

Construction of the Electrostatic Precipitator

The basic construction of the ESP can be seen from the cover sheet.

The ESP casing and the connection channels are welded gas tight. Under the precipitation areas the dust hoppers are situated to which the dust discharge elements are connected.

The interior equipment of the ESP comprises:

a) The collecting system with rapping devices

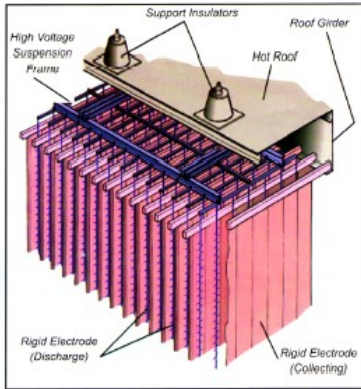
b) The discharge system with rapping devices

a) The collecting system is subdivided into electrodes and rapping devices. The collecting electrodes are profiled metal sheets, several of which are bundled into an electrode frame. These electrodes are hanging in gas direction in the ESP with a certain distance such that single passages are formed. Each electrode frame is rapped

individually by a hammer. The rapping hammers of one zone are fixed onto a shaft which is rotated by a gear motor and is directly coupled. This suspension is maintenance - free and resistant to wear.

b) The discharge system consists of supporting frames hanging insulated in the ESP by support insulators, the electrodes' frames, and the rapping whereby the rapping is placed outside the gas stream in insulated chambers on top of the filter roof.

The electrodes are hanging centrally between two collecting electrodes. Whereas the collecting electrodes' rapping is directly connected via a coupling with the gear motor, the discharge electrodes' rapping is connected to the gear motor via an insulator for isolation from high voltage (called a Rotary Insulator in this context).



Collecting & Discharge System

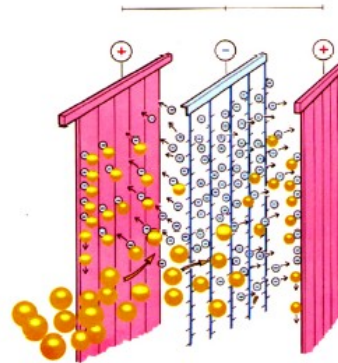
Function of the ESP

The principal of the electrostatic precipitator is to provide the particles in the gas stream with a negative electrical charge so that they deposit on the positive collecting electrodes.

The charging and collecting happens in the same electrical field. The required energy for the charging is fed into the discharge system by a high voltage transformer unit. A direct voltage of 40,000 to 60,000 volts is necessary for the production of a strong electrical field around the discharge electrodes depending on the chemical and physical conditions.

The electrical field is visible as a bluish optic phenomenon, the Corona. On their way to the positive pole - the collecting electrodes - the electrodes provide the dust particles in the gas stream with a charge. Under this influence the loaded particles pass onto the collecting electrodes and deposit their charge. Depending on the operating necessity the electrodes are rapped from time to time. The dust, in the meantime, has grown to an appropriate thickness, falls into the hoppers and is then removed.

The discharge electrodes are rapped from time to time similar to the collecting electrodes.



Information required to size a precipitator

Type of process	Fuel analysis*
Size or production rate of process	Dust analysis
Gas Volume	Particle Size
Temperature	Resistivity
Gas analysis	Efficiency required
Type of Fuel*	Space limitations

* For particulate control on power boilers