# Opteon™ XP10 Supports Sustainablity Commitments of Chemours China Technology Center

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In early 2024, Chemours unveiled its state-of-the-art China Technology Center, marking a major leap forward in the company's R&D and technical service capabilities in China. The opening of the center is poised to fuel expansion in the China and Asia-Pacific markets, particularly in areas such as clean energy, electrification, digitization, and decarbonization.

The recently established technology center is outfitted with two advanced air-cooled screw chillers, both powered by Opteon™ XP10 (R-513A) refrigerant. This refrigeration system delivers outstanding heating and cooling efficiency, offering the benefit of reduced energy consumption and environmentally sustainable operation. Opteon™ XP10 (R-513A) can achieve an impressive 56% reduction in direct carbon emission throughout the refrigeration lifecycle compared to the use of R-134a – equivalent to saving 10,178 tons of CO2 over a 10-year period*.

## Urgent Industry Transformation Driven by Policy Convention

The refrigeration sector has long been a focal point of global climate change governance. In recent years, guided by the Montreal Protocol and other international conventions, and in line with the dual-carbon goal strategy, the industry has faced increasing pressure to rapidly transition into a new phase of high-quality development. The pursuit of eco-friendly alternative technologies and the widespread adoption of environmentally conscious practices, aiming for zero ozone depletion potential (ODP) and lower global warming potential (GWP), have emerged as crucial battlegrounds for the advancement of the refrigeration industry.

The adoption of R-513A refrigerant in newly-manufactured commercial and industrial chiller systems, particularly in medium-temperature chillers, has seen extensive growth across Europe and America. This trend is accentuated by the enforcement of stringent energy policies and environmental regulations in the region. At the same time, R-513A refrigerant is being used to retrofit existing R-134a refrigeration systems, with the aim of reducing their environmental footprint.

Governments around the world are tightening their environmental policies, so is the Chinese government. In the past, China has utilized refrigerants like R-134a and R-22 in screw chillers (heat pumps) unit. However, due to their high greenhouse effect and detrimental impact on the ozone layer, the industry has consistently prioritized research into identifying and implementing alternative refrigerants for these applications.

* Calculation: (GWPR-134a × ChargeR-134a × Service Life) – (GWPR-513A × ChargeR-513A × Service Life). The analysis assumes a service life of 10 years. The refrigerant is not recycled at the end of its life cycle. The data for the two chillers is the value obtained for a single unit multiplied by a factor of 2.

## A Winning Combination of Performance and Sustainability

Chemours is a socially responsible company committed to creating a greener world through the transformative power of chemistry. Our dedication is evident in the proactive measures we take to minimize our environmental footprint and responsibly manage energy resources, aligning with our pledge to achieve net-zero emissions by 2050. One of the ways that we seek to realize this commitment is through the careful selection of refrigerants for our projects.

| Opteon™ XP10 | |
|---|---|
| ASHRAE Number | R-513A |
| Composition | R-1234yf/R-134a |
| Weight % | 56.0/44.0 |
| Molecular Weight | 108.4 g/mole |
| Boiling Point at 1 atm (101.3 kPa) | -29.2°C |
| Critical Pressure | 3766 kPa.abs |
| Critical Temperature | 96.5°C |
| Liquid Density at 21.1 °C (70°F) | 1185.7 kg/m³ |
| Ozone Depletion Potential (CFC−11 = 1.0) | 0 |
| AR5 Global Warming Potential | 573 |
| ASHRAE Safety Classification | A1 |
| Glide Temperature | 0K |

Opteon™ XP10 (R-513A) refrigerant can find applications across a diverse array of chiller and commercial refrigeration settings. This includes its use in medium-temperature applications within commercial and industrial direct expansion (DX) systems. Additionally, it serves in medium-temperature circuits in cascade refrigeration system and is widely used in various facilities such as chillers, air conditioners, heat pumps, centrifugal chillers, DX chillers, and ice rink systems.

According to Michael Zhou, Asia Pacific Business Director of Chemours Thermal & Specialized Solutions (TSS), "The newly established Chemours China Technology Center will collaborate closely with Chemours' global technical resources to deliver comprehensive technical support to China and the broader Asia-Pacific region. The Technology Center is equipped with cutting-edge facilities and incorporates Opteon™ XP10 (R-513A) air-cooled screw chillers (heat pumps). With their non-ozone depletion, low GWP, and high energy efficiency, these units position the Technology Center as a benchmark for energy conservation and emission reduction within the Asian refrigeration industry. This initiative aims to catalyze the green and low-carbon development of the industry in both China and the broader Asia-Pacific region."

## Seamless Transition: the Optimal Substitute for R-134a with Easy Retrofitting

The project implemented two screw chillers (heat pumps) charged with Opteon™ XP10 (R-513A). These units boast a nominal cooling capacity of 1,509.1 kW and a nominal heating capacity of 1,594 kW. Each chiller is equipped with four compressors and twenty-four fans, utilizing a refrigerant charge of 700 kg. In practical applications, Opteon™ XP10 (R-513A). demonstrates outstanding performance and energy efficiency, rivaling that of R-134a.

Particularly noteworthy is the ability to achieve of a 56% reduction in Global Warming Potential (GWP) compared to R-134a, striking an optimal balance between high performance, energy efficiency, and environmental sustainability. In addition, Opteon™ XP10 (R-513A) holds an ASHRAE safetyclassification of A1, signifying low toxicity and nonflammability.

R-513A has many similar fundamental physical properties as R-134a, such as its boiling point, critical temperature, and critical pressure. The absence of temperature glide in R-513A makes it a suitable refrigerant for directly replacing R-134a in chillers. With the urgent need to safeguard the ozone layer and address global warming concerns, R-513A has emerged as a valuable and environmentally friendly replacement.

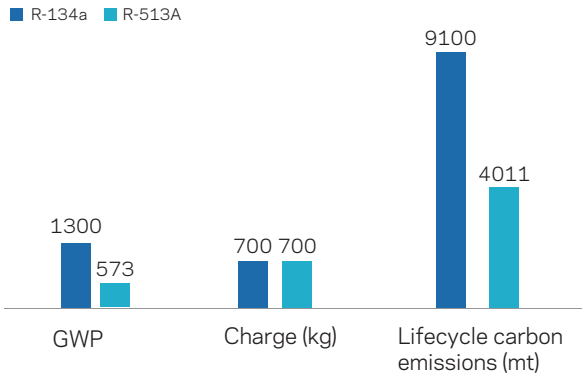


Fig. 1: R-134a vs. Opteon™ XP10 (R-513A) Properties*

* This graph is based on data from an on-site single chiller, as suming a service life of 10 years.

Besides being incorporated into a range of new systems, Opteon™ XP10 (R-513A) is also compatible with most existing R-134a equipment. This ensures a straightforward retrofitting process, eliminating the need for unit redesign and manufacturing. This seamless compatibility can allow for units to be replaced with ease, reducing equipment upgrade costs and streamlining the entire replacement process.

As the foremost alternative to R-134a in chiller applications, Opteon™ XP10 (R-513A) has earned recognition from major equipment and component manufacturers across the globe. Chemours is a leader in the refrigeration industry, with more than 90 years of experience in innovative thermal solutions. Dedicated to achieving energy savings, reducing carbon emissions, and promoting sustainable development, Chemours steadfastly upholds the principles of sustainable environmental protection. The company remains committed to ongoing research and the safe application of green, low-carbon, and high-efficiency refrigerants.

Moving forward, Chemours will remain dedicated to proactively advancing the industrial upgrading and sustainable development of the HVACR industry. Leveraging its technological prowess in research and development (R&D) and innovation, the company is ommitted to contributing to the early realization of China's "dual-carbon" goal and to fostering green, high-quality development within the industry.

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