

WT-400	DISINFECTION EQUIPMENT
WATER TREATMENT SPECIFICATIONS	

GENERAL

1.01 SECTION INCLUDES

- A. Mixed Oxidant Generation System, Accessories, and Appurtenances

1.02 RELATED SECTIONS

- A. Division 16: Electrical

1.03 SUBMITTALS

- A. Division 1

1.04 SYSTEM DESCRIPTION

- A. Oxidants are generated on site with a mixed oxidant generator using granular salt.
- B. The mixed oxidants are stored in a holding tank and fed into the main water line with a venturi injection system.
- C. The system includes a water softener that conditions feed water to the mixed oxidant system at a level of 1 grain hardness or less.
- D. System controls for the mixed oxidant generator automatically monitor system functions and provide fault indications and electrical contacts for alarm system operation.
- E. All connections required for installation of the mixed oxidant generator, control panel installation, and piping as packaged by the supplier.

PART 2: PRODUCTS

2.01 MATERIALS AND DESIGN REQUIREMENTS

- A. Mixed Oxidant Generator
 1. _____ gallons per hour of an aqueous mixed oxidant solution.
 2. Mixed oxidant constituents include hypochlorous acid, hydrogen peroxide, oxygen and other chlor-oxygen species.
 3. Free chlorine equivalent production of _____ pounds per day.
 4. Power supply shall be ___ VAC _____ phase, 50/60 cycle.

5. 1/2" NPT water softener port in brine tank for brine feed for water softener recharge.
 6. Control panel with automated control system and diagnostic system for fault indication.
 7. Control panel connector with contact closure on system fault for SCADA or alarm system interface.
 8. 3/4" male hose connection for fresh water feed line to system. System feed pressure less than 125 psi.
 9. Vacuum breaker on feed water source to prevent backflow to water supply system.
 10. ___ system(s) required.
- B. Oxidant Holding Tank
1. ___ gallon capacity with lid.
 2. Linear low density polyethylene (LLDPE) construction.
 3. Liquid level switch for high and low level control. Switch is a dry circuit type hermetically sealed reed switch with gold contacts. Single pole single throw. When floats are dry, contacts are closed. 10 watt rating.
 4. Supply tube for mixed oxidants to the tank enters at the top and is fed through a drop tube to the bottom of the tank. Supply tube inlet includes vent at the entrance to the tank for venting offgas accumulation in mixed oxidant stream.
 5. Tank drain is 1/2" PVC ball valve with 3/8" hose barb connection to injection system.
 6. One tank required.
- C. Catholyte Holding Tank (required only if needed for special process conditions such as pH control)
1. ___ gallon capacity with lid.
 2. Linear low density polyethylene (LLDPE) construction.
 3. Liquid level switch for high and low level control. Switch is a dry circuit type hermetically sealed reed switch with gold contacts. Single pole single throw. When floats are dry, contacts are closed. 10 watt rating.
 4. Supply tube for catholyte to the tank enter at the top and is fed through a drop tube to the bottom of the tank. Supply tube inlet includes vent at the entrance to the tank for venting offgas accumulation in mixed oxidant stream.
 5. Tank drain is 1/2" PVC ball valve with 3/8" hose barb connection to injection system.
 6. One tank required.
- D. Water Softener, Dual Tank Type
1. Dual type water softener with hydraulically driven flow controlled switchover valve. When first tank is loaded with calcium, the control mechanism automatically switches to the alternate tank and performs a backwash operation on the first tank.
 2. Connections for feed water to softener (3/4" hose connection), brine feed from mixed oxidant system (1/4" high density polyethylene tubing), backwash drain (3/8" high density polyethylene tubing), and feed line to mixed oxidant generator (3/4" hose connection).
 3. Power supply: none required -- system operates off of water supply hydraulic pressure.
- E. Injection System, Venturi
1. Liquid injector with _____ gallon per hour capacity.
 2. Kynar construction.
 3. Inline mounting with ___ inch inlet and outlet connections.
 4. Vacuum connection is _____ inch female NPT for direct connection to flow meter.
 5. Inline flow meter with operating range of 0 to ___ gallons per hour with 1/2 inch male NPT inlet and outlet connections.
 6. Metering valve with 1/2" female NPT connections. Kynar material.

7. Check valve with 1/2" male NPT connection to metering valve and 3/8" hose connection for mixed oxidant suction -- integral to venturi injector.
 8. Booster pump with inlet pressure rated to water system maximum pressure of _____ psi. Differential pressure across booster pump to be _____ psi providing an outlet pressure of _____ psi at a flow rate of _____ gallons per minute.
- F. Injection System, Diaphragm Pump
1. Pump flow rate shall be _____ gallons per minute.
 2. Pump injection pressure shall be _____ psi minimum.
 3. Pump stroke length shall be manually adjustable.
 4. Generally, fluid end components shall be teflon or teflon faced diaphragms, ceramic ball check valves, teflon or teflon coated seals, and pump head materials of teflon or PVDF. Note: PVC components are not recommended by Prominent Fluid Controls, Inc. Consult other manufacturers for their recommendations.
 5. Discharge piping shall include a pressure relief valve to protect pump and piping components from overpressure conditions.
 6. Discharge piping shall include a check valve to prevent backstreaming through the pump head. Check valve shall have a pressure rating exceeding the pressure rating of the pressure relief valve.
 7. For proportional flow control: Injection pump shall include control electronics for input of a 4 to 20 milliamp control signal.
 - For chlorine residual control: 4-20 milliamp control signal shall be inversely proportional to input control signal from zero to full volume. As input control signal increases, pump volume rate shall decrease.
 - For volume control applications: 4-20 milliamp control signal shall be directly proportional to input control signal. As input control signal increases, pump volume rate shall increase.
 - Note to specifier: In many applications, the flow transmitter sending a signal to the metering pump may have an operational range that is greater than the desired pump operational range. For instance, if the flow transmitter is designed for an output signal of 4 to 20 ma over a flow range of 0 to 1000 GPM and the operating range of the water system is only 0 to 500 GPM, then the signal from the flow transmitter to the injection pump will not be synchronized. In this situation, the oxidant injection pump would only pump at half of rated capacity because the input signal from the controller is only transmitting a signal that is half the rated capacity of the flow transmitter. In these situations, it may be desirable to specify a signal translator that shifts the output signal from the flow transmitter up so that the pump will inject oxidants at the full capacity of the pump when the water system flow rate is at maximum capacity - i.e. 500 GPM in this example. Signal translators are available from pump manufacturers or can be obtained separately.
- G. Mixed Oxidant Tubing: Supplied by manufacturer.
- H. Safety Equipment
1. None Required.
- I. Salt supplied by owner. Salt to be solar type salt with granular size less than 1/2" and processed to provide salt purity of greater than 99.5%. The salt should not have additives or rust inhibitors.

Most solar salts meet these requirements. Recommended brands include Morton's Solar Salt for water softeners, Diamond Crystal water softener solar salt as sold by Akzo Nobel Salt, Inc., or solar salt sold by North American salt. Moab water softener salt is not recommended.

- J. Spare Parts:
 - 1. Mixed oxidant tubing: 20 ft.
 - 2. Mixed oxidant generator electrolytic cell.
- K. General: All equipment and materials specifically designed and recommended for this application.

2.02 ACCEPTABLE MANUFACTURERS

- A. MIOX Corporation (for mixed oxidant generators and associated equipment)
- B. Mazzei Injector Corporation (for injection system components)
- C. King Instrument Company (rotometers)
- D. Sta-Rite Pump Company (booster pumps)
Gould Pump Co. (booster pumps)
Grundfos Pumps Corporation (booster pumps)
- E. LMI Liquid Metronics Division Milton Roy (Injecton pumps)
Prominent Fluid Controls, Inc.
- F. Kinetico (water softener)
- G. All system components for the mixed oxidant system shall be made by the same manufacturer.

PART 3: EXECUTION

3.01 INSTALLATION

- A. Per manufacturer's installation manual.

3.02 MANUFACTURER'S ON-SITE SERVICE

- A. Startup, check, adjust, and verify all components and entire system is properly installed and ready for use.
- B. Certify in writing that system and components are properly installed and ready for use.
- C. Train Owner's Personnel: Two hours minimum, scheduled in advance in writing with Engineer.

END OF SECTION