

Small Cyclone Pre-Filters...A Low-Tech Answer to High-Tech Problems

Cyclone dust collectors and pre-filters have been around for as long as dust collection systems have been used in woodshops, manufacturing plants, and powder processing plants. When a Cyclone is used as a pre-filter, it is generally because the dust and debris being collected contains large and abrasive particles that can easily damage or clog the primary filters in the dust collector, increasing filter maintenance and replacement. These Cyclone pre-filters are generally large, made of steel and placed on the outside of the building.

The first of the small or “mini” Cyclone pre-filters, were developed for the Jewelry and Dental Laboratory industries to collect gold and other precious metal from grinding and polishing workstations. These mini pre-filters are typically under 30” in height, accommodate vacuum hoses from 1 ½” to 3” in diameter, and are used with small, high suction or high volume dust collectors for individual workstations.

In the last few years companies involved in high-tech manufacturing, pharmaceutical packaging, dust-free sanding, and food processing and packaging, have looked to these small Cyclone pre-filters as a low-tech answer to some very high-tech problems traditional central dust collection systems do not address. Specifically, how do you recover precious metal and expensive coating material before it reaches the central dust collector filters, protect sensitive components during product packaging or processing, or simply decrease the frequency of filter maintenance and replacement of costly filters.

Pharmaceuticals

Cyclone pre-filters have been combined with small, powerful, high suction dust collectors which can be incorporated into pharmaceutical packaging machines to remove debris that can contaminate the finished product or damage delicate components.

Aerospace

Aerospace and Automotive industries often use expensive coatings such as Tungsten Disulfide (WS₂) to coat parts against wear. The coating is usually sprayed on the part under pressure, in an enclosed area for containment and reclamation. The Cyclone pre-filter will capture the overspray in a removable container, allowing the operator to reuse the collected material.

Sanding

Portable dust-free sanding equipment used to prepare aircraft for painting will include a vacuum to pull dust generated at the sander through a hose which is then directed through the cyclone pre-filter and finally to the primary HEPA filter. Using the Cyclone pre-filter is critical in order to extend the life of expensive HEPA filters.

Food Processing

A large frozen pie producer installed an 18 robot system to increase production that incorporated a state-of-the-art vision quality control system as well as a custom designed vacuum picker to gently pick and place the pies into shipping cases. Soon after production began, the blowers which provide the vacuum to the pickers, experienced a substantial build-up of cinnamon from

the thousands of pies being processed. This required the production line to shut down until the blowers could be cleaned. Engineering determined that installing a Cyclone pre-filter between each of the 18 pickers and blowers would eliminate the cinnamon dust problem. As a result, the only interruption in production now is to empty the removable bucket on the bottom of the Cyclone pre-filter.

Cyclone pre-filters then, have proven to be a simple and low cost answer to production problems caused by dust and debris, or when reclaiming of expensive material or precious metal is desirable. The use of this technology will increase as manufacturing techniques continue to evolve and with it, the unanticipated problems caused by dust and debris.