

## 2015 ELGI AGM Best Paper Award

The ELGI Best Paper Award committee is pleased to announce that this year's award for the best paper will be presented to Gareth Fish (Lubrizol).

All the presentations were evaluated on several criteria that covered both the content of the paper and the quality of the presentation.

On behalf of this committee and the ELGI board I would like congratulate Gareth in recognition of his presentation for this well-deserved achievement.

Mehdi Fathi-Najafi  
BPA Committee Chair



**Author: Dr Gareth Fish PhD CLS CLGS**  
[Gareth.Fish@Lubrizol.com](mailto:Gareth.Fish@Lubrizol.com)  
**The Lubrizol Corporation, Wickliffe, Ohio USA**

Gareth is the Strategic Technology Manager in the Industrial Additives market segment of The Lubrizol Corporation, Wickliffe, Ohio. He has a BSc in Chemistry and a PhD in Tribology from the Imperial College of Science, Technology and Medicine, University of London, England. He has over 25 years of experience in greases and lubricants. Prior to Lubrizol he spent 2 ½ years with the UK Ministry of Defence, in London, 12 years as grease and tribology specialist with GKN Technology in England, followed by 5 years with GKN Driveline in Auburn Hills, Michigan.

He has 2 European patents, and over 35 technical and commercial publications on greases and tribology. He has received 2000 NLGI Chevron Award, 2002 NLGI Fellows Award, 2011 NLGI Author's award and the Clarence E. Earle Award from the NLGI in both 2010 and 2012 for technical papers presented at the NLGI Annual Meeting.

# The development of energy efficient greases

Under pressure from governmental legislation, original equipment manufacturers (OEMs) have been focused on improving the efficiency of engines and drive trains. There was little focus on improving the efficiency of other automotive components. With the desire to utilize every means of potential efficiency saving, all moving componentry on a typical automobile is now being scrutinized for friction and energy losses. This includes the greases used in the wheel and accessory equipment bearings, and transmission components, including universal joints (UJs) and constant velocity joints (CVJs), which transmit power and motion from the gearbox to the wheels.

There are two main contributors to energy losses in bearings: churning through the grease; and friction losses due to sliding of the cage against the rolling elements and raceways. By optimising the lubrication of the bearings, theoretical improvements in energy efficiency are possible, but as bearings are extremely efficient, measuring the losses is a significant challenge.

In components that have significant sliding contacts, such as plunging CVJs, lower friction greases have been developed. Initially they were developed to reduce the noise, vibration and harshness (NVH) profile of transmissions, but now more focus is being given to their application to improve energy efficiency.

Historically, friction coefficients of greases have typically been measured using an Optimol Instruments™ SRV tester. This has been standardized as DIN 51834 for friction measurements. However, published papers show that many users of the instrument do not follow the standardized conditions to determine the friction coefficients of greases. Other tests used to measure friction include the high frequency reciprocating rig (HFRR), the Cameron Plint TE77, and the sliding 4-ball wear tester.

Today, grease frictional losses are not just an issue for the automobile industry but also for industry in general as users seek to improve energy efficiency. This paper looks at friction and efficiency losses in greases and the application of friction modifiers to potentially reduce the frictional losses in grease-lubricated componentry in a wide variety of applications.