(b) High-strength alloy steel bolts may be required, and these should conform to the ASTM A 354 or A 490 Specification.

c) For high-temperature applications, bolt material should conform to the ASTM A 193 B7 or A 569 Specification covering alloy and stainless steels. Stainless steel bolts are also covered under the ASTM F 593 Specification.

d) Unless otherwise specified, nuts should conform to the ASTM A 563 Specification. Stainless/heat-resisting nuts shall be of a material corresponding to that of the bolt unless galling/seizing considerations dictate otherwise.

e) Washers shall conform to the ASTM F 436 Specification. Stainless/heat-resisting washers shall be of a material corresponding to that of the bolt.

(f) Protection from corrosion may be required. Section 3 should be consulted and utilized as appropriate.

2.2.7 Appurtenances
(a) Ladders, cages, and stairs may be constructed of one or more of the following materials:

1. Structural steels and stainless steels conforming to the standards under para. 2.2.2(a).

2. Carbon steel sheet and strip conforming to the ASTM A 569 and A 570 Specifications.

3. High-strength, low-alloy sheet and strip conforming to the ASTM A 606 and A 607 Specifications.

(b) Platforms and grating may be constructed of one or more of the following materials:

1. Materials under para. 2.2.7(a).

2. Stainless steels conforming to the ASTM A 666 Specification.


(c) Handrails, toe plates, etc. typically are made of one of the following materials:

1. Carbon structural steel conforming to the ASTM A 36 or A 20 Specification.

2. High-strength, low-alloy steel conforming to the ASTM A 242, A 588, or A 618 Specification.

3. Aluminum conforming to the ASTM B 221 Specification.

4. Stainless steels conforming to the ASTM A 666 and A 554 Specifications.

(d) Access doors and instrument and sampling ports

1. Access doors shall be of a material matching the shell plates or cast iron.

2. Instrument and sampling ports shall be of a material of matching or higher alloy content than the shell plates.

(e) Painter’s trolley and ring

1. A painter’s trolley and ring may be of carbon steel or high-strength, low-alloy steels as specified under para. 2.2.3, provided suitable corrosion protection is applied.

2. Ring also may be of a material such as Type 304 or Type 316 stainless steel conforming to the ASTM A 240 or A 666 Specification. Adequate structural supports are to be provided.

3. Stainless/heat-resisting nuts shall be of a material corresponding to that of the bolt unless galling/seizing considerations dictate otherwise.

4. Washers shall conform to the ASTM F 436 Specification. Stainless/heat-resisting washers shall be of a material corresponding to that of the bolt.

5. Protection from corrosion may be required. Section 3 should be consulted and utilized as appropriate.

2.2.8 Welding Electrodes
(a) AWS D1.1, Structural Welding Code Steel is usually specified for structural welding of steel stacks. As an alternative, ASME BPVC, Section IX, Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operations may be specified.

(b) Welding electrodes with a minimum tensile strength of 70 ksi are to be used for carbon steel applications in steel stack construction. The type of electrode specified is a function of the welding process to be used.

(c) For high-temperature applications, above 750°F (400°C), using high-strength, low-alloy steels, welding electrodes with a minimum tensile strength of 80 ksi are to be used.

(d) For steel stack construction using alloy steels, such as ASTM A 335 and A 387, E8018-B2L electrode with welding procedures conforming to AWS D10.8, Recommended Practice for Welding of Chromium-Molybdenum Steel Piping and Tubing should be used.

(e) When stainless steels and nickel alloys are used as plate, sheet, or as clad plate, the following specifications apply:

1. ANSI/AWS A5.4, Specification for Stainless Steel Electrodes for Shielded Metal Arc Welding

2. ANSI/AWS A5.9, Specification for Bare Stainless Steel Welding Electrodes and Rods

3. ANSI/AWS A5.11, Specification for Nickel and Nickel Alloy Welding Electrodes for Shielded Metal Arc Welding

4. ANSI/AWS A5.14, Specification of Nickel and Nickel Alloy Bare Welding Electrodes and Rods

5. ANSI/AWS A5.1, Specification for Covered Carbon Steel Arc Welding Electrodes

6. ANSI/AWS A5.18, Specification for Carbon Steel Filler Metals for Gas Shielded Arc Welding