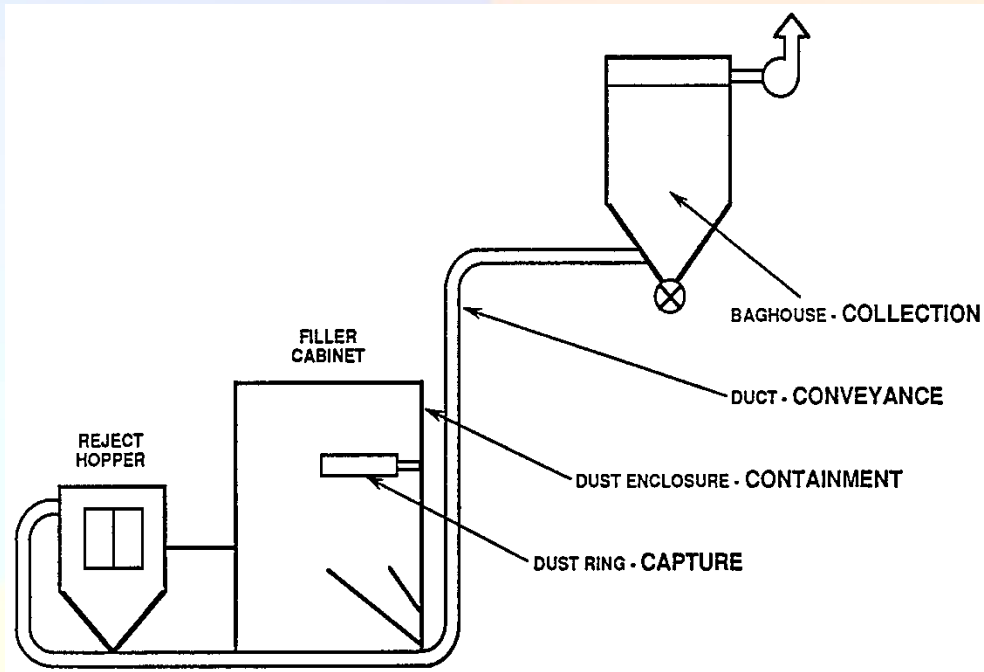


## An Introduction to Dust Control Basics

Dust and aerosol control systems are designed to contain and capture dusts/aerosols at their source in the process, to bring the dust/aerosol laden air to a central point for collection and then discharge it from the working environment. While installing a dust control system does not promise complete prevention of dust emission, a well-designed system can protect employees and other benefits such as; preventing or reducing the risk of a dust explosion or fire, reducing the likelihood of accidents, reducing cleanup and maintenance costs, reducing equipment wear, and assuring continuous compliance with existing health regulations.

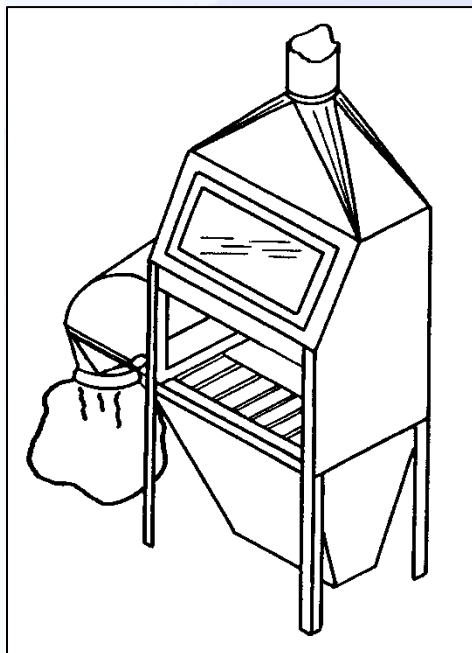
There are four main aspects to a dust control system, commonly referred to as *The 4 C's of Dust Control*- Capture, Contain, Convey, and Collect. This post will help to explain how each of the 4 C's can help you alleviate your dust problem.



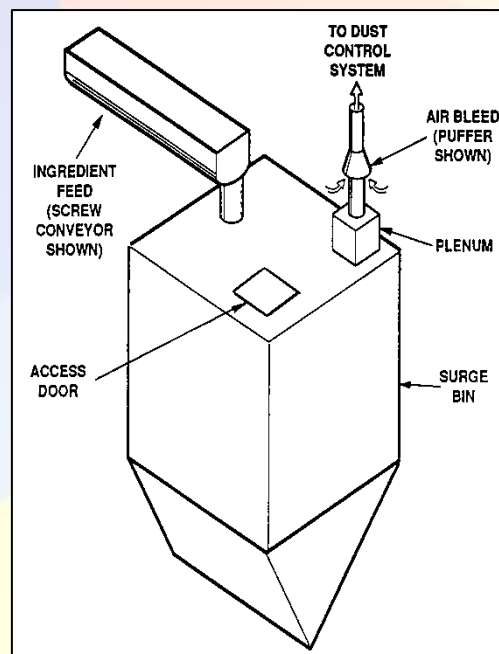
## Contain

Where possible, dust sources are contained within enclosures. An enclosure is a structure that intentionally confines dust/aerosol for more effective capture in a dust control system. These structures can also be used in the containment of spillage to assist in an easier clean up.

Air is drawn into the enclosure by the dust control system either continuously through designed opening or intermittently when access doors are opened. Enclosures rely on air velocity entering them to contain and prevent dust escape.



Open Enclosure



Sealed Enclosure

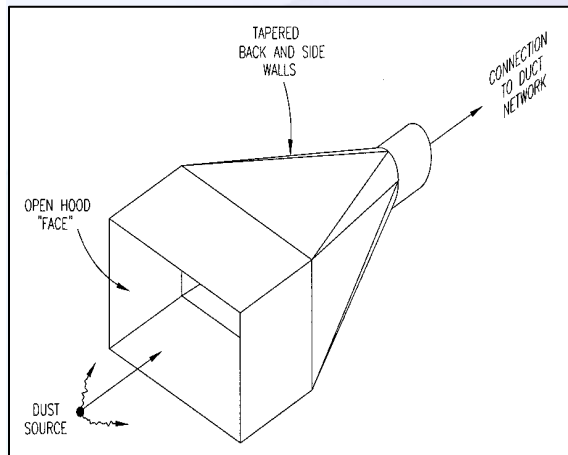
Two types of enclosures are Open Enclosures and Sealed Enclosures and will be further discussed in a following post.

Enclosures are typically used in situations where the dust sources are too large to use slotted hoods for collection and provide higher levels of protection to the operators.

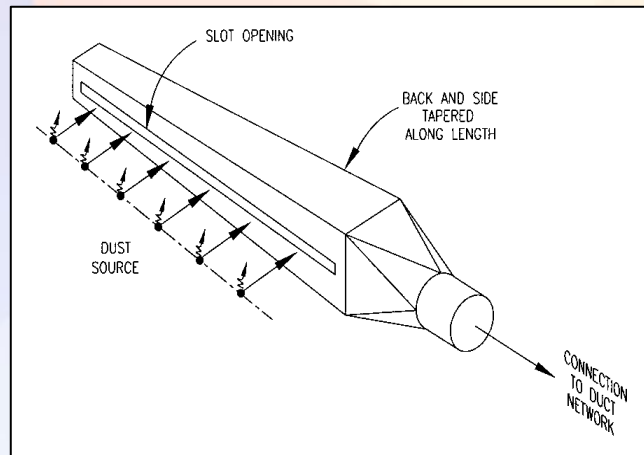
## Capture

Hoods are designed to capture dust laden air from free standing dust sources and sources that are not able to be contained within an enclosure. A hood is considered a “capture point,” or an area in which air and dust are being drawn into the ductwork. These rely on air velocity to capture dust particles.

Benefits of a hood are the dust is captured at its source of generation and it is freestanding, so it does not enclose the work zone or dust generation source.



Open Faced Hood



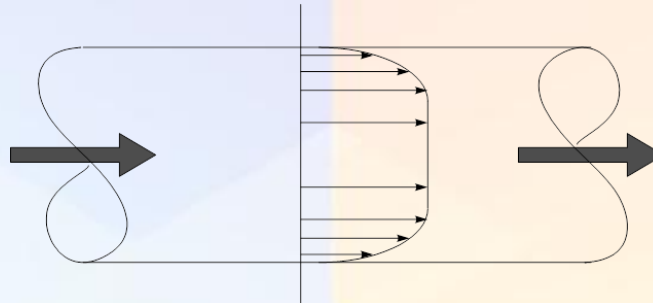
Slotted Hood

Two types of hoods are Open Faced Hoods and Slotted Hoods, and will be further discussed in a following post.

## Convey

The conveyance in a dust control system is performed by the duct work. The duct network conveys the dust/aerosol laden air stream to a central point for collection (dust) and discharges air from the facility. Inside the ducts, air moves within a range of velocities designed to convey the dust efficiently.

Problems with dust within the ductwork arise where the airflow changes direction, such as elbows and y-branch fittings. Moving air and dust naturally resist any change of direction, causing the velocity profile to skew to the outside of the elbow. Some of the dust may stick to the sides of the ductwork when this happens. To prevent this, the interiors of the ductwork must be as smooth as possible and the use of flexible ductwork needs to be minimized. Even with these preventions, duct cleaning is still required to keep the conveying velocity in the desired range.

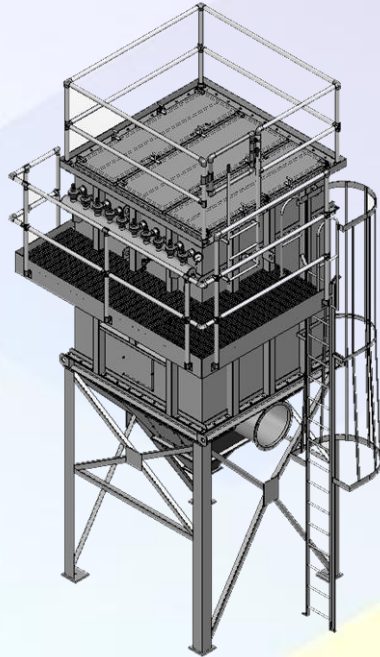


The ideal velocity distribution within the ducts

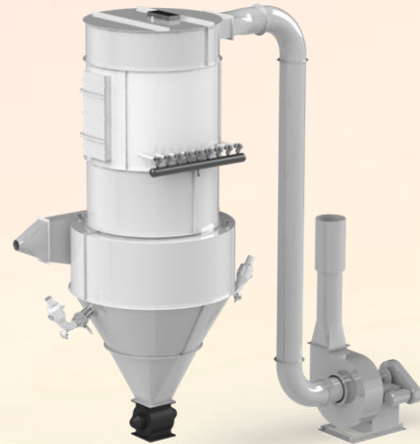
## Collect

A dust collector collects the dust that is captured by the system and removes the dust from the air stream. The dust is recovered and recycled to process.

For fines handling, the dust collector must have means for continuous discharge of the collected fines. Fines discharge equipment must provide a seal between the dust collector vacuum and the ambient pressure of downstream equipment.



Example Pulse Jet Filter



Example Circular Pulse Jet Filter

Hope this was a good introduction to the basics of dust and aerosol control systems. There will be more informational posts to follow on each aspect of the system in more detail including the different types of equipment and further explanation of conveying velocities within the system.

If you have any questions on The 4 C's of dust control, or any general questions, please feel free to contact us!