



LEED BD+C: Schools | 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) that minimize or eliminate the emission of compounds that contribute to ozone depletion and global 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:

| | | | | | | |
|-------|---|-------|---|--------|--------|-----|
| LCGWP | + | LCODP | x | 10^5 | \leq | 100 |
|-------|---|-------|---|--------|--------|-----|

Calculation definitions for $LCGWP + LCODP \times 10^5 \leq 100$

$LCODP = [ODPr \times (Lr \times Life + Mr) \times Rc] / Life$

$LCGWP = [GWPr \times (Lr \times Life + Mr) \times Rc] / Life$

LCODP: Lifecycle Ozone Depletion Potential (lbCFC11/Ton-Year)

LCGWP: Lifecycle Direct Global Warming Potential (lbCO2/Ton-Year)

GWPr: Global Warming Potential of Refrigerant (0 to 12,000 lbCO2/lbr)

ODPr: Ozone Depletion Potential of Refrigerant (0 to 0.2 lbCFC11/lbr)

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)

Rc: Refrigerant Charge (0.5 to 5.0 lbs of refrigerant per ton of gross ARI rated cooling capacity)

Life: Equipment Life (10 years; 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:

| | | | | | | | | | | |
|----------|---|-------|---|-------|---|--------|---|---|-------|------------|
| Σ | (| LCGWP | + | LCODP | x | 10^5 |) | x | Qunit | ≤ 100 |
| <hr/> | | | | | | | | | | |
| Qtotal | | | | | | | | | | |

Calculation definitions for $[\sum (LCGWP + LCODP \times 10^5) \times Qunit] / Q_{total} \leq 100$

Qunit = Gross ARI rated cooling capacity of an individual HVAC or refrigeration unit (tons)

Qtotal = Total gross ARI rated cooling capacity of all HVAC or refrigeration

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.