Fleetguard®

FF53093

Stage II Fuel Filter featuring NanoNet™
for Cummins QSX 11.9L & 15L T4i Engines

FUEL

The Challenges of Global Fuel Cleanliness

Clean, uncontaminated fuel is the key to maximum fuel system performance and longevity for modern diesel engines.

According to the World Wide Fuel Charter (WWFC), approximately 50% of the world diesel fuel supply does not meet ISO 18/16/13 at the retail pump. Reports indicate diesel fuel is getting dirtier.

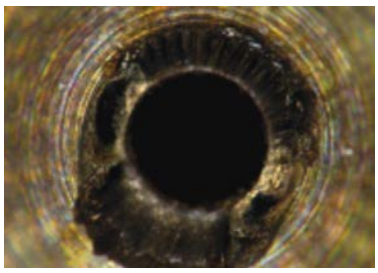
Modern diesel engines use XPI common-rail fuel systems that require unprecedented fuel cleanliness levels.

XPI fuel systems have tighter clearances that deliver injection pressure up to 37,710 psi (2600 bar).

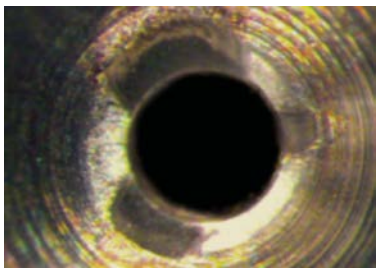
FF53093 performance provides greater protection and longer life of the Fuel Injection Equipment (FIE) and lower Total Cost of Ownership (TCO).

The new Stage II fuel filter featuring NanoNet® for Cummins QSX 11.9L and 15L T4i engines is focused on protection and providing optimal particle removal necessary for a long fuel system life.

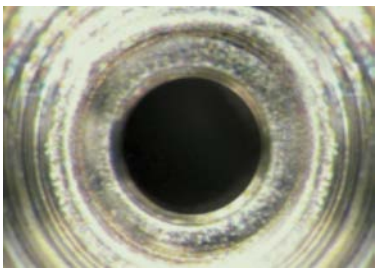
Accelerated Testing to Identify Wear on the Diesel Metering Valve (DMV) Seat



Field Failure
After teardown observation



Dust in Fuel
Testing with competitor media (After 50 hours)



Dust in Fuel
Testing with NanoNet media (No failure after 190 hours)

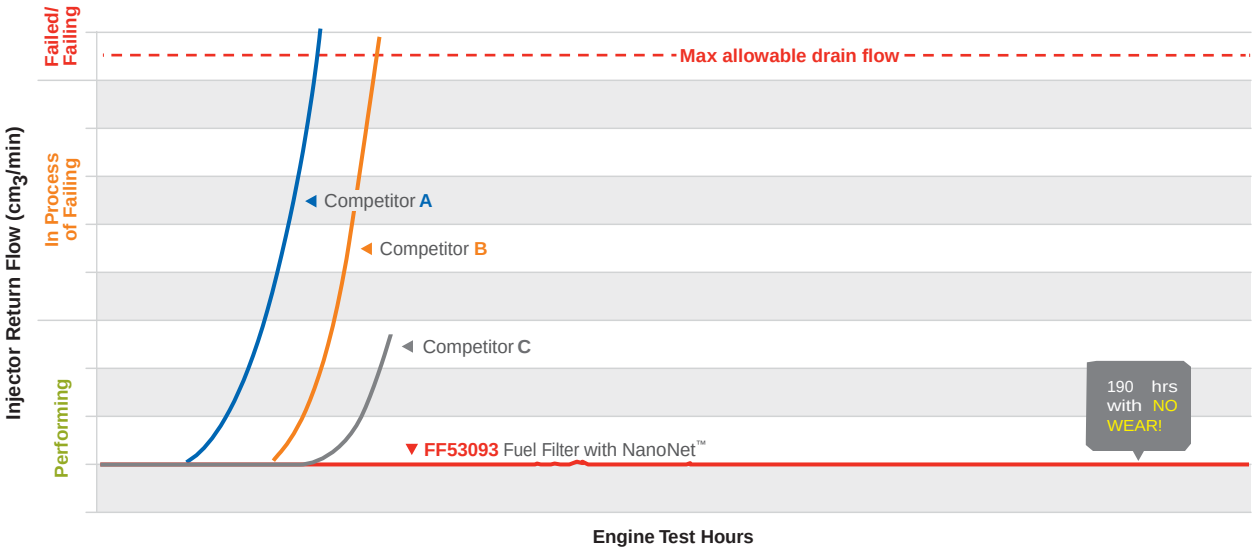
Figure 1

Proven Real World Testing

Cummins Filtration has developed proprietary testing that simulates real world engine conditions. These tests were used to develop high performance products with NanoNet®. These products provide higher level of system protection while maintaining the required service interval. The new FF53093 fuel filter for Cummins QSX 11.9L and 15L engines protects the fuel system from the harmful hard particles thereby reducing downtime and repairs.

Fast Cycle Engine Testing Results*

Injector return fuel flow
Goal is to be as **low as possible** through test cycle.



The above table shows that FF53093 offers lower injector wear (3rd picture in Fig.1) during Fast Cycle Engine Testing Results*. Beta Ratio for FF53093 is 3.3 times better than its competitors.

For more information regarding the above testing, please contact your local Cummins Filtration representative.

The FF53093 Heavy Duty Fuel Filter ensures the best performance and longer life for your XPI fuel system.

Fleetguard Genuine Filtration fuel system products are manufactured to meet and exceed OE standards for optimum protection and reduced operating costs. With extensive experience in integrated system solutions for modern diesel engines, Cummins Filtration offers products to support the rigorous requirements of modern XPI fuel systems.

* All are Stage-2 filters

Why Use Beta Ratio?

As a fuel filtration leader, Fleetguard recognizes the importance of providing superior filtration for High Pressure Common Rail (HPCR) fuel systems to operate as designed. Fleetguard's new NanoNet™ media has a consistent pore size throughout the media unlike conventional synthetic and cellulose media. Current industry fuel filtration product testing provides performance values that are described in terms of filtration "efficiency". The quantum leap in performance in NanoNet™ requires the use of "Beta Ratio" to truly convey the radical performance advantage.

How is Beta Ratio Calculated?

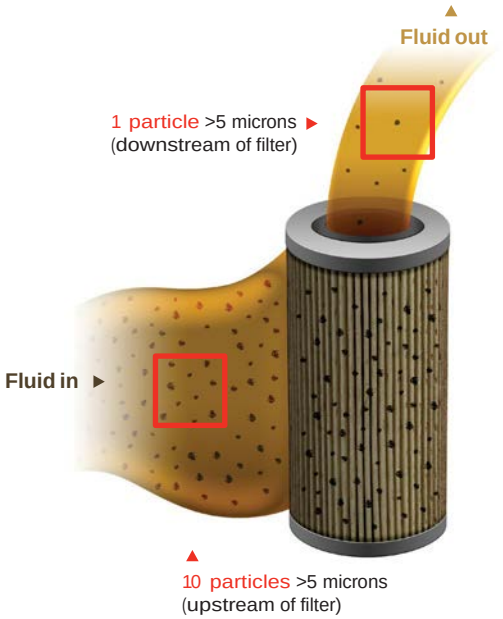
The Beta Ratio, from lab testing, is the current state-of-the-art method used to express a filter's ability to remove contaminants.

The Beta Ratio is calculated as follows:

$$\textbf{Beta Ratio} = \frac{\text{Number of Upstream Particles}}{\text{Number of Downstream Particles}}$$

Efficiency is a derivative and is calculated as follows:

$$\textbf{Efficiency \%} = \frac{\text{Beta Ratio} - 1}{\text{Beta Ratio}}$$



Beta Ratio Explained

The picture above shows a beta ratio of 10. The number of particles entering the filter (in the lower red box) is 10 and the number exiting is 1 (in the upper red box). Ten divided by 1 equals 10, which is the beta ratio.

$\beta_{4(c)}=60$

Micron Size (c)

This ratio of 60 states that the Current media filter is 98.3% efficient at 4 micron (c)

Beta Ratio	Efficiency	# Upstream	#Downstream
2	50%	100,000	50,000
4	75%	100,000	25,000
10	90%	100,000	10,000
20	95%	100,000	5,000
40	97.50%	100,000	2,500
60	98.30%	100,000	1,667
75	98.70%	100,000	1,333
100	99.00%	100,000	1,000
125	99.20%	100,000	800
200	99.50%	100,000	500
300	99.60%	100,000	333
500	99.80%	100,000	200
1000	99.90%	100,000	100

Current Media Performance (Absolute Value)

FF53093 Performance Provides 3.3x better protection of the engine fuel system.

Filtration

For more information, visit cumminsfiltration.com

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