SulNOx Group PLC
10 Orange Street, Haymarket,
London, WC2H 7DQ

+44 (0)20 3441 5363
info@sulnoxgroupplc.com

What is Lubricity, why is it Important, and why is there a new focused attention to lubricity in Fuels

What is Lubricity?

Everybody knows what a lubricant is, and we use lubricants to reduce friction in order to prevent chaffing, scuffing and wear between two surfaces that are moving in relationship to one another.

Lubricity is the term used to rate the effectiveness of a lubricant, and a system of measuring this was devised by applying a controlled amount of friction between two surfaces, using the lubricant under test to protect these surfaces, and then measuring the amount of wear that occurs to rate that lubricant's performance.

Understanding the results of a lubricity test

The function of a lubricant is to prevent, or at least reduce, wear between two surfaces. The lubricity test result is a reading of how much wear occurred during the test, or simply put "how much wear the lubricant failed to prevent".
It follows then that a lower score indicating less wear is more desirable than a higher score indicating more wear.

Why is it important?

Lubricants prevent or at least reduce wear, which in some instances can be extremely costly to repair. Thus, the better a lubricant and the lower it is lubricity score, the more wear will be prevented, and the greater the value of the costs of repair, that are reduced and thus saved.

Why the renewed and increasing interest in lubricity in fuels.

Historically, or at least into the 70's, fuels such as diesel were considered to have adequate inherent lubricity for their use in engines without any additional lubricity improvers.

This all began to change when Sulphur Oxides in exhaust gases were targeted for reduction as part of the campaign to reduce harmful emissions, which rolled out globally and to this day, continue to increase in severity. This is achieved primarily by reducing the sulphur content in the fuel itself and is carried out at the refinery level.

The processes used to reduce the sulphur content in the fuel, further reduced the lubricity, due to their effect on the properties of other constituents of the fuel. This essentially amplified the worsening of lubricity caused by reducing the sulphur content.

What can be, and is being done, to improve the fuel lubricity?

Additives have become necessary in order to improve the lubricity of fuel, which has been subjected to the processes of lowering the sulphur content.

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This is done both by refineries themselves, and through the use of commercial, after market, specialist additive suppliers.

Due to the superior lubricity inherent in a host of vegetable oils, these began to be introduced into fuels distributed for use in diesel engines, in order to restore the lubricity levels.

This process continues to repeat, as fuels progress along the path of diesel from low sulphur diesel, to very low sulphur diesel, to ultra-low sulphur diesel, and the percentages of vegetable oils is increased each time.

This process is not without its issues, and new problems are found with each change.

The bottom line is that improving the lubricity of any level of fuel is going to improve the fuel, reduce wear, and save money.

Improved lubricity also saves fuel.

It is estimated that as much as 30% of the energy in fuel is lost in overcoming friction in vehicles, with over 10% being friction in the engine itself.

It thus stands to reason that regardless of the grade of fuel used, significant improvements in the lubricity of a fuel will reduce the friction in the engine and lead to significant improvements in fuel consumption as well.

Jimmy Redman Jnr (Inventor of the SulNOx proprietary technology)