

## WOOD CHIP BIOFILTER

### Composición

**BURÉS PROFESIONAL, S.A.** has created the **wood chip biofilter** product from a mixture of different chip particle sizes, treating it in the plant to obtain a material that can absorb odoriferous compounds and other pollutants from the residual air stream. The free-living microorganisms that proliferate naturally in this organic material use these compounds as a source of nutrients and energy, via aerobic decomposition.

The high-efficiency and long-shelf-life biofilter is created from **pine chips** made from the following species:

| SPECIES                              | %          | Density (g/cm <sup>3</sup> ) |
|--------------------------------------|------------|------------------------------|
| <i>Pinus nigra</i>                   | 39         | 0.62                         |
| <i>Pinus sylvestris</i>              | 46         | 0.55                         |
| <i>Pinus uncinata</i>                | 6.5        | 0.07                         |
| <i>Pinus pinaster/ Pinus radiata</i> | 1.5        | 0,08-0,10                    |
| Other ( <i>Picea, Abies, etc.</i> )  | 7          | -                            |
| <b>TOTAL</b>                         | <b>100</b> | -                            |

The filling materials undergo a pre-treatment process (crushing and screening) that increases their surface area and enables the microorganisms to more effectively colonise the medium.



### Characteristics

| Characteristics                                 | Unit                      | Value  |
|---|---------------------------|--|
| Moisture  | (%)                       | 40 - 60                                      |
| pH  | -                         | 4.5 - 5.6                                    |
| Particle size (mm)                              | (mm)                      | 10 - 45                                      |
| Porosity  | (%)                       | 67-71  |
| Organic matter OM                               | (%)                       | 40 - 50                                      |
| Real density                                    | (Kg/m <sup>3</sup> )      | 200 - 250                                    |
| Moisture bulk density UNE-EN12580               | (Kg/m <sup>3</sup> )      | 220 - 330                                    |
| Electrical conductivity                         | (dS/m)                    | 0,1-0,5                                      |
| Cationic Exchange Capacity (CIC)                | (meq/100gr)               | 43.6   |
| Water retention capacity                        | (Water at 10 cm a.c.) (%) | Buena  |
| Aeration capacity                               | (Air at 10 cm a.c.) (%)   | 20 - 30                                      |
| Shelf life                                      | (years)                   | 5  |
| Types of microorganisms that eliminate          | -                         | COV'S<br>H <sub>2</sub> S<br>NH <sub>4</sub> |
| Total nitrogen                                  | (%)                       | 0.5 - 1                                      |
| Total Phosphorus, P <sub>2</sub> O <sub>5</sub> | (%)                       | < 50 mg/l                                    |
| Total Potassium, K <sub>2</sub> O               | (%)                       | < 50 mg/l                                    |
| Total Sodium, NaO                               | (%)                       | 0.6  |
| C/N ratio                                       | (%)                       | 10.31  |

**Pine chips** tend to seek hygroscopic equilibrium in moisture content that is in harmony with the relative humidity and temperature of the environment. The water content of the chip depends on the relative humidity in the air, which means that variations are influenced by humidity changes.

The electrical conductivity of wood essentially depends on its water content.

The porosity or empty volume of the chip varies greatly with the species, within the individual and even within the same piece, although conifers are commonly more porous than hardwoods, with the pores more or less uniformly arranged.

**Pine chip** is highly porous material, between 66.8-70.4%, which provides a high contact surface between the stream of



gases to be purified and the microorganisms. This results in greater processing efficiency and a lower need for retention time. The average pore radius ranges from 200 to 2,000 nm.

Burés biofiltration materials are extremely stable, with very slow physical and microbiological alteration of their properties over time, so there is practically no compaction of the bedding in the long term.

## control parameters

Appropriate physical and chemical conditions must be created and preserved to allow the microbiotic proliferation on the filling material. The essential parameters are temperature, pH, moisture and nutrient quantity.

### Moisture

*One of the main challenges of a biofilter care is maintaining the right moisture point. The air is usually moistured before entering the system with a water nebulisation system, moistening chamber, bioscrubber or biological hydrofilter. The moisture depends on the material, but always oscillates in the 50-70% range.*

### Temperature

The most common microorganisms are mesophyles, which need a 15-35°C range of temperatures, and have an optimal growth at 30-40°C. This is the range in which the filling material must be kept.

### Granulometry

The granulometry of the filling material affects its efficiency, the granulometry being the size range of the particles. The granulometry that provides the biofilter with a larger surface must be found, as it will make it efficient and useful also to purify non-soluble complexes.

The efficiency and useful life of the biofilter depends on the kind of contaminant and its mass, but **BURÉS PROFESIONAL, S.A.** recommends changing the filling material every 3-5 years, depending on the environmental conditions in which it's kept. After its useful life the material can be composted without any previous treatment.



This product can be used as a filling material, or as a layer of a multilayer biofiltration.

Biofiltration is a very versatile technique, able to treat odours (ammoniac...), toxic compounds and volatile organic compounds.

The efficiency of the treatment of these elements is higher than 90-95% for low contaminant concentration (<1.00ppm).

The biofilters offered by **BURÉS PROFESIONAL, S.A.** are used successfully in the following activities:

- EDAR
- Composting plants
- Dump areas
- Chemical industry
- Alimentary industry
- Water cleansing
- Smoking industry
- Paper industry
- Pharmaceutical industry
- Furniture industry
- Painting and recovering application
- Resinous materials treatment
- Leather treatment

**The biofilters offered by BURÉS PROFESIONAL, S.A. is a technological alternative respectful with the environment, with an effective control of the atmosphere's and odours contamination. Some of its great advantages are the following:**

- Simple technology and low application cost; economically available to all business.
- High efficiency of volatile contaminants and odoriferous complexes elimination
- Odoriferous contamination control
- Nearly null maintenance of the biofilter is required.
- Total decomposition of the contaminants without secondary products creation through the Biofiltering process.
- The filling material is organic, non toxic and biodegradable through composting once its useful life is over.



## advantages and applications