

te-ion™

Innovative Oxidation Technology



The te-ion™ technology is an advanced oxidation process based on the dosing of non-thermal plasma.

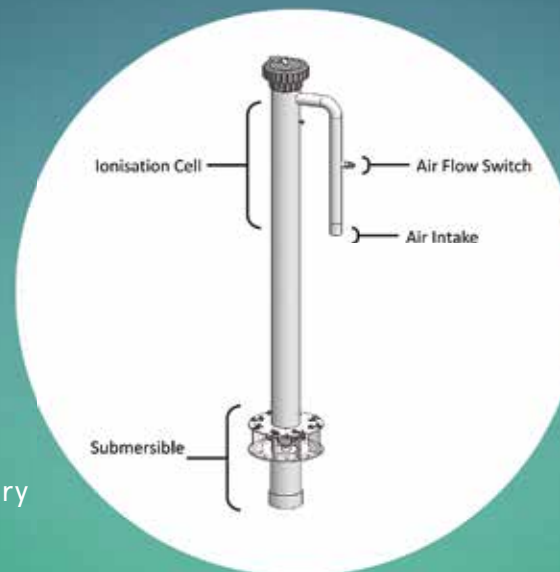
te-ion™ generates an electrical glow discharge to form reactive oxygen species (ROS) in a non-thermal plasma (NTP).

Due to their very high oxidation potential these radicals, can oxidize most organic compounds (via proton transfer or hydrogen atom transfer) and inorganic compounds like arsenic salts from the oxidation state + III to + V. Oxygen radicals can be introduced into the water either by immersed turbine or by external blowers and a floor mounted diffuser system.

For production of NTP just ambient air can be used without additional pretreatment.

Main Advantages

- Much lower energy demand than conventional ozone or advanced oxidation processes
- No inflow air treatment required
- Simple system, robust process, no fine mechanical parts
- Small footprint
- Easy installation, modularly expandable
- Start-up / stop of operation possible
- Long lifetime of equipment
- Cheap and easy replacement
- No additional chemicals or consumables necessary



Applications

- Removal of trace substances
- Arsenic removal
- Suppression of bulking sludge (Microthrix Parvicella and / or Nocardia)
- Removal of heavy metals
- In-situ membrane cleaning
- Colour removal (humic acids)
- Disinfection

Removal of Trace Substances

Through human activities and human sewage, anthropogenic trace substances enter the municipal wastewater systems and finally get into surface waters via wastewater treatment plant effluents. From the surface waters they can also pass into ground and drinking water resources.

Our solution to treat these persistent substances is the te-ion™ technology. The overall process consists of two steps. The innovative te-mem™ ultrafiltration technology removes most suspended solids, turbidity and microorganisms. The following te-ion™ process oxidizes the remaining trace substances or splits them into

subcomponents that are easily biologically degradable in the recipient water course.

The modular nature of the process is suitable for all sizes of existing and new wastewater treatment plants.



Arsenic Removal

Arsenic is a naturally occurring element in ground waters, especially near geothermic or mountainous environments.

In drinking water it constitutes a serious health risk and may lead to chronic diseases. With te-ion™ abstracted water can be treated with the a combination of advanced oxidation with non-thermal plasma, iron coagulation

(precipitation of arsenate) and te-mem™ ultrafiltration membrane technology (complete separation of arsenate precipitations and bacteria /viruses > 0.02 µm). The combination of these technologies can achieve degradation in excess of 99%.

Suppression of Bulking Sludge

The te-ion™ technology immersed in activated sludge bioreactors provides superior suppression of bulking sludge by destruction of Microthrix Parvicella and / or Nocardia.

The non-thermal plasma generated in the te-ion™ process is introduced into the aeration tank and breaks down filamentous microorganisms on the sludge flocs which leads to an enhanced settling behaviour. This will avoid the need for additional dosing of coagulation or sludge suppression chemicals.



Before

After



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