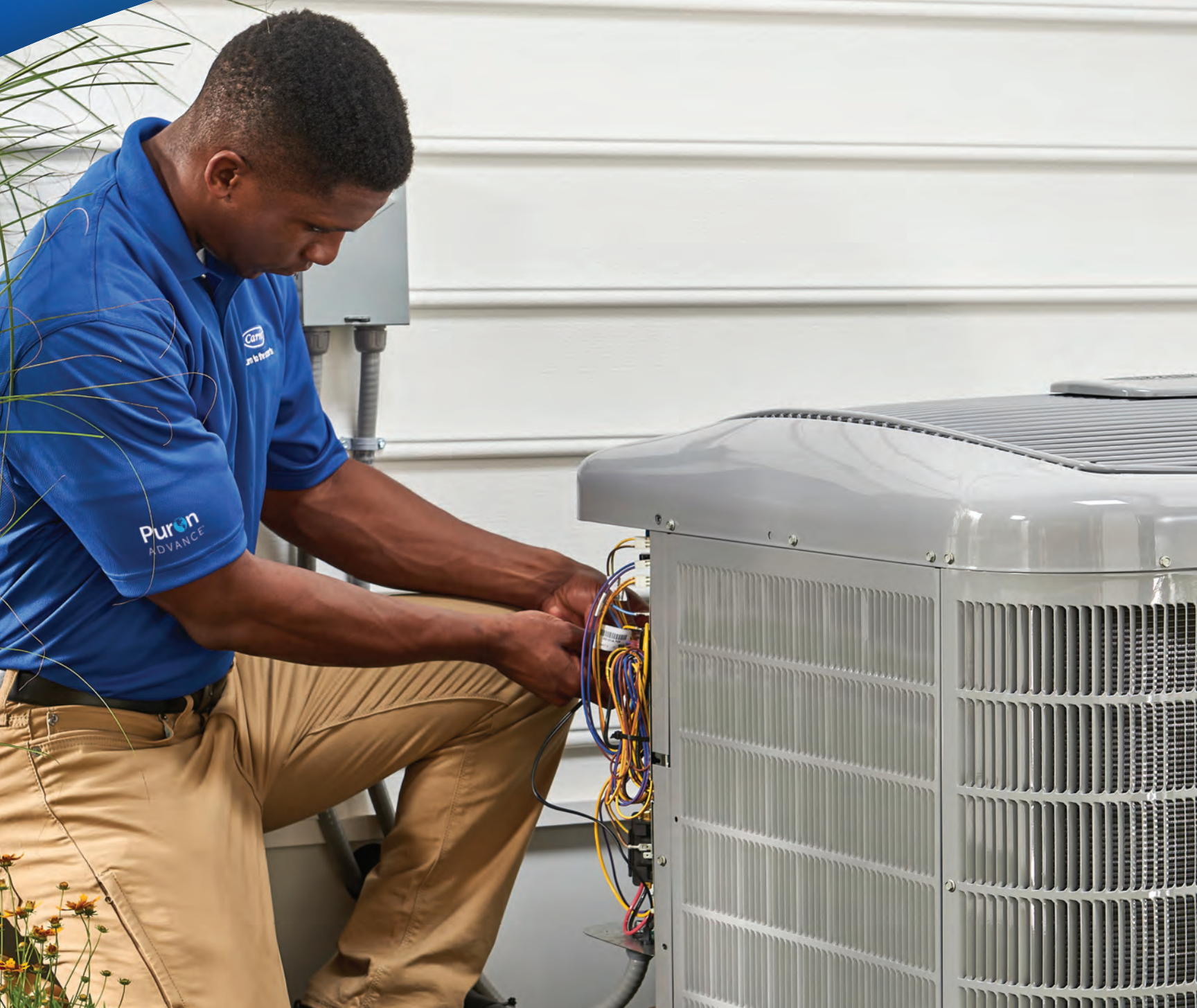




Turn to the experts

# INTRODUCING PURON ADVANCE™

A new refrigerant  
for a better future





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Dear Carrier Expert:

**THE FUTURE OF LOW GWP REFRIGERANT IS HERE, AND PURON ADVANCE IS OUR ANSWER.**

Regulations are a critical part of the HVAC business, and they can be challenging to say the least. But staying ahead of the curve is a way of life at Carrier. We take regulatory changes as opportunities to make our products better, more efficient, and more innovative. The #2023Ready product change set the stage for what we believe will be a successful transition to Puron Advance through innovations such as Vertex™ technology, gas furnace NFC technology, and IntelliSense™ technology. And now we enthusiastically answer the call for reduced global warming potential (GWP) with Puron Advance.

Puron Advance is the latest chapter in the evolution of refrigerants, the first major change since we introduced non-ozone depleting Puron® refrigerant in 1996. Now, with Puron Advance, Carrier once again shows a commitment to going beyond the minimum with a refrigerant that will easily surpass the EPA's lower GWP requirements for 2025.

Puron Advance delivers a greater than 75% decrease in GWP than the original Puron. And, with operating pressures and temperatures similar to the original Puron, it will result in a relatively simple transition in the field for installers and service technicians.

To help you prepare for the lower GWP future, our Puron Advance launch kit includes:

- What is Puron Advance and why this is the best answer for low GWP refrigerants
- Why do we need to change refrigerants
- A brief history of refrigerants
- Comparison of Puron Advance vs. Puron and R-32
- Details on flammability, dissipation requirements, and field service procedures
- Key Messaging and Top 11 Things to Remember regarding Puron Advance

We hope the materials in this kit will help prepare you for a successful entrance into the future of reduced GWP refrigerants and Puron Advance. All this information is available now on HVACpartners, along with more detailed training courses on My Learning Center. We will continue to provide updates as new information becomes available, so be sure to re-visit the site periodically for the most current marketing resources.

Thank you for your support!



Heidi Gehring  
Director, Residential HVAC Products



## Introducing Puron Advance



## Setting the Stage

Due to the full-system approach that Carrier took to become #2023Ready, we can confirm that the transition to R-454B will be far less of a change for our customers. Let's take a moment to recap the system approach that has put Carrier, and our customers, in a position to move into this refrigerant transition with ease.

For 2023, the system approach included the introduction of our new award-winning Vertex technology. The addition of the Vertex coil to our lineup has set us apart from our competition by offering our customers the shortest and lightest coils in the industry. The new design offers customers the flexibility to maintain the increased demand for efficiency without increasing the height necessary to fit the application. This new technology creates an easier and more durable approach to making sure the equipment is running at optimal efficiency for years to come.



**VERTEX™**  
Technology



**IntelliSense™**  
TECHNOLOGY

Additionally, Carrier has implemented serviceability improvements to our Performance™ Series line of furnaces, air conditioners, heat pumps, and fan coils with the addition of IntelliSense technology. IntelliSense gives contractors the ability to “know before they go” to ensure the right technician is dispatched with the right part – the smarter way to service. And our lineup of 2023-compliant products has seen efficiency boosts and serviceability improvements that will create a positive lasting effect on the overall equipment performance.

Carrier's focus on the full-system approach has prepared us for this next regulatory transition. Let's take a closer look at Puron Advance.

**Puron**  
ADVANCE™



# What Is Puron Advance?

Puron Advance is Carrier's solution for meeting the EPA's anticipated global warming potential (GWP) limits for refrigerants and the scheduled phasedown of higher GWP refrigerants like Puron. It is the refrigerant we will be transitioning to for our ducted and ductless residential and light commercial products. We plan to start this transition in late 2023 in order to be ready for the 2025 deadline.

## BUT WHAT EXACTLY IS PURON ADVANCE?

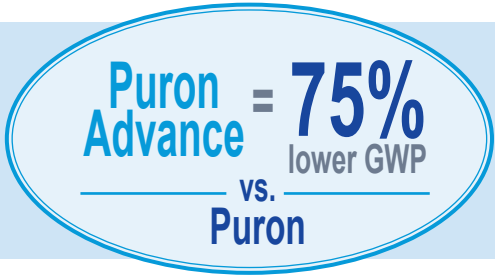
- Puron Advance is Carrier's trade name for R-454B
- Puron Advance performs very well in normal and high ambient conditions
- Puron Advance offers similar operating temperatures, pressures, and oil compatibility to Puron, meaning technicians will have less of a learning curve compared to the alternative

## WHAT'S THE DIFFERENCE BETWEEN PURON ADVANCE AND PURON?

|                                 |  |  |
|---------------------------------|---|---|
| Refrigerant Type                | R-410A  | R-454B  |
| Launch Timing                   | 1996  | Late 2023   |
| GWP Level                       | 2,088   | 466   |
| Ozone Depletion Potential (ODP) | No ODP  | No ODP  |
| ASHRAE Classification           | A1  | A2L   |
| Flammability                    | No Flame Propagation  | Mildly Flammable  |
| Leak Detection                  | None  | Required  |

## THE BOTTOM LINE

Puron Advance, with a 75% reduction in GWP from Puron, is the refrigerant with the most similar operating characteristics to Puron. Carrier is committed to providing our planet and people a better future by offering the best refrigerant for each application.





# Why the Change from Puron to Puron Advance?

Change is inevitable in every industry, and HVAC is no different. We just transitioned to new minimum efficiency standards for 2023, and now we turn our focus to 2025 and a new target: global warming potential (GWP) of refrigerants.

## THE FIGHT AGAINST GLOBAL WARMING IS HEATING UP

Global leaders worldwide are adopting much stricter control over the GWP of refrigerants, and the United States is getting on board as well. The Environmental Protection Agency (EPA) plans to limit the GWP of refrigerants to a maximum of 700 starting in 2025. At the same time, the EPA is implementing a phasedown of existing, higher GWP refrigerants, including Puron. And if you were around for the R-22 phase-out, you might remember the supply issues and hefty price increases that ensued during the phase-down period.

## SO, SPECIFICALLY, WHY THE CHANGE?

- The AIM Act has put limitations on the allowed emissions of total refrigerant supply, targeting an 85% reduction in production and consumption of refrigerant emission levels by 2036.
  - 2022 saw a 10% reduction in refrigerant emissions which impacted the supply of R-410A. 2024 will have an additional 30% reduction, resulting in further diminished supply availability that is 40% of pre-2022 levels.
- A second regulation from the EPA impacts the manufacturing of equipment, requiring units to use refrigerants lower than 700 GWP.\*
  - On January 1, 2025, R-410A will no longer be allowed in newly manufactured residential and rooftop light commercial HVAC products.\*
  - VRF is proposed as January 1, 2026, and chillers are January 1, 2025.

Note: It is important to reiterate that as of the above dates, HVAC equipment manufacturers will not be allowed to build equipment using the current R-410A refrigerant. The draft of the ruling proposes a one-year sell-through meaning that all equipment built before 2025 with R-410A must be installed before January 1, 2026.\*

\* Pending final EPA ruling.

## WE'LL BE READY – AND SO WILL YOU

As a leader in the HVAC industry, Carrier has been working towards a more GWP-friendly refrigerant for over 10 years. That's when we first anticipated growing concerns over global warming potential of refrigerants. Now, after years of research, development and with products currently in field trials, we anticipate being ready to start the transition to Puron Advance in late 2023.

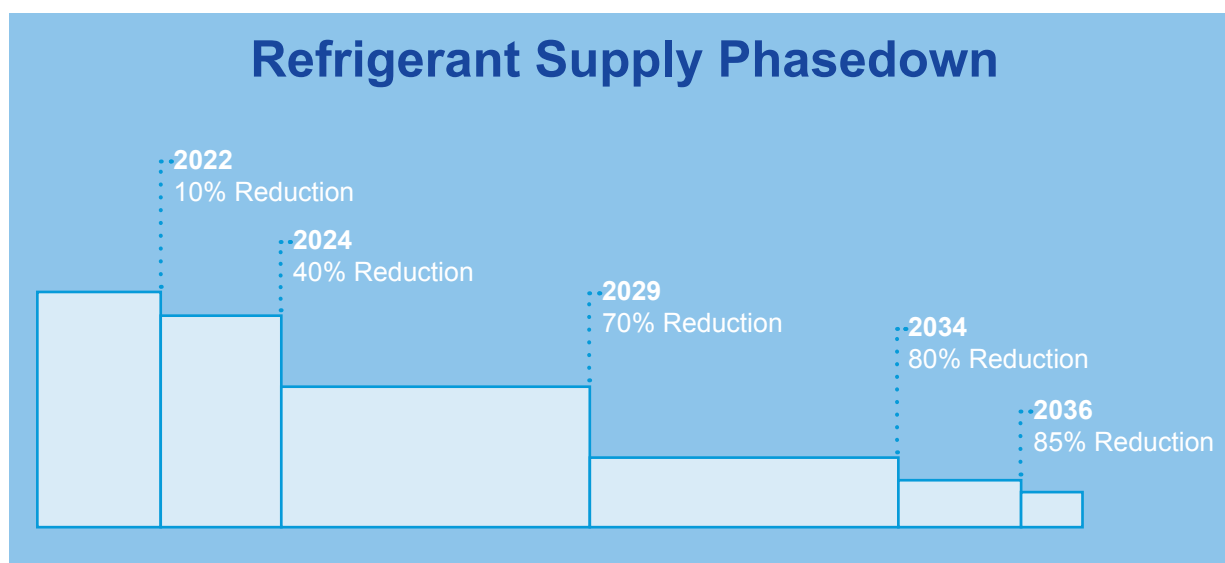
# Refrigerant Phasedown Timeline

## IT'S NOT A COMPLETE PHASE-OUT, BUT IT'S ALREADY MAKING AN IMPACT

The EPA's vision for reduced GWP refrigerants in 2025 is just one part of the program. The other is a targeted phasedown of higher GWP gases like R-410A. We're not calling it a phase-out because the current goal isn't a complete ban – it's a gradual, 85% reduction in global warming emissions from refrigerants by 2036.

Keep in mind that higher GWP refrigerants will remain available for the foreseeable future – but with more limited quantities and expected higher costs. In fact, the phasedown actually began in 2022 with a 10% reduction, so it's already in progress.

If you've noticed a difference in R-410A pricing and availability, that's why.



## BE PREPARED: THE BIGGEST CUT SO FAR

Starting in 2024, refrigerant supplies will see their largest cuts to date of the phasedown – a 30% reduction of 2022 levels – which represents a total of 40% from 2021. This rate will remain in place until 2029 when we will see another 30% reduction. As you might imagine, supplies of R-410A will continue to dwindle, and prices will continue to rise.

That means reclaiming R-410A will become – and remain – a very important part of your daily routine!

While many of you may remember what it was like when the industry shifted away from R-22 to non-ozone-depleting refrigerants like Puron, this transition will be far more accelerated, and will see the cost of Puron increase more quickly.

## CARRIER'S COMMITMENT TO YOU

Carrier will deliver comfort, efficiency and products with dramatically reduced GWP to meet and beat regulations expected to take effect in 2025.

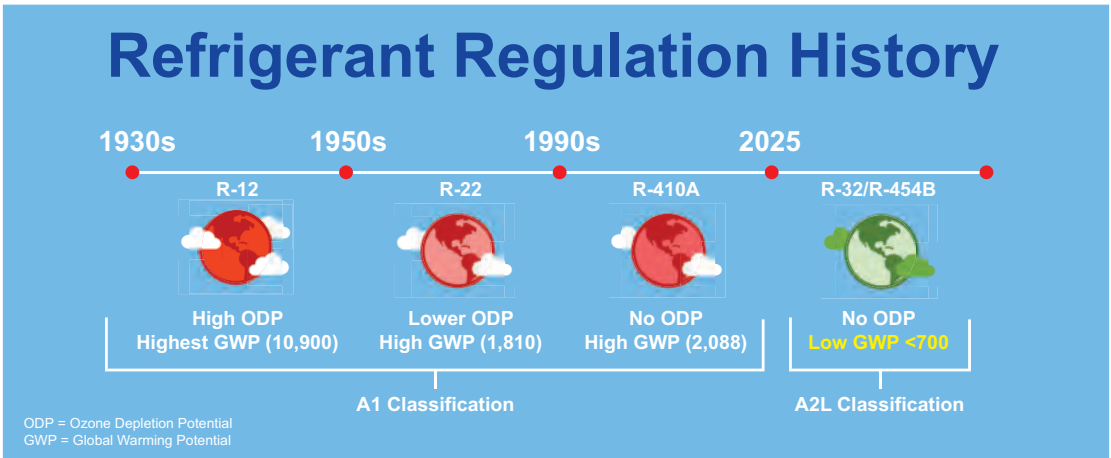
We've been working towards this goal for more than a decade... are currently in field trials... and will start the transition in late 2023.

**Puron**  
ADVANCE™

# Refrigerants Through the Years: A Historical Perspective

If you examine the timeline below, you'll see a history of change for refrigerants. And if you look closely, you'll see the transitions from R-12 to R-22 and to Puron were focused on reducing ozone depletion.

Something you won't see on the chart: the previous transitions were made a little easier due to the number of readily available alternatives. Switching from R-410A to a lower GWP refrigerant has been a bit more complicated due to the lack of available options that didn't require a refrigerant with a higher flame propagation.

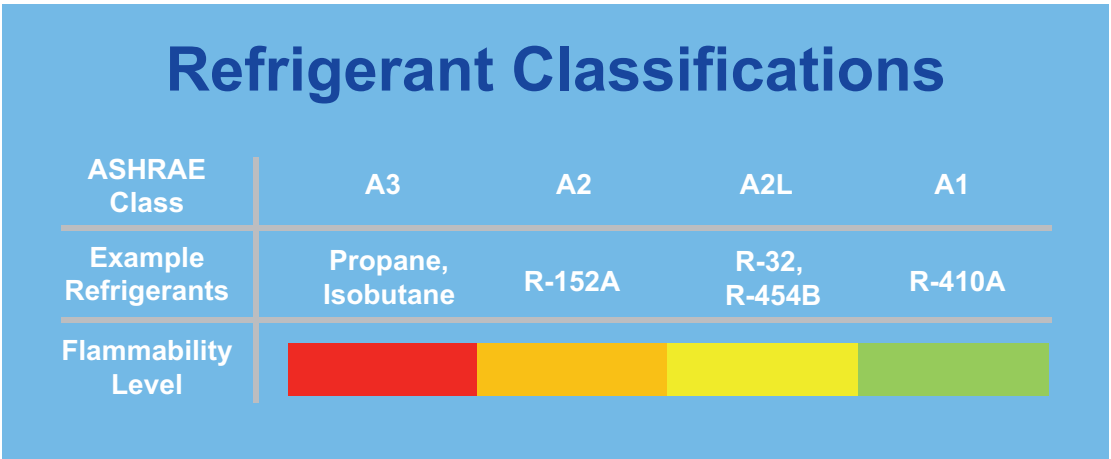


## WITH CHANGE COMES COMPROMISE

The transition from R-22 to Puron came with an increase in GWP. It wasn't ideal, but it helped us achieve the goal of finding a non-ozone depleting refrigerant.

Now, with the change from Puron to Puron Advance, the focus has been to dramatically reduce global warming potential, while maintaining no ozone depletion. To achieve this goal, the industry had to collectively make another concession: a shift in flammability classification.

R-12, R-22 and Puron all fall into the A1 classification of refrigerants which have no flame propagation. Puron Advance falls into a new category – A2L – which is “mildly flammable.” We'll go into more detail on flammability later – but be assured that the new refrigerant is still VERY low on the flammability scale and is quite safe.





## ONE FINAL WORD: PERSPECTIVE

Change can be unnerving, but it's often necessary. If you were around for the transition to Puron, you might remember some concern over increased operating pressures. In the end, products were tested, technicians were trained, and the transition to Puron went smoothly. We are expecting more of the same as we make the switch to Puron Advance.

# Refrigerant Make-Up and Comparison: Puron Advance vs. Puron vs. R-32

Carrier is committed to providing our planet and people a better future by offering the best refrigerant for each application. To that end, Puron Advance became our leading choice for replacing Puron due to the performance similarities between the two. We will be using Puron Advance in all of our ducted and ductless residential products and our light commercial products.

Here's a closer look at the high-level similarities and differences between the three refrigerants:

|                        | <br><small>non-ozone depleting refrigerant</small> | <br><small>ADVANCE™</small> | R-32  |
|------------------------|---|---|---|
|                        | Non-compliant with new unit manufacturing as of 1/1/25  | Compliant for Phase 1 of low GWP alternatives   | Compliant for Phase 1 of low GWP alternatives |
| GWP                    | 2088  | 466   | 675   |
| Discharge Temperatures | Lower discharge temperatures  | Lower discharge temperatures  | Higher discharge temperatures                 |
| Glide                  | Negligible glide  | Negligible glide  | No glide                                      |
| Formula                | 50% R-32/50% R-125  | 68.9% R-32/31.1% R-1234yf   | 100% R-32                                     |

## SYSTEM DESIGN CHANGES

New systems with Puron Advance will include:

### Indoor Units

- Factory-installed leak detection
- Active dissipation system
- Ignition source isolation
- No competent ignition sources
- New metering devices for different pressures
- Straight liquid and vapor lines on all tiers to allow brazing or press fitting use

### Outdoor Units

- New metering devices for different pressures
- New compressors
- Straight service valves on all tiers to allow brazing or press fitting use

## SERVICING

- Charging/servicing techniques will remain the same when switching from Puron to Puron Advance as they are both negligible glide blends
- Charge limits to be based on the home's square footage and other design criteria
- R-32 and R-454B systems should be properly leak-checked, and should be evacuated and purged before any brazing
- Reclaiming equipment and other servicing tools will need to be A2L-certified for both R-32 and R-454B - i.e. a separate set of hoses is required for each unique refrigerant

As you would expect, the above content is a simplified and high-level summary of the thinking that went into our decision on Puron Advance. These findings and much, much more were the result of years' worth of research, development, and testing. Continue reading for a more detailed understanding of Puron Advance and how to safely work with this new refrigerant.

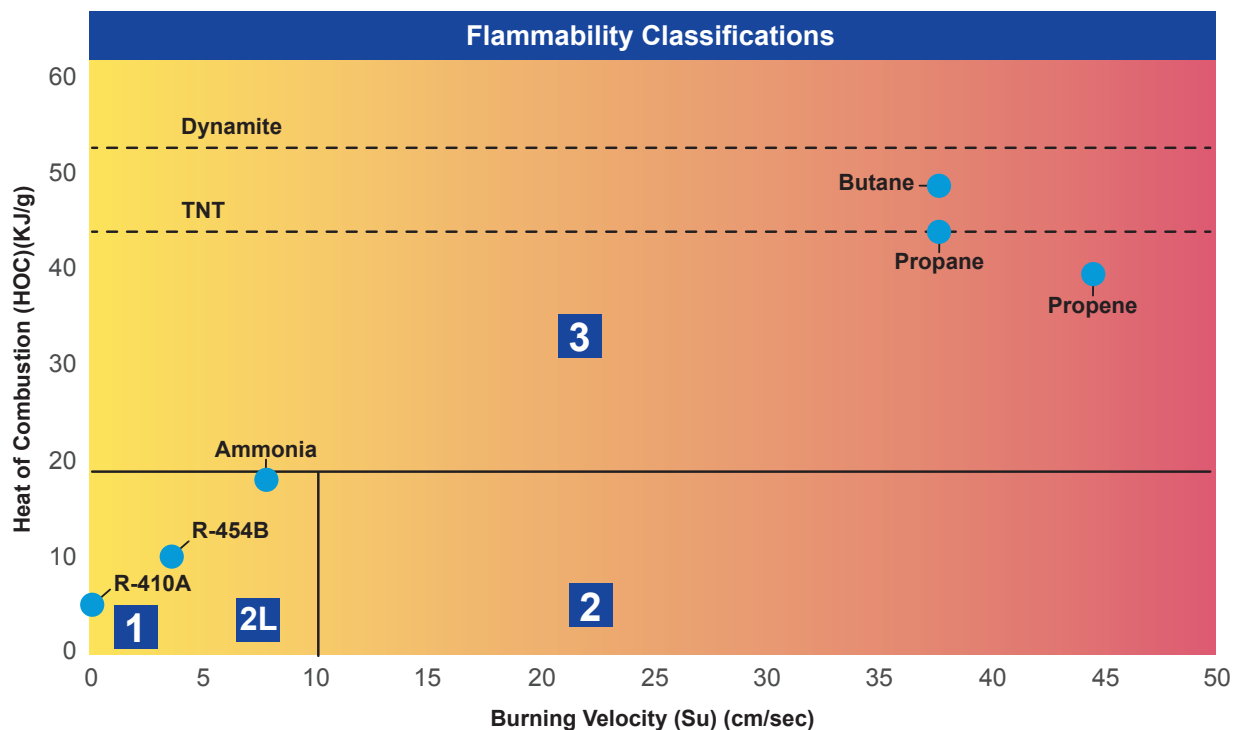


## Working with Puron Advance

# What About Flammability?

## ASHRAE Classifications A1 vs. A2L vs. A3

As previously touched on, the main apprehension for Puron Advance is its “mildly flammable” classification. We get it. Nobody wants to think their new HVAC system is going to be a potential hazard. But the fact of the matter is, Puron Advance falls into a new ASHRAE classification: A2L, or mildly flammable. It is important to note that Puron Advance poses no significant risk for installers, service technicians or homeowners.



### COMPARING CLASSIFICATIONS

Looking at the chart, you'll see how Puron Advance compares to previous refrigerants and other, more flammable gases:

#### A1 – No Flame Propagation:

Current refrigerants like R-410A (Puron) and R-134A are classified as A1 with no ability to carry a flame.

#### A2L – Mildly Flammable:

To hit the new targeted GWP levels, manufacturers are switching to A2L-classified refrigerants R-32 or R-454B which are considered mildly flammable, difficult to ignite, and have a low flame speed.

#### A3 – Higher Flammability:

By comparison, propane, a gas familiar to many HVAC installers and service technicians, is classified as A3 for higher flammability and its explosion potential.

### LET'S PUT A2L FLAMMABILITY IN PERSPECTIVE

- A2L refrigerants are so mildly flammable that there must be a direct flame source and a high concentration of refrigerant to create a flame
- If an A2L refrigerant were to ignite, the flame would be unsustainable
- An A2L refrigerant flame would spread at an extremely slow speed – less than half a mile per hour – you can walk faster than that

In the final analysis, Puron Advance necessitated some minor equipment modifications by Carrier and will require use of A2L-certified equipment for refrigerant reclaiming. However, the service and installation procedures for equipment charged with Puron Advance are, for the most part, the same as those for Puron. See the section on *Field Service Procedures* for more details.



# Refrigerant Charge Limits and Dissipation Requirements

Now let's look at the new refrigerant charge limits with which all manufacturers using an A2L refrigerant must comply. According to new UL guidelines, dissipation will be required in the event of a refrigerant leak and will be based on a combination of total square footage and total system charge. The total system charge includes the line set, indoor coils, and the outdoor unit – in other words, any component that holds refrigerant. UL has set the following guidelines:

**m1** = Charge limits that fall at or below 3.9 pounds of total charge will not require a dissipation system.

**m2** = Charge limits that fall between 4.0 – 33.9 pounds of total charge will require a dissipation system. Note: Most typical residential HVAC equipment will fall into this category.

**m3** = Charge limits that fall between 34.0 – 169.3 pounds of total charge will require a dissipation system in addition to other requirements that may be defined by separate commercial or control room requirements.

## OUR COMMITMENT TO SAFETY

In response to this and to instill confidence in our products, we will be designing ALL our units, regardless of charge amount, with the SAME dissipation system to meet the new requirements. Additionally, we opted for a leak dissipation system designed with a leak detector for activation of a unit fan and a dissipation board. It was determined that having a continuous fan as the dissipation system was not justified, as it requires excess energy. The decision to go with this consistent safety design across all products utilizing Puron Advance provides you with the extra confidence that all our units have safety measures built into the design.

## CARRIER DISSIPATION SYSTEM

As stated, all products using Puron Advance are designed with a dissipation system that consists of:

- A factory-installed leak sensor\* located in the indoor coil cabinet
- A dissipation control board
- Unit blower

The new dissipation boards are compatible with existing furnaces and can be wired into any existing furnace and thermostat when installing a new outdoor unit and a new evaporator coil with Puron Advance.

As with all Carrier products, we put these new leak-detecting sensors through rigorous testing procedures to ensure durability, reliability, and longevity. It is important to note that all sensors are not created equally. The sensors chosen by Carrier are of a quality that adheres to our standards of excellence. We have tested multiple sensors in the last several years and are avoiding single-use, or throw-away, sensors as they will create an equipment operation gap and inconvenience for the homeowner, waiting for parts to be ordered and replaced.

We also took this dissipation requirement into account when designing our 2023-compliant gas furnaces so that no additional changes will be needed on those product lineups.

### How It Works

In the event of a leak, the leak sensor sends a signal to the dissipation board, which energizes a blower to dissipate the refrigerant into the air stream.

Once activated, the blower is always on in dissipation mode and stays on for five minutes after the sensor readings are below the dissipation threshold. The system allows a heating or cooling call after 15 minutes of dissipation as long as the sensor is reading below the threshold. You can find more detailed information about the Carrier dissipation system in the A2L training modules on My Learning Center.

\* Subject to change, pending final design



# Ignition Source Isolation

In addition to installing dissipation systems on all our Puron Advance products, we are also taking the required steps to assess our products' electrical systems and mitigate any potential ignition sources within them. Below are examples of the steps we are taking with our outdoor and indoor products to ensure no ignition source exists.

## OUTDOOR UNIT\*

### Compressor Plugs

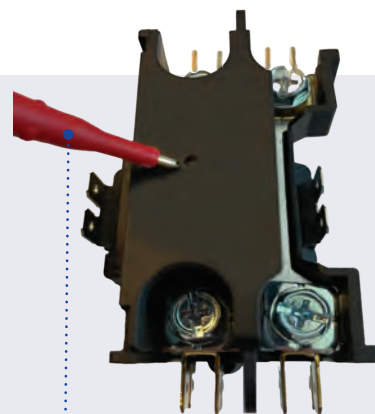
- The enclosed (molded) plugs on our compressors have been assessed and provide the necessary isolation from ignition

### Electrical Ignition Points

- Wire sleeves may be installed on compressor and crankcase heater wiring to mitigate potential ignition points
- Pinch points are carefully assessed at the factory

### Contactors

- A new top cover design eliminates the gap that resulted from manual push button operation. This patented design feature still allows for manual operation by using multimeter probes.
- Minimal air gaps inside the contactor act as a flame arrestor



## INDOOR UNIT\*

- Protection is factory-installed on wiring to prevent pinching and arcing
- Evaluating approved fan coil electric heaters for ignition sources (Note: Our approved electric heaters are not considered an ignition source.)



\* Subject to change, pending final design

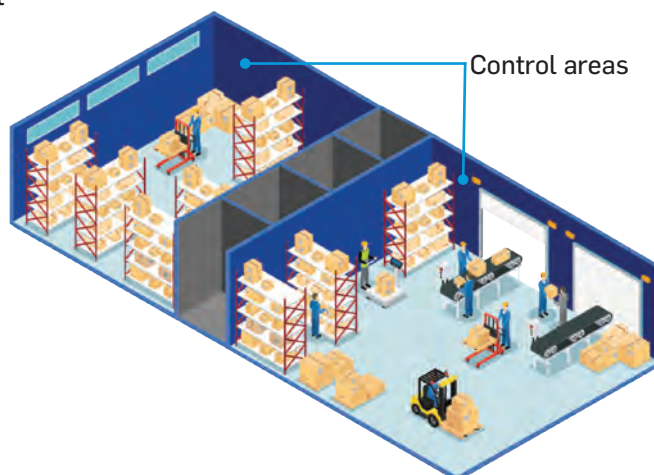
# Storage

As we transition to utilizing Puron Advance, it will be important to acquaint yourselves with the proper storage requirements for this refrigerant. The International Fire Code (IFC) and the National Fire Protection Association (NFPA) have established detailed codes and standards for on-site refrigerant storage.

Things to consider for stage include:

- Maximum allowable quantities
- Control areas within a building
- Shelving materials and spacing
- Ambient temperatures
- Signage and documentation

We recommend visiting [NFPA.org](https://www.nfpa.org) to find the latest information on storage.



# Required Labels

In accordance with UL requirements, new and additional labels are now required on our equipment and literature to draw attention to the use of Puron Advance in our products. These labels help to warn technicians of the mild flammability of the refrigerant and the new components that require extra attention to detail, such as recommendations to review literature for more details. You can learn more about these labels by taking the new A2L refrigerant training course at [MyLearningCenter.com](http://MyLearningCenter.com).

**Flammable Pictogram**



**Low Voltage Wire Label**



**Charging Label**

|         |                      |    |                      |    |
|---------|----------------------|----|----------------------|----|
| ① =     | <input type="text"/> | KG | <input type="text"/> | LB |
| ② =     | <input type="text"/> | KG | <input type="text"/> | LB |
| <hr/>   |                      |    |                      |    |
| ① + ② = | <input type="text"/> | KG | <input type="text"/> | LB |

**Compressed Gas Pictogram**



**Operator's Manual Symbol**



## Transportation

With the transition to Puron Advance, technicians may be faced with additional protocols to properly and safely transport this new refrigerant.

The rules for transporting a refrigerant like Puron Advance are set by the U.S. Department of Transportation – with additional requirements coming from state and municipal departments of transportation.

We recommend referring to these groups for the very latest guidance on the safe transport of A2L refrigerants.



# Cylinder Differentiation

Another change to be aware of as Puron Advance is introduced has to do with the cylinders within which the refrigerant is transported. Changes in the cylinder design have been made to help technicians in the field avoid any confusion between two different refrigerants. Below are seven ways to differentiate the new Puron Advance cylinders.

## COLOR

As of 2020, all refrigerant cylinders went to a universal light green-gray color. The A2L refrigerant cylinders will have a red top for identification, to warn that it contains a mildly flammable substance.

## THREADS

Cylinders for A1 refrigerants like Puron have a right-handed thread. Cylinders for A2L refrigerants, like Puron Advance, have a left-handed thread. And for an extra safety measure, connectors for A1 refrigerants will not work to connect an A2L cylinder.

## PRESSURE RELIEF VALVES

Noticeable changes in cylinders for the A2L refrigerants are in the pressure safety design on the top.

- A1 service cylinders feature a rupture disc for safety.
  - A rupture disc releases all the cylinder contents when it activates.
- A2L service cylinders are required to have a pressure relief valve instead of a rupture disc, for increased safety.
  - A relief valve will only release content until the pressure setting allows the valve to close.

## WARNING LABELS

Two warning labels are required for cylinders that contain A2L refrigerants.

- The **Flammable** pictogram warns of potentially flammable contents. It must appear on all cylinders containing A2L refrigerants.
- The **Compressed Gas** pictogram warns of high-pressure gas that could explode when heated. It may be used on cylinders containing A2L refrigerants.

## DISPOSAL PROCEDURE

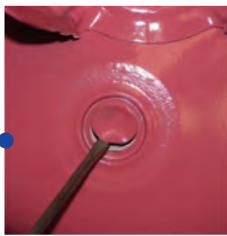
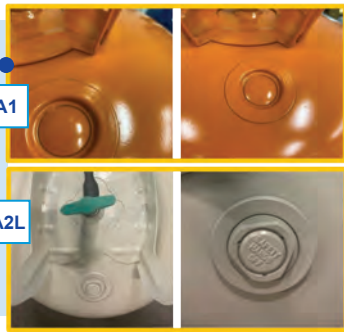
Handling of disposable refrigerant cylinders for A1 and A2L will have a slight difference.

- With A1 cylinders, the technician removes or punctures the rupture disc.
- For A2L cylinders, a non-sparking piercing tool must be used to puncture the side of the cylinder itself.

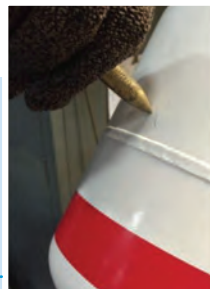
## RECOVERY

Both A2L and A1 recovery cylinders are gray in color with a yellow top. A2L cylinders may also have a red band or stripe, as well as left-handed threads.

NOTE: Keep all refrigerant types clearly identified and do not mix refrigerants.



A1 Rupture Disc



A2L Rupture Disc

Images: [https://www.ahrinet.org/sites/default/files/2022-11/AHRI\\_Guideline\\_Q\\_2016.pdf](https://www.ahrinet.org/sites/default/files/2022-11/AHRI_Guideline_Q_2016.pdf)



# Tool Changes

The following chart compares service items and tools you will need when working with Puron Advance and how this compares to the ones you are used to using with Puron. It is always recommended to inspect refrigerant service tools and equipment for damage and to ensure compatibility with both A1 and A2L refrigerants. If you're unsure about the compatibility of any of your tools or instruments, check the AHRI website or contact your Carrier representative to learn more.

| Service Item / Tool                  | Use with Puron Advance (vs. Puron)                          |
|--------------------------------------|---|
| Gauge manifold                       | No change   |
| Charging hoses                       | Separate set for each type of refrigerant                   |
| Refrigerant leak detector            | Move to A2L-compatible                                      |
| Electric hand tools                  | Non-sparking required                                       |
| Ventilation Fan                      | Similar (may be differences in machine rooms)               |
| Dry chemical / CO2 fire extinguisher | Chemical-compatible   |
| Scales                               | No change   |
| Gas detector                         | Move to A2L-compatible                                      |
| Vacuum pump                          | Check with manufacturer                                     |
| Recovery machine                     | Move to A2L-compatible                                      |
| Refrigerant recovery cylinder        | Must be for flammable gas (GHS label);<br>Left-hand threads |
| Refrigerant cylinder                 | Left-hand threads   |



# Field Service Procedural Changes

We've covered tools and equipment – what about processes and procedures: practical tasks you perform in the field? Review the chart below for a comparison of how required field service procedures are – or are not – changing with the move from Puron to Puron Advance.

| Requirement  | Puron         | Puron Advance   |
|--|---------------|-----------------|
| Remove refrigerant safely following local and national codes | Required      | Required        |
| Purge circuit with inert gas (nitrogen)                      | Best Practice | <b>Required</b> |
| Evacuate   | Best Practice | <b>Required</b> |
| Purge with inert gas for five minutes                        | Best Practice | <b>Required</b> |
| Evacuate again   | Best Practice | <b>Required</b> |
| Open the circuit by cutting or brazing                       | Final Step    | Final Step      |
| For repairs, purge with nitrogen during brazing              | Required      | Required        |
| Pressure test  | Best Practice | <b>Required</b> |
| Leak test  | Best Practice | <b>Required</b> |
| Evacuate system again after service                          | Required      | Required        |
| Charge system  | Required      | Required        |

Many actions that are now required with Puron Advance were already best practice. So, if you've been taking those extra precautions already, your processes won't need to change at all. With Puron Advance, we're requiring you to take extra precaution to ensure all the refrigerant is out of the system prior to opening it for repair or replacement service. Always refer to the installation manual for procedures that may have changed with Puron Advance.

# Puron Advance Key Messaging

Keeping with its long history of leading environmental responsibility, Carrier has once again taken a leadership role in offering the refrigerant of the future. Here are the key messages for you to remember as you work through this transition.

## 1 **Carrier is focused on providing a refrigerant that offers a higher efficiency and the lowest GWP that will positively impact people, our planet, and our communities.**

- Carrier Global Corporation has set an ambitious goal to help our customers avoid more than one gigaton of greenhouse gas (GHG) emissions from their carbon footprint by 2030 by leveraging our energy-efficient products, using lower global warming potential (GWP) refrigerants and more.
- With its GWP of 466, Puron Advance was selected as the best refrigerant solution for ducted and ductless residential and light commercial products to minimize environmental impact and energy use, while providing performance, safety, and durability.
- With the switch Puron Advance, we will dramatically reduce the GWP level while maintaining no ozone depletion. This will continue to aid in the reduction of damage to the ozone layer – the layer around the earth that inhibits UV radiation from negatively impacting the environment and human health.
- Carrier Global Corporation's ducted and ductless residential and light commercial products switching to Puron Advance is like avoiding the greenhouse gas emissions from over 5 million gas powered passenger vehicles each year.\* That's a big impact!

## 2 **Carrier is easing fears of dealers, technicians, and homeowners through robust training resources and product enhancements.**

- Switching to Puron Advance will be a relatively easy transition for technicians because it operates at temperatures and pressures like those of our current refrigerant, Puron.
- Carrier technicians and installers have access to thorough training so they can be certified in knowing how to properly install, maintain, and reclaim the Puron Advance.
- Puron Advance falls under the classification of A2L by ASHRAE. A2L refrigerants have lower toxicity and lower flammability than A2 refrigerants. While A2Ls are more flammable than A1s, such as R-410A, they are still much less flammable than natural gas or propane and even things like rubbing alcohol and nail polish remover like you may already have in your home.
- Carrier is committed to safety and will, therefore, include a dissipation system in all products containing Puron Advance. Technicians and homeowners alike can be confident that the required safety measures have been built into our system designs.

## 3 **Carrier goes beyond the regulatory minimums and thinks about long-term innovations and solutions.**

- As a leader in the HVAC industry, we have been working towards creating a more GWP-friendly refrigerant since before 2010. Puron Advance will deliver comfort, efficiency and a dramatically reduced GWP of 466 to meet regulations expected to take effect in 2025.
- With the EPA's decision to require GWP's to be at or below 700 by January 1, 2025, our choice of Puron Advance, with a GWP of 466, will be able to meet and exceed this requirement. Puron Advance represents a 75% reduction in GWP compared to Puron.

# Top ~~10~~ 11 Things to Remember About Puron Advance

- 1 Puron Advance is Carrier's choice to replace Puron and to meet the new EPA requirements for a low GWP and zero ozone depletion refrigerant.
- 2 Puron Advance will be used on all Carrier ducted and ductless residential products and our light commercial products.
- 3 Puron Advance offers similar operating temperatures, pressures, and oil compatibility to Puron – but delivers a GWP of 466 which is a 75% reduction in GWP vs. Puron.
- 4 Puron Advance falls into a new ASHRAE class of refrigerants called A2L – which are only mildly more flammable than A1 refrigerants, and which are less flammable than many common substances found in homes such as rubbing alcohol or nail polish remover.
- 5 At launch, ALL new Carrier products with Puron Advance will include a factory-installed leak dissipation system to meet new UL requirements.
- 6 The new dissipation control boards can be wired into any existing furnace and thermostat when installing a new Puron Advance outdoor unit AND evaporator coil.
- 7 All Puron Advance products – including all components and accessories within – have been assessed to ensure no ignition source providing you with the extra confidence around our built-in safety measures.
- 8 Many of the field service procedures that are now required with Puron Advance were already best practices – so your process should not need to change at all.
- 9 Cylinders containing Puron Advance will have obvious differences – such as different colors, left-handed threads, and pressure relief valves to name a few – to avoid any confusion in the field.
- 10 Puron Advance allows the highest overall refrigerant supply through the refrigerant emissions supply phasedown – which means less change for you.
- 11 Carrier Global Corporation's ducted and ductless residential and light commercial products switching to Puron Advance is like avoiding the greenhouse gas emissions from over 5 million gas-powered passenger vehicles for one year.\* That's a big impact!

\* Assuming Carrier Corporation residential, DLS and light commercial units shipped with refrigerant annually.  
<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

# Frequently Asked Questions

## Puron Advance - General

- 1) Why is Carrier switching to a refrigerant that falls in the A2L classification – which makes it mildly more flammable than Puron?

In order to meet the new requirement a low GWP refrigerant, that also maintains no ozone depletion, the industry as a whole had to move to this new A2L classification.

- 2) What does A2L mean?

A2L is a newly created classification on the ANSI/ASHRAE Standard 34 chart for classifying refrigerants. The chart is broken down between A and B and 1 through 3. “A” means lower toxicity, while 2 represents the flammability level. Previously, A2L was just A2. The “L” was added to the chart because the new refrigerant did not burn at a rate similar to an “A2” classified refrigerant, but there was a minimal flame propagation potential requiring a new classification.

- 3) Why is Puron Advance categorized as “mildly flammable”?

In order for Puron Advance to propagate there must be a direct flame source and a high concentration of refrigerant. Even with these conditions, a flame is difficult to ignite and difficult to sustain – hence the term “mildly flammable”.

- 4) How long will I be able to sell products with Puron?

At this time, the draft ruling by the EPA proposes a one-year sell-through. This means that any ducted and ductless residential and light commercial equipment built before January 1, 2025, with Puron (R-410A) must be installed before January 1, 2026.

- 5) Is Puron Advance more efficient than Puron?

Puron Advance is a near drop-in in terms of performance compared to Puron, with very similar temperatures and pressures. While creating a better planet for tomorrow, Puron Advance systems will achieve similar efficiency across the board.

- 6) Will I need special certification to work with Puron Advance?

As of today, the existing EPA 608 certification is still the only needed requirement for refrigerant handling, including R-454B. We highly recommend continuous education and training as a best practice for any field work. You can find thorough A2L refrigerant training on [MyLearningCenter.com](https://www.mylarningcenter.com). And be sure to always check for any local requirements governed by municipalities in your area.

- 7) Does this refrigerant contain propane?

No. There is absolutely zero propane gas in the new Puron Advance refrigerant.

- 8) Will I still be able to get Puron for my customers' existing equipment?

Yes. Puron will continue to be available for existing installed equipment. Be aware however, the availability of Puron will be limited in the coming years as the phasedown of R-410A continues. With limited quantities, this will likely result in increased pressure on the cost of Puron.

- 9) What is the benefit to a homeowner of switching over to a Puron Advance system as soon as available?

The benefit of switching over to a Puron Advance system, when available, would ensure the homeowner is not utilizing a system with a refrigerant that is being phased down. This is important when considering the life of the equipment and potential future repairs. As the phasedown continues, the availability and demand will drive to very costly repairs of R-410A equipment.

- 10) What is the benefit to a dealer of switching over to selling Puron Advance systems as soon as possible?

Based on the EPA's proposed one-year sell-through of R-410A equipment, switching to R-454B equipment will help to ensure that all R-410A ducted and ductless residential and light commercial equipment is out of inventory so it does not have to be scrapped on January 1, 2026. Additionally, the dealer would help to ensure that their customers are up to code and help them avoid potentially expensive repair costs on older R-410A equipment.

- 11) Does the new refrigerant regulation apply to Canadian markets?

At this time, decisions are pending for the Canadian market. Check back regularly to make sure you are up to date with the latest legislation from the Canadian government.

12) How will the installation process change with a Puron Advance system?

Installation of a Puron Advance system will be quite similar to a Puron system. However, there are some field service practices that will become required where before they were recommended. See page 23 for a complete list of required procedures

13) Do I need to get a completely new set of tools in order to work with Puron Advance?

Not necessarily. If your tools are compatible with A2L refrigerants and are non-sparking, then you will be able to continue to use them. You will need to make sure you have separate charging hoses for each unique refrigerant type. If you are unsure, check with AHRI or your Carrier representative to learn more.

14) Will I be required to replace the evaporator coil or the fan coil, or can I just replace the outdoor unit with a Puron Advance unit?

A new Puron Advance indoor coil will be required when installing a new Puron Advance outdoor unit – due to the required dissipation system.

15) What are the requirements in order to reuse existing piping with Puron Advance?

The piping must meet standards, be the correct size and length for the system being installed, be clean, and pass a pressurized leak test.

16) Am I required to change the lineset on existing systems?

As long as the piping meets UL codes then reusing the lineset is permitted.

17) Will charging a system with Puron Advance be different than one with Puron?

No. Fundamental charging practices will remain the same.

18) What all goes into the calculation of the total system charge during installation?

The total system charge is the sum of the lineset, indoor coils, and the outdoor unit - in other words any component that holds refrigerant.

19) Can I use the same charging hoses for Puron Advance that I used for Puron?

No. You should use a separate set of hoses for each unique refrigerant type to avoid any mixing of refrigerants.

20) Will Carrier offer an uncased furnace A-coil with Puron Advance?

Per UL codes, uncased coils will no longer be an option due to the complexities of the ductwork - reducing the confidence in acceptable sensor placement for dissipation purposes.

21) Does the dissipation system come with the AC/HP or the coil?

The sensor will be installed on the indoor coil and the dissipation system control board will be shipped with the indoor coil. For a fan coil, the dissipation system will be fully factory-installed.

22) Can we pair an existing furnace with a new Puron Advance furnace coil or a Puron Advance AC/HP?

Yes. The dissipation control will come with the new coil and it will directly interface with the existing furnace through the Y, W, and G terminals – stopping a call for heating or cooling and activating the blower in the event of a detected leak.

23) Will indoor air quality products need to be replaced or upgraded when a new Puron Advance system is installed?

No. Carrier has tested all our indoor air quality products to ensure they are compatible with these new products. Technicians will also be able to check the installation manual to see if any third-party products present any concerns when paired with our equipment.

24) Can I use the same recovery tanks for Puron Advance that I currently use for Puron?

No. It is important to avoid mixing the refrigerants so you must use separate tanks for each unique refrigerant type.

25) What if I accidentally connect a Puron cylinder to a Puron Advance system?

If this occurs, you will need to follow the proper evacuation procedure listed in the installation manual. To reduce the occurrence of this happening, the Puron Advance products will have a R-454B label near the service valves and a red indicator attached to the service valves per UL regulation.

26) How will I be able to tell the Puron Advance cylinders from the Puron ones?

The Puron Advance cylinders – while a similar green-gray color – will also have red stripe around the top as a clear visual distinction and left-hand threads.

27) Why is it important to reclaim Puron?

With the phasedown of HFC refrigerants, the availability and cost of the refrigerant will begin to change. If Puron is reclaimed it can be recycled and reused for service and repairs and is not restricted by the phasedown of this refrigerant.

28) At what pressures will the Puron Advance coils operate?

The pressures and temperatures of Puron Advance coils will operate similarly to Puron. The pressure for Puron Advance will be roughly 7% less than current Puron products. This has allowed us to utilize the same coils with changes to the TXV and dissipation system being the only necessary changes for performance.

29) Are there other benefits to the new products featuring Puron Advance?

There will be standard stub outs on HPs/ACs/evap coils/fan coils to give flexibility for installation options, mechanical TXVs on evap coil, QR codes on products for quick access to installation instructions, and IntelliSense technology on all mid-tier AC/HP units.

30) What happens if the leak detection sensor fails?

If the dissipation system sensor fails, the control board will fail safe. This means that the unit will stay in dissipation mode not allowing the system to operate in heating or cooling until the sensor is replaced. This is the primary reason the sensors that we are installing have been tested for durability and longevity.

31) How can you tell if the leak detection sensor and/or dissipation system is working properly?

The dissipation system performs a self test every hour to determine functionality and displays a light on the board to indicate normal operation. If this self test fails, the unit will display an error LED and activate dissipation.

32) Will units with R-454B use the same oil as current units using R-410A?

Yes. Unlike with the transition from R-22 to R-410A, R-454B models will use the same oil as is currently used with R-410A models.

33) Why are you including a dissipation system on all ducted products?

The decision to go with a consistent safety design across all of our products using Puron Advance provides you with the extra confidence that all our units have safety measures built-in. All Carrier ducted products with Puron Advance ship with more than 3.9 pounds of refrigerant – meeting the UL m2 level requiring dissipation systems.

34) How can installers feel comfortable about their safety working with Puron Advance?

Closely following the required and recommended field service procedures is the first step in technician safety. Further, Carrier will be installing a leak dissipation system on all of our units, regardless of charge amount. This consistent safety design provides you with the extra confidence that all our units have built-in safety measures.

35) What does “flame speed” refer to?

Flame speed refers to the rate at which a flame spreads. Puron Advance has a very slow flame speed - less than half a mile per hour, which is a rate you out pace by casually walking.

36) How long will the blower motor run after a leak is detected to ensure dissipation?

Once the leak is no longer detected, the blower will run for an additional 15 minutes before allowing for a resumed heating or cooling demand call.

37) Are there any concerns for homeowner safety with Puron Advance?

No. Homeowners should not feel concerned about updating to a Puron Advance system. Carrier is committed to safety and reliability as evidenced by our rigorous testing protocols on all products. Plus, we have built a leak detection/dissipation system into each Puron Advance system for added safety.

38) Will homeowners need to purchase an additional type of detector for their home to ensure their safety with this new refrigerant?

No. Carrier has put technician and homeowner safety first when developing our new products with Puron Advance. We have built leak detection safety measures into each Puron Advance system.

39) Will homeowners remain safe even when the HVAC system in their home has been turned off – i.e. during nice weather?

Yes. When the system is set to off, the leak detection system is still monitoring for any refrigerant leak and can override the thermostat to turn on the blower motor to mitigate the leak.

# Where to Go for More Information



## LAUNCH MATERIALS

Visit [HVACpartners.com](http://HVACpartners.com) for access to the Puron Advance launch page where you will find a link to order more of these kits as well as links to additional marketing support materials.



Go to: *HVACpartners > Marketing > Sales Tools > Marketing Launch Kits > Puron Advance*

## CONTENT INCLUDES:

- Launch Kit PDF
- Product Presentations
- Brochures
- Videos

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## MERCHANDISING MATERIALS

Visit [HVACpartners](http://HVACpartners.com) to access a variety of Puron Advance merchandising material.



Go to: *HVACpartners > Marketing > Marketing Your Business > Marketing Merchandise*

## CONTENT INCLUDES:

- Banner Stands
- Branded Apparel
- Vehicle Graphics



## TRAINING

Visit [MLCTraining.com](http://MLCTraining.com) and search Puron Advance in the Online course catalog and video section to access available training.

## Notes





Turn to the experts

[carrier.com](https://www.carrier.com) 1-800-CARRIER

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