

ePTFE Technology

Pharmaceutical and Isolator Applications

TECHNOTE

AAF ePTFE Technology - Latest Advancement in High-End Air Filtration

AAF ePTFE Technology is based on patent pending polymer based dual-density ePTFE membranes. ePTFE Technology provides significantly more durable filter media than ultrafine microglass media, resulting in greater performance reliability, comparable PAO testing compliance, and lower energy consumption. With unique performance characteristics, the AAF MEGAcel® II filter with ePTFE Technology is an excellent solution to the reliability and energy challenges seen in the pharmaceutical and biotech industries.



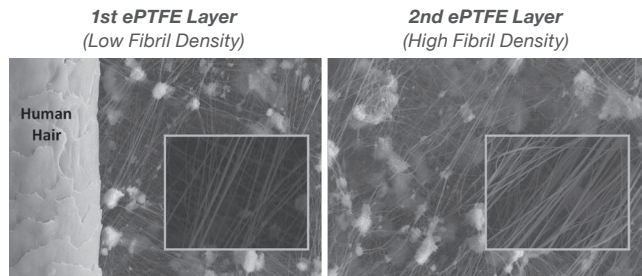
The MEGAcel® II filter with AAF's ePTFE Technology represents the latest advancement in high-end air filtration for the pharmaceutical industry.

MEGAcel® II - First PAO Compliant ePTFE HEPA Filter

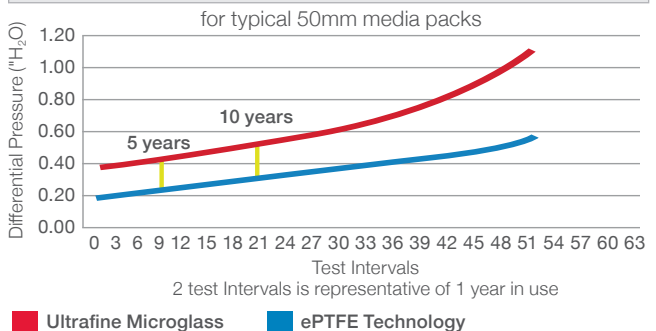
The purpose of installed HEPA filter integrity testing, also called in-situ testing, is to confirm a flawless performance during normal operation. With AAF's new ePTFE Technology, MEGAcel II filters can now be scan tested with the industry standard photometer at the standard aerosol concentrations set forward, as well as the low-aerosol concentration, Discrete Particle Counter (DPC) method.

The MEGAcel II filter contains dual-density ePTFE Technology media specifically developed to retain equivalent amounts of PAO aerosol and equivalent pressure drop increases as ultrafine microglass. The dual-density ePTFE layers allow for the in-depth capture of progressively smaller solid particles.

Independent laboratory studies have shown that MEGAcel II filters with ePTFE Technology have superior PAO holding capacity over traditional ultrafine microglass HEPA media as seen in the results below.



1 Hour Test Intervals (@15µg/l) Time VS DP



BETTER AIR IS OUR BUSINESS®

ePTFE Technology

Reduce Operational Risk

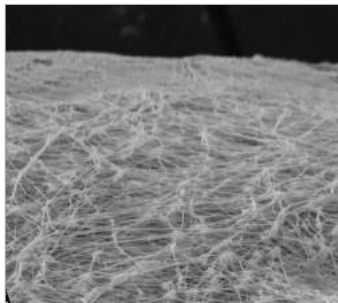
The pharmaceutical industry estimates that 77% of production downtime can be attributed to failures of equipment and environmental problems. This downtime can be caused by HEPA filters failing. Traditional HEPA filters typically fail due to some form of contact combined with the poor mechanical strength of the filter. The actions required when these failures occur include repairing/replacing the HEPA filter, certifying the repair or new installation, investigating potentially contaminated product, and generation of a risk assessment report.

Improved Durability

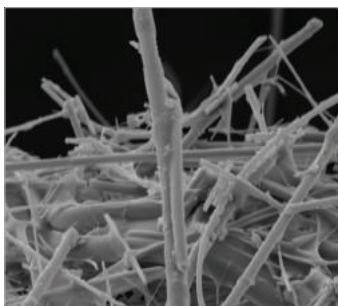
Independent tests have shown that MEGAcel II HEPA filters with ePTFE Technology have superior mechanical strength over filters with traditional ultrafine microglass media.

The superior mechanical strength is demonstrated by a high tensile strength, burst pressure, and abrasion resistance. ePTFE Technology retains its integrity with a high resistance to any potential damage, such as mishaps in handling or installation. This means that the risk of filter media failure is minimized and that fiber shedding, which could cause contamination when entering the airstream, is eliminated.

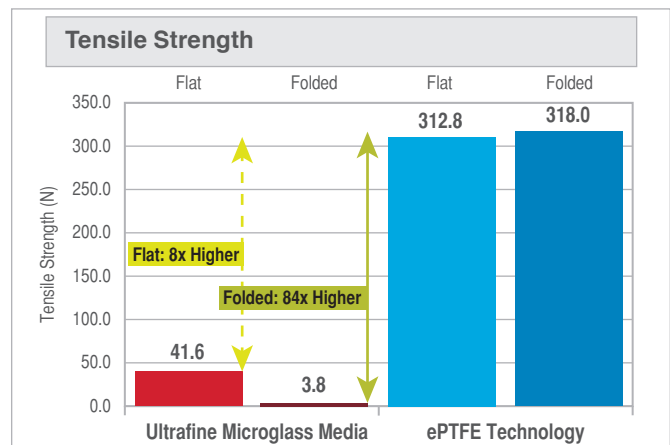
As a result, there is a decreased probability of contaminants entering cleanroom environments. Protection of sterile products and cleanroom personnel is optimized. Improvement in quality risk management systems of critical applications ensures a consistent supply of quality products and a reduction of failure rates.



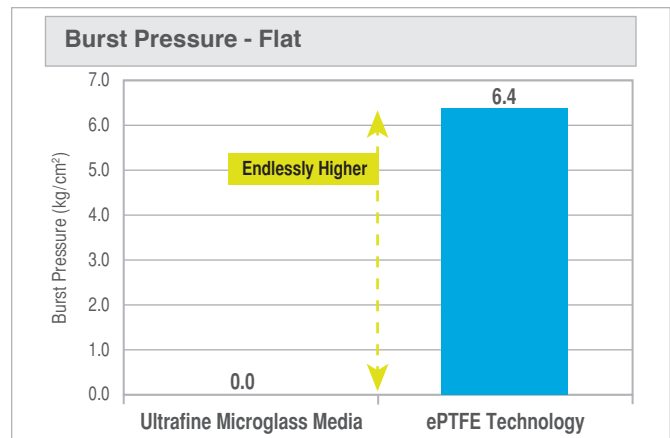
Resilient ePTFE Technology media at fold tip @ 10,000x magnification.



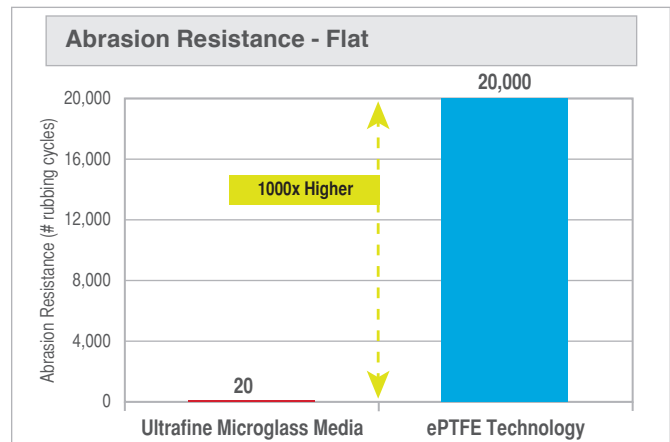
Fractured ultrafine microglass media fibers at fold tip @ 10,000x magnification.



Results based on Test Standard DIN EN 29073-3.



Results based on Test Standard DIN EN 13938-2.



Results based on Test Standard DIN EN 12947-2.

ePTFE Technology

Improved Chemical Properties

High Corrosion Resistance

ePTFE Technology is proven to be resistant in highly corrosive environments and will withstand attacks from common sterilizing chemicals such as hydrogen peroxide, formaldehyde, and chlorine dioxide. Both components of the ePTFE Technology, the membrane and non woven layers are stable against exposure at the prescribed time and concentration for the above disinfectant agents.

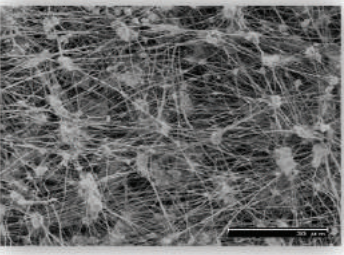
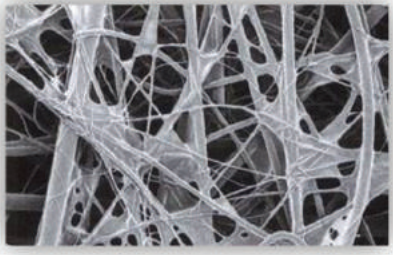
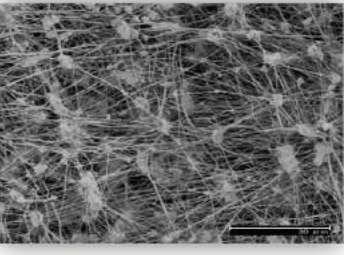
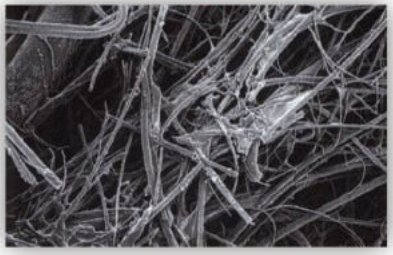
Superior Water Resistance

Based on AAF's test lab results, ePTFE Technology provides superior water resistance in comparison with ultrafine microglass and low boron microglass media.

Negligible Off-Gassing

ePTFE Technology has near zero off-gassing of chemical components resulting in the highest quality clean air available.



ePTFE Technology	Ultrafine Microglass Media
BEFORE	
	
AFTER	
<i>Damage after use of Hydrogen Peroxide (H₂O₂) for cleanroom sterilization.</i>	
	

SEM photos at 5,000x magnification.

ePTFE Technology

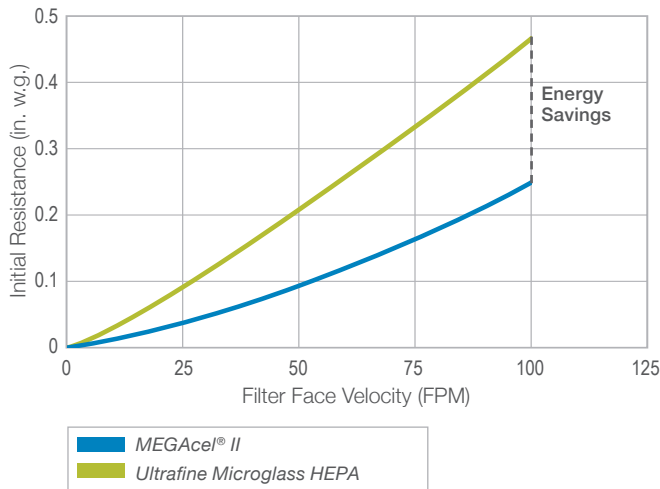
Lower Energy Consumption

Estimates show that up to 50% of a facilities energy consumption is used on heating, cooling, and air handling. With increasing utility prices and peak power billing plans, lowering energy consumption is a key initiative.

MEGAcel II filters with ePTFE Technology feature a lower pressure drop than traditional filters with ultrafine microglass media, up to 50% lower depending on the exact conditions. At the same time, the overall filtration efficiency for MEGAcel II filters has proven to be higher than for filters with ultrafine microglass media. The lower pressure drop and improved efficiency are achieved from an evenly distributed layer of fibers with very fine nanometer-scale diameters. Air molecules can efficiently pass through the fibers and airborne particles can be captured more easily. The result: air quality is optimized and energy costs are substantially reduced.

Performance Data

Initial Resistance vs. Filter Face Velocity



99.99% HEPA Filter, 50mm Packs

Energy Savings Calculation

Average Pressure Drop

MEGAcel II	0.25 in. w.g. (62 Pa)
Ultrafine Microglass HEPA	0.47 in. w.g. (117 Pa)

Airflow Rate

100 FPM – 0.5 m/sec

Annual Energy Consumption

ePTFE Technology	285 kWh
Ultrafine Microglass HEPA	535 kWh
Δ Savings	250 kWh

Annual Savings

250 kWh = **\$20.00** / filter

Based on a national average of **\$0.08** kWh.



9920 Corporate Campus Drive, Suite 2200, Louisville, KY 40223-5690
888.223.2003 Fax 888.223.6500 | www.aafintl.com

AAF has a policy of continuous product research and improvement and reserves the right to change design and specifications without notice.

ISO Certified Firm
AFP-8-101A 02/15

©2015 AAF International