Premier Web™ 3D
A Disruptive Nanofiber Technology

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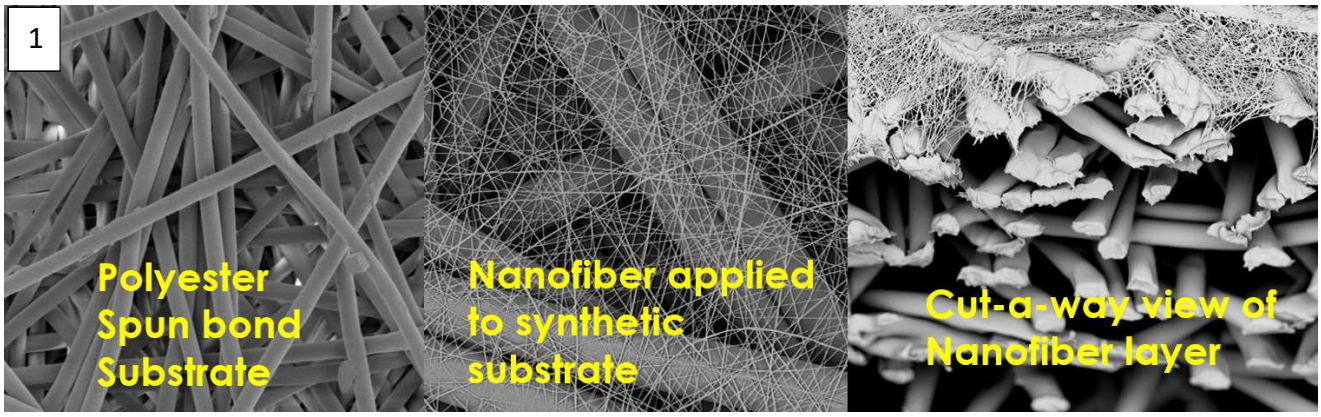
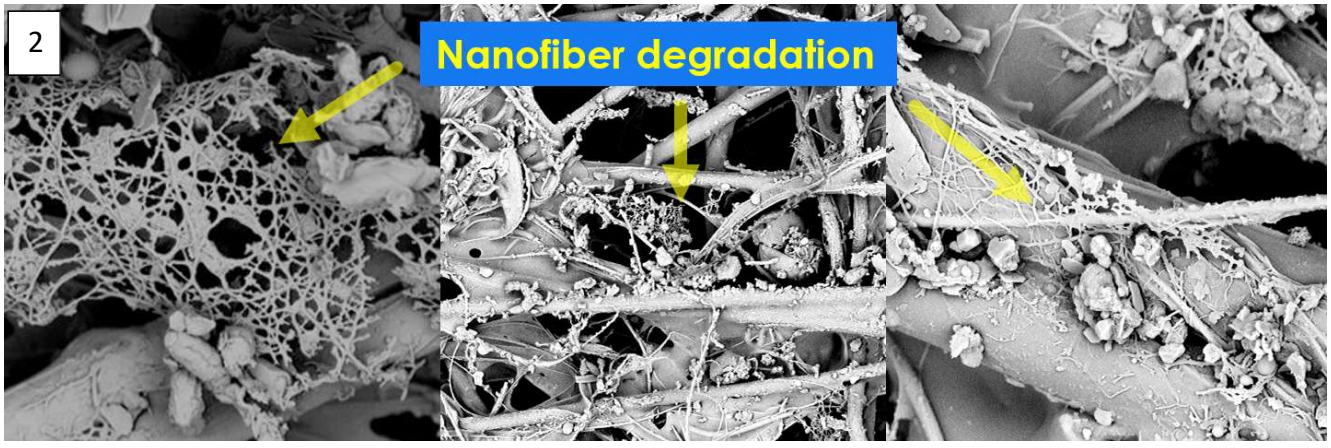
Nanofiber Technology for Air Filters

Nanofiber technology has been around for many years, with the significant portion of air filtration sales being focused around only a few primary technologies and even fewer filter manufacturers. But in today's competitive market, develop a patented technology and the world seems to place a target on your back. But this drives the development of new and improved or more value driven products.



The challenging aspect of filter design is the balance between maintaining high efficiency and operating pressure drop over the lifetime of the filter. Nanofibers have a proven ability to separate fine particles with a low overall resistance. And at the outset, they appear to have the added ability to shed dust on the surface through pulse cleaning. At least… on the surface.



Historical experience and filter diagnostics have identified areas for improvement. 1) Durability of the nanofibers. 2) Rate of pressure drop increase. Cleaning system adjustments can help control flow resistance, but at what cost? Image #2 shows the impact of prolonged filter cleaning and effects on the filter surface. Premier Web™ was developed with higher "cohesive fiber to fiber" strength. New polymers and application technology provides measurably higher levels of durability and flexibility. Fibers are now more robust, adhere to the substrate surface more effectively and provide the flexing needed to shed the dust.

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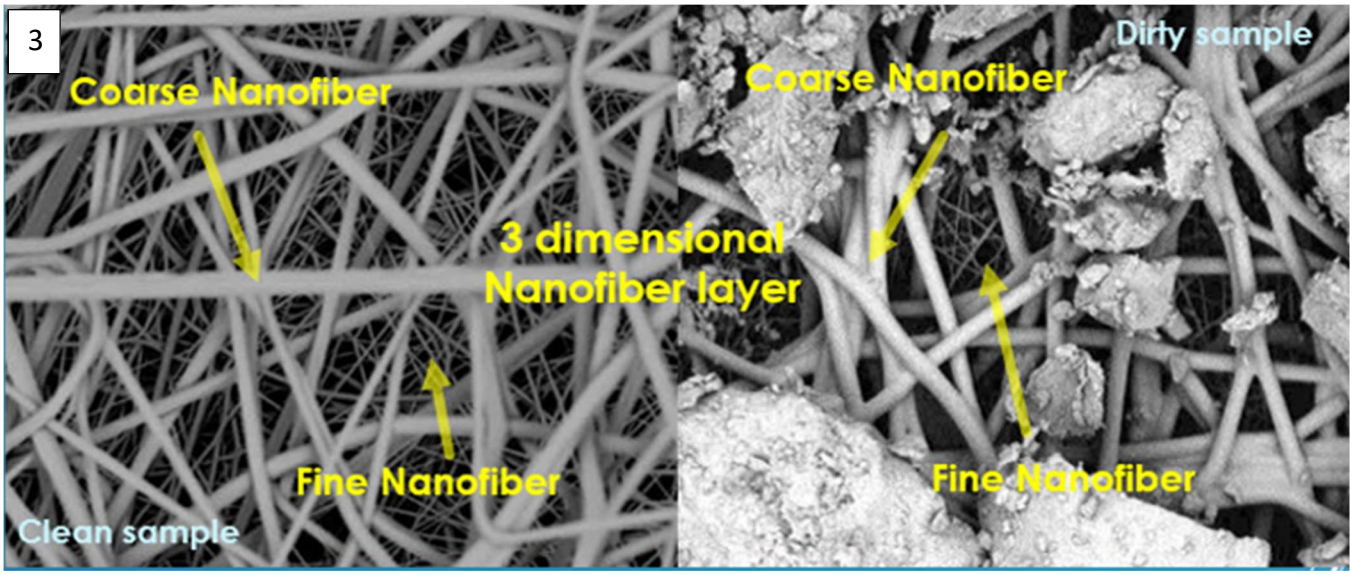
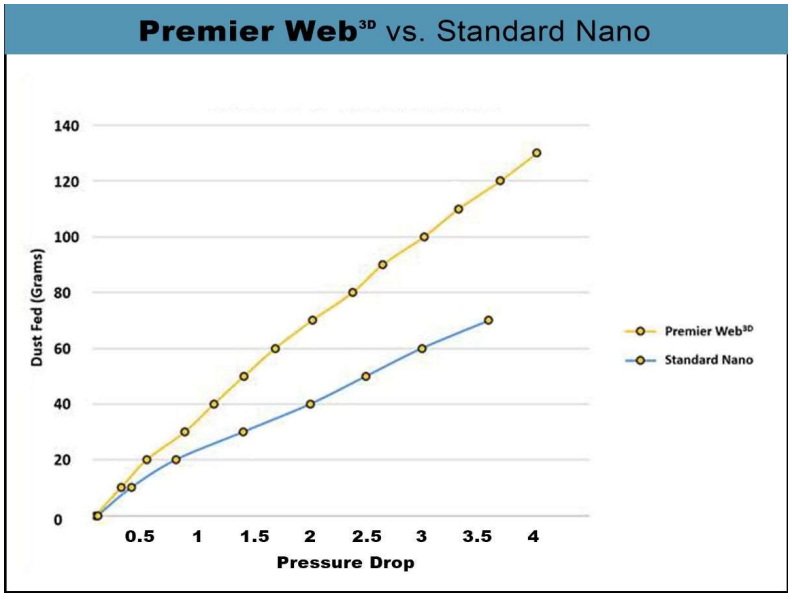


A Disruptive Technology - The term "surface filtration" has been almost synonymous with nano filters. But today, the most recent development is a nano layer with "depth"! Yes, depth filtration with nanofibers. No longer does a nanofiber layer have to exhibit rapid increase of the flow resistance exhibited by that flat surface. Stratified sizes of nanofiber within the layer impact not only the mechanical separation of particles, but actually reconstruct the permeability of the filter dust cake after every pulse. Microscopic as it may be, the "depth" created by this 3D Nano technology allows the layer to "sieve" particles and change the manner in which they re-deposit on surface. What results is an incredible increase in dust holding capacity. Not just a 30% or 50% increase but as much as 80%!



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$ Value for Industrial Filter Users

For Industrial Dust Collection users, the largest impact is reduced energy consumption. The higher dust holding capacity means the filters will require cleaning less frequently. For example, in laboratory testing, over an 8 hour period, conventional nano required as many as 90 cycles of cleaning to keep the pressure drop at or below 4" w.c.. The new 3D Nano technology, over the same period required 42 cleaning cycles. That means the 3D Nano filters had to be operating at average pressure drops at considerably lower levels than with the conventional media. So, if you are paying an increasing amount of $ for the operation of a fan due to high operating resistance, you are going to save a significant amount of money operating with the newer 3D nanofiber design.

$ Value for Energy Producers

For users of Gas Turbine Air Inlet Systems, certainly life expectancy is based upon pressure drop. The longer you can perform at an acceptable pressure drop, the longer the filter life. The largest impact is the potential for a decrease in fuel consumption. Results vary depending upon the turbine design. But operations have shown that a 1" average drop in flow resistance, based upon $0.05/kwh for 150 MW gas turbine could realize close to $300K in fuel cost savings!.

The Finish Line

Nothing lasts forever. That includes every filter product out there. However, most successful Operation Managers will tell you that incremental improvements to processes that are the key to a successful operation. Filter performance is in fact measurable and can contribute to the bottom line. A lower operating pressure drop and longer filter cycle life can absolutely benefit most operations. The Premier Web 3D Nanofiber technology may just be the next step in contributing to your bottom line.