

SPECIFICATION SECTION XXX

PRODUCT: SODIUM REGENERATED ION EXCHANGE WATER SOFTENER

1.0 GENERAL Furnish a meter demand sodium regenerated water softener as specified here in this section and as called for in the equipment schedule for the reduction of water hardness. The water softener shall be supplied complete, skid mounted, pre-plumbed, and assembled entirely by one manufacturer. System to include all components required for proper operation of the system. These components include mineral tanks, steel equipment skid with pre-plumbed PVC inlet, outlet and drain plumbing headers, ion exchange resin, gravel under-bedding, internal distributor system, control valves, meter(s), back wash flow controller(s), and brine tank(s) with air check. System configuration shall be a [Duplex Alternating] [Duplex Progressive] [Triplex Progressive] [Quadplex Progressive]. Expressed grain capacity of the system is per mineral tank. The system shall be a Watts Model # M4 _____

2.0 RELATED SECTIONS XXX

3.0 COMPONENTS

3.1 Mineral Tank

The mineral tank shall be constructed of a polyethylene liner with a continuous roving outer fiberglass reinforced wrapping. The tank shall be non-ASME code with a 150 psi maximum pressure rating and a 120 deg. F (48 deg. C) maximum temperature rating, and certified to NSF/ANSI Standard 44 or 61. 14" diameter tanks and larger shall have a bottom base permanently installed with industrial grade adhesive. Tank shall be supplied with a 6" top flange or a 4" top threaded port for loading media and connection of the control valve. The tank shall be designed with a safety factor of 4:1 for minimum burst pressure.

3.2 Ion Exchange Resin

The ion exchange resin shall be a high quality, premium grade, strongly acidic gel-type cation exchange resin specially designed for drinking water treatment and certified to NSF/ANSI Standard 61 and 372. The ion exchange resin shall be composed of polystyrene with 8% divinylbenzene crosslinking that offers excellent bead integrity, high resistance to bead fracture or osmotic shock, and very low extractables. The resin shall have a light amber color and shall be specially pretreated to remove taste, odor and color throw. Resin bead size shall be 16X40 mesh. The resin shall meet the requirements of FDA regulation CFR section 21,

§173.25. Maximum grain capacity per cubic foot of resin shall be 30,000 grains as CaCO₃ when regenerated with 15 lbs of sodium chloride and 20,000 grains as CaCO₃ when regenerated with 6 lbs of sodium chloride. PH stability of the resin must be 0-14. Temperature stability of the resin must be up to 250 deg. F (121 deg. C). The resin shall be Watts Model # A4000.

3.3 Gravel Under-bedding

The gravel under-bedding shall be a flint media. This media shall be washed to rid it of fines to prevent clogging of the lower distributor system. Enough gravel must be furnished to completely cover the lower distributor in the mineral tanks.

3.4 Internal Distributor System

The internal distributor system shall come already installed in the water softener mineral tanks. The screens/laterals of the internal distribution system shall be a slotted screen type diffuser. The slot cross section shall be a V shape to promote a self-cleaning characteristic of the slot. Slot size shall be .008" and not allow the resin to pass through and become present in the systems effluent water. The lower distributor shall be a hub and lateral design for mineral tanks over 24" in diameter and a single point design for mineral tanks 24" in diameter and below. Lateral type screen will have an internal perforated pipe core to evenly distribute water flow across the entire lateral to prevent resin bed channeling. The internal distributor system screens shall be made of abrasion resistant 20% glass filled polypropylene. The distributor tube connecting the internal distribution system to the system control valve shall be made of polyvinyl chloride.

3.5 System Control Valve

The system's control valves shall control all functions of the water softener regeneration and service cycles. The control valves shall be a multi-port type constructed of lead free brass as defined in the US EPA Safe Drinking Water Act and be tested and certified to NSF/ANSI STD. 61 Section 8 Material Safety Only and NSF/ANSI STD. 372 for Lead Free compliance. Cycle positioning shall be motor driven, slow in actuation, and not cause pressure surges or water hammer. The system control valve shall be furnished with a fully programmable microprocessor based controller with an LCD screen. Operating data from the system shall be stored within the controller and displayed on the screen. Operating data shall be

peak flow rate, totalizing meter, gallons remaining in softening cycle, use since last regeneration, regeneration interval, and error history log. The control valves will be provided with a multi-color LED display to indicate the position of the system. In service, regeneration, standby position, and error conditions will be indicated by the condition of the LED. The valves will be supplied with a normally open and normally closed dry contact for interface with the building control system. The controller, related wiring, and positioning motors shall be housed within a water resistant gasket sealed enclosure. The control valves shall be supplied with a meter capable of tracking gallons higher and lower than the system is capable of processing so that it is not a flow restriction at high flow rates or not sensitive to low flow rates. A drain line flow controller shall be provided to regulate the flow of water to drain during a regeneration cycle. The flow controller shall be constructed of a sch. 80 PVC nipple or brass coupling with an orifice plate in the middle. Pressure sensitive rubber flow restrictors shall be installed in the orifice plate. These flow restrictors shall not be able to wash out of the plate and shall allow the consistent passage of water with pressure fluctuations between 30 to 100 psi.

3.6 Brine Tank

Provide a brine tank made of high density polyethylene for making a brine solution for the water softener to use during a regeneration cycle and for salt storage. The brine tank shall be furnished with an over flow connection, lid, aircheck, and brine well. The brine tank shall be sized to hold enough salt for 12 regenerations at 6 lbs of salt per cubic foot of resin.

3.7 Test Kit

Provide a Watts model T10460 hardness test kit to the owner upon start up of the system.

3.8 Skid Mounting

The system mineral tanks shall be factory skid mounted on one common equipment skid that includes inlet, outlet and drain plumbing headers. The skid shall be constructed of powder coated carbon steel, have a continuous horizontal metal platform surface for placement of mineral tanks, and include a vertical support structure for securing mineral tanks and supporting plumbing headers. The inlet, outlet, and drain plumbing headers shall be constructed of Type 1, Grade 1, schedule 80 PVC plumbing that conforms to ASTM D-1785 and produced from the NSF approved compounds conforming to ASTM D-1784.

Inlet and outlet header plumbing will include individual mineral tank inlet and outlet isolation valves and an overall system bypass valve. Union connections shall be included at the inlet, outlet, and drain port of each mineral tank.

4.0 SERVICES

4.1 Warranty

The Contractor providing the equipment shall provide a 1 year parts and labor warranty for the system to protect against manufacturers defects. The system shall not be subjected to water temperatures above 110 deg. F (43 deg. C) or below 34 deg. F. (1 deg. C) nor shall it be subjected to pressure exceeding 125 psi. During operation the feed water pressure must not fall below 25 psi so a proper regeneration can be performed. The resin shall not be subjected to iron levels greater than 1 ppm or free chlorine greater than 1 ppm. The resin attrition shall not be more than 3% per year.

4.2 Start Up

The Contractor providing the equipment shall provide start up of the water softener system, ten 50 lb bags of pellet form sodium chloride for the brine tank, and perform a training for the owner upon completion of start up.