

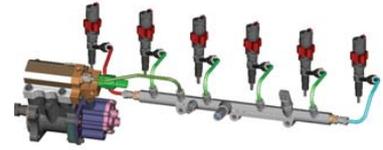


Across the world, fuel cleanliness problems are causing costly damage to engines and components.

Evolution of the Modern Diesel Engine



Diesel engines have changed dramatically over recent decades in order to provide higher power density, better fuel efficiency, and greater reliability. This progression in technology has resulted in engine architecture that utilizes High Pressure Common Rail Fuel Systems (HPCR). These fuel systems require increased pressures up to 2000 bar and tighter tolerances. Fuel system component degradation can occur when organic and inorganic contamination, including water, enters the fuel. Protection against these potential threats is vital to maintain engine uptime and decrease maintenance costs.



Global Emission Regulations Impact Operating Conditions

The introduction of global clean air standards that focused on reduced particulate emissions (NOx & Particulate) also increased the challenges for diesel engine fuel systems. Changing emissions regulations and increasing fuel costs established the use of ultra low sulphur diesel (ULSD) and biodiesel blends which created unique maintenance challenges for the fuel system. In most HPCR systems, particulate filtration efficiency requirements are more stringent, making finer filtration a critical requirement for modern diesel engines.

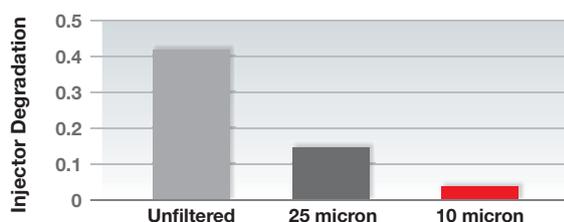
Clean Fuel and Finer Filtration

Clean, uncontaminated fuel is key to maximum fuel system performance and longevity for modern diesel engines. Without high quality fuel filtration and regularly scheduled service, fuel contamination can lead to costly repairs and engine downtime. A fuel cleanliness study found that more than 50% of fuel used worldwide does not meet the ISO 4406 18/16/13 (2,500 particles /1ml / @4µm©) fuel cleanliness standard. Fuel injection system suppliers today require that fuel entering the fuel injection system meets ISO 12/9/6 cleanliness standard. Dirt and contaminant removal and effective fuel/water separation with high quality filtration reduces component wear and creates optimized fuel atomization and engine power.



Why Fine Filtration?

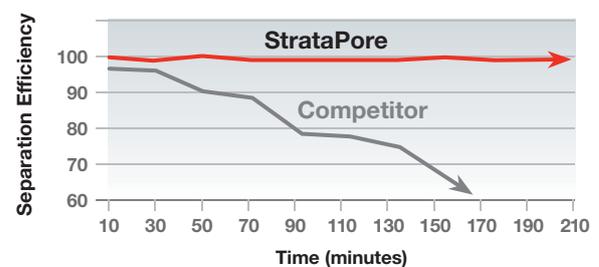
Filtration Effects on Injector Degradation



Fine filtration significantly reduces injector wear

Why Fleetguard Pro® Series?

Fuel/Water Separation Efficiency



- StrataPore maintains >95% fuel/water separation
- Best emulsified water removal available
- Holds approximately 3.5x more contaminant
- Supports the use of bio fuels



From Prefilter to all-in one Fuel Management Systems, Cummins Filtration offers solutions that protect your equipment.

Fleetguard® Fuel Products for Today's Diesel Engines

As the leading supplier of fuel filtration products to major global OEMs, Cummins Filtration provides fuel filtration products and systems that protect engines, components and equipment. Our wide range of Fleetguard fuel products includes:

■ On-Engine Fuel Filtration

Fleetguard fuel filters deliver best-in-class performance using proprietary StrataPore™ media with superior micron efficiencies that remove large particles and smallest debris and contaminant. Each media layer contains unique properties that extend filter life based on specific application requirements. Use of Fleetguard main, on-engine type filters and prefilters is appropriate under normal operating conditions with an acceptable cleanliness level of the fuel.



Product durability is an important factor in diesel engine operation because filter dents or handling damage can cause corrosion, affect burst pressure and affect proper flow of fuel through the filter. Fleetguard's User-Friendly Filter is constructed of advanced polyamide nylon material with glass fiber to resist denting. The lightweight filter provides more disposal options and is easy to install with an integrated hand grip texture and one-way 1/2" square drive removal. And, StrataPore media prevents the most harmful metal and dirt particles from reaching the moving parts of the engine.

■ Advanced Fuel Filtration

As pressure to burn cleaner fuel increases, more OEs are specifying the use of fuel/water separators throughout the service interval. Fleetguard fuel filters and fuel/water separators are constructed of lightweight, composite material with patented StrataPore finer filtration media inside.



The high performance Fleetguard Filter-in-Filter technology for High Pressure Common Rail engines provides optimally designed filter media to prevent water-related corrosion in modern high pressure fuel systems. The filter features two-stage particle removal with a 5 micron filtration rating and eliminates the hassle of extra filters and fuel plumbing. Its unique design allows reuse of the filter canister and replacement of only the filter cartridge at service time.

■ Near Engine, Remote Mount Fuel Filtration

Fleetguard fuel and diesel processors are best-in-class at fuel/water separation and particle removal operating at 225 to 680 l/hr (60 to 180 gal/hr). With StrataPore media inside, these processors reduce contamination and support longer service intervals. Each system offers unique features, like Water-in-Fuel sensors to monitor fuel cleanliness; fuel heaters to maintain proper temperature; and Seeing Is Believing™ technology that tells users when to change the filter. The Product range includes Fuel Pro®, Diesel Pro® and Industrial Pro® "All-in-One" single, double (duplex) and triple (triplex) units for On-Highway, Off-Highway and stationary industrial applications and equipment.





Real Performance.
Dependable Solutions.

■ **Off-Engine Fuel Filtration**

Because contaminant-free fuel is a prerequisite for higher performance and longer fuel system life, especially with ULSD fuels and biodiesel blends, Cummins Filtration offers a first line of defense at the fuel storage tank to ensure that the cleanest fuel reaches the engine system. Fleetguard® Fuel Island Filtration uses StrataPore™ synthetic media in a wide range of micron ratings to provide maximum protection. Cleaner fuel means higher fuel economy and saves operating costs. Fleetguard's Fuel Island and Winslow Depth Filters deliver the value our customers have come to expect from an industry leader.



Expert Fuel Filtration Solutions

Cummins Filtration designs and manufactures Genuine Filtration fuel system products that meet and exceed OE specifications for optimum protection, extended service intervals, and reduced operating costs. With extensive experience in integrated system solutions for modern diesel engines, we offer products to support the rigorous requirements of modern high pressure fuel systems.

Our innovative technologies include cleaning fuel to ISO 22/20/18 to ISO 18/16/13 and better with the Fleetguard Fuel Island Filtration and On-engine Remote Mount and Spin-on Fuel Processors. You can trust Cummins Filtration as the technology expert for the complete protection of your diesel engine fuel system.

Fuel Island Filtration



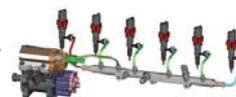
Near Engine – Remote Mount



On Engine – Spin On Products



Clean Fuel throughout Fuel Injection System



For more information, visit cumminsfiltration.com

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