

**USask Master Specification Directions:** The master specifications are intended to be incorporated into the Consultant's final, project specific specification package. The project specific specifications are expected to include any and all sections or portions of sections (Part 1, Part 2, Part 3) that are required to create a fully executable project specification. USask Master Specs only provide information that USask **requires** be a part of the final specification package. Components or sections not included in the Master USask Specifications may still be required for a complete, well-designed project. **It is the consultant's responsibility to ensure all specifications match USask requirements. Any deviations or revisions to any section included in the master specifications requires written consent from the USask Engineering department. The consultant is liable for any omissions, errors, or incorrect equipment or components supplied to site.**

The Master Specifications shall be used in conjunction with USask's Design Guidelines. Any conflicts shall be brought to the attention of USask Engineering staff for clarification.

**Part 1            General**

**Part 2            Products**

**2.1                BELLOWS TYPE EXPANSION JOINTS – STANDARD SERVICE**

- .1 For axial, lateral or angular movements, as indicated.
- .2 Maximum operating pressure: 200 psi.
- .3 Maximum operating temperature: 750°F.
- .4 Bellows:
  - .1 Multiple bellows, hydraulically formed, austenitic stainless steel for specified fluid, pressure and temperature, water treatment and pipeline cleaning procedures.
- .5 Ends:
  - .1 62mm and above: flanged.
  - .2 Below 62mm: screwed.
- .6 Liner:
  - .1 Austenitic stainless steel in direction of flow.
- .7 Shroud:
  - .1 Carbon steel, painted.
- .8 Type: externally pressurized, single or double ended to suit required displacement, unless noted otherwise.
- .9 Acceptable products: Senior Flexonics Series H2, H3, HB, SX or DX, pressure rating to suit application.

**2.2                BELLOWS TYPE EXPANSION JOINTS – HIGH PRESSURE STEAM**

- .1 Externally pressurized guided expansion joints with 321 stainless steel bellows, internal and external guide with metal shroud over the bellows. Single or double sided to provide

required expansion range, with flanged connections. Maximum operating pressure: 1378kPa (200 PSI).

- .2 All high-pressure steam expansion joints and pipe guides shall be manufactured by Hyspan.
  - .1 Expansion joints shall be Hyspan Series 3500.
  - .2 Pipe guides shall be Hyspan Series 9500.

### **2.3 FLEXIBLE CONNECTION**

- .1 Application: to suit motion as indicated.
- .2 Minimum length in accordance with manufacturer's recommendations to suit offset as indicated.
- .3 Inner hose: stainless steel corrugated.
- .4 Braided wire mesh stainless steel outer jacket.
- .5 Diameter and type of end connection: as indicated.
- .6 Operating conditions:
  - .1 To match system requirements.
- .7 Three flexible grooved couplings placed in close proximity to vibration source for vibration attenuation and stress relief.

### **2.4 ANCHORS AND GUIDES**

- .1 Anchors:
  - .1 Provide as indicated.
- .2 Alignment guides:
  - .1 To accommodate specified thickness of insulation.
  - .2 Vapour barriers, jackets to remain uninterrupted.
  - .3 Install at spacing required by manufacturer along the entire length of the piping system.

## **Part 3 Execution**

### **3.1 INSTALLATION**

- .1 Install expansion joints, flexible connections, and alignment guides in accordance with manufacturer's instructions.
- .2 Install pipe anchors and guides as indicated. Anchors to withstand 150% of axial thrust.

**END OF SECTION**