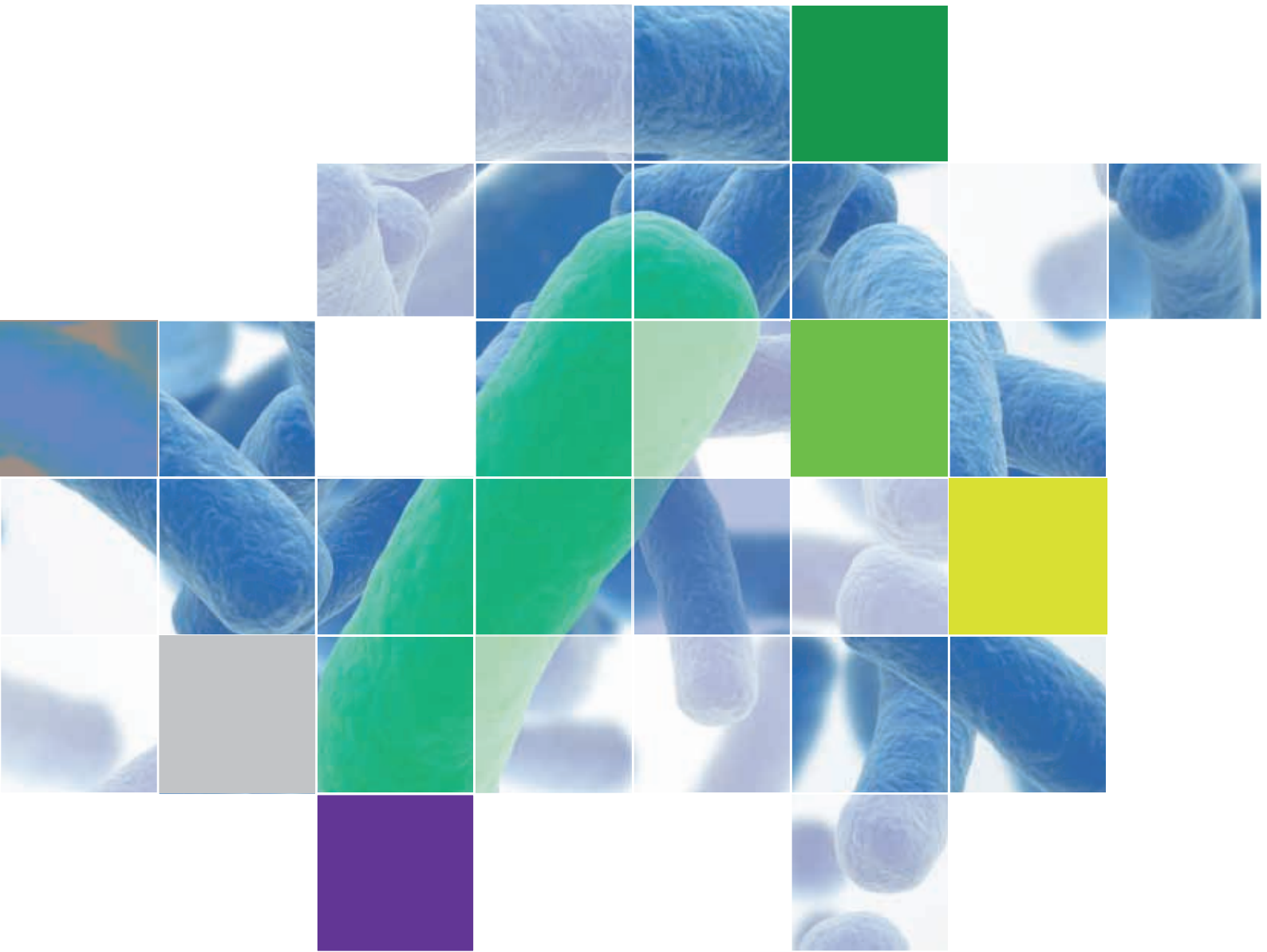
ECOTEC

ADVANCED
GAS TREATMENT
SOLUTIONS








About us

ECOTEC, ECOLOGIA TÈCNICA S.A., was established as an answer to the increasing market opportunities in the environmental field.

With over 25 years since its founding, ECOTEC is a pioneer company in the gas treatment field that designs, manufactures and distributes a comprehensive range of innovative, high-efficiency air emissions control systems. We work continuously to improve our solutions and to move forward in a constantly changing environment.

In view of recent economical situation, and with the purpose of taking advantage of such challenging scenario, ECOTEC has set one main strategic goal: leading the development of innovative technologies for biological treatment of air. After years of research, we have achieved a predominant place in this field, and we have several installations successfully operating in various significant applications.

ECOTEC designs, builds and delivers complete turnkey installations. We have pilot plants available to carry out tests in order to ensure and optimize our designs on an industrial scale.

CONTENT

BIOTECHNOLOGICAL PROCESSES FOR GAS PURIFICATION

dBiox®

• BIOTRICKLING FILTER

Biotrickling technology is based on a biological reactor with a scrubber-type washer (vertical configuration) which incorporates a high surface inorganic media where the microorganisms will grow. The metabolic process of these microorganisms will remove the pollutant compounds contained in the gas stream.

Unlike other types, biotrickling's media can be washed easily, and it doesn't have to be replaced over time.

In comparison, biotrickling equipments reach higher efficiencies than traditional chemical scrubbers, and they are capable of absorbing a much wider range of pollutants.

Biotrickling technology does not require the use of chemical reactives (or very low quantities whenever they are necessary). This fact minimizes running costs and eliminates the generation of toxic effluents that have to be treated.

BIOTRICKLING FILTER for odours, chemical scrubber upgrading, VOC's and NH_3

Biotrickling can be used as an alternative to traditional systems (chemical washers and activated carbon filters) for the treatment of an increasing range of pollutants.

ECOTEC has delivered several installations for odour removal as well as chemical scrubber upgrading which are successfully operating for years now. Other applications such as VOC's or NH_3 are currently being developed.

Biotrickling filters can reach higher efficiencies for the removal of pollutant compounds, and also provides the following advantages:

- Higher efficiencies.
- Reduced operation costs, which provide short term investment return.
- No chemical reactive required.
- Traditional chemical scrubbers can be turned into biotricklings with low investment requirements.
- The biotrickling/bioscubber technology is capable of treating high pollutant concentrations.

BIOTRICKLING FILTER for Desulphurization

This biotrickling application is specifically conceived to remove reduced sulphide compounds contained in the biogas.

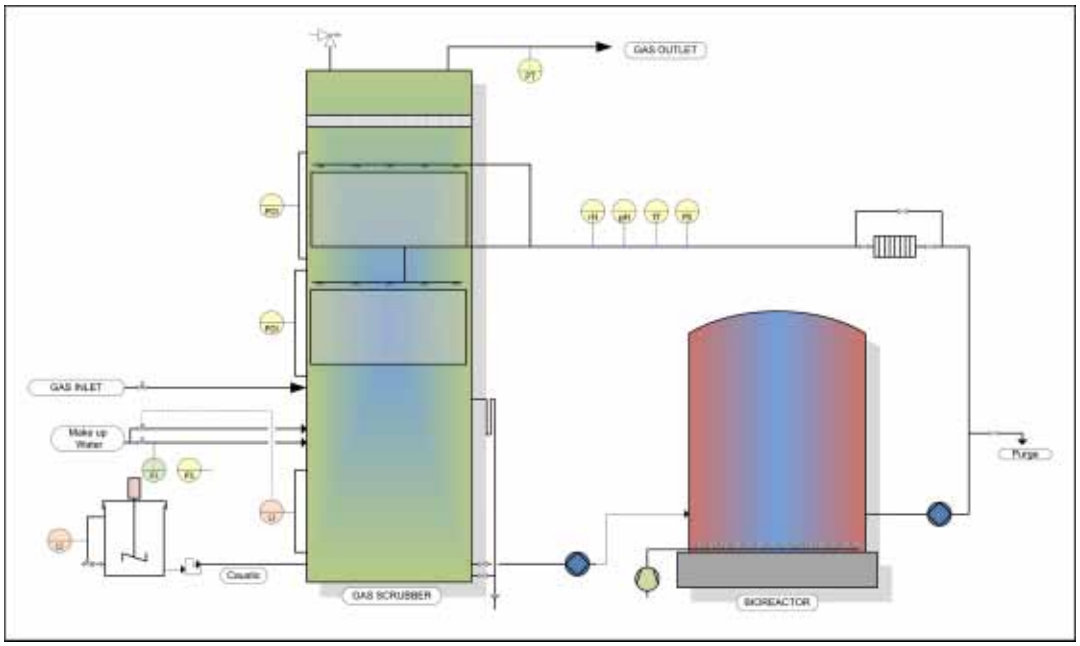
Biotrickling technology provides the following advantages:

- High H_2S removal efficency.
- Minimum reactive consumption.
- Reduced operation costs, which provide short term investment return.
- No waste generated.

Biotrickling filter is feasible for pollutant concentrations up to 10.000 ppm, and it can be used in applications where traditional systems are not suitable due to high running costs.

• BIOSCRUBBER

Bioscrubber systems have proven their efficiency in the treatment of pollutant gases highly soluble in water such as hydrogen sulfide, or certain volatile compounds of low molecular weight.



As opposed to biotrickling filters or conventional biofilters, bioscrubbers have 2 differenciated reactors with a liquid phase in continuous recirculation in between. First stage is a scrubber where the targeted pollutant is dissolved into liquid phase. Afterwards, the liquid now enriched with the pollutant is transferred into the second stage, a bioreactor in liquid phase where the biological oxidation of the compounds takes place, so that the liquid returned to the scrubber is regenerated.

Bioscrubber for Desulphurization

This system allows for the efficient and economical removal of H_2S from biogas at concentrations in the range of the tens of thousands of ppmv and gas flow rates of thousands of m^3 / h.

Bioscrubber comprises a two-stage biological system that allows for the immediate reactive sorption of pollutants in an alkaline medium, obtaining transfer efficiencies higher than 99% and leading to the emission of non-diluted, H_2S-free biogas.

The empty bed residence time of the gas in this scrubber is in the range of seconds, leading to minimal investment costs. Subsequently, the $H_2S(l)$ is channeled to a liquid phase bioreactor, where an aerobic microbial consortium performs its biological oxidation at alkaline pH.

In order to promote optimal performance of the microorganisms, the equipment comprises an advanced air control dosing system, as well as temperature, redox potential, pH and nutrient content control devices. Subsequently, this regenerated water is recycled back to the chemical scrubber.

This biological system has a minimum consumption of reagents (essentially a diluted nutrient solution and NaOH) and water, which means that the operating cost is greatly reduced. As a result of its use a small flow of an acidified liquid effluent, with applications in various industrial sectors without requiring expensive treatment, is generated. All operating parameters are continuously recorded and stored, enabling the effective control of the installation.

Bioscrubber for VOC's & NH_3 removal

The latest of our development projects is NH_3 removal by means of bioscrubber system, an innovative technology with several potential applications, and with significant advantages compared to traditional NH_3 treatment technologies.

In this case, oxidation that takes place in the bioreactor turns N-ammonium into N-nitrate or N-nitrite, which can be denitrified afterwards.

• BIOFILTERS

Biofiltration was ECOTEC's first step into the biological treatment of air. This equipments use organic matter (kept at proper humidity) to allow microbial development which will provide absorption and degradation of odorous compounds.

ECOTEC has designed and delivered several biofilters since the early 2000's. Most of them are still operating with excellent performance values, reduced power consumption and low maintenance requirements.

Biofilters can also be installed as an in-line refinement treatment after a biotrickling or chemical scrubber in applications with high pollutant concentrations.

ABSORPTION, NEUTRALIZATION. Physical-Chemical Treatments

• CHEMICAL SCRUBBER

In most industrial processes where chemical products are produced or handled, gaseous emissions can be generated. These potential emissions of pollutants such as HCl, Cl_2, SO_2, HF, NOx, NH_3, H_2S, etc. must be properly treated and processed before its emission to the atmosphere.

ECOTEC has its own know-how, and long experience in both equipment construction and industrial applications. The use of the most innovative technologies has allowed us to reach emission values that comply with the current legal regulations concerning atmospheric emissions.

Chemical scrubber process is based on physical absorption or chemical reaction of the gaseous pollutants contained in an air stream, with the liquid and gaseous phases at countercourrent flow (in vertical assembly scrubbers) and equicurrent (horizontal assembly scrubbers).

Mass exchange is carried out by means of high specific surface packings (random or structured type depending on the application) which allow to operate with high gas and liquid loads and low pressure drops.

• DESORPTION / STRIPPING

ECOTEC has a long experience and multiple successful references of gas desorption installations (stripping).

Gas desorption consists essentially in the removal of the pollutants contained in a liquid stream by means of a countercurrent air stream .

The most common gases suitable for desorption processes are: COVs, NH_3, CO_2, H_2S…

★ A specific case: NH_3 STRIPPING:

NH_3 stripping is a special name among desorption processes, due to the wide range of potential application fields (leachate, industrial, pig slurry, etc.). ECOTEC has several of these installations successfully in operation for over 20 years now.

These installations are conceived to remove NH_3 contained in some waters. After pH adjustment and by means of countercurrent air, NH_3 desorption takes place in the stripping column.

NH_3 desorbed is neutralized in a second stage in acidic conditions, so that it is not released to the atmosphere, and ammonia sulphate is produced.

• AERODROP® Chrome aerosol washers

In the surface treatment field, galvanic deposition processes of hard chrome do lead to formation of aerosols with a high pollutant value.

The aerosol contains small drops of chromic acid which size and behaviour makes the usual chemical washing systems become inefficient, and requires of alternative treatments.

ECOTEC uses an overexposure of several mesh layers which provides a highly efficient aerosol retention for extra small drop sizes.

AERODROP® can have 2, 3 or up to 5 washing stages installed that combine and add up their effect. The number of stages is chosen in accordance with limit values related to the emission area.

• VENTURI

Venturi systems are used for solid particles captation, and also for the washing of medium / high solubility gases. Both physical dillution and chemical reaction are used for the process.

The high-pressure drop WET VENTURI is used for collection of solid particles or liquid vesicles with over 5 micron granulometry. Its efficiency is directly related to L/G value with a total pressure that can eventually reach 6000 Pa.

The system is usually complemented with a cyclonic column and a high efficiency drop separator.

ATEX INSTALLATIONS

ECOTEC acertifies equipments according to directive 94/9/CE RD-400/1996 about devices and protection systems for explosive atmospheres.

These equipments can be built in both steel and semiconductor plastic materials

WHERE WE CAN WORK AND WHAT WE CAN DO

• TYPE OF INSTALLATION

	Absorption / Washing	Biological	Biotrickling	Bioscrubber	Dust captation (wet)	Dust captation (dry)	Activated carbon
Pharmaceutical synthesis	■	■	■	■	■	■	■
Fertilizers	■				■		
Chemical	■	■	■	■	■	■	■
Painting	■	■	■	■	■		■
Aluminium foundry						■	
Food	■	■	■	■			■
Foundry	■				■		
Rubber	■					■	■
Waste	■	■	■	■	■	■	■
Printing		■	■	■			■
Galvanic	■						■
Packaging							
Electronic	■						■
Textile	■					■	
Water treatment	■	■	■	■			■
Tannery	■	■	■	■			
Biogas			■	■			

ECOTEC

ECOLOGÍA TÉCNICA S.A.

Pol. Ind. Bufalvent
C/ Esteve Terradas, 37 A
08243 Manresa (Barcelona)

Tel. 93 877 31 33
Fax 93 877 05 58

Grupo TEFSA

www.ecotec.es
ecotec@ecotec.es