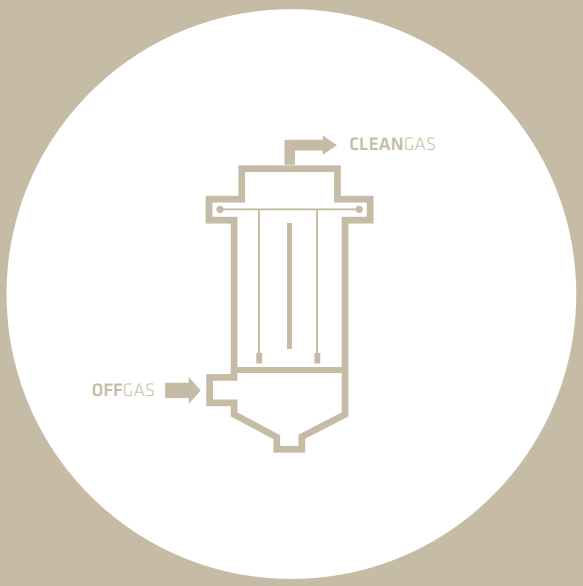
KVT PROCESS TECHNOLOGY

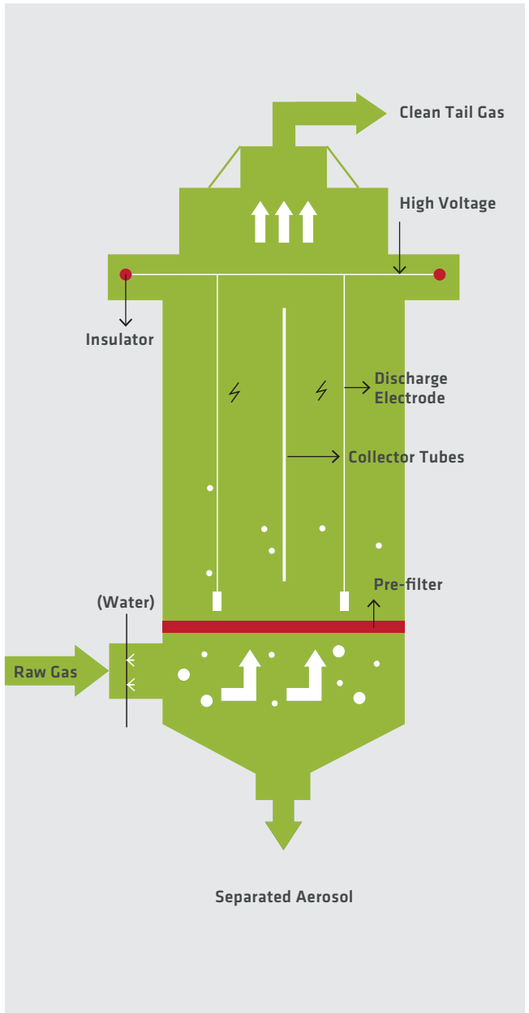


WESP - Wet Electrostatic Precipitator®

Engineered to protect our environment.

WESP - Wet Electrostatic Precipitator®

KVT develops sustainable and efficient technologies for the pollution control. It is specialized in several filtration system such as Wet Electrostatic Precipitator. Since many years the use of WESP in the metallurgical industry is a common procedure to remove aerosol dusts. Today with the more and more stringent emission control requirements and the necessity to protect equipment and catalyst from lasting damage due to dust and/or acid aerosols the wet electrostatic precipitator is used in a large variety of industrial applications. As post combustion technology in the coal, oil, petcoke, chemical waste industry in order to comply the emission regulation limits, as process step in sulfuric acid plants, metallurgical sulfuric acid plants or regeneration of spent sulfuric acid.



1. Pre-filtration
The air stream enters the precipitator from the bottom and passes a pre-filter, where big aerosol droplets are separated. By flowing through this pre-filter, the air stream is equally distributed over the following, vertically arranged collector tubes. This is essential to optimize the flow conditions inside the collector tubes in order to achieve a high cleaning efficiency.

2. Aerosol Precipitation
Flowing through the collector tubes at low velocity, the aerosols are charged negatively by the discharge electrodes, which are hanging co-axially within the tubes. The char-ged aerosols move to the positively charged collector tubes, where they are precipitated and thus separated from the gas. The precipitated acid forms a liquid film and flows downwards to the bottom of the filter, whereas the clean tail gas leaves from the top. In case of dust in the raw gas, water is injected up-stream the filter.
Control System: The DC high tension for the discharge electrodes is controlled electronically. It is installed in a separate control cabinet including all necessary instruments, control loops and safety devices for the smooth operation of the HT device is installed indoor nearby.

Main Parameters for Design

Precipitator Sizing and Collecting Efficiency Based on specific gas volume and dust load, the size of precipitator is designed to achieve a desired collecting efficiency.

Power Input
Under normal conditions increasing voltage improves the collecting efficiency. The power supply system is designed to control the required high voltage avoiding arcing or sparking.

Gas Flow Rate
There is a calculated range where a precipitator operates at optimized conditions. A too high velocity or too low can impair the performance.

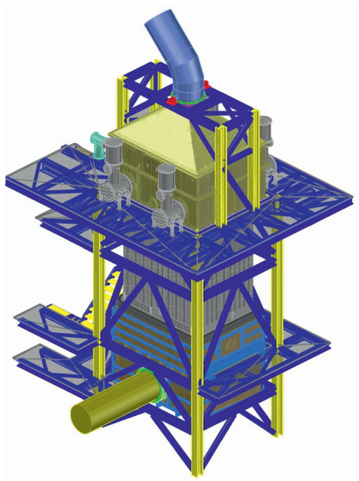
Gas Temperature
The gas temperature influences the particle resistivity. It is very important to consider the temperature range.

Particle Size
A precipitator operates on the best efficiency even for particles smaller than 1µm.

Particle Resistivity
The resistivity is influenced by the chemical composition and temperature of the particles. A too high resistivity of the particles impairs the charge exchange.

The KVT WESP Advantages

- **Due to the electrical conductivity of the collector tubes liquid film is not required**
- **The control system provides a self regulation of the discharges ensuring much higher availability, lifetime and low maintenance costs. The spark quench time is < 5µs**
- **CO Peak Alarm Shut down (COPAS)**
- **The acid dew point of the raw gas up to 200°C**
- **Separated fluids can be recycled in to the process**
- **It is not necessary to use cooling water**
- **The casing is made of corrosion resistant synthetic material**



KVT WESP Design 3D

WESP in Brief	
Gas Flow Rate	1.0 - 1.8 m/s
Gas Temperature	30 - 70 °C optimal operating
Particle Size	< 1 µm
Particle Resistivity	108 - 1010 ohm/cm
Collecting Efficiency	up to 99,9%
Spark Quence Time	< 5 µs
Temperature Control in the Insulator Part	raw gas acid dew point up to 200°C

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