



Title	ES-301-2.02A Ozone-depleting Compounds Management
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1) Activity Description: Ozone-depleting Compounds Management

The storage, use, release, and disposal of ozone-depleting compounds (ODCs), including chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs or HFCs), associated with:

- Centralized and point-of-use heating, ventilation, and air conditioning (HVAC) systems and equipment;
- Commercial refrigeration equipment;
- Motor vehicle air conditioning (MVAC) equipment; and
- Halon-based fire suppression systems.

Section 608 of the Clean Air Act (CAA) prohibits the intentional release into the atmosphere of CFC-12 (a/k/a R-12) or HCFCs such as R-22 (a/k/a HCFC-22), R-142b, and R-124. R-12 is a Class I controlled substance per 40 CFR Part 82 Subpart A. R-22 is a Class II controlled substance per 40 CFR Part 82 Subpart A Appendix B. Section 609 of the CAA and Colorado Air Quality Regulation No. 15 establish standards for recovering and recycling CFC-12 refrigerant from MVACs, training and certification requirements for technicians handling this equipment, and recordkeeping and notification requirements for service facilities.

Units with 100 compressor horsepower or more are required to be registered with the CDPHE. Units that have a greater than 50-pound refrigerant charge are regulated by EPA and CDPHE such that a leak rate calculation must be performed and a record kept whenever refrigerant is added to the regulated equipment. Whenever the calculated leak rate exceeds EPA's acceptable leak rate threshold, maintenance must be performed within 30 days to restore an operational condition that complies with the acceptable leak rate.

2) Potential Environmental Risks

- A. The following environmental concerns are associated with these activities:
- i) Air pollution
 - ii) Improper management of refrigerant
- B. Potential consequences from performing the activity incorrectly:
- i) Intentional and unintentional releases of ODCs to the environment
 - ii) Property damage, personal injury, or damage to the environment
 - iii) Regulatory and judicial enforcement actions and related [financial and non-financial] penalties

3) Critical Operating Requirements

- A. Prohibited Activities
- i) Intentional venting of ODC-containing refrigerants or other ODCs to the atmosphere.
 - ii) Failure to comply with technician training requirements.
 - iii) Failure to comply with ODC leak-rate calculation and recordkeeping requirements.
 - iv) Operation of unregistered stationary equipment over 100 compressor horsepower or stationary commercial food refrigeration units containing over 300 pounds of CFCs or HCFCs.

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- v) Failure to perform and record a leak rate calculation for equipment with over a 50-pound ODC charge.
- vi) Improper disposal of appliances containing regulated ODC refrigerants.

B. General Considerations

- i) Each airport tenant, contractor, and operator that owns, maintains, services, or repairs stationary or mobile equipment containing regulated charges of ODC refrigerants is responsible for understanding the applicable regulations and managing their activities accordingly; this Environmental Guideline is meant as guidance and does not supersede any regulations.
- ii) Technicians that install or remove refrigerants, or that maintain or repair stationary or mobile air conditioning or refrigeration equipment must have the proper training certification from an EPA-approved training provider.
- iii) Records must be kept for maintenance activities on regulated equipment and ODC refrigerant consumption. Records must be kept on site at the facility for a minimum of 3 years.
- iv) For any equipment with more than 50 pounds of ODC capacity, leak rate calculations must be performed for regulated stationary equipment each time ODCs are added to the equipment charge. Leak rate records must be kept and used as a maintenance decision point.
- v) Equipment losses of ODCs above regulatory thresholds trigger leak repairs that must be performed within the applicable regulatory timetable - 30 days - or the equipment must be drained of ODCs and mothballed until repair is completed. Additional time for repairs may be available under certain circumstances. *See "Compliance Guidance For Industrial Process Refrigeration Leak Repair Regulations Under Section 608 Of The Clean Air Act," CMA/EPA October, 1995; available at: <http://www.epa.gov/ozone/title6/608/compguid/guidance.pdf>*

C. Training Requirements

- i) Technicians who repair or service ODCs (CFC-12 and HFC 134a) on HVAC and MVACs must be trained and certified by an EPA-approved organization. Training programs must include information on the proper use of equipment, the regulatory requirements, the importance of refrigerant recovery, and the effects of ozone depletion. A test is required.

D. Storage and Materials Management Requirements

- i) HVAC owners and operators should evaluate their system's emissions for regulation under the Clean Air Act.
- ii) HVAC refrigerants should be stored so as to prevent releases and emissions.
- iii) HVAC owners and operators should manage used oil in accordance with federal and state used oil regulations.
- iv) HVAC operators should manage new and used refrigerant in accordance with federal and state ODC regulations.

4) Planning Requirements

- A. Properly select equipment and systems that will utilize lower impact HCFCs and that will reduce leakage by design. Equipment and systems should allow addition and removal of refrigerant while minimizing loss.

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- B. Emphasize the recovery, recycling, and reuse of CFC/HCFC refrigerants. The operator should institute management systems that will emphasize recovery of refrigeration fluids that become contaminated. This includes using agents who in turn use self-certified equipment for refrigerant recovery that complies with USEPA standards pursuant to 40 CFR Part 82.
- C. Provide capability to measure CFC/HCFC refrigerant weights as added and removed from refrigeration systems. Perform leak rate calculations as required.
- D. Record EPA certificates for each technician and institute measures to ensure that these are the only personnel who work on applicable systems (i.e., stationary and MVAC and MVAC-like systems).
- E. A recordkeeping system should be instituted to organize and maintain applicable records.
- F. Currently, there is no halon-based fire extinguishing equipment owned by DEN. If halon-based equipment is contemplated, DEN Life Safety and DEN Environmental Services should be contacted.

5) **Critical Tasks**

- A. Registration with CDPHE of stationary equipment over 100 horsepower or stationary commercial food refrigeration units containing over 300 pounds of CFCs or HCFCs is required. Go to <http://www.cdphe.state.co.us/ap/down/sser.pdf> for registration form. Facilities that service mobile and stationary air conditioning and refrigeration equipment are also required to notify CDPHE of their ODC activities. The facility notification form can be obtained at <http://www.cdphe.state.co.us/ap/down/fn.pdf>.
- B. Demonstrate compliance with technician certification requirements prior to conducting maintenance or repair activities on stationary or mobile equipment containing regulated ODC charges.
- C. Demonstrate compliance with leak rate calculation requirements each time ODCs are added to regulated stationary equipment or systems with over a 50-pound refrigerant capacity.
- D. Demonstrate compliance with leak repair timetable when leak rate thresholds are exceeded for regulated stationary equipment.
- E. Demonstrate compliance with pre-disposal ODC removal/recovery and related documentation requirements prior to disposal of regulated ODC-containing equipment.
- F. Store refrigeration fluid containers in such a manner so as to prevent or minimize the possibility of leaks (e.g., cylinders should have plugs in their outlets to back up valves).

6) **Emergency Response**

- A. There are no specific emergency response requirements associated with the release of ODCs. However, there is a requirement to repair systems with more than 50 pounds of ODC refrigerant

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capacity that have lost a significant percentage of their charge (15% for comfort cooling and 35% for industrial applications) prorated per one-year period since the last addition of ODC to the equipment OR one year, whichever is shorter. Leaking equipment should be shut down for repairs or maintenance to reduce the leakage rate below the applicable threshold level. If the leak rate cannot be repaired within the 30-day time frame, the equipment should be removed until the equipment can be replaced.

- B. There is the possibility that the release of ODC materials in a closed area can reduce oxygen levels. This is a safety issue and would need to be reported to the DEN Communications Center.
- C. An R-12 (CAS No. 75-71-8) release at or above certain thresholds ($RQ \geq 5,000$ pounds) are reportable pursuant to the EPA List of Lists. There are no reportable quantities for R-22, R-414 or R-134a.

7) Inspection and Maintenance Requirements

- A. Weigh and record amounts of ODCs added to systems or equipment during maintenance or as “trim” charges. Perform leak rate calculations every time ODCs are added to systems or equipment.
- B. Monitor and inspect regulated equipment performance problems that could lead to releases. The use of automated release detection equipment may assist in identifying releases during periods between leak rate calculations.
- C. Document all maintenance activities including leak rate calculations and weights of ODCs sent for disposal, recycle, or reclamation.

8) Expected Records and Outputs

- A. Registration of applicable systems
 - i) Complete registration form and submit to CDPHE. Operator to maintain records.
- B. Maintenance records with leak rate calculations for equipment with over 50 pounds ODC refrigerant capacity
 - i) Operator to maintain records – minimum of 3 years.
- C. Technician Training Records
 - Stationary Systems
 - Type I – Servicing small appliances
 - Type II – Servicing and disposal of high or very high pressure systems other than small appliances and MVAC (motor vehicle air conditioning) systems
 - Type III – Servicing or disposing of low-pressure appliances
 - Universal – Servicing all types of equipment
 - i) Operator to maintain records – minimum of 3 years.
 - MVAC or MVAC-like Systems
 - Training by USEPA-certified program per 40 CFR Part 82.40

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- ii) Operator to maintain records – minimum of 3 years.
- D. Refrigerant purchasing, recovery, recycle, and disposal records
 - i) Operator to maintain records – minimum of 3 years.
- E. Disposal records for discarded appliances using ODCs
 - i) Operator to maintain records – minimum of 3 years.

9) References

- A. Phone Numbers
 - i) DEN Communications Center (for spill reporting) (303) 342-4200
 - ii) DEN Environmental Services (Main Line) (303) 342-2730
 - iii) John Hambright (DEN Environmental Services) (303) 342-2759
- B. Guidance Materials (list is not limited to the following)
 - i) CMA/EPA Compliance Guidance For Industrial Process Refrigeration Leak Repair Regulations Under Section 608 of the Clean Air Act, October, 1995; available at <http://www.epa.gov/ozone/title6/608/compguid/guidance.pdf>
 - ii) U.S. EPA Fact Sheets on Stationary Air Conditioning: <http://www.epa.gov/ozone/title6/608/general/index.html>
 - iii) U.S. EPA Fact Sheets on Motor Vehicle Air Conditioning: <http://www.epa.gov/ozone/title6/609/index.html>
- C. Training Materials (list is not limited to the following)
 - i) For Motor Vehicle Air Conditioning Service technicians
 - ii) For Stationary ODC-containing Refrigeration and Air Conditioning Equipment Technicians
- D. Related Environmental Documents (list is not limited to the following)
 - i) ES-306 Notification Handbook for Spills and Releases to the Environment
 - ii) ES-301-2.02 Heating, Ventilation, and Air Conditioning (HVAC) Operations
 - iii) ES-301-6.03 Management of Recyclable and Reusable Materials
 - iv) ES-308-01.2A HVAC Work Instruction for Ozone-depleting Compounds
 - v) ES-308-01.2B Fleet Maintenance Work Instruction for Ozone-depleting Compounds
- E. Applicable Regulations (list is not limited to the following)
 - i) Federal air quality regulations for refrigerants in mobile and stationary equipment Sections 608 and 609 of the Clean Air Act (40 CFR Part 82)
 - ii) State air quality regulations (5 CCR 1001-2, -3, -5, -8, -9, and -19). The program was authorized by the state legislature in 1992 and the working statute can be found at 25-7-105(11)(a-h), C.R.S.
 - iii) CDPHE Air Quality Control Regulation Number 15 “Regulation to Control Emissions of Ozone Depleting Chemicals”
 - iv) Local air quality regulations (D.R.M.C. Title II, Chapter 4, Article III)
- F. Other Documents (list is not limited to the following)
 - i) Air Conditioning and Refrigeration Institute, ARI 700-1993 or most recent issue

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ii) ARI 740-1993 or most recent issue

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