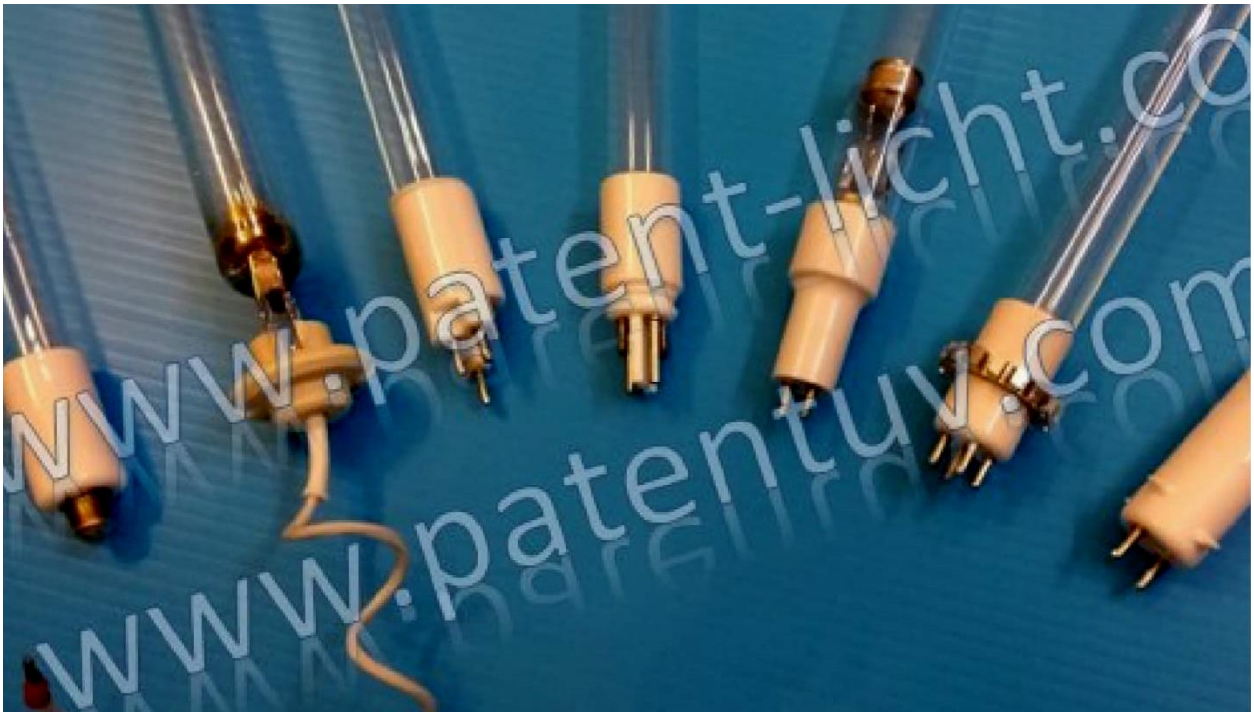
PATENT Total Oxidizable Carbon (TOC) Lamp



Total Organic Carbon is a term used to describe the measurement of organic (carbon based) contaminants in a water system. Organic contamination can come from a variety of sources, since "organics" are compounds such as sugar, sucrose, alcohol, petroleum, PVC cement, plastic based derivatives, etc.

Organics may exist in the feed water.

Organics may result from the leaching or shedding of various components within the purification or water distribution system.

Organics may result from the formation of biofilms (bacteria) in the water system

Reduction of Total Organic Carbons (TOC's) in water is achieved via three types of reactions initiated by UV that work to destroy and/or remove organic carbons.

1) Oxidation
   - It begins with high-energy 185 nm UV dissociates water molecules, by creating hydroxyls (free OH- radicals). The hydroxyls created by UV are highly reactive and readily combine with other molecules, such as the hydrocarbon molecules that make-up TOC's. When hydroxyls combine with the TOC hydrocarbons they form water and carbon dioxide molecules; TOC's are destroyed and the oxidation is complete.

2) TOC reduction
   - It works to remove the ultraviolet photons dissociate organic molecules directly. This result is TOC removal/ TOC reduction by means of destruction.

3) Deionization
   - UV reaction occurs when deionization is added downstream of a UV reactor. Ultraviolet energy will ionize TOC's, which allows for subsequent removal by a deionization system.

Lamp References:

Aquafine 17498, Aquafine Silver L, Aquafine 3095, Aquafine 3084, Aquafine 17820, Aquafine 18953, Aquafine 18063, Chiyoda Kohan SV1500, Hanovia 130033-0652, Hanovia 130033-3001, Photoscience S990W-F, Photoscience 7990W, Photoscience 7990WS, Ideal Horizon LMP11004, LMP 41007, LMP42005, Berson B80TI 2.43.173