



Combustible Dust?

Is your dust collection system
NFPA compliant?

- Deflagration safety
- Fire suppression
- Spark protection





RoboVent: Your Total Solution Partner for Combustible Dust

RoboVent engineers and manufactures industry-leading NFPA compliant dust collection equipment at our manufacturing facilities. As part of the Rensa Filtration family, we also manufacture high-quality filters for practically any make and model of dust collector as well as other filtration applications. We guarantee a solution that delivers superior performance and safety while minimizing maintenance and operating costs. We can help you at every stage of the process to keep your people and facility safe from combustible, toxic or hazardous dust.



Equipment



Industrial Air Filters



Facility Testing & Engineering Services



Project Management & Installation



Preventive Maintenance

Confused About NFPA Compliance for Dust Collection Systems?

Choose RoboVent and our combustible dust experts will help you:



Step 1:
Onsite Consultation



Step 2:
Data Collection



Step 3:
Modeling



Step 4:
System Design



Step 5:
Final Review & Analysis



NFPA Compliance for Dust Collection Systems

Dust collection systems for combustible dust must be designed according to standards set by the National Fire Prevention Association (NFPA). RoboVent designs our systems to be fully compliant with relevant NFPA standards, including:

- **NFPA 652:** Standard on the Fundamentals of Combustible Dust
- **NFPA 654:** Standard on the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids
- **NFPA 68:** Standard on Explosion Protection by Deflagration Venting
- **NFPA 69:** Standard on Explosion Prevention Systems

Mitigating Explosion Risks in the Dust Collection System

The dust collection system is an essential component of combustible dust safety, preventing dangerous dust buildup in your facility. But the dust collector also provides many of the elements necessary to generate a combustible dust explosion:

- High concentrations of combustible dust
- Dispersion of the dust in the airstream
- Plenty of oxygen thanks to airflow through the collector
- Confinement of the dust cloud inside the ductwork and collector filter chamber

With these conditions met, all that is needed to spark an explosion is an ignition source. Ignition inside the dust collection system can come from:

- Sparks from welding, cutting, grinding, or other spark-producing processes near the dust collection system intake.
- Heat or sparks generated by the dust collector blower/motor (e.g., motor short, friction from belts or bearings, etc.).
- Static electricity generated by some types of dust when particles rub together in the airstream (self-ignition).

NFPA standards for dust collection system design were developed to:

- Reduce the risk of dust collector fire or explosion by eliminating elements that create conditions where a thermal event can occur (e.g., ignition risk).
- Mitigate the damage of a thermal event if one should occur inside the dust collection system to reduce the risk of injury to people, damage to the facility or other equipment, or a dangerous secondary dust explosion.



**Senturion**

The Ultimate Industrial Dust
Collector by RoboVent

Meet Senturion.

Small Footprint. Tough Dust Control. NFPA Compliant.

Is combustible dust putting your facility at risk? Senturion is a tough, versatile dust collector designed for performance and safety. With integrated fire suppression and deflagration options, it is an NFPA-compliant solution for combustible dust control.

- Tough steel construction
- Smallest footprint per CFM in the industry
- Modular and customizable for any application
- Integrated explosion protection, fire suppression and spark control (optional)

With Senturion, you can build your dust collector around your needs and application. We'll help you choose the right explosion, fire and spark protection options to mitigate your specific risks and keep your people and facility safe.

Bulk & Powder

Food Processing



Plastics/FRP



Recycling



Seed Processing



Mining

Metalworking

Welding



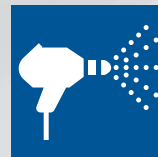
Metal Cutting



Grinding



Thermal Spray



Surface Prep



Fire and Explosion Safety for Dust Collection Systems

Fire and explosion safety for dust collection systems is built around several key principles, including:

- Deflagration safety
- Fire suppression
- Spark protection

Deflagration Safety

NFPA-compliant dust collection systems must be equipped with a deflagration package when used to collect combustible dust. The package design depends on the explosive potential of the dust (ST class) and the environment in which the collector is located. A deflagration package may include some or all of the following.



Explosion Vents *(Standard and Flameless)*

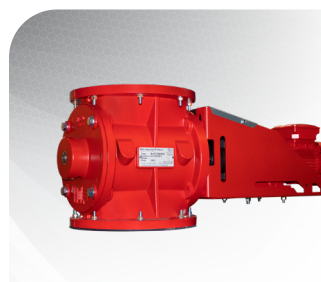
A Standard Explosion Vent is a simple panel designed to safely release the pressure of an explosion. The panel pops off when pressure rises to unsafe levels inside the collector to direct the pressure away from people or sensitive locations and prevent further damage to the collector.

A Flameless Explosion Vent performs the same pressure-relief function and is also designed to stop flames.



Isolation Valve

The Isolation Valve is placed in line with dust collector ductwork to prevent a pressure wave from an explosion inside the collector from propagating backward into the facility. Pressure from the explosion triggers a valve to close inside the device, which creates a barrier to contain the explosive force. Isolation valves limit the damage of an explosion and can help prevent a secondary dust explosion in the facility.



Rotary Airlock

The Rotary Airlock is installed between the dust collector filter chamber and the collection tray or bin. The airlock acts as a one-way valve, allowing dust to fall into the bin while preventing it from reentering the filter chamber. This reduces the risk that collected dust can add more fuel to an explosion in the filter chamber.



High-Speed Abort Gate

The Abort Gate is installed on the outlet ducting of the dust collection system. It prevents flames and burning debris from a dust collector fire or explosion from entering the facility through the return air system.

Your system may also include:

- Upgraded doors to withstand the pressure of an explosion
- An upgraded dust collector control system to automate safety equipment in the event of a fire or explosion

Fire Suppression

Engineering Services

We don't just sell equipment, we design and engineer air quality systems around your specific processes, facility layout, dust hazard level and clean air goals. Depending on your specific dust and process hazards, NFPA compliance may require placing the dust collector outside the facility to maximize safety. We can help you determine the best compliant solution for dust collection system design and placement.

Fire Suppression

Dust collector fires are much more common than explosions. If a spark or heat source reaches the filter chamber, the filter media provides a ready source of fuel—with plenty of oxygen to fan the flames. Fire suppression is recommended even when working with dust that provides little or no risk of an explosion. The goal of a fire suppression system is to contain the damage of a fire to the dust collector itself and prevent its spread to other parts of the facility.



Sprinkler System

A sprinkler system uses facility water to spray down the filters and extinguish the fire. The sprinkler system may be triggered by a temperature-sensitive sprinkler head or a smoke/fire detection system.

Carbon Dioxide Gas

A CO₂ fire suppression system smothers the fire by displacing oxygen in the system with carbon dioxide gas. A CO₂ system does not fully extinguish the fire but prevents it from spreading until firefighters arrive. It can be triggered by a temperature-sensitive release mechanism.



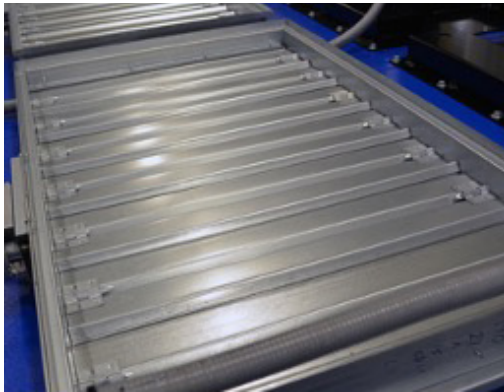
Supprex-200: Clean Agent Gas System

The FM-200 gas and canister system, from Firetrace, automatically releases a proprietary gas into the dust collector chamber as soon as heat is detected—no power source required. The clean agent gas effectively suppresses fire until firefighters arrive, keeping your facility safe. It is safe for both humans and electronics and minimizes cleanup and downtime in the event of a discharge.



**Watch RoboVent's video
on Fire Suppression**

Other Fire Safety Elements



Damper System

The Supprex-200 Damper System stops the spread of fire and smoke through your ductwork. Activated by heat, the damper closes automatically to stop airflow and suppress fires in your ductwork and dust collector. Part of the Supprex-200 Fire Suppression System.

Smoke Detector

In addition to your general building smoke detection system, you need to have a smoke detector for your dust collector. There are several kinds of smoke detectors to choose from. For dust collectors, an Ionization/Thermal Dual Sensor is typically recommended.

Spark Protection

Keeping sparks out of your dust collector and ductwork is an essential element of fire and explosion safety. You can minimize ignition risks from spark-producing processes by installing a spark arrestor or detect-and-suppress system at the intake of your dust collector or ductwork. There are two main types of spark control systems for dust collection equipment.

- Passive, or mechanical, systems use screens, strike plates, baffles or centrifugal force to strip the thermal envelope from sparks and prevent them from reaching the filters. Most dust collection systems can be protected using one of these methods.
- Active systems (detect-and-suppress) use a sensor to detect sparks and a water- or chemical-based system to extinguish them. They are typically used for systems operating in explosive atmospheres or applications that require near 100% assurance of suppression.

Screen and Baffle Systems

Senturion can be equipped with intakes with integrated spark control in the form of mesh screens and baffles. It can also be configured with a dropout box and baffle system that blocks hot embers and allows them to drop out of the airstream before hitting the filters.

Delta3™ Inline: Advanced Spark Protection

For applications producing a large number of sparks, we recommend Delta3™ Inline. Delta3 Inline is a powerful centrifugal spark arrestor that delivers unbeatable spark control with exceptionally low pressure drop. It is installed in line with the ductwork.



Need a Detect and Suppress System?

Ask us about active spark suppression options from our industry partners.



Talk to a Combustible Dust Expert Today.

robovent.com • 888.ROBOVENT
www.robovent.com/contact-us



Making a Difference One Breath at a Time.™

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