



Hydrofluorocarbons Proposed Rule Language: Informational Guidebook

Chapter 173-443 WAC Hydrofluorocarbons (HFCs) and Other Fluorinated Greenhouse Gases

Air Quality Program

Washington State Department of Ecology

Olympia, Washington

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Website: [Washington State Department of Ecology](http://www.ecology.wa.gov)¹

ADA Accessibility

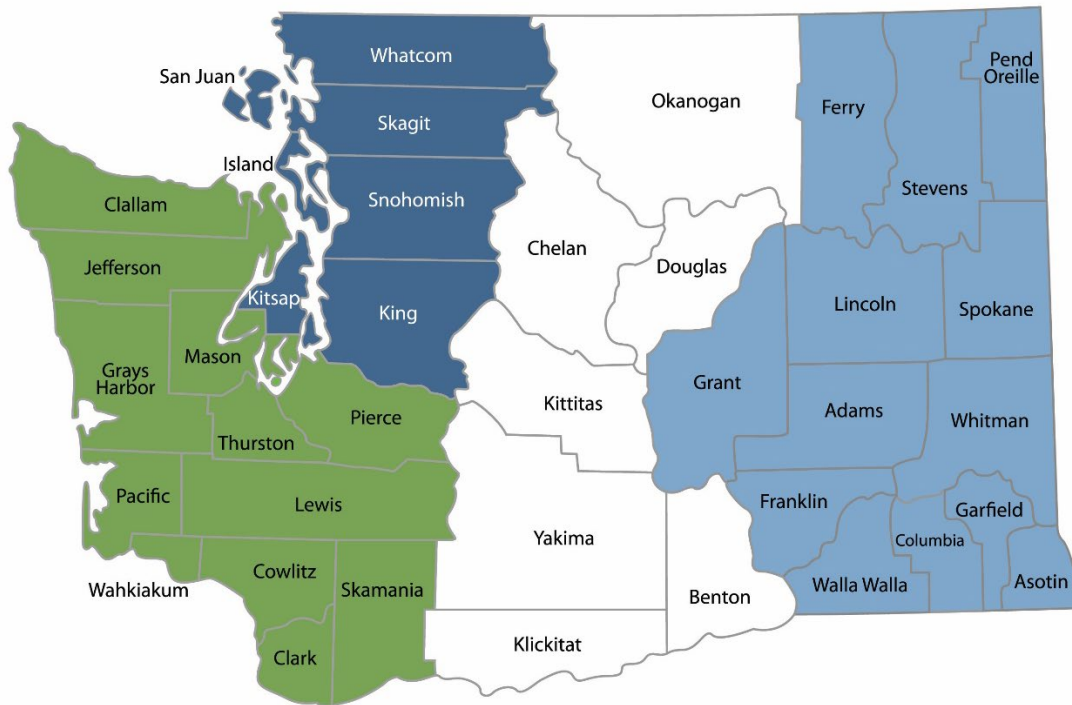
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¹ <http://www.ecology.wa.gov/contact>

Department of Ecology's Regional Offices

Map of Counties Served



Southwest Region 360-407-6300	Northwest Region 206-594-0000	Central Region 509-575-2490	Eastern Region 509-329-3400
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Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	PO Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	PO Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
Headquarters	Across Washington	PO Box 46700 Olympia, WA 98504	360-407-6000

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DEPARTMENT OF
ECOLOGY
State of Washington

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Introduction

Hydrofluorocarbons (HFCs) are a type of fluorinated gas commonly used in refrigeration and air conditioning. Over recent decades, they gained popularity as a replacement for chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), which were shown to be depleting the Earth's ozone layer. However, HFCs are a short-lived “super pollutant” that can be thousands of times more potent than carbon dioxide. Due to increased global demand for cooling and refrigeration, they are now responsible for the fastest-growing greenhouse gas emissions in the world and are having a disproportionate impact on the climate crisis.

In 2021, the Washington Legislature passed HB 1050, Hydrofluorocarbons – Emissions Reduction (Chapter 70A.60 RCW). This law requires Ecology to establish maximum global warming potential (GWP) thresholds for new stationary refrigeration and air conditioning equipment sold in Washington and to establish a refrigerant management program to reduce HFC leakage. It also requires Ecology to adopt GWP thresholds for refrigerants used in ice rinks and prohibits the sale of small cans of high-GWP HFC refrigerants, as well as non-essential consumer products (e.g., air horns, noisemakers) containing high-GWP refrigerant.

This guidebook provides supplemental information to aid the public in reviewing and commenting on the proposed rule. It is intended to provide general information to stakeholders about the Chapter 173-443 WAC Hydrofluorocarbons (HFCs) and Other Fluorinated Greenhouse Gases proposed rule language and how it may affect them. In the event that any provision of this guidebook conflicts with the provision of Chapter 70A.60 RCW or the proposed rule language, the statute and proposed rule language are controlling. This guidebook will be updated upon rule adoption, as necessary.

Benefits of proposed rule

Ecology estimates that the proposed rule, if finalized as written, would result in significant greenhouse gas (GHG) emissions reductions that provide benefits and savings to Washington consumers and industries, through energy efficiency gains and lower cost alternatives. Equipment containing 50 pounds or more of refrigerant is estimated to leak the equivalent of 5.8 million metric tonnes of CO₂ equivalent (MMTCo₂e) statewide every year. Of this leakage, we estimate 3.4 MMTCo₂e are HFCs. Combined with other statewide carbon reduction programs, HFC emission reductions will help Washington achieve its statutory GHG emission reduction limit of 95 percent below 1990 levels by 2050. The GHG emissions reductions from this proposed action would reduce the equivalent of about half a million gasoline-powered vehicles driven for one year.

Rulemaking timeline

Date	Event
August 16, 2021	Announced rulemaking (filed CR-101 form)
December 2021	Proposed recommendations to the legislature about how to manage end-of-life of HFCs/refrigerants
February 2022 – January 2023	Hold stakeholder meetings Develop and prepare rule language
July 13, 2023	Propose rule (file CR-102 form) Start public comment period
August 24, 2023	Hold public hearing(s)
August 31, 2023	End public comment period
Summer 2023 – Fall 2023	Review public comments Prepare adoption package
November 2023	Adopt rule (file CR-103 form)
December 2023	Rule effective 31 days after filing

For more information on this rule and how to comment, as well as information about public hearings, please visit our website: [WAC 173-443-455 - Washington State Department of Ecology](#).

Part 1: Prohibitions on the use of certain HFCs

This section of the guidebook covers Washington setting maximum global warming potential thresholds for new stationary air-conditioning and refrigeration equipment, including ice rinks and motor vehicle air conditioning (MVAC).

What does the rule propose?

Ecology is proposing to restrict the use of high-GWP HFCs in refrigeration, air conditioning, and heat pump products and equipment. The proposed rule would prohibit manufacture and sale of products containing restricted HFCs in Washington by the dates outlined in the tables below. The proposed restrictions are listed by sector and subsector in the sections below.

Who is affected?

These requirements will apply to manufacturers of new equipment and to owners of existing equipment that uses a high-GWP refrigerant. You may be affected by this rule if you:

- Offer for sale, lease, rent, install, or otherwise bring into Washington commerce equipment that contains or uses a regulated refrigerant, HFC, or other substitute;
- Own or operate stationary refrigeration or air conditioning equipment containing a regulated refrigerant, HFC, or other substitute;
- Install, repair, maintain, service, replace, or dispose of a stationary refrigeration or air conditioning system;
- Distribute, reclaim, refrigerant with a high GWP.

Individual homeowners are **not** directly impacted by this rulemaking.

What sectors and subsectors are covered by the proposed rule? What is exempt?

Ecology is proposing to restrict high-GWP HFCs used in products and equipment in the refrigeration and air conditioning sectors. These proposed restrictions and exemptions are summarized in Tables 1.1 through 1.4 in the pages that follow.

Table 1.1: Lists prohibited substances in new products and equipment for refrigeration and air conditioning.

Table 1.2: Lists prohibited substances in new refrigeration equipment and exemptions.

Table 1.3: Prohibited substances for new air conditioning equipment and exemptions.

Table 1.4: Prohibited substances for small containers of refrigerant and nonessential consumer products.

Table 1.1a Prohibited substances for new products and equipment (added through current rulemaking). End-use category: air conditioning.

End-Use Category: Air Conditioning	Prohibited Substances	Effective Date
Centrifugal chillers - heating and heating and cooling <i>(New)</i>	FOR12A, FOR12B, HFC-134a, HFC-227ea, HFC-236fa, HFC-245fa, R-125/134a/600a (28.1/70/1.9), R-125/290/134a/600a (55.0/1.0/42.5/1.5), R-404A, R-407C, R-410A, R-410B, R-417A, R-421A, R-422B, R-422C, R-422D, R-423A, R-424A, R-434A, R-438A, R-507A, RS-44 (2003 composition), THR-03	January 1, 2025
Positive displacement chillers – heating and heating and cooling <i>(New)</i>	FOR12A, FOR12B, HFC-134a, HFC-227ea, KDD6, R-125/134a/600a (28.1/70/1.9), R-125/290/134a/600a (55.0/1.0/42.5/1.5), R-404A, R-407C, R-410A, R-410B, R-417A, R-421A, R-422B, R-422C, R-422D, R-424A, R-434A, R-437A, R-438A, R-507A, RS-44 (2003 composition), SP34E, THR-03	January 1, 2025

Table 1.1b Prohibited substances for new products and equipment (added through current rulemaking). End-use category: refrigeration.

End-Use Category: Refrigeration	Prohibited Substances	Effective Date
Automatic commercial ice machines - remote condensing units <i>(New and retrofit)</i>	R-404A, R-507, R-507A, R-428A, R-422C, R-434A, R-421B, R-408A, R-422A, R-407B, R-402A, R-422D, R-421A, R-125/R-290/R-134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, and R-410B	January 1, 2025
Automatic commercial ice machines – stand-alone units <i>(New and retrofit)</i>	R-404A, R-507, R-507A, R-428A, R-422C, R-434A, R-421B, R-408A, R-422A, R-407B, R-402A, R-422D, R-421A, R-125/R-290/R-134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, R-410B, R-407A, R-410A, R-442A, R-417C, R-407F, R-437A, R-407C, RS-24 (2004 formulation), and HFC-134a	January 1, 2025

Table 1.2. Applies to manufacturers and business owners. Prohibited substances for new refrigeration equipment, including ice rinks.

End-Use	Criteria	Prohibited Substances	Exemptions	Effective Date
Retail food refrigeration <i>(New and existing facilities)</i>	New refrigeration equipment containing more than 50 pounds of refrigerant	Refrigerants with a GWP of 150 or more	**	January 1, 2025
Cold storage warehouses <i>(New and existing facilities)</i>	New refrigeration equipment containing more than 50 pounds of refrigerant	Refrigerants with a GWP of 150 or more	**	January 1, 2025
Industrial process refrigeration excluding chillers <i>(New and existing facilities)</i>	New refrigeration equipment containing more than 50 pounds of refrigerant	Refrigerants with a GWP of 150 or more	** Very low temperature (VLT) refrigeration or cooling uses	January 1, 2025
Chillers used for industrial process refrigeration <i>(New and existing facilities)</i>	New refrigeration equipment containing more than 50 pounds of refrigerant	Refrigerants with a GWP of 750 or more	** Very low temperature (VLT) refrigeration or cooling uses	January 1, 2025
Ice rinks <i>(New facilities)</i>	New refrigeration equipment containing more than 50 pounds of refrigerant	Refrigerants with a GWP of 150 or more		January 1, 2024
Ice rinks <i>(Existing facilities)</i>	New refrigeration equipment containing more than 50 pounds of refrigerant	Refrigerants with a GWP of 750 or more		January 1, 2024

****Exemptions:**

- Equipment with 50 pounds or less of refrigerant;
- Replacement of a refrigeration component in an existing facility as part of normal maintenance provided the result does not meet the criteria of “new refrigeration equipment” as defined in WAC 173-443-030; and
- Facilities with new refrigeration equipment with a building permit issued before the effective date of this chapter.

Table 1.3. Prohibited substances for new air-conditioning equipment.

End-Use	Criteria	Prohibited Substances	Exemptions	Effective Date
Room/wall/window air conditioning equipment, PTAC/PTHPs, portable air conditioning equipment, and residential dehumidifiers <i>(New and existing facilities)</i>	New air conditioning equipment	Refrigerants with a GWP of 750 or more	Facilities with new air conditioning equipment with a building permit issued before the effective date of this chapter.	January 1, 2024
Other types of air conditioning equipment used in residential and nonresidential applications <i>(New and existing facilities)</i>	New air conditioning equipment	Refrigerants with a GWP of 750 or more	Facilities with new air conditioning equipment with a building permit issued before the effective date of this chapter.	January 1, 2028
Variable refrigerant flow (VRF) or volume system <i>(New and existing facilities)</i>	New air conditioning equipment	Refrigerants with a GWP of 750 or more	Facilities with new air conditioning equipment with a building permit issued before the effective date of this chapter.	January 1, 2026

Table 1.4. Prohibited substances for small containers of refrigerant and nonessential consumer products, including MVAC. Applies to manufacturers and suppliers.

End-Use	Prohibited Substances	Effective Date
Small containers of refrigerant (less than two pounds) designed for consumer recharge of a motor vehicle air conditioning system or consumer appliance	Refrigerants with a GWP of 150 or more	July 25, 2021
Nonessential consumer products	Refrigerants with a GWP of 150 or more	July 25, 2021

Part 2: Refrigerant Management Program

The purpose of the Refrigerant Management Program (RMP) is to reduce GHG emissions from stationary commercial refrigeration and air-conditioning systems, which includes the installation and servicing of equipment systems using high-GWP refrigerants. This section covers what property owners/operators and facility managers need to know about the RMP and how it may impact them.

What does the rule propose?

As proposed, the refrigerant management program will address emissions from large refrigeration and air-conditioning equipment operating in Washington containing high-GWP refrigerant. This will be accomplished by requiring owners to perform regular leak inspections and timely leak repairs.

Equipment owners using high-GWP refrigerants will not be required to replace their existing equipment if the equipment remains in good operating condition and detected leaks of high-GWP refrigerants are repaired. Equipment owners will need to register with Ecology and participate in annual reporting based on equipment size.

Who is affected?

The RMP requirements apply to you if you are:

- Any owner or operator of a facility that has refrigeration or air conditioning system(s) with a full charge greater than or equal to 50 pounds of a high-GWP (>150) refrigerant;
- Any person who installs, repairs, maintains, services, or disposes of refrigeration or air conditioning equipment; and
- Any person who wholesales, distributes, or reclaims any amount of high-GWP refrigerants in Washington.

Beginning January 1, 2024, the owner or operator of a facility that has a refrigeration or air-conditioning system with a full charge greater than or equal to 50 pounds of a high-GWP refrigerant must maintain records (outlined in the recordkeeping section below) for a minimum of five years.

Understanding the charge of your equipment or system

Since the RMP requirements for a given facility varies by facility category, it is important to confirm the full refrigerant charge of the largest system. Full charge weight of a system can be determined by checking the equipment plate, reviewing the service records or by contacting your service provider or manufacturer.

California Air Resources Board provide a [charge calculator](#) (Microsoft Excel file) to calculate the charge from the size components in the system.

What are the requirements of the RMP in the proposed rule?

As proposed, the RMP requirements apply to the following:

- Industrial process refrigeration (IPR);
- Commercial refrigeration;
- Air conditioning; and
- Other refrigeration systems containing 50 pounds or more of a high-GWP refrigerant.

These regulations do not apply to systems containing less than 50 pounds of refrigerant.

Registration and fees

If you are an owner/operator of equipment subject to the RMP and you have a business in operation as of January 1, 2024, then you are required to register by March 15, as outlined in the table below. For businesses that are not in operation until after the effective date, registration will be required by March 15 of the following year. i.e., a facility with a large system charge that begins operations on January 2, 2024, must register by March 15, 2025.

Implementation fees are required for owners/operators of facilities with refrigeration or air conditioning systems as outlined in Table 2.1. Fees are due and payable to Ecology within 30 days of receipt of invoice following registration.

Owners/operators must register their facility and refrigeration or air conditioning equipment with Ecology according to the schedule in Table 2.1 below. Further information about how to register and pay fees will be provided when the rule is adopted and implemented.

Table 2.1. Registration deadlines and fees

System Charge	Registration Deadline	Initial Implementation Fee	Annual Implementation Fee
≥ 1,500 (large)	March 15, 2024	\$150	\$370
200 ≤ 1,499 (medium)	March 15, 2026	None	\$170
50 ≤ 199 (small)	March 15, 2028	None	None

Registration for wholesalers, distributors, and reclaimers

If you are a wholesaler, distributor, and/or reclaimer, you are required to register with Ecology by March 15, 2024, and do not have any implementation fees.

Leak detection and monitoring

Leak inspections

Owner/operators must conduct leak inspections for systems according to the schedule in Table 2.2 below. Leak inspections must be conducted by a Section 608 certified technician, and they may use a calibrated refrigerant leak detection device or conduct a bubble test. All visible and accessible components of a system must be inspected.

Table 2.2. Leak inspection requirements

Facility Category	Leak inspection frequency	Effective Date
Large	Monthly	January 1, 2024
Medium	Every 3 months	January 1, 2024
Small	Yearly	January 1, 2024
Systems Not Operated Year-round	Within 30 days of resuming operation; then every 3 months	January 1, 2024

In addition to regularly scheduled leak inspections, system leak inspections are to be conducted:

- At the time of verification and follow up verification tests;
- Each time refrigerant is added in an amount equal to or greater than five (5) pounds, or one percent of the full charge, whichever is greater; and
- Each time oil residue is observed on any refrigerant circuit component indicating a refrigerant leak.

If your systems (or portions of systems) are in an enclosed building and are continuously monitored by an automatic leak detection system (ALD), which is audited and calibrated annually, then you are not required to conduct regular leak inspections (see details in section on ALD below).

Automatic leak detection (ALD)

If you are an owners/operator of large refrigeration systems ($\geq 1,500$ pounds of refrigerant), and intend to operate year-round, you are required to install an ALD system by January 1, 2025. This applies to systems which have:

- The refrigerant circuit located entirely within an enclosed building or structure; or
- The compressor, evaporator, condenser, or any other component of the refrigeration system is located inside an enclosed building or structure.

Installation of ALD is not required if the system is intended to be replaced or retrofit to use a low-GWP refrigerant before January 1, 2027.

If you are an owner/operator of refrigeration systems with less than 1500 pounds of refrigerant (small and medium systems) and your system meet the above criteria, you may choose to install ALD and in doing so will not be required to conduct regular leak inspections.

Leak rate thresholds

Leak rate thresholds for commercial refrigeration, industrial process refrigeration (IPR), and air conditioning systems are outlined in Table 4 below.

Table 2.3. Leak rate thresholds

End Use	Leak Rate Threshold
Commercial or Retail Refrigeration	16%
Industrial Process Refrigeration (IPR)	24%
Air Conditioning	8%

The owner/operator of a facility with a system that exceeds the leak rate thresholds, shown above in Table 2.3, must notify Ecology through the Ecology RMP platform within 30 days of determining the exceedance, followed by leak repair verification tests as required.

Calculating your leak rate

Owners/operators must calculate the leak rate every time:

- There is a leak inspection conducted and
- Refrigerant is added to a system.

If the addition of refrigerant is made immediately following the installation of a new system, you are not required to conduct a leak rate calculation at that time.

The leak rate must be calculated using the 12-month rolling average method below:

$$\text{Leak Rate} = \frac{\text{lb refrigerant added over previous 365 day period}}{\text{lb refrigerant normally contained in the system at full charge}} \times 100\%$$

Repairing your leaks

Beginning January 1, 2024, all owners and/or operators of a facility that has a refrigeration or air conditioning system with a refrigerant charge greater than or equal to 50 pounds of a high-GWP refrigerant must ensure that all detected leaks are repaired.

- A refrigerant leak must be repaired by a certified technician within 14 calendar days of its detection, except when a longer period is allowed.
- Owners/operators must verify leaks have been repaired:
 - An **initial verification test** must be performed upon completion of any leak repair and before any additional refrigerant is added to the system.
 - If a system was evacuated to make the repair, a **follow-up verification test** must be performed within 14 days of the system returning to normal operating characteristics and conditions.
- If either the initial or follow-up verification test indicates that repairs were not successful, owners/operators may have one (1) additional time period, equal in time to the first, to ensure the leak is repaired.
- If owners/operators fail to fix all identified leaks within the required timeframe, and do not have an approved exemption, they must create and implement a retrofit or retirement plan.

Retrofit or retirement of equipment

If a system cannot be repaired within the required timeframe and does not have an approved exemption, the owner/operator must create a retrofit (to a low-GWP refrigerant) or retirement plan. The plan must be submitted to Ecology within 90 days of the leak repair timeline expiring.

- The retrofit or retirement must be completed within 6 months of the leak repair timeframe expiring unless granted extra time.
- Owners/operators must repair all identified leaks as part of any retrofit.
- Owners/operators may request relief from the obligation to retrofit or retire a system if:
 - Within the 6-month plan time frame, the owner/operator can establish that the appliance is no longer leaking and,
 - They have successfully repaired all identified all leaks.
- The retrofit or retirement plan requirements are halted during any time that a refrigeration or air conditioning system is undergoing “mothballing”, or intentionally shutting down for longer than 60 days where the refrigerant has been evacuated from the system. Once the system resumes operation, the requirements resume immediately.

Recordkeeping and reporting

If you are an owner/operator of a facility with a refrigeration or air conditioning system(s) with a full charge greater than or equal to 200 pounds of a high-GWP refrigerant (medium and large systems as defined in Table 2.1 of registration and fees section), you must submit an annual facility report to Ecology each year following the year your facility is registered. Annual implementation fees are due and payable to Ecology within 30 days of receipt of invoice following annual reporting.

Beginning January 1, 2024, all owners/operators of **all sized systems** must maintain, at a minimum, the following records for a minimum of 5 years:

- All registration information;
- Documentation of all leak detection systems, leak inspections, and annual audit and calibrations of ALD systems;
- Records of system service and refrigerant leak repairs and documentation of any conditions allowing more than 14 days to repair a refrigerant leak after detection;
- Any retrofit or retirement plans required;
- All reports required;
- Any application for an exemption and any Ecology notification of approval, denial, revocation, or modification of an exemption;
- Any plan or other written documentation required, signed by the facility’s representative, indicating that the system will be replaced or retrofitted to a low-GWP refrigerant before January 1, 2027, in lieu of installing ALD;

- Invoices of high-GWP refrigerant purchases;
- Record of all shipments of high-GWP refrigerants for reclamation or destruction; and
- Records of all refrigeration or air condition systems component data, measurements, calculations, and assumptions used to determine full charge.

Reporting for refrigerant wholesalers, distributors, and reclaimers

If you are a refrigerant wholesaler, distributor, and/or reclaimer, you are required to submit an annual report to Ecology starting March 1, 2025, and each year thereafter, for the previous calendar year. These reporting requirements do not apply to the following purposes:

1. Selling to a refrigerant distributor or wholesaler for eventual resale
2. Providing to a person for reclamation or destruction

The annual report must cover all Washington facilities under the operational control of the refrigerant wholesaler, distributor, or reclaimer and must provide annual statewide aggregated data including:

1. Contact information
2. Refrigerant distribution data
3. Refrigerant reclamation data

Required service practices

A person performing any installation, maintenance, service, repair, or disposal of a refrigeration or air conditioning system with a full charge greater than or equal to 50 pounds of a high-GWP refrigerant must comply with ALL the following conditions:

- The person must hold a current, valid, and applicable certificate issued under 40 CFR 82.161;
- In preparing the equipment for recycling or disposal, the person may not intentionally disrupt the refrigerant circuit resulting in discharge to the atmosphere unless an attempt to recover the refrigerant is made using certified refrigerant recovery equipment;
- The person must evacuate the equipment in accordance with 40 CFR 82.156 when evacuation is required before opening equipment to atmospheric conditions (refrigerant may be returned to the equipment from which it was recovered or to another piece of equipment owned by the same person without being recycled or reclaimed);
- The person may not add an additional refrigerant charge of a refrigerant not compatible with the refrigerant contained in the system;
- The person may not add an additional refrigerant charge to a system known to have a refrigerant leak unless the additional charge is needed to maintain operations while preparing for or conducting the leak repair;

- The person must use refrigerant recovery or recycling equipment certified by EPA under 40 CFR 82.158;
- The person must evacuate refrigerant from a nonrefillable cylinder to a vacuum of 15 inches of mercury, relative to standard atmospheric pressure of 29.9 inches of mercury, before recycling or disposal; and
- The person must satisfy job site evacuation of refrigerants during recycling, recovering, reclaiming, or disposing in accordance with 40 CFR 82.156.