

SECTION 40 05 17

COPPER PROCESS PIPE

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Scope:
1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish copper pipe and fittings.
 2. Extent of piping is shown and indicated in the piping schedules in Section 33 05 05, Buried Piping Installation, and Section 40 05 05, Exposed Piping Installation.
- B. Coordination:
1. Review installation procedures under this and other Sections and coordinate installation of items to be installed with or before copper pipe Work.
- C. Related Sections:
1. Section 31 23 05, Excavation and Fill.
 2. Section 33 05 05, Buried Piping Installation.
 3. Section 40 05 05, Exposed Piping Installation.
 4. Section 40 05 07, Pipe Hangers and Supports
 5. Section 40 05 08, Wall Pipes, Floor Pipes, and Pipe Sleeves
 6. Section 40 42 00, Insulation of Process Piping and Equipment.

1.2 REFERENCES

- A. Standards referenced in this Section are:
1. ANSI/ASME B16.15, Cast Copper Alloy Threaded Fittings: Classes 125 and 150.
 2. ANSI/ASME B16.18, Cast Copper Alloy Solder Joint Pressure Fittings.
 3. ANSI/ASME B16.22, Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
 4. ANSI/ASME B16.23, Cast Copper Alloy Solder Joint Drainage Fittings: DWV.
 5. ANSI/ASME B16.24, Cast Copper Alloy Pipe Flanges and Flanged Fittings: Classes 150, 300, 600, 900, 1500 and 2500.
 6. ANSI/ASME B16.26, Cast Copper Alloy Fittings for Flared Copper Tubes.
 7. ANSI/ASME B16.29, Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings: DWV
 8. ANSI/ASME B16.39, Malleable Iron Threaded Pipe Unions: Classes 150, 250, and 300.
 9. ANSI/ASME B16.42, Ductile Iron Pipe Flanges and Flanged Fittings: Classes 150 and 300.

10. ANSI/ASME B16.50, Wrought Copper and Copper Alloy Braze-Joint Pressure Fittings.
11. ANSI/ASME B18.2.1, Square and Hex Bolts and Screws, Inch Series.
12. ANSI/ASME B18.2.2, Square and Hex Nuts.
13. ASTM A194, Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
14. ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
15. ASTM B32, Specification for Solder Metal.
16. ASTM B68, Specification for Seamless Copper Tube, Bright Annealed.
17. ASTM B88, Specification for Seamless Copper Water Tube.
18. ASTM B251, Specification for General Requirements for Wrought Seamless Copper and Copper-Alloy Tube.
19. ASTM B302, Specification for Threadless Copper Pipe, Standard Sizes.
20. ASTM B306, Specification for Copper Drainage Tube (DWV).
21. ASTM D1330, Specification for Rubber Sheet Gaskets.
22. FS WW-U-516, Unions – Brass or Bronze.
23. NSF/ANSI 61, Drinking Water System Components - Health Effects.

1.3 QUALITY ASSURANCE

- A. Component Supply and Compatibility:
 1. Unless otherwise approved, obtain all pipe, fittings, and appurtenances included in this Section from a single copper pipe manufacturer.
 2. Copper pipe Supplier shall review and approve or prepare all Shop Drawings and other submittals for pipe, fittings, and appurtenances furnished under this Section.

- B. Regulatory Requirements:
 1. Pipe and fittings that will convey potable water or water that will be treated to become potable, shall be certified by an accredited organization in accordance with NSF/ANSI 61 as being suitable for contact with potable water, and shall comply with requirements of authorities having jurisdiction at the Site.
 2. Pipe and fittings materials and joint types shall comply with requirements of authorities having jurisdiction at Site.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following with Shop Drawings required under Section 33 05 05, Buried Piping Installation, and Section 40 05 05, Exposed Piping Installation:
 1. Shop Drawings:
 - a. Detailed layout drawings for pipe, fittings, and appurtenances.
 2. Product Data:
 - a. Detailed data on pipe, fittings, and appurtenances.

- B. Informational Submittals: Submit the following:

1. Certificates:
 - a. Submit certificate signed by manufacturer of each material that material conforms to applicable referenced standards and the Contract Documents.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 33 05 05, Buried Piping Installation, and Section 40 05 05, Exposed Piping Installation.
- B. Maintain ASTM B68 pipe, fittings, and appurtenances free of scale and dirt during transportation, delivery, storage, and handling.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Pipe for Compressed Air: Pipe shall be seamless, bright annealed copper tubing, complying with ASTM B68. Pipe material shall be free from scale and dirt. Dimensions and tolerances shall comply with ASTM B251.
- B. Brazed Copper Pipe: Assemble piping with braze joint pressure fittings. Pipe material shall comply with ASTM B302.
- C. Potable Water Pipe:
 1. Pipe Materials: Comply with ASTM B88.
 2. For interior, exposed pipe, provide Type L, hard-drawn tube.
 3. For buried pipe and for exterior, exposed pipe, provide Type K, soft-annealed tube.
 4. Fittings shall be soldered except at valves, which may be flared or flanged joints.

2.2 JOINTS

- A. Refer to piping schedules at the end of Sections 33 05 05, Buried Piping Installation, and Section 40 05 05, Exposed Piping Installation for the service and joint type specified for each piping system.
- B. Provide type of fittings corresponding to the specified joint type in accordance with Table 40 05 17-A.

**TABLE 40 05 17-A
COPPER PIPE JOINT TYPE AND FITTING SCHEDULE**

Joint Type	Fitting Type, Applicable Reference Standards
Soldered	ANSI/ASME B16.22,

	ANSI/ASME B16.29 (DWV)
Threaded	ANSI/ASME B16.15
Brazed	ANSI/ASME B16.50
Flared	ANSI/ASME B16.26
Flanged	ANSI/ASME B16.24 (bronze), ANSI/ASME B16.42 (ductile iron at dielectric connections)

- B. When fully developed, the strength of the joint shall be greater than strength of adjoining pipe.
- C. Flanged Joints: Comply with the following:
1. Flanges: ANSI/ASME B16.24, Class 150.
 2. Gaskets: Red rubber, ASTM D1330, Grade 1, 1/8-inch thick.
 3. Bolts: ASTM A307, Grade B. Conform to ANSI/ASME B18.2.1.
 4. Nuts: ASTM A194, Grade 2H, Heavy hex. Comply with ANSI/ASME B18.2.2.
- D. Unions: Shall be bronze, 250-pound class, conforming to FS WW-U-516.
- E. Dielectric Connections:
1. Manufacturers: Provide products of one of the following:
 - a. Watts Regulator Company.
 - b. Wilkins, a Zurn company.
 - c. Or equal.
 2. Type: Union or flanged.
 3. Ratings:
 - a. Unions: Rated for 250 psi, complying with ANSI/ASME B16.39.
 - b. Flanges: Rated for 175 psi, complying with ANSI/ASME B16.42 (Ductile Iron), or ANSI/ASME B16.24 (Bronze).
 4. Bodies and flanges, and bolts and nuts shall be steel with galvanized coating. Insulator shall be nylon; tailpiece shall be brass. Provide EPDM gaskets for pipe temperature up to 200 degrees F, and Viton gaskets for temperatures over 200 degrees F.

2.3 MARKING

- A. Mark or label all materials with the following:
1. Metal or alloy designation.
 2. Temper.
 3. Size and schedule.
 4. ASTM reference standard number.
 5. Name and location of Supplier.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Refer to Section 33 05 05, Buried Piping Installation, for buried piping installation, disinfection, testing and cleaning.
- B. Refer to Section 40 05 05, Exposed Piping Installation, for exposed piping installation, disinfection, testing and cleaning.
- C. Refer to Section 40 42 00, Insulation of Process Piping and Equipment, for requirements for piping specified as insulated in the piping schedules at the end of Section 33 05 05, Buried Piping Installation, and Section 40 05 05, Exposed Piping Installation.

++ END OF SECTION ++