



ATEX systems for powders and VOCs treatment in paint production sector

Dedusting with self-cleaning bag filter and VOCs abatement with activated carbon filter

Application 1: Methacrylates and thermoplastic sector

The customer is an important Italian company that deals with the production of high quality paints to be used for road marking. The company is able to offer a wide range of products in various sectors and is specialized in the production of methacrylates and thermo-sprayed products.

The production of these materials involves the emission of powders of calcium carbonate, titanium dioxide and VOC's that are dangerous for the operators and the surrounding environment.

Gallery

The customer company also had an obsolete system that did not meet the needs of the production system and that did not comply with current regulations. Tecnosida® was contacted to solve this problem and to design a system to be applied to the tints' production area. Given the nature of the compounds, it must be manufactured in compliance with the European ATEX directive in order to be used in a potentially explosive atmosphere.

Two-stage ATEX system for powders and VOCs treatment in potentially explosive atmospheres:

Tecnosida®, after an adequate technical inspection, designs a suction system able to significantly reduce the dust and VOCs emissions (calcium carbonate and titanium dioxide) created by the productive process.

The aspiration system is composed of:

- DustDown® self-cleaning bag filter made of carbon steel. It represents the first stage of abatement and is used to treat fine and ultrafine powders present in the flow. It is ATEX II 3D certified and is equipped with a break panel that is used as a safety element to prevent the system from being stressed beyond its resistance to explosions;
- Chemsorb® activated carbon filter used as a second stage to break down VOCs present in the aeriform flow deriving from the production machines and previously treated by our bag filter. This purifier has also been developed in compliance with the ATEX directive 94/9/CE and is equipped with a break panel.



As we have seen, the system, together with all its components, has been designed for use in potentially explosive atmospheres and is equipped with:

- Non-return valve = ATEX certified safety element used to prevent the propagation of any explosion in the suction line;
- Inverter = applied inside the electrical panel to monitor the energy consumption of the suction system;
- Pressure stabilizer = through the inverter, keeps the pressure inside the collectors constant.

Application 2: spray painting production

The customer is an Italian company that operates in the construction and marketing of machines and plants for production of aggregates. The company is composed of several departments, among which there is also a spray painting room where products such as varnishes and solvents are used. An environmental survey carried out by special bodies in this production department, has detected a high concentration of VOCs resulting from the painting process.

Painting booth and activated carbon purifiers

Given the particularity of the situation, Tecnosida[®], following an appropriate technical inspection, proposed the construction of a front-mounted intake cabin able to respond to our customer's needs. It is made of galvanized sheet metal and consists of a suction front wall made of special honeycomb cardboard. This particular structure allows the suction of pollutants deriving from painting operations, thus protecting the health of the operator.



The realization for the abatement of VOCs and solvents is completed by the following equipment:



1. **Circular pipe connection** in galvanized sheet metal complete with ATEX butterfly shutters for the regulation / exclusion of the suction connections;
2. **centrifugal fan** with reverse blades made of sheet steel and with a directly coupled motor in ATEX execution;
3. **Non-return valve** for safety and compartmentation: prevents the propagation of a possible explosion inside the suction line;
4. **Activated carbon purifier** composed of two modules made of strong electro-welded steel sheet. The two-stage system allows to treat VOCs present in the flow and deriving from the spray painting process. The two purifiers are ATEX certified and equipped with **stainless steel breakage panels** able to guarantee the operators' safety and the protection of the surrounding environment in case of explosion;
5. **Electrical panel** complete with inverter to monitor the energy consumption of the suction

system

The system, in combination with the equipment, was designed in accordance with the European directive ATEX II 3G T3 concerning equipment and protective systems intended for use in potentially explosive atmosphere.

Bag filter and activated carbon purifier: characteristics

Our plants represents the best solution for the problems of our customers because they allow to heal the work environment and, at the same time, to reduce powders and VOCs emissions from paint production.

In detail, the DUSTdown® **bag filter** is an high efficiency technology that can remove fine and ultra-fine dusts, while keeping a high filtration efficiency. It has the following characteristics:

- Is designed and built on the basis of your specific needs;
- May be designed in order to ensure a very high filtration efficiency, up to 99,9%;
- Is simple, reliable and economic;
- May be designed in order to comply with the ATEX norms, in the case of potentially explosive dusts.

Chemsorb® activated carbon filters, on the other hand, are suitable to abate almost all compounds of organic origin (VOCs and odorous emission), and many of inorganic origin. It has the following characteristics:

- May be designed with different shapes (cylinder or parallelepiped). These construction methods make it easy to extend the filter after the installation;
- Are simple to use and their efficiency is kept constant thanks to ordinary maintenance;
- May be used to filter a wide range of gaseous pollutants.