

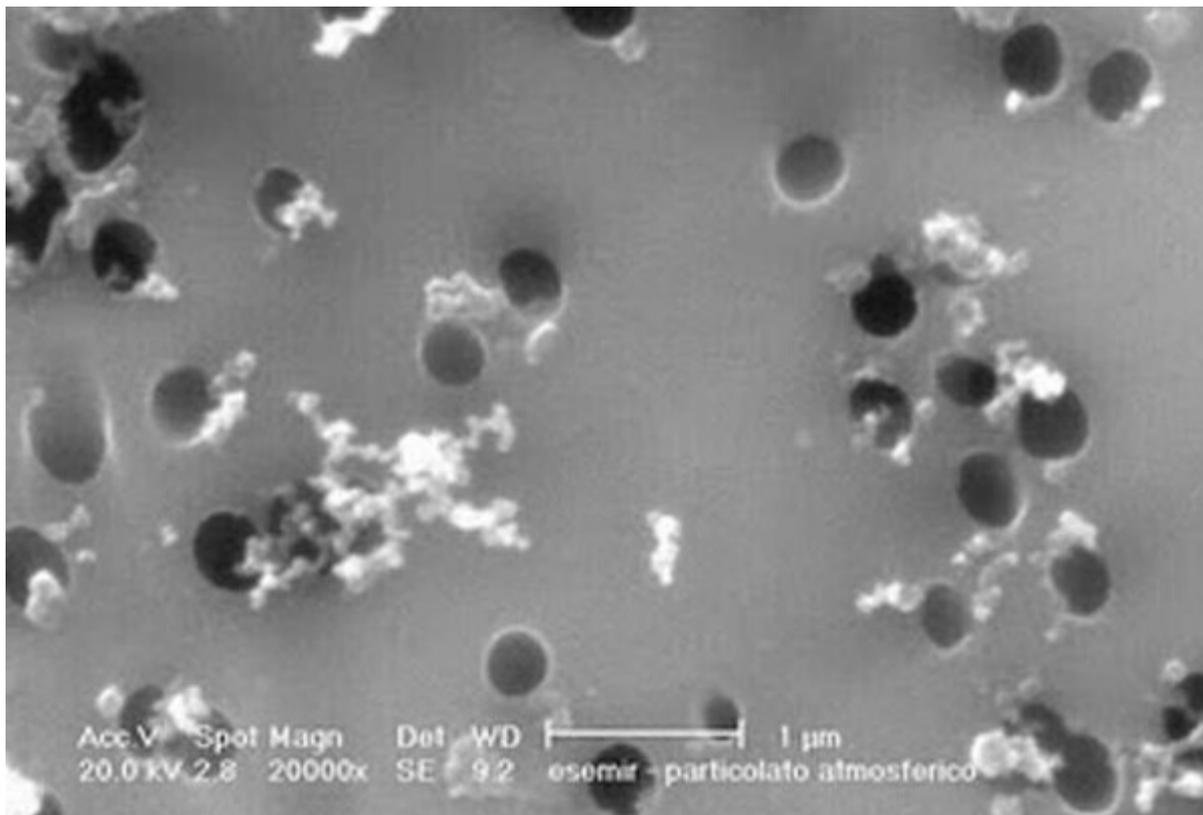
## Powders: nature and treatment

### Origin and physical-chemical characteristics of the dust!

#### Definition

It is defined as a solid powder with an average particle diameter between 1 and 100 microns. The powders are among the main pollutants in our atmosphere and are responsible for many diseases, and serious problems mainly of the respiratory organs, but not only. Relevant parameters, under the profile of the hazardous dust, are:

- average size (represented by the so-called grading curve)
- chemical characteristics



#### Physical and chemical characteristics

The **average size** of the powders have a direct effect on various relevant aspects such as:

- Their breathability. Particles are inhaled and can enter directly into the blood tissue (below a certain size), while medium and coarse powders are retained in the outer systems of the human respiratory system and animal.
- Their ability to propagate the flame.
- Their behavior in relation to physical force (eg. Centrifugal force, gravity force, ...)

In relation to the size of the particles, we often talk about particle size or size distribution. These are tools and diagrams resulting from specific screening tests, which accurately represents the dimensional performance of the powders contained in a sample (gas exhausted from industrial process, for example). In the field of combustion, for example, it is very important to perform an analysis of the particle size.

The **chemical characteristics** of the powders also affect several important aspects:

- The inflammability and explosiveness of these powders. Under certain conditions, the powders should be treated and managed using certified equipment built following specific regulations (see our article on powders and explosives and looks for insights about the ATEX directive and subsequent updates).
- The toxicity of certain compounds show respect to others.

## Origin and formation of dust

Dust originating from anthropogenic processes are derived by many operations, so that it is impossible to list them exhaustively. Among the main ones there are:

- Storage Operations, handling, pneumatic conveying, mixing, weighing and packing of dry bulk solid materials.
- Sanding operations, sandblasting, grinding, sanding, edging, cutting various kinds of surfaces and materials.
- Operations typical of polymers, elastomers and thermosets industrial field.
- Melting Operations of metallic materials, glassy and of other type.
- Operations combustion of solid material and waste.
- Painting Working with powder products
- Drying operations of solid or similar material.
- Operations of oxyfuel, plasma cutting, laser cutting
- Mechanical cleaning Surface operations.
- Welding work.



## Technologies for the capture of the powders dispersed in a gaseous flow: dust filters

In order to limit the concentrations of dust present in a gaseous stream and fall within regulatory limits, you can recourse to the use of treatment technologies and abatement of various nature. These include:

Dry technologies

- Cyclones
- Multicyclones
- Bag filters
- Filters in cells
- Electro filters

Wet technologies

- Scrubber, especially venture type.

See you soon with new interesting items!