

Refrigerants

Refrigerants are substances used in equipment for cooling and heating purposes. Most of the refrigerants used today are HFCs or blends thereof. HFCs are the third generation of synthetic fluorinated chemicals and were used to replace ozone depleting refrigerants. However, HFCs are potent GHGs that often have high GWP values. Different types of refrigeration equipment are used by different types of land uses. For example, an office may use various types of A/C equipment, while a supermarket may use both A/C equipment and refrigeration equipment.



All equipment that uses refrigerants has a charge size (i.e., quantity of refrigerant the equipment contains), and an operational refrigerant leak rate, and each refrigerant has a GWP that is specific to that refrigerant. The GWPs of common refrigerants are presented in Table R-1.1 in Appendix C, *Emissions Factors and Data Tables*. For purposes of calculating refrigerant emissions in this Handbook, the equipment charge sizes and leak rates have been determined for relevant land use and equipment types. This information is presented in Tables R-1.2 through R-1.5 in Appendix C.

Emissions from equipment can be reduced by decreasing the charge size and/or leak rate, or replacing the baseline refrigerant with a lower GWP refrigerant. The quantification method for all refrigerant measures, except Measure R-7, address emissions generated during equipment operation. Measure R-7 reduces emissions from the disposal of refrigeration and A/C equipment at the end of its lifetime. The quantification approach for Measure R-7 includes lifecycle considerations (i.e., downstream emissions) and, as a result, emission reductions from this measure should not be compared to the emission reductions calculated for other refrigeration measures in this Handbook, which do not include lifecycle emissions.



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- ☐ R-1. Use Alternative Refrigerants Instead of High-GWP Refrigerants
- ☐ R-2. Install Secondary Loop and/or Cascade Supermarket Systems in Place of Direct Expansion Systems
- ☐ R-3. Install Transcritical CO₂ Supermarket Systems in Place of High-GWP Systems
- ☐ R-4. Install Microchannel Heat Exchangers in A/C Equipment in Place of Conventional Heat Exchanger
- ☐ R-5. Reduce Service Leak Emissions
- ☐ R-6. Reduce Operational Leak Emissions
- ☐ R-7. Reduce Disposal Emissions

Use the graphic to click on an individual measure to navigate directly to the measure's factsheet.

