



AmericanAirFilter®

MEGAcel™

*Ultra-High Efficiency and Ultra-Low
Resistance PTFE Membrane Filter*

Better Air is Our Business®



LPD Series PTFE Membrane Filters for State-of-the-Art Cleanroom Requirements

- *PTFE membrane combines ultra-high efficiency with negligible pressure drop*
- *Lower energy consumption — save more than 30%*
- *High resistance to corrosive environments (acids, alkalis, and organic substances)*
- *Negligible off-gassing properties (boron, sodium, potassium, silicon)*
- *Tougher media, more resistance to rough handling in transportation and installation*
- *Meets I300I specifications and UL 900 Standard Class 1 rating*
- *Lower profile, reducing space and weight*

The AAF MEGAcel™ line of PTFE membrane filters is designed to meet semiconductor industry cleanroom filtration requirements for fabs, modular, mini, and microenvironments, as stated in the I300I specifications. The MEGAcel provides extremely high particulate filtration efficiencies, lower pressure drops and negligible off-gassing.

State-of-the-Art Design

Designed to combine maximum efficiency with lowest pressure drop, the MEGAcel media pack is available in various depth and size configurations, allowing for a variety of application requirements.

The PTFE membrane pack is produced to assure precision in pleat spacing and height, thereby reducing "dead-spots" and promoting consistent and uniform air distribution throughout the filter. The pleat design allows the air to move throughout the entire depth of the filter, utilizing the full cleaning capability of the membrane.

Energy Conservation

PTFE pleated pack resistance is a minimum of 30% lower than conventional micro-fiberglass media, a factor contributing to greatly reducing fan energy consumption. AAF's new pleating method using intermittent polyamide separators allows more open media area, optimizing pleat pack resistance.



Perfect Filter Media

Compared with micro-fiberglass media, the MEGAcel's PTFE media provides superior benefits including inert chemical properties, more uniform fiber distribution, smaller fiber diameters and pore size, which reduces resistance with higher filtration performance to achieve substantial energy savings.

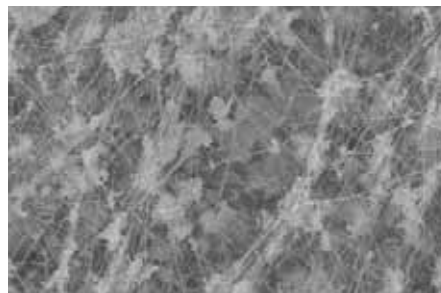


Figure A (10,000x)

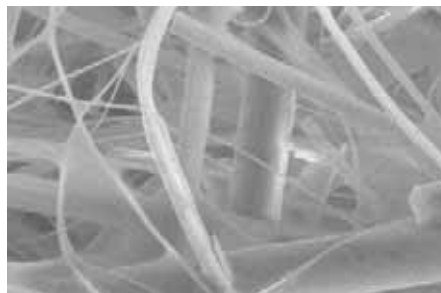


Figure B (10,000x)

Photographed at 10,000x magnification, these images illustrate the finer diameter and more consistent composition of PTFE membrane media (Figure A), when compared with ULPA micro-fiberglass media (Figure B).

State-of-the-Art Testing

AAF has established an air filtration testing methodology that is among the most comprehensive and accurate in the industry. Testing is essential in documenting filter efficiency and assisting in research and development of filtration products. AAF's testing facilities meet the highest standards for quality control.

Every MEGAcel filter is tested and certified, using procedures tailored to your specifications, to meet your performance requirements prior to shipping.



Ongoing Quality Control

Process control starts with sample flat sheets taken from each roll of media tested to verify efficiency and pressure drop. The media is carefully pleated and assembled in the cell side designed for each specific application. The filter is then rigorously tested and certified to meet performance requirements.

The filter is inspected for dimensional accuracy, automatically scanned by computer controlled scanning equipment for pinhole leaks, and tested for filtration efficiency and pressure drop. Every filter is labeled identifying product code numbers, dimensions, a serial number, tested filter efficiency, and filter resistance at the rated airflow. Rigorous testing ensures customers receive products of the highest quality and performance to meet their stringent requirements, while reducing operating costs and providing the highest energy savings.



MEGAcel™ frames are available with gel seal frame, gasket seal frame, and knife edge frame (shown from left to right.)

Sturdy Construction

Tooling environments often produce harmful and corrosive by-products. MEGAcel is extremely resistant to these harsh conditions and also offers superior efficiency and pressure drop characteristics.

Manufactured with high quality PTFE membrane and protective substrates, the MEGAcel filter is water resistant and meets the requirements of UL900 Class 1. The media pack is permanently attached to an anodized extruded aluminum frame with a urethane adhesive.

Chemical Advantages of PTFE Medium

Negligible Off-gassing

MEGAcel membrane has a smaller pore size and fiber diameter than micro-fiberglass. These characteristics significantly reduce the levels of off-gassing impurities typical to micro-fiberglass (which include boron, sodium, potassium, and silicon) to almost zero.

High Corrosion Resistance

PTFE membrane has been proven to be resistant in highly corrosive environments including alkaline, acid, and organic substances. All of these environments can be found in semiconductor manufacturing processes.

Superior Water Resistance

MEGAcel media provides superior water resistance in comparison with micro-fiberglass and low boron microglass media.

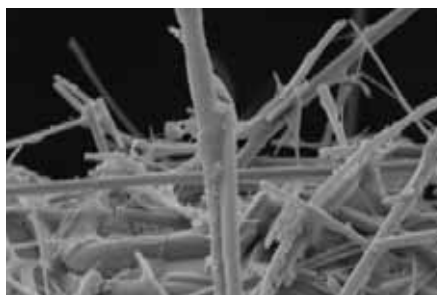
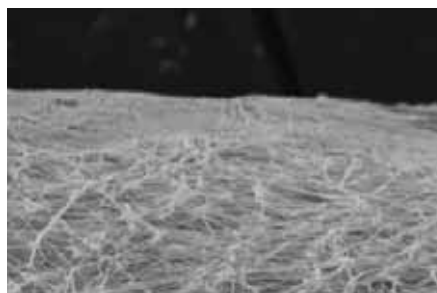


Figure C (5,000x)



Examining the structure under the microscope clearly shows the broken glass fibers at the pleat edge (Figure C) while the fold of the PTFE media (Figure D) is intact.

Figure D (5,000x)

Operating Data

High Efficiency Performance

MEGAcel provides efficiency and performance far superior to the competition. AAF is first with providing filters which meet rigorous I300I specifications for the manufacturing of 300 mm wafers.

At a peak airflow of 100 FPM, Most Penetrating Particle Size (MPPS) efficiency is superior to the stringent requirements of 99.99995% efficiency.

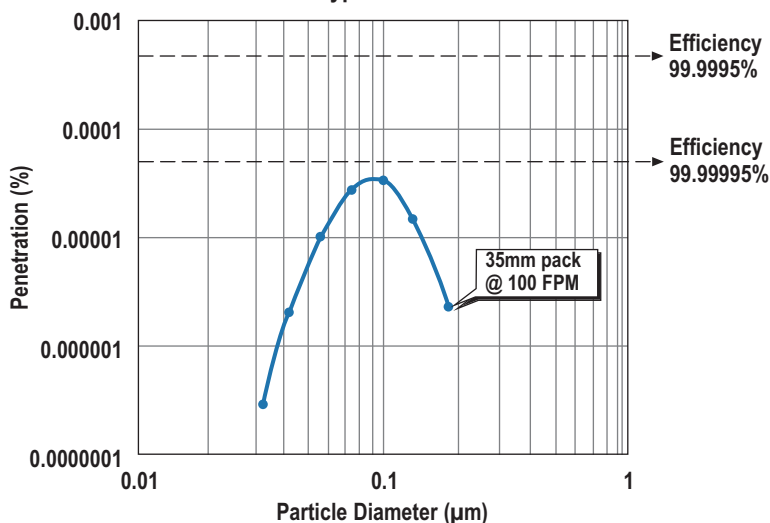
The combination of advanced levels of efficiency and the lowest possible pressure drop makes MEGAcel a simple choice for use in 300 mm wafer production.

Lowest Possible Pressure Drop

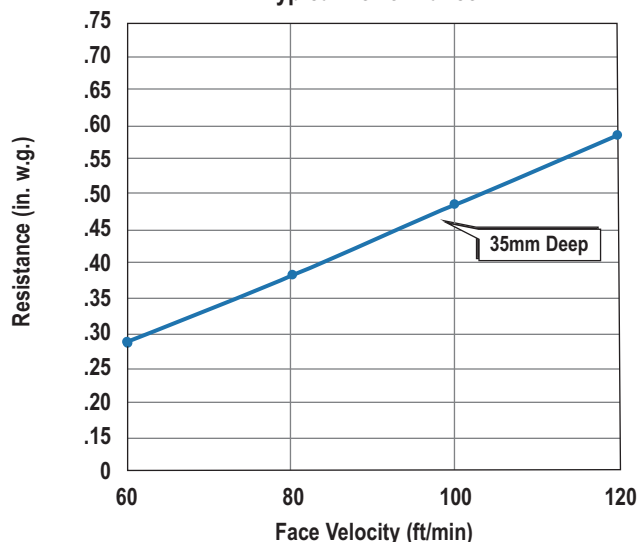
Pressure drop is measured using a manometer as the test filter is subjected to a metered air volume. Testing on a volumetric basis is specified in the Institute of Environmental Sciences and Technology IEST-RP-CC007 recommended practice on ULPA filters.

AAF calculates the total square footage of usable media pack area (outside dimensions of filter minus the frame thickness and adhesive) and multiplies this number by 100 FPM to determine an accurate volumetric test flow. (This value is approximately 720 CFM for a nominal 24" X 48" filter.) This method simulates actual cleanroom airflow conditions ensuring a true measurement of pressure drop.

Penetration vs. Particle Size
Typical Data



Resistance vs Velocity
Typical Performance



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

ISO Certified Firm

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