

**AHRI Guideline Q**

**2016 Guideline for  
Content Recovery & Proper  
Recycling of Refrigerant  
Cylinders**



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## 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 guideline.

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

Note:

This guideline supersedes AHRI Guideline Q-2010.

## TABLE OF CONTENTS

SECTION		PAGE
Section 1.	Purpose.....	1
Section 2.	Scope.....	1
Section 3.	Definitions.....	1
Section 4.	Responsibilities .....	2
Section 5.	Procedure .....	2

## FIGURES

Figure 1.	Placement of Screwdriver for Piercing .....	2
Figure 2.	Pierce Rupture Disc.....	3
Figure 3.	Open Rupture Disc.....	3
Figure 4.	Placement of Non-sparking Pick for Piercing .....	3
Figure 5.	Pierce Side of Tank .....	4
Figure 6.	Label Pierced Hole.....	4

## APPENDICES

Appendix A.	References – Normative.....	5
Appendix B.	References – Informative .....	5

# CONTENT RECOVERY AND PROPER RECYCLING OF REFRIGERANT CYLINDERS

## Section 1. Purpose

**1.1** *Purpose.* For practical, safety and environmental reasons, there is a need for content recovery and proper recycling of refrigerant cylinders. This document is a guideline for content recovery and recycling of cylinders at the end of their useful service life. This document is not intended to be an exhaustive listing of all good practices or requirements. Applicable federal, state and local requirements should be reviewed.

**1.1.1** *Intent.* This guideline is intended for the guidance of the industry, including manufacturers, engineers, installers, contractors, users, refrigerant reclaimers and metal recyclers

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

## Section 2. Scope

**2.1** *Scope.* This guideline is applicable to all U.S Department of Transportation (DOT) non-refillable and refillable fluorocarbon refrigerant cylinders, as defined in Section 3, having water capacity greater than two pounds used to transport refrigerants sold in the United States.

**2.2** *Exclusions.* This guideline does not apply to drums used to ship refrigerants.

## Section 3. Definitions

All terms in this document will follow the standard industry definitions in the *ASHRAE Terminology* website (<https://www.ashrae.org/resources--publications/free-resources/ashrae-terminology>) unless otherwise defined in this section.

**3.1** *DOT-39 Non-refillable Cylinder.* A single-use container produced in accordance with Title 49, Code of Federal Regulations, Section 178.65.

**3.2** *DOT Refillable Cylinder.* A refillable container produced in accordance with the Title 49, Code of Federal Regulations, Section 178.36 (DOT 3A), 178.37 (DOT 3AA), 178.51 (DOT 4BA) or 178.61 (DOT 4BW) or as specified in an applicable special permit authorization as provided by the cylinder manufacturer.

**3.3** *Empty State.*

**3.3.1** *Non-refillable Cylinder.* A cylinder whose contents have been evacuated to a vacuum of 15 in Hg, relative to standard atmospheric pressure of 29.9 in Hg.

**3.3.2** *Refillable Cylinder.* A cylinder whose contents have been recovered to an internal pressure of 0 psig or less with the intent to return it to the owner for proper handling.

**3.4** *End User.* The individual or entity that renders the cylinder empty as defined in Section 3.3.

**3.5** *Metal Recycler.* A business or organization that processes or recycles industrial consumed scrapped material in a sound, environmentally responsible manner.

**3.6** *Recover.* To remove refrigerant from a cylinder at the end of its useful service life and store it in a properly pressure rated recovery cylinder.

**3.7** *Should.* "Should" is used to indicate provisions which are not mandatory but which are desirable as good practice.

**3.8** *Special Permit Cylinder.* A cylinder that has been authorized by the DOT to be manufactured outside the scope of existing DOT regulations but in accordance with the requirements specified by DOT in a special permit. The requirements in

the special permit may include design, composition, manufacture, testing, marking, and transportation criteria as well as special provisions.

### Section 4. Responsibilities

**4.1** *Responsibilities.* It is the responsibility of the End User to verify that any residual refrigerant contents are recovered from the cylinder while the cylinder is still under the control of the End User.

### Section 5. Procedure

**5.1** *Labeling Recommendations.*

**5.1.1** *Recommended Label for DOT-39 Non-refillable Cylinder.* “Do not vent residual pressure to the atmosphere. Recover residual contents using proper recovery equipment, hoses and gauges to a vacuum of 15 in Hg. Observe all precautions printed on the cylinder labels. After recovery, close valve and return for proper recycling or open valve and pierce according to AHRI Guideline Q. Do not reuse. Cylinder should be returned for proper metal recycling.”

**5.1.2** *Recommended Label for DOT Refillable Cylinder.* “Do not vent residual pressure to the atmosphere. Observe all precautions printed on the cylinder labels. Close valves tightly. Promptly return to supplier.”

**5.2** *Residual Content Recovery Procedures.* Disposition of refrigerants must be in compliance with all applicable federal, state and local regulations.

**5.2.1** Valves should remain closed at the onset of the refrigerant recovery process.

**5.2.1.1** Recover refrigerant from cylinder into an appropriate pressure-rated recovery cylinder to Empty State as listed in Section 3.3.

**5.2.1.2** For non-refillable cylinders only, open the valve on the cylinder. Verify cylinder is empty.

**5.2.2** Important: Do not mix refrigerants that have different ASHRAE numbers into the same recovery container.

**5.3** *Cylinder Recycling Recommendations for Non-flammable Refrigerant.*

**5.3.1** *DOT-39 Non-refillable Cylinder.* Do not reuse cylinders. Cylinder must be emptied of their contents as described in Section 5.2.1. After emptied of their contents, open valve. Cylinders may be rendered to a recyclable condition by the following method.

**WARNING: Failure to follow these instructions for safe disposal of the non-refillable refrigerant cylinder can result in an immediate release of contents resulting in personal injury, property damage or both. Read all tank warnings for more information.**

**5.3.1.1** Place the tip of a flat-headed screwdriver on the inside serration of the rupture disc located on the shoulder of the tank (see Figure 1).



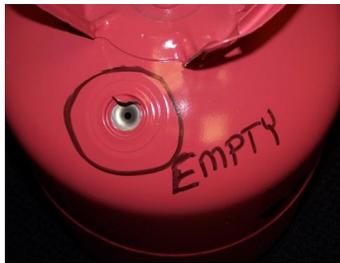
**Figure 1. Placement of Screwdriver for Piercing**

**5.3.1.2** With a hammer or mallet, lightly tap the handle of the screwdriver to pierce the rupture disc open (see Figure 2).



**Figure 2. Pierce Rupture Disc**

**5.3.1.3** Carefully, completely open the rupture disc. With a permanent magic marker, draw a large circle around the open rupture disc and write the word “EMPTY” on the tank (see Figure 3).



**Figure 3. Open Rupture Disc**

**5.3.1.4** Once the rupture disc is open, the tank can be recycled with other steel recyclables at your local steel recycling center.

**5.3.2** *DOT Refillable Cylinder.* Valves should be closed tightly and hood cap securely placed, if applicable. Cylinders should be returned to supplier or owner.

**5.4** *Cylinder Recycling Recommendations for Flammable Refrigerant.*

**5.4.1** *DOT-39 Non-refillable Cylinder.* Do not reuse cylinders. Cylinder must be emptied of their contents as described in Section 5.2.1. After emptied of their contents, open valve. Cylinders may be rendered to a recyclable condition by the following method.

**WARNING: Failure to follow these instructions for safe disposal of the non-refillable refrigerant cylinder can result in an immediate release of contents resulting in personal injury, property damage or both. Read all tank warnings for more information.**

**5.4.1.1** Place the tip of a non-sparking pick on the side of the tank (see Figure 4).



**Figure 4. Placement of Non-sparking Pick for Piercing**

**5.4.1.2** With a hammer or mallet, lightly tap the handle of the non-sparking pick to pierce a hole in the side of the tank (see Figure 5).



**Figure 5. Pierce Side of Tank**

**5.4.1.3** With a permanent magic marker, draw a large circle around the hole and write the word “EMPTY” on the tank (see Figure 6).



**Figure 6. Label Pierced Hole**

**5.4.1.4** Once the hole is made, the tank can be recycled with other steel recyclables at your local steel recycling center.

**5.4.2** *DOT Refillable Cylinder.* Valves should be closed tightly and hood cap securely placed, if applicable. Cylinders should be returned to supplier or owner.

## APPENDIX A. REFERENCES – NORMATIVE

**A1** Listed here are all standards, handbooks and other publications essential to the formation and implementation of the standards. All references in this appendix are considered as part of the standard.

None.

## APPENDIX B. REFERENCES – INFORMATIVE

**B1** Listed here are all guidelines, handbooks and other publications essential to the formation and implementation of this guideline. All references in this appendix are considered as part of the guideline.

**B1.1** AHRI Guideline K-2015, *Containers for Recovered Fluorocarbon Refrigerants*, 2015, Air-Conditioning, Heating, and Refrigeration Institute, 2111 Wilson Boulevard, Suite 500, Arlington, VA 22201, U.S.A.

**B1.2** *ASHRAE Terminology*, <https://www.ashrae.org/resources--publications/free-resources/ashrae-terminology>, 2016, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., 1791 Tullie Circle, N.E., Atlanta, GA 30329, U.S.A.

**B1.3** Title 49 CFR, Code of Federal Regulations, Office of the Federal Register, National Archives and Records Administration, 800 North Capitol Street, NW, Washington, DC 20402, U.S.A.