Refrigerant Regulations

The Transition to Low Global Warming Potential Refrigerants

NEW YORK STATE | NYSERDA

What changes are happening?

The United States Environmental Protection Agency (EPA) is phasing out hydrofluorocarbon (HFC) refrigerants as part of its focus on reducing environmental harm. HFC refrigerants are currently widely used, however, they are being phased out because of their high global warming potential (GWP[1]). HFCs are powerful greenhouse gases. They take an average of 15 years to decompose in the atmosphere and can absorb thousands of times more energy than carbon dioxide.

The American Innovation and Manufacturing Act of 2020 (AIM Act) and It's Regulations

- Enacted by Congress in 2020 as an effort to reduce HFCs
- Reduce HFC consumption by 85% by 2036 through production and trade caps
- Facilitate a transition to next-generation refrigerants
- Regulate the reclamation of HFCs to minimize atmospheric release

How does this affect heat pumps?

The AIM Act regulations will limit both the availability and installation of heat pumps that use R-410A and other high GWP HFC refrigerants. Through its refrigerant production limits, it will also impact the availability and price of refrigerant itself – for both new R-410A installations and recharges. The new suite of lower GWP refrigerants cannot be used as a drop-in replacement.

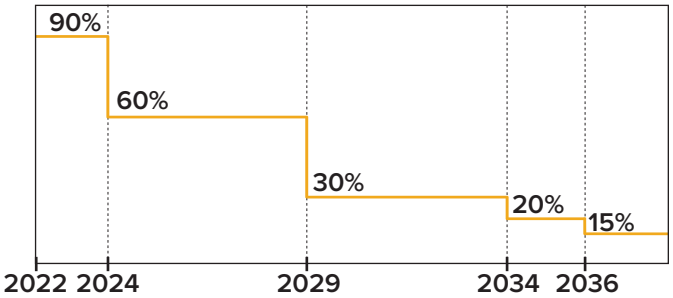
EPA Dates to Know

January 1

Starting **January 1, 2025**, heat pumps using refrigerants with GWP>700, including R-410A, cannot be **imported** or **manufactured**.

Starting **January 1, 2026** they cannot be **installed**.

AIM Act HFC Refrigerant Consumption Stepdown[2]



Manufacturing volume caps, relative to 2019, are enacted to reduce the production of HFCs. As less volume is produced, reclamation will become more important and the cost to recharge old systems will increase.

New York State Proposed Regulation

New York State Department of Environmental Conservation (DEC), as the agency regulating refrigerant emissions in New York State, recently proposed amendments to a regulation titled 6 NYCRR Part 494, "Hydrofluorocarbon Standards and Reporting." DEC is in the process of reviewing comments to the amendment proposal and assessing alternatives suggested by the comments. DEC outreach communications make it clear that, while the DEC proposed regulation differs from EPA regulations, it is intended to align with the AIM Act. Follow DEC announcements to see how the final rule may impact refrigerant availability and use.

— Meet the New Refrigerants —

The replacements for R-410A and other high GWP HFCs come from a family of refrigerants with higher flammability potential. ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) assigns refrigerants a safety classification based on their toxicity and flammability. The new refrigerants – R-32 or R-454B for most manufacturers – have a classification of A2L.

Refrigerant GWP Table

Refrigerant	Classification	EPA SNAP approved for Residential and Light Commercial AC and HPs	GWP100 Standard*
R-410A	**A1** (no flame propagation)	Previously	2090
R-454B	**A2L** (Lower flammability)	Yes, as of May 6, 2021	470
R-32		Yes as of April 28, 2023	675
R-290	**A3** (Higher flammability)	Pending	3
R-441A		Pending	5

Note: A3 refrigerants may be used in packaged heat pumps in the future.
*GWP100 is from the Intergovernmental Panel on Climate Change (IPCC) 2007 Assessment Report (AR4)

What are the safety requirements of A2L and A3 refrigerants?

While new to heat pump applications, A2L and A3 refrigerants have an extensive history of safe and effective use in self-contained window HVAC units, car ACs, and refrigerators. These refrigerants are safe to use when handled properly and installed in equipment designed for them. ASHRAE Standard 15 provides safety requirements for these systems that include precautions such as non-sparking materials. The 2024 International Mechanical Code (IMC) Chapter 11 contains codes and standards for flammable refrigerant in residential spaces, requiring protection against physical damage to refrigerant lines.

Review these standards to ensure they are met. Refer to the manufacturer for safety requirements for the heat pump in question and to learn more about the refrigerant they will be using.

It is crucial to:

Monitor

- Do not use a leak detector with an arc or spark module.
- If a refrigerant leak is detected, take necessary precautions as outlined in ASHRAE 15 and IMC Chapter 11.

Ventilate

- Conduct all servicing in a well-ventilated area.

Eliminate

- Ensure no ignition sources are present.
- Properly ground the system.
- Keep a class B rated dry powder fire extinguisher on-site during work and transportation.

Always review the relevant safety data sheet (SDS) and the original equipment manufacturer (OEM) manual before starting work and use the correct personal protective equipment (PPE).

Do installers need new tools and equipment?

Yes, according to ASHRAE, electronic tools and testing equipment must be rated for use with flammable refrigerants. The four tool categories that require A2L compatibility are gauges and manifolds, recovery machines, vacuum pumps, and leak detectors.

Not all refrigerants will be compatible with polyolester oil (POE). Ensure the selected refrigerant oil is compatible with the refrigerant being used.

Do installers need additional training?

Yes, installers should take A2L specific trainings to learn safe installation, storage and transportation practices. These training courses are offered by equipment manufacturers.

Are A2L refrigerants drop-in matches?

No. A2L refrigerants ***cannot*** be used as direct replacements for A1 refrigerants in existing heat pumps. A2L refrigerants can ***only*** be used in equipment designed for them due to the refrigerants operating at different pressures and required spark-prevention features.

A2L refrigerants should *not* be freely vented. They have low GWP but not zero.

[1] GWP measures how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide (CO_2).

[2] https://www.epa.gov/climate-hfcs-reduction/frequent-questions-phasedown-hydrofluorocarbons

New York Department of Environmental Conservation Climate Change Regulatory Revisions:
https://dec.ny.gov/regulatory/regulations/proposed-emergency-recently-adopted-regulations/climate-change

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