

# Spark Detection/ Extinguishment Systems Safety for Your Production



GreCon®

**Detection and extinguishment systems detect and automatically extinguish sparks. Dust fires and explosions can thus be prevented.**

Dust fires and explosions often occur in filters, silos and dryers. They endanger human lives, cause severe property damage and interrupt production operations.

The reason can be sparks or burning embers caused when working with or drying combustible material and reaching endangered plant areas through the pneumatic and mechanical conveying systems.

The GreCon system was developed especially for detecting and extinguishing these ignition sources in pneumatic exhaust systems before they reach filters and silos and cause a fire or explosion in these areas.



## Protection of Dust Filters and Silos

GreCon sensors are mounted in the walls of the exhaust ducts and will detect infrared radiation emitted by sparks even through layers of dust and in dense material flow.

Immediately upon detection of sparks, a water mist spray is released and the sparks are extinguished. The extinguishing device consists of a special high speed solenoid valve with one or more spray nozzles. These are mounted in the duct wall about 4 to 6 meters (12 to 18 feet) downstream of the sensors, depending on the conveying velocity.

Extinguishment is accomplished in a split second. Special extinguishing nozzles spray a water mist which will cover the entire cross section of the duct. With a properly planned installation, the ignition sources enter the water mist and are effectively extinguished.

The valve opens for a preset or adjustable time frame, normally 5 seconds, then closes within a split second.

The GreCon system effectively detects and extinguishes ignition sources without machinery shut-down or interruption of the production process.

The amount of water released is sufficient to extinguish the sparks, but does not adversely affect the filter media.



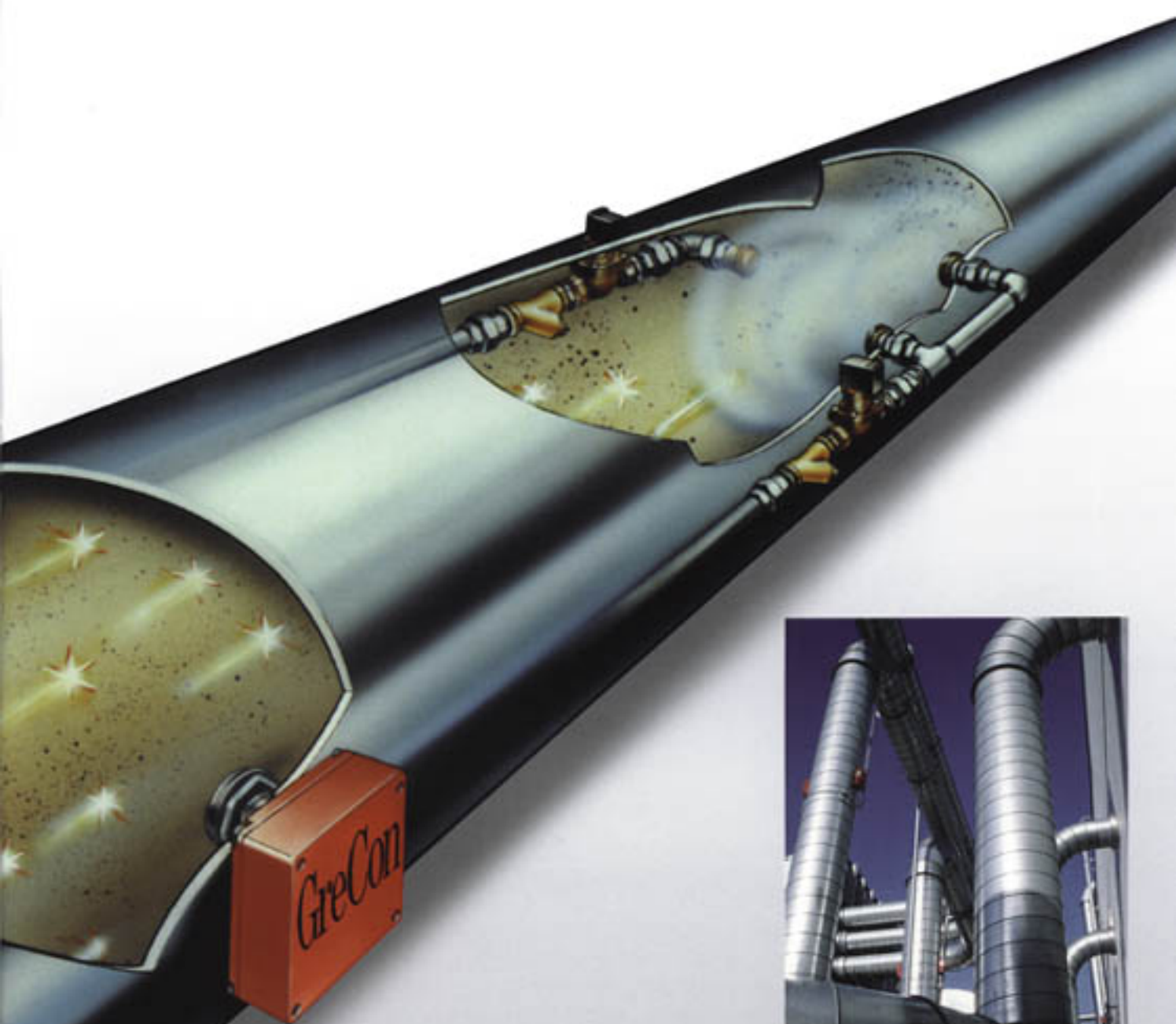
## Protection of Dryers

Sparks and burning embers can occur any time when combustible materials are dried. Sources of spark danger can be an uncontrolled machinery shut-down, overdried material within the dryer or overheated material build-up in the ducts. Overheated glowing particles leave the dryer, come in contact with oxygen in the air, and can result in a fire or explosion. All plant areas connected by the pneumatic conveyor system and even the dryer itself can be affected.

Because temperatures in this area exceed the operating temperature of standard sensors, sensors with fibre optic cables are required. GreCon sensors can detect sparks in pneumatic transport ducts of dryers or in discharge chutes and mechanical conveyors.

Upon detection of sparks, pre-programmed countermeasures are automatically triggered; i. e., release of extinguishing spray, closing or aborting pneumatic pipes, or, in extremely critical cases, shut-down and flooding of the dryer with water, if necessary.





### Protection of Milling Equipment

Due to the high speed of milling equipment, heavy showers of sparks can be generated instantly when metal or stones enter the mill, or when mechanical parts are damaged. GreCon sensors detect these showers of sparks and activate the extinguishing devices, thereby protecting downstream plant areas.

The GreCon system counts each spark as it is detected. The system can be pre-programmed to extinguish individual sparks without interrupting production and additionally shut down machinery upon counting a preset number or shower of sparks. This feature protects machinery from further damage due to mechanical failure or foreign material in the mill.

## Spark Detection Preferably in Dark Areas

Preferable location for a GreCon Spark Detection and Extinguishment System is the darkness within a pneumatic conveying duct or other areas where ambient light is not present. This ensures high sensitivity of the sensors which can detect ignition sources

even in dense material flow. In pneumatic transport ducts, the optics of the sensors are normally kept clean by the material which makes the system easy to maintain.



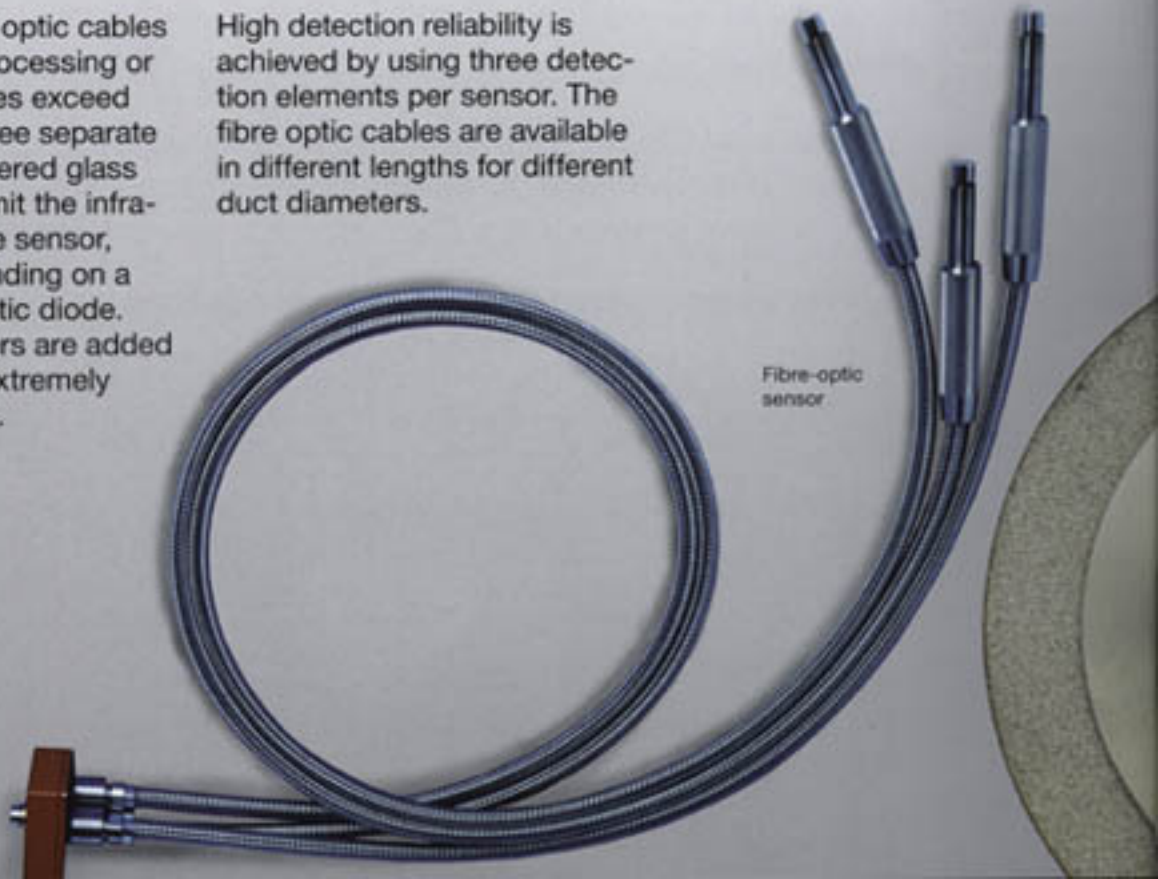
Spark sensor



## Spark Detection in High Temperature Areas

Sensors with fibre optic cables are used where processing or drying temperatures exceed 65° C (149° F). Three separate stainless steel covered glass fibre cables transmit the infra-red radiation to the sensor, with each cable ending on a separate photo optic diode. Solid glass adapters are added to the cables for extremely high temperatures.

High detection reliability is achieved by using three detection elements per sensor. The fibre optic cables are available in different lengths for different duct diameters.



Fibre-optic sensor

## Spark Detection under Daylight Conditions

GreCon can also monitor and detect sparks on conveyor belts, production lines, or at transfer points between conveyor systems. A special sensor, which responds only to the movement of invisible infrared radiation from glowing particles, is used where ambient light is present.



Air purge adapter

Daylight sensor

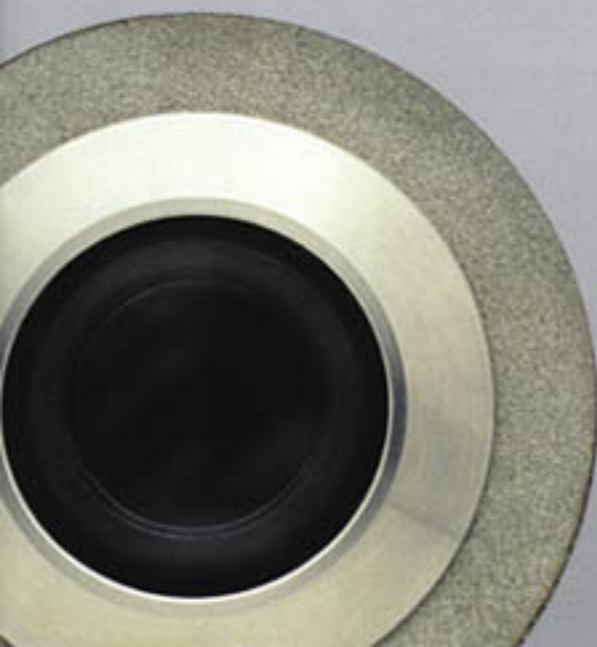
## Additional Measures against Heavy Dirt Accumulation

If any dirt accumulation or other build-up on the sensor optics is expected (e. g. in drop chutes), special air purge adapters can be used.



## Interference-Free Installation

Sensors and spray nozzles are flush-mounted in the duct walls and do not obstruct the material flow.



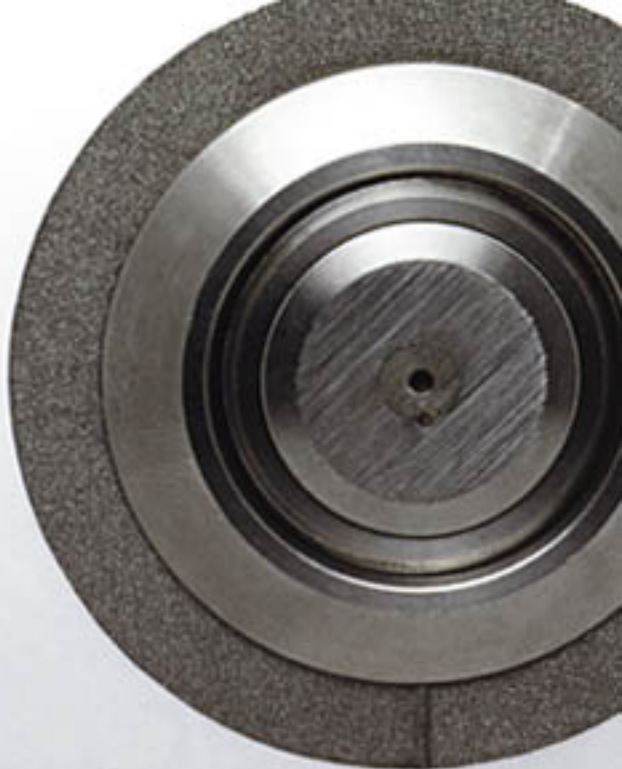
Sensor lens  
(view into the inside of the duct).  
Scale up picture

## Water Mist Extinguishment

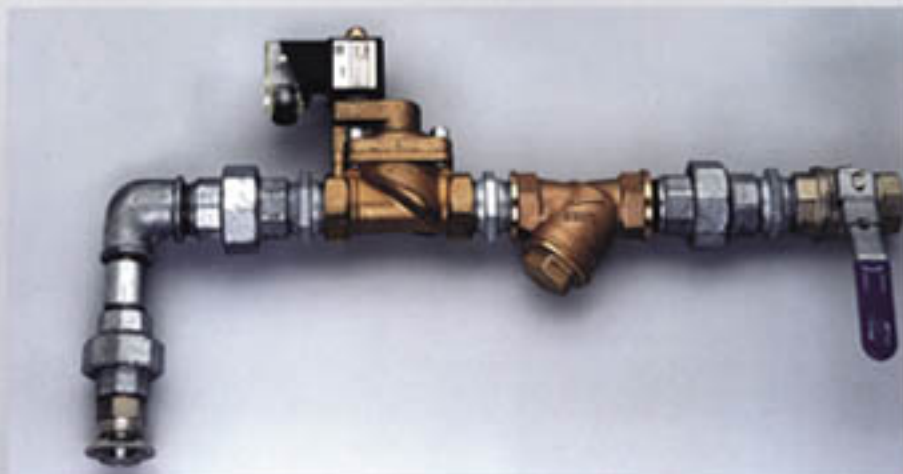
A fine water mist spray emerges from the extinguishing nozzles which are flush-mounted in the walls of the duct. They are made of high-quality stainless steel and are wear resistant and contamination-free due to the

water controlled shutter cone which seals the nozzle or face after extinguishment.

Extinguishing nozzle  
(view from the inside of the duct)  
Scale up picture



Extinguishing device



## Anti-Freeze Protection

Heat tape and insulating material is used to protect water pipes and extinguishing devices from freezing in areas exposed to frost. Special insulating bags are available for the extinguishing devices.

## Pressure Increasing Units

Water Pressure Booster Pumps provide increased water pressure for sufficient extinguishment operations. Standard Booster Pumps are designed to increase plant pressure up to 65 psi. Automatically self-activated, the pump is monitored by the GreCon BS-7 Control Console.



Water pressure booster pump

## Shut-Down of Material Flow

GreCon Fail-Safe™ Abort Gates exhaust hazardous airflow to the atmosphere. Activated by sensors, a spring-loaded gate closes in less than 500 milliseconds. In compliance with NFPA 664 standard, when used in an air return

system, the abort gate prevents hazards from re-entering the building.



RBS-4 Fail-Safe™ Abort Gate



Available in Different Sizes

## GreCon Control Consoles

The GreCon control console receives and processes signals from the sensors and immediately activates countermeasures. The microprocessor-based console is a dust-proof enclosure and is suitable for severe industrial surroundings. All functional elements and terminal connections are easily accessible, and spacious room for connections is available. Maintenance-free batteries assure uninterrupted protection in case of power failure.

## Automatic Function Checks

Function checks and testing of, for example, sensors and extinguishing devices are performed regularly and automatically. This substantially reduces necessary checks by operating personnel.

## Ease of Operation

The control console's operation is user-friendly: only the buttons to be pressed light up. Displayed menus lead the operator through all functions and test procedures for the console, sensors and extinguishing devices. Operating personnel can easily operate the system.

## Evaluation of Events

The GreCon console displays and records information from each individual occurrence of sparks; i.e., time of occurrence, exact number of sparks, duration of extinguishment and location of the spark occurrence. The severity of alarms can thus be evaluated. All other system event information is also displayed and recorded in memory.



## Alarm Threshold in Case of Heavy Spark Flight

Spark counters within the GreCon system allow for response to a single spark or a shower of sparks. The GreCon system can be pre-programmed to extinguish individual sparks and automatically shut down machinery during abnormal spark activity.

## Alarm Threshold in Case of Long Extinguishment

Repeated spark detection within short intervals can give a clue to a faulty production process. To be notified of this condition or to avoid long extinguishments, an additional alarm can be activated or the individual production process can be shut down automatically.

## Recording of Spark Events

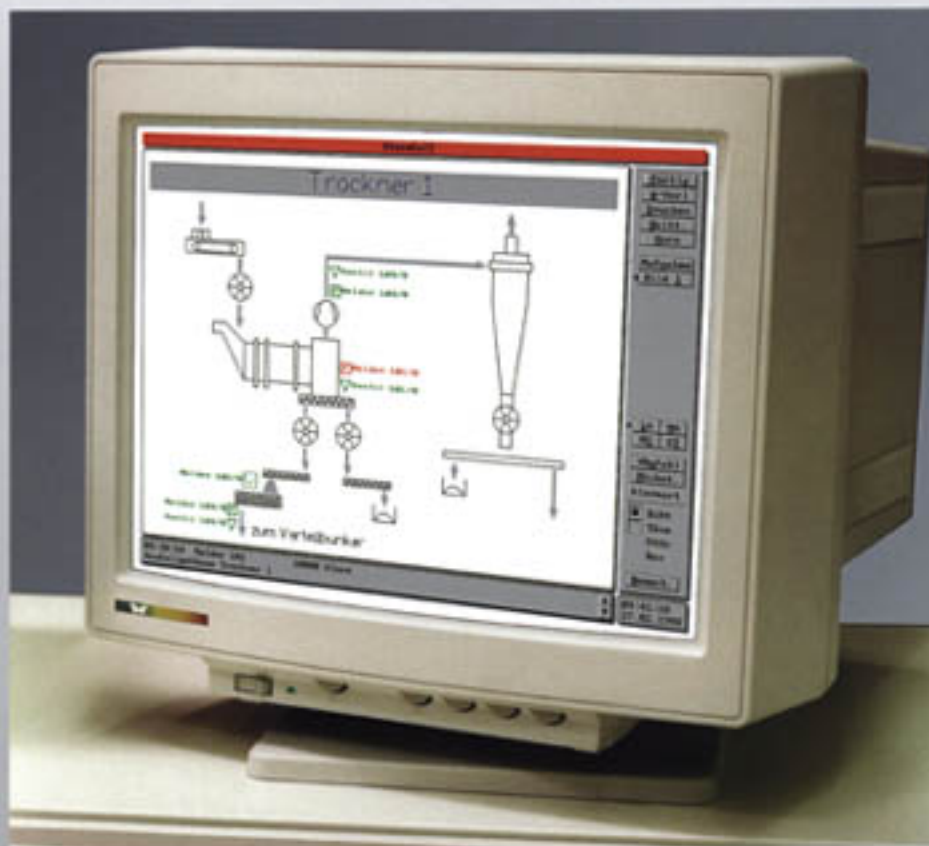
The GreCon console stores up to 2,500 events which can be displayed or printed out for later review. Alarms can then be analyzed to determine potentially hazardous areas or malfunctioning machinery.



One/two/four-zone console

## Central Visualization

Events recorded by several consoles which are installed in different areas of the plant are clearly shown on a monitor. This gives the operator an overview of the current situation at any time. Freely programmable graphics and text can be allocated to each event. All events and operating processes are recorded.



Visualization system of the spark extinguishing system

## Interchangeable Components

GreCon consoles are available in different sizes and can be expanded for protection of additional areas at any time. GreCon components are programmed to "backup" non-functioning components until repaired or replacement parts can be installed.

## Extinguishment Protection

The GreCon system automatically monitors the extinguishing assemblies and immediately triggers an alarm in case of no water flow or in case of water system leakage.

## Application Recommendations

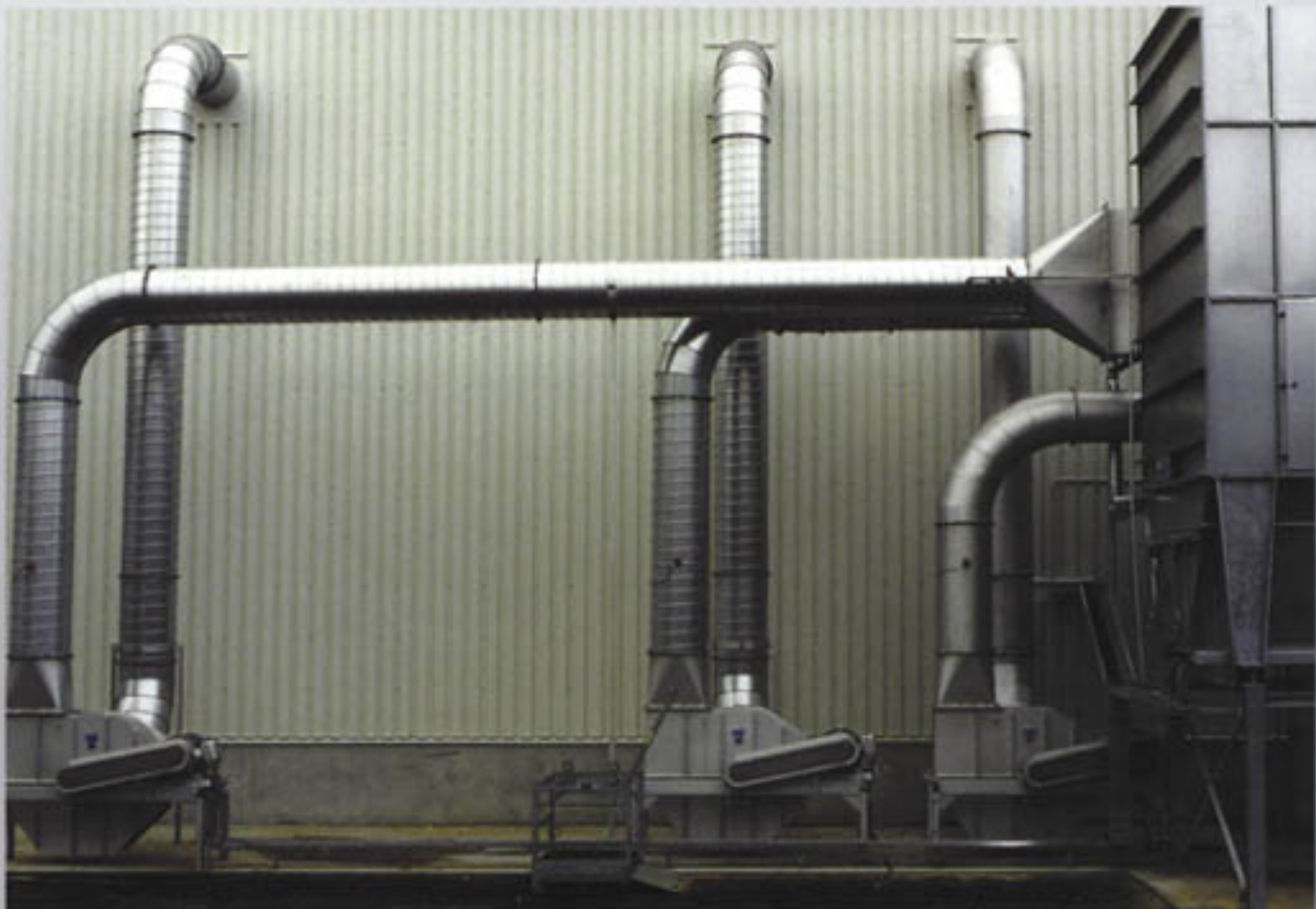
A GreCon Spark Detection and Extinguishment System can easily be installed in existing production plants. However, it is advantageous to take the installation of a spark detection and extinguishment system into account when planning a new plant.

The mounting of sensors and nozzles is very easy. Standard non-shielded wiring may be used for the electrical installation. The water supply system should be installed in galvanized steel.

## Maintenance

High-quality materials with very long wear resistance are used for all components that come in contact with the material flow. This greatly reduces the wear of sensor optics and extinguishing nozzles.

Rapid connections and a modular design make an easy replacement of components possible. The stand-by batteries of the console are maintenance-free.



## After-Sales Service and Maintenance Contract

After-sales and contractual maintenance service is available at any time after the purchase of the system. Thorough training and instruction of the operating personnel is part of this service. During the maintenance of the system, which is usually carried out once or twice a year, technical improvements or software updates can be implemented.

## State-of-the-Art Technology

GreCon Spark Detection and Extinguishment Systems are fully warranted and are approved by Factory Mutual (FM) and the German Association of Property Insurers (VdS). These institutions require stringent manufacturing standards and technical reliability. The same applies to planning and after-sales service.

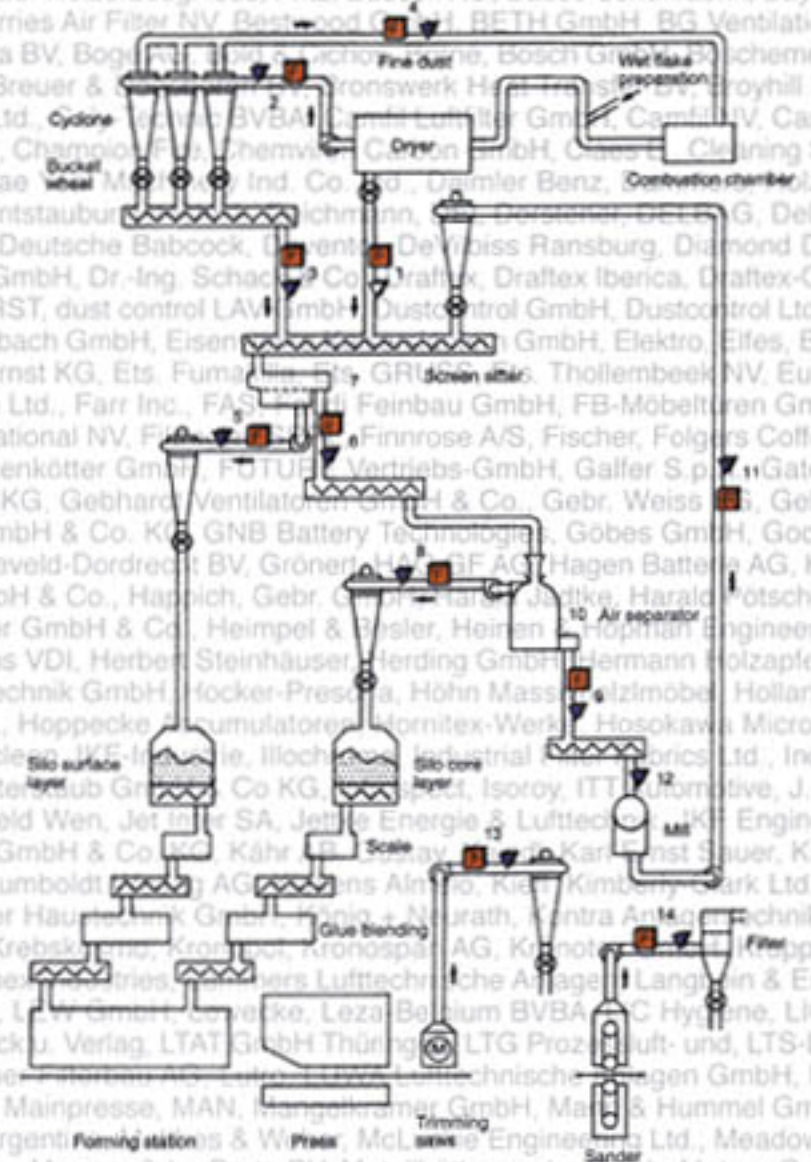
GreCon has their own experimental station to test new applications.

## References

GreCon protects more than 100 different industries with over 30,000 applications of the GreCon Spark Detection and Extinguishment System worldwide. Reliable after-sales service is available 24 hours a day to assist you and ensure your plant's safety.

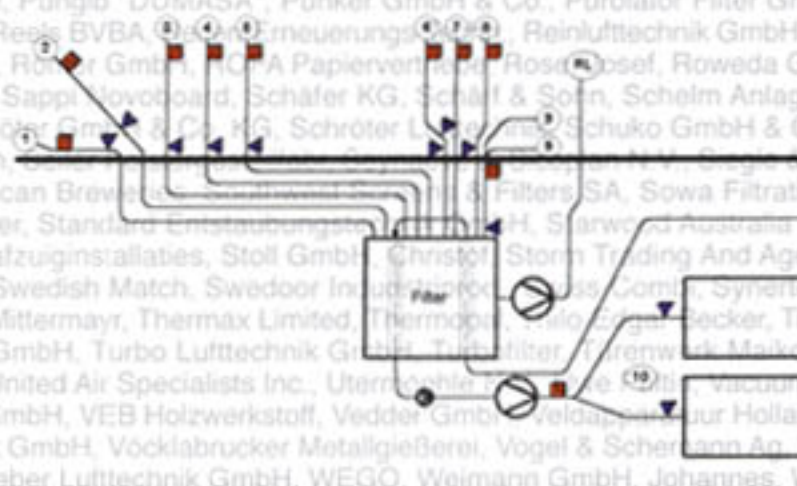


### Particle Board Industry



Spark Detection  
Spark Extinguishment

### Furniture Industry





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VdS

Factory  
Mutual  
System

CE

ISO  
9001

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