



INTRODUCING R-454B



A new refrigerant
for a better future



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Dear SmartComfort Dealer:

THE FUTURE OF LOW GWP REFRIGERANT IS HERE, AND R-454B 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 SmartComfort. 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 R-454B through innovations such as Power-V technology and gas furnace NFC technology. And now we enthusiastically answer the call for reduced global warming potential (GWP) with R-454B.

R-454B is the latest chapter in the evolution of refrigerants, the first major change since we transitioned to non-ozone depleting R-410A refrigerant in 1996. Now, with R-454B, SmartComfort 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.

R-454B delivers a greater than 75% decrease in GWP than the original R-410A. And, with operating pressures and temperatures similar to the original R-410A, 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 R-454B launch kit includes:

- What is R-454B 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 R-454B vs. R-410A and R-32
- Details on flammability, dissipation requirements, and field service procedures
- Key Messaging and Top 11 Things to Remember regarding R-454B

We hope the materials in this kit will help prepare you for a successful entrance into the future of reduced GWP refrigerants and R-454B. All this information is available now on HVACpartners. 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 R-454B



Setting the Stage

Due to the full-system approach that SmartComfort by 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 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 Power-V technology. The addition of the Power-V 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.

The focus on the full-system approach has prepared us for this next regulatory transition. Let's take a closer look at R-454B.



POWER-V
TECHNOLOGY

What Is R-454B?

R-454B 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 R-410A. 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 R-454B?

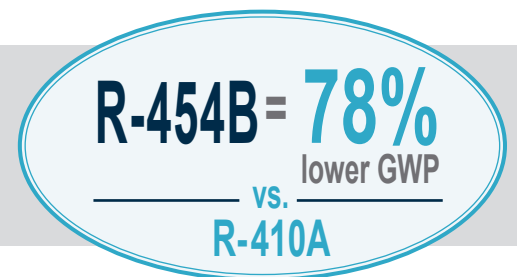
- R-454B is Carrier's choice for a low GWP refrigerant
- 80% of the industry is using R-454B
- R-454B performs very well in normal and high ambient conditions
- R-454B offers similar operating temperatures, pressures, and oil compatibility to R-410A, meaning technicians will have less of a learning curve compared to the alternative

WHAT'S THE DIFFERENCE BETWEEN R-454B AND R-410A?

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

R-454B, with a 78% reduction in GWP from R-410A, is the refrigerant with the most similar operating characteristics to R-410A.





Why the Change from R-410A to R-454B?

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 R-410A. 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 2024.

Note: It is important to reiterate that as of January 1, 2025, 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-410 must be installed before January 1, 2026.*

* Pending final EPA ruling.

WE'LL BE READY – AND SO WILL YOU

We have been working towards creating 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 R-454B in late 2023.

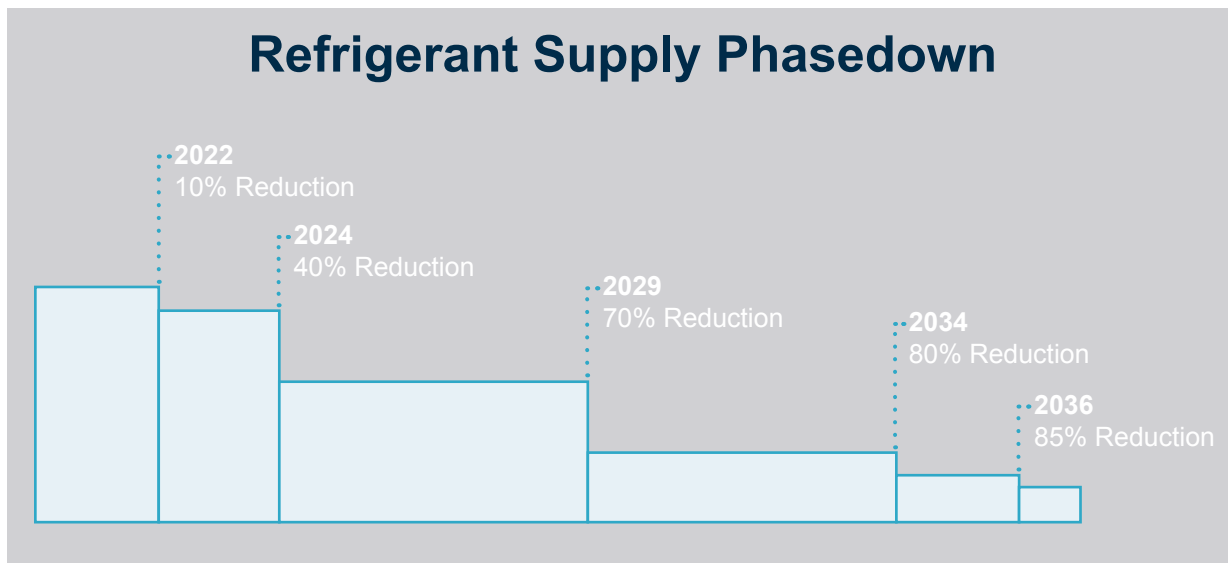
Refrigerant Phasedown Timeline

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.

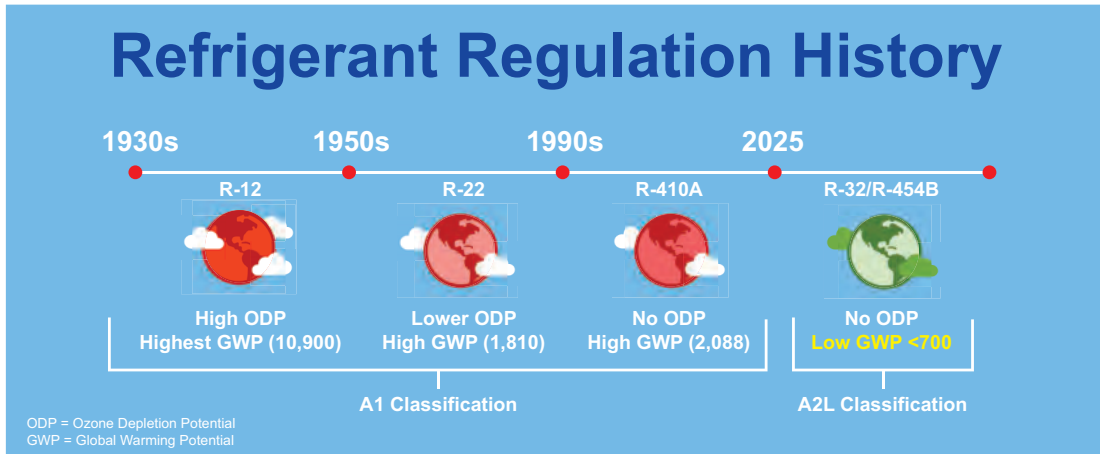
That means reclaiming R-410A will become – and remain – a very important part of your daily routine!

While many of you may remember what it was like when the industry shifted away from R-22 to non-ozone-depleting refrigerants like R-410A, this transition will be far more accelerated, and will see the cost of R-410A increase more quickly.

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 R-410A 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.

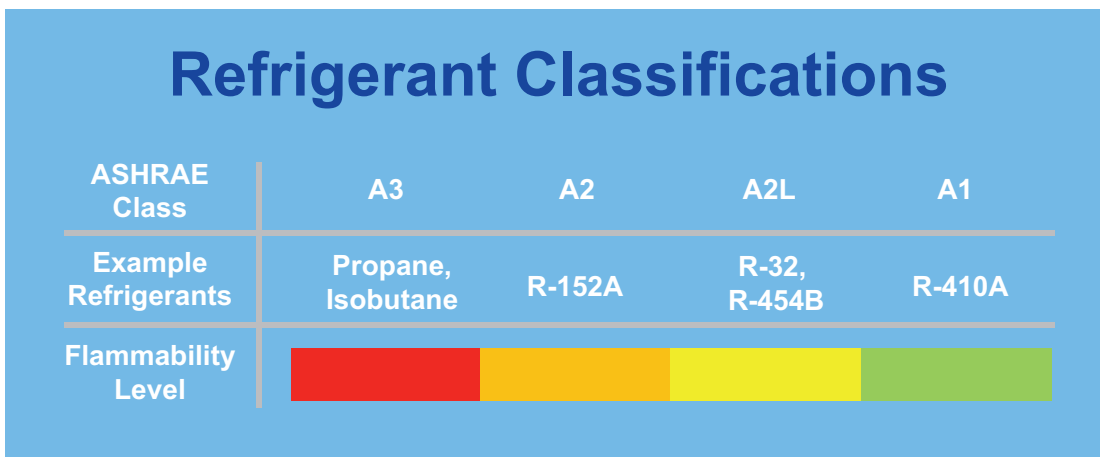


WITH CHANGE COMES COMPROMISE

The transition from R-22 to R-410A 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 R-410A to R-454B, 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 R-410A all fall into the A1 classification of refrigerants which have no flame propagation. R-454B 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 R-410A, you might remember some concern over increased operating pressures. In the end, products were tested, technicians were trained, and the transition to R-410A went smoothly. We are expecting more of the same as we make the switch to R-454B.

Refrigerant Make-Up and Comparison: R-454B vs. R-410A vs. R-32

R-454B became our leading choice for replacing R-410A due to the performance similarities between the two and, ultimately, because it has a much lower GWP than R-32. That difference in GWP is expected to allow R-454B to remain compliant significantly longer than R-32. Because of these factors, we will be using R-454B in all of our ducted and ductless residential products and our light commercial products.

To give you a little more insight into our decision to go with R-454B, here's a closer look at the high-level similarities and differences between the three refrigerants:

	R-410A	R-454B	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	No glide	Little to no glide	Little to 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 R-454B will include:

Indoor Units

- Factory-installed leak detection
- Active mitigation for leaks
- 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 R-410A to R-454B as they are both low 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 R-454B. 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 R-454B and how to safely work with this new refrigerant.

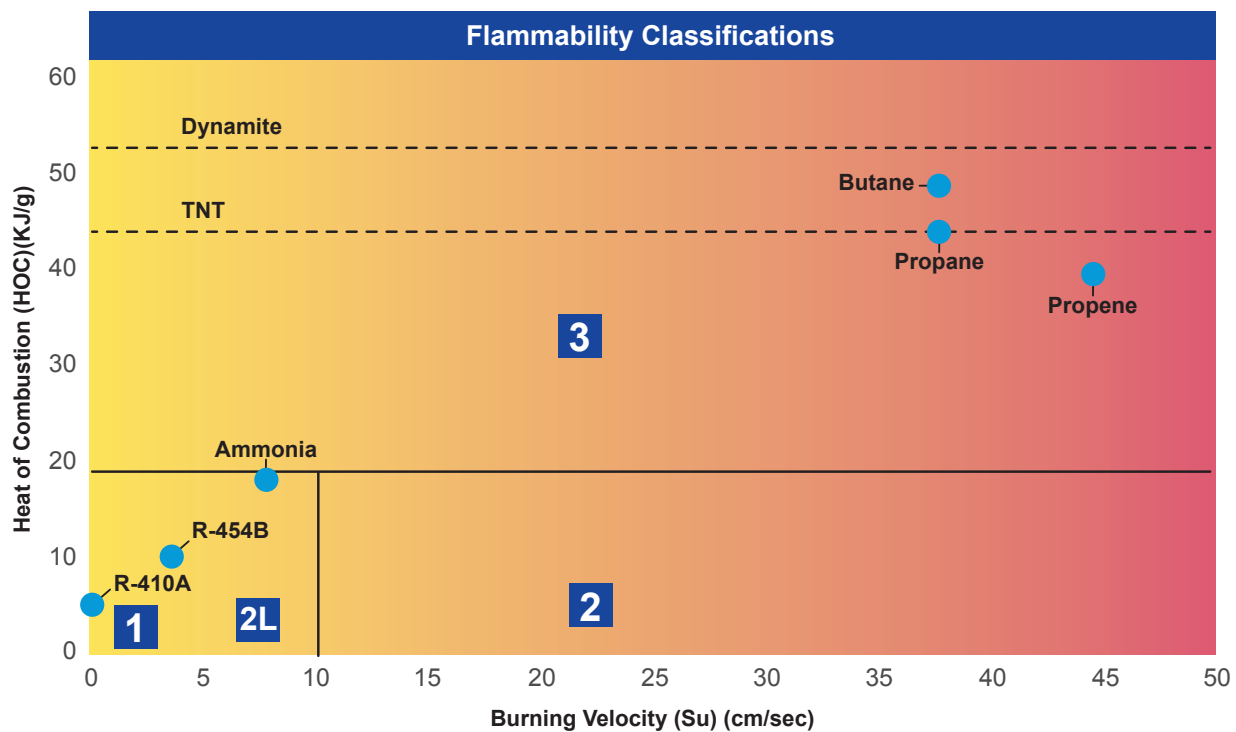


Working with R-454B

What About Flammability?

ASHRAE Classifications A1 vs. A2L vs. A3

As previously touched on, the main apprehension for R-454B 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, R-454B falls into a new ASHRAE classification: A2L, or mildly flammable. It is important to note that, R-32 (used by some competitors) also falls into this category as well, and neither poses significant risk for installers, service technicians or homeowners.



COMPARING CLASSIFICATIONS

Looking at the chart, you'll see how R-454B compares to previous refrigerants and other, more flammable gases:

A1 – No Flame Propagation:

Current refrigerants like R-410A 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, R-454B necessitated some minor equipment modifications and will require use of A2L-certified equipment for refrigerant reclaiming. However, the service and installation procedures for equipment charged with R-454B are, for the most part, the same as those for R-410A. See the section on *Field Service Procedures* for more details.



Refrigerant Charge Limits and Mitigation 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, mitigation 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 MITIGATION AND 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 mitigation 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 R-454B provides you with the extra confidence that all our units have safety measures built into the design.

SMARTCOMFORT DISSIPATION SYSTEM

As stated, all products using R-454B are designed with a dissipation system that consists of:

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

The new mitigation 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 R-454B.

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 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 mitigation 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 mitigation 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 mitigation threshold. The system allows a heating or cooling call after 15 minutes of mitigation as long as the sensor is reading below the threshold..

* Subject to change, pending final design



Ignition Source Isolation

In addition to installing dissipation systems on all our R-454B 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

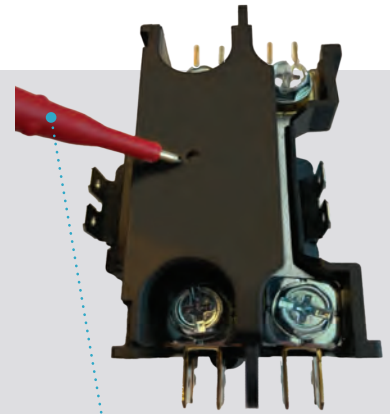
- The enclosed (molded) plugs on our compressors have been assessed and provide the necessary isolation from ignition

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

Contactor

- 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

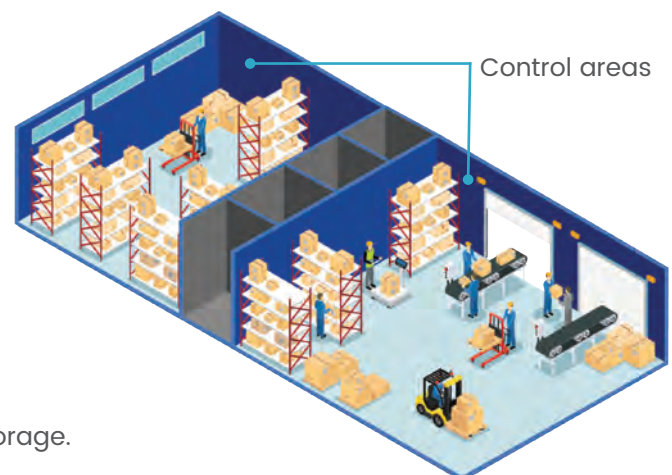
Storage

As we transition to utilizing R-454B, 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 to find the latest information on storage.



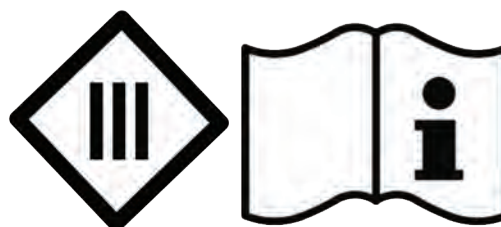
Required Labels

In accordance with UL requirements, new and additional labels are now required on our equipment and literature to draw attention to the use of R-454B 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.

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 R-454B, technicians may be faced with additional protocols to properly and safely transport this new refrigerant.

The rules for transporting a refrigerant like R-454B 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 R-454B 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 R-454B 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 R-410A have a right-handed thread. Cylinders for A2L refrigerants, like R-454B, 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

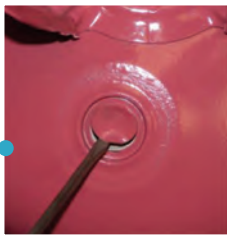
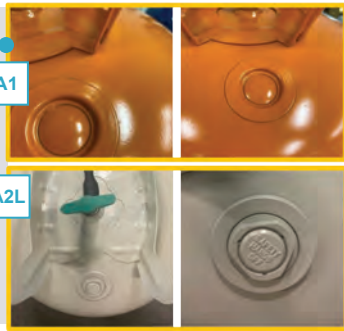
Handling of disposable refrigerant cylinders for A1 and A2L will have a slight difference.

- 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.

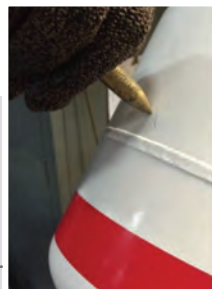
RECOVERY

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



Tool Changes

The following chart compares service items and tools you will need when working with R-454B and how this compares to the ones you are used to using with R-410A. 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 HVAC representative to learn more.

Service Item / Tool	Use with R-454B (vs. R-410A)
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); 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 R-410A to R-454B.

Requirement	R-410A	R-454B
Remove refrigerant safely following local and national codes	Required	Required
Purge circuit with inert gas (nitrogen)	Best Practice	Required
Evacuate	Best Practice	Required
Purge with inert gas for five minutes	Best Practice	Required
Evacuate again	Best Practice	Required
Open the circuit by cutting or brazing	Final Step	Final Step
For repairs, purge with nitrogen during brazing	Required	Required
Pressure test	Best Practice	Required
Leak test	Best Practice	Required
Evacuate system again after service	Required	Required
Charge system	Required	Required

Many actions that are now required with R-454B were already best practice. So, if you've been taking those extra precautions already, your processes won't need to change at all. With R-454B, 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 R-454B.

R-454B

Key Messaging

Here are the key messages for you to remember as you work through this transition.

1 **SmartComfort 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.**

- SmartComfort's parent company, 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, R-454B was selected as the best refrigerant solution to minimize environmental impact and energy use, while providing performance, safety, and longevity.
- With the switch to R-454B, 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 residential products switching to R-454B is like avoiding the greenhouse gas emissions from over 5 million gas powered passenger vehicles each year.* That's a big impact!

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

- Switching to R-454B will be a relatively easy transition for technicians because it operates at temperatures and pressures like those of our current refrigerant, R-410A.
- SmartComfort technicians and installers have access to thorough training so they can be certified in knowing how to properly install, maintain, and reclaim the R-454B.
- R-454B 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.
- SmartComfort is committed to safety and will, therefore, include a dissipation system in all products containing R-454B. Technicians and homeowners alike can be confident that the required safety measures have been built into our system designs.

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

- We have been working towards creating a more GWP-friendly refrigerant since before 2010. R-454B 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 R-454B, with a GWP of 466, will be able to meet and exceed this requirement. R-454B represents a 78% reduction in GWP compared to R-410A.

Top ~~10~~ 11 Things to Remember About R-454B

- 1** R-454B is Carrier's choice to replace R-410A and to meet the new EPA requirements for a low GWP and zero ozone depletion refrigerant.
- 2** R-454B will be used on all SmartComfort residential ducted and ductless products and our light commercial products.
- 3** R-454B offers similar operating temperatures, pressures, and oil compatibility to R-410A – but delivers a GWP of 466 which is a 75% reduction in GWP vs. R-410A.
- 4** R-454B 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 SmartComfort products with R-454B will include a factory-installed leak dissipation system to meet new UL requirements.
- 6** The new mitigation control boards can be wired into any existing furnace and thermostat when installing a new R-454B outdoor unit AND evaporator coil.
- 7** All R-454B 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 R-454B were already best practices – so your process should not need to change at all.
- 9** Cylinders containing R-454B 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** R-454B allows the highest overall refrigerant supply through the refrigerant emissions supply phasedown – which means less change for you.
- 11** Carrier Global Corporation's residential products switching to R-454B is like avoiding the greenhouse gas emissions from over 5 million gas-powered passenger vehicles for one year.* That's a big impact!

*Assuming an average of 10 pounds of refrigerant per installed HVAC system that the residential division ships annually.
<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

Frequently Asked Questions

R-454B - General

- 1) **Why is Carrier switching to a refrigerant that falls in the A2L classification – which makes it mildly more flammable than R-410A?**
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 R-454B categorized as “mildly flammable”?**
In order for R-454B 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 R-410A?**
At this time, the draft ruling by the EPA proposes a one-year sell-through. This means that any equipment built before January 1, 2025, with R-410A must be installed before January 1, 2026.
- 5) **Is R-454B more efficient than R-410A?**
R-454B is a near drop-in in terms of performance compared to R-410A, with very similar temperatures and pressures. While creating a better planet for tomorrow, R-454B systems will achieve similar efficiency across the board.
- 6) **Will I need special certification to work with R-454B?**
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. 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 R-454B refrigerant.
- 8) **Will I still be able to get R-410A for my customers' existing equipment?**
Yes. R-410A will continue to be available for existing installed equipment. Be aware however, the availability of R-410A 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 R-410A.
- 9) **What is the benefit to a homeowner of switching over to a R-454B system as soon as available?**
The benefit of switching over to a R-454B 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 R-454B 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 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 R-454B system?**
Installation of a R-454B system will be quite similar to a R-410A 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 R-454B?**
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 HVAC 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 R-454B unit?**
A new R-454B indoor coil will be required when installing a new R-454B outdoor unit – due to the required dissipation system.
- 15) **What are the requirements in order to reuse existing piping with R-454B?**
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 R-454B be different than one with R-410A?**
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 R-454B that I used for R-410A?**
No. You should use a separate set of hoses for each unique refrigerant type to avoid any mixing of refrigerants.
- 20) **Will an uncased furnace A-Coil be offered in R-454B?**
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 mitigation 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 R-454B furnace coil or a R-454B AC/HP?**
Yes. The mitigation 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 R-454B system is installed?**
No. All our indoor air quality products have been tested 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 R-454B that I currently use for R-410A?**
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 R-410A cylinder to a R-454B 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 R-454B 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 R-454B cylinders from the R-410A ones?**
The R-454B 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 R-410A?**
With the phasedown of HFC refrigerants, the availability and cost of the refrigerant will begin to change. If R-410A 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 R-454B coils operate?**
The pressures and temperatures of R-454B coils will operate similarly to R-410A. The pressure for R-454B will be roughly 7% less than current R-410A 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 R-454B?**
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.
- 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 mitigation 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 mitigation.

Safety

32) Why are you including a mitigation system on all ducted products?

The decision to go with a consistent safety design across all of our products using R-454B provides you with the extra confidence that all our units have safety measures built-in. All ducted products with R-454B ship with more than 3.9 pounds of refrigerant – meeting the UL m2 level requiring mitigation systems.

33) How can installers feel comfortable about their safety working with R-454B?

Closely following the required and recommended field service procedures is the first step in technician safety. Further, we 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.

34) What does “flame speed” refer to?

Flame speed refers to the rate at which a flame spreads. R-454B has a very slow flame speed – less than half a mile per hour, which is a rate you out pace by casually walking.

35) 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.

36) Are there any concerns for homeowner safety with R-454B?

No. Homeowners should not feel concerned about updating to a R-454B system. SmartComfort 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 R-454B system for added safety.

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

No. We have put technician and homeowner safety first when developing our new products with R-454B. We have built leak detection safety measures into each R-454B system.

38) 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* for access to the R-454B 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 > *R-454B*

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