



### 1.03 RELATED DOCUMENTS

#### A. Reference Specifications:

1. Section 18002 - General Piping Fabrication and Erection.
2. Section 18003 - Automatic Welding Procedure and Inspection.
3. Section 18004 - Specification for Sanitary Stainless Steel Tubing Fabrication and Erection.
4. Section 18005 - Specification for Piping Supports.

**IMPORTANT:** All Materials used are to be in accordance with the following standards but sizes are listed in millimeters with inch equivalents. Pressures and temperatures are converted to metric but ratings are retained as USA standard nomenclatures.

#### B. References:

##### 1. Codes and Standards:

- a. All materials shall be furnished in accordance with this Specification and the requirements of the ANSI Code for Pressure Piping B31, "Process Piping B31.3". In addition all materials shall be manufactured in accordance with the following Codes and Standards:

Tube & Fittings – 316L Stainless Steel (Sanitary Style)		ASME BPE 1997 & 2000 Addenda
Pipe	-Carbon Steel	ASME B36.10M
	-Stainless Steel	ASME B36.19M
Valves	- Dimensions	ASME B16.10
	- Flanged & Buttwelding Ends	ANSI B16.34
Fittings	-Malleable Iron Threaded Fittings	ASME B16.3
	- Wrought Carbon and Stainless Steel	
	- Buttwelding Fittings	ASME B16.9
	- Forged Fittings, Socketwelded & Threaded	ANSI B16.11
	- Ferrous Pipe Plugs and Bushings	ANSI B16.14
	- Buttwelding Ends	ASME B16.25
	- Wrought Carbon and Stainless Steel	
Flanges	- Buttwelding Short Radius Elbows & Returns	ASME B16.28
	- Carbon & Stainless Steel Pipe Flanges	
	- And Flanged Fittings	ANSI B16.5
	- Orifice Flanges	ANSI B16.36
Bolting	- Hex Bolts and Screws	ASME B18.21
	- Hex Nuts	ANSI B18.22

Gaskets - Nonmetallic Gaskets	ANSI B16.21
Threads - Pipe Threads	ASME B1.20.1
Materials - As specified in Material Specification or - Purchase Order - Materials for Product Contract Surfaces - Bioprocessing Equipment and Piping	ASTM Stds. FDA Require ASME BPE-1997 & 2000 Addenda.
Miscellaneous – As specified in Material Specification or Purchase Order	
- Food, Drug, and Beverage Equipment	ANSI F2.1 ANSI F2.1a
- Accepted Practices for Permanently Installed Sanitary Product – Pipelines & Cleaning Systems	3-A & FDA Accepted Practices

- b. Nothing in this specification shall be interpreted as in any way relieving a supplier of the responsibility for complete compliance with the aforementioned codes and standards where they apply.

C. Attachments:

1. Service Listing.
2. Piping Specification 18001-B1.
3. Piping Specification 18001-B2.
4. Piping Specification 18001-B3
5. Piping Specification 18001-B7.
6. Piping Specification 18001-B9.
7. Piping Specification 18001-B10.
8. Piping Specification 18001-C1.
9. Piping Specification 18001-C2
10. Piping Specification 18001-D1.
11. Piping Specification 18001-E3.
12. Piping Specification 18001-E6.
13. Piping Specification 18001-E8.
14. Piping Specification 18001-S1.
15. Piping Specification 18001-S2
16. Piping Specification 18001-S3.
17. Piping Specification 18001-S4.
18. Piping Specification 18001-S5.

- 19. Piping Specification 18001-S7.
- 20. Piping Specification 18001-S12.
- 21. Piping Specification 18001-U4.

#### 1.04 SUBMITTALS

- A. Make submittals in accordance with Terms and Conditions of the Contract.

#### 1.05 QUALITY ASSURANCE

- A. A Quality Control Plan shall be required for products covered by this specification.
- B. Any documentation required shall be readily identified with the piping material to which it corresponds.
- C. The Owner or the Owner's Representative reserves the right to reject any piping materials if it has not been demonstrated to the Owner's or Owner's Representative's satisfaction that the requirements of all applicable specifications, purchase orders and inspection and examination procedures have been met.

#### 1.06 DELIVERY, STORAGE, HANDLING

- A. Refer to Section 18002 – General Piping Fabrication and Erection, Paragraph 1.06.

#### 1.07 PROCUREMENT

- A. Procurement requirements listed here apply to all materials unless more stringent instructions are contained in individual Section 18001 – General Piping Requirements (C2, S1, etc.) or in Section 18004 – Sanitary Stainless Steel Tubing Fabrication and Erection. If conflicting requirements occur the instruction contained in individual piping specifications shall govern.
- B. All pipe is to be furnished in double random lengths within quantity and manufacturing limits, except where specifically modified in the requisition and/or purchase order.
- C. A Manufacturer's Certificate of Compliance shall accompany all welded pipe, certifying that the pipe has been manufactured and tested in accordance with the applicable ASTM standard. The certificate shall identify the items it covers.
- D. Mill certificates are required for all stainless steel pipe and tubing.

#### 1.08 CLEANING

- A. All piping materials shall be thoroughly cleaned to remove all grease, oil, loose mill scale and other foreign matter.

- B. Sandblasted surfaces shall be free of residual quantities of cleaning media such as grit, aluminum oxide or silica prior to packing and/or shipping.
- C. The use of cleaning fluids containing free chloride shall be prohibited unless specifically approved by the Owner, or their Representative.

#### 1.09 MARKING

- A. All valves shall be tagged with their appropriate specification number on an aluminum tag securely fastened to the valve with stainless steel wire.
- B. All piping materials shall be marked and identified in accordance with the applicable ASTM specifications listed in the Materials Specifications. If cleaning is performed on the materials and markings are removed, the materials shall be remarked.

#### 1.10 PACKAGING

- A. All pipe fittings 50 mm (2 inches) and smaller shall be containerized according to material type and size (e.g. 50 mm (2 inch) Carbon Steel Socket Weld Tees). Each container shall be marked to completely identify the quantity, type and size of the materials within.
- B. Before shipping, all flange faces shall be protected with wood, plastic or soft metal to prevent damage to these surfaces during shipping and handling.
- C. Before shipping, all threaded ends of pipe shall be protected by plastic thread protectors to prevent damage to the threads during shipping and handling.
- D. Stainless steel pipe and fittings should preferably be stored indoors and in contact with wood or coated racks in a protected area. For long term (6 months or more) outdoor storage, it shall be fully wrapped in polyethylene film and sealed with tape. Exposure to carbon steel during storage is prohibited.
- E. All pipe, fittings, and valves over 75 mm (3") in size may be stored in the dedicated area, but must be adequately blocked on dunnage and adequately protected from weather and dirt. Piping shall arrive at the site with protective covers on the ends. These covers must remain in place until the piping is installed. Fittings and valves must be covered with polyethylene film. Pipe fittings and valves under 75 mm (3") in size and all gaskets, bolts, specialties, and similar items shall be stored inside a temporary warehouse furnished by the Mechanical Contractor.

#### 1.11 SHIPPING

- A. The manufacturer or vendor shall be responsible for delivery of all materials to the designated delivery point in clean, undamaged and workable condition.

#### 1.12 SUBSTITUTIONS

- A. Substitution of materials or equipment considered by the Seller to be equal to that specified in the Piping Materials Specifications shall be subjected to approval by The Owner or their Representative.

#### 1.13 INSPECTION

- A. The Owner or their Representative reserves the right to inspect all material prior to shipment. Manufacturer/Vendor shall notify The Owner or their Representative when material is to be shipped in order to make arrangements for inspection.

#### 1.14 RESTRICTIONS

- A. Asbestos packing and gaskets are not permitted in any valves or pipeline components.

### PART 2 PRODUCTS

#### 2.01 PIPING MATERIALS

- A. Refer to Paragraph 1.03 (Reference Specifications) for detailed descriptions of each piping material.

### PART 3 EXECUTION

#### 3.01 INSTALLATION OF MATERIALS

- A. Refer to Specification 18002 - General Piping Fabrication and Erection, and 18004 - Sanitary Stainless Steel Tubing Fabrication and Erection for installation.
- B. Refer to Section 18005 – Specification for Pipe Supports, for materials and installation of pipe supports.
- C. Refer to Section 15083 –Specification for Pipe Insulation.

**END OF SECTION**