

R-4. Install Microchannel Heat Exchangers in A/C Equipment in Place of Conventional Heat Exchanger



GHG Mitigation Potential



Up to a 35.0% reduction in GHG emissions during operation

Co-Benefits (icon key on pg. 34)

None

Climate Resilience

Non-applicable

Health and Equity Considerations

Microchannel heat exchangers can reduce noise produced by the condenser fan.

Measure Description

This measure replaces conventional heat exchangers in A/C equipment (e.g., unitary A/C) with microchannel heat exchangers (MCHX). Whereas conventional heat exchangers use single or multiple large-diameter tubes to transfer heat in A/C equipment, MCHX use a series of small tubes. A/C equipment using MCHX require 35 percent to 40 percent less refrigerant than those using conventional heat exchangers (U.S. EPA 2019). The reduction in refrigerant charge in A/C equipment results in a reduction of potential GHG emissions.

Scale of Application

Project/Site

Implementation Requirements

See measure description.

Cost Considerations

MCHX have a lower overall equipment cost compared to conventional heat exchangers. Long-term maintenance costs are comparable.

Expanded Mitigation Options

Pair with Measure R-1 *Use Alternative Refrigerants Instead of High-GWP Refrigerants*, for increased GHG reductions in A/C equipment.





GHG Reduction Formula

$$A = -B$$

GHG Calculation Variables

ID	Variable	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from refrigerant emissions	35	%	calculated
User Inputs				
	None			
Constants, Assumptions, and Available Defaults				
B	Assumed charge size reduction due to MCHX	35	%	U.S. EPA 2019

Further explanation of key variables:

- (B) – Based on industry data, the percent reduction in charge size obtained from using MCHX in A/C equipment is provided as an average reduction across A/C equipment.

GHG Calculation Caps or Maximums

This measure has a maximum GHG emissions reduction of 35 percent.

Example GHG Reduction Quantification

The user reduces high-GWP emissions replacing a conventional heat exchanger in A/C equipment with MCHX. Implementation of this project would reduce GHG emissions from the A/C equipment by 35 percent.

$$A = -35\%$$

Quantified Co-Benefits

None.

Sources

- U.S. Environmental Protection Agency (U.S. EPA). 2019. *Global Non-CO₂ Greenhouse Gas Emission Projections & Marginal Abatement Cost Analysis: Methodology Documentation*. U.S. EPA Office of Atmospheric Programs, EPA-430-R-19-012, Washington, DC, September 2019. Available: https://www.epa.gov/sites/production/files/2019-09/documents/nonco2_methodology_report.pdf. Accessed: January 2021.