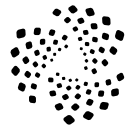




DUST AND ODOR
SUPPRESSION SYSTEMS
SMALL DROPS, BIG IMPACT.







WE PROTECT OUR CUSTOMERS FROM DUST AND ITS CONSEQUENCES.

The topic of dust suppression has become enormously important in the last years – on the one hand, due to stricter requirements imposed by the authorities and on the other hand due to increasing environmental awareness.

At EmiControls we not only fight dust through competent consulting, plant engineering, and implementation of dust control systems but also offer a decisive added value for your company:

- › Cost and time savings: maximum results thanks to minimum use of resources
- › Happy employees, safe working conditions, and satisfied neighbors
- › Better image thanks to the implementation of sustainable measures

For more than 10 years we have been helping customers all over Europe to suppress dust emissions. We are happy to be walking this important path with you as well.

Small particles, serious consequences

THIS IS WHY DUST SUPPRESSION IS IMPORTANT

Dust has various negative effects on people as well as the environment and can lead to serious consequences if you are exposed to it unprotected for a longer period of time. How to properly abate dust depends on several factors.

WHAT IS DUST?

Dust is nothing else, but finest particles suspended in the air, created by mechanical processes. Dust particles can differ in size, shape, colour, chemical composition, physical properties, and their origin and formation.

Therefore, dust is basically omnipresent and has various sources: industry, transport, agriculture, fires, nature or volcanic eruptions.

ORIGIN OF DUST

Dust can be generated by various natural as well as industrial processes – such as the mechanical processing of solids (e.g. crushing, surface treatment, abrasion, rearrangement) or through physical influences on solids (e.g. erosion by wind and weather). Dust can also be generated secondarily by chemical processes in the atmosphere.

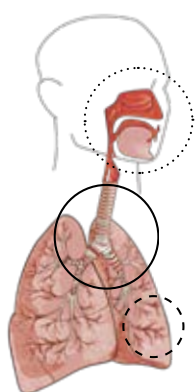
In the industrial sector, we deal almost exclusively with dust generated from mechanical processing.





DIFFERENCES: DUST ISN'T DUST

In the context of workplace safety, it is important to know the following types of dust:



- › **E-dust** is the inhalable fraction of the dust and gets into the mouth and nose.

Size: The particles are smaller than 100 μm .

- › **Tracheobronchial dust** reaches the upper airways.

Size: The particles are between 5 – 10 μm in size.

- › **The alveolar dust (A-dust)** reaches the alveoli (the smallest branches of the lungs) completely unnoticed.

Size: The particles are smaller than 4 μm .

EFFECTS OF DUST

Dust has effects on the environment as well as on people. If we talk about effects generated by dust, we do so from the perspective of environmental protection as well as work health and safety:

- › Long-term exposure to dust can lead to respiratory diseases
- › Heavy dust obstructs vision
- › Working tools are polluted by dust and damaged in the long term

Dust can be a cause of technical problems, e.g. overheating of electronics in the absence of ventilation, rapid wear of moving parts, and poorly functioning sensors.



We cooperate with laboratories for professional dust analysis. Photo source: Particle Vision, our partner for dust analysis.

Small Drops, Big Impact.

THE SECRET OF WATER MIST

The expectation on the effectiveness of dust suppression systems has increased enormously in recent years. So how does efficient dust suppression look like?

The most important element is water mist itself: the fine mist moistens the dust, gives it weight and brings it to the ground without forming puddles or muddying the material. Water mist has a double function in order to reduce unwanted dust emissions in the air:

- › when the air is humidified, the dust swirling around in it is brought to the ground
- › by moistening the surfaces (material as well as floor), the “open surfaces” are sealed and dust does not get into the air in the first place

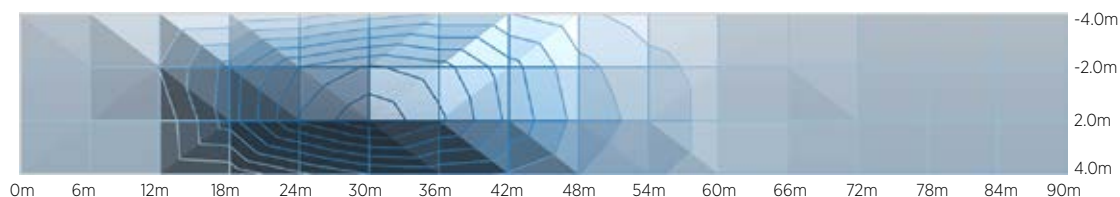
THE RIGHT DROPLET SIZE

The optimal size of the water droplets is the key to success: dust particles bounce off the fast-falling large droplets, but stick to the smaller (slow-falling) droplets of similar size (see graphic). Conventional spray systems usually produce large, heavy water droplets that do not catch most of the floating dust in the air.

Thanks to sophisticated valve technology, our machines nebulize the water droplets into different sizes between 10 and 100 μm .

As a result, our solutions for dust suppression can be in use on any type of dust and adapt to a whole range of conditions thanks to full control of the water flow rate and droplet size.





The graphic shows how the V22 dust controller distributes the water.

THE CORRECT DISTRIBUTION OF THE WATER MIST

Another crucial point for successful dust suppression is the optimal distribution of the water mist.

The amount of dust in the air is specified as $[\text{mg}/\text{m}^3]$. Through many years of experience as well as tests and trials with independent institutes, we know exactly how much water per m^3 we need to use in order to combat the dust concentration (per m^3).

This means: once we have defined the source of the dust, we know exactly how to position our machines to knock down the dust as effectively as possible.

A FINAL SOLUTION

Effective dust suppression depends next to the water mist as well on these factors: the general dust tendency of the material, plant-specific conditions such as conveying speed, drop height of the material, but also the ambient conditions have a significant influence on the effectiveness of a dust abatement system.

In order to find the right solution, all of the mentioned factors must be taken into account as well. In the end, only know-how and experience helps to choose the ideal configuration (type of machine, type of nozzle, amount of water, etc.).



With the help of a water test we have documented the quantity $[\text{l}/\text{m}^3]$ for all our solutions. This gives us a decisive advantage in the positioning of our solutions.

1 PROBLEM
IDENTIFICATION
AND SOLVING

2 COMPETENT ORGANIZATION
DURING INSTALLATION
AND COMMISSIONING

3 AFTER-SALES
SERVICE & MONITORING
OF DUST VALUES



ACTI



WE PROTECT OUR CUSTOMERS FROM DUST PROBLEMS

Behind every well-functioning plant stands an excellent planning as well as consulting team. At EmiControls, nothing is left to chance: before starting a project, we personally visit the site and provide our customers with competent and professional advice.

Once the problem has been evaluated, we work hard to find the ideal solutions. First, our project management team starts by planning the system, before finalizing the project in constant exchange with our customers and then finalizing with the installation of the plant on schedule.

After a successful briefing and handover of all necessary documents, the plant will be commissioned.

Even after commissioning, we are always there for our customers. The Service team is available to our customers for questions regarding the plant, as well as for any repair, spare parts and maintenance work.

ON



**THANKS TO AUTOMATED
AND EFFICIENT SOLUTIONS,
OUR CUSTOMERS ACHIEVE
MAXIMUM RESULTS WITH
MINIMUM USE OF RESOURCES.
THIS SAVES COSTS AND TIME.**

**THANKS TO THE MANAGEMENT
SOFTWARE CURTPRO, THE
MACHINES CAN BE CONTROLLED
EASILY FROM THE OFFICE.**

**THANKS TO INTERFACING WITH A
METEO STATION, THE MACHINES
SWITCH ON OR OFF AUTOMATICALLY
BASED ON PREDEFINED WEATHER
CONDITIONS SUCH AS WIND
STRENGTH, WIND DIRECTION,
TEMPERATURE AND HUMIDITY.**



**THE MACHINES ONLY
RUN WHEN REALLY
NECESSARY. THIS SAVES
WATER AND ENERGY.**

**EMPLOYEES ARE NOT
DISTURBED IN THEIR
WORK PROCESSES.**

CURTPRO **DUST**

FULLY UNDER CONTROL THE CENTREPIECE OF YOUR PLANT.

INTELLIGENT DUST MANAGEMENT SYSTEM

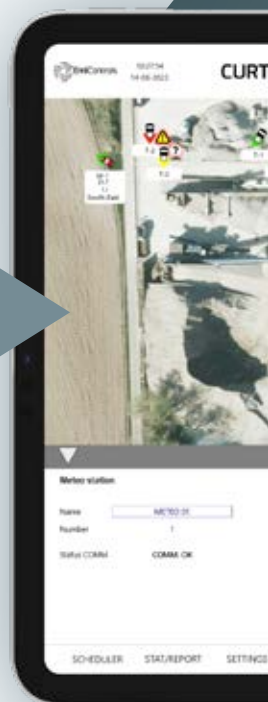
The automated management software CURTpro oversees all dust controllers and associated components of a plant and controls them in real-time. CURTpro is a control system which is smart and easy-to-operate. It can be configured with customized settings, allowing the system to automatically react according to the inputs of the linked sensors. The responsibility for dust and odor abatement no longer rests on the shoulders of human workers, as CURTpro now operates in a fully automated manner, effectively optimizing resource deployment.



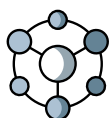
High-end sensor technology

- › Meteo Station
- › Digital Sensor
- › APSensor Dust
- › Soil Humidity Sensor
- › Odor Sensor

INPUT

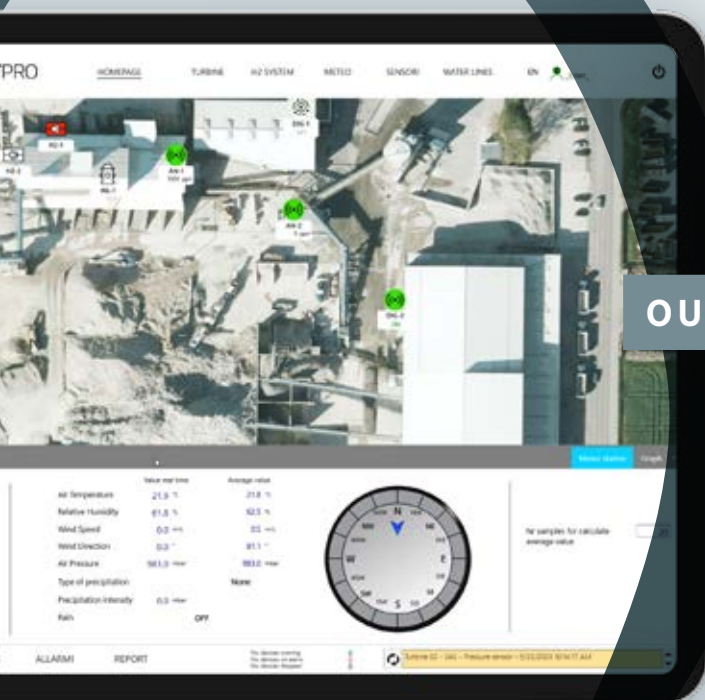


Various inputs play a central role in the proper functioning of the control software. In order to be able to react correctly to any situation, CURTpro bases its behaviour on the data from a weather station.



CUSTOM CONFIGURATION

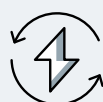
based on predefined parameters



OUTPUT

CURTPRO FEATURES

- › New userfriendly dashboard
- › Enhanced event configuration which enables:
 - › specific values to be monitored
 - › interconnection to specific operational programs
- › Integration of H2 System and waterlines
 - › each single line can be configured and controlled individually
- › Implementation of digital sensors
- › Possibility to set scale values for analog sensors
- › Processing of input data from the weather station incl. temperature, humidity, wind speed and direction, precipitation, quantity of precipitation
- › Intelligible data analysis with intuitive graphical visualizations, providing clear insights into the history of system operativity and external conditions



Efficient dust abatement



Turbines



H2 System



Waterlines



AUTOMATED PROCESSING

independent operation
+ data processing



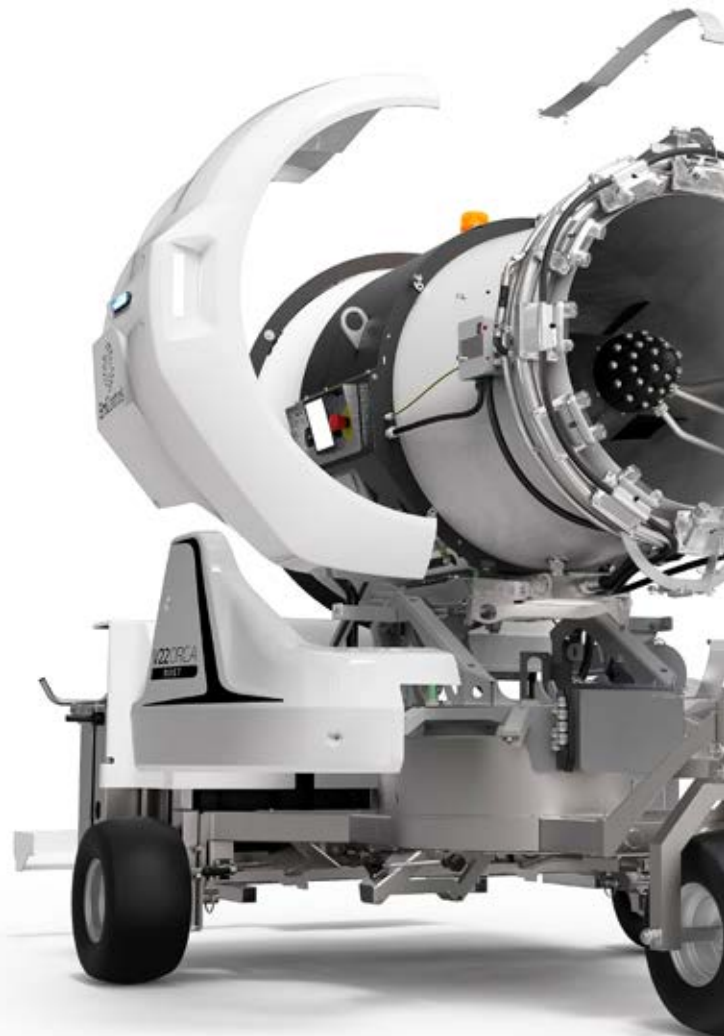
In the video you can see the application of our CURTpro in action.

Attention to detail

OUR TECHNOLOGY MAKES THE DIFFERENCE

ALL OUR MACHINES INCLUDE:

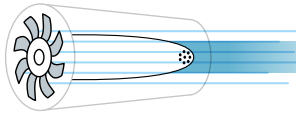
- › radio remote control
- › centrifugal pump with a stainless-steel filter
- › sensors that protect the machine against overheating and dry running
- › automatic drainage (makes turbines frost-proof)
- › at least 3 waterways
- › automatic swing
- › timer for automatic on and off
- › water and electricity connection
- › lifting system
- › special cooling system for control cabinet and technical documentation



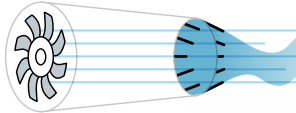
Low energy consumption

Thanks to the special aerodynamics of the blades as well as the nozzle head, our machines offer less consumption for the same performance. Compared to other machines, they consume on average 25% less energy by keeping the same throwing distance.

Nozzle head



The internal nozzle head makes optimum use of the air flow, since the direction of the water spray is parallel to the airflow (laminar).



In comparison, with an external nozzle ring*, the water is sprayed obliquely into the airflow and creates a turbulent flow, which is accompanied by a loss of power.

The nozzle ring has the following advantages:

- › better performance
- › machine is less affected by wind

* Our larger models have a nozzle ring in addition to the nozzle head. This is needed to put through the necessary amount of water for optimal dust abatement.



Water supply



The performance of the pump, filter, valves and sensors are specifically designed for efficient dust suppression; i.e., enough water can be pushed through to achieve an optimal result in the fight against dust.



Turbine

Thanks to innovative materials and refined aerodynamics of the blades, our machines are:

- › particularly quiet and
- › energy efficient



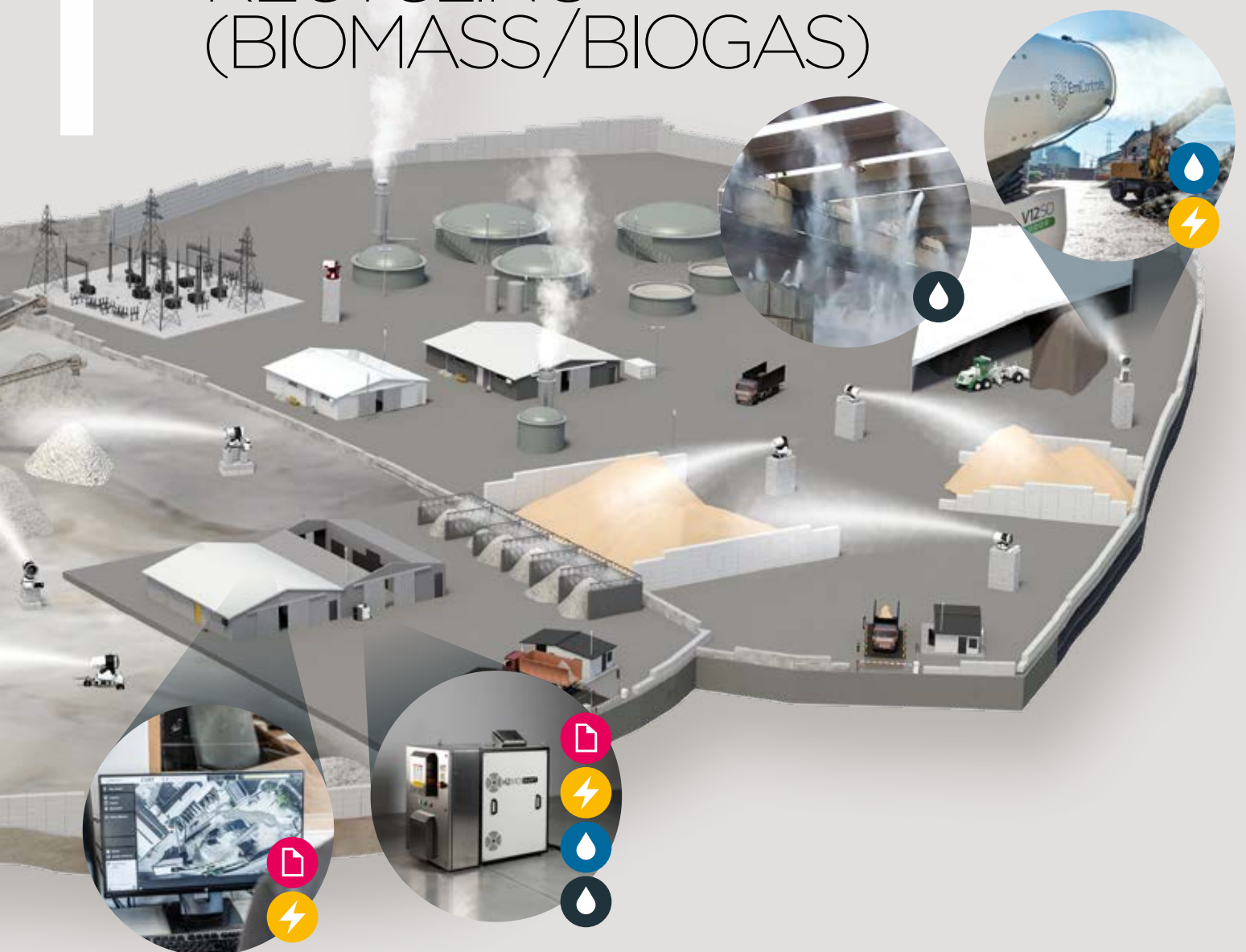
EXAMPLE OF A PLAN



CONSTRUCTION
WASTE RECYCLING
(MINERAL MATERIALS)

T

RECYCLING (BIOMASS/BIOGAS)



-  Data Cable
-  Power Line
-  Water Line
-  High Pressure Water Line

OUR VERSATILE DUST AND ODOR CONTROL SOLUTIONS FIND APPLICATIONS ACROSS MANY FIELDS.

Our solutions provide the following benefits in addition to emission reduction:



HEAVY INDUSTRY

- › Enhanced safety for staff through a drop in emission values
- › Better visibility
- › No issues with neighbours
- › Better working conditions for employees



PORTS, STORAGE AND HANDLING SITES

- › Protection of neighborhood from dust
- › Our solutions use little water, which ensures that the goods do not get wet
- › No issues with neighbours



DEMOLITION

- › Protection of neighborhood from dust
- › Silent dust controllers ensure low noise emission
- › For demolition works, low dust and noise production avoids interruptions from either neighbours or the community



RECYCLING

- › No issues with neighbours
- › Our solutions use little water, which ensures that the goods do not get wet



COMPOSTING

- › No issues with neighbours



TUNNEL CONSTRUCTION

- › Better working environment for employees
- › Better visibility
- › Dust suppression prevents other construction vehicles from being covered with dust



QUARRIES AND MINES

- › Complete systems allow dust suppression even on large surfaces
- › Protection of neighbourhood from dust



SUCCESS STORIES

EMICONTROLS, WITH YOU ON SITE.

LA PEDICARA, ITALY

The La Pedicara quarry in Balvano is one of the largest quarries in southern Italy and is located in the heart of the Italian Dolomites. The quarry mainly extracts dolomite rock, which is used to make glass. In the La Pedicara quarry, raw materials are extracted, ground and sieved and then sold on in various quality grades.

The problem here is that each individual work step causes a lot of dust and the employees are exposed to this on

a daily basis. When the wind blows, the dust cloud can even reach the neighbouring village. The dry Mediterranean climate in Balvano and the long months without rain also increase the dust formation. The enormous size of the site (3.5 hectares) was also one of the challenges when realizing the plant.

To successfully counteract the dust formation in La Pedicara, a combination of several elements was installed: in total, the system consists of 2 fixed V12s turbines on 6 metres high towers, a mobile V7 turbine on an undercarriage and further fixed high-pressure spray heads distributed across the area to form water mist curtains, plus two high-pressure pumps. The objectives were to improve the working conditions of the employees on site, as well as to protect the environment and, above all, the beautiful valley around Balvano.



BETON LANA, ITALY

To protect the surrounding buildings and neighbours, Beton Lana has installed a complete solution consisting of a turbine and CURT management software. The dust binding machine runs automatically for ten minutes every morning and then switches on again at regular intervals throughout the day. If necessary, the turbine is also used for dust suppression during the loading and unloading of lorries (manually). Thanks to the coupling with the weather system, the turbine does not start when it is raining, if the wind is coming from the wrong direction or in other unfavourable weather conditions.



BWR, ITALY

The dust from the construction waste recycling plant regularly covered the photovoltaic system on the roof of the neighbouring company. BWR therefore opted for an efficient dust suppression system. The two turbines with the CURT control system do not work according to a fixed interval schedule, but are conveniently activated by employees at the click of a mouse in the office when there is a particularly high volume of dust (e.g. during lorry unloading).



KORN RECYCLING GMBH, GERMANY

Korn is a specialized waste management company with its headquarters in Albstadt, where it operates one of the most modern commercial waste sorting and substitute fuel processing plants in Europe. Korn's core competence is the disposal of waste for industrial, commercial and retail companies, as well as for private households.

As the company attaches great importance to the environment and minimising emissions, it decided to install a fully automated dust binding system. The two open areas near the waste wood handling area and the mineral processing area were equipped with two V12s dust binding turbines. Both are controlled and activated via the CURT system and additionally monitored using a weather station. Three H2 pumps were also installed at this location in the hall at the infeed and discharge points.

KIBAG, SWITZERLAND

At the building materials producer KIBAG in Regensdorf, a fully automated system from EmiControls ensures better air quality. With the help of several dust binding machines (2x V22 and 2x V12s) and the CURTpro control system, the turbines can be operated independently of each other in real time. The system runs according to a predefined weekly programme as standard, even at weekends. In this way, the dust load can be kept as low as possible.

The turbines switch on in the morning before the first employees arrive at work, ensuring that the workplace is already free of dust by this time. The system on site is now also equipped with a weather station and 2 dust sensors, which work in combination with all other components and forward inputs. These sensors are also used to measure and record all weather data and general dust levels.



Emission Control
with two V22
Dust Controllers.



OTHER SOLUTIONS: COMBATING OF UNPLEASANT ODOR

Many recycling centers, composting plants and landfills experience problems with unpleasant odors. We have developed an innovative solution for this problem: A misting system for odor suppression.



Find out more about
how odor suppression
works in the video.



The idea of building an odor binding machine came about when a recycling yard from France contacted us. The owner was looking for a solution to an odor problem, as the surrounding neighbors in the area had made a complaint. As there was no suitable solution on the market at the time, we set ourselves the goal of developing the first pure odor controllers. The basis for this was a dust binding machine, which we then fitted with a dosing pump to get rid of unpleasant odors.

In 2014, the “Politecnico di Milano” University proved that our solutions can neutralize between 60-80% of bad odors in accordance with UNI EN 13725 standards. An excellent result.

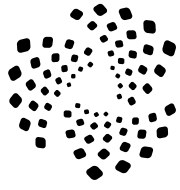
WHEREVER UNPLEASANT ODORS ARISE: AREAS OF APPLICATION

Our products, mobile or stationary, are the ideal instruments for eliminating odors in many areas. To name a few: Waste management, landfills, composting plants, recycling centres, water treatment, gastronomy, food production, rubber industry, and many more.

HOW DOES ODOR CONTROL WORK?

The water is mixed together with the special biological solution and is atomized using the nozzles. The combination of water mist and the special solution then binds with the unpleasant-smelling molecules and neutralizes the odor. The solution used is organic and is harmless to humans, animals or the environment. The mixture produced is in the form of a light spray (droplet size of a diameter of about 10/20µm), which remains suspended in the air and does not form any unwanted puddles.





EmiControls®

**WE PROTECT
OUR CUSTOMERS
FROM DUST AND
ITS CONSEQUENCES.**



YOU CAN FIND ALL OUR PRODUCTS IN DETAIL HERE.





Nautilus



V1250



V22ORCA



V22



V125



V7



H2SYSTEM



L3

ODOR SUPPRESSION

CONSULTING + PLANNING

IMPLEMENTATION

SPECIAL SOLUTIONS (MOBILE)

MONITORING + EVALUATION



CURTPRO
DUST
MANAGEMENT SYSTEM

In order to achieve this goal, we develop each mobile as well as stationary dust control solution according to the following guidelines:



Low Energy Consumption



Long Lifespan for Machine and its Components



Low Maintenance Costs



Versatile Configuration



High Safety Standards



Full Control over Water Flow, Throw and Droplet Size

WITH OUR SOLUTIONS
YOU ARE SAVE FROM
DISCUSSIONS WITH
NEIGHBORS, EMPLOYEES
OR ABOUT WORK SAFETY.







SMALL DROPS, BIG IMPACT.



EMICONTROLS SRL/GMBH

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