



## Q: What is the advantage of filter cartridges in a horizontal position compared to vertically hung?

*Daniel D., Internal Applications Engineer*

**A:** Horizontal vs. vertically-hung cartridges: The major advantage to horizontal is the airflow pattern within the collector. Horizontally-mounted cartridges allow the tubesheet to be positioned in vertically, which allows the air to enter in a downward pattern. The inlet airflow then assists with cleaning.

When the filters are pulse-cleaned, the particles are carried downward into the hopper, decreasing re-entrainment and making it easier to maintain a lower operating pressure drop.

The housing design for a vertical cartridge demands that the inlet be located in the hopper with an upward airflow. This design then demands that the released particulate must pass through the upward airflow, which in turn carries back to the filter. This arrangement results in a higher operating pressure drop that may require prolonged or frequent cleaning -- increasing compressed air usage and a higher stabilized pressure drop.

Some designs attempt to overcome this airflow problem with high side inlets and staggered inlet baffles, but this creates turbulence in the hopper and increases filter abrasion. Fluent<sup>®</sup> Flow Modeling

Software (CAD) clearly indicates that cross-airflow patterns cause significant hopper sweeping and create an upflow air pattern into the collector and filters. This can cause major dust re-entrainment and difficulty pulse cleaning, resulting in higher pressure drop and shorter filter life.

Donaldson pioneered dust collectors with cartridge filters starting in 1973 with the vertical cartridge arrangement and tried several design iterations. Through our FLUENT<sup>®</sup> and CAD modeling, lab tests, and extensive field experience, we created & patented another enhanced technology in 1982: the Downflo<sup>®</sup> design with horizontally-mounted cartridges. In 2000, we enhanced Downflo collector performance even further with oval-shaped cartridge filters, which handle more airflow without increasing velocities.

For more information:  
Downflo Oval Collectors  
Downflo Workstation  
Fluent Model of Downflo Design

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If you have a dust collector question for Little Joe, send it to [dustmktg@mail.donaldson.com](mailto:dustmktg@mail.donaldson.com). If your question is printed, we'll send you a free baseball cap.

