



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 High Pressure Common Rail (HPCR) Fuel Systems that require unprecedented fuel cleanliness levels.



HPCR fuel systems have tighter clearances that deliver injection pressure up to 33358 psi (2300 bar).

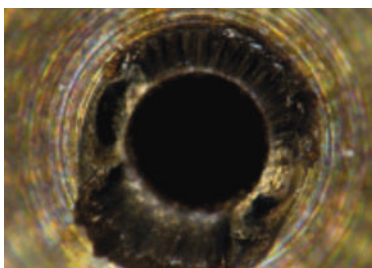


The Cummins B/L Series Stage II UFFXT fuel filter, FF63009, provides greater protection and longer life of the Fuel Injection Equipment (FIE) and lower Total Cost of Ownership (TCO).



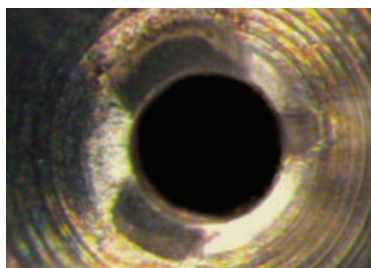
The new Stage II User-Friendly Filter with XT design featuring **NanoNet™** for Cummins B/L Series engines is focused on protection, providing optimal particle removal necessary for a long fuel system life.

Diesel Metering Valve (DMV) Seat



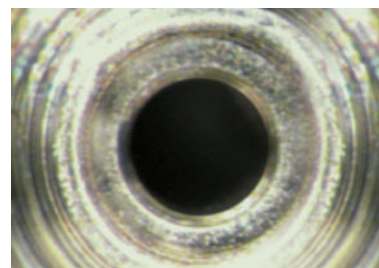
Field Failure

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)

The Fleetguard® Solution:



Why Use Beta Ratio?

As a fuel filtration leader, Cummins Filtration recognizes the importance of providing superior filtration for 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?

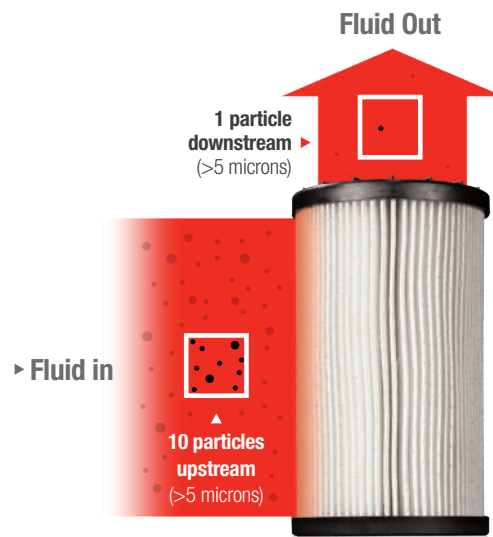
The Beta Ratio, from lab testing, is the current state-of-the-art method used to express a filter's ability to remove contaminants.

The Beta Ratio is calculated as follows:

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

Efficiency is a derivative and is calculated as follows:

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



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 Ratio	Efficiency	# Upstream	#Downstream
	2	50%	100,000	50,000
	4	75%	100,000	25,000
	10	90%	100,000	10,000
	15	93%	100,000	5,000
	40	97.50%	100,000	2,500
	60	98.30%	100,000	1,667
$\beta_{7(c)} = 75$ ▶	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
$\beta_{7(c)} = 725$ ▶	725	99.86%	100,000	138

The ratio of 75 states that this filter is 98.7% efficient at 7 micron (c).

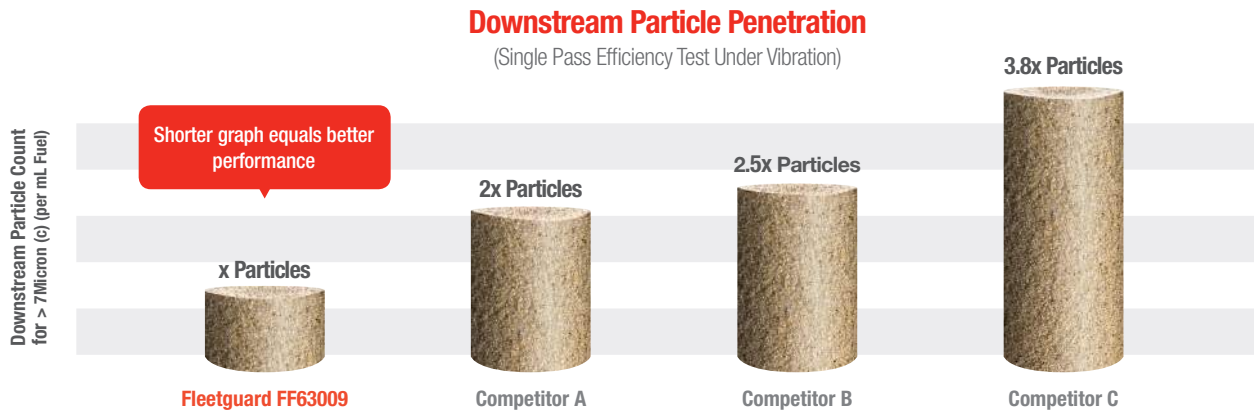
Current Media Performance
(Absolute Value)

FF63009 Performance
Provides ~10x better protection of the engine fuel system.



Proven Real World Testing

Cummins Filtration has developed proprietary testing that simulates real world engine conditions. These tests were used to develop high performance filters with **NanoNet™**. These filters provide a higher level of particle retention compared to its competitors, which increases the protection of the fuel system while maintaining the required service interval. The new FF63009 with UFFXT filter construction for Cummins B/L series engines protects the fuel system from the harmful hard particles thereby reducing downtime and repairs.



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

The Cummins B/L Series Stage II fuel filter, FF63009, delivers the best performance and longer life for your HPCR fuel system. FF63009 patent pending XT design ensures that your engine is protected consistently from contamination in the fuel. The 'user friendly' composite design ensures easy handling of the filter during service avoiding spills and improves recycling options for the filter.

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 high pressure fuel systems.



cumminsfiltration.com

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For technical details, refer to the **Fleetguard Technical Information Catalog** or visit **Fleetschool**.

Nothing Guards Like Fleetguard.