

LEED O+M: Retail | v4 - LEED v4

Enhanced refrigerant management

Possible 1 point

1 result in All .

Intent

To reduce ozone depletion and support early compliance with the Montreal Protocol while minimizing direct contributions to climate change.

Requirements

Option 1. No refrigerants or low-impact refrigerants (1 point)

Do not use refrigerants, or use only refrigerants (naturally occurring or synthetic) that have an ozone depletion potential (ODP) of zero and a global warming potential (GWP) of less than 50.

OR

Option 2. Calculation of refrigerant impact (1 point)

Select refrigerants that are used in heating, ventilating, air-conditioning, and refrigeration (HVAC&R) equipment to minimize or eliminate the emission of compounds that contribute to ozone depletion and climate change. The combination of all new and existing [base building](#) and tenant HVAC&R equipment that serve the project must comply with the following formula:

<p>IP units</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>LCGWP+</td> <td>LCODP x</td> <td>10⁵ ≤</td> <td>100</td> </tr> </table> <p>Calculation definitions for LCGWP + LCODP x 10⁵ ≤ 100 (IP units)</p> <p>LCODP = [ODPr x (Lr x Life +Mr) x Rc]/Life LCGWP = [GWPr x (Lr x Life +Mr) x Rc]/Life LCODP: Lifecycle Ozone Depletion Potential (lb CFC 11/Ton-Year) LCGWP: Lifecycle Direct Global Warming Potential (lb CO2/Ton-Year) GWPr: Global Warming Potential of Refrigerant (0 to 12,000 lb CO2/lbr) ODPr: Ozone Depletion Potential of Refrigerant (0 to 0.2 lb CFC 11/lbr) Lr: Refrigerant Leakage Rate (2.0%) Mr: End-of-life Refrigerant Loss (10%) Rc: Refrigerant Charge (0.5 to 5.0 lbs of refrigerant per ton of gross AHRI rated cooling capacity) Life: Equipment Life (10 years; default based on equipment type, unless otherwise demonstrated)</p>	LCGWP+	LCODP x	10 ⁵ ≤	100	<p>SI units</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>LCGWP+</td> <td>LCODP x</td> <td>10⁵ ≤</td> <td>13</td> </tr> </table> <p>Calculation definitions for LCGWP + LCODP x 10⁵ ≤ 13 (SI units)</p> <p>LCODP = [ODPr x (Lr x Life +Mr) x Rc]/Life LCGWP = [GWPr x (Lr x Life +Mr) x Rc]/Life LCODP: Lifecycle Ozone Depletion Potential (kg CFC 11/(kW/year)) LCGWP: Lifecycle Direct Global Warming Potential (kg CO2/kW-year) GWPr: Global Warming Potential of Refrigerant (0 to 12,000 kg CO2/kg r) ODPr: Ozone Depletion Potential of Refrigerant (0 to 0.2 kg CFC 11/kg r) Lr: Refrigerant Leakage Rate (2.0%) Mr: End-of-life Refrigerant Loss (10%) Rc: Refrigerant Charge (0.065 to 0.65 kg of refrigerant per kW of AHRI rated or Eurovent Certified cooling capacity) Life: Equipment Life (10 years; default based on equipment type, unless otherwise demonstrated)</p>	LCGWP+	LCODP x	10 ⁵ ≤	13
LCGWP+	LCODP x	10 ⁵ ≤	100						
LCGWP+	LCODP x	10 ⁵ ≤	13						

For multiple types of equipment, calculate a weighted average of all base building HVAC&R equipment, using the following formula:

<p>IP units</p> $\frac{\sum (LCGWP + LCODP \times 10^5) \times Q_{unit}}{Q_{total}} \leq 100$ <p>Calculation definitions for [∑ (LCGWP + LCODP x 10⁵) x Qunit] / Qtotal ≤ 100 (IP units)</p> <p>Qunit = Gross AHRI rated cooling capacity of an individual HVAC or refrigeration unit (Tons) Qtotal = Total gross AHRI rated cooling capacity of all HVAC or refrigeration</p>	<p>SI units</p> $\frac{\sum (LCGWP + LCODP \times 10^5) \times Q_{unit}}{Q_{total}} \leq 13$ <p>Calculation definitions for [∑ (LCGWP + LCODP x 10⁵) x Qunit] / Qtotal ≤ 13 (SI units)</p> <p>Qunit = Eurovent Certified cooling capacity of an individual HVAC or refrigeration unit (kW) Qtotal = Total Eurovent Certified cooling capacity of all HVAC or refrigeration (kW)</p>
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Meet Option 1 or 2 for all HVAC systems.

Stores with commercial refrigeration systems must comply with the following.

- Use only non-ozone-depleting refrigerants.
- Achieve an average HFC refrigerant charge of no more than 1.75 pounds of refrigerant per 1,000 Btu/h (2.72 grams of refrigerant per kW) total evaporator cooling load.
- Achieve a store-wide annual refrigerant emissions rate of no more than 15%.

Alternatively, stores with commercial refrigeration systems may provide proof of attainment of EPA GreenChill's silver-level store certification for fully operational food retail stores.