



# ODOR TREATMENT AND ABATEMENT

Design, Implementation and Revamping  
*Technical and legal consulting*

Fields of Application

*Industry*

*Waste*

*Food & Beverage*

*Breeding*

EXPERTISE IN ODOR  
TREATMENT AND  
ABATEMENT



# INTRODUCTION

LABIOTEST, having thirty years of experience in various fields, has specialized in air **treatment and in the abatement of smells, dusts and chemical contaminants more specifically**. The company is now in a position to offer many solutions to such problems. LABIOTEST designs, manufactures and tests its equipment, also ensuring after-sale assistance. Constant investments in **Research and Development** allowed certifying the efficiency of LABIOTEST solutions using dynamic olfactometry. Non-toxicity of selected products is a further guarantee of a policy respecting man and the environment. The company operates through distributors in Europe, North Africa, Israel, and Australia. Furthermore, it has been regularly present in China for more than one decade.



The reduction of odorigenous emissions can take place through two types of methods:

- **at the very source**, i.e. by determining processes causing emissions, in order to optimize them and reduce significantly the impact on the environment, following a clean technology rationale;
- **at the level** of the emission, i.e. by analyzing effluents chemical and physical characteristics, in order to implement the optimum technological abatement solution, from the point of view of management and performances (*end-of-pipe techniques*).



## 1. SERVICES

- DESIGN AND IMPLEMENTATION OF NEW EQUIPMENT
- REVAMPING OF EXISTING EQUIPMENT
- TECHNICAL AND LEGAL CONSULTING

## 2. FIELDS OF APPLICATION

- INDUSTRY
- BREEDING & FEED PRODUCTION
- FOOD & BEVERAGE
- WASTE MANAGEMENT

## 3. TECHNOLOGIES

- **OSMOGENIC BARRIER**
  - HPS Evo
  - HPS Midi Fresh
  - HPS Midi Var
  - Big Fogger Plus
  - La.BioFog 400 Evo
  - Zephiro UTS
- **FILTERING SYSTEMS**
  - Dry filtering (Dry scrubber - DKFil®)
  - Wet filtering (Wet scrubber)
- **SPECIAL AND MULTIPLE STEP EQUIPMENT**
  - Hybrid system (wet + dry)
  - Hybrid system with a third stage
  - Dusts abatement equipment (Trap Dust)
- **CHEMICAL AND BIOLOGICAL TREATMENTS**
  - Scrubber additional treatment
  - Bins sanitation treatment
  - Treatment of grease condensate reservoirs
  - Treatment of landfills smells

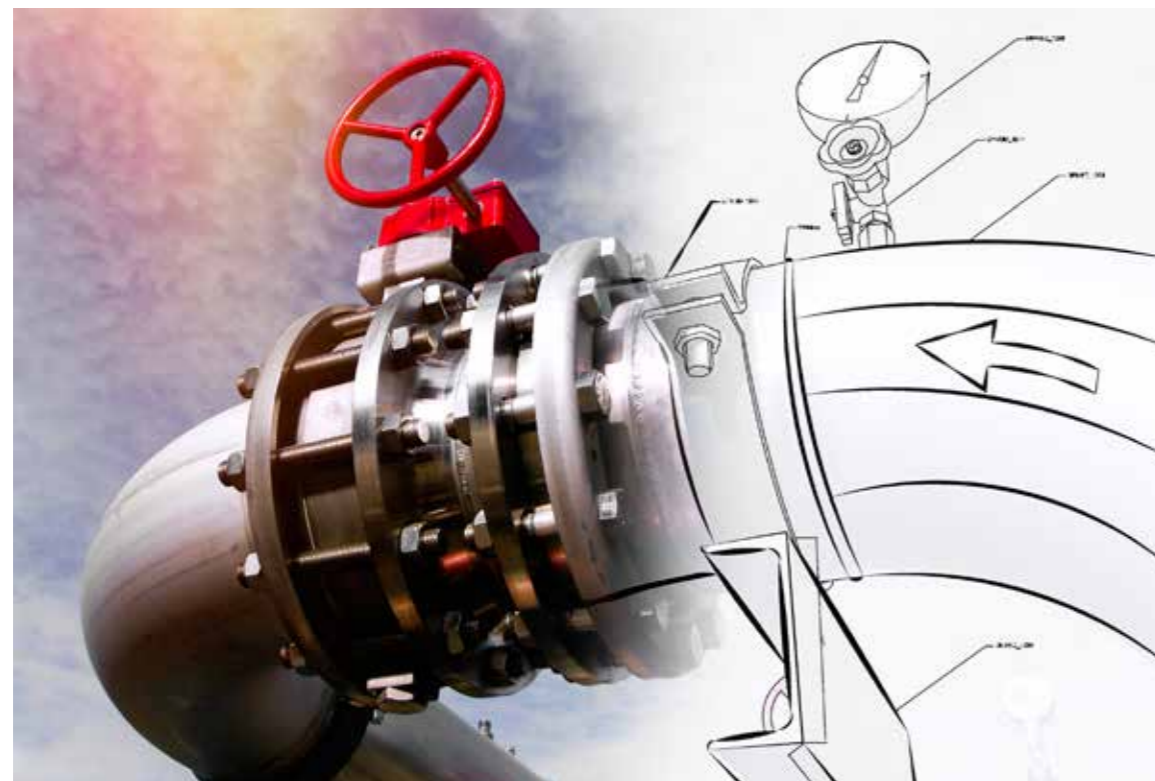
# 1. SERVICES

## DESIGN AND DEVELOPMENT OF NEW EQUIPMENT

Labiotest offers complete services, starting from a careful examination of the production site and an analysis of the problem. Labiotest **designs, implements and tests its equipment, also ensuring after-sale assistance and maintenance.**

### THE SERVICE INCLUDES:

- Technical investigation on site
- Analysis of emissions Labiotest must treat (e.g. chemical and physical analysis – fluid dynamic parameters, olfactometry)
- Possible test with a pilot plant, together with chemical and olfactometric investigations
- Design in our technical offices
- Implementation of the plant
- "Start-up": commissioning and start-up of the plant



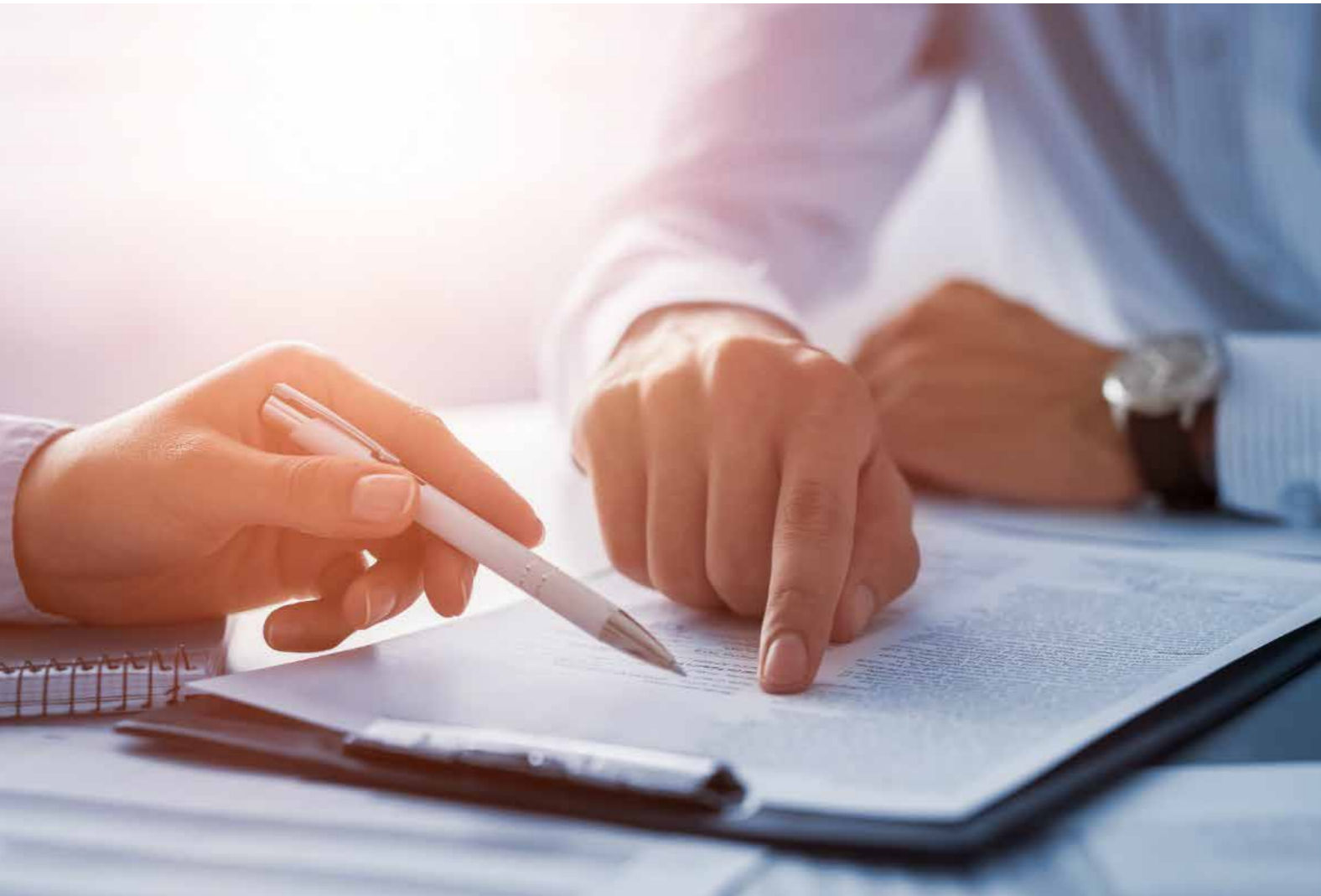
## REVAMPING OF EXISTING EQUIPMENT

Abatement plants need upgrading as any other plant. Obsolete equipment cause an increase in maintenance costs and a decrease in efficiency. This often involves also non-compliance with emission limits required by organizations entrusted with controls in this matter.

Labiotest designs and implements efficient and reliable equipment. However, before proposing something new, the company tries to understand if a pre-existing system may potentially operate at the required efficiency level. Otherwise, it examines whether corrective or additional measures are necessary to achieve this goal.

Besides **equipment revamping**, Labiotest offers paying a **monthly fixed amount**, against a maintenance program that will safeguard the client from any risk.

## TECHNICAL AND LEGAL CONSULTING



An emission does not always cause an odor problem, as this depends on chemical components that are present in the emission. Very often, companies cannot deal by themselves with possible claims from City Committees or control organizations.

In such peculiar cases, **Lbiotest** may play the role of a **partner for companies, organizations** and people involved in activities that need to **solve an osmogenous problem** without being able to rely on resources specialized in this field.

A partnership of a new type may develop in view of a possible **procurement** (consulting, surveys, analytical and olfactometric investigations, pilot test), or **during** procurement (technical reports, design and sizing) and **later** (maintenance service, global service, revamping, refilling).

In order to offer a more and more focused and precise service, Lbiotest relies on the cooperation of important *National and International Research Institutes*.

Odorigenous emissions coming from production facilities are becoming more and more of a real problem, this being due also to an increased sensibility as regards odors.

Besides, within the framework of norms and authorizations that are continuously changing, it is most important to equipment managers to be able to receive precise information, to meet requests coming from control organizations.

Thanks to a close cooperation with **Lod Srl (Laboratory of Dynamic Olfactometry)**, Lbiotest may offer consulting services in the field of standards regarding odors.

The purpose is to get a picture of the potential olfactive impact of a plant on the surrounding territory, through the model study of odors dispersion, as well as surveys over the territory (*field inspection*).

## 2. FIELD OF APPLICATION

### INDUSTRY



Labiotech uses various technologies depending on the odorigenous problem to solve. **Every typology of industry and processing can cause an odorigenous emission requiring an abatement treatment.** Labiotech is able to deal with any problem and find a solution in various fields such as:

- Foundries
- Tanneries
- Paper mills
- Rubber industries
- Plastics industries
- Food industries
- Production of food for animals
- Tobacco processing
- Distilleries
- and many others.

### BREEDING AND FEED PRODUCTION

Breeding activities and production of animal feed are often associated with smells, due to high concentrations of malodorous substances and particular processes, necessary to obtain the final product. Having to live in the neighborhood of such facilities is particularly difficult and often causes bad moods and disputes. From this point of view, Labiotech may solve the problem through the treatment of emissions and the **abatement of odor concentration by 70%**, mostly by means of **osmogenic barriers**.

The processing and production of animal feed, storage and processing of animal carcasses are some fields of activities having a big impact, where we have obtained excellent results as regards odor abatement.



### FOOD & BEVERAGE

In the field of catering and fast food, **the problem of odors coming from kitchens exhaust pipes is often the cause of olfactive nuisance and consequent disputes.** Especially in residential areas and cities, they cause more than a few problems to neighbors as regards quality of life. They also influence other activities in commercial areas, shops and boutiques located in the neighborhood of restaurants, cafeterias and fast food restaurants.

To deal with this problem, thanks to more than 30 years of experience in this industrial field, Labiotech has designed **Zephiro UTS**, an innovative technology that can be adapted to any type of kitchen and premises, to abate odor concentration (troublesome) by means of ultrasounds.



### WASTE

Labiotech started as a **chemical analyses laboratory** to support companies belonging to Gruppo Luci that operate in **the field of waste collection and disposal.** Throughout the years, the company has developed its own technologies for odors abatement, in order to solve osmogenous problems in the neighborhood of such plants.

Labiotech is now able to deal with any problem and solve matters related to waste, whether solid or liquid.

**Landfills, composting plants, treatment and sorting equipment, storage devices, and treatment equipment for wastewaters** are some of the most meaningful Labiotech references. In these cases, the company has obtained **abatement rates of odor concentration up to 80%**, as certified by olfactometric investigations carried out according to standard UNI EN 13725: 2004.



## 3. TECHNOLOGIES

### OSMOGENIC BARRIER

Osmogenic barriers operate using **dilution water and specific products**. These products contain elements that are hydrophobic, consisting of rather long hydrocarbons chains. They have properties enabling them to form various types of large molecular units, called micelles.

Osmogenic barriers are the only solutions in case of **diffused emissions**, when conveying is not possible. However, they are also efficient when the **conveying of emissions** takes place with the help of bars equipped with spraying nozzles directly set up inside the fumes exhausting

stacks.

These solutions are also helpful in the case of activities using chemical and physical methods with the help of washing towers (scrubbers), absorbing towers, or biological methods, such as biofilters. They are efficient when assembled upstream or downstream of the equipment.

Olfactometric investigations performed in compliance with standard UNI EN 13725: 2004 tested all the **abatement efficiencies** of solutions offered by Labiotest.

**Tests have shown that efficiency exceeds 75% in the fields of application investigated.**

#### MAIN ADVANTAGES

- High deodorizing power
- No chemical substances introduced in the environment
- No use of substances producing secondary products
- Components present do not oxidize and do not change when in contact with the air
- Process not influenced by visible and ultraviolet sunrays
- Presence of terpenic extracts and natural essential oils acting as olfactometric indicators of an optimal dilution.



It is also possible to supply all the spraying equipment as a **GLOBAL SERVICE**. This innovative service makes it possible for the client to avoid an immediate payment to purchase the equipment. Labiotest guarantees the complete **monitoring and maintenance service against the payment of a monthly fee.**

#### TYOLOGIES OF DEVICES

- HPS *Evo*
- HPS *Midi Fresh*
- HPS *Midi Var*
- *Big Fogger Plus*
- *La.BioFog 400 Evo*
- *Zephiro UTS*



# HPS Evo



Outdoor diffused emission - 250 nozzles for wastewaters treatment

**HPS EVO** is one of the most demanded spraying systems, used for the containment of odors and the abatement of dusts.

The most important options it can be equipped with are the following:

- antifreeze system
- heating cable
- softening system for network water
- pressurization unit
- air separator

# HPS MIDI FRESH

**HPS Midi Fresh** purpose is to manage odorigenous problems that are very different one from the other. In fact, it can support a varying **number of nozzles according to the pump used.**

Advantages:

- easy to configure with various optional devices
- reduced cost
- extremely simple use
- excellent reliability

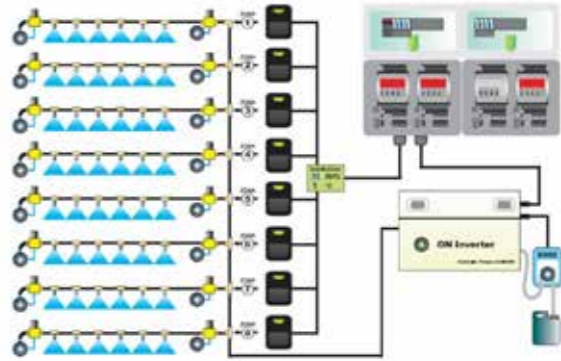
# HPS MIDI VAR

**HPS Midi Var** purpose is to supply a **varying flow-rate at a constant pressure, in order to support several lines with independent nozzles.**

With the help of an optional control board that allows starting the plant and activating the corresponding solenoid valve, it is possible to start every line by means of a remote control.

**According to the activated lines, the plant distributes the necessary water flow-rate while maintaining a constant pressure on the line. With all the lines at a standstill, the plant shuts off automatically, to start again at the first request coming from any line.**

Flow-rate regulates automatically and a pressure transducer exchanging information with the electric motor *inverter* maintains the pressure



# HPS MIDI

## BIG FOGGER PLUS

The spraying system **Big Fogger Plus** comes in two types:

- wheeled
- fixed

The **wheeled version** is an efficient solution in emergency conditions, as it is possible to move it easily and put it wherever necessary. In fact, it requires only electric power in order to operate, as it is already equipped with its own autonomous reservoir

The **fixed version** is the ideal solution to deal with vast areas without hindering in any way the normal performance of work activities in the treated area. In fact, it can be easily set up on an existing structure at a varying height, and in in

any case above 4 m.

In order to operate, it requires electric power and a water feeding line.

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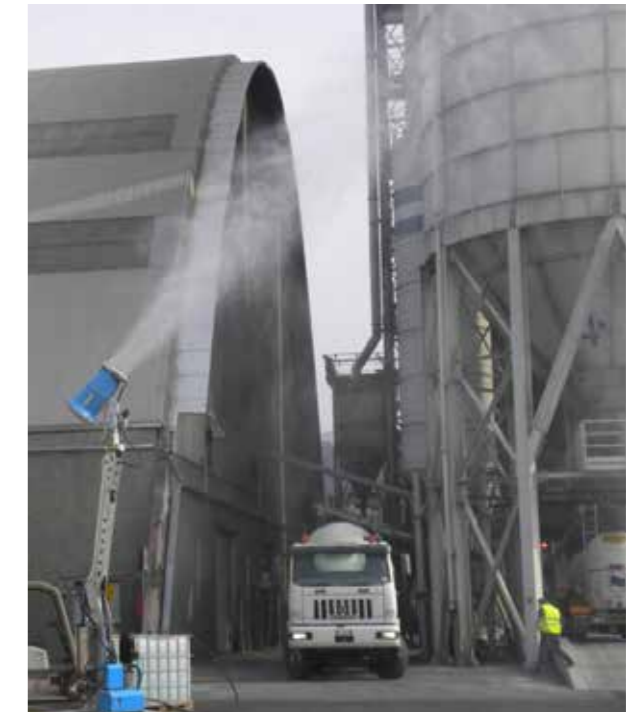
Both versions can be equipped with various **optional** devices, such as:

- **automatic dosing unit**
- **softening unit**
- **pressurization unit**
- **1000 liters reservoir (included in the wheeled version).**

It is also possible to use both these systems to abate dusts, with good results.



*Diffused emission outside waste treatment plant*



*Diffused emissions of dusts outdoor - Cement factory*

It is a spraying system used for:

- **odors containment**
- **dusts abatement**

**La.BioFog400 Evo** can be equipped with various **optional** devices, such as:

- **palette type of baseplate on wheels**
- **telescopic arm**
- **auxiliary current generator**
- **remote control**
- **reservoir for product dosing.**

To abate dusts, **La.BioFog400 Evo** uses specific nozzles to spray tiny drops of water that collide with the dust particles, envelope them and have them fall to the ground due to gravity.

Even under difficult operational conditions, it is possible to get a **high abatement level of dusts.**



*Diffused emission inside waste treatment plant - fixed Big Fogger Plus*

## LA.BIOFOG 400 Evo

## ZEPHIRO UTS

Within the framework of osmogenic barriers, the innovation introduced by LABIOTEST with Zephiro UTS consists in using ultrasounds.

This equipment produces micro-drops with a large contact surface (dry fog). **The neutralizing capacities of our products increase in an exponential way, thus minimizing water and energy consumption.**

Zephiro UTS can be equipped with some optional devices, such as:

- **an air kit with an electrically controlled shutting valve**
- **a softening system for network water.**



*Application in the field of catering*

**Zephiro UTS** is the ideal solution for the abatement of troublesome odors coming from kitchens.

### ASSOCIATION OF VARIOUS ABATEMENT SYSTEMS

All the equipment offered by LABIOTEST goes through **constant upgrading from a technological point of view.**

This allowed understanding that, **by building an additional step into filtering systems, as an osmogenic treatment barrier**, the abatement efficiency reaches levels that are difficult to obtain with one single equipment.



*Application of an ultrasounds osmogenic barrier as an additional abatement step.*

## FILTERING SYSTEMS

### DRY FILTERING

Odors abatement takes place through **physical-chemical absorption by a multiple layer and multiple reagent filtering bed, sized specifically in view of the typology of effluent to be treated.**

The proper sizing of the filtering system allows optimizing abatement efficiency and lengthen the average life of the filtering materials, as it allows **eliminating any type of maintenance for 12 months at least.**

Furthermore, the choice of absorbing materials and specific pre-impregnations for classes and families of mixtures allow ensuring a selective abatement of odorigenous substances and offering **olfactometric efficiencies up to 99%.**

### MAIN ADVANTAGES

- High olfactometric abatement efficiencies
- Absence of maintenance, except for the substitution of the filtering bed
- Absence of components subject to wear or breakage
- No need of water inlet or outlet pipes
- Electric consumption limited to the only fan section
- Applicable to almost all industrial types of odorigenous emissions.

## DRY SCRUBBER - DKFIL®

DKFil® is an innovative **dry chemical-physical filtering system** used for:

- containing odors
- abating chemical contaminants of various nature.

The multiplicity of absorbing and / or filtering materials, pre-activated and pre-impregnated, offer a vast range of reactors manufactured and designed ad hoc for emissions to be treated.

DKFil® is thus a global solution to many removal processes:

- salty neutralization
- chemical oxidation
- polymerization
- physical adsorption
- mechanical filtering.



DKFil® 14.000 Nm<sup>3</sup>/h applied to a wastewaters treatment plant

## WET FILTERING

Wet abatement systems foresee the **removal of pollutants by means of a washing solution.**

The most commonly used solvent is water.

However, it is possible to select specific reagents according to mixing and dissolving capacities of the species present in effluents to be treated.

Nevertheless, as regards odor abatement, it may be necessary to adopt specific methods or additional sections:

- series of towers with various washing solutions;
- wet Venturi sections;
- injections of adsorbing solids in containment reservoirs;
- introduction of additional filtering sections;
- insertion of additional abatement levels.



Scrubber 60.000 - Impianto di compostaggio

## WET SCRUBBER

Due to the high level of automation, it is possible to monitor plant management and find the best possible operational layout, depending on environmental context and characteristics of airflow to be treated.

### MAIN ADVANTAGES

- high deodorizing efficiency for all substances that dissolve in water with a strong chemical reactivity
- no substitution of exhausted materials
- reduced encumbrance as a surface
- low load losses (energetic advantage) good pre-treatment system upstream of biofilters and dry filtering systems
- the development can be vertical or horizontal according to whatever space is available
- the fan units can be adapted to classified ATEX zones
- the constructive materials for towers may be of various types: stainless AISI 304/316, PP, PEHD, PVC
- easy installation of additional sections for the optimization of the mitigation efficiency as regards olfactive nuisance.



2 Scrubbers da 50.000 Nm<sup>3</sup>/h

## SPECIAL AND MULTIPLE STEP PLANTS

The ability in designing a multiple-step equipment consists in knowing how to make a wise use of every unit capacities, in order to optimize the following steps involved in the abatement process.

**LABIOTEST offers tailor-made solutions to supply the best answer to the problem deriving from every single emission.**

Each emission has its own history, impact and treatment technology.

Physical and chemical characteristics, typology of emission process, location of the emission point, neighboring context and treatment management, are only some of the aspects that make every single emission problem special and unique.

Odors treatment, due to its complexity, vastness and sensibility, requires design rules that it is not possible to reduce to one single operation, most of the time, i.e. one single treatment.

This is the reason why there are “special” plants, tailor-made systems resulting from a deep knowledge of various single treatment systems that are re-designed in view of a group action, in order to offer significant abatement rates, **thus reducing management costs and by-products production to a minimum.**

Most of the time, this last aspect is more strategic than the choice of the abatement system itself.

**The whole range of solutions offered by Labiotest make it possible to design multiple step abatement processes for complex odorigenous mixtures with a high polluting load.**

## HYBRID SYSTEM (WET + DRY)



*DkFil® + Scrubber applied to a wastewaters treatment plant.*

The system makes use of the washing effect of a liquid solvent and selective adsorption of substances not related to the solvent. The result is a high abatement rate, a vast range of action and optimization of management costs. DkFil® + Scrubber applied to a wastewaters treatment plant.

## EQUIPMENT FOR DUSTS ABATAMENT

For diffused emissions, Labiotest proposes the use of **Trap Dust** systems. Their operation is an imitation of what happens in nature. The machine uses specific nozzles to distribute tiny drops of water that collide with dust particles, envelope them and have them fall to the ground due to gravity. **Also under difficult operational conditions, it is possible to get a minimum abatement of 50 % of dusts present in the air.**

For conveyed emissions, Labiotest suggests using specific cyclones filters and /or bag filters capable of performing an activity of automatic dust removal.

They are designed to operate under extreme conditions, with a continuous

operation and with a possible countercurrent cleaning of the filtering fabric. They can treat air containing very thin dusts, while maintaining a very high collection rate, also in the case of particles having dimensions lower than 1 micron.

The field of application is definitely quite vast: from coarse dusts up to dusts with submicron dimensions (0,20 - 0,25 microns). Abatement rates, with suitable filtering surfaces, exceed 97%.

## SYSTEM HYBRID WITH A THIRD STEP

To the advantages of the classical hybrid solution, it is possible to associate the benefits of the stack osmogenic barrier. The result is an extraordinary abatement rate with the possibility of characterizing the neutralized emission also from the hedonic point of view.



*Zephiro UTS applied as an additional step to DkFil®*



*Ciclone Filter*



*LabioFog600*

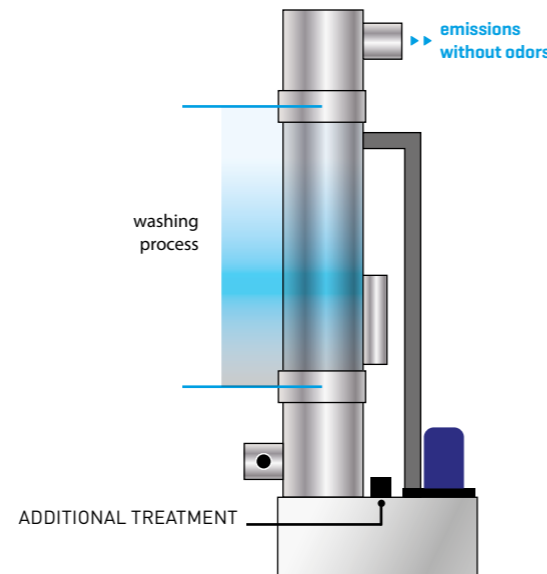
# CHEMICAL AND BIOLOGICAL TREATMENTS

## SCRUBBER ADDITIONAL TREATMENTS

There is a specific product called **La.BioWF5** to use inside washing towers, in order to increase odorigenous efficiency.

### Advantages:

- no effect on washing water
- significant improvement of abatement odorigenous efficiency
- minimum installation costs
- minimum dosing
- easy use and immediate results



High concentration of greases and oils in wastewaters leads to the formation of superficial layers in greases reservoirs and lifting pumps. This causes the stoppage of pumps and faulty operation of floaters. This translates into higher costs for drainage and maintenance.

The solution is the product **La.BioCPL 60** ensuring:

- hydrolysis of greases and other suspended materials;
- fermentation process opposing the dominant anaerobic effect responsible for unpleasant smells.

## TANK TREATMENT CONDENSE FAT

### Advantages:

- Degradation of greases due to the presence of enzymes;
- Elimination of unpleasant smells;
- Less tank maintenance, therefore less expenses;
- Reduction of drainage frequency;
- Safe and non aggressive treatment;
- Elimination of waste due to a precise dosing;
- 100% biological treatment and positive impact on the environment.

## WASTE BINS SANITATION TREATMENT



This is the ideal treatment for odors **abatement in market areas, and in organic sludge storage areas or areas for the storage of waste. Spraying systems operating at a low pressure distribute the biological-deodorizing product La.BioWaste** on the surface, in order to degrade odorigenous components, without limiting the process to the mere action of covering them up. The product should not be mixed with acid, alkaline substances or disinfectants and sanitizing products, which might modify the efficiency of its active principle.

**BioSorb M** is the ideal product for the removal of odours on market areas, in particular where organic waste is produced, on areas for waste storage, in landfills

**Advantages:** The product degrades odorous compounds, not just covering them. It is suitable for spraying manuals and/or lorries with working pressure between 5 and 50 bar.

## TREATMENT OF LANDFILLS ODORS

It is particularly used in landfills where it is distributed through a system called **Nebulizer** directly on the collected waste, in particular during the unloading phase and/or before its covering.

The active substance distributed, immediately carries out its **activity of neutralization of the bad smell** and continues with the subsequent percolation inside the waste itself.



*Example of La.BioSorb treatment in a landfill*

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