

WE ARE CUMMINS. WE KNOW ENGINES.

Don't be fooled by industry followers...Cummins Filtration is the only filter manufacturer that is also part of an engine manufacturer. Cummins Inc. is an engine, filter, fuel systems, turbocharger and after-treatment manufacturer. As part of this family, Cummins Filtration is one of only a few filter companies in the world that has in-house filter media manufacturing capabilities. Of those few, we are the only filtration manufacturer that can tie this filtration expertise directly to the knowledge of what is required for optimal diesel engine protection.

We know precisely how to provide the very best in engine

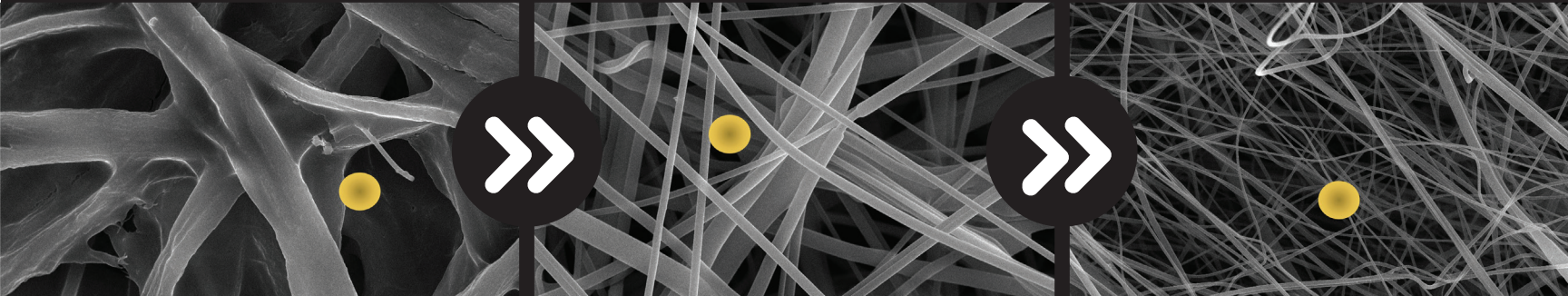
protection...period. Our technology has been proven with millions of miles and hundreds of thousands of hours of both laboratory and real-world, operating engine analysis. As a part of Cummins, we have the benefit of developing our products directly alongside the development of each engine, testing their capabilities in dozens of engine test cell and field trial environments around the world. While others have attempted to imitate our award-winning StrataPore[®] media in their filters, we continue to push our media to the next performance level with our state-of-the-art nanofiber media called NanoNet[®].

MEDIA TECHNOLOGY LEADERSHIP

Conventional Cellulose
(10 to 60 micron fiber size)

StrataPore® Polymeric Microfibers
(1 to 20 micron fiber size)

NanoNet® and NanoForce® Polymeric Nanofibers
(0.1 to 1.0 micron fiber size or 100 - 1000 nanometers)



In use since the origin of pleated filtration media.

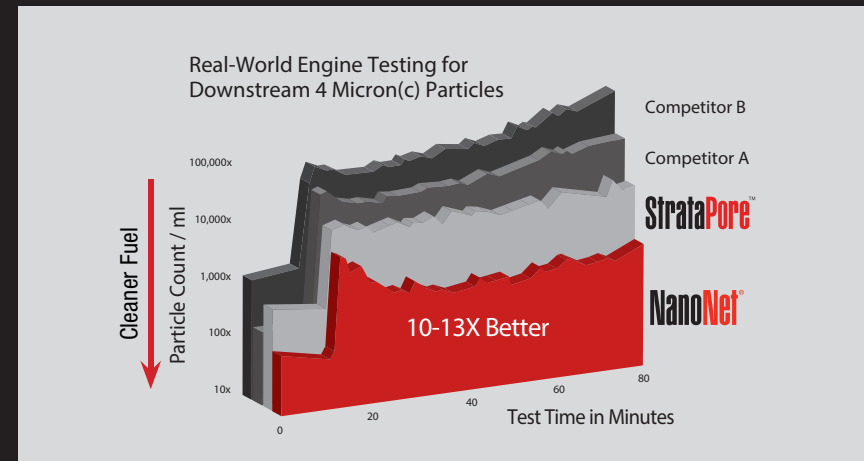
Pioneered for high performance lube & fuel applications in the mid-'90s.

Opened the door for higher performance fuel, lube and air filter applications since 2011.

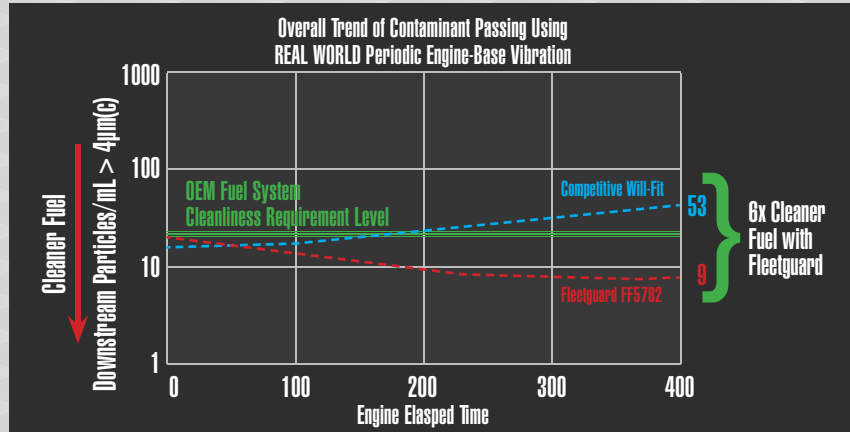
● Represents a 10 MICRON DOT

With the introduction of NanoNet media, our fibers are now entirely sub-micron in specific layers and can even approach an average size of 0.25 micron. To keep things in perspective,

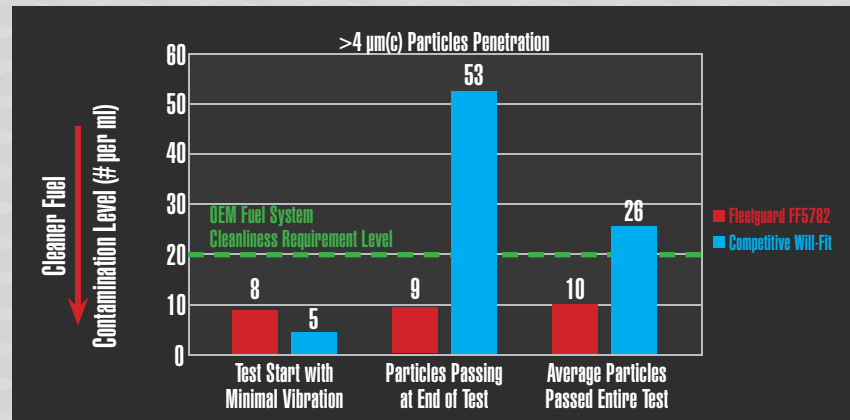
a human hair is roughly 70 microns. That's 10 times larger than the average StrataPore fiber and at least 100 times larger than the size of the average NanoNet fiber.



BEYOND THE STANDARD TESTING



By looking at the graph, you'll notice that both filters meet the OEM fuel system cleanliness requirement level in the beginning of the test; however, only a short time later we see how the two filters quickly are trending in opposite directions as random vibration is introduced. Over the course of the 400 minute test (simulating a complete service interval for these fuel filters), the Fleetguard filter is still maintaining a high efficiency of particle removal to meet the OEM fuel cleanliness requirement while the will-fit filter is letting nearly 6x more contamination downstream.



You may have seen statements made by our competitors, claiming their fuel filters achieve a higher level of performance than our own. What they forgot to mention was that they were testing their premium and costly product against one of our older, legacy cellulose filters rather than our latest technology which is engineered to protect HPCR fuel systems—hardly a fair comparison, wouldn't you say?

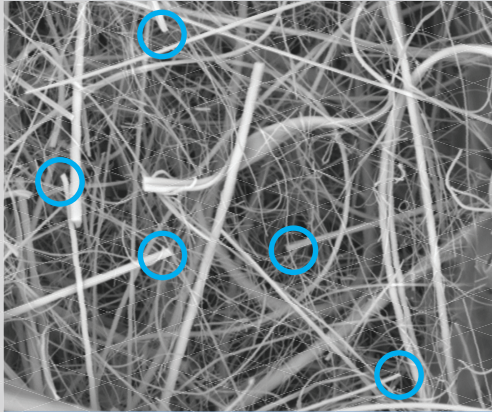
We decided to replicate a competitor's test based on what information we could gather from their graphs comparing their premium filter to a Fleetguard NanoNet® filter and the results are telling. Our test is designed to measure the contaminant removal efficiency of a filter while subjecting it to simulated real world engine vibration...just like a filter would experience on an engine in a piece of equipment.

We think the results speak for themselves. Remember, Fleetguard filters are engineered, developed and validated over thousands of hours and millions of miles alongside the development of Cummins engines, all to ensure optimum performance and protection. Nothing guards like Fleetguard!

Filter Merits	OEM Filter	Will-Fit Filter
Meets proprietary OEM requirements	YES	NO
Developed in conjunction with the engine OEM	YES	NO
Utilizes premium continuous polymeric media (eliminates possibility of short-fiber release into engine)	YES	NO
Utilizes premium 100% glass-free media	YES	NO
Is completely cellulose/paper free	YES	NO
Premium clean-side center-tube is rust/metal free	YES	NO
Best filter for handling real engine vibration	YES	NO
Approved by and warranted by Cummins	YES	NO

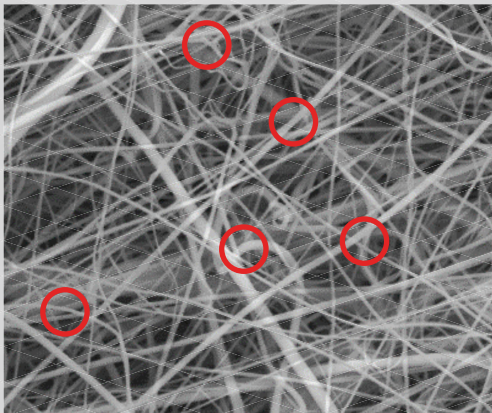
MEDIA TECHNOLOGY COMPARISON

(PHOTOGRAPHS ARE SHOWN WITH EQUAL MAGNIFICATION)



Will-fit Filter with Many Loose Fibers

- Will-fit media uses “paper-making-technology” where only short chopped fibers can be utilized
- Ends of brittle glass fibers that have been chopped and broken are readily visible as pictured to the left
- Fiber pieces could be released from the filter and enter critical areas within the engine system to cause premature wear
- Loose fibers move and release particles under dynamic conditions such as vibration and fuel surges, meaning fewer contaminants are contained over the life of the filter



NanoNet[®]

Genuine OEM / Aftermarket Filter with Continuous and Bonded Fibers

- 100% continuous polymeric fibers are formed from a state-of-the-art proprietary production process
- Completely glass free media means that NanoNet fibers do not degrade over time and will not pass downstream and into the engine
- Fibers are bonded at each junction for improved rigidity and do not move apart during vibration and flow surge, meaning contaminant stays put over the life of the filter

PATENTED TECHNOLOGY FOR GENUINE FILTRATION.

NanoNet[®] | FUEL

- Designed to deliver fuel to your engine that meets the fuel injection equipment (FIE) manufacturer's suggested ISO 12/9/6 cleanliness level *
- 100% fully polymeric, multilayered synthetic media means it's extremely resistant to saturation and degradation over time
- Best at protecting injectors against the release of captured particles during engine vibration and fuel surge which occur in real world operating environments. This level of protection allows fuel injectors to perform like new over the course of their life
- Can extend service intervals, maintain high efficiency, reduce downtime and maintenance cost
- Proven with millions of miles and hundreds of thousands of hours of testing in the field

*ISO 12/9/6 is the proper means of communicating fluid particle contamination per the ISO 4406 fluid cleanliness methodology. The ISO 12/9/6 is an example of the fuel cleanliness level specified by some FIE manufacturers and corresponds to particle counts per 100 ml of 4000 at >4 micron-C, 500 at >6 micron-C and 64 at >14 micron-C.



NanoNet[®] | LUBE

- Improves oil flow ability both at cold and operating temperatures resulting in overall fuel economy
- Captures and retains real world contaminants that can damage the engine
- Structural integrity and design allows for maximum contaminant holding capacity
- The LF14000NN holds between 11-24% more contaminant than the will-fit filters made by competitors
- Provides high efficiency due to the performance characteristics of the NanoNet media by-pass section



NanoForce[®] | AIR

- Nanofiber filter media provides 99.99% filtration efficiency; the best engine protection available
- 3X the engine protection vs. conventional filters; quantifiable reduction in wear particles
- Long service interval -2X longer service life achieved versus conventional air filter; fewer air filter changes
- Robust construction enhanced with nanofiber media; reliable engine protection
- Advanced pleat geometry, spacing and stabilization; superior engine protection and longest filter service life

