



# TRESA $O_3$

WASTEWATER TREATMENT SOLUTION



ADVANCED OXIDATION PROCESS

## TODAY'S ENVIRONMENTAL CHALLENGES IN THE MEDICAL INDUSTRY

**Health care responsibility is to save lives, but what about its environmental impact with all the by-products and waste generated through its activity?**

Laboratory management is constantly confronted with constraints surrounding disposal waste that may be hazardous for its staff and the environment. Countries are enforcing new EPA norms and regulations, and there is a clear momentum towards ensuring our place of work respects the environment we live in and progress is made towards carbon footprint reduction.

**ABOUT**  **MAUMEE  
SCIENTIFIC**

Maumee Scientifics is a Swiss startup company dedicated to tackling the environmental challenges faced in the medical industry. Our goal is to introduce new technologies that are environmentally friendly and provide solutions for waste discharge that suits any medical environment.



## WASTEWATER TREATMENT SOLUTION

TRESA<sub>3</sub> is the on-site solution designed to help health care laboratories overcome the most stringent requirements related to effluent treatment by:



Neutralization  
and inactivation  
of pathogens /  
microorganisms



Reducing  
COD Level



Improving the  
biodegradability of  
effluents to a COD/  
BOD ratio <3\*





## PRINCIPLE OF ADVANCED OXIDATION PROCESS

The Advanced Oxidation Process (AOP) used by the **TRESA O3** combines Ozone (O<sub>3</sub>) with UVc at 254nm to offer a powerful effluent treatment solution that neutralizes organic compound in the effluent.

Organic oxidation occurs due to the indirect reaction with produced hydroxyl radicals (OH<sup>•</sup>), dissolved molecular Ozone (O<sub>3</sub>) and direct photolysis generated by the UV Lamp. The process consists of three different reactions: direct, indirect and mechanism. These three reactions will oxidize and neutralize organic compound in the wastewater.

## PROCESS DESCRIPTION

The **TRESA O3** is equipped with two tanks, a primary tank and a reaction tank. Once the primary tank is filled the cycle starts and the Ozone generator turns on. The reaction tank pump pushes the wastewater to the reaction tank along with the Ozone through a venturi cone to facilitate dissolution.

Once the reaction tank is full, the switch valve closes to the reaction tank and the effluent circulates in a closed loop cycle between the reaction tank and the UVc lamps while Ozone is continuously injected. Excess Ozone accumulates at the top of the reaction tank and goes back into the primary tank for pre-treatment for the next cycle. The chosen timing parameters for the cycle determines the quantity of Ozone injected, and the UVc dose applied to the effluents. Once the predetermined timing parameter is met, the circulation stops, and the effluent goes through an active carbon filter that will capture residual dissolved Ozone.

The effluents are then discharged to the main sewage and the next cycle starts.





## KEY BENEFIT

### ENVIRONMENTALLY FRIENDLY

- No usage of harsh chemical
- Turns your laboratory into an eco-friendly setting with a reduced carbon footprint
- Final wastewater treated can be rejected into the drain

### ECONOMICAL

- Competitive investment for its low price per m<sup>3</sup> of treated wastewater
- Only requires 220 V electricity supply and access to city water (optional)

### SAFE

- Eliminates the need for onsite bio-hazardous waste storage
- Eliminates the risk of exposure of laboratory staff during transportation
- Fully automated process

### TECHNOLOGY

- Advanced Oxidation Process technology combining Ozone and UVc
- Real time monitoring and efficiency control through PLC
- Low consumables requirement and maintenance



FULLY  
AUTOMATED



SAFE / COST  
EFFECTIVE



ECO  
FRIENDLY

## ADAPTED FOR

The **TRESA O<sub>3</sub>** is designed to fit any clinical and hospital laboratory including Biochemistry, Hematology, Microbiology, and Histopathology. It can also be installed in research laboratories or specialty test laboratories (Food, Agriculture, Blood banks, Anti-Doping). The **TRESA O<sub>3</sub>** is targeted to laboratories which have an effluent output of 500 to 1000 L of waste water per day.



Clinical & Hospital laboratories



Research laboratories



Specialty test laboratories



## OVERVIEW OF THE DIFFERENT COMPONENTS THAT CAN BE OXIDIFIED

**Organic Compounds react with Ozone and in a process similar to combustion.** The reaction of an organic compound with ozone and the combustion of the same compound yield carbon dioxide and water as the main end products. Ozone also combines with most of the Hetro-elements found in organic compounds to produce the elemental oxide with the highest oxidation number.

**Inorganic compounds of lower oxidation numbers react with Ozone to produce oxides, however, there are many inorganic compounds which will not react.** The below table summarize inorganic compounds that will be oxidified.

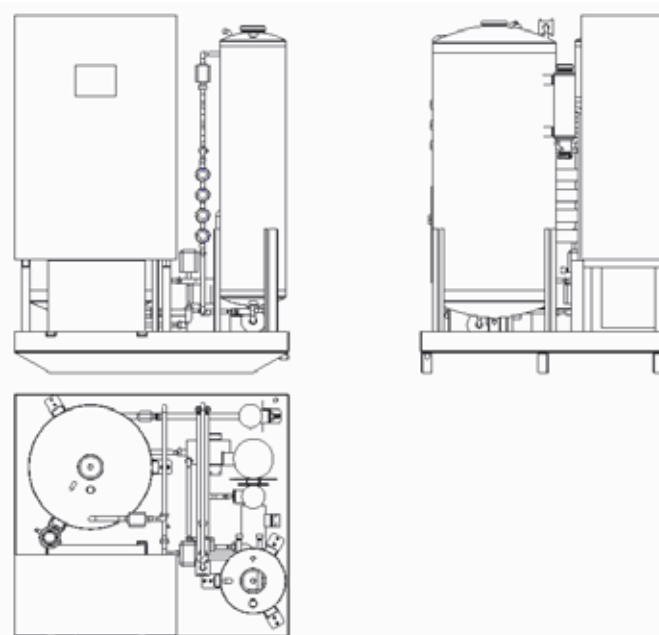
<b>ACIDS, ALCOHOLS, ALDEHYDES AND KETONES</b>	Acetic Acid, Acetone, n-Butyle Acetate, Butoxyethanol, Cetyl Alcohol, Formaldehyde, Isopropyl Alcohol, Glycerol, Methacrylic Acid, Methyl-ethyl Keytone (MEK), Propylene Glycol
<b>AROMATIC COMPOUNDS</b>	Benzene, Benzyl Alcohol, n-Butyl Phthalate, Camphor, Para-Phenylenediamine, Resorcinol, Styrene, Tricresyl, Toulene, Xylene
<b>ALIPHATIC COMPOUNDS</b>	Butane, Isobutane, Liquified Petroleum Gas (LPG), Mineal Spirits, Propane
<b>CHLORIDES</b>	Methylene Chloride, Chloroform, Methyl Chloroform, Perchloroethylene, Trichloroethylene, Phenacetin
<b>NITROGEN CONTAINING COMPOUNDS</b>	Hydrogen Cyanide, Amino Phenol, Ammonia, Ammonium Hydroxide, Benzopyrene, EDTA (Ethylene Diamine Tetracetic Acid), Ethanolamine
<b>SULFUR CONTAINING COMPOUNDS</b>	Ammonium Persulfate, Ammonium Thioglycolate, Sodium Bisulfite, <b>Thioglycolic Acid</b>

**Note:** Wastewater tests will need to be performed prior and after installation of the Tresa O<sub>3</sub> Unit to verify the results of the AOP process on Organic and Inorganic compounds.



## TECHNICAL SPECIFICATION

DIMENSIONS	Hight: 1800 mm – Width: 1200 mm – Length: 1350 mm
WEIGHT	350 kg
TREATMENT CAPACITY	500 to 1000 L per day
ELECTRICITY	230V
TECHNOLOGY	Advanced Oxidation Process (Ozone + UVc)
LOCATION CONDITIONS	Closed Space with ventilation / Minimum 10m <sup>2</sup>
PERIPHERALS	Remote alarm system





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