



# HVAC World After R-410A

## With Opteon™ XL41 (R-454B)

[www.opteon.com](http://www.opteon.com)

# Check up Questions

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- Did you know that residential and light commercial AC applications will likely require refrigerants with a GWP less than 750 starting 1/1/2025?
- Did you know five of the seven major air conditioning OEM's have already selected R-454B as their R-410A replacement for ducted split systems and light commercial products in North America?
- Have you attended any of 11 Chemours featured webinars about Opteon™ XL41/ A2Ls in 2021?

# Refrigerants for HVAC applications

\*GWP = 100-year Global Warming Potential, IPCCAR4

1950s

## R-22

- HCFC
- Lower ODP
- GWP\* = 1810

1990s

## R-410A

- HFC Blend
- No ODP
- GWP\* = 2088

ODP impacted by Montreal Protocol

GWP impacted by Kigali Amendment

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Coming Soon

## R-454B

## Opteon™ XL41

- HFO Blend
- No ODP
- GWP\* = 466

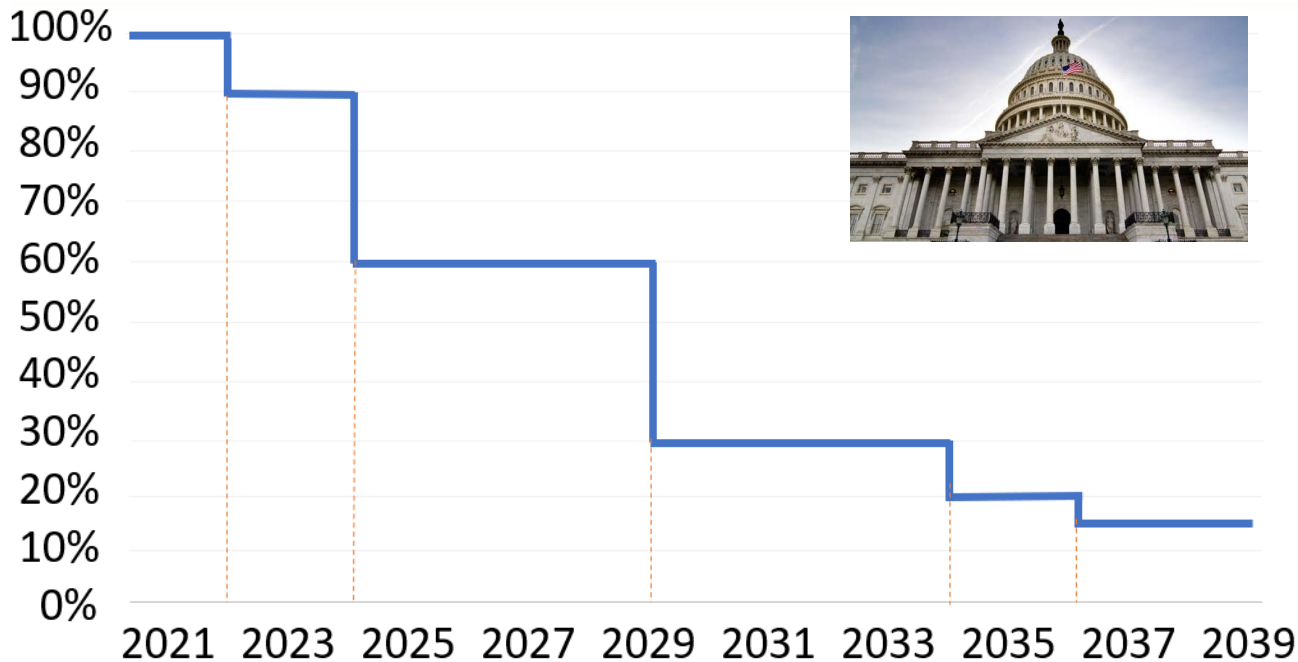
Lowest  
GWP

ODP impacted by Montreal Protocol  
GWP impacted by Kigali Amendment

# Regulations are Driving Change

US Regulatory Activity requiring refrigerants with low Global Warming Potential (GWP)

## American Innovation and Manufacturing (AIM) Act



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### California Air Resource Board (CARB)

- September 2018, SB 1013 passed SNAP Rules 20 and 21
- Additional regulations related to the Short-Lived Climate Pollutant (SLCP) plan were recently approved

New Air Conditioning Refrigerant Limits	Year	GWP Limit
Window Units and Residential Dehumidifiers	2023	750
Residential & light commercial systems (excluding chillers)	2025	750
VRF Systems	2026	750

\* Exemptions for R-410A and reclaimed refrigerant under consideration

# Why OEMs Select Opteon™ XL41 (R-454B)?

## Key Characteristics

Lowest GWP of SNAP 23 approved R-410A-like alternatives



Similar operating conditions to R-410A & Compatible with POE lubricants



Near-performance match to R-410A with improved efficiency



Lower toxicity & lower flammability



## Benefits

Enables **equipment production longevity** as HFC refrigerants phase down

**Minimum design changes** and fast “learning curve”

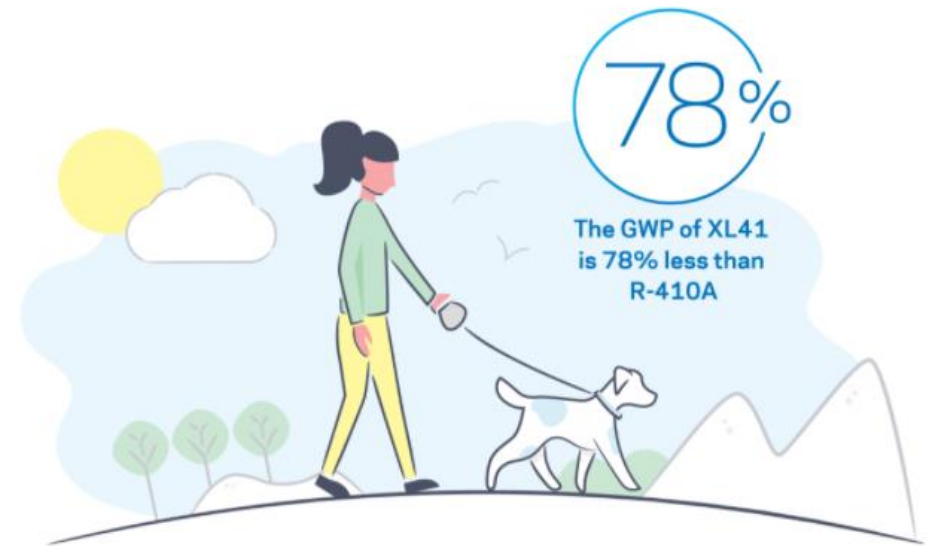
Can leverage many existing R-410A components

Can be used in **many applications**

# Opteon™ XL41 Properties

\*GWP = 100-year Global Warming Potential, IPCCAR4

	R-410A	Opteon™ XL41 (R-454B)
<b>Composition Wgt.%</b>	<b>R-32/R-125 (50/50)</b>	<b>R-32/R-1234yf (68.9/31.1)</b>
<b>GWP* (vs. R-410A)</b>	<b>2088</b>	<b>466 (22%)</b>





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<b>GWP* (vs. R-410A)</b>	<b>2088</b>	<b>466 (22%)</b>
<b>Capacity vs. R-410A</b>	<b>100%</b>	<b>97%</b>
<b>COP vs. R-410A</b>	<b>100%</b>	<b>103%</b>
<b>P Discharge (kPa)</b>	<b>2802</b>	<b>2615 (93%)</b>
<b>T Discharge (°C)</b>	<b>82</b>	<b>87 (106%)</b>
<b>Evaporator Glide (°K)</b>	<b>0.1</b>	<b>1</b>

-Thermodynamic cycle model results for Tavg Cond = 46.1°C [115°F], Tavg Evap = 10.0°C [50°F], Subcool = 8.3 K [15°F], Superheat = 11.1 K [20°F], Compressor efficiency = 0.70

# Momentum is growing towards Adoption of R-454B

## Carrier Introduces Puron Advance™; The Next Generation Refrigerant for Ducted Residential, Light Commercial Products in North America

INDIANAPOLIS - Dec. 19, 2018

Carrier, in collaboration with The Chemours Company, will offer Puron Advance (R-454B) to meet UN Montreal Protocol Kigali Amendment regulations.

## MEHITS offers lower GWP refrigerants on chillers

27 MAY 2019



## YORK® YLAA Scroll Chiller with low-GWP R-454B



Leading the transition to the next generation of low-GWP refrigerants. York's YLAA scroll chiller is the next generation of the global leading scroll chiller, available in the USA, Canada, and other markets. It is a low-GWP scroll chiller with a capacity of up to 100 tons.

## Engie updates Pensum air-cooled chiller to R454B

20 NOV 2019

## GI Industrial Holding adopts lower GWP refrigerant R454B

15 NOV 2019

## Johnson Controls

Johnson Controls | Media Center | News | Johnson Controls Commits to R-454B as Future Environmentally Sustainable Refrigerant Solution in North America

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- The next-generation, lowest Global Warming Potential (GWP) EPA SNAP approved refrigerant, produced by The Chemours Company, was chosen as the best solution to minimize environmental impact and energy use

MILWAUKEE, May 27, 2021 /PRNewswire/ -- Johnson Controls (NYSE: JCI), the global leader for smart, healthy and sustainable buildings, announced that R-454B will serve as the primary low Global Warming Potential (GWP) refrigerant in the company's ducted residential and commercial unitary products as well as air-cooled scroll chillers in North America and specific international markets where codes are in alignment. This transition away from the use of high-GWP refrigerants, such as R-410A, reinforces the company's commitment to addressing climate change and lowering customers' emissions for a healthier, more sustainable planet.

## Trane Upgrades its Entire Scroll Compressor Portfolio with Low GWP R-454B Refrigerant

Date: 15 March 2021

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## Rhosso chillers and heat pumps on R454B

10 DEC 2019



ITALY: Rhosso has introduced a new range of air-cooled water chillers and heat pumps for lower GWP refrigerant R454B.

WinPower 600 is a range of air-cooled water chillers, heat pumps and EXH multi-purpose units with the latest generation from 600 scroll compressors optimized for R454B refrigerant.

# Opteon™ XL41 Applications



## Positive displacement, DX air conditioning & heat pumps and chillers

- Residential, light commercial, commercial

## Direct replacement for all equipment types designed for R-410A

- Ducted splits, multi-splits, mini-splits, DX chillers, VRF Systems, Window units, PTACs, and other

# Carrier Story



Turn to the experts

**Carrier selected R-454B for ducted residential and light commercial products in NA.**

## Field trials:

- 25 heat pump systems with R-454B
- with “UL 60335-2-40 3<sup>rd</sup> ed” certification





# Chemours Resources to Support the Safe Transition

- Quarterly A2L Refrigerant News
- ACHR Podcasts
  - *with Carrier, Emerson, Danfoss*
- Webinars with
  - RSES
  - Carrier (CB)
  - Rheem (ACHR NEWS)
  - JCI (ACCA)

***Opt in to learn more***





# Opteon™ XL41. The Clear Future of HVAC Refrigerants.

For more information, go to [www.opteon.com/gobeyond](http://www.opteon.com/gobeyond)



# Opt

for better



**Opteon™**

Refrigerants

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February 3, 2022

