



LEM® — A Diesel-Fuel Soot Early Warning

Soot, if left unchecked, will become a residue that will clog the internal parts of your diesel engines. A by-product of combustion, soot wears down any lubricating oil's additive package designed to keep it in suspension.

New, more stringent EPA restrictions have forced manufacturers to redesign the way their engines handle this harmful combustion by-product. Less soot escaping through exhaust systems means that more of it must be trapped or recycled into the engine oil.

Now you can economically prevent soot from killing your engines.

With the cooperation of major engine manufacturers, oil companies and additive suppliers, Analysts has developed a technology that quickly, accurately and economically measures and helps monitor the amount of soot buildup within your diesel-engine oil.

Leading-Edge Technology

Called **LEM®**— short for Light Extinction Measurement®— this advanced technology precisely identifies soot levels. Through the program's reporting procedures, LEM helps you monitor soot levels to avoid the harmful effects that soot can cause.

Results of new laboratory procedures used to analyze your oil samples accurately measure the amount of soot that may be present within your engines. The resulting amount is then applied to OEM-recommended maximums for particular engines. The procedure is executed by directly reading your oil sample, assuring the sample has not been altered through dilution or burning.

LEM overcomes the drawbacks of other laboratory methods to determine a lubricant's remaining service range. It is accurate for new engine technologies, lubricants and today's fuels. It accommodates higher levels of soot that are produced by some engines. It is inexpensive, fast and easy to understand.

Before LEM, three laboratory methods were used to give indications of soot content. Because of new standards and an increasing need to monitor this by-product, Analysts developed the LEM Analyzer.

Routine FTIR infrared testing may have been acceptable for past emission levels. However, soot levels in emissionized diesel-engine lubricants routinely exceed standard IR's capacities and capabilities.

Thermogravimetric Analysis (TGA) is still used as a benchmark test for soot, but is time consuming and expensive. The need to regularly monitor soot can make this type of analysis out of reach for many truck and fleet owners.

Total Solids determines the total content of contaminants in oil. It does not definitively measure soot. Instead, it measures the combined amount of contaminants, including dirt, wear metals, and even spent additives. Additionally, this testing uses solvent extraction, which is an environmental concern and increases costs because of waste-disposal expenses.



LEM combines the speed of IR with the accuracy of TGA. It gives you key data for determining the most effective and economic oil-change intervals for the engines within your fleet.

LEM improves your fleet management and prolongs the life of your engines by helping you:

- ➔ Maximize the service of your lubricants
- ➔ Maximize engine performance
- ➔ Avoid harmful engine deposits
- ➔ Determine optimum oil-change intervals

LEM readings:

- ➔ Correlate almost point-for-point with soot-mass percentages as determined by expensive TGA measurements, even when high-soot concentrations are present.
- ➔ Give no false positive high-soot readings that are caused by conditions unrelated to fuel soot, unlike standard IR testing.
- ➔ Require no solvents, standards or reference oils. The procedure reads directly from your oil sample.

Once the LEM Analyzer has scanned the sample, Analysts' high-speed LEM computer program examines the results and automatically calculates the percent soot.

Five U.S. Locations To Serve You

See for yourself how Analysts' services help increase your equipment productivity. Call your representative or the lab nearest you, or visit us at www.analystsinc.com.

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