

General information

File No.: 65

Technology: Percolator biofilter

Typology: Processing gaseous fraction



Goal: Control of residual gaseous emissions (polluted air, combustion gases, biogas, etc.) contaminated with NH₃, H₂S, VOCs, siloxanes, NO_x, SO₂, particles through systems that consist of an inorganic filling where the pollutants are absorbed and are biologically degraded.

TRL: 9

Status: Consolidated

Complexity: Medium

Inlets:

Gases with polluting compounds generated in processes of treatment/valuation of agro-industrial waste, droppings, etc. and in livestock activities (breeding sheds, storage of droppings, etc.)

Products:

Decontaminated gaseous effluents; Dilute sulfate and nitrate salts

Other outputs:

Organic liquid purges with nutrients; Microbial biomass; biological sulfur

Consumption

Energy: Medium

Water: Medium

Reagents: Medium

Efficiency:

NH₃ removal efficiencies and H₂S >95%. Lower efficiencies in the elimination of odors and VOCs.

Economics

Investment:

Superior to biofilters since the filling is inorganic (plastic, ceramic, metal) and requires a system of continuous liquid pumping and pH control

Operation:

Superior to biofilters (requires external nutrients, continuous recirculation of liquid through the biofilter and consumption of chemicals for pH control of the

Strong points:

Efficient system for the elimination of pollutants;
High efficiency in the reduction of inorganic compounds;
Oxidation of emissions to non-volatile and harmless products;
Low process control;
It is not necessary to humidify the emissions before

Weak points:

The accumulation of NH₃ can inhibit nitrification;
It is important that there is an appropriate N/C balance, and nutrients to ensure the growth of microorganisms;
Spread of pathogenic bacteria such as *Legionella* due to poor filter maintenance.

Others:

The main limitation is to have a good design of air distribution systems to avoid preferential paths and decrease in efficiency;
Overfeeding can produce excessive biomass growth, which can clog the biofilter bed.

Technology train:

1. Membrane technologies -> Percolator biofilter;
2. Stripping Technologies -> Percolator Biofilter.