

REFRIGERANT MANAGEMENT PROGRAM

COMPLIANCE PRACTICES AND REGULATORY UPDATES

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BACKGROUND

- Montreal Protocol
 - Agreed - 1987
 - Effective – 1989
- Objective
 - Protecting the ozone layer by phasing out ozone depleting substances (ODS)
- Ratified by the United States – 1988
- R-11 was given an ozone depleting potential (ODP) of 1.0
 - ODP > 0.2 – Class I (CFCs)
 - ODP < 0.2 – Class II (HCFCs)
- CFCs were initially phased out. HCFCs are currently in the process (Complete phase out by 2030)



BACKGROUND

- Phase out of Class I substances (Section 604 of the CAA)
- Phase out of Class II substances (Section 605 of the CAA)
- Establishing refrigerant substitutes (Section 612 of the CAA)

- National Recycling and Emission Reduction Program (Section 608 of the CAA)
 - Certified technicians
 - Certified refrigeration recovery equipment
 - Leak repair
 - Maintenance and Disposal



DEFINITIONS



SWEEPING CHANGE

- *Appliance* means any device which contains and uses a class I or class II substance or substitute as a refrigerant and which is used for household or commercial purposes, including any air conditioner, motor vehicle air conditioner, refrigerator, chiller, or freezer. For a system with multiple circuits, each independent circuit is considered a separate appliance.)
- The change in definition makes refrigerant substitutes also subject to the requirements of Section 608
- Does EPA have the authority to make substitutes subject to the regulation if the CAA Title VI is called Stratospheric Ozone Protection?
 - Numerous comments 11-page legal analysis in the preamble to establish EPA's authority (Sections III.A and III.B)
 - "If Congress had intended the maintenance, service, and disposal rules to include equipment containing ODS substitutes, it would have expressly identified them in the statute, just as it did as an "exten[sion]" of the venting prohibition in Section 608(c)."



SWEEPING CHANGE

- *Substitute* means any chemical or product, whether existing or new, that is used as a refrigerant to replace a class I or II ozone-depleting substance. Examples include, but are not limited to hydrofluorocarbons, perfluorocarbons, hydrofluoroolefins, hydrofluoroethers, hydrocarbons, ammonia, carbon dioxide, and blends thereof. As used in this subpart, the term “exempt substitutes” refers to certain substitutes when used in certain end-uses that are specified in § 82.154(a)(1) as exempt from the venting prohibition and the requirements of this subpart, and the term “non-exempt substitutes” refers to all other substitutes and end-uses not so specified in § 82.154(a)(1).



EXEMPT REFRIGERANTS

Exempt Refrigerant	Exempt End-Use	Regulatory Citation
Carbon Dioxide (CO ₂)	Any application	40 C.F.R. 82.154(a)(1)(i)
Nitrogen	Any application	40 C.F.R. 82.154(a)(1)(ii)
Water	Any application	40 C.F.R. 82.154(a)(1)(iii)
Ammonia	Commercial or industrial process refrigeration or in absorption units.	40 C.F.R. 82.154(a)(1)(iv)
Chlorine	Industrial process refrigeration.	40 C.F.R. 82.154(a)(1)(v)
Hydrocarbons	Industrial process refrigeration.	40 C.F.R. 82.154(a)(1)(vi)
Ethane (R-170)	Very low-temperature refrigeration equipment and equipment for non-mechanical heat transfer	40 C.F.R. 82.154(a)(1)(vii)
Propane (R-290)	Most applications.	40 C.F.R. 82.154(a)(1)(viii)
Isobutane (R-600a)	Most applications.	40 C.F.R. 82.154(a)(1)(ix)
R-441a	Most applications.	40 C.F.R. 82.154(a)(1)(x)



DETAILED CHANGES TO SECTION 608 REFRIGERANT MANAGEMENT REGULATIONS



DEFINITIONS

- *Commercial refrigeration* means the refrigeration appliances used in the retail food and cold storage warehouse sectors. Retail food appliances include the refrigeration equipment found in supermarkets, convenience stores, restaurants and other food service establishments. Cold storage includes the refrigeration equipment used to store meat, produce, dairy products, and other perishable goods.
- *Industrial process refrigeration* means complex customized appliances that are directly linked to the processes used in, for example, the chemical, pharmaceutical, petrochemical, and manufacturing industries. This sector also includes industrial ice machines, appliances used directly in the generation of electricity, and ice rinks. Where one appliance is used for both industrial process refrigeration and other applications, it will be considered industrial process refrigeration equipment if 50 percent or more of its operating capacity is used for industrial process refrigeration.



DEFINITIONS

- *Small appliance* means any appliance that is fully manufactured, charged, and hermetically sealed in a factory with five (5) pounds or less of refrigerant, including, but not limited to, refrigerators and freezers (designed for home, commercial, or consumer use), medical or industrial research refrigeration equipment, room air conditioners (including window air conditioners, portable air conditioners, and packaged terminal air heat pumps), dehumidifiers, under-the-counter ice makers, vending machines, and drinking water coolers.



UPDATED DEFINITIONS

- *Comfort cooling* means the air-conditioning appliances used to provide cooling in order to control heat and/or humidity in occupied facilities including but not limited to residential, office, and commercial buildings. Comfort cooling appliances include but are not limited to chillers, commercial split systems, and packaged roof-top units.
 - Computer rooms were originally included in the proposed rule
 - (81 FR 82295) “EPA responds that the intent was to apply the term *comfort cooling* only to spaces occupied by humans.”
 - Further clarification with EPA
 - Server farms could be *industrial refrigeration units* if they are “complex customized appliances”.
 - If the appliance is similar to the one defined in the definition of comfort cooling, it could be *Other Appliances*. This term is undefined.



UPDATED DEFINITIONS

- *Leak inspection* means the examination of an appliance to determine the location of refrigerant leaks. Potential methods include, but are not limited to, ultrasonic tests, gas-imaging cameras, bubble tests as appropriate, or the use of a leak detection device operated and maintained according to manufacturer guidelines. Methods that determine whether the appliance is leaking refrigerant but not the location of a leak, such as standing pressure/vacuum decay tests, sight glass checks, viewing receiver levels, pressure checks, and charging charts, must be used in conjunction with methods that can determine the location of a leak.
 - Definition is added to address the periodic leak inspections that have been added to the regulation



UPDATED DEFINITIONS

- *Initial verification test* means those leak tests that are conducted after the repair is finished to verify that a leak or leaks have been repaired before refrigerant is added back to the appliance.
- *Follow-up verification test* means those tests that involve checking the repairs to an appliance after a successful initial verification test and after the appliance has returned to normal operating characteristics and conditions to verify that the repairs were successful. Potential methods for follow-up verification tests include, but are not limited to, the use of soap bubbles as appropriate, electronic or ultrasonic leak detectors, pressure or vacuum tests, fluorescent dye and black light, infrared or near infrared tests, and handheld gas detection devices.
 - Both definitions are less prescriptive. The details are moved to the body of the regulation (30-day time limit, etc.)



CHANGES IN CERTIFICATION REQUIREMENT

- Technician Certification (40 CFR 82.161)
 - Facilities are required to utilize certified technicians to conduct all appliance maintenance, servicing, repair, leak inspection, and disposal work (Same as before)
 - Starting **January 1, 2018**, only certified technicians can perform these tasks on appliances containing Class I, Class II, **and non-exempt refrigerant substitutes**
 - Technician certification programs will be updated but technicians who are currently certified will not be impacted. There is no need for updating certification.
- Refrigerant Recovery Certification (40 CFR 82.158)
 - Manufacturers and importers must certify the refrigerant recovery equipment
 - Starting **January 1, 2017**, owners and operators are no longer required to certify their refrigerant recovery equipment using EPA's device acquisition form – Confirmed with EPA in February of 2017



CHANGES IN LEAK REPAIR

- No changes in leak repair for refrigeration units containing less than 50 pounds of refrigerant per circuit – Minimal requirements apply (Do not knowingly vent)
- Starting **January 1, 2019**, new applicable leak rate thresholds apply to each category

Category	Before January 1, 2019	After January 1, 2019
Industrial Process Refr.	35%	30%
Commercial Process Refr.	35%	20%
Comfort Cooling	15%	10%
Other Appliances	15%	10%

- Note that “Other appliances” may be used more often now that comfort cooling is **ONLY** for places with human occupancy.



CHANGES IN LEAK REPAIR – LEAK RATE CALCULATION

- Starting **January 1, 2019**, calculating appliance leak rate is mandatory for all equipment with over 50 pounds of refrigerant per circuit **every time refrigerant is added to an appliance [40 CFR 82.157(b)]**
 - Annualizing method and Rolling Average method
 - Either one can be used but facility must be consistent in using either method
- EPA inspectors always asked to see the leak rate calculations but it was not really a “regulatory requirement” unless the facility wanted an extension
- Leaks above the applicable leak threshold must be repaired within 30 days of discovery unless a retrofit or retirement plan is developed within the 30-day period



CHANGES IN LEAK REPAIR – LEAK RATE CALCULATION

- Verification tests
 - Initial verification test within 30 days of leak discovery; **must be performed prior to adding refrigerant back into an appliance**
 - Follow up verification test, within 10 days of initial verification or 10 days of reaching normal characteristics
 - As many verification tests or additional repairs can be done as necessary if the repairs are unsuccessful
 - The proposed rule required bringing all leaks to zero. Final rule requires bringing the leak rate to below the thresholds
- All process types are now eligible for extensions, unlike the current rule that only allows them for specific types (IPR, federally-owned)



CHANGES IN LEAK REPAIR – INSPECTION

- Starting **January 1, 2019, Periodic** Inspections are required for units that exceed the leak rate threshold

Equipment	Full Charge	Frequency
Commercial Refrigeration and IPR	\geq 500 pounds	One per quarter until the rates are not exceeded for a year
	50 to 500 pounds	One per year until the rates are not exceeded for a year
Comfort Cooling	\geq 50 pounds	One per year until the rates are not exceeded for a year



CHANGES IN LEAK REPAIR – CHRONIC LEAKS

- Starting **January 1, 2019**, owners or operators of appliances containing 50 pounds or more of refrigerant leaking 125% or more of the full charge in a calendar year must submit a report to EPA by March 1 of the subsequent year and describe efforts to identify leaks and repair the appliance.
 - “The earliest chronically leaking appliance report would be due March 1, 2020, and cover calendar year 2019.” – Correspondence with EPA, December, 2016



APPLIANCE DISPOSAL

- Requirements for Small Appliances (Full Charge < 5 Pounds)
 - Starting **January 1, 2018**, existing requirements applicable to safe disposal of appliances have been extended to appliances containing non-exempt substitutes. These include:
 - Existing appliance evacuation requirements [40 CFR 82.156(b)-(d)]
 - Use of recycling and recovery equipment that meets the defined standards [40 CFR 82.158(e)-(g)]
 - Final processors of appliances for disposal are required to verify the final refrigerant charge and keep records of this information prior to ultimate disposal. All signed statements or contracts obtained in relation to final disposal and refrigerant recovery steps must be kept on-site for at least 3 years.
 - **Updated Rule**: Establishes evacuation and recovery requirements for small appliances containing both ODS **and non-exempt substitutes** to specific levels based on refrigerant recovery equipment manufacture date.



APPLIANCE DISPOSAL - RECORDKEEPING

- Appliances with Full Charge Between 5 and 50 Pounds
 - Starting **January 1, 2018**, technicians evacuating refrigerant from appliances with a full charge greater than 5 but less than 50 pounds are required to keep the following records:
 - The company name, location of the appliance, date, and type of refrigerant recovered for each appliance;
 - Amount of refrigerant (by type) recovered from all disposed appliances in each calendar month; and
 - Quantity of refrigerant (by type) transferred for reclamation and/or destruction, the person to whom it was transferred, and the date.
 - This recordkeeping requirement is the burden of the **certified technician**, and NOT the owner/operator of the appliance. Records must be kept for 3 years following disposal.
 - “the technician evacuating the appliances or that technician’s employer (i.e. the entity paying the technician’s salary). 40 CFR 82.156(a)(3) does not require owner/operators contracting with a third-party technician to keep a copy of those specified records.” – Correspondence with EPA, December, 2016



APPLIANCE DISPOSAL - RECORDKEEPING

- Appliances with Full Charge > 50 Pounds
 - Starting **January 1, 2019**, owners/operators must maintain the following records for all appliances that undergo disposal:
 - Appliance identity and location;
 - Date of appliance disposal and part(s) of appliance being disposed of;
 - Type of disposal actions performed for each appliance;
 - Amount and type of refrigerant removed from the appliance prior to ultimate disposal;
 - Full charge of the appliance.
 - This recordkeeping requirement is the burden of the **owner/operator**. Certified technicians conducting disposal activities must provide these records to owner/operators when applicable.



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