

References

Listed here are all standards, handbooks, and other publications essential to the formation and implementation of the standard. All references in this Appendix are considered as part of this standard.

ASHRAE *Terminology of Heating, Ventilating, Air Conditioning and Refrigeration*, American Society of Heating Refrigeration and Air-Conditioning Engineers, 1992, 1791 Tullie Circle NE., Atlanta, GA 30329-2305; U.S.A.

ASHRAE Standard 34-1992, *Number Designation and Safety Classification of Refrigerants*, American Society of Heating Refrigeration and Air-Conditioning Engineers, 1992, 1791 Tullie Circle NE., Atlanta, GA 30329-2305; U.S.A.

Appendix C to ARI Standard 700-1995: *Analytical Procedures to ARI Standard 700-1995, Specifications for Fluorocarbon and Other Refrigerants*, Air-Conditioning and Refrigeration Institute, 1995, 4301 North Fairfax Drive, Suite 425, Arlington, VA 22203; U.S.A.

Federal Specification for *Fluorocarbon Refrigerants, BB-F-1421-B*, dated March 5, 1992, Office of the Federal Register, National Archives and Records Administration, 1992, 800 North Capitol Street, NW., Washington, DC 20402; U.S.A.

■ 11. Appendix B to subpart F is amended by:

- a. Designating appendix B as appendix B1;
- b. Revising the introductory text of appendix B and sections 3.2 through 3.4;
- c. Adding paragraph 11.3;
- d. Removing section 12; and
- e. Adding appendix B2 to read as follows:

Appendix B1 to Subpart F of Part 82—Performance of Refrigerant Recovery, Recycling, and/or Reclaim Equipment

This appendix is based on the Air-Conditioning and Refrigeration Institute Standard 740-1993.

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Section 3. Definitions

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3.2 Recover. Reference 40 CFR 82.152.

3.3 Recycle. Reference 40 CFR 82.152.

3.4 Reclaim. Reference 40 CFR 82.152.

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11.3 The nameplate shall also conform to the labeling requirements established for certified recycling and recovery equipment established at 40 CFR 82.158(h).

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Appendix B2 to Subpart F of Part 82—Performance of Refrigerant Recovery, Recycling, and/or Reclaim Equipment

This appendix is based on the Air-Conditioning and Refrigeration Institute Standard 740-1995.

Section 1

Purpose 1.1 *Purpose*. The purpose of this standard is to establish methods of testing for rating and evaluating the performance of

refrigerant recovery, and/or recycling equipment and general equipment requirements (herein referred to as “equipment”) for contaminant or purity levels, capacity, speed and purge loss to minimize emission into the atmosphere of designated refrigerants.

Section 2

Scope 2.1 *Scope*. This standard applies to equipment for recovering and/or recycling single refrigerants, azeotropics, zeotropic blends, and their normal contaminants from refrigerant systems. This standard defines the test apparatus, test gas mixtures, sampling procedures and analytical techniques that will be used to determine the performance of refrigerant recovery and/or recycling equipment (hereinafter, “equipment”).

Section 3. Definitions

3.1 *Definitions*. All terms in this appendix will follow the definitions in § 82.152 unless otherwise defined in this appendix.

3.2 *Clearing Refrigerant*. Procedures used to remove trapped refrigerant from equipment before switching from one refrigerant to another.

3.3 *High Temperature Vapor Recovery Rate*. For equipment having at least one designated refrigerant (see 11.2) with a boiling point in the range of -50 to $+10^{\circ}\text{C}$, the rate will be measured for R-22, or the lowest boiling point refrigerant if R-22 is not a designated refrigerant.

3.4 *Published Ratings*. A statement of the assigned values of those performance characteristics, under stated rating conditions, by which a unit may be chosen to fit its application. These values apply to all units of like nominal size and type (identification) produced by the same manufacturer. As used herein, the term “published rating” includes the rating of all performance characteristics shown on the unit or published in specifications, advertising or other literature controlled by the manufacturer, at stated rating conditions.

3.5 *Push/Pull Method*. The push/pull refrigerant recovery method is defined as the process of transferring liquid refrigerant from a refrigeration system to a receiving vessel by lowering the pressure in the vessel and raising the pressure in the system, and by connecting a separate line between the system liquid port and the receiving vessel.

3.6 *Recycle Flow Rate*. The amount of refrigerant processed divided by the time elapsed in the recycling mode. For equipment which uses a separate recycling sequence, the recycle rate does not include the recovery rate (or elapsed time). For equipment which does not use a separate recycling sequence, the recycle rate is a rate based solely on the higher of the liquid or vapor recovery rate, by which the contaminant levels were measured.

3.7 *Residual Trapped Refrigerant*. Refrigerant remaining in equipment after clearing.

3.8 *Shall, Should, Recommended or It Is Recommended* shall be interpreted as follows:

3.8.1 *Shall*. Where “shall” or “shall not” is used for a provision specified, that

provision is mandatory if compliance with this appendix is claimed.

3.8.2 *Should, Recommended or It Is Recommended* is used to indicate provisions which are not mandatory but which are desirable as good practice.

3.9 *Standard Contaminated Refrigerant Sample*. A mixture of new or reclaimed refrigerant and specified quantities of identified contaminants which constitute the mixture to be processed by the equipment under test. These contaminant levels are expected only from severe service conditions.

3.10 *Trapped Refrigerant*. The amount of refrigerant remaining in the equipment after the recovery or recovery/recycling operation but before clearing.

3.11 *Vapor Recovery Rate*. The average rate that refrigerant is withdrawn from the mixing chamber between two pressures as vapor recovery rate is changing pressure and temperature starting at saturated conditions either 24°C or at the boiling point 100 kPa (abs), whichever is higher. The final pressure condition is 10% of the initial pressure, but not lower than the equipment final recovery vacuum and not higher than 100 kPa (abs).

Section 4. General Equipment Requirements

4.1 *Equipment Information*. The equipment manufacturer shall provide operating instructions, necessary maintenance procedures and source information for replacement parts and repair.

4.2 *Filter Replacement*. The equipment shall indicate when any filter/drier(s) needs replacement. This requirement can be met by use of a moisture transducer and indicator light, by use of a sight glass/moisture indicator or by some measurement of the amount of refrigerant processed such as a flow meter or hour meter. Written instructions such as “to change the filter every 181 kg, or every 30 days” shall not be acceptable except for equipment in large systems where the liquid recovery rate is greater than 11.3 kg/min where the filter/drier(s) would be changed for every job.

4.3 *Purge of Non-Condensable*. If non-condensables are purged, the equipment shall either automatically purge non-condensables or provide indicating means to guide the purge process.

4.4 *Purge Loss*. The total refrigerant loss due to purging non-condensables, draining oil and clearing refrigerant (see 9.5) shall be less than 3% (by weight) of total processed refrigerant.

4.5 *Permeation Rate*. High pressure hose assemblies $\frac{5}{8}$ in. [16 mm] nominal and smaller shall not exceed a permeation rate of 3.9 g/cm²/yr (internal surface) at a temperature of 48.8°C . Hose assemblies that UL recognized as having passed ANSI/UL 1963 requirements shall be accepted without testing. See 7.1.4.

4.6 *Clearing Trapped Refrigerant*. For equipment rated for more than one refrigerant, the manufacturer shall provide a method and instructions which will accomplish connections and clearing within 15 minutes. Special equipment, other than a vacuum pump or manifold gauge set shall be furnished. The clearing procedure shall not rely upon the storage cylinder below saturated pressure conditions at ambient temperature.