PENTAIR

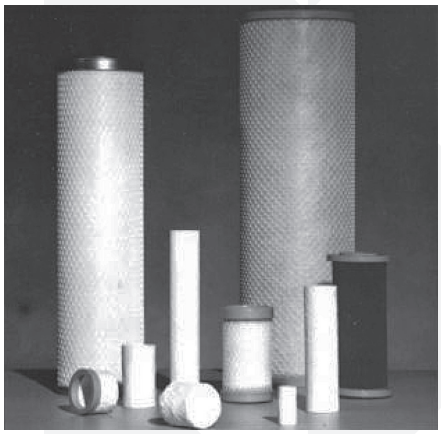
ENGINEERED FILTRATION

ULTRAFIT™ COALESCING FILTERS

FOR SEPARATING SOLID AND LIQUID CONTAMINANTS FROM AIR AND GAS STREAMS

Pentair's proprietary microfiber media offers the filter engineer the versatility and flexibility of combining high efficiencies, high flow rates, low pressure drops, chemical compatibility, custom design capabilities and low cost for the separation of solid and liquid contaminants from air and gas streams.

Pentair designs and manufactures high-performance filter media. Innovative products of superior quality, backed by unparalleled service, offer exceptional value for the demanding needs of the compressed air, instrumentation, medical, oil and gas, semiconductor, lubrication, hydraulic, transportation and chemical process industries.



Element configurations using UltraFit Coalescing Filters.

Filtration Mechanisms

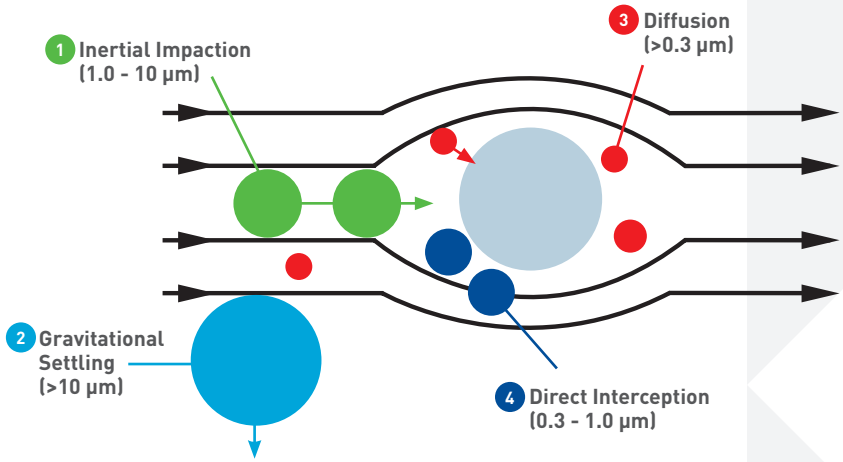
The removal of a solid or liquid contaminant from the air or gas stream occurs via one of four filtration mechanisms:

1. **Inertial Impaction Collection –** results from a change in direction of the gas flow. Particles 1 µm and larger in diameter tend to remain on their original course and strike the fiber's surface due to their relatively large mass and inertia.

2. **Gravitational Settling –** relies on low air velocities and large particle sizes (greater than 10 µm) to be most effective.

3. **Diffusion –** is most effective for particles less than 0.3 µm in diameter. It depends on the existence of a concentration gradient. Particles diffuse from the gas stream to the surfaces of the fibers where the concentration is zero. Diffusion is favored by low gas velocities and high concentration gradients.

4. **Direct Interception –** (of a particle) occurs when the particle passes within 1/2 of its diameter of a fiber's surface. It is the mechanism used to capture particles in the 0.3 to 1.0 µm range. The interception effectiveness of a filter media is primarily a function of pore structure. The smaller the pores, the greater the effectiveness of the media to intercept particles.



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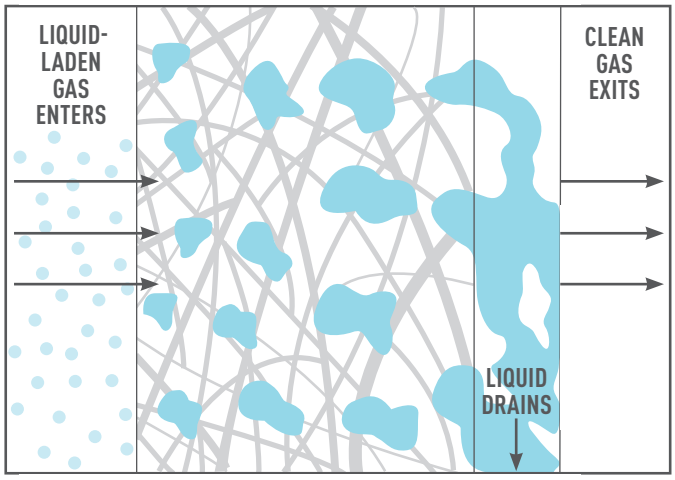
The Coalescing Process

While solid particles are captured and retained in the filter media, liquid aerosols are captured by the media but are removed from the air or gas stream via the process of coalescing.

Coalescing, by definition, means "to come together". It is a continuous process by which small aerosols come in contact with the fibers in the filter media, uniting with other collected aerosols and growing to emerge as a droplet on the downstream surface of the media which is capable of being gravitationally drained away.



Proprietary Pentair Filter Design

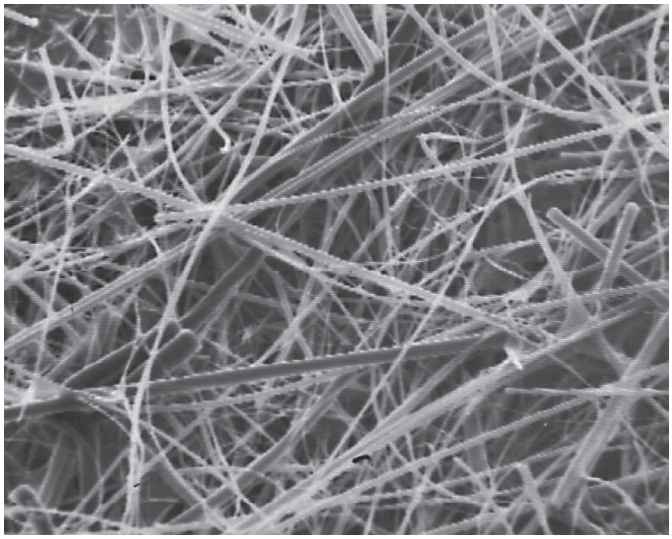
Pentair's proprietary microfiber media is a precision matrix of synthetic microfibers designed to maximize efficiency and dirt holding capacity while minimizing pressure drop.

High quality borosilicate glass microfibers are formed into a seamless tubular configuration by a proprietary Pentair process. The media is highly porous, with 90-95% of its volume being void, or open, and available to hold contaminants. Precisely controlled manufacturing conditions and media formulations ensure reliable performance and exceptional quality in all Pentair media.

The pore size structure in a media and, therefore, the efficiency of that media, is a function of the relative surface area (fiber surface area per unit volume) which, in turn, is a function of the median fiber diameter and fiber packing density. The larger the relative surface area, the smaller the pore size and therefore, the higher the efficiency.

The proper ratio of various fiber diameters are combined to produce the desired pore size, media thickness and void volume for each media grade. The media is manufactured so as to provide a gradient density matrix of microfibers with a "tapered" pore structure which allows for true depth loading of contaminants through the entire media.

The mircofiber matrix is then secured into a fixed-pore configuration by the introduction of a binder which adheres adjoining fibers together within the media. This fixed-pore configuration gives the media structural stability and ensures that solid contaminants which are captured by the



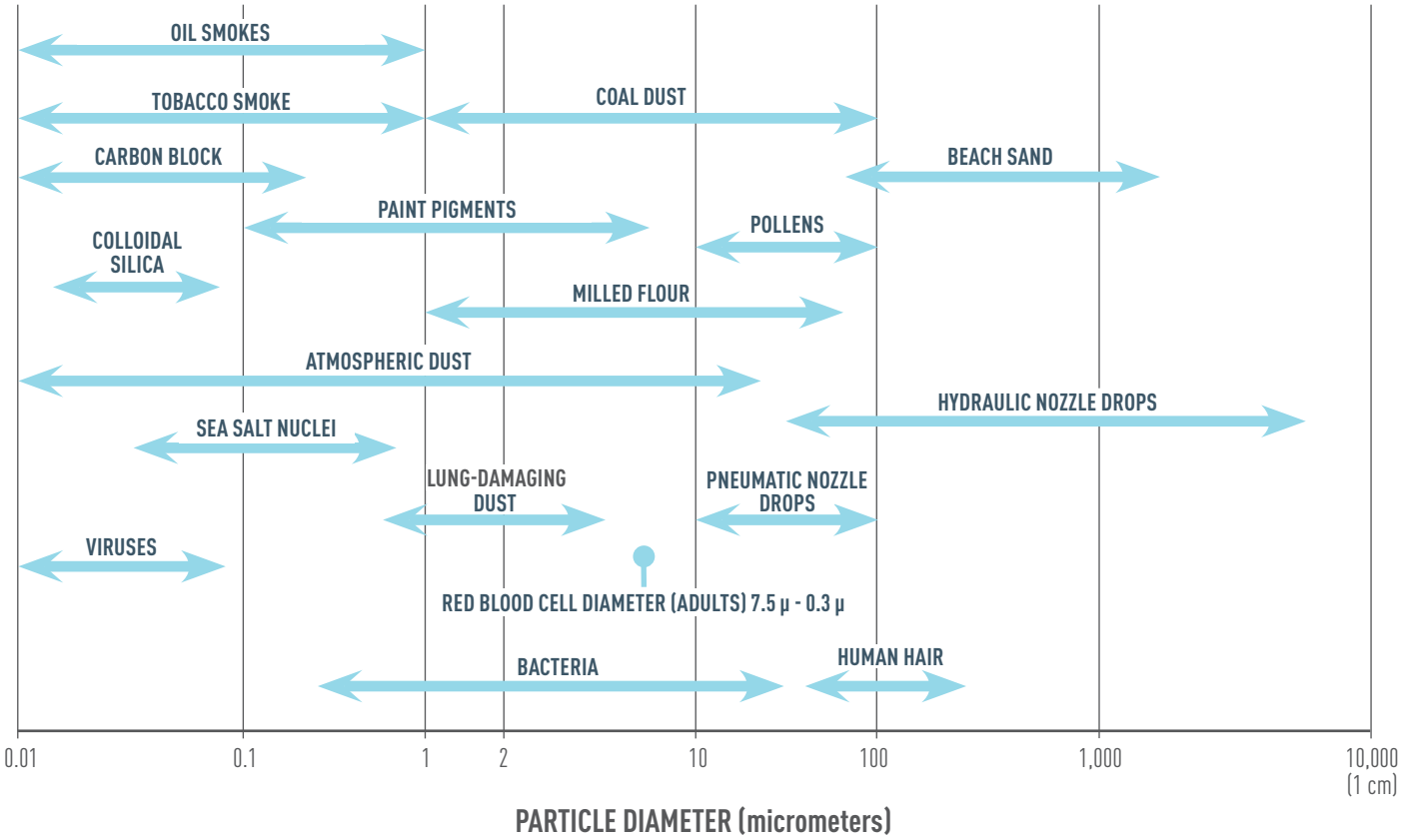
Scanning Electron Micrograph of Pentair's proprietary microfiber media (500x magnification).

media are not released back into the gas or liquid stream because of pressure or flow surges, as is common with unbonded or loosely bonded media.

Specialized binders and fibers are available for resistance to corrosive gases, chemicals and extreme temperatures. Various end caps and support structures can be added for additional support and positive sealing. For high-efficiency coalescing applications, polyurethane or glass drain layers are added for positive drainage of coalesced liquids.

Custom shapes, sizes and proprietary configurations can be manufactured for O.E.M. applications.

Typical Particles and Gas Dispersoids



Typical Applications

- Particle Removal
- Instrumentation
- Analyzers
- PneumaFuse™ Filters
- HVAC Controls
- Dryer Afterfilters
- High Temperature Filters
- Medical
- Respiratory
- Steam Sterilizers
- Membrane Prefilters
- Venting or Breathers
- Bacteria Removal
- Custom Designs
- High-Efficiency Coalescing
- Vacuum Exhaust
- Vacuum Inlet
- Mist Eliminators
- Air / Oil Separators
- Silencer / Reclassifiers
- Dryer Prefilters

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Element Specifications

Element Type	UltraFit Coalescing filter element
Separation Media	Proprietary microfiber media formulation comprised of a precision matrix of synthetic microfibers designed to maximize efficiency and dirt-holding capacity while minimizing pressure drop
Media Efficiency	99.98% efficiency at 0.3, 0.5, or 0.7 microns
End Caps	None
Seals	N/A
Maximum Operating Temperature (°F)	250
Maximum Differential Pressure (psi)	75
Length (inches)	1.25 to 18.75
Inner Diameter (inches)	0.5 to 2
Recommended Change-out	Differential pressure of 15 psi
Direction of Flow	Outside-in

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