

THE EGB FILTER

The EGB filter is a dry electrostatic precipitator. The particulate picking-up and precipitation process takes place in two phases. In the first phase the particulate contained in the gases to be treated receives, at its inlet into the filter, a negative charge ($30\div 60$ kV) in the ionization zone; in the second phase the gases flow through the gravel bed. The gravel bed is positively charged by means of embedded electrodes ($10\div 20$ kV), hence the dust, with negative charge, adhere to the gravel with positive charge.

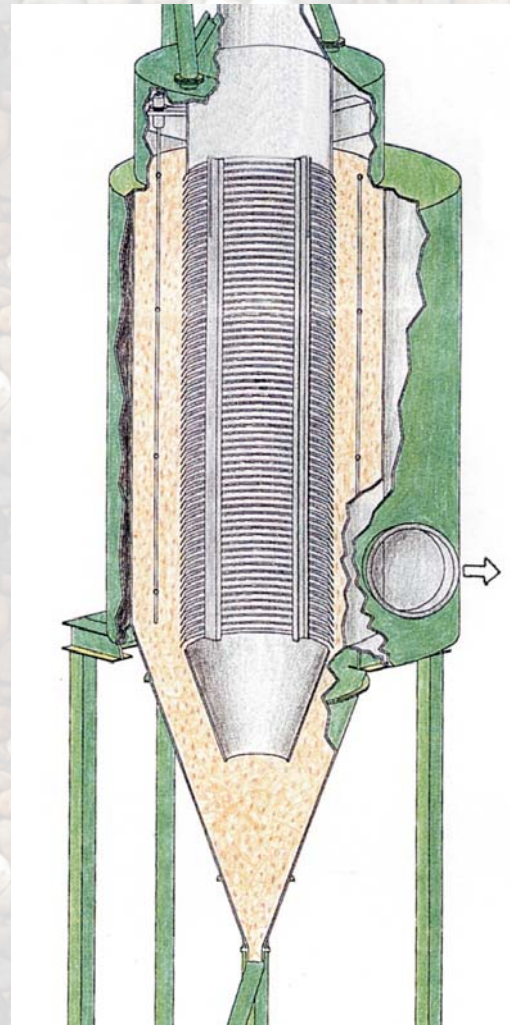
The gravel bed is continuously recirculated and fed to the dust separation circuit through the discharge hopper. The cleaned gravel is fed back to the top of the filter body.

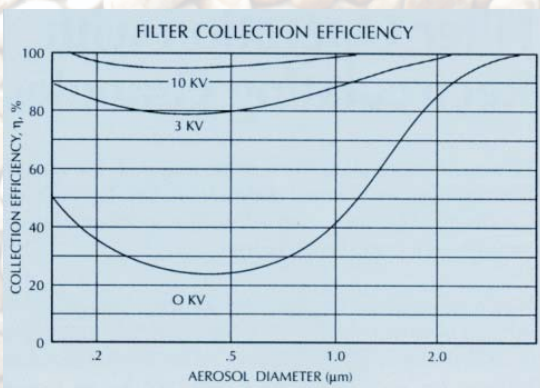
PECULIARITY OF THE SYSTEM

This type of filter has been devised to precipitate especially submicronic particulate, condensable hydrocarbons and high resistivity dusts contained into industrial exhaust fumes.

Some advantages of the EGB filter:

- **Submicronic particulate** the electrostatic picking-up on the enormous surface area of the granular filtering medium allows for a high efficiency of precipitation, especially of the submicronic particulate
- **Blue haze** the EGB filter allows the precipitation of submicronic hydrocarbon aerosol, thus effectively eliminating opacity and blue haze
- **Non flammability** the filtering medium consists of gravel, which makes the filter virtually non-flammable
- **Sticky pollutants** the pollutants are separated from the gravel in systems external to the filter. This allows to operate with sticky pollutants, usual condition for hydrocarbon gases
- **Totally dry** the dusty pollutants and particulate are captured in their original dry form: there is no production of sludge or semi-liquid paste. The filter body is not subject to any corrosion
- **Low energy consumption** the system works in two electrostatic precipitation steps (ionizer and gravel bed); furthermore the inert mass has high resistivity and the temperature always stays above dew point, causing no condensation phenomena. For these reason the absorbed power of the high voltage circuit is extremely low.
- **Installation easiness** the single units which compose the filter are completely pre-assembled and insulated in the workshop: the filter assembling at site is therefore easy, quick and straightforward, even on already running plants.
- **Equipment reliability** the simpleness of the various components grants a long life. Furthermore, by using gravel as a filtering medium, no problem arises, even at high temperature.





Collection efficiency of the filter, in function of the particulate dimensions and of the electrodes cage voltage HV2.

It can be noticed that, even in absence of high voltage field, a good collection of particulate with dimensions above 2.0 µm is achieved

ADVANTAGES AS TO OTHER TECHNOLOGIES

No production of dirty waters to be treated, nor mud or sludge

The EGB filter, being a dry precipitator, does not require during the filtering process any usage of water, unlike other technologies such as the WESP (Wet Electro Static Precipitator) or the Venturi scrubber. Furthermore, remaining always above the dew point, there is no condensation of the steam contained in the fumes to be treated. This allows to get a dry waste that does not require any further treatment, and thus allows an easier disposal, and surely more economical for the company, than that of the even driest sludge obtained from a centrifuge and press-filter in the normal WESP technology.

Energy saving

The EGB filter is equipped with few electrical devices, all of them low power except the main fan. Furthermore, compared to the WESP technology, the installed power for the high voltage fields HV1 e HV2 (ionizer and electrodes cage) is very low, since the filtering medium, the particulate and the fumes have very high resistivity and there is no condensation: thus there is a very high electric potential but a very low current. In total, in a medium-high capacity filter, the installed power is approximately 240 kW and the absorbed one slightly over 180 kW, versus an average absorbed power over 250 kW for a WESP technology filter of the same capacity. Besides, the EGB filter requires no consumption of water at all, versus a water requirement ranging from 3 to 10 m³/h for filters of different technologies. The savings in terms of water and energy are consistent, and translate directly into money saving for the company and a benefit for the environment.

The EGB filters are totally modular and allow the set-up of filtering systems for capacities ranging from 10,000 m³/h up to 500,000 m³/h (approx. 6,000 to 300,000 acfm), thus fit for plants using wood, waste or biomasses boilers, and driers in any industrial field