

## Air Quality Regulatory Compliance

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## Purpose and Scope

**Purpose** This chapter provides information to facilitate Linde compliance with air quality environmental regulatory issues.

**Scope** This chapter applies throughout Linde in the United States.

## Responsibilities

**Location Manager or designee** The Location Manager or designee is responsible for:

- Understanding site air quality regulatory conditions
- Maintaining site compliance with air regulatory requirements including:
  - operating equipment within air quality permit or exemption conditions
  - minimizing releases of Ozone Depleting Substances
  - submission of any regulatory required reports
  - maintenance of required regulatory documentation
- Implementing site corrective/improvement actions to comply with permit requirements
- Paying regulatory fees
- Notifying the Environmental Affairs Department:
  - When a new or modified air permit is required
  - At least 9 months prior to a permit expiration date
  - Of any regulatory inspections and/or violations
  - When the leak rate of an industrial process refrigeration system containing ozone depleting substances exceeds 35%

**Note:** Construction of a new air emission source that requires an air permit cannot start until the permit is obtained.

**Environmental Affairs Department** Environmental Affairs is responsible for the following:

- Providing guidance/assistance to help sites comply with air quality regulatory requirements and minimize our environmental impact
- Working with the site to manage Linde's response and/or corrective actions related to air related regulatory violations

## Background

### Clean Air Act (CAA)

The Clean Air Act (CAA) is the comprehensive law that regulates air emissions from area, stationary, and mobile sources as well as ozone depleting substances and potential hazardous material catastrophic releases. CAA authorizes the U.S. Environmental Protection Agency to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment.

The 1990 amendments to the Clean Air Act were principally intended to meet unaddressed or insufficiently addressed problems such as acid rain, ground-level ozone, stratospheric ozone depletion, and air toxics.

### State Implementation Plans (SIPs) and enforcement

The setting of NAAQSs was coupled with directing the states to develop state implementation plans (SIPs) applicable to appropriate industrial sources in the state. As a result, states do much of the work to carry out the CAA. For example, a state air pollution agency reviews and approves air permit applications and enforces state air quality laws and regulations. States are allowed to have more stringent requirements but must at least meet federal requirements.

SIPs are collections of the regulations a state will use to maintain or improve air quality and comply with the CAA. EPA must approve each SIP, and if a SIP isn't acceptable, EPA can take over enforcing the Clean Air Act in that state.

### Ozone Depleting Substances (ODSs)

Under the 1990 Clean Air Act, EPA established new regulatory requirements to protect the stratospheric ozone layer from ODSs. As a result of the Montreal Protocol and Title VI of the 1990 Clean Air Act Amendments (CAAA), extensive requirements apply to the manufacture, usage, and disposal of chlorinated fluorocarbons (CFCs), hydrochlorinated fluorocarbons (HCFCs), halons, or the group of chemicals collectively known as Ozone-Depleting Substances (ODSs). The requirements also apply to any blends of these substances.

**Note:** The primary area of impact on Linde covers our use of chlorofluorocarbons and hydrochlorofluorocarbons, such as R-11, R-12, R-13, R-22, R-23, R-123, R-502, R-404A, as refrigerants.

### Risk Management Program

Under CAA Section 112(r), the US EPA also established the Risk Management Program (RMP) to prevent chemical accidents. These requirements apply to facilities having listed hazardous substances above established threshold quantities. For additional information see the chapter [IMS-02-11 : PSM/RMP Overview](#).

## Air Pollutants

### Criteria air pollutants

Criteria air pollutants include common air pollutants that are found all over the United States, such as Nitrogen Oxides (NO<sub>x</sub>) and Sulfur Dioxide (SO<sub>2</sub>).

There are two sets of national ambient air quality standards for criteria air pollutants:

- Primary Standard, which protects health including the health of sensitive populations such as asthmatics, children and the elderly.
- Secondary Standard, which is intended to prevent environmental and property damage such as decreased visibility, damage to animals, crops, vegetation and buildings.

Although EPA has been regulating criteria air pollutants since the 1970 CAA was passed, many urban areas do not meet national ambient air quality standards and are classified as non-*Attainment* Areas for at least one criteria air pollutant. The attainment status of an area is usually determined through air quality monitoring stations that continually measure local air pollutant concentrations.

For a list of specific criteria air pollutants and their effects, see *Criteria Air Pollutants (see attachment)*.

### Non-attainment areas

The EPA classifies non-attainment areas according to how badly polluted the areas are. There are five classes of non-attainment areas for smog (ground level ozone). For other pollutants the same categories generally apply.

The classifications are:

- Marginal Areas (relatively easy to clean up quickly)
- Moderate Areas
- Serious Areas
- Severe Areas
- Extreme Areas (will take a lot of emission reductions and a long time to clean up)

The 1990 CAA uses this new classification system to tailor clean-up requirements to the severity of the pollution and set realistic deadlines for reaching clean-up goals, such as meeting ambient air quality standards. If deadlines are missed, the law allows more time to clean up, but usually a non-attainment area that has missed a clean-up deadline will have to meet the stricter clean-up requirements, such as the more stringent pollution controls/emission limits set for more polluted areas.

**Note:** Not only must non-attainment areas meet deadlines; states with non-attainment areas must show EPA that they are moving on clean up before the deadline, or making reasonable further progress.

### Clean-up responsibility

States will usually do most of the planning for cleaning up criteria air pollutants, using the permit system to make sure pollution sources meet their clean-up goals. As the pollution gets worse, pollution controls are required for smaller air emission sources.

Emission offsets (reduction in pollutant emissions from another air pollution source) are often required in non-attainment areas before a new air pollution source, or increased pollutant emissions at an existing source, can be approved. Companies must provide these offsets from other sources they own, or purchase them from other parties.

**Air permits** Air permit requirements vary widely from state to state. Any source of air pollutants could require an air permit depending on their “potential to emit” air pollutants. For complete details about air permitting, see *Air Permits (in IMS-22-05)* in the chapter Environmental Permitting.

## Ozone Depleting Substances (ODSs)

**Class I refrigerant** Class I refrigerants are mostly chlorofluorocarbon (CFC) refrigerants or any refrigerant mixture containing a CFC. For example: Freon 11, 12, 13.

A production ban for Class I substances has been established and began on January 1, 1996. For Class II substances, the ban will begin in 2015. Halons are no longer manufactured. Class I ODSs that were no longer manufactured as of January 1, 1996, affecting Linde Americas, include CFC-11, -12, -13, -506, and methylchloroform (1,1,1 trichloroethane).

**Class II refrigerant** Class II refrigerants are hydrochlorofluorocarbon (HCFC) refrigerants or any refrigerant mixture containing an HCFC. For example: Freon 22, 123.

**Class I & II listings** See a listing of Class I and Class II substances in *Class I and II ODSs (see attachment)*.

**Detailed regulations on appliances using ODSs** The Clean Air Act Amendments (CAAA) contain detailed regulations on the service, maintenance, and disposal of refrigeration/air conditioning appliances using ODSs, as well as stringent labeling and recordkeeping requirements. The development of the Significant New Alternatives Policy (SNAP) also requires the EPA to review and approve/disapprove ODS replacement chemicals.

## Refrigeration/Air Conditioning Equipment Requirements

**ODS Requirements** Following are the ODS requirements related to appliances (such as refrigeration and air conditioning equipment) service, maintenance, repair, sale, and disposal:

- Venting and releasing of ODSs during service, maintenance, repair, and disposal activities is prohibited.
- Appliances may not be opened without evacuating refrigerant to a receiver or certified recovery/recycling equipment. Refrigerant must be evacuated according to conditions specified in the table *Required Levels of Evacuation for Appliances*.
- Appliances may not be opened for service, maintenance, or repair until the recovery/recycling equipment has been certified to the EPA.
- Appliances cannot be sold without a servicing aperture for refrigerant removal.
- Technicians must be certified to service, maintain, and repair appliances.
- ODSs may not be sold unless the buyer proves that a certified technician is in their employ.
- Refrigerant must be recovered prior to disposal of an appliance, or proof of prior evacuation must be available.

## ODS Recovery/Recycling Equipment

### Recovery/ recycling equipment standards

Following are the primary requirements covering ODS recovery/recycling equipment:

- At least one piece of certified, self-contained recovery equipment must be on-site prior to opening appliances.
- Recovery equipment manufactured before 11/15/93 must recover 80% of refrigerant; if made after 11/15/93, it must recover 90%.
- Equipment manufactured after 11/15/93 must be certified according to specification. (Equipment must not release greater than 5% if fitted with a non-condensable purge device.)
- After 5/14/95, equipment must not release greater than 3% of refrigerant being recycled.
- Recovery/recycling equipment must be labeled as certified.
- Equipment manufactured before 11/15/93 will be considered certified if capable of meeting evacuation specifications in the table below.

### Required Levels of Evacuation for Appliances

Type of Appliance	Using "Grandfathered" Recovery or Recycling Equipment	Using New Recovery or Recycling Equipment
HCFC-22 appliance, or isolated component of such appliance, normally containing <200 lbs. of refrigerant	0" Hg	0" Hg
HCFC-22 appliance, or isolated component of such appliance, normally containing >200 lbs. of refrigerant	4" Hg	10" Hg
Very-high-pressure appliance	0" Hg	0" Hg
Other high-pressure appliance, or isolated component of such appliance, normally containing <200 lbs. of refrigerant	4" Hg	10" Hg
Other high-pressure appliance, or isolated component of such appliance, normally containing >200 lbs. of refrigerant	4" Hg	15" Hg
Low-pressure appliance	25" Hg	25" Hg absolute

**Notes for table:**

1. Excludes small appliances, MVACs, and MVAC-like appliances
2. Inches of Hg vacuum relative to standard atmospheric pressure of 29.9 inches of Hg, except where noted

**Technician Certification**

Maintenance, service, and repair of ODS appliances must be conducted by a certified technician who has attended an approved certification program. See the table below for types of technician certifications:

Class	Certification
Type I	Certified to maintain, service, or repair small appliances
Type II	Certified to maintain, service, repair, or dispose of high- or very high-pressure appliances, excluding small appliances and MVACs
Type III	Certified to maintain, service, or repair low- and high-pressure equipment
Type IV	Certified to maintain, service, repair, or dispose of low-pressure appliances

## Leak Repair of Industrial Process Refrigeration Systems

**ODS refrigerant leak repair requirements**

The US EPA has established leak repair requirements that are applicable to industrial process refrigeration systems (50 lbs. or greater of refrigerant). This rule applies to systems that contain and use a class I or class II ODS substance as a refrigerant.

The leak repair requirements of this regulation are triggered when an owner or operator of an industrial process refrigeration system discovers that refrigerant is leaking at a rate which would exceed 35 percent of the system's full charge if the leak were to continue over a 12-month period.

**Note:** It is extremely important that actions are taken and that Environmental Affairs is contacted whenever the leak rate exceeds 35%. Penalties for not complying with these requirements can be enormous.

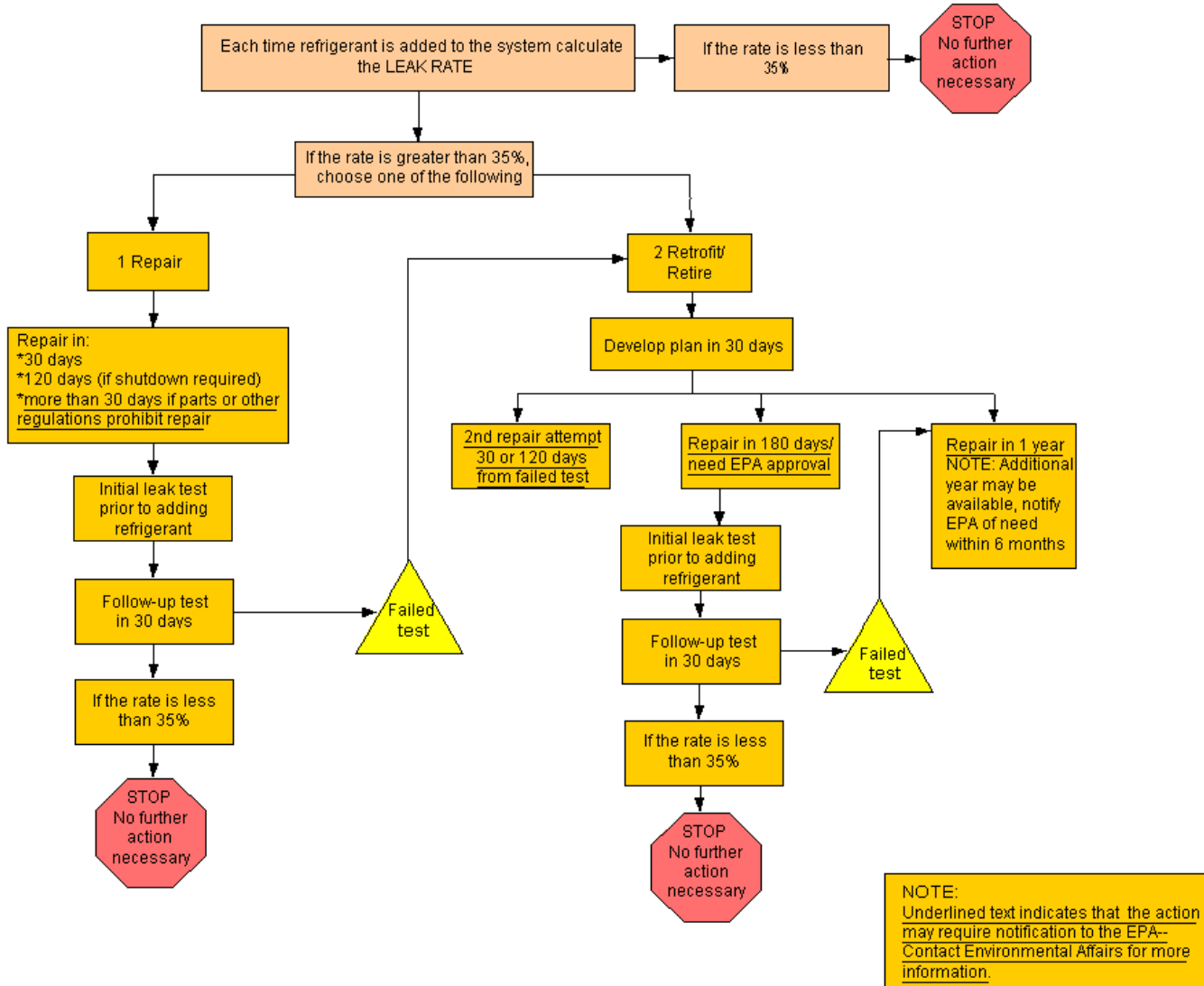
**Determining site's compliance status**

For specific guidelines to help Linde facilities comply with the Ozone Depleting Substances (ODS) leak repair provisions of the US EPA refrigerant recycling regulations, see the [Environmental Guidance Document \(see attachment\)](#).

Also see [Industrial Process Refrigeration Leak Repair Self-Audit Checklist \(see attachment\)](#), which provides help in determining a site's compliance status with the leak repair provisions of the ODS refrigerant regulations. For instructions, see [Instructions for Industrial Process Refrigeration Leak Repair Self-Audit Checklist \(see attachment\)](#).

**Refrigeration leak repair overview** The diagram below provides an overview of the process for determining the best course of action for refrigeration leak repair.

Click here to see the diagram:



## Refrigerant System Oil Changes

**Oil change requirements** Oil in a refrigeration system can contain refrigerant. To reduce the amount of refrigerant lost during oil changes, the EPA requires a drop in pressure prior to oil change. Changing oil at higher than 5 psig is considered venting refrigerant, which is a violation.

The following two procedures can be used to assure recovery of refrigerant found in oil:

- Evacuate (or pressurize) the refrigeration system, or isolated portion, to a pressure no higher than 5 psig and then remove oil; or
- Drain the oil into a system receiver to be evacuated (or pressurized) to a pressure no higher than 5 psig.

**Note:** Used oil containing refrigerant may be considered a hazardous waste. For further information, see the chapter *IMS-22-08: Waste Regulatory Compliance*.

## ODS Recordkeeping

**ODS Reporting and Recordkeeping** All required records must be kept for a minimum of 6 years. Required records include:

- Sellers and distributors of ODSs for use as refrigerants must retain invoices.
- Wholesalers must retain records of the buyer's technician certification.
- Technicians servicing appliances containing more than 50 lbs. of refrigerant must supply appliance owner with invoice indicating amount added.
- Owners and operators of appliances (50 lbs. or greater) must retain servicing records including date, type of service, refrigerant added, and date of addition. See *Servicing Records Example (see attachment)* for an example spreadsheet on keeping these required records.
- Owners or operators whose leak rate exceeds 35% annually must maintain records on-site identifying the facility, leak rate, method used to determine the leak rate and full charge, date of discovery, location of leaks, and repair work that has been completed including dates.

**Note:** EPA notification is required if the leak can not be corrected within 30 days (or 120 days if plant shutdown is required). Please contact Environmental Affairs at any time the leak rate exceeds 35%.

- Technician certificates must be kept on-site.

## Forms and Attachments

**Forms** The following forms are used in this chapter:

- *Industrial Process Refrigeration Leak Repair Self-Audit Checklist (see attachment)*

Attachments

The following attachments are used in this chapter:

- *Instructions for Industrial Process Refrigeration Leak Repair Self-Audit Checklist (see attachment)*
- *Servicing Records Example (see attachment)*
- *Environmental Guidance Document (see attachment)*
- *Criteria Air Pollutants (see attachment)*
- *Class I and II ODSs (see attachment)*
- *Environmental Guidance Document (see attachment)*