CLARCOR

Industrial Air

Industrial Filtration Basics

- CLARCOR Industrial Air is a technology oriented organization specializing in the design and manufacture of high performance filter elements and systems
- Well-established in the air filtration industry
  - Comprised of 4 well-organized high functioning organizations
  - BHA, Altair, Clark Filter, United Air Specialists
- Advanced technology and innovation leader in the air filtration space
- Broad and profitable product portfolio




Filtration Solutions

CLARCOR Industrial Air

altair clearcurrent BHA ProTura aspire event waterproof fabric

Gas Turbine Inlet

Gas Turbine Inlet systems and filters for Power Generation and Oil & Gas customers.

Industrial Filtration

Baghouse / Cartridge filters and solutions for Industrial customers.

Membranes

Specialty fabrics and microfiltration products.

Collector Locations

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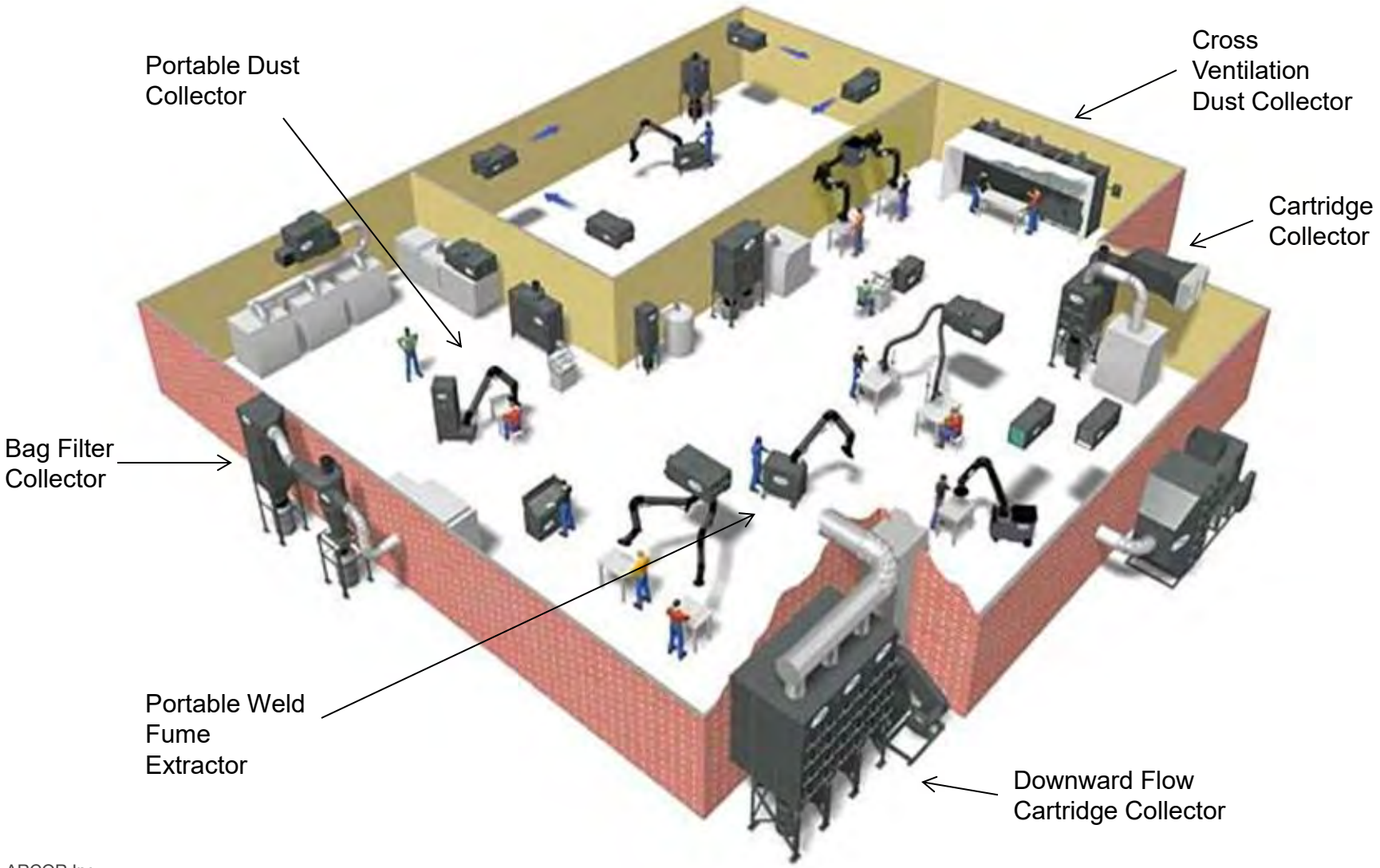
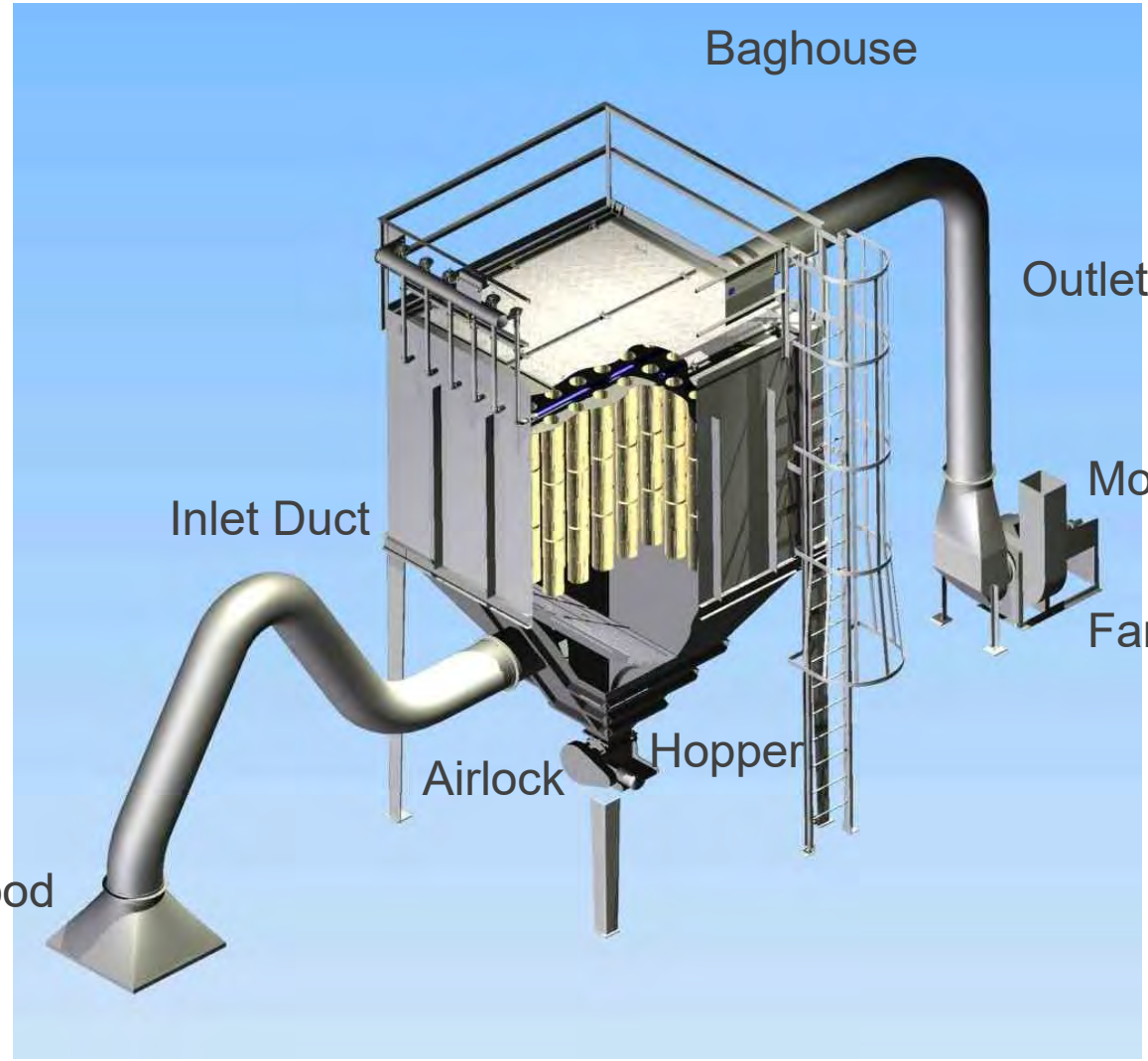


Typical System



Anatomy of a Cartridge Collector

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Dirty Air Inlet

Bin-vent Section

Tube Sheet

Venturi

Clean Air Exhaust

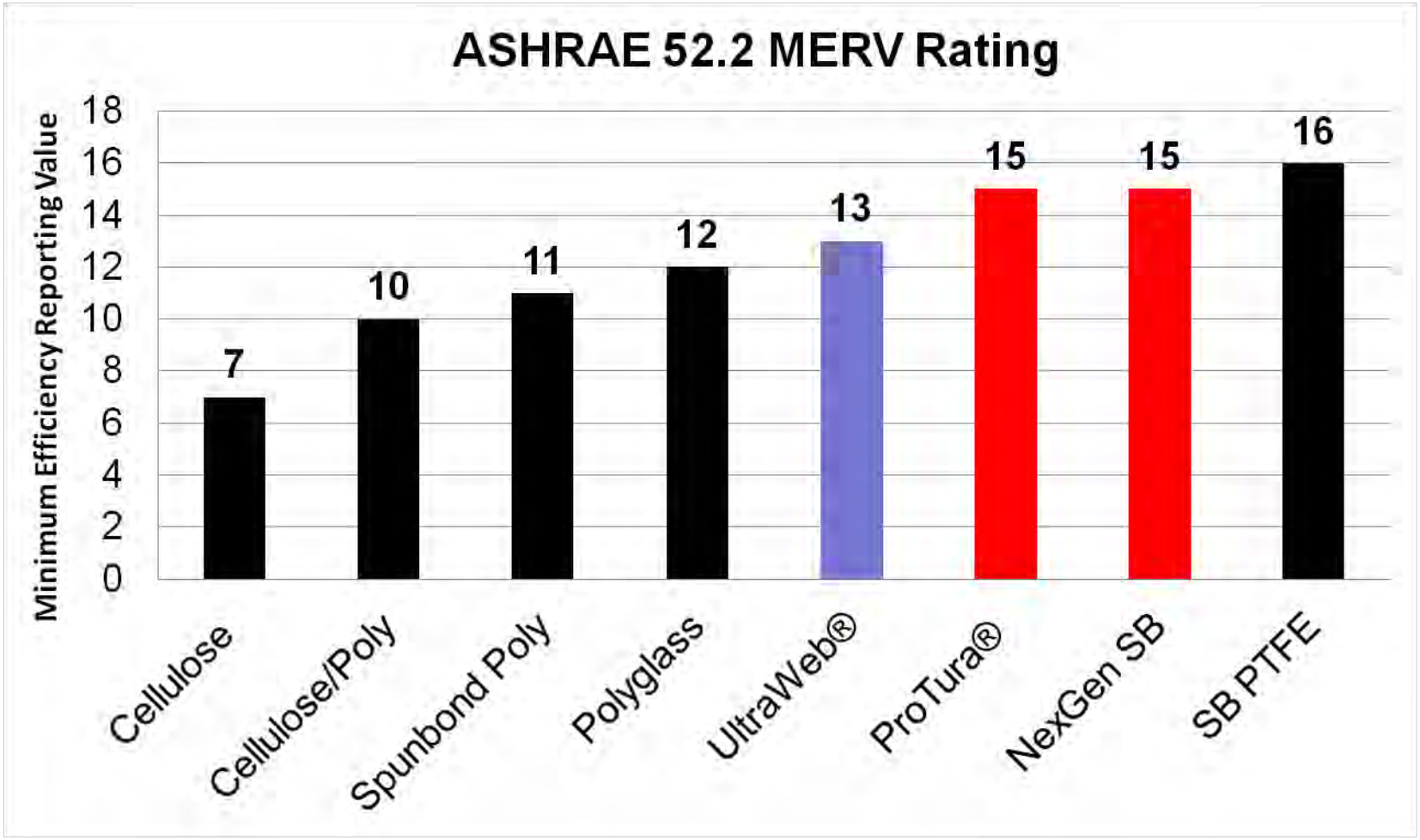
Hopper Section

Access Door

Leg Section

Filter types

Media Efficiencies



Depth Loading

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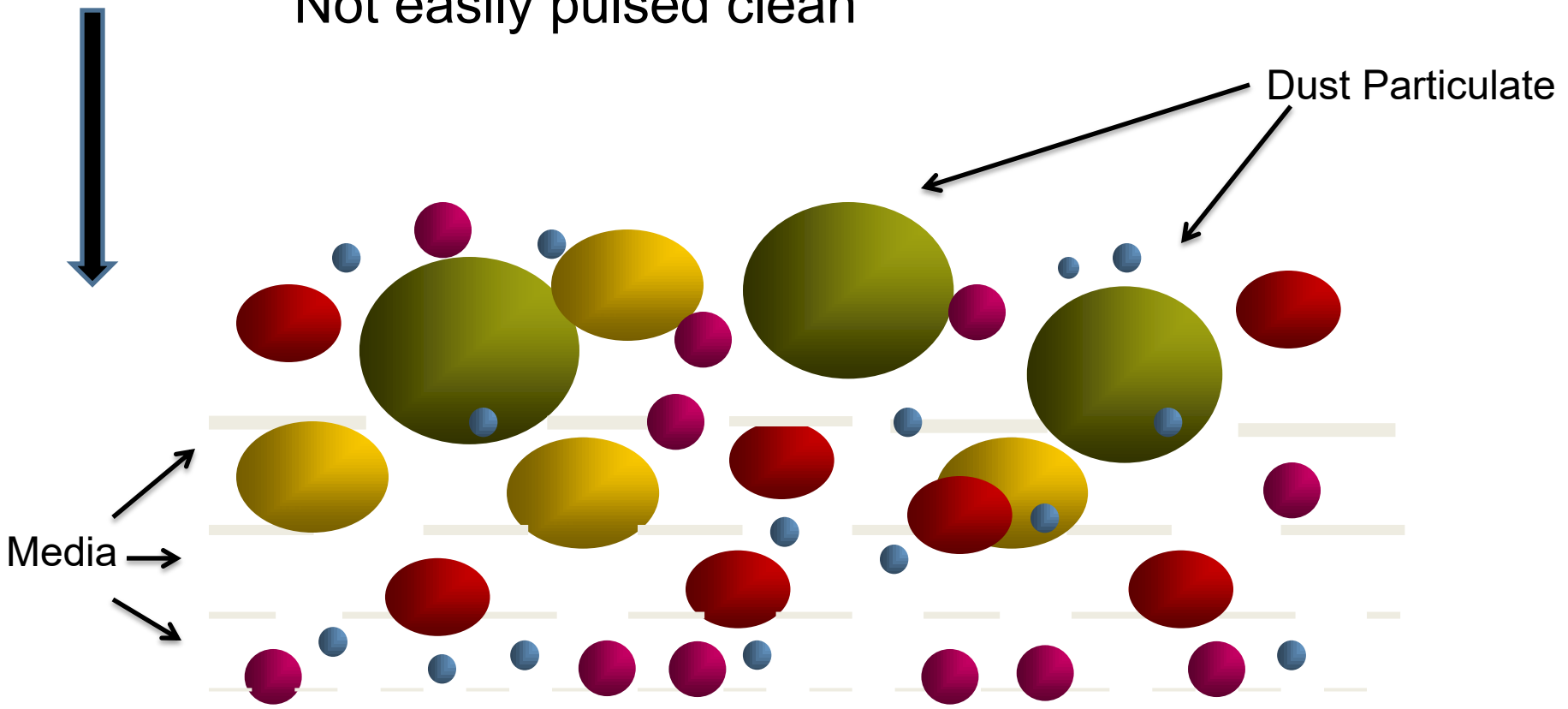
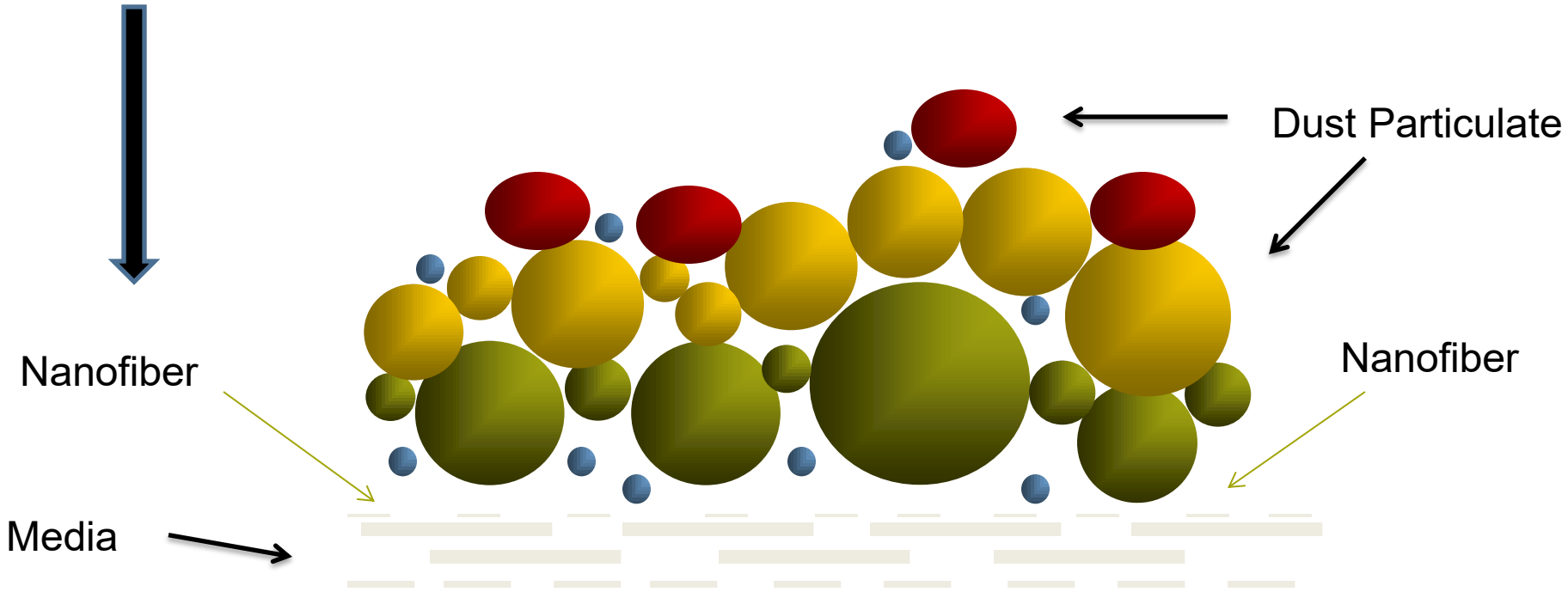
All layers of media exposed to dirt
Particles become trapped between layers
Not easily pulsed clean



Surface Loading

Dust cake forms on surface of media
Easily pulsed clean



Nanofiber Technology

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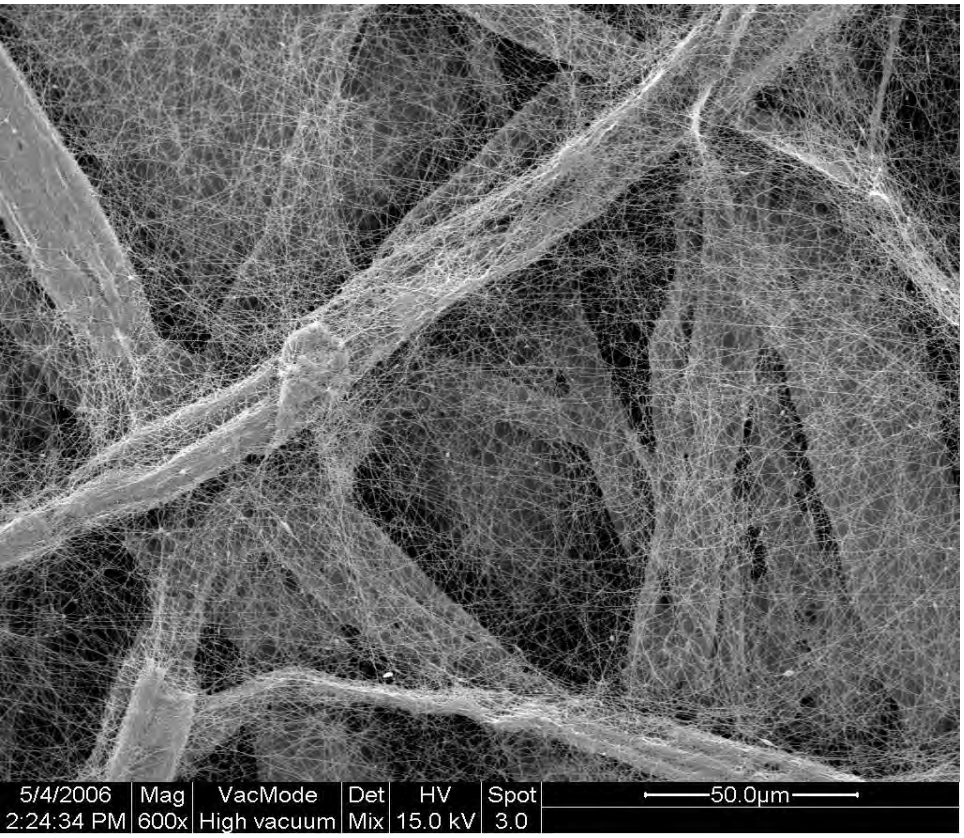
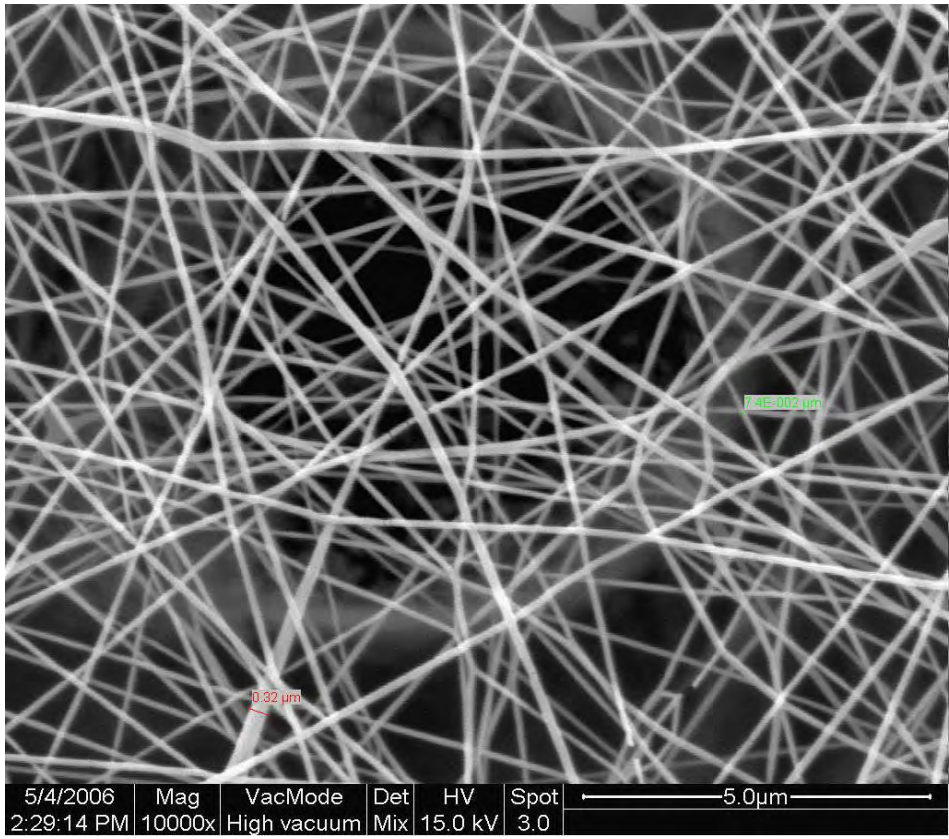
600X SEM magnification



10,000X SEM magnification



Nanofiber Technology

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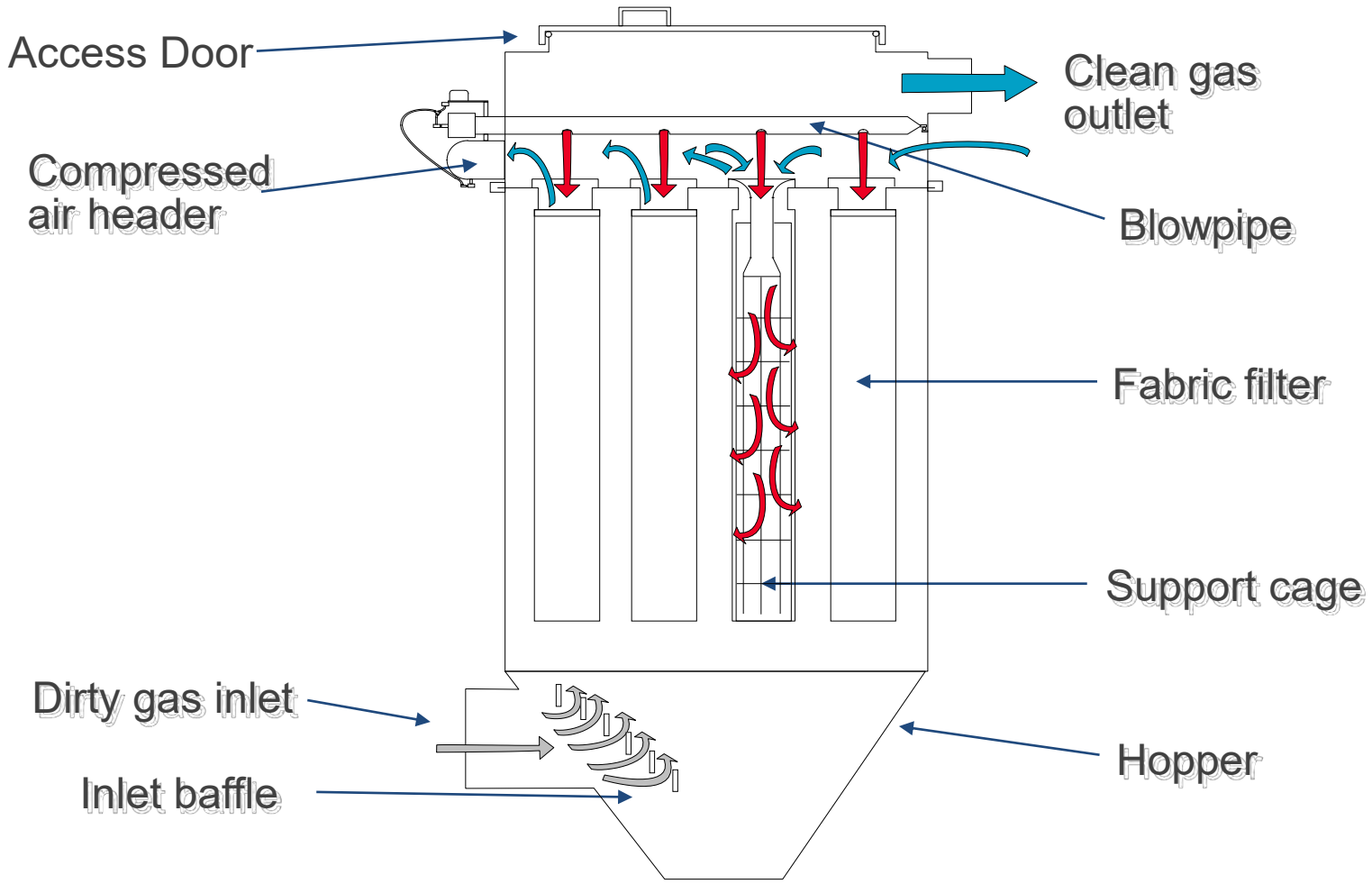
Benefits:

Extended filter life = Lower Cost of Ownership

- Lower labor costs
  - Fewer filter changes required
  - Less handling required by shipping/receiving
  - Reduce the need for on site storage
- Lower disposal costs
- No need for frequent filter cleaning/recycling

Pulse Jet Collector



Typical Filters

Tubesheet or Cell Plate

- The steel plate with holes to which the open ends of the bags are connected
- Separates the clean side from the dirty side of the baghouse

Grain Loading

The amount of particulate by weight in a given volume of air, usually specified in grains/cubic foot (or grams/cubic meter)

1 lb (0.454 kg) = 7000 grains

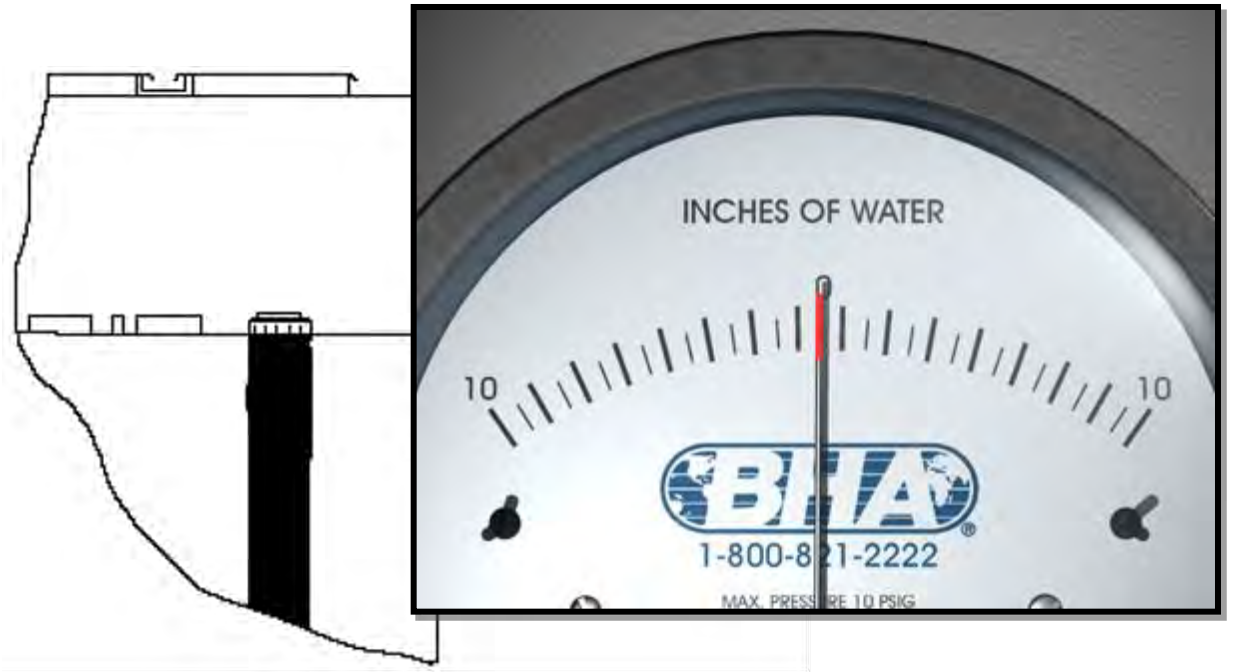
1 kg = 15,432 grains

Air-to-Cloth Calculations

Air-to-cloth ratio = ACFM ÷ total filter area

Total # filters x sq/ft per filter = total filter area

Magnehelic* Gauge



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Differential Pressure

- Pressure difference between two points in a dust collection system
- Typically measure across a tube-sheet in inches of water column

Instruments used to measure DP are:

- U-tube manometers
- Magnehelic* Gauges
- Photohelic* Gauges
- Pressure Transducers

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Inch of Water

- A unit of pressure equal to the pressure exerted by a column of liquid water one inch high at standard conditions (70 degrees at sea level)
- Usually expressed as inches in water gauge (w.g) or water column (w.c)

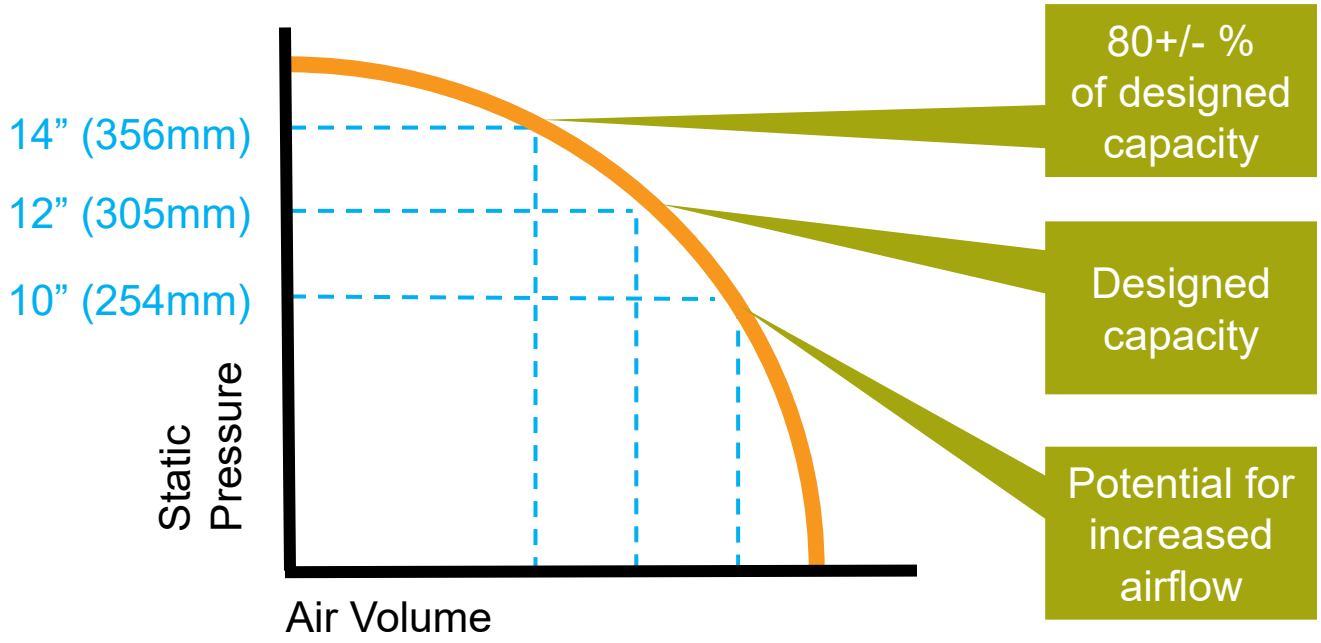
Common Problems in Pulse Jets:

- Fine Particle Emissions
  - Particulate bleed through of conventional felts
  - Aggressive design – high filtration velocities
- High Differential Pressure – Loss of Airflow
  - High air-to-cloth ratios
  - Poor cleaning mechanism efficiency
  - Extra drag across filter due to primary dust cake.

Common Problems in Pulse Jets:

- Abrasion Failure
  - Filters located in direct line of inlet gas stream
- Difficult Installation – Bottom Load
  - Extra downtime to handle multiple and bulky components
  - Accurate installation of multiple filter components
- Aggressive Cleaning Cycles
  - Accelerated pulse cleaning causes premature flex failure

High DP/Loss of Airflow



Static pressure vs. air volume

Questions?

Thank You