

## **1 General**

### **1.1 RELATED SECTIONS**

- .1 Section 23 08 16 - Cleaning and Start-up of HVAC Piping Systems.

### **1.2 REFERENCES**

- .1 American Society of Mechanical Engineers (ASME)
  - .1 ASME Boiler and Pressure Vessel Code, Section VII.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).

### **1.3 SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures. Include product characteristics, performance criteria, and limitations.
    - .1 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
  - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Quality assurance submittals: submit following in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .4 Closeout Submittals:
  - .1 Submit operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
  - .2 Include following:
    - .1 Log sheets as recommended by manufacturer.

### **1.4 QUALITY ASSURANCE**

- .1 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

### **1.5 DELIVERY, STORAGE, AND HANDLING**

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store and handle in accordance with manufacturer's written instructions and Section 01 61 00 - Common Product Requirements.
- .2 Waste Management and Disposal:
  - .1 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse in accordance with Section 01 74 00 - Cleaning.

## **2 Products**

### **2.1 MANUFACTURER**

- .1 Equipment, chemicals, service provided by one supplier.

### **2.2 POT FEEDER**

- .1 Bypass filter feeders to be supplied and installed in the following systems:
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- .1 Closed circuit hot water heating systems.
- .2 Maximum working pressure: 1200 kPa.
- .3 Welded steel, pressure rating 1200 kPa. Temperature rating: 90 degrees C.
- .4 Tank shell: 10 gauge.
- .5 Tank head: 9 gauge.
- .6 Cap: Cast iron with Buna 'N' square O-ring seal. Cap to have wide mouth, easy open-easy close.
- .7 Vertical style with bottom dished in.
- .8 NPT female 3/4 connections.
- .9 Provide each bypass feeder with a 30 micron filter bag to filter chemical before injection into closed loop heating systems.

### **2.3 WATER TREATMENT FOR HYDRONIC SYSTEMS**

- .1 Hot water heating system: pot feeder, 19 L.
- .2 Micron filter for each pot feeder:
  - .1 Capacity 2% of pump recirculating rate at operating pressure.
  - .2 Six (6) sets of filter cartridges for each type, size of micron filter.
- .3 Provide one (1) molybdenum test kit to verify water treatment performance.
- .4 Recommended start-up dosage to be in accordance with feed rate as determined by water treatment system supplier for purposes of tendering consider 100ppm molybdate.
- .5 Solution to arrive on site in sealed drums in liquid form. Contractor responsible to store the chemical in a cool dry well ventilated area.

## **3 Execution**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

### **3.2 INSTALLATION**

- .1 Install HVAC water treatment systems in accordance with ASME Boiler Code Section VII, and requirements and standards of authorities having jurisdiction, except where specified otherwise.
- .2 Ensure adequate clearances to permit performance of servicing and maintenance of equipment.

### **3.3 CLEANING OF MECHANICAL SYSTEM**

- .1 Provide copy of recommended cleaning procedures and chemicals for approval by Departmental Representative.
- .2 Flush mechanical systems and equipment with approved cleaning chemicals designed to remove deposition from construction such as pipe dope, oils, loose mill scale and other extraneous materials. Use chemicals to inhibit corrosion of various system materials that are safe to handle and use.
- .3 Examine and clean filters and screens, periodically during circulation of cleaning solution, and monitor changes in pressure drop across equipment.
- .4 Drain and flush systems until alkalinity of rinse water is equal to make-up water. Refill with clean water treated to prevent scale and corrosion during system operation.
- .5 Disposal of cleaning solutions approved by authority having jurisdiction.

### **3.4 FIELD QUALITY CONTROL**

- .1 Start-up:

- .1 Start up water treatment systems in accordance with manufacturer's instructions.
- .2 Commissioning:
  - .1 Commissioning procedures - Closed Circuit Hydronic Systems:
    - .1 Analyze water in system.
    - .2 Based upon an assumed rate of loss approved by Departmental Representative, establish rate of chemical feed.
    - .3 Record types, quantities of chemicals applied.
  - .2 Training:
    - .1 Commission systems, perform tests in presence of, and using assistance of, assigned O&M personnel.
    - .2 Train O&M personnel in softener regeneration procedures.
  - .3 Certificates:
    - .1 Upon completion, furnish certificates confirming satisfactory installation and performance.
  - .4 Commissioning Reports:
    - .1 To include system schematics, test results, test certificates, raw and treated water analyses, design criteria, other data required by Departmental Representative.
  - .5 Commissioning activities during Warranty Period:
    - .1 Check out water treatment systems on regular basis and submit written report to Departmental Representative.

### **3.5 CLEANING**

- .1 Proceed in accordance with Section 01 74 00 - Cleaning.
- .2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

**END OF SECTION**

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