

**SECTION 23 2213**  
**STEAM AND CONDENSATE HEATING PIPING**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Pipe and pipe fittings.
- B. Pipe hangers and supports.
- C. Steam piping system.
- D. Steam condensate piping system.

**1.2 RELATED REQUIREMENTS**

- A. Section 09 9123 - Interior Painting.
- B. Section 23 2214 - Steam and Condensate Heating Specialties.

**1.3 REFERENCE STANDARDS**

- A. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2011.
- B. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2012.
- C. ASME B31.1 - Power Piping; 2014.
- D. ASME B31.9 - Building Services Piping; 2014.
- E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- F. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2015.
- G. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers; 1992 (Reapproved 2014).
- H. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015 (Errata 2016).
- I. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2009.

**1.4 SYSTEM DESCRIPTION**

- A. When more than one piping system material is selected, ensure systems components are compatible and joined to ensure the integrity of the system is not jeopardized. Provide necessary joining fittings. Ensure flanges, unions, and couplings for servicing are consistently provided.
- B. Provide pipe hangers and supports in accordance with ASME B31.9 or MSS SP-58 unless indicated otherwise.
- C. Use gate valves for shut-off and to isolate equipment, part of systems, or vertical risers.

**1.5 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories. Provide manufacturers catalogue information. Indicate valve data and ratings.

**1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Accept valves on site in shipping containers with labelling in place. Inspect for damage.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

## **PART 2 PRODUCTS**

### **2.1 REGULATORY REQUIREMENTS**

- A. Comply with ASME B31.9 and ASME B31.1 code for installation of piping system.

### **2.2 LOW PRESSURE STEAM CONDENSATE PIPING**

- A. Steel Pipe: ASTM A53/A53M, Schedule 80, black.
  - 1. Fittings: ASME B16.3 malleable iron Class 150, or ASTM A234/A234M wrought steel.
  - 2. Joints: Threaded, or AWS D1.1/D1.1M welded.

### **2.3 PIPE HANGERS AND SUPPORTS**

- A. Provide hangers and supports that comply with MSS SP-58.
  - 1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
- B. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch (13 to 38 mm): Malleable iron, adjustable swivel, split ring.
- C. Hangers for Pipe Sizes 2 to 4 Inches (50 to 100 mm): Carbon steel, adjustable, clevis.
- D. Wall Support for Pipe Sizes to 3 Inches (70 mm): Cast iron hook.
- E. Vertical Support: Steel riser clamp.
- F. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Verify all existing pipe sizes.
- B. Ream pipe and tube ends. Remove burrs.
- C. Remove scale and dirt on inside and outside before assembly.
- D. Prepare piping connections to equipment with flanges or unions.
- E. Keep open ends of pipe free from scale and dirt. Whenever work is suspended during construction protect open ends with temporary plugs or caps.

### **3.2 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Route piping in orderly manner, plumb and parallel to building structure, and maintain gradient.
- C. Install piping to conserve building space and avoid interference with use of space.
- D. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- E. Pipe Hangers and Supports:
  - 1. Install in accordance with ASME B31.9.
  - 2. Place hangers within 12 inches (300 mm) of each horizontal elbow.
- F. Provide clearance for installation of insulation and access to valves and fittings.
- G. Provide access where valves and fittings are not exposed. Coordinate access door locations in metal enclosure
- H. Slope steam piping one inch in 40 feet (0.25 percent) in direction of flow. Use eccentric reducers to maintain bottom of pipe level.
- I. Slope steam condensate piping one inch in 40 feet (0.25 percent). Provide drip trap assembly at low points and before control valves. Run condensate lines from trap to nearest condensate receiver. Provide loop vents over trapped sections.

- J. Prepare unfinished pipe, fittings, supports, and accessories ready for finish painting. Refer to Section 09 9123.
- K. Install valves with stems upright or horizontal, not inverted.

### 3.3 SCHEDULES

- A. Hanger Spacing for Steel Steam Piping.
  - 1. 3/4 inch (20 mm) and 1 inch (25 mm): Maximum span, 9 feet (2700 mm); minimum rod size, 1/4 inch (6 mm).
  - 2. 1-1/4 inches (32 mm): Maximum span, 11 feet (3.3 m); minimum rod size, 3/8 inch (9 mm).
  - 3. 1-1/2 inches (40 mm): Maximum span, 12 feet (3.6 m); minimum rod size, 3/8 inch (9 mm).
  - 4. 2 inches (50 mm): Maximum span, 13 feet (4.0 m); minimum rod size, 3/8 inch (9 mm).
- B. Hanger Spacing for Steel Steam Condensate Piping.
  - 1. 1/2 inch (15 mm), 3/4 inch (20 mm), and 1 inch (25 mm): Maximum span, 7 feet (2100 mm); minimum rod size, 1/4 inch (6 mm).
  - 2. 1-1/4 inches (32 mm): Maximum span, 8 feet (2400 mm); minimum rod size, 3/8 inch (9 mm).
  - 3. 1-1/2 inches (40 mm): Maximum span, 9 feet (2700 mm); minimum rod size, 3/8 inch (9 mm).
  - 4. 2 inches (50 mm): Maximum span, 10 feet (3.0 m); minimum rod size, 3/8 inch (9 mm).

**END OF SECTION**