less (18 percent)," Lancaster observed.

The top three heavy-duty truck producers in Europe are Daimler, with 24 percent market share, MAN (14 percent) and DAF (13 percent). These three key OEMs have a combined market share of 51 percent, and all recommend the use of SAE 10W-40 engine lubricants meeting ACEA E6, the survey found. Iveco, the next largest, recommends E7 quality and 15W-40, while Volvo and Renault favor E9 oils in 10W-30 grade.

More than a third of the truck drivers in these countries expressed concern over turbocharger deposits and turbocharging failures, according to the survey. "It is one of the areas that lube marketers should look into," Lancaster noted.

E6 and E9 grades also show enhanced durability performance compared to conventional E7 oils, thanks to superior additive quality. "Advanced additive components combined with higher quality base stocks bring higher performance to the end user," Lancaster stated. "Oil that demonstrates good soot control can lead to improved fuel economy."

Lube marketers should really be looking to the end user, he continued. "An owner of about 250 vehicles spends around €16 million for fuel annually, and if a lube marketer shows him fuel economy of only 1 percent, the truck owner can save €160,000. It is a lot of money."

Published by [LNG Publishing Co., Inc.](http://www.LNGpublishing.com)

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