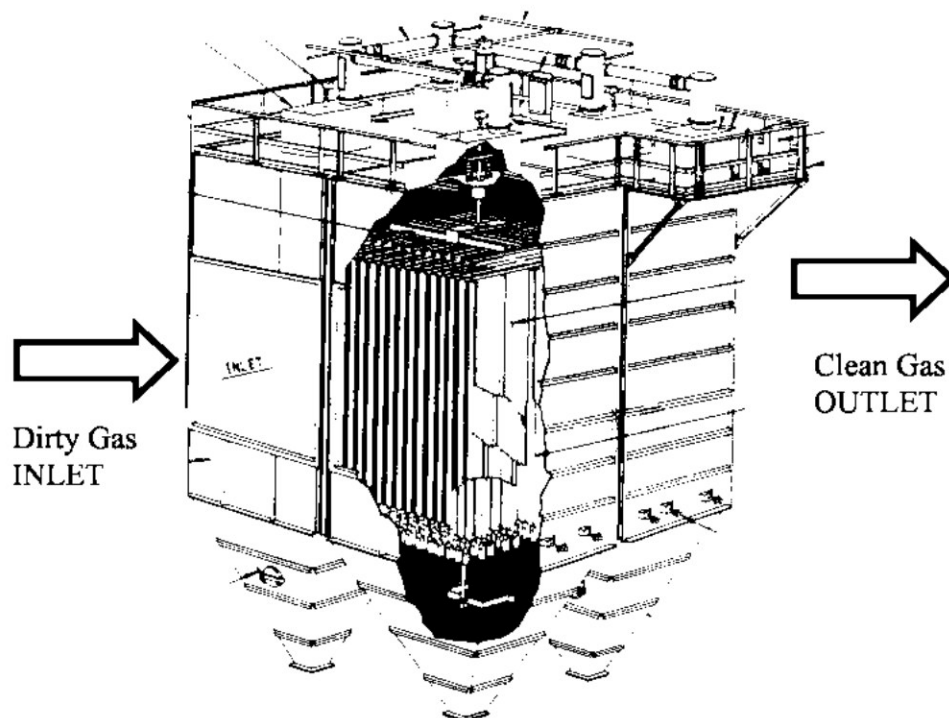


Figure 3-3: Typical Dry Electrostatic Precipitator Process Flow Diagram



ESPs offer an advantage of operating at a very low pressure drop across the system. The ESP is essentially a large box that slows the gas stream and uses an electrostatic attraction to collect the particulate. The ESP is arranged in a series of ‘fields’ which consist of negatively charged discharge electrodes and positively charged collection plates hanging in the gas stream. The discharge electrodes impart a negative charge to the particles in the gas stream. The negatively charged particles are then attracted to large positively charged plates. The particulate is collected on the plates and is periodically removed by “rapping” the plate. Most, but not all of the ash knocked off the plates will fall into the hoppers and will be removed by the ash handling system. Most of the particulate that is re-entrained in the gas stream during rapping is collected in subsequent sections of the ESP. Factors affecting the efficiency of the ESP include flue gas flow rate, resistivity of the ash, plate area, voltage and the number of fields.

ESPs are typically constructed of carbon steel and thus do not have significant corrosion resistance. In addition, the collection mechanism of the dry ESP requires dry particulate matter. If the collected materials were wet, the moisture would diffuse the induced charge and reduce the collection efficiency of the ESP. Also, wet materials would be difficult to dislodge from the collection plates, which would also