

**Board of High Pressure Piping Systems****Proposed Permanent Rules Adopting High Pressure Piping Regulations****5230.0220 BIOPROCESS PIPING.**

Subpart 1. **ASME BPE.** All bioprocess piping must meet the requirements of ASME BPE. For purposes of this chapter, "ASME BPE" means the ~~2012~~ 2016 edition of the Bioprocessing Equipment Standard adopted and published by ASME, Two Park Avenue, New York, New York 10016. ASME BPE is incorporated by reference and made part of the code for high pressure piping systems. ASME BPE is not subject to frequent change and a copy of ASME BPE is available in the office of the commissioner of labor and industry and at the State Law Library, 25 Rev. Dr. Martin Luther King Jr. Blvd., Saint Paul, Minnesota 55155.

Subp. 2. **Examination of welded pipe joints.** All welds on bioprocess piping systems must comply with the visual examination acceptance standards in sections ~~MJ-6.3~~ MJ-8.3 to ~~MJ-6.4~~ MJ-8.4 of ASME BPE. When nondestructive examination other than visual examination is required by job specification or by the administrative authority, the welds must comply with the acceptance standards in sections ~~MJ-6.3~~ MJ-8.3 to ~~MJ-6.4~~ MJ-8.4 of ASME BPE for each type of nondestructive examination required. All costs of nondestructive testing shall be paid by the installing contractor. The contractor shall provide a copy of all examination results to the administrative authority upon request.

**5230.0260 SCOPE.**

Valves, fittings, and piping for boilers, as prescribed in the ASME Code for Power Boilers, are within the scope for this code but provisions of the ASME Code for Power Boilers shall govern where they exceed corresponding requirements of this code. For purposes of this chapter, "ASME Code for Power Boilers" means the ~~2013~~ 2017 edition of the ASME Boiler and Pressure Vessel Code, section I, as adopted and published by ASME, Two Park Avenue, New York, New York 10016. The ASME Code for Power Boilers is incorporated

by reference in the code for steam or heating media piping systems. The ASME Code for Power Boilers is not subject to frequent change and a copy is available in the office of the commissioner of labor and industry and at the State Law Library, 25 Rev. Dr. Martin Luther King Jr. Blvd., Saint Paul, Minnesota 55155.

Economizers, heaters, tanks, and other pressure vessels are outside the scope of this code, but connecting piping shall conform to the requirements herein specified.

### **5230.0265 ADOPTION OF ASME B31.1 BY REFERENCE.**

For purposes of this chapter, "ASME B31.1" means the ~~2012~~ 2016 edition of the standard for power piping, as approved and published by ASME, Two Park Avenue, New York, New York 10016. ASME B31.1 is incorporated by reference and made part of the code for steam or heating media piping systems, except as amended in this chapter. Portions of this chapter reproduce text from ASME B31.1. ASME B31.1 is not subject to frequent change and a copy of ASME B31.1 is available in the office of the commissioner of labor and industry and at the State Law Library, 25 Rev. Dr. Martin Luther King Jr. Blvd., Saint Paul, Minnesota 55155. ASME B31.1 is copyright by ASME. All rights reserved.

### **5230.0295 CHAPTER III, MATERIALS.**

Section 124 is amended by adding a subsection as follows:

#### **~~124.11~~ 124.13. Furnace Butt Welded Pipe**

The use of furnace butt welded pipe is prohibited on steam or heating media piping systems.

### **5230.0305 CHAPTER VI, INSPECTION, EXAMINATION, AND TESTING.**

**Section 136.** ASME B31.1, ~~section 136 and all subsections~~ sections 136.1 to 136.3.2 are deleted.

**5230.5001 INCORPORATIONS BY REFERENCE.**

Subpart 1. **ANSI/IIAR 2.** For purposes of this chapter, "ANSI/IIAR 2" means the ~~2008~~ 2014 revision ~~with addendums A and B~~ of the standard for ~~Equipment, Safe Design, and Installation~~ of Closed-Circuit Ammonia ~~Mechanical Refrigerating~~ Refrigeration Systems, as approved by the American National Standards Institute and as published by the International Institute of Ammonia Refrigeration, ~~1110 North Glebe Road~~ 1001 North Fairfax Street, Suite ~~250~~ 503, ~~Arlington~~ Alexandria, Virginia ~~22204~~ 22314. ANSI/IIAR 2 is incorporated by reference and made part of the code for ammonia refrigeration systems, except as amended in this chapter. Portions of this chapter reproduce text from ANSI/IIAR 2. ANSI/IIAR 2 is not subject to frequent change and a copy of ANSI/IIAR 2 is available in the office of the commissioner of labor and industry and at the State Law Library, 25 Rev. Dr. Martin Luther King Jr. Blvd., Saint Paul, Minnesota 55155. ANSI/IIAR 2 is copyrighted by the International Institute of Ammonia Refrigeration. All rights reserved.

Subp. 2. **ASME B31.5.** For purposes of this chapter, "ASME B31.5" means the ~~2013~~ 2016 revision of the standard for ~~ammonia~~ Refrigeration Piping and Heat Transfer Components as approved and published by ASME, Two Park Avenue, New York, New York 10016. ASME B31.5 is incorporated by reference and made part of the code for ammonia refrigeration piping. ASME B31.5 is not subject to frequent change and a copy of ASME B31.5 is available in the office of the commissioner of labor and industry and at the State Law Library, 25 Rev. Dr. Martin Luther King Jr. Blvd., Saint Paul, Minnesota 55155.

**5230.5003 ~~SECTION 3~~ CHAPTER 2, DEFINITIONS.**

ANSI/IIAR 2, ~~Section 3~~ chapter 2, is amended by adding the following definitions:

**brine:** Any liquid used for the transmission of heat without a change in its state.

**jurisdictional authority:** Administrative authority, as defined in Minnesota Rules, part 5230.0005, subpart 2.

**liquid line:** The parts of the ammonia refrigerating system, at any pressure, intended to be wholly filled with liquid refrigerant.

**5230.5005 ~~SECTION 10~~ CHAPTER 13, PIPING.**

Subpart 1. ~~Section 10.2.1.5~~ Chapter 13.2.1.1. ANSI/IIAR 2, ~~section 10.2.1.5~~ chapter 13.2.1.1, is amended by adding a subsection to read as follows:

**~~10.2.1.5.1~~ 13.2.1.1. Application of materials.**

- a. Carbon steel liquid lines must utilize A106 seamless pipe or A333 seamless pipe.
- b. Piping material used in the discharge line of a pressure relief device, when discharging to atmosphere, Type F butt weld pipe is allowed.
- c. Mill test reports must be provided for the inspector at the inspector's discretion to verify heat numbers on the pipe and to verify compliance with this part.

Subp. 2. ~~Section 10.2.2.1~~ Chapter 13.2.2. ANSI/IIAR 2, ~~section 10.2.2.1~~ chapter 13.2.2, is amended to read by adding a subsection as follows:

**~~10.2.2.1~~ 13.2.2.1. Carbon steel, welded.**

- a. 1-1/2 inch and smaller - schedule 80.
- b. 2 inch through 10 inch - schedule 40.
- c. 12 inch and larger - standard weight.

Subp. 3. ~~Section 10.2.2.3~~ Chapter 13.2.2. ANSI/IIAR 2, ~~section 10.2.2.3~~ chapter 13.2.2, is amended to read by adding a subsection as follows:

**~~10.2.2.3~~ 13.2.2.2. Stainless steel, welded.**

- a. 3/4 inch through 6 inch - schedule 40.
- b. 8 inch and larger - schedule 10.

Subp. 4. ~~Section 10.3.1.3~~ **Chapter 13.3.** ANSI/IIAR 2, ~~section 10.3.1.3~~ chapter 13.3, is amended to read by adding a subsection as follows:

~~10.3.1.3~~ **13.3.8.** Operating speed of control valve actuators shall be considered in the system design. Quarter turn valves (ball valves, butterfly valves, etc.) must utilize an actuator that restricts the time from fully open to fully closed, both directions, to at a minimum of 60 seconds.

**5230.5006 CHAPTER 14, PACKAGED SYSTEMS AND EQUIPMENT.**

ANSI/IIAR 2, chapter 14.1.2, is amended by adding a subsection as follows:

**14.1.2.1.** Installers of packaged systems and equipment must submit a copy of the manufacturer's design specifications of each model to the department for evaluation of compliance with the standards in parts 5230.5000 to 5230.5915 and approval prior to installation.

**5230.5007 ~~SECTION 11~~ CHAPTER 15, OVERPRESSURE PROTECTION DEVICES.**

Subpart 1. ~~Section 11.1.5~~ **Chapter 15.2.5.** ANSI/IIAR 2, ~~section 11.1.5~~ chapter 15.2.5, is amended to read as follows:

~~11.1.5~~ **15.2.5.** Relief valves shall not be located in refrigerated spaces unless precautions are taken to prevent moisture migration into the valve body or relief valve vent line. A drip pocket the size of the discharge pipe and at least 24 inches in length must be installed below a vertical riser in the discharge pipe and must be fitted with a drain plug or valve.

Subp. 2. ~~Section 11.1.6.2~~ **Chapter 15.2.6.2.** ANSI/IIAR 2, ~~section 11.1.6.2~~ chapter 15.2.6.2, is amended by adding the following paragraph at the end:

Rupture discs may only be used when installed in series with a pressure relief valve.

Subp. 3. ~~Section 11.2.5~~ Chapter 15.3.2. ANSI/IIAR 2, ~~section 11.2.5~~ chapter 15.3.2, is amended to read by adding a subsection as follows:

~~11.2.5. Pressure vessels of 10 ft<sup>3</sup> [0.3 m<sup>3</sup>] or more internal gross volume shall be protected by one or more dual pressure relief device(s). Dual pressure relief valves shall be installed with a three-way valve to allow testing or repair. When dual relief valves are used, each valve must meet the requirements of section 11.2.7. When multiple dual relief valve assemblies are used,~~

- ~~a. the sum of the capacities of the pressure relief devices actively protecting the vessel must equal or exceed the requirements of section 11.2.7, and~~
- ~~b. the capacity of any dual relief assembly whose manifold valve is set to a position other than fully seated (one side open and one side closed) shall be counted to be zero.~~

15.3.2.1. Where the refrigerant inlet and outlet of air-cooled or evaporative condensers can be isolated, they shall be equipped with overpressure protection.

Subp. 4. ~~Section 11.3.3~~ Chapter 15.4.3. ANSI/IIAR 2, ~~section 11.3.3 of addendum A~~ chapter 15.4.3, is amended to read as follows:

**11.3.3.** The discharge piping from pressure relieving devices to atmosphere shall be a minimum schedule 40 steel for all pipe sizes.

**5230.5009 SECTION 15, TESTING AND CHARGING CHAPTER 5, GENERAL SYSTEM DESIGN REQUIREMENTS.**

ANSI/IIAR 2, ~~section 15.1.7~~ chapter 5.13.1, is amended by adding a subsection to read as follows:

~~15.1.7.6~~ 5.13.1.2. **Declaration.** A dated declaration of test shall be provided for all systems. The declaration shall give the name of the refrigerant and the field test pressure applied to the high side and the low side of the system. The declaration of test shall be signed by the installer or, if permitted by the administrative authority, by the owner's representative. If a representative of the administrative authority is present at the test, that representative shall also sign the declaration.

### **5230.5915 PIPING JOINTS.**

Subpart 1. **Design standards.** Piping joints must be designed for ammonia service. Joints must be designed for the pressure temperature and mechanical strength requirements of ammonia service and items ~~A to E.~~ and B as follows:

~~A. One and one-quarter inch and smaller joints may be threaded or welded. Threaded pipe must be American Society for Testing and Materials schedule 80 seamless. Threaded fittings must be 2,000 pounds per square inch rating. Threaded fittings must be forged steel.~~

~~B. Joints one and one-half inch and larger must be welded. Fittings must match pipe schedule and material. Welded pipe one and one-half inch and smaller must be jointed with the use of socket weld fittings of at least 2,000 pounds per square inch ratings or butt weld fittings of the same wall thickness and material as the pipe. Socket weld fittings must be forged steel.~~

~~C. Flanges must be a tongue and groove type, or raised face type, rated and designed for ammonia service and system pressure.~~

~~D. Gaskets must be designed for ammonia service and system pressure.~~

~~E.~~ B. Unions must be at least 2,000 pounds per square inch forged steel ground joint unions, and must be used only for three quarters inch and smaller pipe.

Subp. 2. **Branch, run-outs, laterals, and saddles.** When joining carbon steel to carbon steel material, if the main piping is two inches and smaller, or the branch or run-out is two inches and smaller, branch or lateral connections must be forged steel TEE fitting, forged steel ~~WELD-O-LET™~~ or ~~THREAD-O-LET™~~ reinforced branch fitting, or engineering equivalent of ~~at least class 3,000 pounds per square inch~~ rating. Engineering equivalency must be based on proper documentation signed by a ~~registered~~ licensed professional engineer. When joining materials other than carbon steel to carbon steel, ASME standard B31.5 must be followed.

Where the main piping exceeds two inches, branch or lateral connections must be made by forged steel TEE fitting, be forged steel ~~WELD-O-LET™~~, or ~~THREAD-O-LET™~~ of ~~at least 2,000 pounds per square inch rating~~; reinforced branch fitting, or in cases where the branch exceeds two inches (further providing that a branch lateral or saddle is two pipe sizes smaller than the main piping it is connected to) the connection may be made by the use of a saddle or lateral connection that complies with the requirements of this part.

Branches or run-outs the same size as the main must be connected using forged steel TEE fittings.

Welding of saddles and laterals must comply with the provisions of ASME standard B31.5.

Subp. 3. [Repealed, 34 SR 145]

Subp. 4. [Repealed, 34 SR 145]

[For text of subp 5, see M.R.]

Subp. 6. **Examination of welded pipe joints.** All welds on ammonia piping systems must comply with the visual examination acceptance standards in section ~~527.3.2~~ 536.4.1 of ASME B31.5. When nondestructive examination other than visual examination is required by job specification or by the administrative authority, the welds must comply with the



acceptance standards in ~~section 536.6.3~~ sections 536.6.2 to 536.6.4 of ASME B31.5 for each type of nondestructive examination required. All costs of nondestructive testing shall be paid by the installing contractor. The contractor shall provide a copy of all examination results to the administrative authority upon request.

**5230.5920 QUALIFICATION OF WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS.**

*[For text of subp 1, see M.R.]*

Subp. 2. **Incorporation by reference.** For purposes of this chapter, "ASME section IX" means the ~~2013~~ 2017 edition of section IX of the Boiler and Pressure Vessel Code, as approved and published by ASME, Two Park Avenue, New York, New York 10016. ASME section IX is incorporated by reference and made a part of this chapter. ASME section IX is not subject to frequent change. A copy of ASME section IX is available in the office of the commissioner of labor and industry and at the State Law Library, 25 Rev. Dr. Martin Luther King Jr. Blvd., Saint Paul, Minnesota 55155.

*[For text of subps 3 to 9, see M.R.]*

**EFFECTIVE DATE.** Minnesota Rules, parts 5230.0220 to 5230.5920, are effective five working days after publication of the amendments' notice of adoption in the State Register.