

## BIO-UV GROUP



### Company profile

BIO-UV Group, one of France's most innovative small businesses was created in May 2000. It is one of Europe's leading manufacturers of ultraviolet water treatment equipment for private and public swimming pool markets. The BIO-UV Group designs, manufactures, and markets ultraviolet (UV-C) disinfection systems from its production site in Lunel, France. Since July 2018, BIO-UV Group is introduced on Euronext Growth stock exchange.

Our management's experience in fields of medical equipment, water treatment, and engineering enables BIO-UV Group to be active in 20 countries. The company's growth strategy is based on the most advanced technology. BIO-UV Group is at the forefront of the market leaders in just a few years and has had significant annual growth due to its qualitative and competitive UV-C solutions.

The Group currently employs almost 70 people and has one fully-owned subsidiary, BIO-SEA, manufacturing and marketing ballast water treatment systems.

BIO-UV Group is active in various activities such as:

- Water purification for domestic use in homes and towns
  - Solar panel powered drinking water
  - Waste water purification and waste water reuse, industrial water treatment
  - Ballast water treatment for ships
  - Sanitation and chlorine removal for commercial pools and spas
  - Automatic non-chlorine water treatment for residential pools and spas
  - Water treatment for aquaculture, fish farms, ornamental ponds and fountains
  - Refrigeration tower anti-legionella treatment, hot water tanks anti-legionella treatment
  - Water treatment for industrial processes in all sectors and for all types of industrial use
- More than 50% of BIO-UV Group's turnover comes from Export to all the continents.

### Research and development engineering office

Day in and day out, BIO-UV Group's engineers study and find solutions to new requirements with the capacity of manufacturing specific UV-C reactors upon request. The company permanently maintains ties with universities, laboratories, and research cells in order to address, develop, and validate optimal solutions for specific requests. CFD (Calculation of Fluid Dynamics) is part and parcel of our engineers' daily tools.

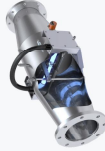
### BIO-UV delivers

BIO-UV Group is certified ISO 9001/2015 as well as obtaining certifications from NSF, ONORM, and the French Health Ministry. BIO-UV Group is also a member of the international Cluster Pôle Eau for water and competitiveness, an association of water related companies in the Occitanie and PACA French Regions. BIO-UV Group continues to pursue its path of progress and innovation in order to respond to all requests for Water Treatment throughout the world.

## MARKET USES

### Private pools and spas

The BIO-UV and Delta UV Residential ranges for private pools and spas offer an automatic chlorine-free water treatment. More than 100 000 swimming pools or spas owners are already benefiting from better quality and safer water.



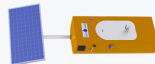
### Commercial pools and spas

Chloramine Removal using the BIO-UV Medium Pressure and Low Pressure Multi-lamp ranges, are capable of treating 1 to 1000 m<sup>3</sup>/h. With a view towards sustainable environment, these UV-C reactors considerably reduce chlorine levels while safely sanitizing and treating the water. The return on investment is relatively fast due to substantial savings in water renewal.



### Domestic and municipal drinking water

UV-Home, IBP+/IAM/DW Ranges  
All of these units safely allow delivering potable water to homes and communities from 1 to more than 1000 m<sup>3</sup>/h. They guarantee water purification from wells, and, drillings as well as treating rain water for reuse in sanitation.



### Solar powered drinking water

BIO-UV Group patented a free-standing solar powered unit for drinking water call the BIO-SUN. This drinking water post filters and sanitizes drinking water and is powered with a photovoltaic panel. It is easily carried and can be set up anywhere in the world. One BIO-SUN unit can produce enough drinking water for 100 to 200 people.



### Aquaculture, fish farms, aquariums, and ponds

Our ranges of 316L stainless steel or HDPE ensure a perfect water quality. Used in fresh- or sea-water these UV-C reactors answer the needs of professionals and end-users guaranteeing healthy water for the aquatic life. These units treat flows ranging from 0.5 to 1000 m<sup>3</sup>/hour.

## MARKET USES

### Industrial processes water treatment and ultra-pure water

BIO-UV Group manufactures the IBP+ and PHARMA lines of reactors for sanitizing water in industrial processes and for the ultra-pure water treatment for pharmaceutical, medical, cosmetic, and agricultural industries.



### Ship ballast water treatment



[www.ballast-water-treatment.com](http://www.ballast-water-treatment.com)

In 2012 under the auspices of the International Maritime Organisation for Ballast Water Treatment (IMO Convention) BIO-UV Group developed and patented the BIO-SEA. This is a complete Ballast Water Treatment System for all ships and UV-C reactors BIO-SEA treats flows from 10 to 2000 m<sup>3</sup>/h. BIO-SEA and the BIO-UV Group are ISO 9001 and ISO 14001 certified. BIO-UV Group's BIO-SEA range is approved and is able to provide BWT solutions for ships operating worldwide.



### Waste water treatment and Reuse water

BIO-UV developed the IAM and RW ranges of UV-C reactors for tertiary treatment and sanitation of municipal waste water. They are also used for industrial water and for reusing grey water. They protect the environment after the treatment stations and can also reuse the treated waste water for farm irrigation, parks watering.... This use of UV-C is in the process of being used more and more everywhere due to the increased demands.



### Prevention of legionella

On cooling towers or in hot-water networks, BIO-UV offers a preventative treatment against Legionella safeguarding the installations. With UV-C treatment, it is possible to avoid using, or at least reduce the use of chemical products.



### BIO-UV's advantages

The BIO-UV Group has already installed up to 150 000 units throughout the world and has never stopped installing them for 16 years. Many installations are available UV-C. The company monitors with alarms, manual or automatic, quartz- cleaning mechanisms, power regulators, special inlet and outlet configurations...

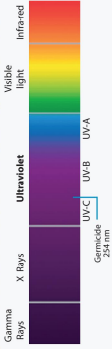


## UV-C LIGHT THAT DISINFECTS

### About UV light

The sun emits an invisible light known as ultraviolet rays. This natural phenomenon is reproduced within BIO-UV Groups light chambers, using powerful lights incorporating the latest technology that emit UV-C rays. 254 nanometers is the optimum wavelength for inactivating micro-organisms (viruses, bacteria, algae, yeasts, fungi). UV-C light penetrates to the heart of the micro-organisms DNA and disturbs the metabolism of the cells. All the cells are destroyed and the organism is no longer able to reproduce.

Concerning the removal of chloramines, special UV-C lamps are designed to produce a larger variety of lightwaves that are more effective at irradiating tri-chloramines which are known to cause respiratory ailments.



### The effective dose

The UV dose is equivalent to the UV energy that the living micro-organism has to absorb to be inactivated. The table below shows the UV-C dose levels (expressed in millijoules (mJ)/cm<sup>2</sup>) required to eradicate 99.9% of the micro-organisms.

	UV-C DOSES
<b>BACTERIA</b>	
<i>B. subtilis</i>	10.5 mJ/cm <sup>2</sup>
<i>E. coli</i>	6.9 mJ/cm <sup>2</sup>
<i>Legionella Pneumophila</i>	9 mJ/cm <sup>2</sup>
<i>Salmonella enteridis</i>	10 mJ/cm <sup>2</sup>
<i>Staphylococcus aureus</i>	10 mJ/cm <sup>2</sup>
<b>ALGAE</b>	
<i>Chlorella vulgaris</i>	22 mJ/cm <sup>2</sup>
<b>PROTOZOA</b>	
<i>Cryptosporidium</i>	16 mJ/cm <sup>2</sup>
<b>VIRUSES</b>	
Hepatitis	8 mJ/cm <sup>2</sup>

### The advantages

- A concept that reduces the use of chemicals
- Respect for the Environment and Ecologically Sustainable Solutions
- A simple physical principle: no by-products or overboiling
- Can be used in combination with other water treatment products
- Reasonable costs for purchase and maintenance
- Easy, quick, and modular installation



UV Water Treatment



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