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## Abstract – NLGI India Chapter 2017

### “Synthetic esters: performance fluids for high capability greases”

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#### 1. Synthetic esters: a unique performance profile

Synthetic esters possess an impressive set of performance features compared to traditional base stocks, including outstanding thermo-oxidation resistance, low volatility, excellent low temperature behavior, inherent lubricity, and excellent additive solvency. This is more particularly true for saturated neopolyol esters.

Synthetic esters are designed from a variety of possible building blocks, and their chemical structure may be chosen to give them a unique combination of technical performance properties.

#### 2. Taking advantage of specific features in grease applications

When focusing on specific features of neopolyol esters, it becomes apparent that they may be useful components for grease formulation. In particular:

- a) their solvating power, combined with their low temperature behavior, can be used for the formulation of PAO based greases
- b) their resistance to thermo-oxidation, low propensity to deposit formation and low volatility is particularly suitable for the formulation of high temperature greases

Using synthetic esters in greases may require some process adjustments; however in most cases very little changes are needed.

#### 3. Use in performance greases: illustration

The following greases may be discussed as an illustration of the benefits brought by the use of synthetic esters:

- a) PAO/diester based, multi-purpose grease with excellent capability at ultra low temperature
- b) Neopolyol ester based, high temperature grease for high speed, small roller bearings
- c) Ultra high temperature grease based on high performance, fully branched neopolyol ester

#### 4. Conclusion

Using synthetic esters in greases is a straightforward process in most cases. It allows extending the benefits of these high performance base fluids to greases.

In particular, suitably additized, high temperature greases based on such technology will cover an extended range of temperatures, where PAO based greases are not effective anymore and silicone greases are not yet necessary.