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UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated 18 July 2006

Latest change indicated by CHG tags

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SECTION 22 15 15.00 40

GENERAL SERVICE COMPRESSED-AIR SYSTEMS, HIGH PRESSURE

06/06

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Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASME INTERNATIONAL (ASME)

ASME B16.11	(2005) Standard for Forged Steel Fittings, Socket-Welding and Threaded
ASME B16.5	(2003) Standard for Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24
ASME B16.9	(2003) Standard for Factory-Made Wrought Steel Buttwelding Fittings
ASME B36.10M	(2004) Standard for Welded and Seamless Wrought Steel Pipe
ASME B36.19M	(2004) Stainless Steel Pipe

ASTM INTERNATIONAL (ASTM)

ASTM A 182/A 182M	(2005) Standard Specification for Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service
ASTM A 193/A 193M	(2005) Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service
ASTM A 194/A 194M	(2005) Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both
ASTM A 307	(2004) Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
ASTM A 312/A 312M	(2005) Standard Specification for Seamless, Welded, and Heavily Worked Austenitic Stainless Steel Pipes
ASTM A 403/A 403M	(2004) Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings
ASTM F 568M	(2004) Standard Specification for Carbon

and Alloy Steel Externally Threaded Metric  
Fasteners

## 1.2 SUBMITTALS

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NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.] [for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

### SD-07 Certificates

Certificates shall be submitted for the following items showing conformance with the referenced standards contained in this section.

Corrosion-Resistant Steel  
Fittings  
Flanges  
Gaskets  
Bolting

### 1.3 GENERAL REQUIREMENTS

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NOTE: If Section 23 00 00.00 40 HEATING, VENTILATING, AND AIR-CONDITIONING is not included in the project specification, applicable requirements therefrom should be inserted and the following paragraph deleted.  
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Section 23 00 00.00 40 HEATING, VENTILATING, AND AIR-CONDITIONING applies to work specified in this section.

### PART 2 PRODUCTS

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NOTE: Select required system materials and delete all others.

The following system pressures are based on ASME B31.3, Zero corrosion factor, welded joints, and a stress of value 18,750 for ASTM A 312/A 312M, Grade TP316 or TP317. System pressures shall be reduced if the largest specified pipe size is increased, service temperatures are increased (over 100 degrees F) (over 38 degrees C), certain size piping is threaded, or alloy specifications are changed.

Materials for piping systems with pressures to 10,000 psi at 100 degrees F 68.9 Megapascal at 38 degrees C may be specified in accordance with MSS SP-75 and MSS SP-65. The same specification may be used for 6,000-psi 41369 kilopascal systems with pipe size larger than 3 inches DN80.

The following material specifications do not take into account material temperatures lower than minus 20 degrees F 29 degrees C.

For accessories and supporting elements, see Section 23 05 00.00 40 COMMON WORK RESULTS FOR HVAC.

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#### 2.1 TYPE SS-350 (2413 kPa 350-PSI SERVICE)

Pipe or tube (DN15 through DN250): (1/2 inch through 10 inches): Schedule 40, seamless Corrosion-Resistant Steel, conforming to ASTM A 312/A 312M, Grade TP 316, and ASME B36.19M

Fittings (DN15 through DN25): 13790 kilopascal (1/2 through 1 inch): 2,000-pound per square inch (psi) water, oil, or gas (wog), forged corrosion-resistant steel, socket weld, conforming to ASTM A 182/A 182M, Grade F 316 and ASME B16.11

Fittings (DN25 through DN250): (1 inch through 10 inches): Schedule 40, long radius, butt weld, corrosion-resistant steel, conforming to ASTM A 403/A 403M, WP 316, ASME B16.9, and ASME B36.19M

Flanges (DN25 through DN300): 2070 kilopascal (1 inch through 12 inches):

300-pound, forged corrosion-resistant steel, weld neck, with raised face and concentric serrated finish, conforming to ASTM A 182/A 182M Grade F 316, and ASME B16.5

**Gaskets:** Spiral wound, filled with chloride-ion-free non-asbestos materials, corrosion-resistant steel, with centering provisions, conforming to ASME B16.5, Group 1

**Bolting:** Heavy-hex head carbon steel bolts or bolt studs and semifinished heavy hex-head nuts conforming to ASTM F 568M, 4.8 or greater. ASTM A 307, Grade B.

Square head bolts are not acceptable.

## 2.2 TYPE SS-2,000 (13790 kPa 2,000-PSI SERVICE)

Pipe or tube: Schedule 40S seamless Corrosion-Resistant Steel, conforming to ASTM A 312/A 312M, Grade TP 316 and ASME B36.19M

**Fittings (DN15 through DN40):** 13790 kilopascal (1/2 inch through 1-1/2 inches): 2,000-psi wog, forged corrosion-resistant steel, socket weld, conforming to ASTM A 182/A 182M, Grade F 316 and ASME B16.11

**Fittings (DN50 through DN80): (2 through 3 inches):** Schedule 40S, long radius, butt weld, corrosion-resistant steel, conforming to ASTM A 403/A 403M WP 316, ASME B16.9, and ASME B36.19M

**Flanges (DN25 through DN80):** 6200 kilopascal (1 inch through 3 inches): 900-pound, forged corrosion-resistant steel welding neck, with raised face and concentric serrated finish, conforming to ASTM A 182/A 182M Grade F 316 and ASME B16.5

**Gaskets:** Spiral wound, filled with chloride-ion-free non-asbestos materials, corrosion-resistant steel, with centering provisions, conforming to ASME B16.5, Group 1

**Bolting:** Alloy steel bolt studs conforming to ASTM A 193/A 193M, Grade B7, and semifinished heavy hex-nuts conforming to ASTM A 194/A 194M, Grade 2H

## 2.3 TYPE SS-6,000 ( 41369 kPa 6,000-PSI SERVICE))

Pipe or tube (DN15 through DN80): (1/2 inch through 3 inches): XXS, seamless Corrosion-Resistant Steel, conforming to ASTM A 312/A 312M, Grade TP 316 and ASME B36.10M

**Fittings (DN15 through DN40):** 41369 kilopascal (1/2 inch through 1-1/2 inches): 6,000-psi wog, forged corrosion-resistant steel, socket weld, conforming to ASTM A 182/A 182M, Grade F 316 and ASME B16.11

**Fittings (DN50 through DN80): (2 through 3 inches):** XXS, long radius, butt weld, corrosion-resistant steel, conforming to ASTM A 403/A 403M WP 316, ASME B16.9 and ASME B36.10M

**Flanges (DN25 through DN80):** 17.2 Megapascal (2500 pound) (1 inch through 3 inches): 2,500-pound, forged corrosion-resistant steel welding neck, with raised face and concentric serrated finish, conforming to ASTM A 182/A 182M Grade F 316 and ASME B16.5

**Gaskets:** Spiral wound, filled with chloride-ion-free non-asbestos

materials, corrosion-resistant steel, with centering provisions, conforming to ASME B16.5, Group 1

**Bolting:** Alloy steel bolt studs conforming to ASTM A 193/A 193M, Grade B7 and semi-finished heavy hex-nuts conforming to ASTM A 194/A 194M, Grade 2H

### PART 3 EXECUTION

#### 3.1 INSTALLATION

Pipe shall be installed as shown on the drawings and as specified in Section 23 05 00.00 40 COMMON WORK RESULTS FOR HVAC.

-- End of Section --