DUST MANAGEMENT

CONTAINMENT • SUPPRESSION • FILTRATION

L3423

CONSEQUENCES OF DUST

The adverse impact of dust is limited only by the distance it can be carried through the air. Risks to employees include potential health problems from exposure to dust and safety hazards associated with manual cleanup and working in dirty, dusty environments. These risks in addition to explosions, material loss, increased maintenance requirements, equipment damage, regulatory citations and fines, and decreased productivity will have unfavorable effects on the operation.

Outside the plant, the risks extend to the surrounding community and environment which are exposed to the pollution and health concerns arising from the dust.

These issues can cost an operation a considerable amount of time, money and energy if not dealt with properly. An effective dust management solution is a wise, if not necessary, investment that should be approached as a project, rather than simply a product off the shelf.

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FUGITIVE MATERIALS

The escape of airborne dust from bulk material handling systems is a hazardous and costly problem.

THE MARTIN® SOLUTION

Martin® Dust Management Solutions reduce the escape of airborne dust from material handling systems.

Problem Solved™ GUARANTEED!

UNDERSTANDING DUST MANAGEMENT

The amount of dust generated by a material handling system is governed by the relationship of three characteristics. The amount of dust generated is proportional to the air velocity divided by the factors of particle size and material cohesiveness, as shown in the equation on the right.

$$\text{DUST GENERATED} \propto \frac{\text{AIR VELOCITY}}{\text{PARTICLE SIZE} \cdot \text{COHESIVENESS}}$$

INCREASE MATERIAL COHESIVENESS

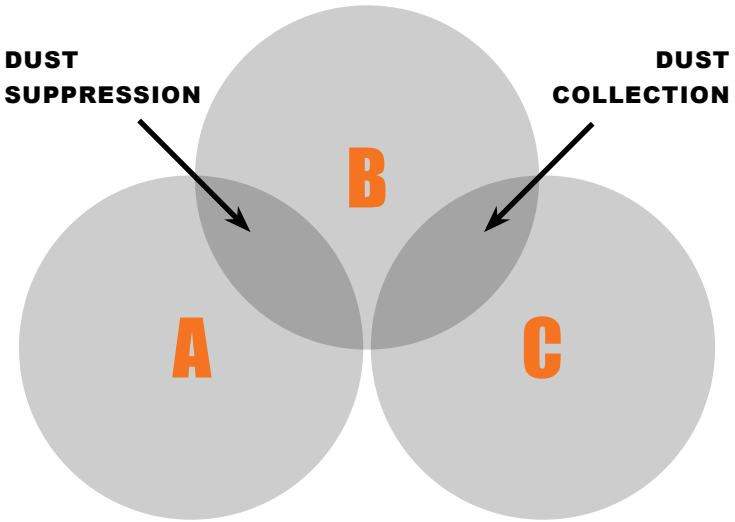
(A) Increasing the cohesiveness of a material makes it harder to separate out individual particles. Particles thus remain in the body of material and avoid becoming airborne.

INCREASE PARTICLE SIZE

(B) Larger particles are heavier, making them harder for moving air to pick up. If picked up, these particles will fall out of the air more quickly.

MINIMIZE AIR VELOCITY

(C) Dust travels in the air stream, so it stands to reason that if air is controlled, dust can be managed. By reducing air velocity, airborne particles will fall back into the material stream.



3 METHODS OF DUST MANAGEMENT

Any of the three characteristics of dust can be altered to minimize the amount of dust generated. Most dust management solutions target one or more of these characteristics.

DUST SUPPRESSION

Increase Material Cohesiveness + Increase Particle Size

Dust-suppression systems **increase the weight and cohesiveness of dust** by combining the particles with droplets of fluid. This prevents particles from becoming airborne, and encourages the airborne particles to fall back into the material stream.

AIR FILTRATION

Increase Particle Size + Minimize Air Velocity

Air filtration systems **minimize air velocity** by pulling air and dust out of the material-handling system. These systems **increase the particle size** of airborne dust by forcing particles to agglomerate before being deposited back into the material stream.

CONTAINMENT

Minimize Air Velocity

Enclosing airborne dust with an effectively-designed transfer chute **reduces air velocity** by minimizing air drawn into the transfer point, sealing leaks that allow dust to escape and allowing particles time to settle out of the air.

DUST SUPPRESSION

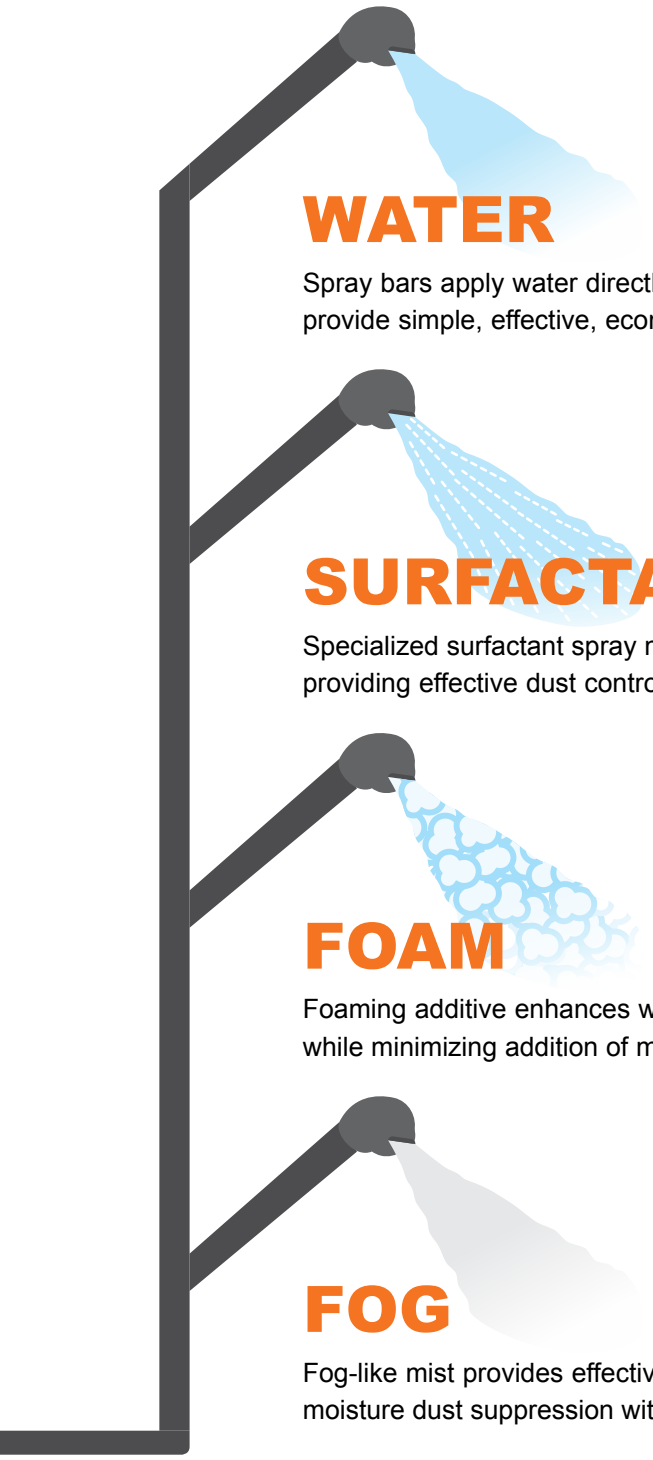
INCREASE MATERIAL COHESIVENESS + INCREASE PARTICLE SIZE

Martin is proactive when it comes to dust control solutions. Our goal is to actually prevent dust at the source if possible, using the treatment application that best suits your needs—from spray to foam to fog. The Martin® Dust Surfactant System gives you the most complete solution in dust suppression on the market today.

The Dust Control Unit offers a compact footprint that includes customizable components such as flexible controls, visual confirmation of operation, and optional remote monitoring. Every application is unique and therefore the solution should also be unique. Martin offers a wide range of equipment and surfactants to customize a comprehensive solution to meet your dust management needs.

OPTIONAL EQUIPMENT & ACCESSORIES

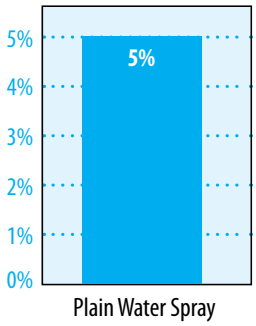
- Material-on-belt sensors
- Flow-controlled activation
- Customizable spray



WATER

ALLOWABLE Moisture Addition 5%

Spray bars apply water directly to material to provide simple, effective, economical dust control.

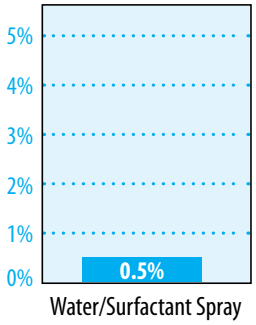


Plain Water Spray

SURFACTANT

ALLOWABLE Moisture Addition 5%

Specialized surfactant spray minimizes moisture addition while providing effective dust control in a wide range of applications.

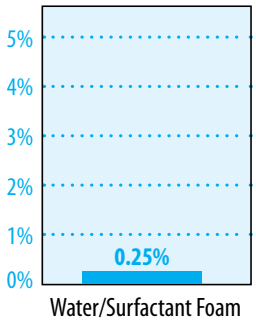


Water/Surfactant Spray

FOAM

ALLOWABLE Moisture Addition 25%

Foaming additive enhances wetting for effective control, while minimizing addition of moisture to conveyed material.

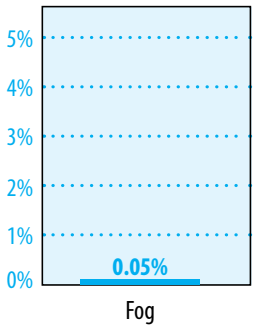


Water/Surfactant Foam

FOG

ALLOWABLE Moisture Addition 05%

Fog-like mist provides effective, single-site, low-moisture dust suppression without any surfactants.



Fog

MARTIN® AIR FILTRATION

Filters dust-bearing air at the transfer point without the ductwork or large fans of central “baghouse” systems and returns material to stream.

ALLOWABLE Moisture Addition 0%

DUST SUPPRESSION

SPECIALIZED DESIGNS TARGET YOUR APPLICATION NEEDS

Every application is unique, therefore the approach to dust management should also be unique. Our first priority is to reduce the amount of dust generated. If the first step is dust prevention, this reduces the amount of airborne dust created that has to be dealt with later in the process.

Martin targets the source of the dust with a wide range of application-specific designs that are customizable to fit your needs. This approach offers the customer the flexibility to control air movement, utilize a surfactant blend that will not affect your process, and to spray water only if that is what is required.

SURFACTANT

Controlled fluid sprays and specialized surfactants minimize moisture addition, leading to effective and efficient dust control.

Application Guidelines:

- Minimal moisture addition
- Surfactant addition is allowed
- Residual effect is desired
- Applicable in hazardous (explosive) environments

FOAM

Foaming additive enhances wetting for effective control, while minimizing addition of moisture to conveyed material.

Application Guidelines:

- Minimal moisture addition is required
- Surfactant addition is allowed
- Residual effect is desired
- Applicable in hazardous (explosive) environments

Martin® Dust Surfactant System Benefits:

- Targeted spray ensures water and surfactants are used efficiently, based on application-specific parameters.
- Activation sensors control the operation of specific application points, thereby, reducing inefficiencies.
- Automatic flow adjustment equates to consistently spraying the right amount of surfactant to properly control your application problems, while reducing overspray and controlling costs.

FOG

Fog-like mist provides effective, single-site, low-moisture dust suppression without any surfactants.

Application Guidelines:

- Use to treat material and/or the air around the material
- Applicable in hazardous (explosive) environments
- Containment is required for effective control

WATER

Spray bars apply water directly to material to provide simple, effective, economical dust control.

Application Guidelines:

- Use to treat material
- Applicable in hazardous (explosive) environments

AIR FILTRATION

INCREASE PARTICLE SIZE + MINIMIZE AIR VELOCITY

Air filtration—the passing of dust-carrying air through some form of filtration or separation system—is the final piece in the dust-management system.

There are both active and passive air filtration systems. A passive system merely allows air to move through the filtration system, whereas active systems work like a vacuum cleaner to pull or push air through a filtration method to remove the particles.

Mechanical air filtration systems are installed to pull dust-laden air away from a dust source, such as a conveyor loading zone; separate the dust from the air; and exhaust the cleaned air. A typical air filtration system consists of three major components:

- An integrated pickup to capture airborne dust at the source(s).
- A filter or separation device to remove dust from the air.
- A method to clean the filter and place the filtered dust back into the material stream.

MARTIN® AIR CLEANER

Filters dust-bearing air at transfer point without the ductwork or large fans of central “baghouse” systems; returns material to stream. Compact filter replacement is simple, all filter media is changed from the “clean side” and no confined space permit is required.

Application Guidelines:

- Use to replace “bag house” or central collectors
- Material is returned to material flow
- Moisture addition is not allowed
- Containment is required
- Applicable in hazardous (explosive) environments

Air Cleaner with PowerCore® filters

Air Cleaner with envelope filters

MARTIN® DUST BAG

Allows positive pressure to escape while removing particles from air. Controls dust without power; self cleans by collapsing when air flow stops.

Dust bag must be the easiest path for air to escape the transfer point; effective containment including curtains is a must.

Application Guidelines:

- No power consumption
- No water addition is desired
- Use when creating a passive path for air to flow
- Containment is required
- Applicable in hazardous (explosive) environments

CONTAINMENT

MINIMIZE AIR VELOCITY

While it is unlikely dust can be completely eliminated, the first consideration in dust control should always be the minimization of the amount of airborne dust created. Therefore, any change in system design or production technique that will reduce the amount of dust produced should be evaluated.

Airflow through the system can be managed by controlling the amount of air entering the transfer point, building the enclosure large enough to slow or minimize air speed and by utilizing additional control measures to slow air movement. As air velocity is reduced, airborne particles that are too heavy to be supported by the reduced air speed begin dropping from the air stream.

MARTIN® TRANSFER POINT SYSTEMS

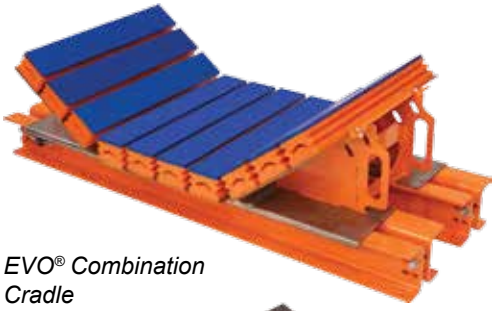
Stabilize the belt path and seal the belt at the skirtboard to prevent escape of dust and spillage at sides and end of loading zone.

- Use when traditional transfer point technology is desired
- Use when support and containment are the focus
- Use to upgrade an existing transfer point with minimal disruption

MARTIN® CRADLES

Martin® and EVO® Impact Cradles, installed in the loading zone impact area, absorb the force of falling material to prevent damage to the belt and structure while eliminating belt sag. Track-mounted design allows for quicker and easier installation and maintenance. Steel-reinforced bars provide long wear life.

Martin® and EVO® Slider Cradles, installed under the skirtboard of a transfer point, support the edges of the belt to stabilize the belt line and allow effective sealing. Outer support bars and center support rollers slide into position on a track, for quicker and easier installation and maintenance. Double-sided UHMW bars provide extended wear life and reduced friction.



EVO® Combination Cradle

EVO® Slider Cradle

MARTIN® SEALING SYSTEMS

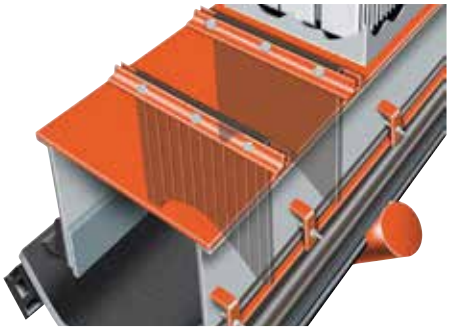
Martin® ApronSeal™ and Self-Adjusting sealing systems, clamped on the chute wall, maintain an effective seal and prevent escape of fines and dust. ApronSeal™ dual-seal systems stop fines with one-piece design for easy maintenance. Self-Adjusting Skirting systems float on the belt and is appropriate for belts with minimal free belt edge.

Martin® Wear Liner creates a dam to shield the sealing system from the weight of the material load, prolonging the life of the seal. EVO® External Wear Liner is attached to the outside of the chute, allowing easy adjustment and maintenance without entering the chute.

Martin® ApronSeal™ Double Skirting

MARTIN® DUST CURTAINS

Installed near the end of the transfer point chute enclosure, Martin® Dust Curtains slow loading zone airflow to allow airborne dust to settle back into the belt cargo. Rugged solid or slit ¼-inch rubber construction provides extended service in tough conditions. Curtains bolt into steel frame for simple replacement.



GLOBAL LOCATIONS

- UNITED STATES
- AUSTRALIA
- BRAZIL
- CHINA
- FRANCE
- GERMANY
- INDIA
- INDONESIA
- ITALY
- MEXICO
- PERU
- RUSSIA
- SPAIN
- SOUTH AFRICA
- TURKEY
- UNITED KINGDOM

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