

CYCLONE

FUNCTIONALITY

Dust laden gas enters the chamber from a tangential direction at the outer wall of the device, forming a vortex as it swirls within the chamber. The larger particulates, because of their greater inertial, move outward and are forced against the chamber wall. Slowed by friction with the wall surface, they then slide down the wall into a conical dust hopper at the bottom of the cyclone. The cleaned air swirls upward in a narrower spiral through an inner cylinder and emerges from an outlet at the top. Accumulated particulate dust is deposited into a hopper, dust bin or screw conveyor at the base of the collector.

Cyclones are best at removing relatively coarse particulates. They can routinely achieve efficiencies of 90% for particles larger than about 20 μm (0.008 inch). By themselves, however, cyclones are not sufficient to meet stringent air quality standards. They are typically used as pre-cleaners and are followed by more efficient air-cleaning equipment such as electrostatic precipitators and bag houses.

EXPLOSION HISTORY

- Loss history for the past ten years due to dust explosions from FM Global Data Sheet 7-76:
 - Twenty-seven losses involved coal dust for a loss of \$12,056,000

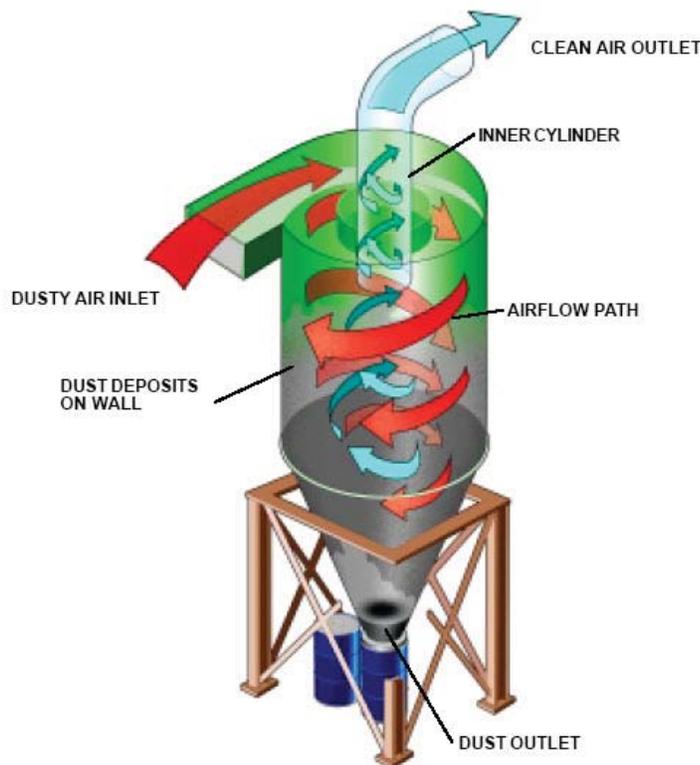


Figure 1: Cyclone Operation

SOURCES OF IGNITION

Because cyclone collectors are designed to handle material produced elsewhere, the ignition source does not have to come from within the cyclone collector. It may come from other equipment upstream or downstream of the cyclone.

Sparks, flame, or smoldering embers, from dust production areas, are potential ignition sources that can ignite an explosion in the cyclone collector.

SOLUTION

Cyclone collectors are best protected by explosion suppression systems. Chemical isolation should be used on the inlet and outlet to prevent flame propagation to other equipment.

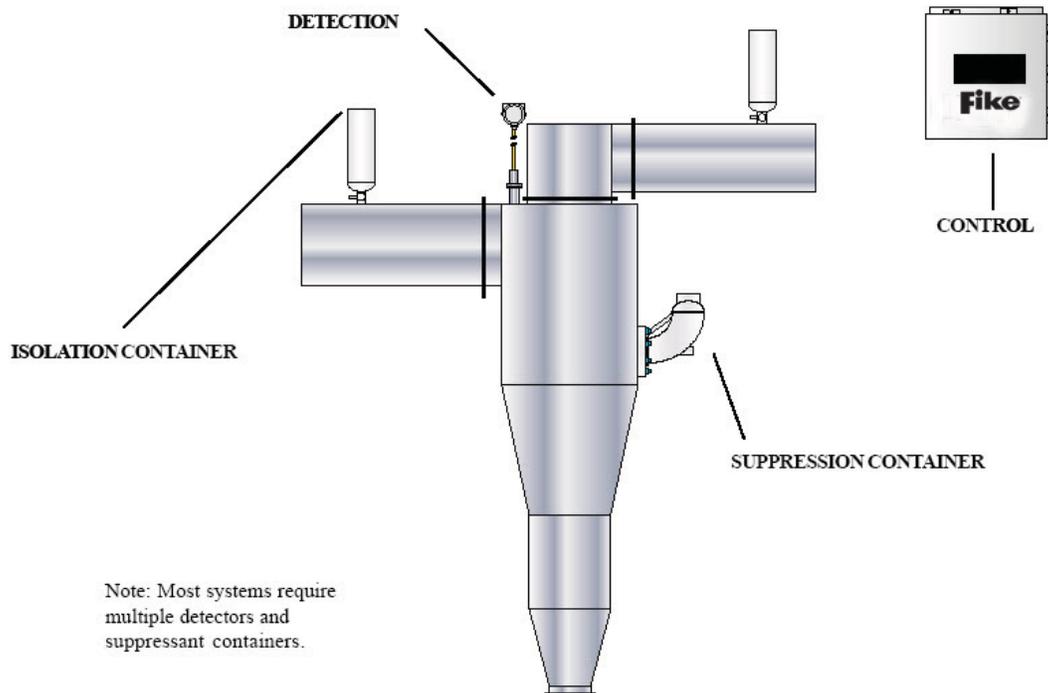


Figure 2: Cyclone Protected by Explosion Suppression and Chemical Isolation

