



#MDMFullSteamAhead





PURON ADVANCE TRANSITION

HOW MINGLEDORFF'S TECHNICAL SERVICES TEAM
WILL HELP YOU REACH YOUR DESTINATION

Harold Nelson | Technical Service & Warranty Support Manager

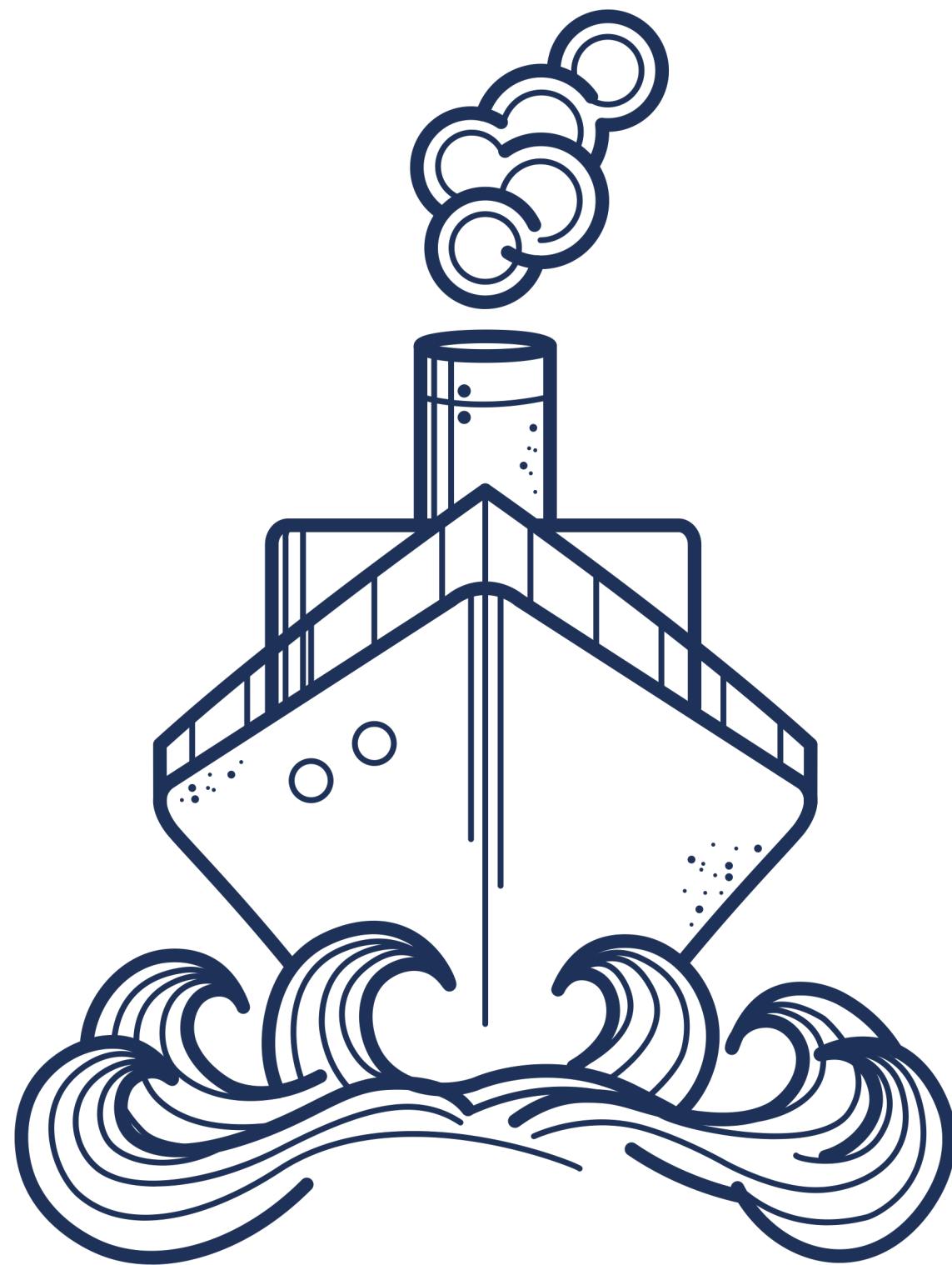
February 29, 2024



Mingledorff's Technical Services Team is here to support your training needs and keep your crew headed in the right direction during this journey.

- All our Spring Service Update Seminars will focus on Puron Advance / R454B training.
- During several "Open Houses" we will be conducting seminars on Puron Advance / R454B.
- All our EPA certification presentation/testing now include "mildly flammable" refrigerants.
- If there's a request for "mildly Refrigerant" Safety Training, we are ready to support your request.
- We also have in the "Bridge" online training for Puron Advance.
- All the Mingledorff's Technical Service Managers are well versed in the components and operation of the Puron Advance system.
- We will have the proper A2L certified tools and instruments available at our distribution centers.

It should be *smooth sailing* for your company, service techs, and customers.



- Safety will be at the forefront when handling/installing/servicing Puron Advance systems.
- The service vehicle can carry up to 440 pounds of refrigerant can be transported **without** need for DOT placards (“materials of trade”).
- You will not need to replace linesets with R-454B as it uses the same POE oil as R-410A as long as the lineset meets the current building codes.
- Mechanical fittings will be standard on all R-454B equipment.
- Puron Advance is not a drop-in replacement for Puron.
- All individuals that have a current EPA certification will not have to be re-certified.

- All A2L cylinders will have **left-handed** threads.
- Currently, cylinders **must** be stored in the upright position.
- A2L recovery tanks will be identified by a red stripe and will have left-handed threads.
- Similar Operating Pressure vs. Saturated Temperatures between R410A & R454B:

Puron – R410A	Puron Advance –R454B
Saturated Suction Temperature = 40°F	Saturated Suction Temperature = 40°F
Pressure = 118.8 psig	Pressure = 113.3 psig
Saturated Condensing Temperature = 110°F	Saturated Condensing Temperature = 110°F
Pressure = 366.4 psig	Pressure = 349 psig

ALL ABOARD!

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Our technical crew is ready to team up with your crew for this new journey & transition. If you have any questions, feel free to stop by the technical service booth during the trade show.



THANK YOU!





Puron Advance

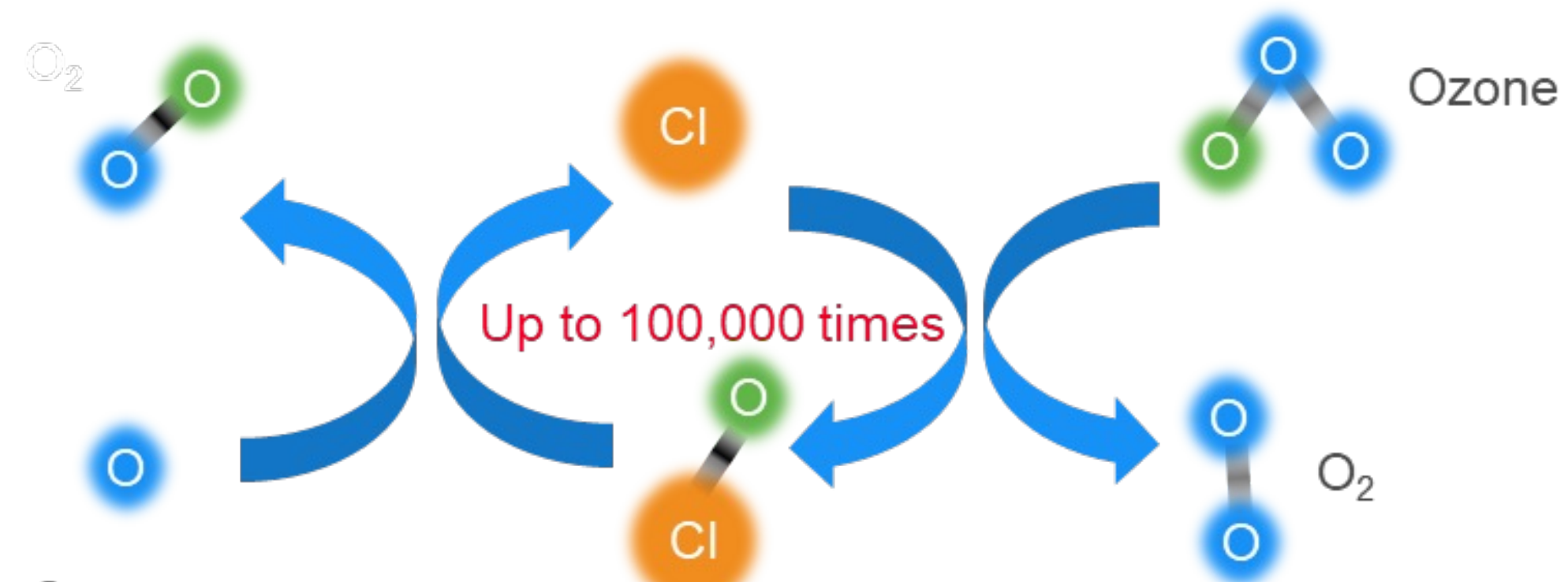
Matt Vargo – Carrier Corporation



Puron

ADVANCE™

REGULATORY OVERVIEW AND PRODUCT UPDATES



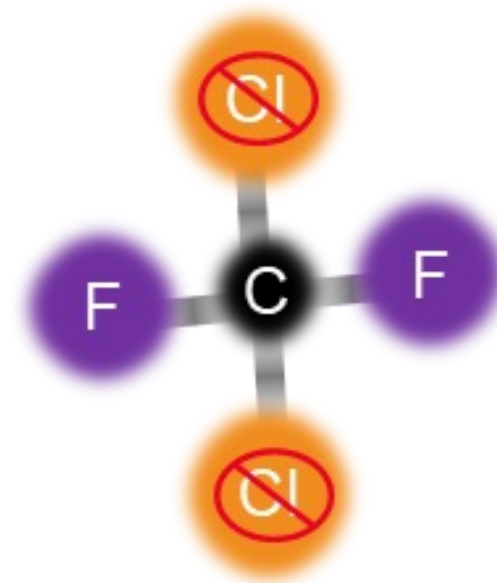
Oxygen atom

Ozone

Up to 100,000 times

O₂

ODP
Ozone Depletion Potential



R-12
~~CCl₂F₂~~

GWP
Global Warming Potential



Greenhouse Gases

REFRIGERANT REGULATION HISTORY



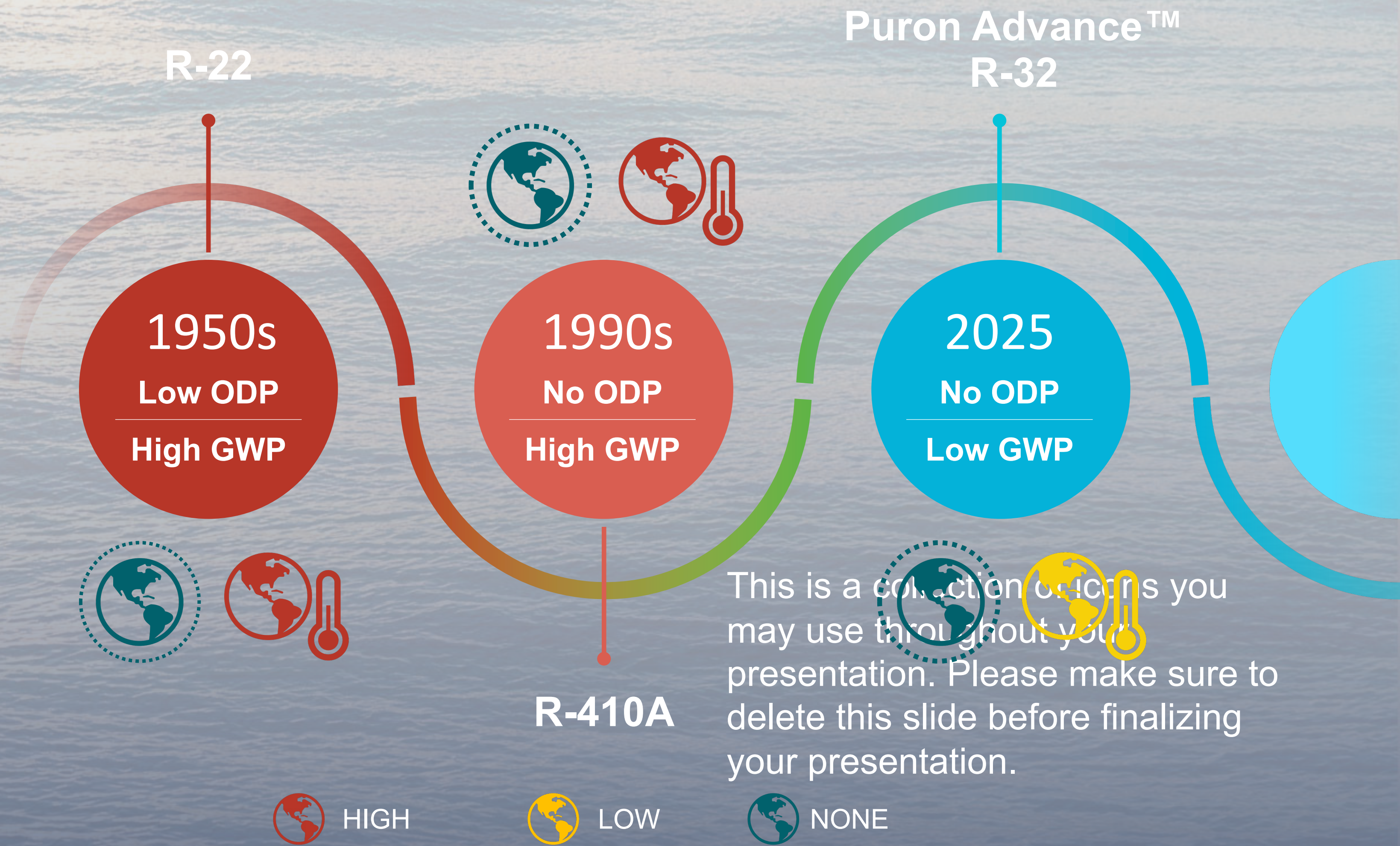
ODP

Ozone Depletion Potential
(Ozone layer is getting thinner)

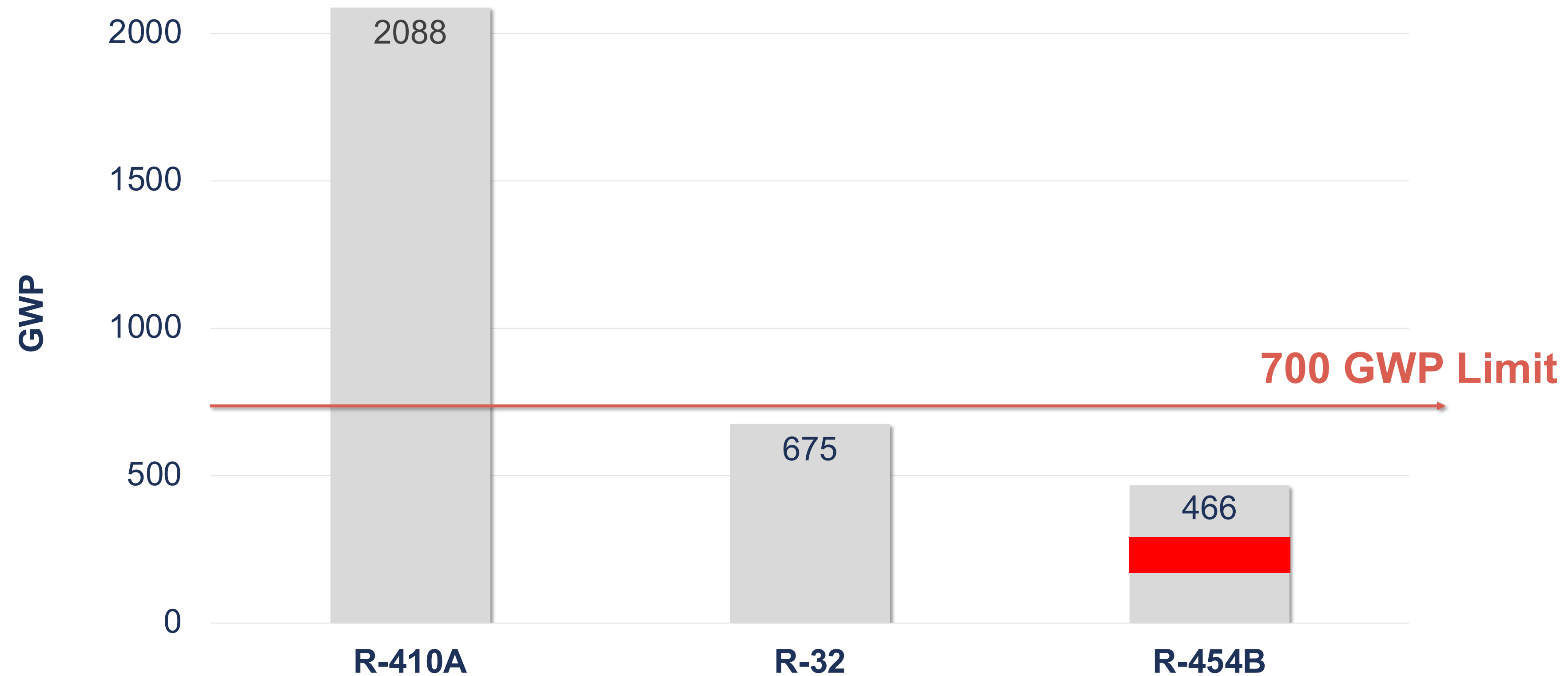


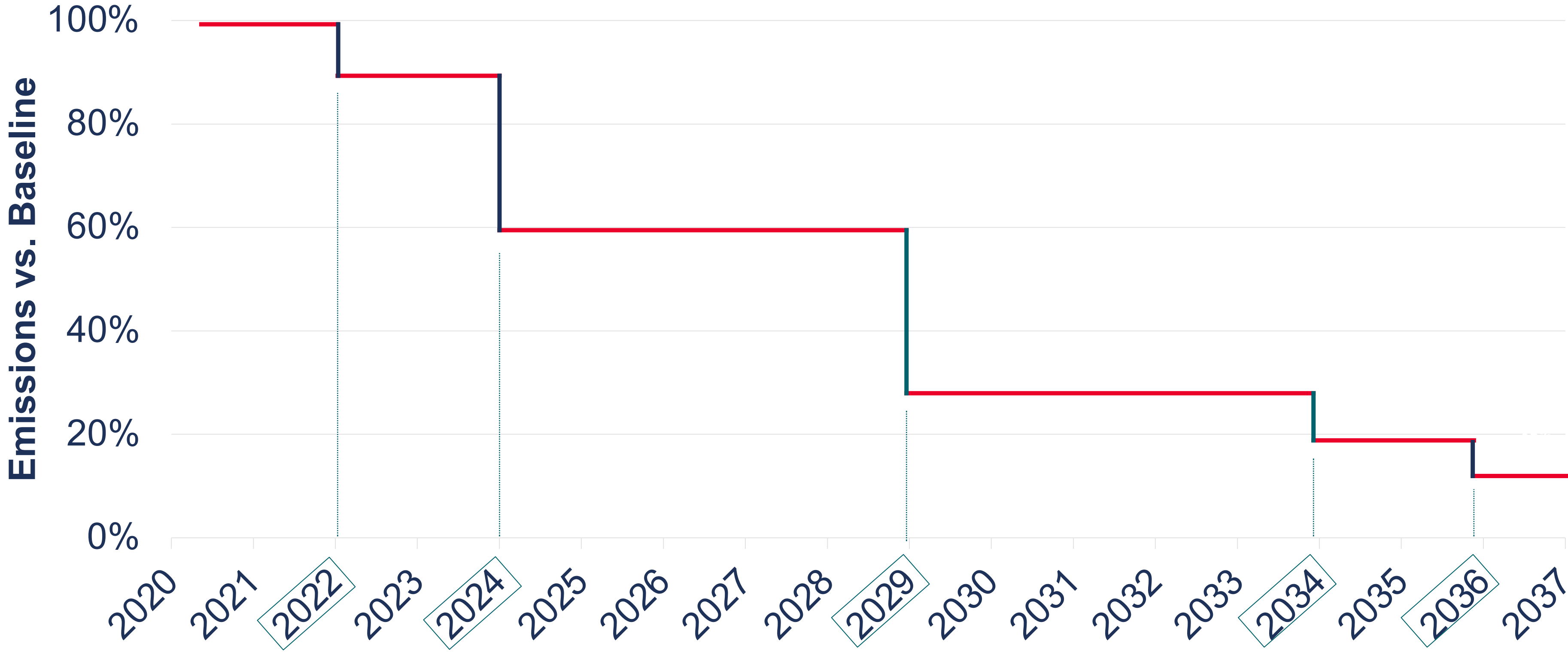
GWP

Global Warming Potential
(Trapping more heat in the earth's atmosphere)



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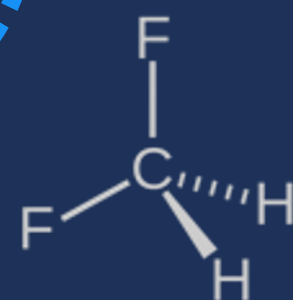




PURON ADVANCE[®] COMPOSITION

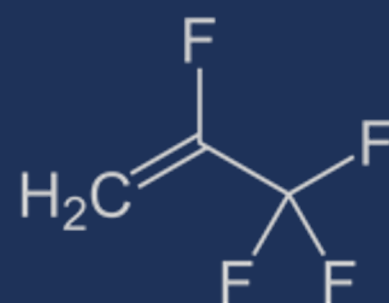
68.9%

R-32



31.1%

R-1234YF



Puron
ADVANCE[™]

R-454B



Low Flammability



No Propane



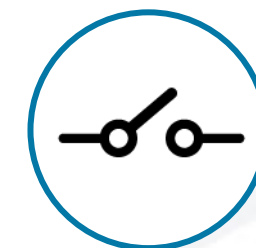
1.

Sensor is triggered
at an LFL of $\geq 20\%$



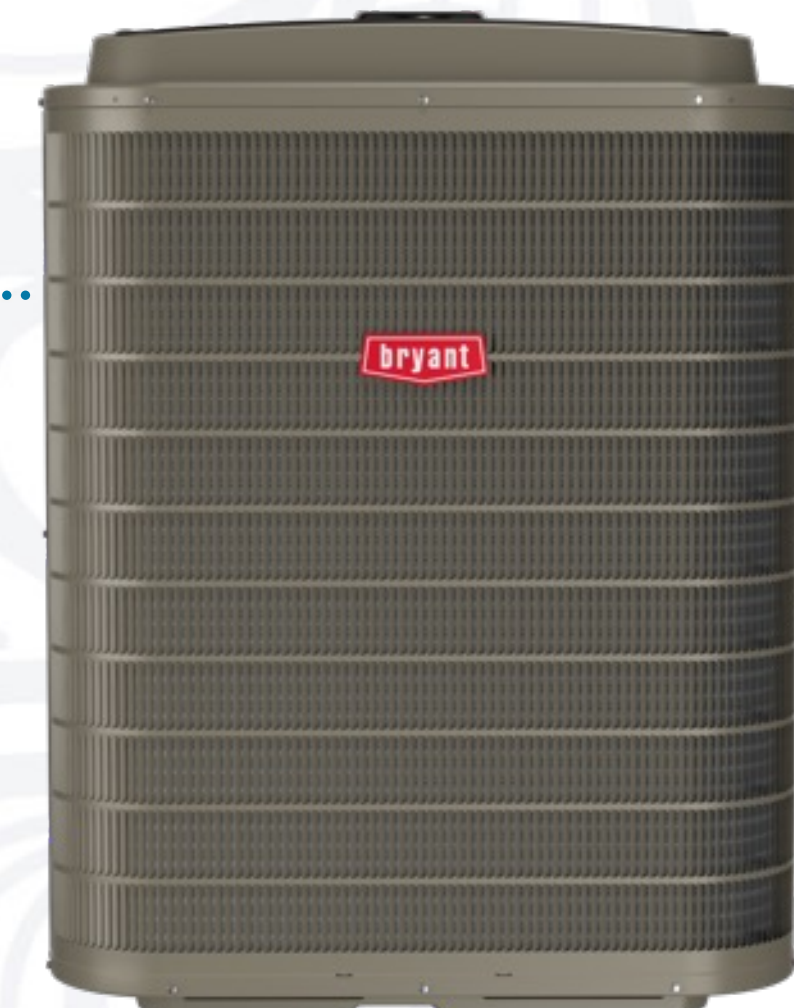
3.

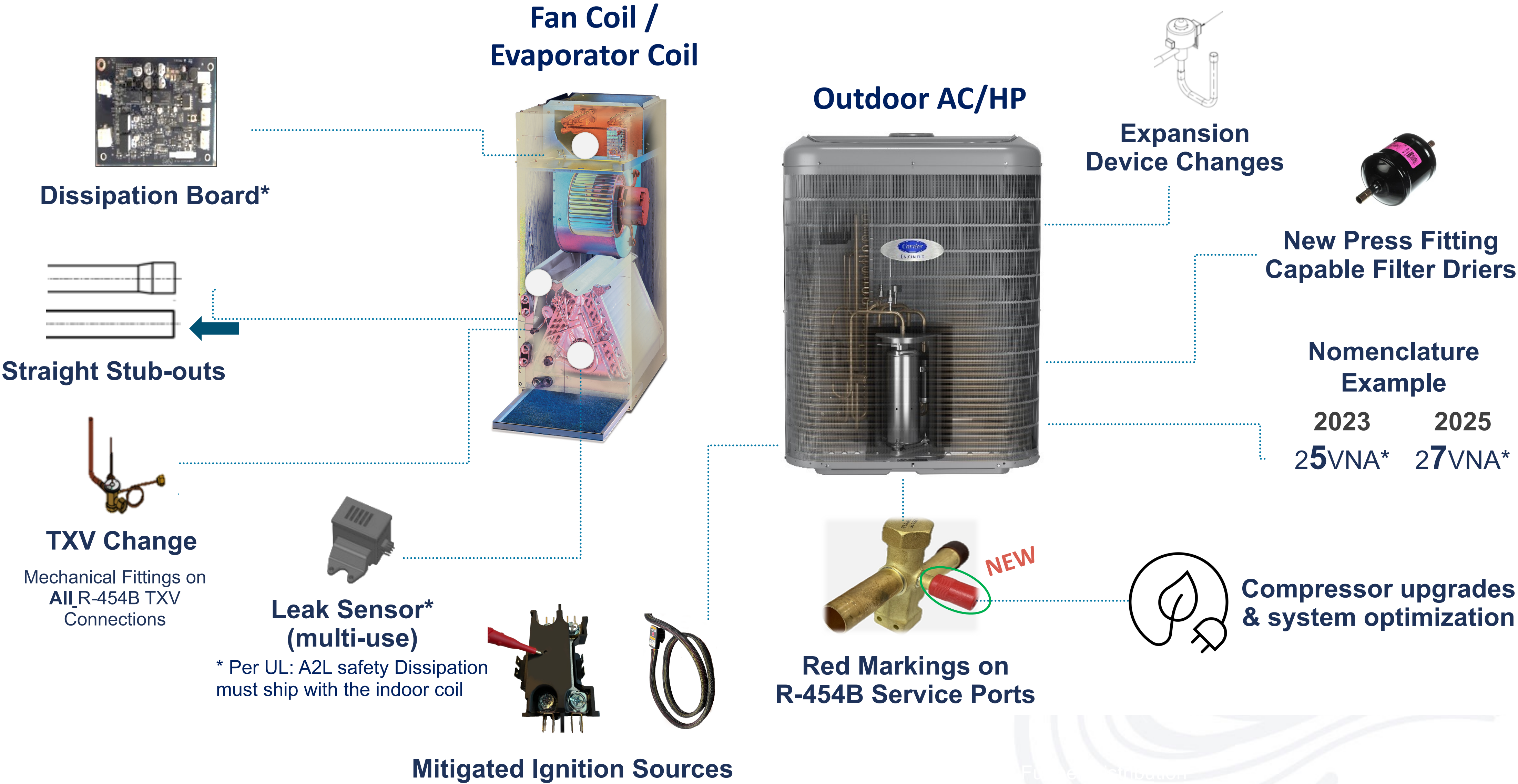
Signal from Dissipation
board activates blower to
dissipate refrigerant until
 $LFL < 20\%$

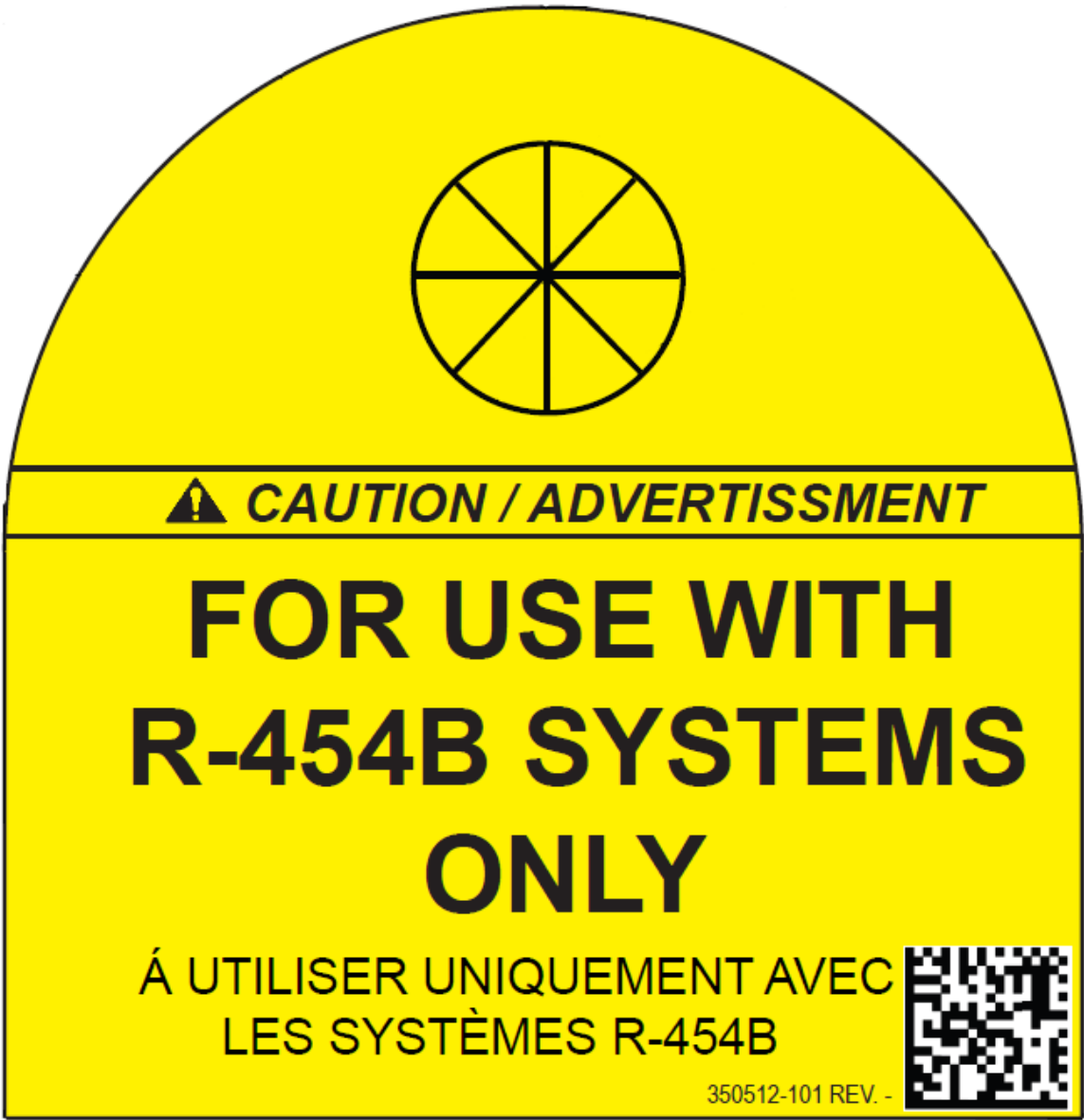


2.

Signal from
Dissipation board
shuts off outdoor
compressor



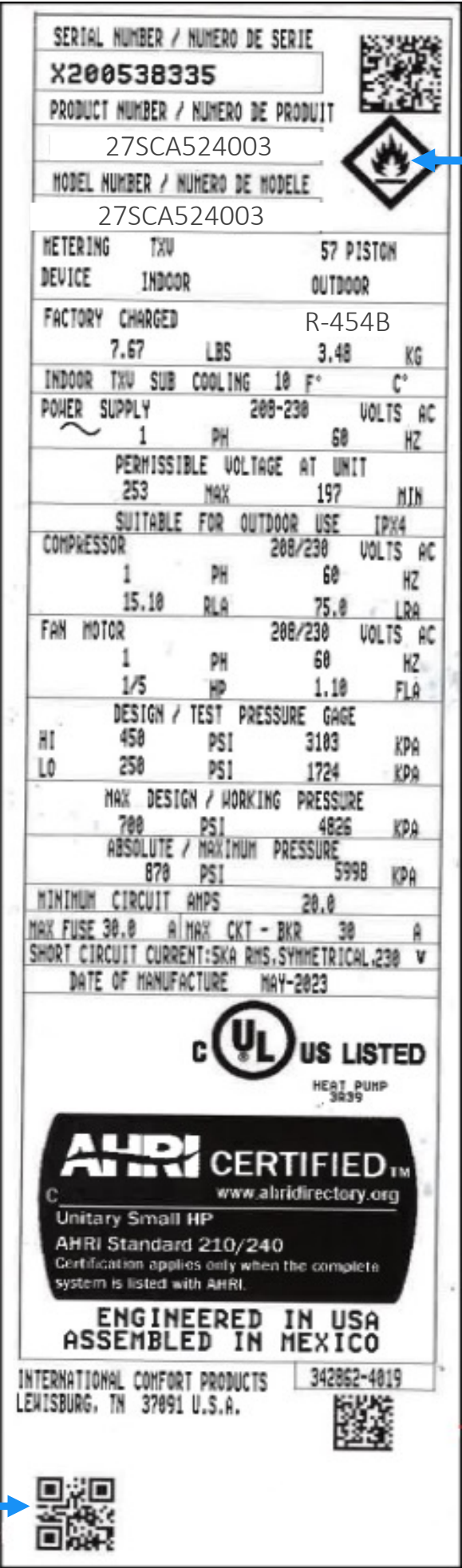




R-454B Hang Tag on Service Valves



Puron Advance™ Sticker for Carrier Outdoor Units



A2L Refrigerant Logo

QR Code for Puron Advance™ Information

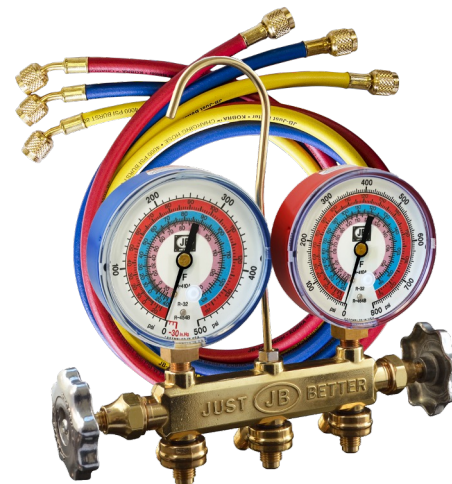
**REPLACEMENT
COMPONENTS**

**2025 R-454B COMPATIBLE
HVAC TOOLS**

Replacement Components has the products and expertise to support you and your customers as the industry transitions to a new class of refrigerants per 2025 EPA regulations.

The Replacement Components 2025 R-454B Compatible Tools Catalog

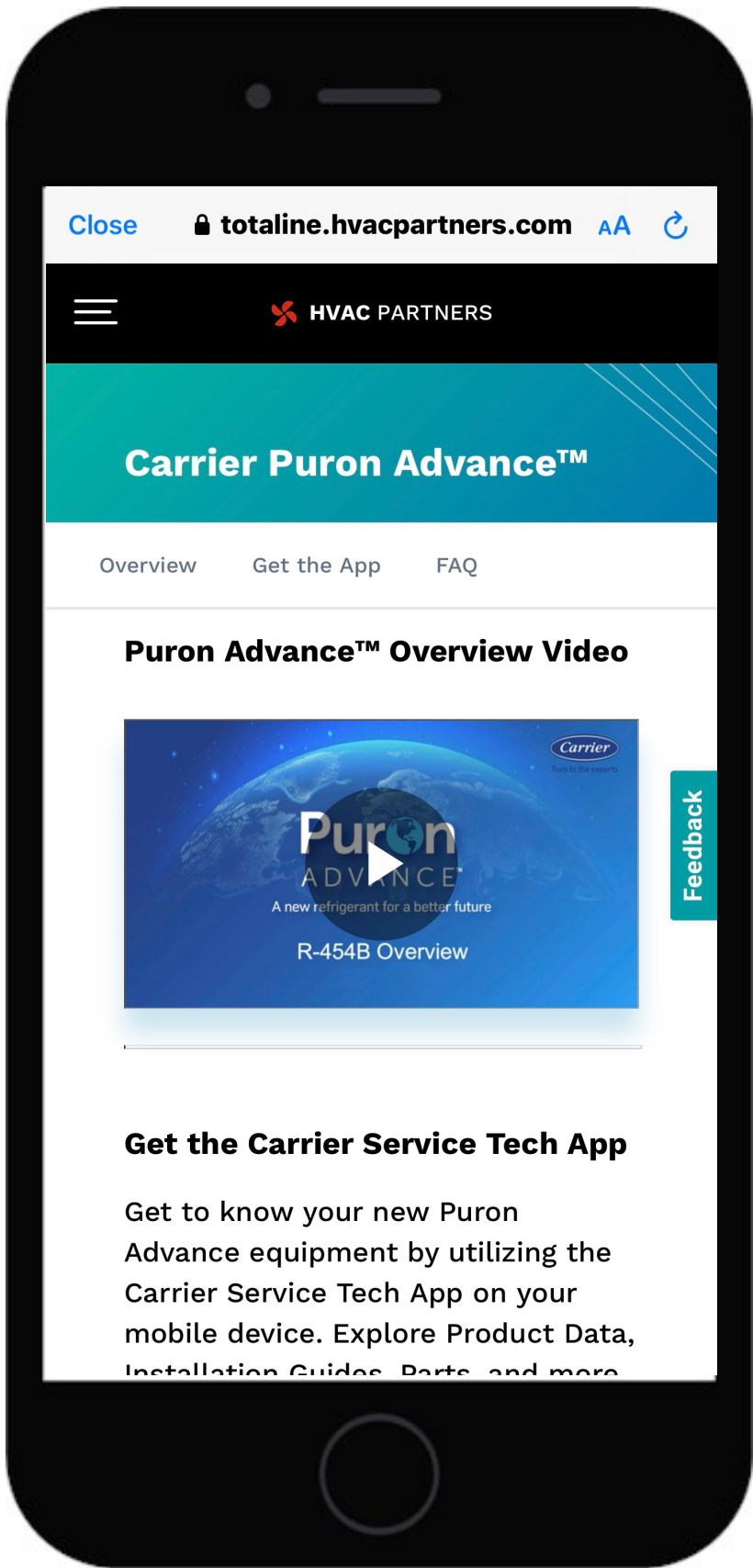
Comprehensive Offering	Full line of tools required for refrigerant service – vacuum pumps, recovery machines & cylinders, gauges, manifolds, hoses, adapters, leak detectors, etc.
Refrigerant Implications	Detailed tool-specific refrigerant implications to advise if a new tool is required, if steps need to be taken to avoid cross contamination, or if it is even impacted
Selection Guides	In many cases, multiple options exist for each tool. Selection guides simplify the decision-making process



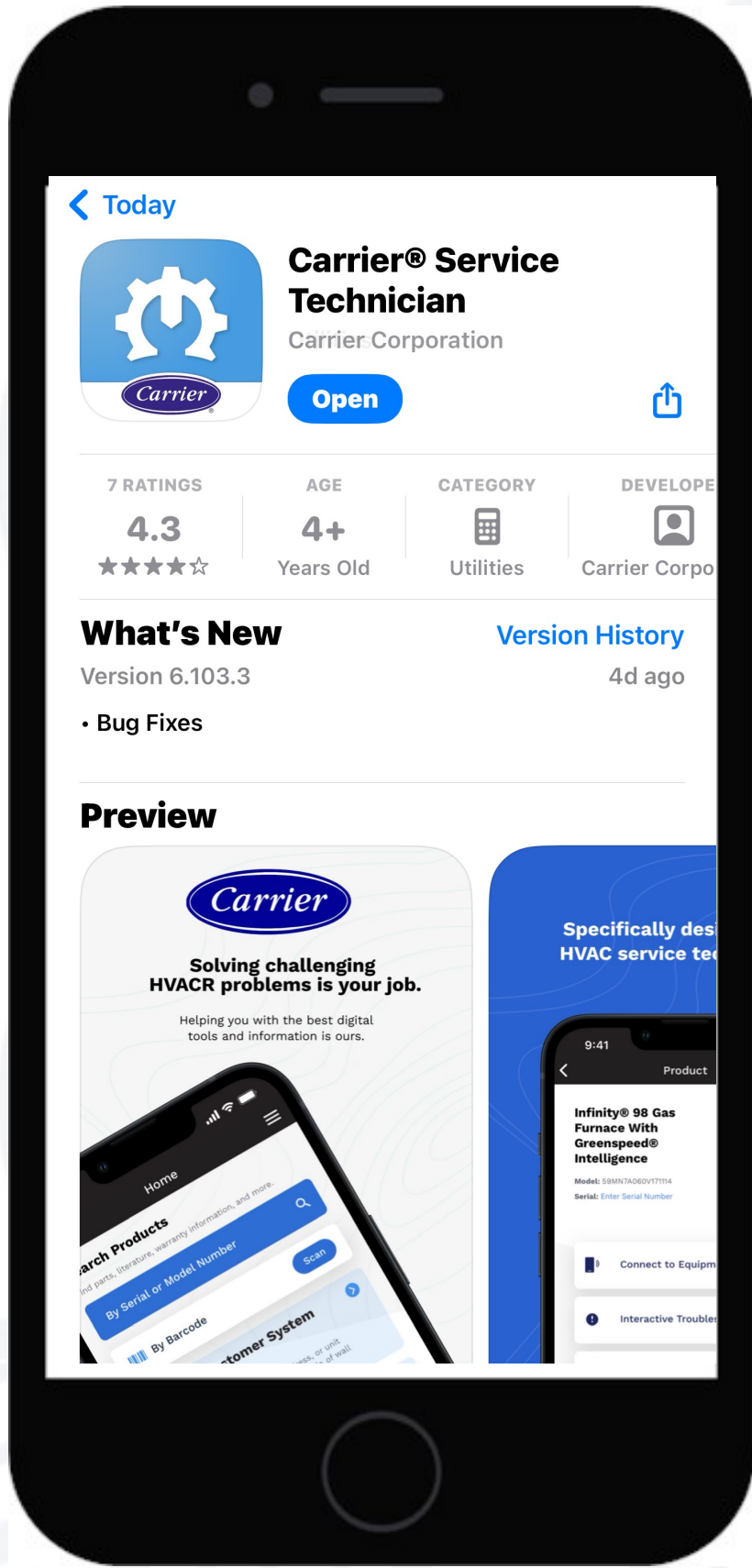
CARRIER



BRYANT



Puron Advance™
Landing Page



Download Service
Technician App

Puron

ADVANCE™

LAUNCH SCHEDULE

CARRIER PHASE IN-PHASE OUT SCHEDULE - RESIDENTIAL

Go to **Puron Advance Launch Kit** on HVAC PARTNERS
to find latest PIPO Schedule

hvacpartners.com/marketing/sales-tools/marketing-launch-kits/R-454B

*Preliminary, subject to change



*Preliminary, subject to change
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COMING SOON...

Q1-2024 Product Launch

Carrier Model Families

Single Stage Heat Pump
- Product Bulletin released November 6th, 2023

27SPA6
27SCA5
GH5SAN5

Single Stage, Two Stage & VS Fan Coils
- Product Bulletin released November 6th, 2023

FE5B, FT5, FG5, FJ5

Furnace Coils (A, V, Slab)
- Product Bulletin released November 6th, 2023

CAAMP, CVAVA, CVAMA, CSAHP

*Preliminary, subject to change



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PURON ADVANCE ONLINE TRAINING

All Puron Advance™ online courses through My Learning Center earn Factory FAD and NATE credit and are eligible for 100% market funds

Currently Available

- ☑ Industry Safe Application
- ☑ Safety, Storage and Transportation
- ☑ Recovery, Evacuation and Charging
- ☑ Installation and Service
- ☑ Residential Split, Ductless & Light Commercial



CARRIER



BRYANT





North American Technician Excellence

THE LEADER IN **DEVELOPING** AND **RECOGNIZING**
PROFESSIONAL HVACR TECHNICIANS.

John Lanier | President, NATE

February 28, 2024



OUR MISSION



**DEVELOP AND RECOGNIZE
PROFESSIONAL HVACR TECHNICIANS.**

NATE certification recognizes real world working knowledge of HVACR systems.

NATE HISTORY



- Established in 1997.
- Founded by leaders across the HVAC industry.
- Exams and training materials developed by industry experts.
- Over 300,000 technicians certified.

Attracting and Retaining New Technicians

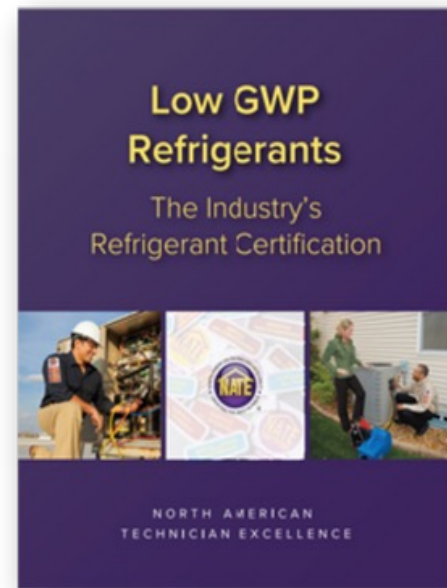


- Younger technicians are looking for more than a job with competitive wages.
- Seeking financial security and rewards that go beyond the industry standard.
- Want jobs with potential for skill and career advancement through ongoing education.
- Want recognition and appreciation through their work.
- Looking for work that is meaningful.



NATE RESOURCES

NATE RESOURCES: TRAINING



STUDY GUIDES

- Paper-back
- Graphic heavy
- Practice questions in each chapter



NATE TRAINING ACADEMY

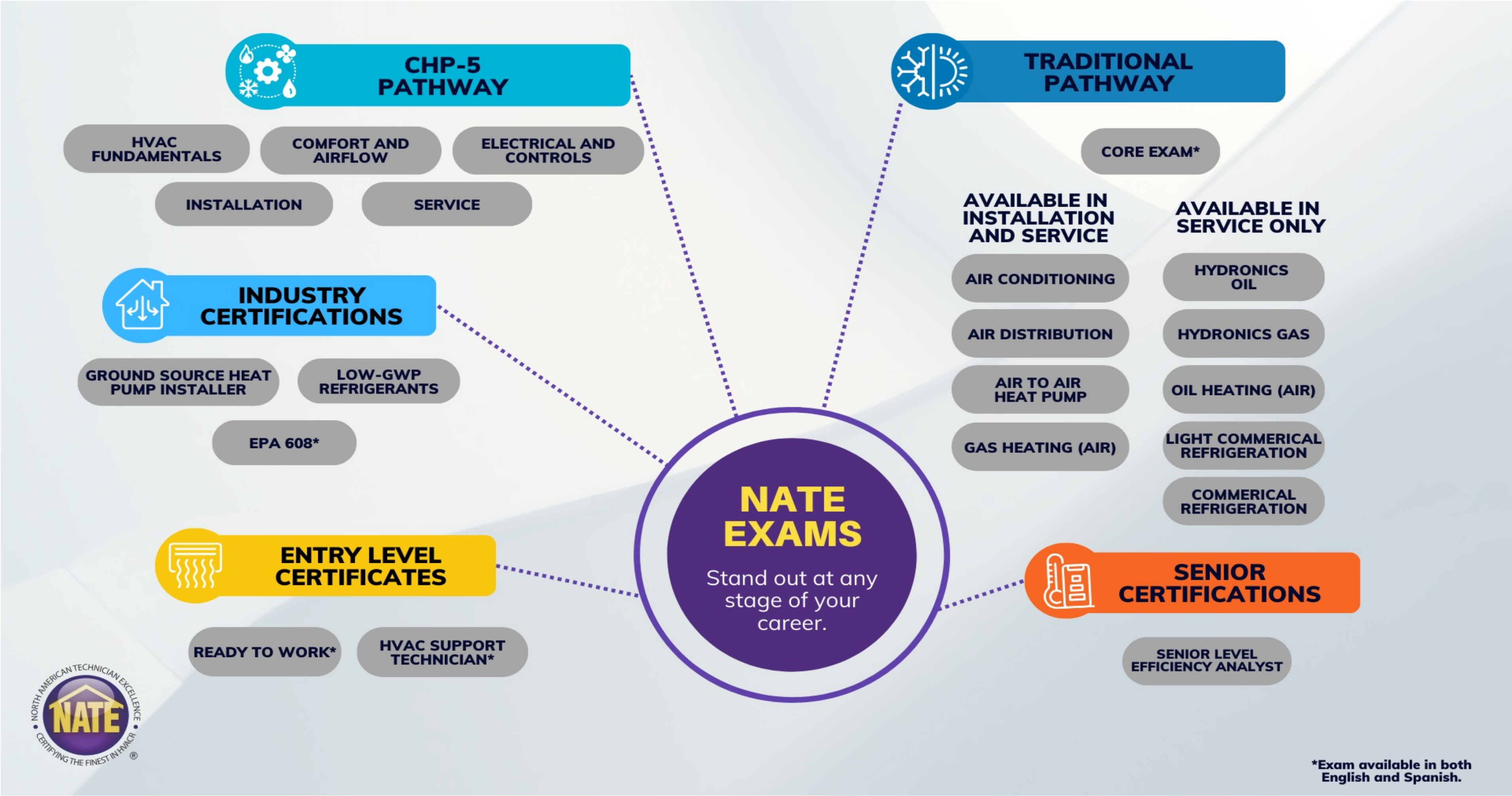
- Partnership with Interplay Learning
- Online, on-demand, interactive courses
- Helps get your technicians "job-ready"



RECOGNIZED TRAINING PROVIDERS

- In-person and online options
- Training Providers that have met rigorous standards set by NATE
- RTPs with online courses can be found on NATEX.org

NATE RESOURCES: CERTIFICATES AND CERTIFICATIONS





CONTRACTOR AND TECHNICIAN PERSPECTIVE

MEASURING THE IMPACT OF CERTIFICATION

CONTRACTOR & TECHNICIAN SURVEYS

- Partnered with Decision Analyst, a top public research firm to better understand contractor and technician perception of certification.
- Developed and executed research project with XOι to evaluate the effectiveness and value of NATE certified technicians in the field.



DECISION ANALYST: PUBLIC OPINION RESEARCH FIRM



TOP RESEARCH COMPANY

- One of the largest privately owned research firms in USA.
- Experience in the HVACR Industry.
- Performed surveys with NATE in 2006, 2008 and 2013.

IMPARTIAL PARTNER

- NATE worked with Decision Analyst to make sure that the survey was unbiased and confidential.
- Questions were created using rigorous research methods.

TECHNICIAN AND CONTRACTOR SURVEY

- 2022 study to better understand contractor and technician priorities.
- 250 contractors, 200 certified technicians, and 100 non-certified technicians participated.

CONTRACTOR PERSPECTIVE



CONFIDENCE

79% of contractors have more confidence in their NATE-certified technicians.

BETTER PREPARED

75% of contractors view their NATE-certified technicians as better prepared in the field.

MOST VALUED

80% of contractors value NATE more than any other HVACR certification.

TECHNICIAN PERSPECTIVE



MEANINGFUL INVESTMENT

75% of technicians believe their NATE certification is worth the cost and effort to attain.

JOB SATISFACTION

74% of NATE-certified technicians believe their certification gives them more satisfaction and confidence in their job.

NATE STANDS APART

86% of NATE-certified technicians value NATE certification the most over any other HVACR certification.

LOWER TURNOVER

76% of technicians report receiving certification assistance increases their likelihood to stay with their employer.

XOI RESEARCH PROJECT

XO*i* TECHNOLOGIES

- Digital tool for technicians to collect jobsite data including unit information, work documentation, fixes applied, etc.
 - Platform for technicians to access diagrams, manuals, videos.
 - Helps contractors standardize workflows and track technician work.

RESEARCH PROJECT

- Evaluated the effectiveness and value of NATE certified technicians in the field.
- 437 technicians across 34 states were surveyed.
- Followed technicians for 120 days in summer 2023.



NATE CERTIFIED TECHNICIANS IN THE FIELD



PRODUCTIVE

Completed 17% more jobs per month during season

VERSATILE

Saw 7% more unique equipment per month

ADDED VALUE

Completed jobs added \$19,100 additional estimated revenue each month



A2L Transition

A2L REFRIGERANTS: TRANSITIONING

WHAT'S THE SAME

- Many physical and chemical properties of these new Class A2L refrigerants are no different from traditional A1 (CFC, HCFC, and HFC) refrigerants.

WHAT'S DIFFERENT

- Popular refrigerants with a higher GWP like R410A and R-22 are classified as A1 refrigerants (non-flammable). A2L refrigerants are slightly more flammable so they pose an increased risk and require additional safety measures.

WHAT YOU NEED TO DO

- Technicians must be aware of and properly trained in the mitigation of risks due to the higher flammability.



A2L Transition

NATE TECHNICIAN SUPPORT

LOW-GWP REFRIGERANTS

ONLINE TRAINING

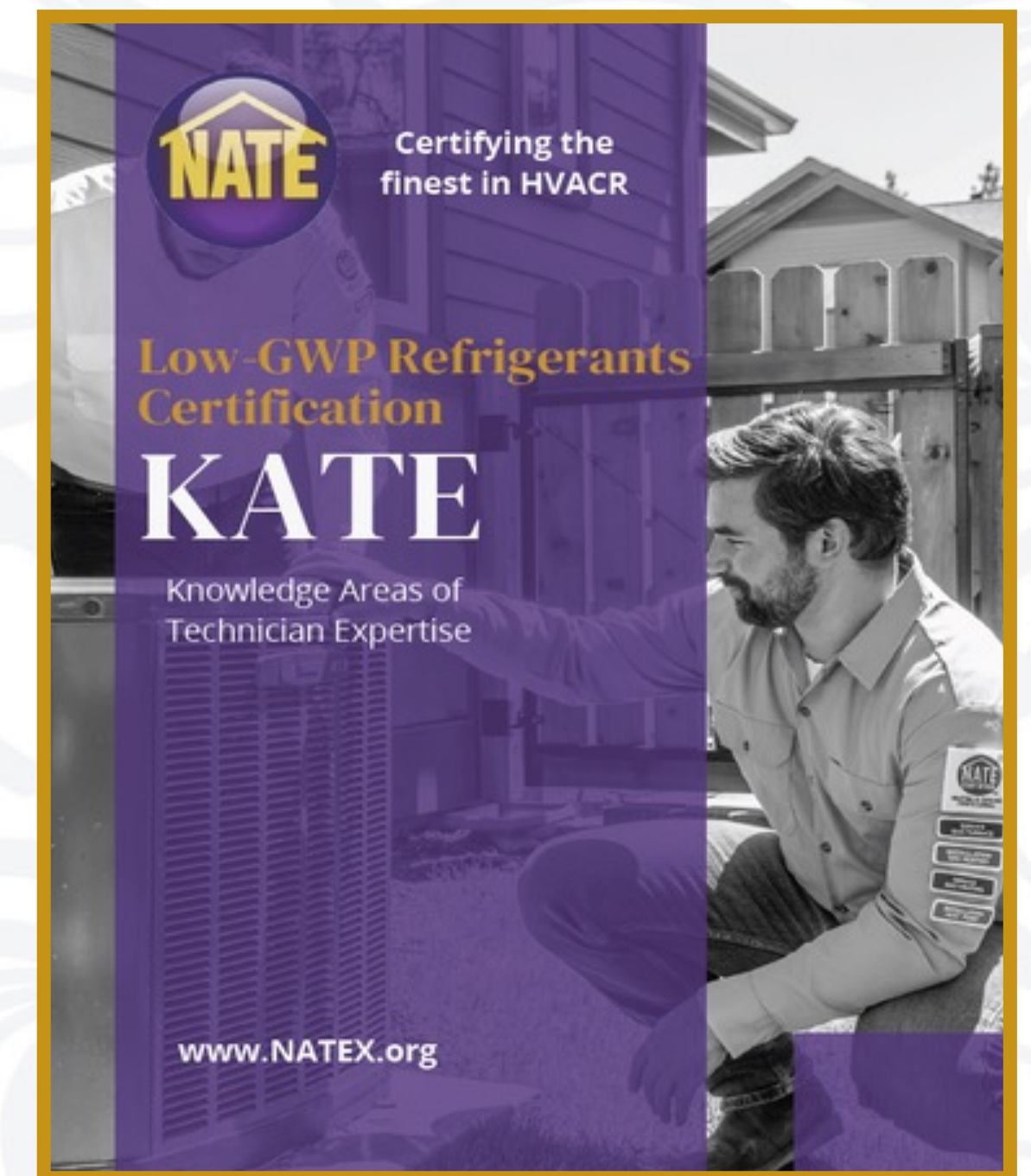
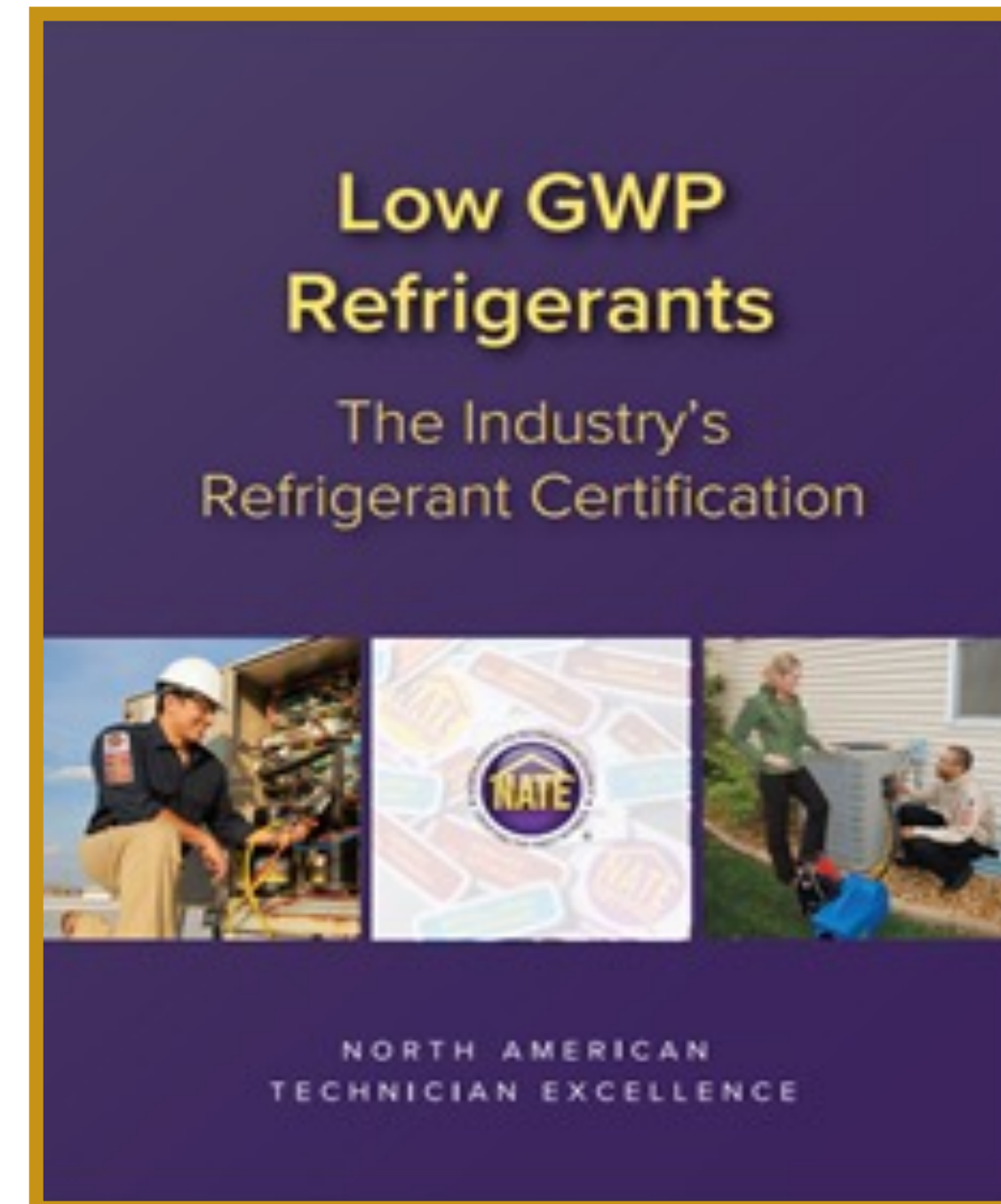
- HVAC230: Low-GWP Refrigerant
 - 1-2 hour online course
 - 9 video lessons and 8 knowledge checks
 - 1 NATE CEH credit
- Content Covered
 - Differentiating types of refrigerants based on GWP.
 - Classifying refrigerants based on their characteristics.
 - New refrigerants designations and safety classifications.
 - Tools, standard safety practices, safe storage and handling practices for low-GWP refrigerants.
 - Installation and service best practices.



LOW-GWP REFRIGERANTS

STUDY RESOURCES

- Paperback Study Guide
 - Graphic heavy
 - 51 pages and appendix
- Exam KATE
 - Free PDF on NATE website
 - Reference material outlining all exam knowledge areas



CREATING THE LOW-GWP CERTIFICATION EXAM



LOW-GWP REFRIGERANTS TECHNICAL COMMITTEE

- NATE Technical Committees:
 - Made up of subject matter experts from across the HVACR industry to create and update NATE exams.
 - Represent a diverse range of stakeholders, including OEMs, national contractor associations, suppliers, contractors, and educational institutions.
- NATE Technical Committee and Carrier:
 - Richard Lord
 - Senior Carrier Fellow
 - NATE Technical Committee, Low-GWP Refrigerants Certification Exam

CREATING THE LOW-GWP REFRIGERANTS CERTIFICATION EXAM

EXAM DEVELOPMENT PROCESS

- Job Task Analysis
 - Technical Committee identified key job knowledge areas and skills required by technicians.
 - Final list of job knowledge areas circulated to industry professionals for review.
- Item Writing
 - Technical Committee developed each exam question using completed job task analysis.
 - Collaborated to write all questions, answers, and "distracters" (incorrect options) to ensure comprehensive assessment.

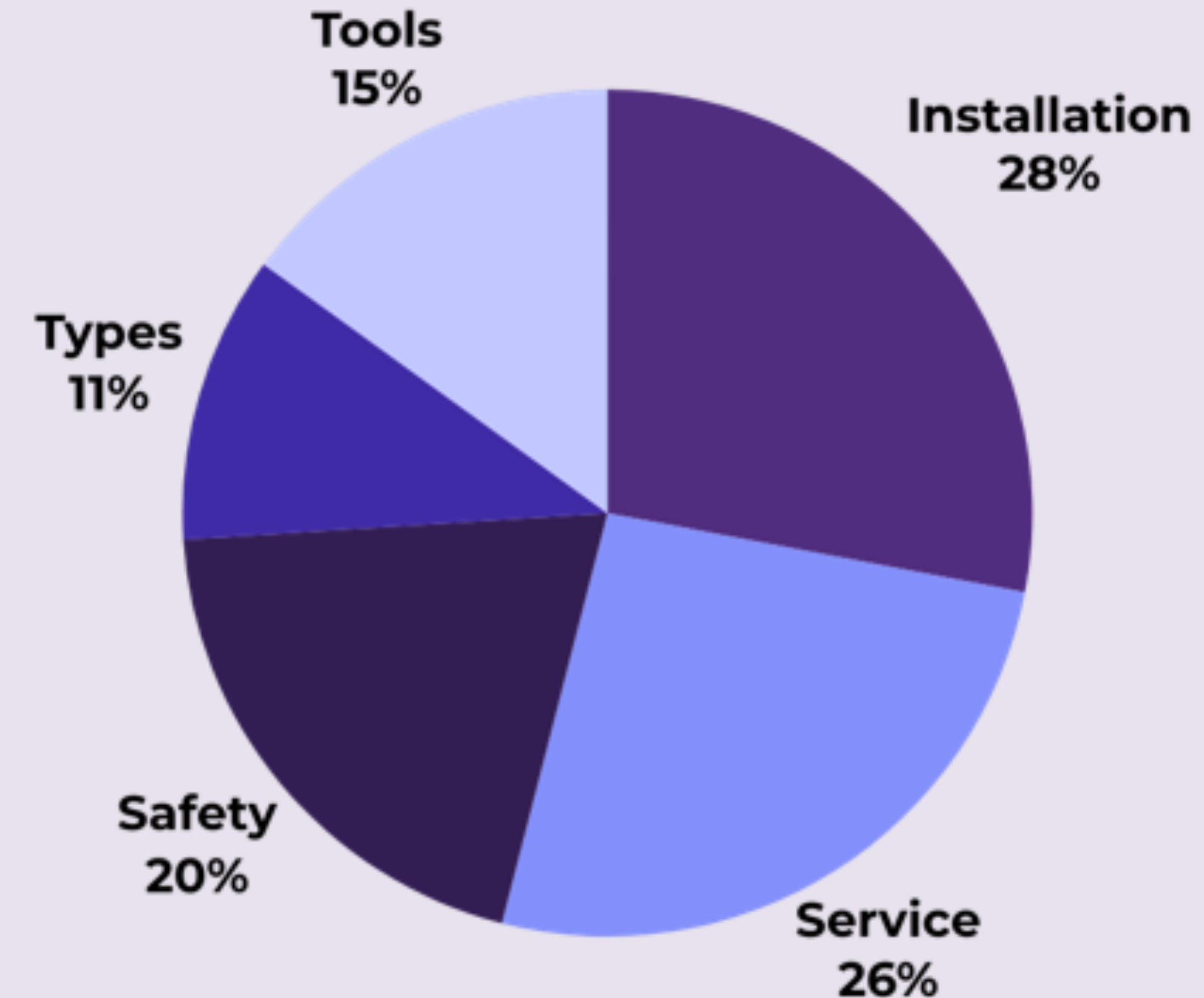


LOW-GWP REFRIGERANTS

CERTIFICATION EXAM

- Helps prepare technicians for changes in:
 - Safety
 - Codes and Standards
 - Transportation and Handling
 - Storage and Packaging
 - Installation, Operation, and Maintenance
 - Recovery, Reclamation, and Destruction
- Designed for technicians with 2 years of HVACR experience
- 100 question exam
- 2.5 hour time limit

Exam Subject Areas



LOW-GWP REFRIGERANTS EXAM QUESTIONS

When a heat pump indoor coil is installed on an existing operable gas furnace, which of the following precautions must be taken?

- A. The furnace must be controlled so that only the blower operates
- B. Add a control so that the furnace and heat pump do not operate at the same time in normal heating mode
- C. The limit control on the furnace must be replaced with one of lower cutout setting
- D. The limit control on the furnace must be replaced with one of higher cutout setting

Which safety classification would be found on the nameplate of a system that contains flammable refrigerant?

- A. B1
- B. R5
- C. A1
- D. A3

Which characteristics must be considered when selecting a Schrader replacement core?

- A. Refrigerant type, oil type, and pressure-temperature range
- B. System size, refrigerant line length, refrigerant type
- C. Pressure-temperature range, critical temperature, superheat/subcooling
- D. Oil type, system size, operating pressure



Updating the NATE Heat Pump Specialty Exam

HEAT PUMP SPECIALTY EXAM CHANGES

INCORPORATING DEPARTMENT OF ENERGY DECARBONIZATION GOALS

- Collaborated with Pacific Northwest National Laboratory (PNNL)
 - Spring 2022 – Spring 2023
 - PNNL: a DOE national laboratory
 - Updated the Heat Pump exam's Knowledge Areas of Technician Expertise (KATE)



HEAT PUMP SPECIALTY EXAM CHANGES

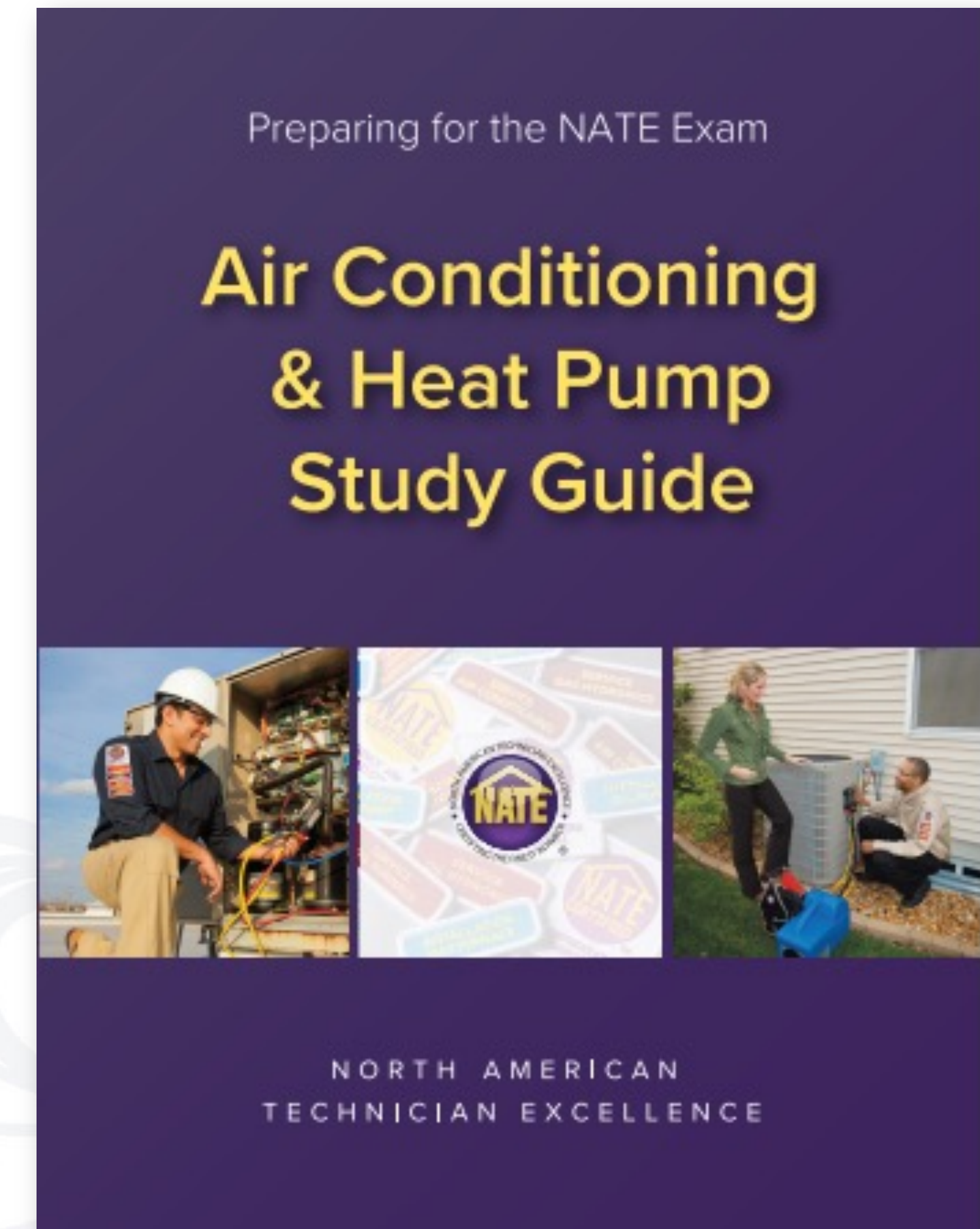
KEY UPDATES

- Microchannel coils
- Mechanical press fittings
- Inverter-driven compressors
- Cold climate heat pumps
- Heat pumps as substitutes for fossil fuel heating
- Smart diagnostic tools

HEAT PUMP SPECIALTY EXAM CHANGES

EXAM RELEASE TIMELINE

- Updated study guide now available
- New exam beta testing begins in April 2024



CONTACT US

Call or Text Us: 703-293-4846

www.NATEX.org

askNATE@natex.org





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BEST COMMITMENT TO CONTINUING EDUCATION WINNERS

<u>District</u>	<u>Brand</u>	<u>Company</u>	<u>City, State</u>
Gulf Coast		Perdido Heating & Air	Pensacola, FL
		Estes Heating & Air Conditioning	Theodore, AL
N. Alabama		Coolray Heating, Cooling, Plumbing & Electrical	Hueytown, AL
		Air Outlook Inc.	Huntsville, AL
N. Georgia		Coolray Heating, Cooling, Plumbing & Electrical	Marietta, GA
		Andy Lewis / Hobson Heating & Air	Cumming, GA
Southeast		Gochnauer Air Conditioning & Heating	Hilton Head, SC
		Gray's Heating & Air Conditioning	Hilton Head, SC
Southwest		Air Conditioning by Luquire	Montgomery, AL
		M & W Heating & Air	Lizella, GA