



Case Study - Ozone to Control Microbial Growth in RO Storage Tanks

Customer manufactures parts for the Aircraft industry where during this process these parts are rinsed with RO water. Facility currently has two existing 5000 gallon Polyethylene RO holding tanks with approximate dimensions of 120" x 144" plumbed in series which are fed by a 20 GPM RO system. Customer estimates 32 – 34 GPM flow rate from #2 to process.

Customer desires to introduce ozone as a mean to control microbial growth in these holding tanks and inquired about bubbling ozone in.

First of all, ozone is a great choice for this application however we would not recommend bubble diffusion. Bubble diffusion is commonly used in the Bottled Water industry where a sealed stainless steel contact vessel typically 30" x 150 – 180" tall is used. To achieve a moderate mass transfer of ozone gas into water the bubble diffuser is placed in the bottom of contact tank and there is a counter flow of water from top. Using bubble diffusion in an atmospheric tank would be comparable to bubbling oxygen in a fish tank. The main issue with the above method is controlling the ozone off gas. If a 50% mass transfer efficiency could be achieved that means 50% is gassing off which can be harmful to personnel.

Ozone contacting skids typically utilize an injector which draws the ozone gas into the water stream allowing it to dissolve more efficiently. Water is then passed through some kind of reactor vessel then a degas separator where the un-dissolved ozone is stripped out and routed to an ozone destruct unit. This method is by far superior with typical mass transfer efficiencies of 85 – 95% easily achieved.

For ozone to be effective in this application each RO tanks would require a recirculation loop for constant monitoring and ozone dosing. Ozone will dissipate over time reverting back to oxygen so we do not recommend just injecting ozone into the main RO feed. The RO water is acceptable to microbial growth while sitting in the storage tanks waiting to be used.

Normally one injection/ozone contacting skid could be used by drawing water out of tank #2 and putting back in tank #1 since they are connected in series. However it was mentioned that these existing tanks are an estimated 20' – 30' apart with a concrete wall between so we propose two separate injection skids for this project.

Each skid will have its own recirculation pump, injector, and flash reactor, degas separator, air vent and destruct along with an ORP probe installed in-line. ORP (Oxidation Reduction Potential) is an economical method of controlling ozone dose with minimal maintenance required.