

Control of Particulate pollutants

Properties of particulate pollution

PM Stands for particulate matter: the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. others are so small they can only be detected using an electron microscope.

Particle pollution includes:

- * PM_{10} :- inhalable particles, with diameters that are generally 10 micrometers and smaller; and.
- * $PM_{2.5}$:- fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.

Particle size distribution

The particle size distribution (PSD) of a powder, or granular material, or particles dispersed in fluid, is a list of values or a mathematical function that defines the relative amount, typically by mass, of particles present according to size.

→ Significant energy is usually required to disintegrate soil, etc. particles into the PSD that is then called a grain size distribution.

→ Some particles less than 10 micro meters in diameter can get deep into your lungs and some

may even get into your blood stream.

Control mechanism

Control mechanism play an important role in any business organization, without which the roles of managers get constrained. Control is required for achieving the goals in a predefined manner because it provides the instruments which influence the performance and decision-making process of an organization. Control is in fact concerned with the regulations applied to the activities within an organization to obtain expected results in establishing policies, plans, and practices.

Dust removal equipment :

We are a leading manufacturer of the dust collection system and air pollution control devices in Ahmedabad, Gujarat, India like bag type dust collector, industrial cyclone dust collectors, mdc for boiler, dust collector fan & blower, etc., in India for many years. We as. pollution control equipment manufacturers know that the dust collection system is very important equipment for efficient performance in most industrial facilities. Dust collection solutions performance efficiency is directly related to the profits as it effectively minimizes machine downtime and provides a healthy workplace environment. Considering all these aspects, it is very

important to make the right choice while selecting a dust collector fan & blower, bag filter dust collector, or other types of pollution control system. working principles and operation of settling chambers.

1. Gravity settling chambers :-

This is a simple particulate collection device using the principle of gravity to settle the particulate matter in a gas stream passing through its long chamber. The primary requirement of such a device would be a chamber in which the carrier gas velocity is reduced so as to allow the particulate matter to settle out of the moving gas stream under the action of gravity. This particulate matter is then collected at the bottom of the chamber. The chamber is cleaned manually to dispose the waste.

$$V_g = (g(\rho_p - \rho)D^2) / 18\mu$$

where,

D = Diameter of the particle.

g = acceleration due to gravity.

ρ_p = density of the particle

ρ = density of the gas

μ = viscosity of the gas.

Cyclones :-

Settling chambers discussed above are not effective in removing small particles. Therefore, one needs a device that can exert more force than gravity force on the particles so that they can be removed from the gas stream. Cyclones use centrifugal forces

for removing the fine particles. They are also known as centrifugal or inertial separators.

wet dust scrubbers :-

Scrubbers are devices that remove particulate matter by contacting the dirty gas stream with liquid drops. Generally water is used as the scrubbing fluid. In a wet collector, the dust is agglomerated with water and then separated from the gas together with the water.

The mechanism of particulate collection and removal by a scrubber can be described as a four-step process.

(i) Transport :- The particle must be transported to the vicinity of the water droplets which are usually 10 to 100 times larger.

(ii) Collision :- The particle must collide with the droplet.

(iii) Adhesion :- This is promoted by the surface tension property.

(iv) Precipitation :- This involves the removal of the droplets containing the dust particles from the gas phase.

fabric filters :

Fabric filtration is one of the most common techniques to collect particulate matter from industrial waste gases. The use of fabric filters is based on the principle of filtration, which is

a reliable, efficient and economic methods to remove particulate matter from the gases. The air pollution control equipment using fabric filters are known as bag houses.

ESP:-

Extrasensory perception or ESP, also called sixth sense, is a claimed paranormal ability pertaining to reception of information not gained through the recognized physical senses, but sensed with the mind. The term was adopted by Duke University psychologist J.B. Rhine to denote psychic abilities such as intuition, telepathy, psychometry, clairvoyance, and their trans-temporal operation as precognition or retrocognition.