



# THE FUTURE IS HERE. WELCOME R290!

## Why is R290 Leer's primary refrigerant?

As an industry leader in temperature-controlled storage solutions, Leer is committed to staying at the forefront of ever-changing technologies, market demand, and the world we live in. We strive to continuously adapt to these conditions so we can consistently offer our customers best-in-industry products.

Since Leer began manufacturing Ice Merchandisers in 1952, R290 is the fourth primary refrigerant offered.

### Leer Refrigerants Through the Years

REFRIGERANT	YEARS OF USE	ODP	GWP	THERMAL CONNECTIVITY	PERFORMANCE
R12	Thru 1994	1.0	10,000+	0.0482	Good
R134a	1994 - 2007	0	1300	0.0586	Good
R404a	2007 - 2023	0	3900	0.0497	Good
R448a	Considered	0	1300	0.0469	Fair
R290	2020 - TBD	0	3	0.0676	Very Good

**Ozone Depletion Potential (ODP)** = The measure of the effectiveness in removing ozone, relative to standard compound (CFC-11/R11). **A lower value is better.**

**Global Warming Potential (GWP)** = The measure of the ability of a gas to trap heat in the atmosphere, relative to carbon dioxide (CO<sub>2</sub>). **A lower value is better.**

**Thermal Conductivity** = The ability of material to transfer heat, measured in Btu/hr-ft<sup>2</sup> o F. Values listed are via ASHRAE. A higher value is better. **A higher value is better.**

### Reason 1: Performance R290 is a high-performance refrigerant

- R290 has higher thermal conductivity, which results in:
  - Higher refrigerant performance
  - Lower running costs
- R290 has lower high-side compressor pressures, which results in:
  - Longer compressor life expectancy
- R290 has more consistent performance, which results in:
  - Easier to size and verify capillary tubes and charge amounts
  - No glide\*
  - Less unpredictable temperature variations (keeping the ice in premium condition)

### Reason 2: Eco-Friendly It's eco-friendly!

- R290 is classified as a hydrocarbon (HC) refrigerant, which is a natural, non-toxic refrigerant and the top alternative to hydrofluorocarbon (HFC) refrigerants. This results in:
  - Ultra-Low GWP (Global Warming Potential)
  - Zero ODP (Ozone Depletion Potential)
  - Commercial Market Acceptance — Commercial refrigeration manufacturers have transitioned complete product lines to R290 and increasingly, retailers are beginning to request or demand such refrigerants.
  - Due to its eco-friendly properties, its projected to have long-term approval as a commercial refrigerant.

### Reason 3: Federal & 50 State Compliance Federal Compliance

Proposed Federal Regulations by the EPA within the rights of the AIM Act highlight additional refrigerant restrictions. With a compliance date of January 1, 2025 for all U.S. States, the new proposed GWP limit is 150. Thus, making R404a and R448a non-compliant. R290 and other hydrocarbon refrigerants are considered 'final solution' refrigerants and will be compliant under these new regulations.

#### 50 State Compliance

The California Air Resources Board (CARB) first adopted the vacated rules from SNAP, listing a phase out date of R404a on January 1, 2020. Since then, eleven additional states, Europe, and all provinces and territories of Canada have followed a similar path phasing out R404a. Over a dozen other states are a member of the U.S Climate Alliance and/or have proposed action in regards to refrigeration. The most up to date legislation can be found on [leerinc.com/eco-friendly](http://leerinc.com/eco-friendly).

\*Glide = The total temperature glide of a refrigerant blend is defined as the temperature difference between the saturated vapor temperature and the saturated liquid temperature at a constant pressure. Another definition is the temperature difference between the starting and ending temperature of a refrigerant phase change within a system at a constant pressure. - ACHR News.

# LEER’S TIMELINE

## How is Leer rolling out R290 refrigerant?

The introduction of R290 refrigerant into our product offering, in 2020, was not a change that was implemented overnight. The introduction required substantial process updates, inventory and production management, and capital expenditures.

We are committed to R290 as the refrigerant of the future, due to its increased performance, eco-friendly properties, and regulatory compliance. **In 2024, Leer will permanently transition away from R404a. As of January 1, 2024, Leer will no longer produce Ice Merchandiser or Ice Vending Machines**

**with R404a refrigerant.** Our standard, default, and only refrigerant will be R290.

We'll continue to update and communicate our timeline as the year progresses.

## Is Leer having success with R290 ice merchandisers?

Leer is experiencing both retailers and Leer customers alike increasingly requesting R290 units due to their high-performance, eco-friendly properties, and regulatory compliance.

# WHAT IS R290?

## What is R290 refrigerant?

In everyday terms, R290 is referred to as refrigeration grade propane. R290 is classified as a hydrocarbon refrigerant, which is natural, non-toxic and the preferred alternative to hydrofluorocarbon refrigerants in cooler and freezer applications.

R290 is referred to as ‘Refrigeration Grade Propane’

- Hydrocarbon Refrigerant
- Natural
- Non-toxid
- Preferred alternative to hydroflourocarbon refrigerant

## How is R290 refrigerant different from standard propane used for heating and cooking?

R290 refrigeration grade propane has a much higher purity than standard propane. The higher moisture content of standard propane will damage a refrigeration system. Standard propane also has scent added (another impurity) that refrigeration grade materials do not.

R290 is different from standard (heating & cooking) propane

- Much higher purity
- Less moisture content
- No scent (another impurity)

# LEGISLATION UPDATES

## What are the new proposed Federal Regulations?

The American Innovation and Manufacturing (AIM) Act was enacted by Congress on December 27, 2020. The AIM Act authorizes EPA to address hydrofluorocarbons (HFCs) in three main ways: phasing down their production and consumption, maximizing reclamation and minimizing releases from equipment, and facilitating the transition to next-generation technologies through sector-based restrictions.

On December 15, 2022, the EPA published a proposed rule focusing on the third area – the transition to alternatives through sector-based restrictions.

The proposed rule would prohibit manufacture and import of products containing restricted HFCs by January 1, 2025. R290 is compliant with the proposed GWP Limit, of 150.

## What States have introduced Legislation and/or Regulations?

As of May 2023, a dozen states have enacted legislation that regulates the use of certain refrigerants. These states include California, Colorado, Delaware, Maine, Maryland, Massachusetts, New Jersey, New York, Rhode Island, Vermont, Washington, and all Provinces & Territories of Canada. Additional states are a member of the U.S. Climate Alliance and/or have proposed action. It is Leer’s belief these states, among others, are awaiting further announcements at the Federal level prior to enacting State-level legislation.

# R290 FAQs

## How does this impact units already in the field?

It doesn't. All units currently deployed in the field are unaffected. No changes will be required. Leer will continue to supply replacement and service parts.

## Can I retrofit my R404a unit to be compatible with R290?

No. The Environment Protection Agency (EPA) has ruled that R290 refrigerant can only be used on new equipment.

## Which agency approvals will an Ice Merchandiser using R290 refrigerant have?

Merchandisers using R290 refrigerant will be DOE compliant, UL listed, and NSF certified. R290 units are standard with NSF certifications and do not require special request, as with R404a units.

## How does this affect how my unit runs?

When your product reaches your facility, you won't be able to tell a difference besides the ‘Natural Refrigerant’ sticker placed on the merchandiser. The internal components of the refrigeration system will be unique to the type of refrigerant used, but the unit itself will look and operate the same, whether its R404a or R290.

## Will R290 change electrical requirements?

Not significantly. Electrical requirements and amp draw will have no significant changes with R290 refrigerant.

## Is R290 flammable?

Yes. R290 refrigerant is flammable, but the amount of refrigerant used is small. Under normal operation, the R290 refrigeration unit is a hermetically sealed system and the refrigerant does not come into contact with any ignition sources. Furthermore, Underwriters Laboratories (UL) has established test protocols that establish safety standards in the event of a refrigerant leak. Millions of commercial retailers and residential refrigeration products already use R290 refrigerant across the United States and throughout the world. In conclusion, yes, R290 is flammable but the amount used is very small and the system is fully sealed. In result, there's not threat or practical fear of the use of R290.

## How much R290 refrigerant is used?

The maximum amount of R290 refrigerant allowed in commercial refrigeration applications is 5.29 oz. Leer Ice Merchandisers use between 3 oz and 5.25 oz depending on the size of the unit. This is comparable to the amount of flammable material used in common everyday items, such as aerosol cans and lighters.

## Are there any storage, handling, or transportation requirements to be aware of?

No. There are no special considerations for the warehousing, handling or transport of ice merchandisers using R290 refrigerant.

## How do I know if my unit contains R290 refrigerant?

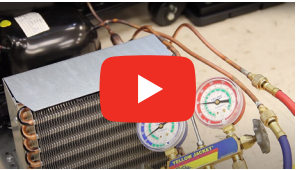
The Leer serial number tag will continue to indicate the type and amount of refrigerant used in the system. Also, various labels noting the use of flammable refrigerant will be located on the unit and product packaging.

## What service and replacement parts will be available for the R290 systems?

We'll offer typical service and replacement parts for R290 systems as we have for all refrigeration systems in the past.

## Is there an R290 Service & Repair Guide?

Yes, please visit [leerinc.com/eco-friendly](http://leerinc.com/eco-friendly) for a printable R290 Service & Repair Guide and a How-To Service Video!



## Is the compressor warranty the same on R290 systems?

Yes. There will be a 5-year compressor warranty.

## Do you need specialized training to service R290?

Leer will continue to recommend trained and qualified Refrigeration Technicians perform maintenance and service.

For the latest updates and a full list of affected states, please visit: [www.leerinc.com/eco-friendly](http://www.leerinc.com/eco-friendly).



