

**CHAPTER 5230**  
**BOARD OF HIGH PRESSURE PIPING SYSTEMS**  
**PIPEFITTERS; POWER PIPING SYSTEMS**

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**5230.0005 DEFINITIONS.**

Subpart 1. **Scope.** The terms used in parts 5230.0005 to 5230.5920 and Minnesota Statutes, sections 326B.91 and 326B.921 to 326B.925, have the meanings given them in this part.

Subp. 2. **Administrative authority.** "Administrative authority" means the inspection agency authorized to inspect high pressure piping under Minnesota Statutes, sections 326B.90 and 326B.92, subdivision 2.

Subp. 3. **Ammonia piping system.** "Ammonia piping system" means a piping system conveying ammonia that is used for refrigeration.

Subp. 4. **ASME.** "ASME" means the American Society of Mechanical Engineers.

Subp. 5. **Bioprocess piping.** "Bioprocess piping" means piping and equipment used for conveying living organisms for medical, research, or pharmaceutical purposes, but does not include piping used to make bio food products or treat waste.

Subp. 6. **Bioprocess piping system.** "Bioprocess piping system" means a piping system for bioprocess piping.

Subp. 7. **Contractor.** "Contractor" means an entity with a valid high pressure piping business license, as described in Minnesota Statutes, section 326B.921, subdivision 2.

Subp. 8. **Department.** "Department" means the Department of Labor and Industry.

Subp. 9. **Direct supervision.** "Direct supervision," with respect to direct supervision of an unlicensed individual by a licensed contracting high pressure pipefitter or a licensed journeyman high pressure pipefitter, means that:

A. at all times while the unlicensed individual is performing high pressure piping work, the supervising pipefitter is present at the location where the unlicensed individual is working;

B. the supervising pipefitter is physically present and immediately available to the unlicensed individual at all times for assistance and direction;

C. electronic supervision does not meet the requirements of item B;

D. the supervising pipefitter reviews the high pressure piping work performed by the unlicensed individual before the high pressure piping system is operated or placed in service; and

E. the supervising pipefitter is able to and does determine that all high pressure piping work performed by the unlicensed individual is performed in compliance with this chapter.

Subp. 10. **High pressure piping system.** "High pressure piping system" means:

A. a steam or heating media piping system;

B. an ammonia piping system; or

C. a bioprocess piping system.

Subp. 11. **High pressure piping work.** "High pressure piping work" means activities for which a contracting or journeyman high pressure pipefitter license is required under Minnesota Statutes, section 326B.921, subdivision 1.

Subp. 12. **Other medium used for heating.** "Other medium used for heating" means hot oil or other liquid that transfers heat without a phase change. Other medium used for heating does not include products within refinery and chemical process complexes that exchange heat with other product streams as part of the core process.

Subp. 13. **Pipefitting laws.** "Pipefitting laws" means this chapter, chapter 5231, and Minnesota Statutes, sections 326B.90 to 326B.925.

Subp. 14. **Piping system.** "Piping system" means the method of conveying liquid, vapor, steam, water, ammonia, or other medium from one point to another and includes all component parts, accessories, apparatus, equipment, or appurtenances necessary for proper and safe operation according to this chapter. Piping system includes pipes, flanges, bolting, gaskets, valves, fittings, the pressure-containing elements or portions of the system, piping and equipment supporting elements, hangers, or structural attachments.

Subp. 15. **Power piping system.** "Power piping system" means high pressure piping system.

Subp. 15a. **Registered unlicensed individual.** "Registered unlicensed individual" means an individual who is:

A. employed in the trade of the practical construction and installation of high pressure piping and appurtenances by a licensed high pressure piping business; and

B. registered with the department under part 5230.0035.

Subp. 16. **Steam or heating media piping.** "Steam or heating media piping" means any system of piping hot water or other medium used for heating that exceeds 30 p.s.i. gauge and 250 degrees Fahrenheit, or any system of piping high pressure steam in excess of 15 p.s.i. gauge.

Subp. 17. **Steam or heating media piping system.** "Steam or heating media piping system" means a piping system for steam or heating media piping.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145; 39 SR 1343*

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**5230.0010** [Repealed, L 2007 c 140 art 13 s 3]

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**5230.0020** [Repealed, L 2007 c 140 art 13 s 3]

**Published Electronically:** *September 16, 2009*

**5230.0030** [Renumbered 5231.0030]

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### **5230.0035 REGISTRATION OF UNLICENSED INDIVIDUAL.**

Subpart 1. **Scope.** Subparts 2 to 5 shall not apply to any individual employed in the trade of pipefitting under an apprenticeship agreement approved by the department under part 5200.0300.

Subp. 2. **Unlicensed individual registration requirement.** No unlicensed individual under the age of 18 shall perform high pressure piping work. An individual who is 18 years of age or older must be registered with the department if the individual does not hold a contracting or journeyman high pressure pipefitter license and if the individual performs high pressure piping work.

Subp. 3. **Information required to be provided by applicant on initial and renewal registration application.** An applicant for registration must provide the following information on the initial application form and each renewal application form provided by the department:

- A. complete name;
- B. date of birth;
- C. Social Security number;
- D. home address;
- E. telephone number; and
- F. date of application.

Subp. 4. **Change in information.** A registered unlicensed individual is responsible for keeping current the information provided to the department under subpart 3. A registered unlicensed individual must notify the department within 30 days of a change in any of the information in the most recent application submitted by the individual to the department under subpart 3.

Subp. 5. **Registration card.** The unlicensed individual shall carry the registration card issued by the department at all times when the unlicensed individual is performing high pressure piping work. The unlicensed individual shall present the registration card to the administrative authority upon request.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145*

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**5230.0040** [Repealed, L 2007 c 140 art 13 s 3]

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#### **5230.0045 COMPETENCY LICENSING REQUIREMENT.**

Subpart 1. **License required.** All licensed contracting high pressure pipefitters and licensed journeyman high pressure pipefitters shall carry their license on their person at all times while performing high pressure piping work, and shall produce the license upon request by the administrative authority.

Subp. 2. **Construction.** Construction of high pressure piping for installation in Minnesota, regardless of where constructed, shall meet the requirements of the pipefitting laws.

Subp. 3. **Remedies required for licensing violations.** The remedies described in this subpart are in addition to any other remedies provided by law. The enforcement of the remedies described in this subpart shall not preclude the use of any other enforcement provision in law for violations of the licensing requirements in the pipefitting laws, such as any provision allowing the commissioner to assess penalties or take disciplinary action.

A. Construction. As used in this item, the term "unauthorized piping" means any high pressure piping constructed by a person who does not hold the license required under the pipefitting laws. If any unauthorized piping is installed as part of a high pressure piping system in Minnesota, then:

- (1) the unauthorized piping must be removed; and
- (2) the high pressure piping system that includes the unauthorized piping cannot be placed in service unless and until the unauthorized piping is replaced with high pressure piping constructed by a person who holds the license required under the pipefitting laws.

B. Installation. As used in this item, the term "unauthorized installation" means any high pressure piping installed by a person who does not hold the license required under the pipefitting laws. If there is an unauthorized installation in a high pressure piping system, then:

(1) the unauthorized installation must be removed; and

(2) the high pressure piping system that includes the unauthorized installation cannot be placed in service unless and until the unauthorized installation is replaced with high pressure piping installed by a person who holds the license required under the pipefitting laws.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145*

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**5230.0050** [Repealed, 34 SR 145]

**Published Electronically:** *September 16, 2009*

**5230.0060 COMPETENCY LICENSE APPLICATIONS.**

Subpart 1. **Contracting high pressure pipefitter and journeyman high pressure pipefitter licenses.** Application for a contracting high pressure pipefitter's license or a journeyman high pressure pipefitter's license shall be made to the department on forms provided for that purpose by the department. Application for a contracting high pressure pipefitter's license or a journeyman high pressure pipefitter's license shall be filed with the department at least 15 days before examination. An application for a contracting high pressure pipefitter's or journeyman high pressure pipefitter's license shall be valid for 12 months from the date the application is received by the department.

If, on examination, the applicant qualifies, the department shall issue to the applicant a license as a contracting high pressure pipefitter or journeyman high pressure pipefitter, as the case may be, for the remainder of the calendar year. If the applicant fails the examination, the applicant cannot retake the examination until at least one month after the date of the failed examination. Before retaking the examination, the applicant must submit a new application and examination fee.

Subp. 2. [Repealed, L 2007 c 140 art 13 s 3]

**Statutory Authority:** *MS s 175.171; 326.48; 326B.921; 326B.925*

**History:** *14 SR 1877; 17 SR 1279; L 2007 c 140 art 10 s 11; art 13 s 3,4; 34 SR 145*

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**5230.0070 CONTRACTING HIGH PRESSURE PIPEFITTER QUALIFICATIONS.**

An applicant for a license as a contracting high pressure pipefitter shall:

- A. be at least 21 years of age;
- B. be able to read and comprehend blueprints, specifications, and terms of contracts, and to compute the cost of installing high pressure piping and equipment;
- C. have worked at the trade of high pressure pipefitting for at least five years;

D. be examined as to their knowledge of high pressure pipefitting, the requirements of the pipefitting laws for the installation of high pressure piping in Minnesota, their ability to lay out a plan of high pressure piping, and their knowledge of the physics and mechanics applicable to high pressure piping;

E. generally demonstrate to the department their fitness to properly, intelligently, and lawfully carry on the business of a contracting high pressure pipefitter in Minnesota;

F. pay an examination fee; and

G. pass the required examination with a weighted score of at least 70 out of 100.

**Statutory Authority:** *MS s 175.171; 326.48; 326B.921; 326B.925*

**History:** *14 SR 1877; L 2007 c 140 art 10 s 11; art 13 s 4; 34 SR 145*

**Published Electronically:** *September 16, 2009*

### 5230.0080 JOURNEYMAN HIGH PRESSURE PIPEFITTER QUALIFICATIONS.

An applicant for license as a journeyman high pressure pipefitter shall:

A. be at least 20 years of age;

B. be able to read and comprehend blueprints and specifications for the installation of high pressure piping;

C. for at least four years, have been a registered unlicensed individual or pipefitter apprentice, or have worked in the trade of high pressure pipefitting;

D. pay an examination fee; and

E. pass the required examination with a weighted score of at least 70 out of 100.

**Statutory Authority:** *MS s 175.171; 326.48; 326B.921; 326B.925*

**History:** *14 SR 1877; L 2007 c 140 art 10 s 11; art 13 s 4; 34 SR 145*

**Published Electronically:** *September 16, 2009*

### 5230.0090 EXAMINATION OF APPLICANTS FOR COMPETENCY LICENSES.

Subpart 1. **Contents.** Examinations shall consist of written questions and drawings of plans and sketches, except that when an applicant has a disability and is unable to provide a written examination, the examination may be entirely oral. All questions and sketches shall pertain to practical experience and knowledge of pipefitting and be standard, but may be changed from time to time.

Subp. 2. [Repealed, 34 SR 145]

Subp. 3. **Test results.** Applicants shall be notified of the outcome of their examination after their examination has been scored. The notice to those who failed to pass shall inform them that: (1) they cannot retake the examination until at least one month after the date of the failed examination; and (2) they will need to submit a new application and examination fee before retaking the examination.

**Statutory Authority:** *MS s 175.171; 326.48; 326B.921; 326B.925*

**History:** *14 SR 1877; 17 SR 1279; L 2005 c 56 s 2; L 2007 c 140 art 10 s 11; art 13 s 4; 34 SR 145*

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**5230.0095 HIGH PRESSURE PIPING BUSINESS LICENSES.**

Subpart 1. **High pressure piping business license required.** An individual, person, partnership, firm, corporation, or association must obtain or use a business with a high pressure piping business license before obtaining a permit for high pressure piping work.

Subp. 2. **High pressure pipefitting business license procedure.** To obtain a high pressure pipefitting business license, as required by Minnesota Statutes, section 326B.921, subdivision 2, an applicant must submit a form approved by the department and signed by the applicant. The application shall include the applicant's certification that the applicant has:

- A. workers' compensation insurance required by law or that the applicant is exempt;
- B. public liability insurance as required by Minnesota Statutes, section 326B.921, subdivision 6; and
- C. a high pressure pipefitting business license performance bond that meets the requirements of Minnesota Statutes, section 326B.921, subdivision 5.

With the application, the applicant shall submit copies of the applicant's workers' compensation insurance certificate, if not exempt; the applicant's public liability insurance certificate; the applicant's high pressure pipefitting business license performance bond; and a check for the amount of the fee required by Minnesota Statutes, section 326B.921, subdivision 7. The term of the high pressure pipefitting business license shall be a calendar year or the balance of the calendar year after application. High pressure pipefitting business licenses must be renewed annually on a calendar-year basis.

Subp. 3. **Affiliation with licensed high pressure contracting pipefitter.**

A. If a high pressure pipefitting business licensee is an individual, then that individual must be a licensed contracting high pressure pipefitter. If a high pressure pipefitting business licensee is not an individual, then the business licensee must have a licensed contracting high pressure pipefitter who works full time for the business licensee and who is affiliated with the business licensee in one of the following capacities:

- (1) as an employee;
- (2) as the proprietor, if the business licensee is a sole proprietorship;
- (3) as a partner, if the business licensee is a partnership;
- (4) as an officer, if the business licensee is a corporation; or
- (5) as a member, if the business licensee is a limited liability company.

B. If at any time the high pressure pipefitting business licensee no longer meets the requirements of item A, then the business licensee must notify the department within five business days after the last day that the business licensee met the requirements of item A. If the business licensee fails to meet the requirements of item A for 60 or more consecutive calendar days, then the high pressure pipefitting business license shall lapse.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145*

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**5230.0100** Subpart 1. [Repealed, L 2007 c 140 art 13 s 3]

Subp. 2. [Repealed, 34 SR 145]

Subp. 3. [Repealed, L 2007 c 140 art 13 s 3]

Subp. 3a. [Repealed, 34 SR 145]

Subp. 4. [Repealed, L 2007 c 140 art 13 s 3]

Subp. 5. [Renumbered 5231.0040]

Subp. 6. [Repealed, 34 SR 145]

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**5230.0110** Subpart 1. [Repealed, 14 SR 1877; 25 SR 992]

Subp. 2. [Repealed, 14 SR 1877; 25 SR 992]

Subp. 2a. [Repealed, 25 SR 992]

Subp. 3. [Repealed, 25 SR 992]

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**5230.0115** [Repealed, 34 SR 145]

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**5230.0120 RIGHTS OF LICENSED CONTRACTING HIGH PRESSURE PIPEFITTER.**

A contracting high pressure pipefitter's license shall entitle the pipefitter to work as a journeyman high pressure pipefitter under rules applicable to journeyman high pressure pipefitters, but a journeyman high pressure pipefitter's license shall not entitle the holder to work as a contracting high pressure pipefitter.

**Statutory Authority:** *MS s 175.171; 326.48; 326B.921; 326B.925*

**History:** *14 SR 1877; 17 SR 1279; L 2007 c 140 art 10 s 11; art 13 s 4; 34 SR 145*

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**5230.0130** [Repealed, 34 SR 145]

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**5230.0140** [Repealed, 34 SR 145]

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**5230.0150** [Repealed, 34 SR 145]

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**5230.0160** [Repealed, 34 SR 145]

**Published Electronically:** *September 16, 2009*

**5230.0170** [Repealed, 34 SR 145]

**Published Electronically:** *September 16, 2009*

**5230.0180 SURRENDER OF LICENSE UPON REVOCATION.**

When any high pressure piping license is revoked, the licensee shall immediately surrender the license to the department.

**Statutory Authority:** *MS s 175.171; 326.48; 326B.921; 326B.925*

**History:** *14 SR 1877; 17 SR 1279; L 2007 c 140 art 10 s 11; art 13 s 4; 34 SR 145*

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**5230.0190 DUPLICATE LICENSES.**

Duplicate licenses and identification cards may be issued by the department upon certification by the license holder that the original is lost or mutilated.

**Statutory Authority:** *MS s 175.171; 326.48; 326B.921; 326B.925*

**History:** *L 2007 c 140 art 10 s 11; art 13 s 4; 34 SR 145*

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**5230.0200** [Repealed, 34 SR 145]

**Published Electronically:** *September 16, 2009*

**5230.0210** [Repealed, 34 SR 145]

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**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 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 to MJ-6.4 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 to MJ-6.4 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.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145; 39 SR 1343*

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#### CODE FOR STEAM OR HEATING MEDIA PIPING SYSTEMS

##### 5230.0250 MINIMUM STANDARDS.

Parts 5230.0250 to 5230.0335 form the code for steam or heating media piping systems. This code prescribes minimum requirements for design, manufacture, test, and installation of steam or heating media piping systems.

**Statutory Authority:** *MS s 326.46; 326B.90; 326B.925*

**History:** *L 2007 c 140 art 10 s 11; art 13 s 4; 34 SR 145*

**Published Electronically:** *September 16, 2009*

##### 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 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.

**Statutory Authority:** *MS s 326.46; 326B.90; 326B.925*

**History:** *L 2007 c 140 art 10 s 11; art 13 s 4; 34 SR 145; 39 SR 1343*

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

For purposes of this chapter, "ASME B31.1" means the 2012 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.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145; 39 SR 1343*

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**5230.0270** [Repealed, 34 SR 145]

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**5230.0275 CHAPTER I, SCOPE AND DEFINITIONS.**

Subpart 1. **Section 100.1.2.** The first paragraph of part (A) of ASME B31.1, section 100.1.2 is amended to read as follows:

(A) This code covers boiler external piping as defined below for power boilers and high temperature, high pressure water boilers in which: steam or vapor is generated at a pressure of more than 15 p.s.i. gauge; and high temperature water or other medium used for heating is generated at pressures exceeding 30 p.s.i. gauge and temperatures exceeding 250 degrees Fahrenheit (120 degrees Celsius).

Subp. 2. **Section 100.1.3.** Subparagraph (F) of ASME B31.1, section 100.1.3, is deleted.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145; 39 SR 1343*

**Published Electronically:** *September 15, 2015*

**5230.0280** [Repealed, 34 SR 145]

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**5230.0285 CHAPTER II, DESIGN.**

Subpart 1. **Parts 1 and 2.** Notwithstanding anything to the contrary in ASME B31.1, the following portions of chapter II of ASME B31.1 are recommended rather than mandatory: Part 1, Conditions and Criteria; and Part 2, Pressure Design of Piping Components. The department shall not enforce compliance with Part 1 or Part 2 of chapter II of ASME B31.1

Subp. 2. **Section 122.5.1.** ASME B31.1, section 122.5.1 is amended by adding the following language at the end:

It is mandatory that a pressure gauge be installed on the low-pressure side of a reducing valve. Where two or more reducing valves are installed in series, a pressure gauge shall be installed on the low-pressure side of each pressure-reducing valve.

Subp. 3. **Section 122.7.** ASME B31.1, section 122.7 and all subsections are deleted.

Subp. 4. **Section 122.8.** ASME B31.1, section 122.8 and all subsections are deleted.

Subp. 5. **Section 122.9.** ASME B31.1, section 122.9 is deleted.

Subp. 6. **Section 122.11.2.** ASME B31.1, section 122.11.2 is amended by adding the following language at the end:

The discharge of a high pressure trap shall not empty into a low-pressure receiver unless first run through a flash tank or there is an ample sized vent so a trap failure could not increase the pressure in low-pressure receiver tank.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145*

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**5230.0290** [Repealed, 34 SR 145]

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**5230.0295 CHAPTER III, MATERIALS.**

Section 124 is amended by adding a subsection as follows:

**124.11. Furnace Butt Welded Pipe**

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

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145*

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**5230.0300** [Repealed, 34 SR 145]

**Published Electronically:** *September 16, 2009*

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

**Section 136.** ASME B31.1, section 136 and all subsections are deleted.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145*

**Published Electronically:** *September 16, 2009*

**5230.0310** [Repealed, 34 SR 145]

**Published Electronically:** *September 16, 2009*

**5230.0315 CHAPTER VII, OPERATION AND MAINTENANCE.**

Chapter VII of ASME B31.1 is deleted in its entirety.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145*

**Published Electronically:** *September 16, 2009*

**5230.0320** [Repealed, 34 SR 145]

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**5230.0325 APPENDICES.**

Notwithstanding anything to the contrary in ASME B31.1, the following "Mandatory Appendices" in ASME B31.1 are recommended rather than mandatory: A, D, G, H, and J. The department shall not enforce compliance with "Mandatory Appendices" A, D, G, H, or J of ASME B31.1.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145*

**Published Electronically:** *September 16, 2009*

**5230.0330** [Repealed, 34 SR 145]

**Published Electronically:** *September 16, 2009*

**5230.0335 EXAMINATION OF WELDED PIPE JOINTS.**

All welds on steam or heating media piping systems must comply with the visual examination acceptance standards in section 136.4.2 of ASME B31.1. 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 136.4.3 to 136.4.6 of ASME B31.1 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.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145*

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**5230.0340** [Repealed, 34 SR 145]

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**5230.0350** [Repealed, 34 SR 145]

**Published Electronically:** *September 16, 2009*

**5230.0360** [Repealed, 34 SR 145]

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### CODE FOR AMMONIA REFRIGERATION SYSTEMS

#### **5230.5000 MINIMUM STANDARDS.**

Parts 5230.5000 to 5230.5915 form the code for ammonia refrigeration systems and applies to ammonia piping systems used for closed circuit refrigeration systems. Parts 5230.5000 to 5230.5915 are minimum standards.

**Statutory Authority:** *MS s 326.46; 326B.90; 326B.925*

**History:** *17 SR 438; L 2007 c 140 art 10 s 11; art 13 s 4; 34 SR 145*

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#### **5230.5001 INCORPORATIONS BY REFERENCE.**

Subpart 1. **ANSI/IIAR 2.** For purposes of this chapter, "ANSI/IIAR 2" means the 2008 revision with addendums A and B of the standard for Equipment, Design, and Installation of Closed-Circuit Ammonia Mechanical Refrigerating Systems, as approved by the American National Standards Institute and as published by the International Institute of Ammonia Refrigeration, 1110 North Glebe Road, Suite 250, Arlington, Virginia 22201. 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 revision of the standard for ammonia refrigeration piping 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.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145; 39 SR 1343*

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### 5230.5003 SECTION 3, DEFINITIONS.

ANSI/IIAR 2, Section 3, 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.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145*

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### 5230.5005 SECTION 10, PIPING.

Subpart 1. **Section 10.2.1.5.** ANSI/IIAR 2, section 10.2.1.5, is amended by adding a subsection as follows:

#### 10.2.1.5.1. 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.** ANSI/IIAR 2, section 10.2.2.1, is amended to read as follows:

#### 10.2.2.1. 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.** ANSI/IIAR 2, section 10.2.2.3, is amended to read as follows:

#### 10.2.2.3. 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.** ANSI/IIAR 2, section 10.3.1.3, is amended to read as follows:

**10.3.1.3.** 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 a minimum of 60 seconds.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145*

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#### **5230.5007 SECTION 11, OVERPRESSURE PROTECTION DEVICES.**

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

**11.1.5.** 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.** ANSI/IIAR 2, section 11.1.6.2, 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.** ANSI/IIAR 2, section 11.2.5, is amended to read 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.

Subp. 4. **Section 11.3.3.** ANSI/IIAR 2, section 11.3.3 of addendum A, 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.

**Statutory Authority:** *MS s 326B.925*

**History:** *34 SR 145; 39 SR 1343*

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#### **5230.5009 SECTION 15, TESTING AND CHARGING.**

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

**15.1.7.6. 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.

**Statutory Authority:** *MS s 326B.925*

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### 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.

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. 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™, or engineering equivalent of at least 3,000 pounds per square inch rating. Engineering equivalency must be based on proper documentation signed by a registered 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; 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]

Subp. 5. **Components.** The assembly of the various components, whether done in a shop or as a field erection, must be done so that the completely erected piping and equipment conform with the requirements of this chapter.

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 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 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.

**Statutory Authority:** *MS s 326.46; 326B.90; 326B.925*

**History:** *17 SR 438; L 2007 c 140 art 10 s 11; art 13 s 4; 34 SR 145*

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

Subpart 1. **Scope.** This part applies to welding that is part of any high pressure piping work, except where the welding is regulated by other codes or Minnesota state regulatory bodies, such as the Power Boiler and Unfired Pressure Vessel sections of the ASME Boiler and Pressure Vessel Code.

Subp. 2. **Incorporation by reference.** For purposes of this chapter, "ASME section IX" means the 2013 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.

Subp. 3. **Welding qualifications.** Standard qualifications for welding procedures, welders, and welding operators made according to ASME section IX qualify for work under this part.

Subp. 4. **Retest and renewal of welder qualification.** Welders and welding operators must meet the standard requirements for initial welder qualification, welder continuity requirements, and retest and renewal requirements, as set forth in ASME section IX.

Subp. 5. **Weld procedure and qualification requirements.** No welding may be performed on high pressure piping systems without a welding procedure specification and an associated procedure qualification record. Welding performed on high pressure piping systems must be performed using only welders properly qualified according to the welding procedure. All welding procedures must meet the requirements of ASME section IX.

Subp. 6. **Evaluation standards.** The welding procedure specification and procedure qualification record must be objectively evaluated by and acceptable to the administrative authority.

Subp. 7. **Documentation required.** Welding performed on high pressure piping systems must be supported by the mandatory documents of the welding procedure specification, welding procedure qualification, and procedure qualification record. These documents must be available at the work site.

Subp. 8. **Welder identification and log requirement.** A welder qualified for a project must be assigned an identification symbol unique to that welder. Each weld must be stamped or marked with the welder's identification symbol. A welding log must be maintained as set forth in ASME section IX.

Subp. 9. **Contractor responsibility.** The contractor is responsible for establishing and retaining the needed documents to conform to the requirements of this part.

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