
Refrigerant Recovery From Appliances/Stationary Sources

Iowa Waste Reduction Center / University of Northern Iowa
319-273-8905 or 1-800-422-3109

40 CFR 82 Subpart F

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Do these regulations apply to my operation?

These regulations apply if your facility recovers refrigerant from appliances or other stationary sources such as air conditioners (not motor vehicle air conditioners) and refrigeration equipment before disposal/recycling.

General Requirements

These regulations prohibit purposeful venting and minimize accidental releases of ozone-depleting refrigerant compounds (CFCs, HCFCs and their blends) during the servicing and/or disposal of air conditioners and refrigeration equipment. These regulations do not cover refrigerant recovery from motor vehicle air conditioners (MVACs) or MVAC-like vehicles (tractors, heavy equipment, boats, etc.) which is covered by 40 CFR 82 Subpart B. A summary of the MVAC regulations may be obtained from the IWRC.

These regulations set certification requirements for recycling and recovery equipment, as well as for technicians and refrigerant reclaimers. The sale of refrigerant is restricted to certified technicians. Persons performing service or disposing of air conditioners or refrigeration equipment must certify to EPA that they have acquired the proper equipment and are complying with these regulations.

Finally, these rules require that substantial leaks from air conditioners and/or refrigeration equipment be repaired, and establish requirements to ensure that equipment entering the waste stream with a charge still intact are properly evacuated and disposed of.

What are the benefits of recovering refrigerants?

- Protection of the ozone layer;
- Regulatory compliance; and
- Reuse of refrigerant in other equipment.

Venting Prohibition

The purposeful venting of refrigerant during the maintenance, repair or disposal of air conditioners and refrigeration equipment is strictly prohibited. Only four specific types of releases are permitted:

- 'De Minimus' quantities during the course of making good faith efforts to recapture refrigerant;
- Refrigerant emitted during the course of normal operation of air conditioning and refrigeration equipment such as mechanical purging;
- Releases of CFCs and HCFCs that are **not** used as refrigerants; and
- Small releases of refrigerant that result from purging hoses or from connecting or disconnecting hoses to charge or service appliances.

Evacuation Requirements

If opening the equipment, technicians are required to evacuate refrigerant to established vacuum levels. The required levels depend on when the equipment being used was manufactured and what type of refrigerant is being evacuated. See Table 1 below.

Table 1. Required Levels of Refrigerant Evacuation from Appliances

TYPE OF APPLIANCE	INCHES OF MERCURY VACUUM* USING EQUIPMENT MANUFACTURED:	
	Before November 15, 1993	On or After November 15, 1993
HCFC-22 appliance** normally containing less than 200 lbs. of refrigerant	0	0
HCFC-22 appliance** normally containing 200 lbs. or more of refrigerant	4	10
Other high-pressure appliance** normally containing less than 200 lbs. of refrigerant (CFC-12, -500, -502, -114)	4	10
Other high-pressure appliance** normally containing 200 lbs. or more of refrigerant (CFC-12, -500, -502, -144)	4	15
Very high pressure appliance (CFC-13, -503)	0	0
Low-pressure appliance (CFC-11, HCFC-123)	25	25 mm Hg absolute

* Relative to standard atmospheric pressure of 29.9" Hg. ** Or isolated component of such an appliance.

Technicians repairing small appliances (window air conditioners, household refrigerators and water coolers) must recover 80% of the refrigerant if:

- Using evacuation equipment manufactured before November 15, 1993; **or**
- The compressor in the appliance is not operating.

Technicians repairing small appliances must recover 90% of the refrigerant if:

- Using evacuation equipment manufactured on or after November 15, 1993; **and**
- The compressor in the appliance is operating.

Exceptions to the evacuation requirements are as follows:

- If, due to leaks, the levels in Table 1 are not attainable, or evacuation to those levels would substantially contaminate the refrigerant, the leaking components must be isolated from the non-leaking components wherever possible. The refrigerant levels in the non-leaking components should be evacuated to the levels in Table 1, and levels in the leaking components should be evacuated to the lowest possible level without contamination.
- If evacuation will not be performed after repairs are complete and the repair is not major, levels should be evacuated to at least 0 psig before it is opened (if high- or very high-pressure appliance) or be pressurized to 0 psig before opening if it is a low-pressure appliance.

Equipment Certification

If evacuation equipment was manufactured on or after November 15, 1993, it must have been certified by an EPA-approved equipment testing organization such as Underwriters Laboratories (UL) or the Air Conditioning and Refrigeration Institute (ARI). Certified equipment will have the following printed on it: “This equipment has been certified by ARI/UL to meet EPA’s minimum requirements for recycling and/or recovery equipment intended for use with [appropriate category of appliance inserted]”.

EPA requires that persons performing maintenance or disposing of refrigeration equipment acquire the proper equipment and notify the appropriate EPA Regional Office of the use of such equipment as well as certify that the applicable requirements are being met. This certification must be signed by the owner/operator. An example certification form is included.

Refrigerant Leaks

Owners of equipment with charges greater than 50 pounds are required to repair refrigerant leaks from such equipment when all leaks would together result in the loss or a certain percentage of total refrigerant over one year.

- For commercial/industrial equipment, leaks must be repaired when the leak rate would result in a 35% loss of refrigerant charge over one year; and
- For all other equipment, leaks must be repaired when the leak rate would result in a 15% loss of refrigerant charge over one year.

More detailed requirements for refrigerant leak repair exist depending on the use/retirement plan for the equipment, if shutdown is required to make repairs, etc. For more assistance, contact the Iowa Waste Reduction Center.

Technician Certification

A technician certification program exists for those performing maintenance, service or repair. A technician is defined as a person conducting any of the following activities:

- Attaching/detaching hoses and gauges to and from appliances to measure pressure within the appliance;
- Adding refrigerant to or removing refrigerant from an appliance; or
- Any other activity that may violate the integrity of the small appliance.

Four types of certification exist:

<u>Type 1:</u>	Service of small appliances;
<u>Type 2:</u>	Service or disposal of high- or very high-pressure appliances, except small appliances and MVACs;
<u>Type 3:</u>	Service or disposal of low-pressure appliances; or
<u>Type 4:</u>	Service on all types of equipment (Universal).

Certification is obtained by passing an EPA-approved test given by an EPA-approved certifying organization. The EPA's Ozone Protection Hotline (800-296-1996) or IWRC may be contacted for a list of EPA-approved certifying organizations.

Technician certification is not required for those removing refrigerant from appliances in the waste stream that could reasonably release refrigerant into the atmosphere.

Refrigerant Sales

The sale of refrigerant in any size container is restricted to certified technicians as described above or certified according to the MVAC regulations. This sales restriction includes refrigerant in bulk containers (cylinders/drums) and pre-charged parts. It does **not** include refrigerant contained in refrigerators/air conditioners with fully assembled refrigerant circuits. Nor does it include pure HFC, CFC or HCFC refrigerants **not** intended for use as refrigerant.

Refrigerant Equipment Disposal

Equipment that typically enters the waste stream with an intact refrigerant charge (MVACs, household refrigerators and freezers, room air conditioners, etc) is subject to special safe disposal requirements. **The final person in the disposal chain is responsible for ensuring that refrigerant is recovered from all equipment before the final disposal of the equipment.** Persons "upstream" may remove and properly dispose of refrigerant before the equipment reaches the final disposal phase. They should provide documentation of its removal to the final person in the waste stream.

The same performance standards are required for equipment used to recover refrigerant at the final disposal phase, however such equipment does not need to be tested by a laboratory. This allows for self-built equipment, as long as it meets the following performance standards:

- For MVACs and MVAC-like appliances - 102 mm of mercury vacuum;
- For small appliances - 90% efficiency when the appliance compressor is operational and 80% if

the compressor is not operational.

Refrigerant Disposal

If refrigerants are recycled or reclaimed, they are not considered hazardous waste. In addition, used oils contaminated with CFCs are not hazardous waste if:

- The oils are not mixed with other waste;
- The oils are subjected to CFC recycling or reclamation; and
- The oils are not mixed with used oils from other sources.