Dust Control Systems Using Spray Nozzles | Two Versions of the System

To design and provide a system suited for an individual worksite, IKEUCHI has prepared two main versions of the system. One is a “soft fog design” that sprays fine and soft fog to settle airborne dust and suppresses scattering. The other one is a “high-velocity fog design” that sprays a large volume of semi-fine fog at high velocity directly at the point where the dust is generated to prevent dust from dispersing.

Both designs are already used in power plants and steel mills in Indonesia, Thailand, Vietnam, South Korea, the United States, Japan, and other countries, to reduce air pollution and improve work environments.

Problems with Airborne Dust at Coal Storage Facilities

At power and chemical plants airborne dust from coal storage escapes into the air and is carried away by wind, resulting in air pollution, affecting nearby residents. The most common measures taken to prevent the dust from dispersing are to install windbreaks upwind and dust netting downwind.

The success of these measures is very limited since controlling airborne dust is next to impossible.

Even though dust prevention measures are required, despite the lack of effectiveness, many companies do not act until they are forced to, because of complaints from nearby residents or workers complaining about health issues.

The soft fog system does not deal with dust in the environment outside the facility. It is a way to prevent dust from dispersing in the first place. More specifically, the spray nozzles produce very fine fog to which dust particles adhere, causing them to become heavier and settle to the ground, thereby keeping them from dispersing. Each system is individually designed based on the amount of airborne dust and the site layout, selecting the optimal nozzles after also considering any other equipment present.

The only things the customer needs to provide are water and compressed air. The amount of dust can be significantly reduced without creating mud as the sprinklers, the costs are a fraction of the electrostatic precipitator and there are less space restrictions.

Soft Fog to Capture and Suppress Airborne Dust Particles

Even though it is difficult to implement solutions to these problems, IKEUCHI would like to present a dust control system using fog. It is the first of its kind with a well-proven record for solving industrial dust problems around the world.
Principle of Dust Suppression; Importance of Fine Water Droplet Size

A nozzle sprays fine fog into its surroundings which then collides with airborne dust particles and absorbs them. The absorbed dust particles slowly settle to the ground due to gravity; this is the principle of dust suppression.

The key is to produce water droplets which are the same size as the dust particles. If the water droplets are too big, the dust particle slide off them and will not be absorbed, preventing effective dust suppression.

The pneumatic spray nozzles, or air-atomizing nozzles, developed and designed with IKEUCHI’s atomization technology, produce water droplets with a diameter of 20 to 50 μm, and can perform effective dust suppression.

Effective Suppression of Airborne Dust at a Coal Storage Facility

Looking at a facility that installed the soft fog system for dust control, it only took 10 minutes for the fine fog to start spreading all the way to the ceiling. Then it slowly drifted downward, absorbing airborne dust particles to such an extent that the difference could be seen by the naked eye.

The dust content in the outside environment was drastically reduced, to the point there have not been any more complaints from nearby residents or citations from the authorities. The work environment inside has also improved greatly, mitigating concerns for the health of the workers. Clearly demonstrating the effectiveness of the system.

Summary | Dust Suppression System | Soft Fog Version

The "soft fog" design sprays fine and soft fog which are the same size as the dust particles to settle airborne dust and effectively suppresses scattering. IKEUCHI selects proper spray nozzles, configures ancillary devices and designs a installation layout to propose an optimal system.

The system also delivers effective performance even in a large space where a large amount of dust arises.

IKEUCHI have two main versions of dust control systems: a “soft fog design” and a “high-velocity fog design”.

The system is applicable to a very wide variety of applications such as dust prevention at a hopper gate or conveyor transfer points, improving a worksite environment and maintaining operators’ health, dust control in sludge treatment, fume suppression at rolling and welding processes, odor prevention, and improving corporate compliances.

Product Details

Dust control system using fog

Suppressing dust from erupting and becoming airborne

- An extensive lineup of spray nozzles and control devices to design a best suited system for each individual worksite
- Capable of dust control in a large space
- Highly effective in suppressing dust from erupting and becoming airborne
- Excellent energy-saving and water-saving effects