



Refrigerant Transition Overview - California

Buildings need to do better for the planet. And they will.



Within the HVAC industry, transitioning to low global warming potential (GWP) refrigerants continues to be one of the most effective decarbonization activities globally. To protect our climate and reduce emissions from hydrofluorocarbons (HFCs), the American Innovation & Manufacturing (AIM) Act directs the U.S. Environmental Protection Agency (EPA) to phase down the supply of HFCs.

The evolution of refrigerants is an ongoing journey. Trane uses the right refrigerants at the right time.

Scientists first observed ozone depletion in the late 1970s and identified chlorofluorocarbon (CFC) refrigerants as one of the causes.¹ Since then, the HVAC industry has made step-changes in lower GWP refrigerant use. As refrigerants have evolved, Trane has made it a priority to help our customers optimize energy efficiency and comfort for their buildings while contributing less to climate change. We are actively helping customers prepare for the reduced supply and bans of the HFCs commonly used today.

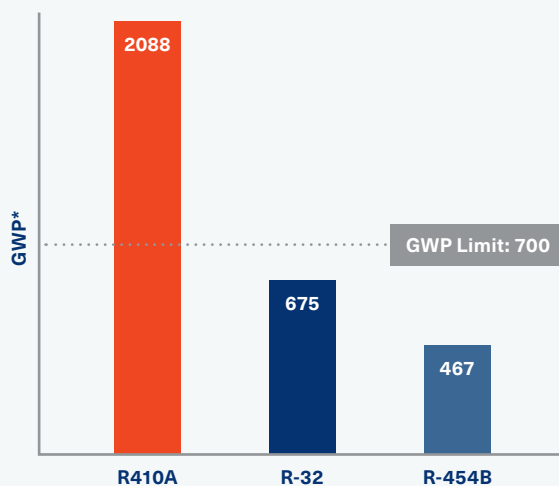
Trane has invested over 15 years and \$500M to determine the best low-GWP refrigerants for our equipment and systems.

The HVAC industry is moving to next-generation refrigerants with less than 700 GWP, which can reduce GWP by 75%. R-454B has a global warming potential of 466 and is the lowest GWP refrigerant to replace R-410A.²

Our refrigerant selection approach is rigorous, unbiased and balanced.

We are thoughtfully engineering our product changeovers to deliver the performance you've come to expect while prioritizing the climate.

- Decisions are based on extensive research and application knowledge.
- We consider factors for optimizing GWP and energy efficiency, as well as upholding safety standards.
- Our choices optimize HVAC operating costs and comfort benefits with lowering emissions.
- Trane has no stake in the refrigerant business. We do not profit from the sale of any refrigerant.



This is a climate priority: Here's what you need to know about refrigerants and decarbonization.

A building's overall "carbon emissions" actually means "carbon dioxide equivalent emissions" (CO₂e), which includes refrigerants.³

Most common HFC refrigerants for heating and cooling emit gases that can have 1,000 to 9,000 times greater capacity to warm the atmosphere than carbon dioxide. Thus, next-generation refrigerants are a top strategy for drawing down global emissions.⁴

Trane has Your Refrigerant Transition Covered.

Trane is transitioning our products to refrigerants that regulators have deemed more sustainable. As you undergo your own transitions, here's how we can help.



1

Assess your equipment needs.

When there's a choice, we can help you select the right refrigerant for your needs.



2

Mitigate site risks.

In some cases, units containing next-generation refrigerants require site modifications. We can help you understand how to bring your site into compliance.



3

Practice safe handling and documentation.

Trane's fully certified mechanical service technicians will provide professional refrigerant handling in compliance with EPA Section 608. We can provide accurate leak rate calculations and provide accurate recordkeeping and reporting on refrigerant activity. All records are easily accessible, on demand.



4

Manage leak detection.

We can discuss whether constant remote monitoring makes sense for your application.



Ask the Trane Experts

Industry transitions can be confusing. Trane has the answers you need.



What is the timing in California for this transition to lower-GWP refrigerants?

California Air Resources Board (CARB) Timeline			
Application	GWP Limit	CA Manufacture Deadline	Installation Deadline > 750 GWP
All chillers for comfort cooling and heating*	750	Jan 1, 2024	Install before Jan 1, 2024 (unless permit preapproved in 2023)
Data center chillers**	750		
Ice rinks	150 for new rinks and 750 for replacements		
750 Industrial process Refrigeration (IPR) chillers with temperatures of chilled fluid >35°F	750		
1500 IPR chillers with temperatures of chilled fluid ≤ +35°F (2 °C) and > -10 °F (-23 °C)**	1500		
1500 IPR chillers with temperatures of chilled fluid ≤ -10°F (-23 °C) and > -22 °F (-30 °C)**	1500		
2200 IPR chillers with temperatures of chilled fluid ≤ -22°F (-30 °C) and > -58 °F (-50 °C)**	2200		
Room/wall/window AC, PTACs, PTHPs, portable AC, and residential dehumidifiers	750	Manufacture: Jan 1, 2023 EPA: sell before Jan 1, 2028	No installation deadline
Split systems, including ductless split systems (new condensing unit triggers 750 GWP limit.)	750	Jan 1, 2025	No California installation deadline EPA install before Jan 1, 2026*
Packaged units (AC/HP) and other AC	750	Manufacture: Jan 1, 2025 EPA sell before Jan 1, 2028	No installation deadline
VRF >65,000 BTU/hr	750	Jan 1, 2026	No California installation deadline EPA install before Jan 1, 2026*

* CA requires building permits approved in 2023

**CA (replacement and new installations) transition January 1, 2025.

IPR (Industrial Process Refrigeration) – CA has different requirements starting in 2024, Contact Account Manager for more information

Source: <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2020/hfc2020/frorevised.pdf>



Do I need to worry about using low-GWP refrigerants in my system? Are they safe?

Trane equipment is designed for next-generation, lower flammability (A2L) refrigerants and meets stringent requirements. Based on our extensive years of testing, Trane can offer these assurances:

- Based on multiple years of testing, Trane documents a lower flammability limit (LFL).
- Trane has evaluated and eliminated competent ignition sources in our equipment (i.e., protected electric circuits).
- An on-board leak detection system, where needed, will mitigate any refrigerant concentrations from reaching a level capable of being ignited. Some parts of the unit may be locked and prevented from running until a resolution has been reached.



What do I need to do to prepare my facility?

New requirements are intended to maintain human safety during a refrigerant leak. Depending on the site, refrigerant and equipment type, safety modifications may include the following:

- Improving ventilation
- Adding leak detection systems
- Increasing refrigerant detection sensors
- Lowering the refrigerant detection limit
- Installing a Building Automation System (BAS) for faster alarming and response
- Automating equipment shutdowns
- Modifying the equipment site to ensure safe public distancing



Do we need to change the way we operate and control equipment with next-generation refrigerants?

Yes. International and regional codes and standards require the ability to detect refrigerant leaks and take appropriate mitigating actions. Unit controllers installed on equipment containing A2L refrigerants must have capabilities in place to effectively detect, mitigate, ventilate and notify building operators of potential refrigerant leaks. This is achieved via a sensing system (consisting of interconnected refrigerant sensor(s) and a control board) which senses any increase in refrigerant gas concentration and initiates an appropriate system response. For split systems, additional leak check requirements must be followed during commissioning.



Will either R-454B or R-32 be a drop-in replacement for existing units using R-410A?

No. In fact, drop-in replacements do not exist. The EPA and industry safety standards specifically prohibit the use of flammable refrigerants in equipment that was originally designed for nonflammable refrigerants like R-410A.

Need to know more? Contact your Trane Account Manager.



Resources

HVAC Industry Update: Industry Progress to Transition Away from High HFC Refrigerants (Trane.com)

- 1 The Montreal Protocol on Substances That Deplete the Ozone Layer. U.S. Department of State, Office of Environmental Quality. Web.
- 2 Phasedown of Hydrofluorocarbons: Restrictions on the Use of Certain Hydrofluorocarbons Under the American Innovation and Manufacturing Act of 2020, Federal Register (A Rule by the Environmental Protection Agency on October 24, 2023.) Web.
- 3 Andrew Lieper, Refrigerants and their Contribution to Global Warming, Net Zero Carbon Guide. Web.
- 4 Refrigerant Management, Project Drawdown. Web.
- 5 Restrictions on the Use of Certain HFCs under Subsection (i) of the AIM Act, EPA.gov. Web.



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