



| v3 - LEED 2009

Enhanced refrigerant management

EAc4 | Possible 1 point

Glossary

Intent

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

Requirements

Option 1

Do not use refrigerants.

OR

Option 2

Select refrigerants and heating, ventilating, air conditioning and refrigeration (HVAC&R) equipment that minimize or eliminate the emission of compounds that contribute to ozone depletion and climate change. The base building HVAC&R equipment must comply with the following formula, which sets a maximum threshold for the combined contributions to ozone depletion and global warming potential:

Imperial Units						Metric units							
LCGWP	+	LCODP	x	105	≤	100	LCGWP	+	LCODP	x	105	≤	13
Calculation definitions for $\frac{LCGWP + LCODP \times 105}{100} \leq$						Calculation definitions for $\frac{LCGWP + LCODP \times 105}{13} \leq$ (Metric units)							
LCODP = [ODPr x (Lr x Life + Mr) x Rc]/Life						LCODP = [ODPr x (Lr x Life + Mr) x Rc]/Life							
LCGWP = [GWPr 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)						LCODP: Lifecycle Ozone Depletion Potential (kg CFC 11/(kW/year))							
LCGWP: Lifecycle Direct Global Warming Potential (lb CO ₂ /Ton-Year)						LCGWP: Lifecycle Direct Global Warming Potential (kg CO ₂ /(kW/year))							
GWPr: Global Warming Potential of Refrigerant (0 to 12,000 lb CO ₂ /lb r)						ODPr: Ozone Depletion Potential of Refrigerant (0 to 0.2 kg CFC 11/kg r)							
ODPr: Ozone Depletion Potential of Refrigerant (0 to 0.2 lb CFC 11/lb r)						GWPr: Global Warming Potential of Refrigerant (0 to 12,000 kg CO ₂ /kg r)							
Lr: Refrigerant Leakage Rate (0.5% to 2.0%; default of 2% unless otherwise demonstrated)						Lr: Refrigerant Leakage Rate (0.5% to 2.0%; default of 2% unless otherwise demonstrated)							
Mr: End-of-life Refrigerant Loss (2% to 10%; default of 10% unless otherwise demonstrated)						Mr: End-of-life Refrigerant Loss (2% to 10%; default of 10% unless otherwise demonstrated)							
Rc: Refrigerant Charge (0.5 to 5.0 lbs of refrigerant per ton of gross ARI rated cooling capacity)						Rc: Refrigerant Charge (0.065 to 0.65 kg of refrigerant per kW of ARI rated or Eurovent Certified cooling capacity)							
Life: Equipment Life (10 years; default based on equipment type, unless otherwise demonstrated)						Life: Equipment Life (default based on equipment type, unless otherwise demonstrated)							

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

Imperial units						Metric units							
\sum	(LCGWP	+	LCODP x 105) x Qunit	\sum	(LCGWP	+	LCODP x 105) x Qunit	\leq	13
Qtotal						Qtotal							
Calculation definitions for $[\sum (LCGWP + LCODP \times 105) \times Qunit] / Qtotal \leq 100$						Calculation definitions for $[\sum (LCGWP + LCODP \times 105) \times Qunit] / Qtotal \leq 13$ (Metric units)							
Qunit = Gross ARI rated cooling capacity of an individual HVAC or refrigeration unit (Tons)						Qunit = Eurovent Certified cooling capacity of an individual HVAC or refrigeration unit (kW)							
Qtotal = Total gross ARI rated cooling capacity of all HVAC or refrigeration						Qtotal = Total Eurovent Certified cooling capacity of all HVAC or refrigeration (kW)							

Small HVAC units (defined as containing less than 0.5 pounds of refrigerant) and other equipment, such as standard refrigerators, small water coolers and any other cooling equipment that contains less than 0.5 pounds of refrigerant, are not considered part of the base building system and are not subject to the requirements of this credit.

Do not operate or install fire suppression systems that contain ozone-depleting substances such as CFCs, hydrochlorofluorocarbons (HCFCs) or halons.