

puraDYN™* Oil Filtration System Does Not Perform to OE Standards

Fleetguard contracted an independent laboratory with expertise in the physical chemistry of engine oils and additives and filtration enhancement techniques, to evaluate puraDYN's bypass oil filtration system. The purpose of the study was to determine if the manufacturer's claims that the system "dramatically extends oil drain intervals, and in many cases, eliminate oil drains completely" were accurate. Fleetguard also performed an in-house filtration evaluation on the puraDYN system per Cummins SAM 10547 test method for evaluating bypass filters and also tested via an internal "soot drawdown" test.

puraDYN Claims

puraDYN claims a technology that can extend oil life or replenish oil additives. Their literature states that the puraDYN system:

- ◆ removes solid contaminant as small as 0.25 microns and additives are replenished through a patented time-release process to help maintain proper TBN/TAN levels and viscosity
- ◆ continuously cleans lubricating oil by reducing solid contaminants to less than one micron, as well as removing liquid contaminants
- ◆ extends oil change intervals and reduces new oil purchases up to 90%
- ◆ can decrease the generation of waste oil by up to 90% and decrease the demand for new oil
- ◆ significantly improves full-flow filter life

Independent Lab Findings

The Labs' detailed study of the puraDYN oil filtration system's additive replacement technology indicates the filter is **no better in extending oil life than any simple bypass filter**. The puraDYN technology, consisting of a pellet pouch and cotton filling, shows no additive benefits either by solution dynamics or by contact effects. Specifically, the tests performed show that the puraDYN pellets were inactive and may even be *inert*. **Any oil life extension may be contributed to the larger volume of oil addition required during filter change.**

Fleetguard Test Findings

Fleetguard's soot drawdown test confirmed the puraDYN system **has no measurable impact on soot levels in a lube oil system**. The filter failed to meet the Cummins specified required flow at the rated inlet pressure. Based on the results of this evaluation, **the puraDYN oil filtration system is not recommended for use on Cummins engines.**

Testing Overview

An overview of the laboratory's evaluation and the Fleetguard soot drawdown tests includes the following results:

1. Presence of Additive

A puraDYN filter cartridge was opened carefully along its axis and its contents evaluated. The results were as follows:

- The filter medium was cotton.
- A sewn pouch of semi-transparent plastic pellets was positioned horizontally in the top portion of the filter canister. These pellets were considered to be the additive pellets, claimed to replenish TBN and reduce TAN, mentioned in the puraDYN literature. The pellets are approximately 4.25% of the filter by weight. This **confirmed the presence of an additive** and in proportionate amount.

*puraDYN is a registered trademark of puraDYN Filter Technologies Inc.

2. Solubility of Any Additives Found

Lab reports indicate that there was no metallo-organic additive dissolved from the pellets as shown by essentially no change in elemental composition. FTIR spectroscopic analyses were run on the 15 one-gram samples of the oil solution study using an approach that simplifies analyses with limited volumes. Little if any organic material was dissolved in the base oil from the lengthy exposure at 100° C at the end of the test.

The data obtained in the solubility study indicated that the puraDYN pellets did not work by solution dynamics.

3. Contact Response of Additive to Oxidized Engine Oil

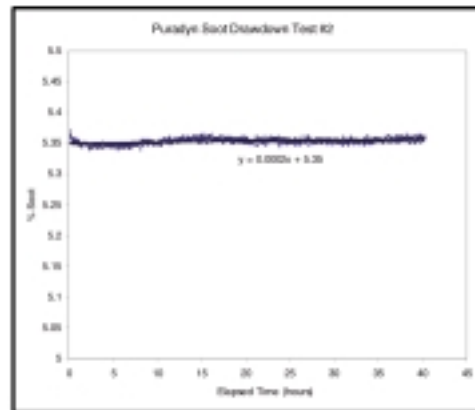
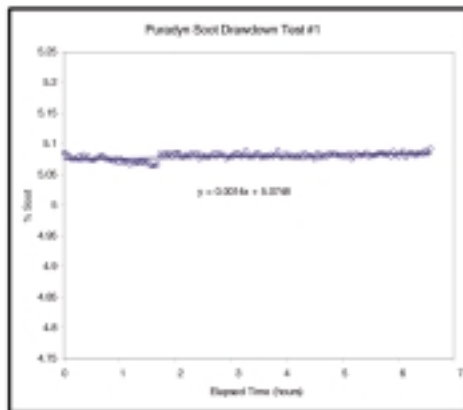
The puraDYN pellets weighed 2.80 grams at the end of the test. This is 0.05 gram or approximately 1.8% less than at the beginning of the test and within experimental error. The value indicates that essentially none of the pellet material was lost during the Contact Response Evaluation and would again suggest that **no loss of TAN occurred in the oxidized oil except by volatilization, meaning the pellets did nothing!**

4. Other Tests

X-ray Fluorescence and Pyrolysis data confirmed no zinc or magnesium was present in the puraDYN pellets. Strong oxidizing acid attack also confirms no visible response of the pellets and the initial weight of pellets was recovered at the end of a 24 - hour test. That is, **the pellets were inert** or inactive.

5. Fleetguard Soot Drawdown Evaluation

An inlet pressure of 60 psi and oil temperature of 225°F was maintained throughout the entire test, and outlet flowrate from the puraDYN was periodically measured to insure proper functioning of the unit. The sooted test oil was composed of a 50 / 50 blend of used oil (~10% soot content by mass) and fresh Premium Blue 2000 15W-40. Two sequential drawdown tests were performed on the same puraDYN unit. **Neither drawdown tests showed any evidence of soot removal.** In the second 40 - hour test, the 7-gallon sump was turned over (i.e. passed through the filter) 34 times, giving the puraDYN filter system ample chances to collect some soot. Fleetguard's on-line and continuously operating spectrophotometer showed no decrease in lube-oil soot levels in either test, indicating that **the soot removal efficiency is nil.**



As the industry leader of lube bypass filtration, Fleetguard is committed to the use of standard testing that includes flow rates of approximately 10% of the oil flow rate or 2-4 gpm, depending on engine size. As with any filtration system, the use of "real world" tests is key to comparing benefits. For detailed information on bypass filtration, consult Fleetguard brochure LT15094.



For more technical information, call Customer Assistance at **1-800-22FILTER** (1-800-223-4583), fax 1-800-999-8664 or visit us at www.fleetguard.com