

1998
STANDARD for

**REFRIGERANT
RECOVERY/
RECYCLING
EQUIPMENT**



AIR-CONDITIONING &
REFRIGERATION
INSTITUTE

Standard 740

IMPORTANT

SAFETY RECOMMENDATIONS

It is strongly recommended that the product be designed, constructed, assembled and installed in accordance with nationally recognized safety requirements appropriate for products covered by this standard.

ARI, as a manufacturers' trade association, uses its best efforts to develop standards employing state-of-the-art and accepted industry practices. However, ARI does not certify or guarantee safety of any products, components or systems designed, tested, rated, installed or operated in accordance with these standards or that any tests conducted under its standards will be non-hazardous or free from risk.

ARI CERTIFICATION PROGRAM PROVISIONS

Scope of the Certification Program

The Certification Program includes recovery, recovery/recycle and recycle equipment including System Dependent Equipment.

Certified Ratings

The following Certified Ratings are verified by tests at rating conditions specified in Section 4:

1. Liquid Recovery Rate (kg/min)
2. Vapor Recovery Rate (kg/min)
3. Final Recovery Vacuum Level (kPa)
4. Recycle Flow Rate (kg/min)
5. Moisture (PPM by wt.)
6. Acid (PPM by wt.)
7. Non-Condensables (% by vol.)
8. High Temperature Vapor Recovery Rate (kg/min)
9. Residual Trapped Refrigerant (kg)
10. Quantity of Refrigerant Processed at Rated Conditions (kg)
11. High Boiling Residue (% by vol.)

Note:

This standard supersedes ARI Standard 740-95.

TABLE OF CONTENTS

SECTION		PAGE
Section 1.	Purpose	1
Section 2.	Scope	1
Section 3.	Definitions	1
Section 4.	Test Requirements	2
Section 5.	Rating Requirements	2
Section 6.	Minimum Data Requirements for Published Ratings	3
Section 7.	Operating Requirements	3
Section 8.	Marking and Nameplate Data	3
Section 9.	Voluntary Conformance	4

TABLES

Table 1.	Standard Contaminated Refrigerant Samples	5
Table 2.	Performance	7
Table 3.	Contaminants	7
Table 4.	ARI Categories of Refrigerants	8

FIGURES

Figure C1.	Test Apparatus for Self-Contained Equipment	11
Figure C2.	System Dependent Equipment Test Apparatus	12

TABLE OF CONTENTS (CONTINUED)

APPENDICES

SECTION	PAGE
Appendix A. References - Normative	9
Appendix B. References - Informative	9
Appendix C. Methods of Testing for Rating Refrigerant Recovery/Recycling Equipment - Normative	10
C1. Purpose	10
C2. Scope	10
C3. Definitions	10
C4. Test Apparatus and Instrumentation	10
C5. Performance Test Procedures	10
C6. Sampling and Chemical Analysis Methods	15
C7. Performance Calculations for Ratings	15
Appendix D. Particulate Used In Standard Contaminated Refrigerant Sample - Normative	17

REFRIGERANT RECOVERY/RECYCLING EQUIPMENT

Section 1. Purpose

1.1 Purpose. The purpose of this standard is to establish for refrigerant recovery/recycling equipment: definitions; test requirements, rating requirements, minimum data requirements for published ratings, operating requirements, marking and nameplate data; and conformance conditions. It establishes methods of testing for rating and evaluating the performance of refrigerant recovery/recycling equipment for contaminant or purity levels, capacity, speed, purge loss to minimize emission into the atmosphere of designated refrigerants and to assure that recycling equipment meets the minimum purity requirements for refrigerants established in the Industry Recycling Guide (IRG-2).

1.1.1 Intent. This standard is intended for the guidance of the industry, including manufacturers, engineers, installers, contractors and users.

1.1.2 Review and Amendment. This standard is subject to review and amendment as technology advances.

Section 2. Scope

2.1 Scope. This standard applies to equipment for recovering and/or recycling single refrigerants, azeotropes, 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").

2.1.1 Equipment shall be as defined in 3.3.1 and 3.3.2.

2.1.2 Refrigerants used to evaluate equipment shall be pure halogenated hydrocarbons, azeotropes and blends containing halogenated hydrocarbons.

Section 3. Definitions

3.1 Definitions. All terms in this document will follow the standard industry definitions in the current edition of *ASHRAE Terminology of Heating, Ventilation, Air Conditioning, and Refrigeration* unless otherwise defined in this section.

3.2 Clearing Refrigerant. Procedures used to remove trapped refrigerant from air conditioning and refrigeration equipment before switching from one refrigerant to another.

3.3 Equipment Classification.

3.3.1 Self-Contained Equipment. A refrigerant recovery or recycling system which is capable of refrigerant extraction without the assistance of components contained within an air-conditioning or refrigeration system.

3.3.2 System Dependent Equipment. Refrigerant recovery equipment which requires for its operation the assistance of components contained in an air-conditioning or refrigeration system.

3.4 High Temperature Vapor Recovery Rate. For equipment having at least one designated refrigerant (see 8.2) 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.

3.5 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.

3.5.1 Standard Rating. A rating based on tests performed at Standard Rating Conditions.

3.5.2 Application Rating. A rating based on tests performed at Application Rating Conditions (other than Standard Rating Conditions).

3.6 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.

3.7 Rating Conditions. Any set of operating conditions under which a single level of performance results, and which causes only that level of performance to occur.