

# CarboPlus®

WASTEWATER



**TREATMENT OF MICROPOLLUTANTS  
TO PROTECT AQUATIC ENVIRONMENTS**

# MICROPOLLUTANTS IN WATER

## WHAT ARE THE ORIGINS AND EFFECTS OF MICROPOLLUTANTS?



Pesticides, biocides, detergents, drug residues: all the molecules produced by domestic, agricultural and industrial activities find their way into aquatic environments. Although the concentrations of these micropollutants are low, the multiplicity of molecules creates a cocktail effect that can lead to biological disturbances in living organisms. The modification of fish reproductive organs is just one among many other examples. These micropollutants are present throughout all stages of the water cycle, posing both an environmental and a public health problem.

## HOW TO TREAT MICROPOLLUTANTS?

These human pollutants flow via sewer systems to urban wastewater treatment plants. The aim of these plants is to purify wastewater before returning it to the environment. However, they were not designed to treat micropollutants and are therefore a vector for the dispersal of these molecules into the aquatic environment. To protect water resources and to complement wastewater treatment, Stereau has developed the CarboPlus® process. It eliminates micropollutants at low cost. CarboPlus® thus contributes to the good chemical and ecological status of water bodies, in line with the European Framework Directive.



**5 to 10 microgramms/liter**

is the quantity of drug residues\* found at the outlet of municipal wastewater treatment plants.

\*analyzed panel : Carbamazépine, Oxazépam, Diclofénac, Ibuprofène, Furosémide, Sulfaméthoxazole, Propanolol, Aténolol



# CARBOPLUS® TREATS WASTEWATER FOR THREE MORBIHAN MUNICIPALITIES

## WASTEWATER TREATMENT PLANT

- Customer : Syndicat mixte Auray-Belz Quiberon
- Location : Kerran (Morbihan)
- Treatment capacity: 21,500 p.e.
- Flow : 7,300 m<sup>3</sup> /d
- Treatment system :
  - > Pre-treatment
  - > Biological treatment with Aqua-RM® membrane bioreactor
  - > Removal of micropollutants using the CarboPlus® process
- Commissioning : July 2013

## CARBOPLUS® ELIMINATES

- Phenols, hormones, endocrine disruptors :  
Bisphenol A, 4-nonylphenol, 17 $\beta$ -oestradiol, Estriol, Estrone, Ethynil Estradiol
- Drug molecules :  
Bromazepam, Oxazepam, Carbamazepine, Propanolol, Atenolol, Metoprolol, Ibuprofen



The fight against micropollutants in the environment involves reducing these chemical substances at source and increasing the purification capacity of wastewater treatment facilities. This is why we have made a conscious decision to include an additional, tertiary treatment stage in the new Kerran wastewater treatment plant. In addition to activated sludge treatment and membrane filtration, a CarboPlus® activated carbon reactor was chosen to eliminate micropollutants. Our Kerran wastewater treatment plant has adapted to the emergence of this new micropollutant issue.

As a result, it is now in a sustainable position as an essential link in the protection of aquatic environments and local economic activity. 

**Jean-Michel BELZ,**  
*Chairman  
of the SIVOM  
Auray-Belz-Quiberon*

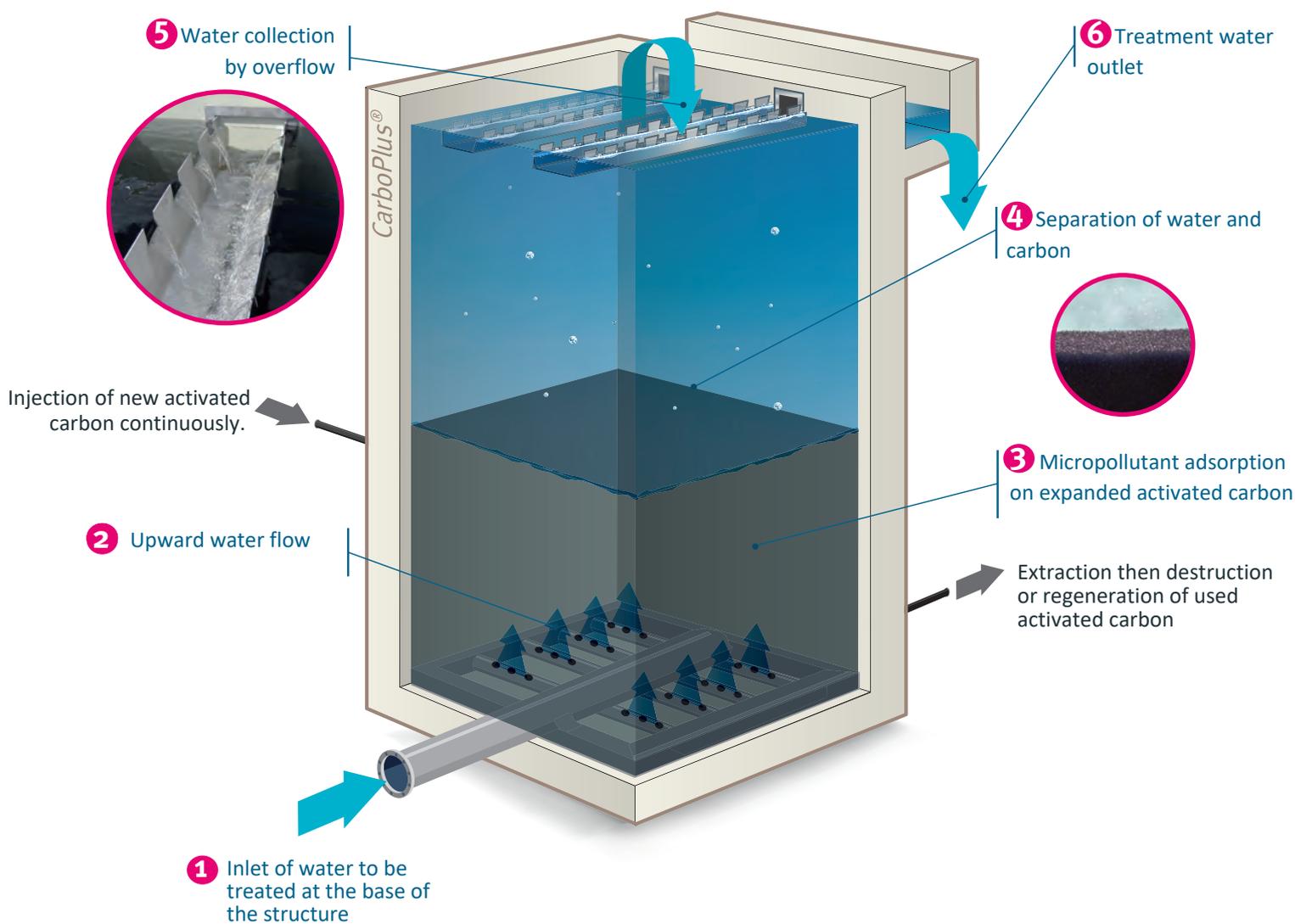


# THE PROCESS

## CARBOPLUS®

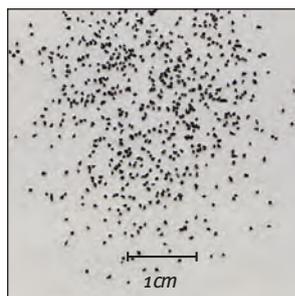
### CARBOPLUS® : A PATENTED PROCESS

This process is the result of over ten years' feedback from installations using activated carbon in suspension.

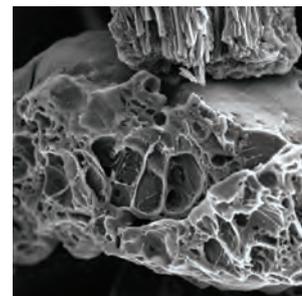


### THE UNRIVALLED CARBOPLUS® EFFECT

Suspending the activated carbon bed makes all the carbon's adsorption sites accessible. The exchange surface between the water to be treated and the carbon pores is thus optimized.



Micrograin of activated charcoal seen with the naked eye

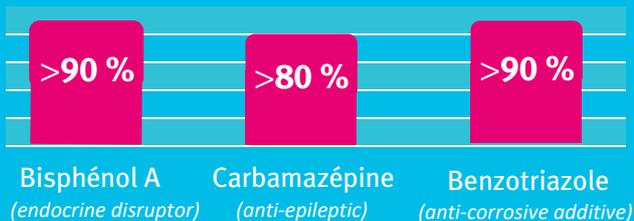


Activated charcoal pores under electron microscope

# CARBOPLUS®

## THE SOLUTION TO MICROPOLLUTANTS

### MICROPOLLUTANT ELIMINATION WITH CARBOPLUS®



Micropollutants are adsorbed on activated carbon. Unwanted molecules are neither concentrated nor transformed into toxic or mutagenic by-products removed from the water. Used carbon is regenerated or incinerated. In both cases, micropollutants are destroyed.

### EFFICIENT AND RELIABLE

CarboPlus® eliminates a very wide spectrum of micropollutants (plant protection products, drug residues, etc.). High, consistent performance over time thanks to three major process features:

①

Large mass of activated carbon in the reactor

+

②

High residence time of coal

+

③

Renouvellement continu du charbon actif pour entretenir la force du système

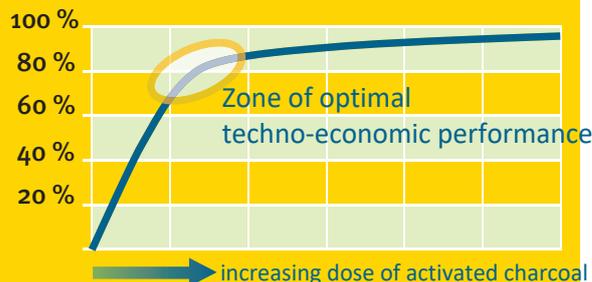
### ECONOMICAL

Both a contact and separation reactor, CarboPlus® is extremely compact and requires very little floor space. Placed in the wastewater treatment plant outlet stream, it can be easily integrated into an existing plant.

It consumes little energy and few or no reagents. CarboPlus® works with a wide range of activated carbons, some of which are regenerable.

The carbon dose can be adjusted according to performance objectives

Percentage of removal of a panel\* of medications.



\*accumulated panel : Carbamazépine, Oxazépam, Diclofénac, Ibuprofène, Furosemide, Sulfaméthoxazole, Propanolol et Atenolol.

### EASY TO OPERATE

Hydraulic operation is simple. There is no electromechanical equipment in the reactor.

Water and coal are separated by gravity. Equipment maintenance is reduced. New carbon is added automatically.

The dose is set in advance or optimized according to a specific UV measurement (patented process).



# CarboPlus®

WASTEWATER



CarboPlus®  
in video

## STEREAU

Head office : 11, chemin de Bretagne 92130 Issy-les-Moulineaux

Tél. : 33 1 30 60 84 00

Stereau - S.A.S. au capital de 5 000 000 € - R.C.S. Nanterre 602 011 918