

SECTION 220516 - EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING**PART 1 - GENERAL****1.1 SUBMITTAL REQUIRMENTS****A. Product Data:**

1. Provide product datasheets for all products specified under this section.
2. Include construction details, material descriptions, dimensions of individual components, finishes, rated capacities, operating characteristics, furnished specialties, and accessories.

PART 2 - PRODUCTS**2.1 PACKLESS EXPANSION FITTINGS****A. Flexible-Hose Packless Expansion Fittings:**

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Flex-Hose Co., Inc.
 - b. Flexicraft Industries.
 - c. Metraflex, Inc.
2. Description: Manufactured assembly with inlet and outlet elbow fittings and two flexible-metal-hose legs joined by long-radius, 180-degree return bend or center section of flexible hose.
3. Potable water piping and components shall comply with NSF 14 and NSF 61.
4. Sanitary flexible expansion joints shall comply with IAPMO IGC 304.
5. Elbows: 304 Stainless Steel long radius 90° elbows.
6. Flexible Hose: 321 Stainless Steel hose, 304 Stainless Steel braid and interlocking liner.
7. Brass cleanout plugs (2).
8. +- 8" of movement.
9. 150 PSI working pressure at 70°F.
10. Flexible Hose: Corrugated-metal inner hoses and braided outer sheaths.
11. 304 Stainless Steel long radius 90° elbows.
12. Expansion Fittings for Copper Tubing NPS 2 and Smaller: Copper-alloy fittings with solder-joint end connections.
 - a. Bronze hoses and single-braid bronze sheaths with 450 psig at 70 deg F and 340 psig at 450 deg F ratings.

13. Expansion Fittings for Copper Tubing NPS 2-1/2 to NPS 4: Copper-alloy fittings with threaded end connections.
 - a. Stainless-steel hoses and single-braid, stainless-steel sheaths with 300 psig at 70 deg F and 225 psig at 450 deg F ratings.
14. Expansion Fittings for Steel Piping NPS 2 and Smaller: Stainless-steel fittings with threaded end connections.
 - a. Stainless-steel hoses and single-braid, stainless-steel sheaths with 450 psig at 70 deg F and 325 psig at 600 deg F ratings.
15. Expansion Fittings for Steel Piping NPS 2-1/2 to NPS 6: Stainless-steel fittings with flanged end connections.
 - a. Stainless-steel hoses and single-braid, stainless-steel sheaths with 200 psig at 70 deg F and 145 psig at 600 deg F ratings.

2.2 ALIGNMENT GUIDES AND ANCHORS

A. Alignment Guides:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Adscos Manufacturing LLC.
 - b. Flex-Hose Co., Inc.
 - c. Hyspan Precision Products, Inc.
 - d. Metraflex, Inc.
 - e. U.S. Bellows, Inc.
2. Description: Steel, factory-fabricated alignment guide, with bolted two-section outer cylinder and base for attaching to structure; with two-section guiding spider for bolting to pipe.

B. Anchor Materials:

1. Steel Shapes and Plates: ASTM A 36/A 36M.
2. Bolts and Nuts: ASME B18.10 or ASTM A 183, steel hex head.
3. Washers: ASTM F 844, steel, plain, flat washers.
4. Mechanical Fasteners: Insert-wedge-type stud with expansion plug anchor for use in hardened portland cement concrete, with tension and shear capacities appropriate for application.
 - a. Stud: Threaded, zinc-coated carbon steel.
 - b. Expansion Plug: Zinc-coated steel.
 - c. Washer and Nut: Zinc-coated steel.

5. Chemical Fasteners: Insert-type-stud, bonding-system anchor for use with hardened portland cement concrete, with tension and shear capacities appropriate for application.
 - a. Bonding Material: ASTM C 881/C 881M, Type IV, Grade 3, two-component epoxy resin suitable for surface temperature of hardened concrete where fastener is to be installed.
 - b. Stud: ASTM A 307, zinc-coated carbon steel with continuous thread on stud unless otherwise indicated.
 - c. Washer and Nut: Zinc-coated steel.

PART 3 - EXECUTION

3.1 EXPANSION FITTING INSTALLATION

- A. Install mechanical expansion fittings at a minimum of every 100 feet on straight runs of all piping and where specifically indicated on drawings.
- B. Install flexible hose mechanical expansion fittings and/or expansion loops in any piping crossing a building expansion joint. Coordinate these locations with the Architectural and Structural drawings.
- C. Install expansion fittings of sizes matching sizes of piping in which they are installed.

3.2 PIPE LOOP AND SWING CONNECTION INSTALLATION

- A. Connect risers and branch connections to mains with at least five pipe fittings including tee in main.

3.3 ALIGNMENT-GUIDE AND ANCHOR INSTALLATION

- A. Install alignment guides to guide expansion and to avoid end-loading and torsional stress.
- B. Install one guide on each side of pipe expansion fittings and loops. Install guides nearest to expansion fitting not more than four pipe diameters from expansion joint.
- C. Install second guide(s) at 10 to 14 pipe diameters from first guide. Install intermediate guides spaced at the following distances for the indicated pipe size:
 1. 1 inch pipe: 11 feet
 2. 1-1/4 inch pipe: 14 feet
 3. 1-1/2 inch pipe: 17 feet
 4. 2 inch pipe: 23 feet
 5. 2-1/2 inch pipe: 27 feet
 6. 3 inch pipe: 33 feet
 7. 4 inch pipe: 37 feet

- D. Attach guides to pipe and secure guides to building structure.
- E. Install anchors at locations to prevent stresses from exceeding those permitted by ASME B31.9 and to prevent transfer of loading and stresses to connected equipment.
- F. Anchor Attachments:
 - 1. Anchor Attachment to Black Steel Pipe: Attach with pipe hangers. Use MSS SP-69, Type 42.
 - 2. Anchor Attachment to Copper Tubing: Attach with pipe hangers. Use MSS SP-69, Type 24, U-bolts bolted to anchor.
- G. Fabricate and install steel anchors by welding steel shapes, plates, and bars. Comply with ASME B31.9 and AWS D1.1/D1.1M.
 - 1. Anchor Attachment to Steel Structural Members: Attach by welding.
 - 2. Anchor Attachment to Concrete Structural Members: Attach by fasteners. Follow fastener manufacturer's written instructions.
- H. Use grout to form flat bearing surfaces for guides and anchors attached to concrete.

END OF SECTION 220516