

**Intent**

Select and test air-conditioning refrigerant to ensure performance and minimize contributions to ozone depletion and global warming.

Requirements**Prerequisites**

11.1 Refrigerant charge test. Provide proof of proper refrigerant charge of the air-conditioning system (unless home has no mechanical cooling system).

Credits

11.2 Appropriate HVAC refrigerants (1 point). Do one of the following:

- Do not use refrigerants.
- Install an HVAC system with non-HCFC refrigerant (e.g., R-410a).
- Install an HVAC system with a refrigerant that complies with the following equation. (See **Table 1** for examples of the equation applied to R410a used in different system sizes.)

$$\text{LCGWP} + \text{LCODP} \times 10^5 \leq 160$$

where

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

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

LCODP = Lifecycle Ozone Depletion Potential (lb CFC11/ton-year)

LCGWP = Lifecycle Direct Global Warming Potential (lb CO₂/ton-year)

GWPr = Global Warming Potential of Refrigerant (0–12,000 lb CO₂/lbr)

ODPr = Ozone Depletion Potential of Refrigerant (0–0.2 lb CFC11/lbr)

Lr = Refrigerant Leakage Rate (0.5–2.0%; default of 2% unless otherwise demonstrated)

Mr = End-of-life Refrigerant Loss (2.0–10%; default of 10% unless otherwise demonstrated)

Rc = Refrigerant Charge (0.50–5.0 lbs of refrigerant per ton of cooling capacity)

Life = Equipment Life (10–35 years; default based on equipment type, unless otherwise demonstrated)

Table 1 Examples of Residential Refrigerants Eligible for EA 11.2

Refrigerant	Combined LCGWP+LCODP score	System size	Refrigerant charge	Leakage rate	Equipment life
R410a	152	2 tons	3.7 lb/ton	1.5%	15 years
R410a	151	3 tons	3.0 lb/ton	2.0%	15 years
R410a	151	4 tons	3.0 lb/ton	2.0%	15 years
R410a	121	5 tons	3.0 lb/ton	2.0%	15 years