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# New US EPA Refrigerant Regulations.

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3M Environment, Health and Safety

# Agenda

- What are Refrigerants
- Montreal Protocol
  - Kigali Agreement
- US HFC Phase-down
- New US Regulations
  - 2017
  - 2018
  - 2019

# What are refrigerants

- **Chlorofluorocarbons (CFC) e.g. R-11, R-12**
  - Class I ozone depleting substances (ODS)
  - ozone depletion potential (ODP) >0.2
  - production phased out since 1996
- **Hydrochlorofluorocarbons (HCFC) e.g. R-22, R-141b, R-142b**
  - Class II ODS, ODP <0.2
  - substitutes for many CFCs
  - product being phased out by 2020
- **Hydrofluorocarbons (HFC) e.g. R-134a, R-407C, R-401A**
  - Non-ODS but potent greenhouse gases (GHG)
  - substitutes for many HCFCs
  - production targeted for future phase down
- **Next Generation**
  - Natural Refrigerants e.g. C02, propane, ammonia
  - Hydrofluoroolefins e.g. R-123yf, R-449A

# Montreal Protocol

- Montreal Protocol
  - International treaty established in 1987 to reverse ozone layer depletion
    - Phase out of CFCs and HCFCs
- Clean Air Act, Title VI - Stratospheric Ozone Protection
  - Statute that allows EPA to develop rules to implement the requirements in the Montreal Protocol
- 40 CFR Part 82 - Protection of Stratospheric Ozone
  - Regulations developed on how to comply

# Montreal Protocol

## Kigali Agreement

- April 2015 - United States, Mexico and Canada jointly submitted an amendment proposal to the Montreal Protocol that includes provisions to phase down the production and consumption, and eliminate byproduct emissions of hydrofluorocarbons (HFCs).
- October 2016 - amendment was adopted. The Kigali Amendment is an amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer.
- January 1, 2019 - Kigali Amendment will enter into force, provided that it is ratified by at least 20 parties to the Montreal Protocol.
- Commitment to cut production/consumption of HFCs:
  - 10% by 2019
  - 40% by 2024
  - 70% by 2029
  - 80% by 2034
  - 85% by 2036

# US Phase-down

Under Section 612 of the CAA, EPA reviews substitutes through the Significant New Alternatives Policy (SNAP) Program to identify substitutes that pose lower overall risks to human health and the environment

EPA's classifications of decisions on alternative substitutes are the following:

- Acceptable - substitute may be used without restriction in a specified end-uses
- Acceptable subject to use conditions – substitute acceptable only if used in a certain way
- Acceptable subject to narrowed use limits - substitute may be used only within certain specialized applications within a sector and end-use
- Unacceptable - substitutes are prohibited

# New US Regulations

## Effective January 1, 2017

| New Rule Change | Previous Rule |
|---|---|
| Extension of rules to Non-ODS Substitutes<br>Two categories of substitutes:<br>1. Non-exempt substitutes<br>2. Exempt substitutes | Only applied to CFC and HCFC |
| No Venting<br>Illegal to knowingly vent these refrigerants | Always applied to all ODS and non-exempt substitutes |
| EPA removed the one-time notification requirement of certified recovery/recycling equipment | Had to registered refrigerant recovery units with EPA |
| Newly manufactured or imported recovery and/or recycling equipment models must be certified for use with HFCs | Only applied to CFC and HCFC refrigerant recovery and/or recycling equipment |
| EPA is adopting UL flammability standard as part of the certification to ensure the safe use of recovery equipment designed for flammable refrigerants | Clarification over existing rule |
| Sales restriction - only sell ODSs to EPA certified technicians | New |

# New US Regulations

## January 1, 2018

| New Rule Change | Previous Rule |
|---|---|
| Technicians must be certified to open an appliance with non-exempt substitutes | Only applied to CFC and HCFC |
| Approved technician certification programs must publish online list of technicians they have certified on or after 01/01/2017 | New |
| Must use certified recovery and/or recycling equipment when opening an appliance with a non-exempt substitute https://www.ahridirectory.org/ahridirectory/pages/rrr/RRREDirectory.pdf | Only applied to CFC and HCFC |
| Must evacuate an appliance to the specified levels of vacuum when opening non-exempt substitutes | Only applied to CFC and HCFC |
| Sales restriction - only sell non-exempt substitutes to EPA Certified Technicians | New |

# New US Regulations

## January 1, 2018 - Disposal

| New Rule Change | Previous Rule |
| --- | --- |
| Medium Appliances with >5 and <50 lbs. of refrigerant<br>1. Company name, location of the appliance, date of recovery, and type of refrigerant recovered for each appliance<br>2. Amount of refrigerant (by type) recovered from all disposed appliances in each calendar month<br>3. Quantity of refrigerant (by type) transferred for reclamation and/or destruction, the person to whom it was transferred, and the date. | New, previously no records were required |
| Small Appliances with 5 lbs. of refrigerant or less<br>Existing safe disposal requirements extended to non-exempt substitute appliances<br>Two Disposal Options:<br>1. Evacuate and recover refrigerant<br>2. Verify that refrigerant has been removed previously via a signed statement or contract | New, applies to CFC and HCFC starting on 1/1/2017 and applies to non-exempt substitutes starting on 1/1/2018 |

# New US Regulations

## January 1, 2019 – Leak Rates

| New Rule Change | Previous Rule |
|---|---|
| Leak Rate Thresholds: Lowers the leak rate thresholds that trigger the repair equipment containing 50 or more pounds of refrigerant.<br>• 30% for Industrial Process Refrigeration (IPR)<br>• 20% for commercial refrigeration<br>• 10% for other cooling | Was<br>• 35% for IPR<br>• 25% for commercial refrigeration<br>• 15% for other cooling |
| The repair must bring the appliance leak rate below the threshold Must be demonstrated when calculating leak rate upon next refrigerant addition | Demonstration of calculation was not required |
| The leak rate must be calculated every time refrigerant is added to an appliance containing ≥50 lbs. of refrigerant | Clarification over existing rule |

# New US Regulations

## January 1, 2019 - Verification Tests

| New Rule Change | Previous Rule |
| --- | --- |
| Applies to ALL types of appliances<br>Demonstration that leaks were successfully repaired:<br>1. Initial verification tests-done before refrigerant is added back into the repaired appliance<br>2. Follow-up verification tests-done after the initial when appliance returns to normal operating conditions - Shortens window for performing follow-up verification test from 30-days to 10-days of initial verification test<br>3. Extended to commercial refrigeration and comfort cooling | Initial and follow-up verification tests only applied only to Industrial Process Refrigeration,<br>follow-up verification test completed within 30 days, and clarification over existing rule |
| If either the initial or follow-up verification test indicates that repairs were not successful, you may conduct as many additional repairs and verification tests as needed within the 30-day repair period | Clarification over existing rule |

# New US Regulations

## January 1, 2019 – Periodic Leak Inspections

| New Rule Change | Previous Rule |
|---|---|
| Periodic Leak Inspections are required for appliances that exceed their duty type threshold leak rate | New |
| All visible and accessible components of an appliance must be inspected<br>Visible or accessible does not mean - components are insulated, under ice, underground, behind walls, or are otherwise inaccessible; personnel must be elevated more than 6.5 feet above a support surface; or components are unsafe to inspect | New |
| Leak inspection must be performed on the following schedule:<br>1. Commercial & Industrial Process Refrigeration - full charge of ≥ 500 lbs. – inspect quarterly<br>2. Comfort Cooling - full charge of 50 to 500 lbs. – inspect annually<br>3. Continue leak inspections until can demonstrate leak rate has not exceeded the threshold consecutively (4 quarters or 1 year) | New |
| Must be conducted by a certified technician | New |

# New US Regulations

## January 1, 2019 – Retrofit/Retirement Plans and Seasonal Variance

| New Rule Change | Previous Rule |
|---|---|
| Extensions to 1-Year Retrofit/Retirement Schedule | Clarification over existing rule |
| Retrofit/Retirement off-ramps available for all appliance types<br>1. Appliance no longer exceeds leak rate within 180 days of the plan date<br>2. Repair all identified leaks within 1 year of the plan date | Only applied to Industrial Process Appliances |
| Modifies available extensions by appliance type<br>1. All appliances automatically allowed 18 months to retire an appliance if replacement uses exempt substitute | New |
| Seasonal Variance<br>1. Allows refrigerant addition to be excluded from leak rate calculations if addition is due to seasonal variance | New |

# New US Regulations

## January 1, 2019 – Other

| New Rule Change | Previous Rule |
|---|---|
| Automatic Leak Detection System - not required to perform periodic leak inspection on appliances that are continuously monitored<br>1. Must be audited or calibrated annually<br>2. If detect refrigerant in air<br>  1. Appliance located indoors<br>  2. Have 10 ppm accuracy<br>  3. Have 100 ppm alert level<br>3. Other systems must alert when lose 50 lbs or 10% of full charge, whichever is less<br>4. If used to monitor only a portion of appliance, then inspection apply | New |
| Chronically Leaking Appliances - for any appliance with ≥ 50 lbs of refrigerant that leaks ≥ 125% of it's full charge in 1 calendar year must submit a report to EPA<br>1. Reports must describe efforts to identify leaks and repair the appliance<br>2. Reports must be submitted no later than March 1 of the following year | New |

# New US Regulations

## January 1, 2019 - Other

| New Rule Change | Previous Rule |
|---|---|
| Recordkeeping<br>1. Technicians must provide owners and operators with invoices (including amount of refrigerant added), and results of leak inspections and verification tests<br>2. Electronic recordkeeping encouraged<br>3. Record retention 3 – 5 years | Clarification over existing rule |
| 30-Day Repair Extension<br>1. Extensions to 30-day repair requirement for ALL appliance types and no more than 180-days (270-days Industrial Process Refrigeration) after leak rate exceeded<br>2. Request an extension | Only available for Industrial Process Refrigeration (120-days) |
| Reporting – electronically to 608reports@epa.gov<br>1. Leak Repair Notification – if can't repair within 30-days request EPA approval<br>2. Chronic Leaker Notification – if exceed 125% of full charge, report due March 1<br>3. Retrofit/Retirement Plan Extension or Off-ramp – considered approved unless EPA notifies otherwise within 60-days of receipt of request | New and clarified |

# New US Regulations

## Summary by Appliance/ Refrigerant Type

| Category | Venting Prohibition | Sales Restrictions | Evacuation Requirements | Technician Certification | Disposal Requirements | Leak Repair Provisions |
|---|---|---|---|---|---|---|
| Appliances w/ Exempt Substitutes | No | No | No | No | No | No |
| Appliances w/ Non-Exempt Substitutes | Yes | Yes<br>Used Ref – 1/1/17<br>Appliances – 1/17/17<br>New Ref – 1/1/18 | Yes<br>1/1/18 | Yes<br>1/1/18 | Yes<br>1/1/18 | Yes<br>≥ 50 lbs – 1/1/19 |
| Small Appliances (≤5 lbs ODS) | Yes | Yes | Yes (specific) | Yes | Yes (specific)<br>'Leaked out' records – 1/1/17 | No |
| Medium Appliances (>5 lbs - > 50 lbs ODS) | Yes | Yes | Yes | Yes | Yes<br>Explicit records – 1/1/18 | No |
| Large Appliances (≥50 lbs ODS) | Yes | Yes | Yes | Yes | Yes | Yes<br>New rules apply 1/1/19 |

# Thank you