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Joint News Release

FUCHS and BASF collaborate for a holistic sustainability assessment and more sustainable lubricant products – Life Cycle Analysis of Hydraulic Fluids

- Jointly executed Eco-Efficiency Analysis: Cradle-to-grave analysis to holistically assess environmental and economic aspects of hydraulic fluids

For more than 10 years FUCHS has continuously been driving its sustainability strategy as contribution for climate protection within the lubricant industry. BASF, a longstanding component partner of FUCHS, has a solid history of success in the area of environmental protection. With a recent Eco-Efficiency Analysis (EEA) for different mineral oil based hydraulic fluids, jointly executed by FUCHS and BASF's global business unit Fuel and Lubricant Solutions, the two partners have now established a strong case for a holistic real fact-based sustainability assessment of lubricants-hydraulic fluids.

Contrary to the currently dominant cradle-to-gate approach, which only assesses a partial product life cycle until a product has been manufactured, the evaluation of different hydraulic fluids was conducted employing a cradle-to-grave approach when assessing the environmental and economic aspects of the involved products in their full life cycle from sourcing of the raw materials, over production, their use phase and the disposal. Holistically considering the products' full life cycle around the usage in a crawler excavator, the findings of the EEA study clearly indicated the lower environmental impact and lower overall cost especially in use of the studied premium

HVLP fluid (high performance multigrade hydraulic oil) versus standard HLP fluid (monograde hydraulic oil). This advantage is mainly based on an improved diesel fuel economy throughout the use phase - primarily due to improved volumetric fluid efficiency lower friction and lower fluid mass circulation ratio - which clearly overcompensates a slightly higher environmental footprint of these products in the cradle-to-gate phase. The improved fuel economy was enabled mainly through the higher hydraulic fluid efficiency of the specific fully formulated multigrade hydraulic oils.

“With this study we are jointly pioneering the assessment of sustainability aspects within the lubricant industry,” said Dr. Lutz Lindemann, Chief Technology Officer, FUCHS PETROLUB SE. “We really value the broad competencies around sustainability and analytical methods which BASF has brought to the table to make it happen in combination with practical, realistic and application relevant FUCHS know-how. FUCHS and BASF are currently looking at further cases to jointly evaluate, but also at application cases for BASF’s sustainable product portfolio of lubricant components.”

“Sustainability is at the core of our business,” added Dr. Julia Frey, Vice President Business Management EMEA Fuel and Lubricant Solutions, BASF SE. “As a leading solution provider to the industries we serve, it is our aspiration to continually, together with our partners, advance the implementation of a fact-based approach to the topic within the fuel and lubricant sector.”

This study is a first example that demonstrates on the one hand the superior relevance of a cradle-to-grave versus a cradle-to-gate assessment and on the other hand the positive impact of a special designed multigrade high VI (viscosity index) hydraulic fluid on such a cradle-to-grave analysis. The fluids investigated were all mineral oil based hydraulic fluids of different quality levels. Further beneficial impacts on EEAs can be expected upon usage of ester based, so called biodegradable ester based (HEES) hydraulic fluids. Such fluids are known to inherently possess high shear stable VIs and in addition lead to lower friction compared to standard mineral oil-based fluids. Another environmental benefit is their biodegradability. Investigations with such ester-based fluids could be a next step.

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About BASF Fuel and Lubricant Solutions

The global business unit Fuel and Lubricant Solutions is a leading supplier to the transportation and mineral oil industries worldwide and part of BASF's Performance Chemicals division. Offerings cover fuel performance packages, refinery additives, polyisobutenes, engine coolants (Glysantin® brand) and brake fluids as well as lubricant additives, compounded lubricants, synthetic base stocks and components for metalworking fluids. The business unit has its main facilities in Ludwigshafen, Germany, Cincinnati and Florham Park in the USA, Nanjing and Shanghai in China, as well as Sao Paulo, Brazil. Research and development is mainly driven out of Ludwigshafen, Germany, Tarrytown, USA and Shanghai, China. Further information is available on the Internet at www.basf.com/fuel-lubricant-solutions.

BASF Fuel and Lubricant Solutions is part of BASF's Performance Chemicals division. The division's portfolio also includes Plastic Additives, Kaolin Minerals, as well as Oilfield and Mining Solutions. Customers from a variety of industries including Chemical, Plastic, Consumer Goods, Energy & Resources and Automotive & Transportation benefit from our innovative solutions. To learn more visit <http://www.performancechemicals.basf.com>.

About FUCHS

The FUCHS Group develops, produces and markets high-grade lubricants and related specialties for virtually all industries and areas of application. Formed in Mannheim in 1931, the Group employs more than 5,600 people worldwide at 62 operating companies. FUCHS is the world's largest independent lubricant manufacturer. Its most important markets in terms of sales revenues are Western Europe, Asia and North America. Further information at www.fuchs.com.