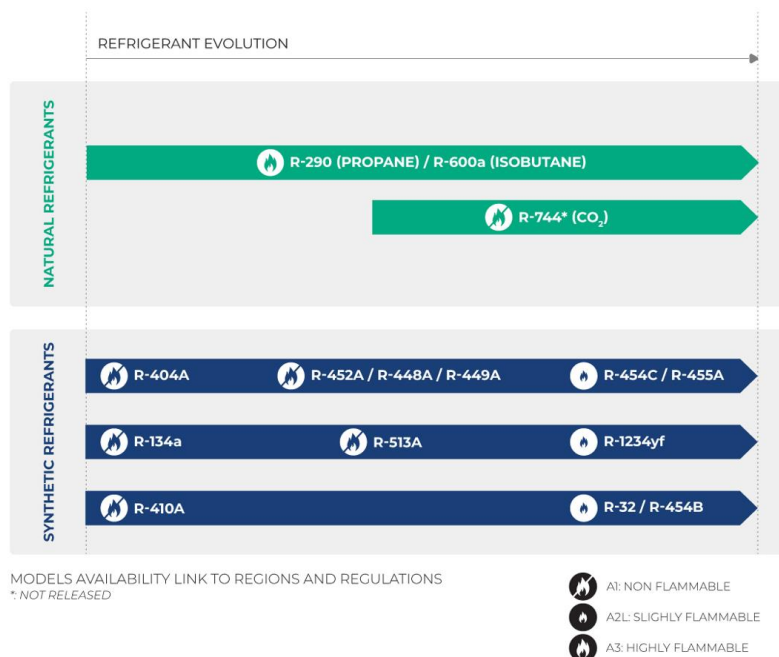


Position Paper: Tecumseh's Commitment to Low GWP Refrigerant

November 2023



Tecumseh Products Company, a leading global manufacturer of compressors and refrigeration products, recognizes the imperative to address environmental concerns related to greenhouse gas emissions. Considering the growing urgency to combat climate change, Tecumseh has embarked on a strategic journey to support low Global Warming Potential (GWP) refrigerant in the HVAC and refrigeration industry. This white paper outlines Tecumseh's position on low GWP refrigerant, focusing on the Kigali Amendment, the Montreal Protocol and future refrigerant.



The Kigali Amendment and the Montreal Protocol

The Kigali Amendment, adopted in 2016, is an integral extension of the Montreal Protocol, a global environmental agreement. These international agreements aim to phase down the production and consumption of high GWP refrigerant. The Kigali Amendment specifically targets hydrofluorocarbons (HFCs), which are potent greenhouse gases. Tecumseh acknowledges the significance of these agreements in mitigating the adverse effects of climate change by reducing the use of high GWP refrigerant. Developed countries are required to start reducing their HFC production and consumption from 2019, with a goal of achieving an 85% reduction by 2036. Developing countries, on the other hand, have more lenient initial targets but are also committed to reducing HFC use over time.

"A3" R-290 / R-600a Refrigerant: A Path to Efficiency

Tecumseh is at the forefront of sustainable refrigeration solutions, embracing both R-290 (propane) and R-600a (isobutane) as environmentally friendly alternatives to high GWP refrigerant. Recognizing the shared benefits of these hydrocarbon refrigerant, including low GWP, high energy efficiency, low-toxicity and wide commercial availability, Tecumseh has strategically positioned itself to cater to the evolving needs of the refrigeration industry. Both refrigerant are particularly well-suited for light commercial applications in the food service, food retail, and medical sectors, offering exceptional efficiency in self-contained equipment with limited refrigerant charge requirements. Tecumseh's commitment to sustainability is evident through its readily available product portfolio of R-290 products and future solutions using R-600a. This strategic roadmap provides customers with efficient, sustainable solutions across diverse applications, including reach-ins, display units in supermarkets, and medical equipment.


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“A2L” Refrigerant: A Path for Alternatives

As the industry transitions towards lower GWP refrigerant, the A2L classification refrigerant have gained prominence. These mildly flammable refrigerant offer a balance between safety and environmental performance. Tecumseh has been proactive in engineering solutions including compressors and refrigeration systems compatible with A2L refrigerant, adhering to the stringent safety standards and guidelines set by regulatory authorities.



SAFETY CLASSIFICATIONS FOR REFRIGERANTS		
	LOWER TOXICITY	HIGHER TOXICITY
Higher Flammability	A3	B3
Flammable	A2	B2
Lower Flammability	A2L	B2L
No Flam Propagation	A1	B1

Reference: ISO 817 Refrigerants – Designation and safety classification

Tecumseh aims to ease customer choice with a limited range of options. We recommend the use of R-32/R-454B, R-455A/R-454C and R-1234yf. These refrigerant offer an environmentally friendly alternative to higher GWP refrigerant where charge and flammability concerns are issues. As a leader in the industry, Tecumseh introduced the first A2L-ready multi-piston reciprocating compressors for refrigeration to the market.

R744 Refrigerant: A Potential Alternative

Carbon dioxide (CO₂) refrigerant, also known as R-744, has garnered attention due to its non-flammability, low GWP and natural classification. Tecumseh recognizes the potential of CO₂ refrigerant, particularly in large commercial and industrial applications. CO₂ systems require specialized components and expertise to operate at optimal levels. Tecumseh will continue to invest in developing products and solutions tailored to these requirements.

Global environment and regulation landscape

As a global leader in HVAC and refrigeration manufacturing, Tecumseh is dedicated to assisting all regions in their unique pathways for sustainable development. Various regions, such as Europe and North America, are at varying stages of transitioning to more environmentally friendly practices with distinct phase-out timelines, regulatory demands, and innovation requirements. Tecumseh is diligently working to create innovative, low-GWP solutions that will enhance our comprehensive global product portfolio.

The phase down of high-GWP refrigerant is underway, and Tecumseh is confident in the effectiveness of its solutions. However, there are other impending regulations that introduce fresh uncertainties. One of these uncertainties pertains to potential restrictions on PFAS (Polyfluoroalkyl Substances), which encompass numerous components utilized in the HVAC and refrigeration industry, such as fluoropolymers and certain F-Gases. Comprehensive research and analysis will be necessary from scientific experts and regulatory agencies before any potential determinations can be made.

Summary

Tecumseh is committed to leading the industry in the adoption of low GWP refrigerant. Through our adherence to the Kigali Amendment and the Montreal Protocol, as well as our investments in R-290, A2L classification and CO₂ refrigerant, we offer a wide spectrum of solutions to navigate the changing landscape of future refrigerant. Our dedication to environmental responsibility and sustainable innovation ensures that Tecumseh remains a trusted partner for customers seeking efficient, environmentally friendly, and compliant refrigeration solutions. As we move forward, Tecumseh remains committed to reducing the carbon footprint of the HVAC and refrigeration industry while delivering reliable, high-performance products to meet the demands of our customers in a rapidly evolving world.