BSR/IIAR CO2-202x

Safety Standard for Closed-Circuit Carbon Dioxide Refrigeration Systems

IIAR CO2 Public Review #4 Draft

Following are supplementary instructions for submitting comments:

1) Provide all of the commenter's contact information [e.g. name, phone number(s), and e-mail].

2) Identify the specific Section (i.e., by its Chapter and Section number) that is the subject of each comment(s). Only changes resulting from Public Review #3 comments and enough content for understanding is shown. Eight (8) highlighted "Note Only:" comments are included to help with understanding. Only ~~striked-through~~ or underlined items can be commented on.

3) Provide specific wording changes or action that would resolve the commenter's concern(s). Additions should be shown by underlining and deletions by strikethrough (i.e., Addition: include this, Deletion: ~~remove this~~), unless clearly shown in another method.

4) Provide a brief substantiation statement that presents the rationale, justification, and supporting documentation; as well as any technical data and backup. Provide an abstract for lengthy substantiations. If supplementary documents are provided to support your comment(s), electronic files in word processed (MS Word preferred) or scanned form are preferred. Indicate whether attachments have been provided. Highlighting pens should not be used since highlighted text will not reproduce.

5) If you do not understand the material, proceed with doing the necessary homework to gain understanding of the material and/or call the IIAR to discuss before commenting. Do not submit comments as opinions or questions.

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TITLE: Safety Standard for Closed-Circuit Carbon Dioxide Refrigeration Systems

Chapter 1. Purpose, Scope, and Applicability

1.2.2 This standard also applies to:

3. *The part of refrigeration systems utilizing carbon dioxide as a secondary fluid.

Note Only: An Asterisk (*) was added above to Section 1.2.2, Item 3 and the following statement was added to (Informative) Appendix A, as Section A.1.2.2, Item 3:

A.1.2.2, Item 3: The intent of this standard is that if carbon dioxide is used in a closed-circuit, regardless if it undergoes a phase change or not, that portion of the system is within the scope of this standard. This includes secondary coolant circuits utilizing carbon dioxide even if the primary refrigeration circuit does not utilize carbon dioxide refrigerant.

Chapter 2. Definitions

2.1 General. Definitions shall be in accordance with this chapter and ANSI/IIAR-1.

Chapter 4. Location of Refrigeration Equipment

4.2.1 ***Listed Equipment.** Equipment constructed and installed in accordance with the listing and the manufacturer's instructions shall be permitted in any occupancy without a machinery room.

Note Only: An asterisk (*) was added above to Section 4.2.1 and the following statement was added to (Informative) Appendix A, as Section A.4.2.1:

A.4.2.1 "Listed" is defined in ANSI/IIAR 1.

Note Only: Section 2.1 above refers to ANSI/IIAR 1.

5.13 Signage, Labels, Pipe Marking

5.13.1 **Installation Identification.** Each refrigeration system erected on the premises shall be provided with a legible permanent sign, securely attached and easily accessible, indicating:

1. The name of and address of the installer.
2. The ASHRAE refrigerant ~~number~~ designation and amount of refrigerant.
3. The lubricant identity and amount.
4. The field test pressure(s) applied.

5. The installation date.

~~6.9.3.5 Machinery room exhaust shall discharge to the outdoors in such a manner as not to cause a nuisance or danger.~~

Note Only: Other subsections of Section 6.9.3 cover this.

~~7.2.10 **Occupancy.** The floor area per occupant is not less than 100 ft² (9.3 m2).~~

Note Only: The 100 ft^2 was from prior editions of the industrial area exception to machinery room requirements, that have been deleted from the UMC, IMC, and ASHRAE 15.

9.2.2.6 *UNS C19400 seamless copper tubing for refrigeration use is permitted for both subcritical and trans-critical systems when listed.

Note Only: The last two (2) sentences of (Informative) Appendix A, Section A.9.2.2.6 were modified as follows:

A.9.2.2.6 High pressure copper tube has been developed that is made from UNS C19400 (aka. Copper-iron, CuFe2P, etc.) The tube is made to meet the dimensional (OD), mechanical, cleanness, and eddy current testing requirements of ASTM B280 (Seamless Copper Tube for Refrigeration Field Service). Similarly, the fittings are made to meet the dimensional requirements and other applicable specifications of ASME B16.22 (WROUGHT Copper and copper alloy…Pressure Fittings). At this time, an ASTM designation is pending for this material. In the meantime, listing is the basis for allowing this material~~. This third party recognized tubing is available for refrigeration applications with continuous operating pressures of up to 1885 psig (130 Bar) at up to 250 °F (120 °C). Fitting MAWP is limited to 1740 psig (120 bar).~~ as verified and approved by UL 207. These third party recognized tubing and fittings are available for applications with a MAWP rating of up to 1885 psig (130 Bar) at up to 250 °F (120 °C).

Chapter 13. Refrigerant Detection and Alarms

13.6.1 **Level 1 Carbon Dioxide Detection and Alarm**. Level 1 carbon dioxide detection and alarm shall have the following features:

1. At least one carbon dioxide detector shall be provided in the room or area.

2. The detector shall activate an audible and visual alarm at an indicated carbon dioxide concentration of~~:~~no greater than 5,000 ppm.

~~a. **Carbon Dioxide** at 5,000 ppm or lower.~~

Note Only: The owner can activate a detector at a lower concentration if they choose to do so.

Chapter 17. Insulation

~~17.1.1 All exterior refrigerant lines which require insulation shall have an insulation thickness selected to minimize condensation.~~

Note Only: The requirements for insulation are covered in Section 5.9.