



Air Components, Inc.

*M & P Air Components, Inc. provides Components, Technologies, Guidelines, Sales and Technical Services for Industrial Air and Dry Solids Processes.*

*Our Goal is to provide Clients with the correct components selection and system design to achieve the best Utilization, Reliability, Safety and Economy for their plant processes.*

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# Technical Bulletin

## Air Pollution Control – Types of Dry Dust Collection Equipment

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Air Pollution Control Equipment for Dry Processes can be classified by:

Cleaning Energy Delivery Level: Low (Shaker), Medium (Reverse Air), or High (Pulse Jet)

Product Design: Self-Contained Unit Collector, or System Integrated using separate fan and dust removal equipment.

System Design: Local Control using source capture hoods or General Control using mass air movement for contaminant collection.

Duty Cycle: Intermittent or Continuous Operation.

Purpose: Nuisance Control, Mandated Control, Product Recovery, or Process Control.

The control purpose will largely influence the type and cost of control equipment.

### Types of Dry Dust Collection Equipment

Cyclone: Primary energy is centrifugal force, using rotational velocity to artificially increase the mass of the particle to separate it from the carrier airstream. The Separation Coefficient is the ratio of centrifugal to gravitational force and is an indicator of Cyclone efficiency. Pressure drop ranges from 1 to 9 in wg, with 1.5 to 3.0 typical.

A fabric after-filter is sometimes used for fibrous contaminants having good release characteristics.

The Cyclone is also useful as a pre-cleaner to a secondary collector for abrasive, flammable, product recovery, or heavy dust loading applications.

Self-Contained Unit Collector: Can be either medium or high energy and includes a dust receiver, hopper, filter, filter cleaning mechanism, and fan in a common unit. Useful for small to medium airflow volumes in applications that may be remote from, dissimilar to, or operated separately from a centralized system. Pressure drop usually ranges from 1 to 6 in wg.

Pulse Jet Cartridge: High energy, compact design handling all airflow volumes with good space savings. Often allows installation inside the plant or near the process. Best suited for Dust or Smoke Collection.

Media efficiencies can reach 0.005 gr/cu ft on 0.5 micron particles and larger, and up to 0.002 gr/cu ft on 0.5 micron particles with specialized media. Pressure drop is normally 1 to 6 in wg.

Pulse Jet Baghouse: High energy, versatile design which adapts well to high temperature, humid, and non-standard gas airstreams. Best suited for Dust and Fume Collection and is more forgiving than cartridge media.

Media efficiencies are typically 0.02 gr/cu ft on 2 micron particles and larger and can reach 0.002 gr/cu ft on 0.5 micron particles with specialized media. Pressure drop is normally 2 to 8 in wg.

Reverse Jet Baghouse: Medium energy, cylindrical design combining a cyclone pre-cleaner with a high efficiency baghouse. Uses either a high pressure fan (2 psig) or a rotary blower (7-12 psig) for filter cleaning. Excellent for high volume, heavy material loading dust collection, and is sometimes used for fumes. Same or better efficiencies than the pulse jet baghouse. Pressure drop ranges from 1 to 4 in wg.

Reverse Air Collectors: Uses multiple, redundant compartments having large diameter, long length bags for off-line cleaning without stopping process flow. Old design predominantly used in high temperature, high volume processes and is normally replaced with the Pulse Jet Bag or Cartridge Collector.

Filter Receiver Baghouse: High energy, specialty pulse-jet baghouse used for low volume, high pressure and high throughput in pneumatic conveying applications. Pressure drop is normally 2 to 6 in wg.

Summary: A good understanding of Dust Collector Types, their characteristics and purpose will lead to the best selection of APC Equipment.

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