

## **SODIUM HYPOCHLORITE STORAGE AND FEED SYSTEM**

### **PART 1 -- GENERAL**

#### **1.1 THE REQUIREMENT**

- A. The CONTRACTOR shall provide a sodium hypochlorite storage and feed system, complete and operable, in accordance with the Contract Documents.
- B. The CONTRACTOR shall assign to a single metering pump manufacturer full responsibility for furnishing and functional operation of the sodium hypochlorite storage and feed system. The designated single manufacturer, however, need not manufacture the entire system but shall coordinate the design, assembly, testing, startup, and training of the entire system. Coordination shall be with:
  - 1. The CONTRACTOR for installation of manufacturer-supplied components as well as other system components provided by the CONTRACTOR.
- C. Various specifications, codes and standards are referenced in this Section. Other specifications, codes and standards may also be used when they are as stringent as those referenced as approved by the ENGINEER.

#### **1.2 CONTRACTOR SUBMITTALS**

##### **A. General:**

- 1. Complete details of tubing and associated fittings and ball valves.
- 2. Complete details of sodium hypochlorite metering pumps, including pump output data, materials of construction, and dimensional information.
- 3. Complete details, including size, type, and materials for the sodium hypochlorite pump multifunction valve.
- 4. 1000-liter polyethylene tanks

## PART 2 -- PRODUCTS

### 2.1 SYSTEM REQUIREMENTS

- A. Each of the areas shall be provided with the following items, with the noted exceptions.
1. Two 1000-liter polyethylene tanks
  2. Tubing and associated fittings and ball valves, to be utilized between the polyethylene tanks and metering pumps and between the metering pumps and injection point, as indicated.
  3. Two electric chemical feed (metering) pumps,
  4. Two multifunction valves
  5. Other miscellaneous appurtenances as specified and shown.
- B. Wetted parts of the entire sodium hypochlorite storage and feed system shall be selected by the manufacturer to ensure optimum, corrosion-free, and erosion-free operation for sodium hypochlorite with the following properties:

Chemical	Sodium hypochlorite
Concentration, trade %	12-16
Specific gravity	1.14
pH	11 to 13
Viscosity, mPa-s at 25 °C	2.5
Maximum temperature, °C	52

## 2.2 TUBING, FITTINGS, AND BALL VALVES

- A. **Tubing:** Tubing shall be constructed of high quality, linear low density polyethylene (LLDPE) resin, 8 mm OD, 6 mm ID, clear color, with a minimum working pressure of 11 bar at 24 °C and a 3:1 safety factor on working pressure.
- B. **Fittings:** Tube fittings shall be constructed of fiberglass reinforced polypropylene, suitable for use with 8 mm OD tubing, compression type, suitable for 14 bar pressure at 20 °C.
- C. **Ball Valves:** Metric-sized plastic valves located in the tubing on the suction and discharge sides of sodium hypochlorite (metering) feed pumps shall be of the vented type, capable of bi-directional flow, with a straight-through flow path for minimum pressure drop. Ball valves shall have compression fittings suitable for use with polyethylene tubing. Body, seats, o-rings, seals, and all other wetted metal parts shall be constructed of materials compatible with sodium hypochlorite. Stem seal shall be capable of being maintained while inline. Ball valves shall have a PN 10 pressure rating. Actuator shall be 90-degree turn with positive stops.

## 2.3 POLYETHYLENE BULK STORAGE TANKS

- A. The metering pump manufacturer shall provide the two polyethylene tanks for each sodium hypochlorite storage and feed system.

## 2.4 ELECTRIC CHEMICAL FEED (METERING) PUMPS

**General:** Sodium hypochlorite feed pumps shall be microprocessor-controlled, simplex, solenoid-driven, reciprocating, and mechanically-actuated diaphragm type. The housing shall be rated NEMA 4X

- A. **Stroke Length Adjustment:** Sodium hypochlorite feed pumps shall have manually adjustable stroke length with a range of 10:1 and an accuracy of 2.0% of the full-scale range.
- B. **Stroke Frequency Adjustment:** Sodium hypochlorite feed pumps shall have manually adjustable stroke frequency with a range of 10:1.
- C. **Power:** The power supply shall be 230 VAC, 50 Hz, single phase. The microprocessor shall automatically compensate for supply voltage variations within 10% of the rated voltage such that the frequency of the pump remains constant.
- D. **Liquid End:** The liquid end shall be physically separated from the drive unit by a backplate with weep hole creating an air gap. A seal shall prevent contamination of the solenoid if the primary diaphragm fails. The diaphragm shall be constructed of a fabric-reinforced EPDM or Hypalon with a metal or plastic core having a Teflon-faced fluid contact surface. The liquid end and seals shall be of materials suitable for use with sodium hypochlorite.
- E. **Check Valves:** Integral suction and discharge check valves shall be of materials suitable for use with sodium hypochlorite and of the double ball check design.

- F. **Fault Relay:** The sodium hypochlorite feed pump shall have an integral relay to allow remote annunciation of a fault condition (i.e. system faults and fuse/power supply failure).
- G. **Connections:** Sodium hypochlorite feed pump connections shall be suitable for the specified tubing.
- H. **Discharge Pressure and flow :** Sodium hypochlorite feed pumps shall have a maximum discharge pressure rating 16 bars @ 2.2 L/Hr
- I. **Manufacturers, or Equal:**
  - 1. **ProMinent Fluid Controls, Inc., Series gamma/L**
  - 2. **Pulsafeeder, Inc., PULSAtron Series MP**

## 2.5 MULTI-FUNCTION VALVES

- A. Multi-function valves shall be provided, mounted on the discharge of each chemical feed (metering) pump. Multi-function valves shall provide for pressure relief, backpressure, anti-siphon, air bleed, and discharge drainage. Multi-function valves shall be of the diaphragm type with a pre-set pressure spring and shall be of PVDF construction with a PTFE-coated diaphragm and Viton o-ring seals. Backpressure setting shall be approximately 1.5 bar. Pressure relief setting shall be between 3.5 and 6.0 bar for all sites except the following, where the pressure relief setting shall be between 8.6 and 10 bar

## 2.6 Polyethylene tanks

- A. tanks are made of UV-stable polyethylene or polypropylene with threaded neck openings for metering pumps and stirring equipment and the capacity is 1,000 liters
- B. Design in accordance with DVS2205 (design calculations for thermoplastic containers and apparatus), conformance with EN 10573
- C. Standard colour: natural,
- D. Contractor to submit tank with all required outlets and inlet and orientation

## 2.6 Exhaust Wall Fans

- Wall fans shall be suitable for sidewall installation; shall be direct drive, centrifugal forward curve type, with corrosion resistant housing and scrollaluminum wheels and housing, and a wheel guard located on the discharge side; and shall be statically and dynamically balanced at the factory. The fan motors shall be of adequate size to prevent overloading when

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operating at the specified capacity and shall be suitable for use with the power supply indicated in the schedules on the Drawings. Each fan shall be complete with 13 mm mesh aluminum bird screen over all openings., and, where indicated in the schedules on the Drawings, a chatter proof backdraft damper.

- Motors and drives shall be mounted outside the airstream. The wheel shaft shall be of ground and polished steel, mounted in heavy-duty, relubricatable or permanently sealed bearings with a minimum L50 service life of at least 200,000 hours at the equipment's maximum cataloged operating conditions. Nomial fan motor speeds shall not exceed 1550 RPM.