

# Clean diesel with new filters

An iFLEET system fitted to the breather on an outdoor diesel tank (left), and the old type open-air breather that allows water vapour and particle contamination into the fuel in the tank.



A three-core 'plug and play' iFLEET filtration system fitted to a forecourt diesel bowser. Filtering contaminants and water before the diesel enters the vehicle's fuel tank reduces the demand on the vehicle's filtration system and eventually increases engine life.

PHOTOS: ANDRÉ STEYN

THE SOUTH AFRICAN COMPANY iFLEET has patented ceramic filtration technology with wide applications for any liquid, including diesel. Since October 2007, its filters have been installed at various mining, construction and transport sites, and there are plans to introduce the filter into the South African agricultural industry.

iFLEET owner André Steyn says ceramic filters last longer than regular filters and can filter any liquid, gas or air, including acids. Most normal depth filters are extremely water sensitive, highly resistant to flow and form channels, while ceramic filtration excels in all eight main filtration criteria.

Historically, ceramic filters have been used to filter gas and water, but never hydrocarbon fuels. Steyn has been involved in the transport sector for many years and has extensive experience with fuel contamination in diesel vehicles. He saw the need for a depth filter without water problems, and brainstormed, tested, and patented the concept of ceramic filtration for diesel.

iFLEET's main objective is to cost-effectively tackle the adoption of Euro 4-5 engine technology by the African environment and deal with the problem of engine failure, contamination, lubricity, carbon emissions, fuel quality and fuel theft.

Steyn explains that the ceramic filters conform to all filter performance criteria: low flow resistance; fixed high structural integrity; pore construction with non-collapse strength; reliable performance with a vast dirt holding capacity, all without chemical or water sensitivity.

The official fuel specifications of diesel lists a maximum level of impurities at 21mg/l, (21g/1 000l). Filters have an efficiency rating meaning even if fully functional, a certain percentage of contamination gets through. It's this "passed through" contamination that leads to the internal wear in the fuel system and combustion chamber, negatively affecting the economical life of the engine.

Upstream filtration decreases the total dirt level of the fuel, assisting the primary and secondary filter in the vehicle to cope

with the sheer volume of contamination. Most diesel filters in the market, especially cellulose filters, have a low contaminant-holding capacity. This is not the case with a ceramic filter, owing to its high-pressure capability and high structural integrity.

The chrome-based ceramic filter has a porosity of 33% and a non-flexible filter medium, directly improving filtration efficiency. It filters fuel at a sustainable level of 100%. Cellulose or synthetic filter mediums break down when the contamination level exceeds their capacity. They also break down

*'Africa's diesel has high levels of particle contamination.'*

due to factors such as surges, pressures, water, biodiesel, surfactants, alcohol and heat. Ceramics filters don't.

The old Atlantic diesel engines were fitted with 170-bar pressure injectors, while the new generation engines operate on an injector pressure of 1 800bar to 3 500bar. Steyn says that while engine technology has progressed filtration technology at bowser and vehicle level hasn't. Africa's diesel fuel has high levels of small particles, and the commonly used open-air breathers on bowsers allow contamination. The additional cost of upstream filtration is more than offset by the benefits of an increased engine life and the savings incurred if components don't fail prematurely. Few if any OEM equipment manufacturers don't strongly support improved filtration upstream that leads to lower contamination levels in the fuel entering the fuel tank. Added benefits include lower soot and emission levels, improved fuel consumption and cooler running engines. Steyn notes that between 50% and 75% of all engine failure is directly related to fuel system failure, and extending the life of an engine saves money. The product ranges from R2 500 to R15 000. There are case studies of modern engines failing on just one bad fuel fill, even from forecourts. – Chris Nel • Contact Auriel Mitchley (011) 889 0796 or e-mail aurielm@caxton.co.za. |fw

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