

Alternative Refrigerants

- **HFO-1234yf** (R-1234yf)
HFO-1234yf is a refrigerant being introduced by many automobile manufacturers. There are cars on the road today using this alternative. HFO-1234yf is mildly flammable, but can be used safely.
- **Carbon Dioxide** (CO₂, R-744)
CO₂ is a high pressure refrigerant being considered by automobile manufacturers. CO₂ systems operate at 5 to 10 times higher pressure than other MVAC systems.
- **HFC-152a** (R-152a)
HFC-152a is a refrigerant that may be pursued in the future. HFC-152a is flammable, but can be used safely.

EPA's Ozone Layer Protection Website

<http://www.epa.gov/ozone/strathome.html>

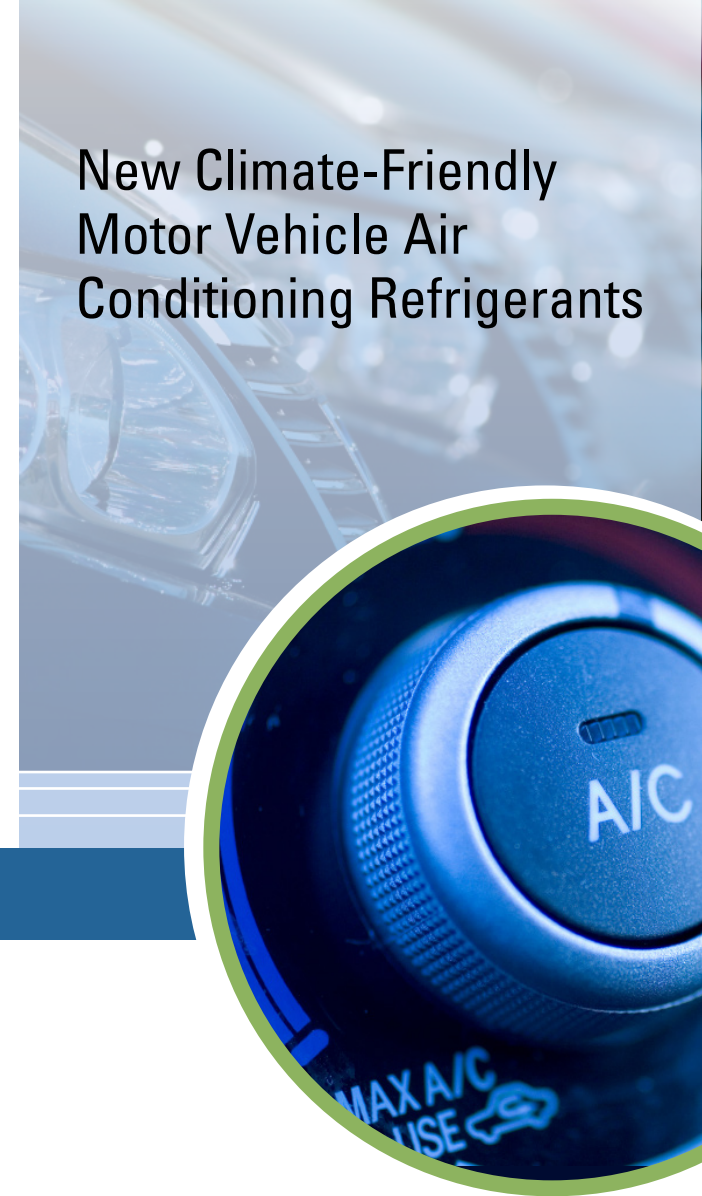
Learn More about CAA Section 609 and How to Become 609 Certified

<http://www.epa.gov/ozone/title6/609/>

EPA's SNAP Program

<http://www.epa.gov/ozone/snap/>

New Climate-Friendly Motor Vehicle Air Conditioning Refrigerants



Environmental Impacts of MVAC Refrigerants

Refrigerant	Global Warming Potential (GWP)	Ozone Depleting?
CFC-12	10,900	Yes
HFC-134a	1,430	No
HFC-152a	124	No
HFO-1234yf	4	No
CO ₂ (R-744)	1	No

**GWP values are from the Intergovernmental Panel on Climate Change Fourth Assessment Report: Climate Change 2007*

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Disclaimer: EPA does not endorse any particular company or its products.



Protecting the Ozone Layer and Climate System

In the past your car was cooled by chlorofluorocarbon (CFC)-12, a substance that destroys the stratospheric ozone layer that shields the Earth from the sun's harmful ultraviolet radiation. Automobile manufacturers transitioned to the non-ozone depleting alternative hydrofluorocarbon (HFC)-134a in the mid-1990s. HFC-134a, like its predecessor, is a potent greenhouse gas that contributes to climate change. Today, automobile manufacturers are beginning the transition to new, climate-friendly alternative refrigerants.

Section 609 of the Clean Air Act (CAA) establishes requirements to prevent the release of refrigerant during the servicing of motor vehicle air conditioning (MVAC) systems through proper servicing procedures.

Transitioning to Alternative Refrigerants

EPA's Significant New Alternatives Policy (SNAP) Program ensures the smooth transition to alternatives that pose lower overall risk to human health and the environment. Under SNAP, EPA recently listed three low global warming potential (GWP) MVAC refrigerants as acceptable subject to use conditions: hydrofluoroolefin (HFO)-1234yf, carbon dioxide, and HFC-152a. None of these alternatives deplete the ozone layer and all have significantly lower impacts to the climate system than CFC-12 or HFC-134a.

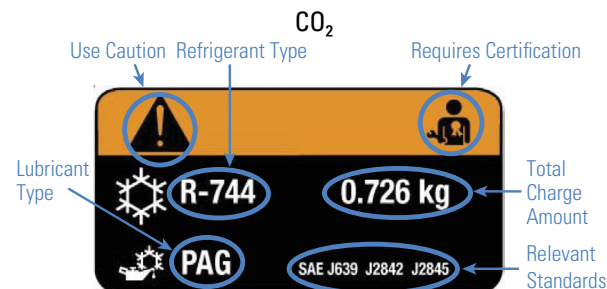
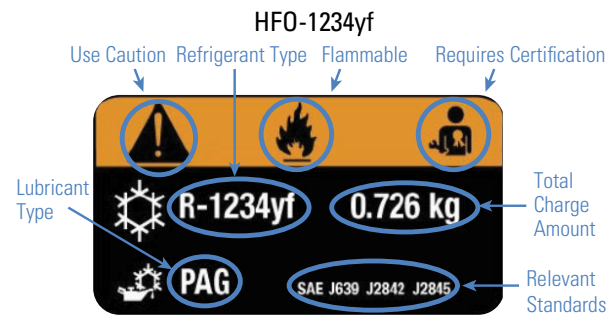
In the United States and globally, many automobile manufacturers are transitioning to these low GWP alternatives. It is important for both consumers and technicians to be aware of these alternative refrigerants, their properties, and proper servicing procedures.

Clean Air Act Requirements

AS REQUIRED BY FEDERAL LAW

- MVAC systems may only be serviced for consideration (payment or bartering) by technicians trained and certified under CAA Section 609.
- It is illegal for any person to knowingly release or vent refrigerants (except CO₂) during service, maintenance, repair and disposal. Such actions pose a risk to human health and the environment.
- Technicians must use certified service equipment designed for recovery only or recovery, recycling and recharging of MVACs.
- MVAC systems, service equipment and containers have unique fittings for each refrigerant to prevent the dangerous mixing of refrigerants. An adapter should not be used to convert a fitting.
- Refrigerant must be properly recycled before recharging it into an MVAC system.
- Hydrocarbons are not approved for use in MVAC systems.

SAMPLE LABELS LOCATED UNDER VEHICLE HOOD



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MVAC Servicing Best Practices

SERVICING TIPS

- Locate and repair leaks before topping off a system. Failing to repair leaks may result in MVAC system damage or failure.
- Do not add more refrigerant than necessary. This can cause system damage and decrease system performance.
- Never mix refrigerants or use a refrigerant not intended for an MVAC system. Mixing refrigerants, even accidentally, can lead to higher than expected system pressures, component and system damage, diagnostic errors and hazards to human health and the environment.
- Beware of contaminated refrigerants. Consider purchasing certified refrigerant identification equipment.
- Read and comply with all specifications on refrigerant containers, vehicle manufacturers' manuals, and lubricants.
- Do not replace system components with salvaged parts, or parts from a system meant for another refrigerant.

MAKE SAFETY A PRIORITY

- Review and practice safety procedures and use protective equipment.
- When servicing MVACs, particularly systems with HFO-1234yf and HFC-152a, avoid sparks or flames in the work area.
- Wear safety glasses and insulated gloves, and avoid direct contact of refrigerant with skin.
- Work in a well-ventilated area. Acute exposure to any refrigerant can lead to harm to your personal safety and health, including asphyxiation.