



# THE FUTURE IS HERE. WELCOME R290!

## Why did Leer introduce R290 refrigerant as an alternative to R404a?

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 will be the fourth primary refrigerant offered. In 2020, technology improvements and global environmental awareness have enabled the introduction of a much-improved refrigerant, R290.

## 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 - TBD	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.**

## 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)

Many other styles of commercial refrigeration have already adapted R290, problem-free, and have seen great results.

## 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: 50 State Compliance

Our investigation into R290 was intensified with the government's announcement of the Significant New Alternatives Policy (SNAP), which listed R404a on their Unacceptable Refrigeration Listings. Although Federal Courts vacated the SNAP listings, the California Air Resources Board (CARB) did not, and adopted the vacated rules from SNAP, listing a phase out date of R404a on January 1, 2020. Since then, additional states have followed a similar path phasing out R404a. The most up to date state-by-state legislation can be found on [leerinc.com/eco-friendly](http://leerinc.com/eco-friendly).

R448a is considered a transitory/temporary/interim refrigerant. R290 and other hydrocarbon refrigerants are considered 'final solution' refrigerants.

\*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.

## How is Leer rolling out R290 refrigerant?

Introducing R290 refrigerant into our product offering 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 and eco-friendly properties. As of now, there is no phase out date set for R404a. Any future transition away from R404a will be driven by environmental legislation and/or market demands, in which case, there will be ample warning and communication at that time.

For the foreseeable future, all Leer products using R404a, will be available from stock and/or with standard lead times. R290 units, will be available from stock, made to order and/or with extended lead times. We'll continue to update and communicate our timeline to rollout additional sizes and products.

## Will Leer phase out the current refrigeration, R404a?

We simply introduced R290 as an alternative refrigeration solution to comply with state-by-state legislation. No phase out date for R404a has been set. Any future transition away from R404a will be driven by environmental legislation and/or market demands. We'll provide ample warning and communications if/when that time comes.

For the foreseeable future, R404a units will be available from stock and/or with standard lead times (state permitting).

## R290 REFRIGERANT

### 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-toxic
- Preferred alternative to hydrofluorocarbon 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)

## R290 COMPARISONS

### Why did Leer choose R290 vs. R448a?

**Efficiency:** R290 displays higher efficiency than R448a.

	R290	R448A
Thermal Conductivity	0.0676	0.0469
Comparison		31%

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

**Eco-Friendly:** R290 displays greater eco-friendly properties.

	R290	R448A
ODP	0	0
GWP	3	1300

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 (CO2). **A lower value is better.**

**50-State Compliance:** R448a is considered a transitory/temporary/interim refrigerant. R290 and other hydrocarbon refrigerants are considered 'final solution' refrigerants.

For additional, information visit US Refrigerant Regulation Update and Emerging Trends from Emerson or Light Commercial Refrigeration, Refrigerants Outlook from Embraco.

	R290	R448A
Performance	X	
Environmental Impact	X	
Service	X	X
50 State Compliance	X	X
Future Support / Longevity	X	
International Markets	X	
Leer's Choice	X	

## R290 TECHNICAL QUESTIONS

### 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 a R290 Service & Repair Guide?

Yes. Visit, <https://www.leerinc.com/wp-content/uploads/2020/05/R290-Service-Repair-Guidelines-05-20.pdf>

### 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.

### Where can I get the Refrigeration Technician training?

Leer suggests the training and certification available from Refrigeration Service Engineers Society ([www.rses.org](http://www.rses.org)).

### How will Leer manufacture both R290 and R404a units?

To maintain proper inventory levels, Leer invested substantial resources, both monetarily and engineering time - to upgrade our refrigeration process, quality, and safety controls. The main manufacturing upgrades include helium-based pressure leak test prior to charging, precisions charge metering, ultrasonic welding equipment, refrigerant lead check after charging, and charging area containment with ventilation. R290 refrigerant combined with improved manufacturing processes result in a better product for the customer.

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



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