

SECTION 15125

EXPANSION FITTINGS AND LOOPS FOR HVAC PIPING

PART 1 –GENERAL

1.1 SUMMARY

- A. Section includes flexible pipe connectors, expansion joints and compensators, pipe loops, offsets, and swing joints.

1.2 DESIGN REQUIREMENTS

- A. Provide structural work and equipment required for expansion and contraction of piping. Verify that anchors, guides, and expansion joints provide an adequately protected system.
- B. Expansion Compensation Design Criteria:
 - 1. Installation Temperature: 60 degrees
 - 2. Hot Water Heating: 180 degrees F
 - 3. Domestic Hot Water: 140 degrees F.
 - 4. Safety Factor: 30 percent.

1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Submit for loops, offsets and swing joints.
- C. Product Data: Submit
 - 1. Flexible Pipe Connectors: Indicate maximum temperature and pressure rating, face-to-face length, live length, hose wall thickness, hose convolutions per foot and per assembly, fundamental frequency of assembly, braid structure, and total number of wires in braid.
 - 2. Expansion Joints: Indicate maximum temperature and pressure rating, and maximum expansion compensation.
- D. Samples: Submit two low-pressure compensators
- E. Design Data: Indicate criteria and show calculations.
- F. Manufacturer's Installation Instructions: Submit special procedures, and external controls.
- G. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Section 01770 - Execution Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of flexible pipe connectors, expansion joints, anchors, and guides.
- C. Operation and Maintenance Data: Submit adjustment instructions.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with applicable codes and laws as well as the Stanford University Design Standards and all Stanford University Contract documents. Maintain one copy of each document on site.

1.6 QUALIFICATIONS

- A. Design expansion compensating system under direct supervision of a professional engineer experienced in design of this work and licensed at the place where the Project is located.

1.7 PRE-INSTALLATION MEETING

- A. Section 01330 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store and protect equipment.
- B. Accept expansion joints on site in factory packing with shipping bars and positioning devices intact. Inspect for damage.
- C. Protect equipment from exposure by leaving factory coverings, pipe end protection, and packaging in place until installation.

1.9 WARRANTY

- A. Section 01770 - Execution Requirements: Product warranties and product bonds.
- B. Provide a minimum of one year manufacturer's warranty for leak free performance of packed expansion joints.

1.10 EXTRA MATERIALS

- A. Section 01770 - Execution Requirements: Spare parts and maintenance products.

PART 2 –PRODUCTS

2.1 MANUFACTURERS

- A. Hyspan
- B. Metraflex
- C. Flexonics
- D. Mason
- E. or equal

2.2 FLEXIBLE PIPE CONNECTORS

- A. Flexonics Series 401M or equal

B. Steel Piping:

- 1. Inner Hose: Stainless Steel.
- 2. Exterior Sleeve: Stainless Steel.
- 3. Pressure Rating: 450 psig at 70 degrees F.
- 4. Joint: As specified for pipe joints.
- 5. Size: Use pipe-sized units.
- 6. Maximum offset: 3/4 inch on each side of installed center line.

C. Copper Piping:

- 1. Inner Hose: Bronze
- 2. Exterior Sleeve: Braided bronze.
- 3. Pressure Rating: 450 psig at 70 degrees F.
- 4. Joint: As specified for pipe joints.
- 5. Size: Use pipe sized units.
- 6. Maximum offset: 3/4 inch on each side of installed center line.

2.3 EXPANSION JOINTS

A. Stainless Steel Bellows Type:

- 1. Pressure Rating: 175 psig at 850 degrees F.
- 2. Maximum Compression: As required.
- 3. Maximum Extension: ¼ inch.
- 4. Joint: As specified for pipe joints.
- 5. Size: Use pipe sized units.
- 6. Application: Steel piping 3 inch and under.

B. External Ring Controlled Stainless Steel Bellows Type:

1. Pressure Rating: 175 psig at 850 degrees F.
2. Maximum Compression: As required.
3. Maximum Extension: 5/16 inch.
4. Maximum Offset: 1/8 inch
5. Joint: Flanged
6. Size: Use pipe sized units
7. Accessories: Internal flow liner.
8. Application: Steel piping over 3 inch.

C. Double Sphere, Flexible Compensators:

1. Mason SFDEJ or equal
2. Body: Tire cord reinforcement with peroxide cured EPDM.
3. Working Pressure: 250 psi
4. Maximum Temperature: 190 degrees F.
5. Maximum Compression: 1-1/4 inch.
6. Maximum Elongation: 3/4 inch.
7. Maximum Offset: 3/4 inch.
8. Maximum Angular Movement: 30 degrees.
9. Joint: Ductile iron flanges.
10. Size: Use pipe sized units.
11. Application: Vibration isolation at equipment connections.

2.4 ACCESSORIES

- A. Pipe Alignment Guides: Two piece welded steel with enamel paint, bolted, with spider to fit standard pipe, frame with four mounting holes, clearance for minimum 1 inch thick insulation, minimum 3 inch travel.
- B. Swivel Joints: Fabricated steel, bronze, ductile iron, or cast steel body, double ball bearing race, field lubricated, with rubber (Buna-N) o-ring seals.

PART 3 –EXECUTION

3.1 INSTALLATION

- A. Construct spool pieces to exact size of flexible connection for future insertion.
- B. Install flexible pipe connectors on pipes connected to equipment supported by vibration isolation. Provide line size flexible connectors.
- C. Install flexible connectors at right angles to displacement. Install one end immediately adjacent to isolated equipment and anchor other end. Install in horizontal plane unless indicated otherwise.

- D. Rigidly anchor pipe to building structure where necessary. Provide pipe guides so movement is directed along axis of pipe only. Erect piping such that strain and weight is not on cast connections or apparatus.
- E. Provide support and equipment required for controlling expansion and contraction of piping. Provide loops, pipe offsets, and swing joints, or expansion joints where required.
- F. Provide Victaulic piping with minimum one joint per inch pipe diameter instead of flexible connector supported by vibration isolation. Victaulic piping need not be anchored.
- G. Provide expansion loops as indicated on drawings.

3.2 MANUFACTURER'S FIELD SERVICES

- A. Provide inspection services by flexible pipe manufacturer's representative for final installation and certify installation is in accordance with manufacturer's recommendations and connectors are performing satisfactorily.

END OF SECTION