



*From nature to nature
For Humanity*



UNGERMI[®]
ULTRAVIOLET HIGH TECHNOLOGY



UVGERMI®

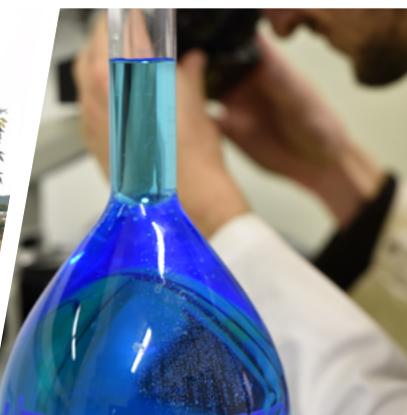
ULTRAVIOLET HIGH TECHNOLOGY

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We respond to...



...challenges of the modern world...

In 2018, the **rate of urbanisation reached 55%**.

At the current pace, **65% of the world's population will be living in urban areas by 2025**, a figure reaching as high as 80% in many countries. In 2017, over 600 cities had populations of more than one million people and 46 cities had populations surpassing 10 million



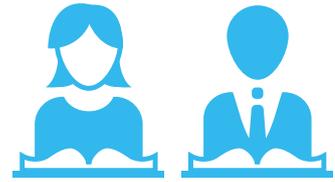
(UN projections).

According to the UN (UNFPA), **68% of the world's population will live in cities by 2050**, and the urban population could double over the next hundred years.

...with **efficient technology inspired by nature to treat air, water and surfaces.**

Ultraviolet (UV) radiation technology: a natural disinfection system based on an environmentally-friendly process that is chemical-free.

...citizen concerns...



37% of 18-24 year olds (and 21% of 45-54 year olds) **list the environment as their primary concern** ("positive and sustainable economy barometer" produced by YouGov for Business Insider France).



...public policy issues...

Many directives and regulations are aimed at **reducing pollutant emissions** from transport, industrial activities, household appliances, and the use of certain products. The Environmental Code requires buildings open to the public, including schools, **to monitor their indoor air quality.**





André Bordas.

founding CEO of UV GERMI, built his company based on **a clear commitment** to using technology to build the world of tomorrow, founded on **strong values** prioritizing a human-scale, sustainable development, continuous innovation and the pursuit of excellence.

Purifying

agricultural water and drinking water

In 1979, André Bordas created a coil-winding company specialised in manufacturing industrial electrical equipment. In 1990, the company's activities were expanded to include industrial and electronic water treatment supplies.

As early as 1995, he manufactured the **first 11 UV treatment reactors for greenhouse water purification** (in response to a call for tenders launched by the Corrèze Chamber of Agriculture).

The invention of this fluid treatment system using UV radiation was **patented in 2000** (by SARL Bordas), and is used to treat effluent from the food industry.

The company then further developed this scientific concept, applying it to water treatment in other fields. In 2006, it received its **first dechloramination authorization** and marketed the UV DECHLO range of dechloramination units.



Established in 2009, UV GERMI continued this research, developed its own areas of expertise, and designed new devices.

In 2012, UV GERMI obtained a **UV Sanitary Compliance Certificate (ACS)** for its range of treatment equipment for water intended for human consumption.

...

Inspired

Inspired

by the **SUN**



Fluid treatment using UV radiation

The water flows through a device consisting of a hermetically-sealed cylindrical chamber (the **reactor**) and one or more **UV lamps** enclosed in quartz sleeves.

The **water leaves the device purified** from microorganisms, **without any chemical modification**. This process is **completely ecological**.

Key dates

1995

- > First UV reactor

2000

- > Patent for a "Fluid treatment device using UV radiation"

2006

- > Authorisation for dechloramination

2009

- > UV GERMI is founded

2012

- > UV Sanitary Compliance Certificate (ACS) obtained for drinking water treatment

2016

- > A subsidiary opens in Saudi Arabia

2017

- > OSHUN company is founded
- > Launch of the ACS machine 1000 m³/h, one of the highest capacities for low-pressure drinking water treatment in Europe
- > "Innovative Company" label awarded by BPI
- > Initial public offering Euronext Growth

2018

- > Development of GERMI R Clean, international patent
- > the Innovation and Research Centre opens in Saint-Viance
- > A subsidiary is founded in Dubai

2020

- > Launch of surface treatment solutions:
UV DP75 and portable lamp UV GERMI BAL 2 Z60

2021

- > To support the company's development, André Bordas appoints Willy Fortunato as Deputy Managing Director



UV GERMI

The purification specialist...

We are a **human-scale company** (49 employees) located in Southwestern France in the Nouvelle-Aquitaine region in Corrèze (sometimes called "green country"), where we manufacture a **range of UV treatment reactors in Saint-Viance.**

UV GERMI is a true reference for water treatment and

the **French market leader in dechloramination** (more than 1,200 tanks at public swimming pools are equipped with our technology). UV GERMI also has a **global reach**, exporting its expertise and UV systems to Africa, the Middle East and the United Arab Emirates.



The emergence of the H1N1 virus motivated UVGERMI to make advances in the germicidal properties of UV technology for applications in air treatment as early as 2009. We sought to support industrialists in meeting their operational needs and health security objectives by researching and developing solutions aimed at **improving the air quality in sensitive environments (industry) and confined spaces (aeroplanes).**

With the advent of COVID-19, **air quality became a major global public health issue.** The issue of coronavirus infection has now become a widespread challenge, affecting schools, medical and hospital settings, buildings open to the public, professional environments (offices, workshops), and transport (plane, train, metro, bus).

...with solutions for all types of sensitive environments.

UV GERMI offers UV technology solutions for all environmental applications, including **air, water and surface decontamination.**

UV GERMI's technology destroys microorganisms, bacteria, viruses, endocrine disruptors, and chemicals in the air, water, and on surfaces.

At UV GERMI, **we work on a daily basis to promote sustainable development and improve the environment** through water resource management, water reuse, air disinfection, and the decontamination of surfaces.

Protecting
nature

UV GERMI

strong **values** applied on a daily basis...

Taking **for sustainable development**

As a French manufacturer, UV GERMI is proud of its **human-scale** and **strong local roots**.

As a company, we prioritise French subcontractors and work primarily with suppliers located near our production sites. This commitment makes us more **responsive, flexible,** facilitates our service **management** and actively contributes to

sustainable development.

UV GERMI teams are involved in every step, from design, manufacturing, and commissioning, to after-sales support and maintenance (including training on the devices). Our teams are

available to specifically **respond**

to customer requests, **adapt** to their individual needs and **ensure** the performance and quality of our products and solutions.

Le +

A smaller carbon footprint

- > **durability:** devices with a minimum life span of 15 years
- > **repairability:** robust and repairable materials, efficient after-sales support

- > **manufactured in France** with French materials
- > local **suppliers**
- > expertise from France and Corrèze
- > **recovery** and **recycling** of reactor lamps
- > **low power** consumption
- > **control** of operating costs
- > natural **disinfection system**
- > **positive impacts** for the environment: water resource management, water reuse, air disinfection, decontamination of surfaces

Sustainable development



Patents & labels



UV GERMI

strong **values** applied on a daily basis...

Investing
in **innovation** and **research**

20%

of turnover devoted to **Research & Development**

Research is a key component in UV GERMI's development strategy. It focuses on two areas: **basic research and experimentation**.

This basic research is applied to our areas of expertise in air treatment, water treatment, heat science, and the electronic engineering of connected devices (IoT), and therefore helps ensure the **ongoing development and expansion of our range of UV reactors**.

- > an integrated team of **engineers and technicians**
- > **400 m²** of laboratory space equipped with **modern design** and testing facilities
- > **5 researchers**

Upon request, our teams conduct **research on specific decontamination solutions** in the areas of air, water and surfaces, which result in the development of experimental processes and products.

For example, these research projects could focus on removing biological and chemical pollutants from a fluid, improving indoor air quality in public transport, or decontaminating sensitive surfaces.

A Guarantee of high performance

The particularly demanding standards that apply to the quality of air, water and surface treatment include continuous development, country-specific requirements. They require constant adaptability. UV GERMI therefore guarantees **consistent quality in its processes** and ensures the **reliability of all the materials and components** in our UV treatment equipment, which undergo one year of testing in our laboratory.

UV GERMI therefore:

- > has chosen to use **high-quality 316L grade stainless steel** to **manufacture its reactors**
- > selects the **materials best-suited** to the desired functionality
- > manufactures these materials in production sites located **in France** and offers **custom-made solutions**
- > designs **jointly optimised lamps and ballasts** to improve yield and maximize the equipment's life span

PROCESS >

- > In-house engineering and design office
- > Prototype production
- > Manufacturing and assembly in production areas
- > Quality control
- > Packaging (wooden crates from Corrèze)
- > Shipping

Ultraviolet (UV) radiation technology

from nature to nature

Sun >> UV >> water purification



The **UV-C (with a wavelength of 253.7 nanometres) naturally destroys the bacteria, viruses and parasites.**

The physical reaction of this light breaks down the DNA of the microorganisms (viruses, bacteria, mould, pollen), volatile organic compounds (formaldehyde, etc.), and fine particles (including odours). The UV radiation causes these human health hazards to become harmless.

UV GERMI has developed **a system that reproduces the bactericidal effect of sunlight.** This process makes it possible to disinfect using a UV light spectrum with a **wavelength of 254 nanometres.** It **therefore reproduces UV light to purify the air, water, and surfaces.**

This technology offers a better alternative to chemical disinfection, given that the **absence of chemicals** reduces negative impacts on the receiving environment and makes the process completely ecological.

THE DIFFERENT TYPES OF POLLUTION

- > Fine particles
- > Odours
- > Viruses
- > Coronavirus
- > Bacteria
- > Mould
- > VOCs (volatile organic compounds)

Inspired

The relevant environments

INDOOR AIR	WATER	SURFACES
Industry Workshops Offices Schools Hospitals Transport Locker rooms	Waste water Industrial water Agricultural water Drinking water Seawater Swimming pool water	Food industry Pharmaceutical industry Cosmetics industry Medical environments Hospital environments



Ultraviolet (UV) radiation technology

from *nature* to *nature*



Indoor air

One of the key challenges for the environment and public health is that of improving indoor air quality in large and small public spaces **without the use of chemicals**.

In order to meet the needs for indoor air treatment, which increased with the emergence of the H1N1 virus and later Covid-19, **UV GERMI developed its technology to offer effective and environmentally-friendly solutions for indoor air disinfection.**

By combining photo-catalysis

and UV disinfection, UV GERMI technology can **decontaminate indoor air**, removing VOCs, microorganisms and fine particles. It can therefore prevent health risks and sterilise the air in enclosed spaces.

Water

Water treatment affects people, animals and their environments around the world.

Population growth, overproduction, and over-consumption lead to an increase in waste water and call for the expansion of UV technology applications.

The applications of UV treatment technology include drinking water, and waste water treatment and reuse in compliance with health standards.

These applications are also used in the sectors of agriculture (greenhouses and livestock), industry (especially pharmaceutical and food industries), and can be used to treat seawater for farming, water parks, thalassotherapy and balneotherapy centres, and water for private and public swimming pools.



Surfaces

Initially designed for industrial, hospital, and medical environments, the disinfection of surfaces became a **major public health issue** with the emergence of influenza A virus (H1N1) in 2009 and Covid-19 in 2020.

UV GERMI technology provides a fast, effective and clean solution (without detergent) for disinfecting all surfaces.

Waste water

Domestic waste water and industrial and agricultural effluents must be treated in compliance with strict standards before discharge.

The **UV GERMI UV waste water treatment range** can disinfect them before they are discharged to sensitive environments or reused.

UV GERMI equipment is used for these purposes in the following settings:

- > water treatment plants
- > industrial environments
- > sanitation
- > irrigation and watering



Domestic waste water
in France
=
150 litres/day/person

Discharge of **23 m³**
of waste water every
second, around the world
(According to the UN)

Pool water

SWIMMING POOLS - BALNEOTHERAPY - SPAS

Chlorine +
nitrogenous pollutants
(introduced by swimmers)



Chloramine production (toxic, corrosive, and carcinogenic) including trichloramine, which causes nose and eye irritation, respiratory disorders, and certain occupational diseases.



Regulatory standards
Chloramine levels:
< 0.6 mg/l

+ 2 500

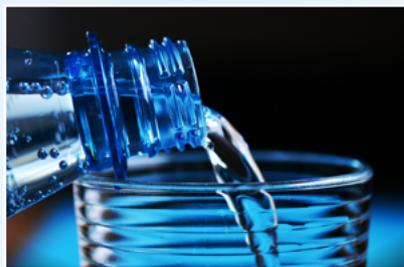
pools equipped with
UV DECHLO

The **UV DECHLO** range (certified by the French Ministry of Health) reduces chloramine levels by **80%** and nitrogen trichloride levels in the air by 50%.

The UV DECHLO process has been **adapted for use in private swimming pools with the UV ZEN range**, which kills bacteria, viruses and microorganisms.

Ranges of drinking water

- > Waste water treatment
- > REUSE
- > Industrial water
- > Agricultural water
GERMISERRE
GERMICHLORE
- > Pool water
UVDECHLO
UVZEN
- > Seawater
PEHD
- > Drinking water
ACS UVGERMI



treatment

Water intended for human consumption contains pathogens; this process of killing bacteria is what makes it suitable for drinking.

The range of ACS-authorized UV GERMI reactors **destroys pathogens without altering the water's organoleptic properties.**

The ACS UV GERMI range guarantees **effective water treatment and offers models adapted to** various flow rates:

- > high flow rates: networks for local authorities and collective housing
- > average flow rates: boreholes or collection wells
- > low flow rates: drinking water purification in Sub-Saharan Africa (Oshun)

Minimum drinking
water needs:

=
20 litres/day/person



748 million
people
do not have access
to drinking water
(www.lemonde.fr
19/08/2019)

Regulatory standards

The UV reactors used for water intended for human consumption must comply with the standards provided for in the Decree of 9 October 2011 (commonly referred to as ACS UV). This certificate is issued based on the following criteria: the safety of the materials used, its effectiveness as validated by biosimetry testing performed by a certified body adhering to international protocol (DVGW-technical standard W294, ÖNORM-technical standard M5873), and validity of the sanitary compliance certificate (issued for a five-year period).

Legionella bacteria

UV GERMI offers a specific, compact range for treating Legionella bacteria.

Legionella bacteria, which proliferate in freshwater, can cause infections (with a 15% risk of death). Certain plumbing components can stimulate their growth.

The relevant environments

- > hot water circuits in sanitation facilities
- > baths, balneotherapy, thermal spas
- > wellness centres and public aquatic centres
- > medical equipment (aerosols)
- > air-conditioning circuits
- > poorly insulated cold water circuits
- > air humidification, misting
- > cooling towers
- > decorative fountains

By destroying pathogens present in the water, **the UVc treatment provided by UV GERMI reactors creates one of the most effective antibacterial barriers.**

Industrial and agricultural water

Water from industrial, semi-industrial, and agricultural environments requiring specific treatment to:

- > **recycle** process, rinse, and washing water
- > **remove** biological and chemical pollutants
- > **remove** contamination and reduce the amount of chlorine to enable use, reuse, or safe discharge into the environment.

UV GERMI **designs, manufactures, and markets specific reactors** to respond to each of these issues.

INDUSTRY

- > **UV water sterilisation range** for industrial effluents
- > **Testing of specific solutions** for eliminating biological and chemical pollutants through advanced oxidation, ozonation-deozonation, and dechlorination.

AGRICULTURE

- > **GERMISERRE Range**
An effective solution for filtering and treating drainage water from greenhouse crops. It destroys nucleic acid from microorganisms (bacteria, viruses, protozoa). This process enables the reuse of water stored after drainage and saves water and fertilizer.
- > **GERMICHLORE Range**
For water used for animal consumption: creates a double barrier, antibacterial UV disinfection, and improves the taste by reducing the amount of chlorine injected.

Seawater

THALASSOTHERAPY & BALNEOTHERAPY – AQUARIUM & ZOO – FISH & SHELLFISH FARMING – BREEDING & HATCHERY – INDUSTRY

Parasites, bacteria, and viruses compromise the quality of the seawater used for these purposes.

UV treatment:

- > An effective and ecological alternative to the use of chemicals, which are harmful for marine organisms
- > The optimal disinfection technique for treating parasites, viruses and bacteria.

The **PEHD UV GERMI range guarantees water of excellent bacteriological quality**, by eliminating the risk of disease and epizootics.

Le +

- Zero risk of corrosion in saline environments**
 - > treatment chamber made with food-grade HDPE
 - > polyester cabinets

UV GERMI, trusted partner of the largest European zoos and water parks!
EuroDisney, Centerparcs, Zoo Parc de Beauval, Nausicaa...

Ranges

indoor air treatment

- > GERMI R 75
- > GERMI R Clean

Surface treatment

- > UV GERMI DP75
- > BAL 2Z60 Portable Lamp



Surfaces

Contact surfaces in industrial sectors and, more generally, any buildings open to the public, contribute to the proliferation and spread of contaminants.

Food, pharmaceutical, cosmetics and cleaning **industries** integrate **antibacterial standards** into their operational processes. This means eliminating any risks of bacterial contaminants in these environments, including in food products, packaging films, packaging machines, conveyor belts, and working surfaces. Since the emergence of the H1N1 virus and the rapid spread of Covid-19 in an outbreak situation, **buildings open to the public** must implement **surface treatment protocols**.

Devices that treat surfaces with UV radiation meet these industrial needs for disinfection and clean all surfaces that contribute to the spread of pandemics. Without the use of heat or chemicals, and without any damage to the equipment being treated, **UV treatment technology offers an effective and ecological alternative for disinfecting surfaces**.

UV GERMI solutions



For industry: **custom-designed, made-to-order UV treatment devices** to meet the specific needs of each activity.



For areas open to the public, with increased needs due to epidemics (**H1N1** then **Covid-19**): design and development of **2 devices capable of destroying pathogens**, such as viruses, and bacteria or mould on dry and inert surfaces by using direct irradiation.

UV GERMI DP75, a mobile device on wheels, can be used inside a closed room, in a dry environment, when no people are present. It can disinfect surfaces in a classroom, for example, in the waiting room of a medical centre, and in any other areas open to the public.

The **BAL 2Z60 Portable Lamp disinfects the hard-to-reach surfaces** on sensitive objects and materials, including computer and electronic hardware. It decontaminates the surfaces of taxi vehicles, operating theatres, dental chairs and photocopiers, which are regularly shared by multiple users. The portable lamp can be operated manually, provided that the user wears a full-visor and protective clothing and gloves.

EXAMPLES OF USES

- > by dentists, doctors, nurses, and physiotherapists to disinfect their offices
- > by taxi drivers, ambulance drivers, forklift operators, firefighters, and transporters to disinfect their trucks and transport vehicles
- > by shopkeepers to disinfect their tills, fitting rooms, and point-of-sale terminals
- > by cafés, hotels, and restaurants to disinfect rooms, furniture, phones, switches, and door handles
- > by local authorities to disinfect schools, gymnasiums, libraries, and public places

Indoor air

With up to 8 times more pollution than outdoor air, indoor air caused 3.8 million premature deaths around the world in 2016.

In France, **the Indoor Air Quality Observatory (OQAI)** found indoor air quality to be poor in 60% of homes and reported that 34% of tertiary buildings (half of offices and three out of every five classrooms) are not equipped with a ventilation and air treatment system.

Covid-19

90% of infections occur through airborne transmission in enclosed and poorly ventilated areas.
(www.caducee.net - 18/05/20, according to an American study)



Its initial research revealed:

- > that **mould** is present in **37% of French homes**
- > **100% of homes are polluted with formaldehyde**



We spend **80%** of our time (on average) in **closed environments** (offices, homes, supermarkets, businesses, workshops, transport, auditoriums).

Daily exposure to physical, biological and chemical agents

- ➔ Changes in atmospheric characteristics
- ➔ Health effects



Viruses (H1N1 then Covid-19)

- ➔ Contamination in closed and confined environments



Air quality has become a major public health issue.



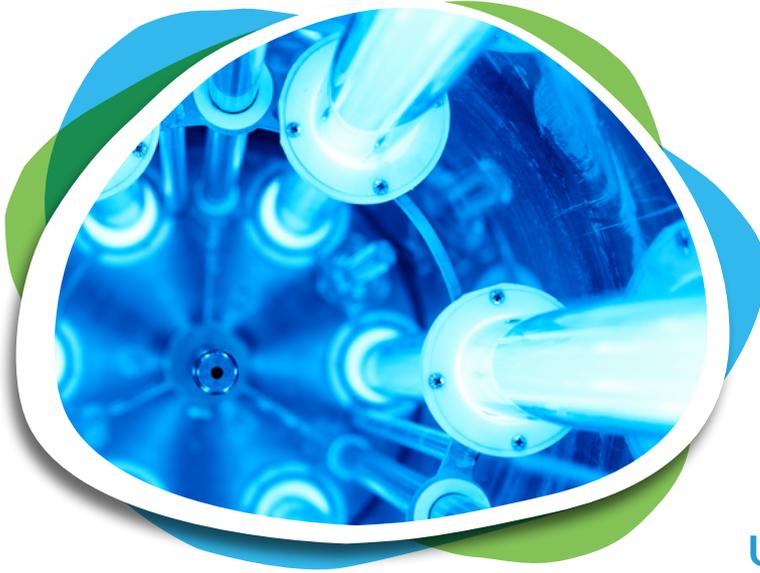
Primary indoor pollutants:

- > **physical elements:** CO2, humidity, particles, man-made mineral fibres
- > **bio-contaminants:** spores, viruses, coronavirus, bacteria, fungi, mould
- > **chemical pollution or volatile organic compounds (COVs):** hydrocarbons, ketones, alcohols, chlorine derivatives, nitrates, amines, aldehydes

Indoor air

UV GERMI offers an air treatment solution based on photo-catalysis combined with UV disinfection

The combined effect of photo-catalysis and UV disinfection purifies indoor air of infectious microorganisms. It relies on titanium oxide to effectively destroy volatile organic compounds (COVs).



By combining UV technology with photo-catalysis, **UV GERMI optimises the treatment's performance** increases its effectiveness:

- > **cleans** the air in indoor environments
- > **disinfects** the air in sensitive environments
- > **limits** the risks of airborne contamination
- > **destroys** microorganisms (chemical pollution) and VOCs
- > **eliminates** viruses and fine particles
- > **treats** odours
- > **protects** archives from the risk of mould
- > **makes the air healthier** and more comfortable for users

UV GERMI solutions: GERMI R75 and GERMI R Clean

- >> **Air purification system** that treats volatile organic compounds (VOCs) and pathogens, including viruses.
- >> Ensures the **protection of individuals** in confined and public spaces, or air-conditioned common areas.
- >> GERMI R75 has been recognised by ADEME (the French Agency for the environment and energy management) as being **the most effective device on the market** (compared to 20 other machines using various techniques).

BENEFITS of UV GERMI devices

- > mobile devices
- > low operating and maintenance costs
- > low-noise

RECOMMENDATIONS

Large indoor spaces
hospital lobbies, industrial
production areas, etc.
= GERMI R Clean

Confined spaces
Waiting rooms, classrooms, dental
clinics, etc.
= GERMI R 75





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