



Frequently Asked Questions

The Opteon™ family of refrigerants from Chemours represents a breakthrough line of low global warming potential (GWP) solutions. They were developed to help meet increasingly stringent global regulations, while often maintaining or improving performance compared to incumbent products. Over the past few years, Chemours has commercialized multiple Opteon™ stationary refrigerants ranging in application from commercial to transport refrigeration, with multiple new products on the horizon for applications including air conditioning and waste heat recovery. The following questions are a non-exhaustive list of the most frequently asked questions, based on both in-field queries and digital submissions. If you have a question that is not covered in the list below, please fill out a contact us form on Opteon.com or reach out to your account manager from Chemours.

Q. What is an HFO?

A. HFO is an acronym for “hydro-fluoro-olefin.” Like HFCs, the three main chemicals that make up an HFO are hydrogen, fluorine, and carbon. HFOs have very low GWP and zero ozone depletion potential (ODP).

Q. What are the GWP values of the Opteon™ low GWP stationary refrigerants?

A. The following GWP values are based on The IPCC Fifth Assessment Reports:

Opteon™ Refrigerant Name	ASHRAE Number	AR5 GWP (CO ₂ =1.0)
XP10	R-513A	573
XP40	R-449A	1282
XP44	R-452A	1945

Q. What are the by-products if an HFO burns?

A. Like HFCs, HFOs are safe to use when handled properly. HFOs are similar to HFCs, in that if they are exposed to an open flame from brazing, hydrogen fluoride, a hazardous acidic compound, can be generated. The probability of generating hydrogen fluoride, and the recommended safe work practices to prevent this scenario, are the same whether using an HFO or HFC. Be sure to read, understand, and follow the SDS when working with HFOs. Always make sure you wear the recommended PPE and have adequate ventilation when working with any refrigerant.

Q. Are the PT charts for Opteon™ XP40 (R-449A), XP44 (R-452A), and XP10 (R-513A) available?

A. Yes, the PT charts and other technical information is available on the Opteon™ website, www.opteon.com, as well as for download from the Apple and Android stores in the form of the Chemours PT Calc app.

Q. Will current leak detection systems be able to detect Opteon™ products?

A. Yes, many of the leak detection system OEMs are in the process of adding Opteon™ products to their refrigerant libraries. For leak detection systems that do not have Opteon™ products as a selection, it is recommended to set your system to detect R-134a.

Q. Will oil break down with higher discharge temperatures when running on these HFOs?

A. No, as long as compressor OEM recommendations for temperature management are followed, the lubricant will be stable and provide adequate lubrication.

Q. Can Opteon™ XP40 (R-449A), XP44 (R-452A), and XP10 (R-513A) be reclaimed?

A. Yes, all three of these refrigerants can be reclaimed, as long as they have not been mixed with any other refrigerants.

Q. Are significant changes expected for pipe sizing of new systems running on Opteon™ XP40 (R-449A) or XP10 (R-513A)?

A. No, changes in the piping of new systems is not expected to be significant. The most updated version of the Chemours Refrigerant Expert Tool (DUPREX) modeling program has the ability to do line sizing calculations. This tool can be downloaded for free from the Opteon.com website.

Q. If you top off Opteon™ XP40 (R-449A) or XP10 (R-513A) multiple times, will this impact its A1 nonflammable rating?

A. No. As part of the ASHRAE Standard 34 listing process for an A1 rating, the refrigerant blend undergoes rigorous fractionation testing, including multiple leak recharge scenarios, in order to ensure that the blend will always maintain a nonflammable A1 rating.

Opteon™ Opteon™ XP40 (R-449A)

Q. What compressor manufacturers approve Opteon™ XP40 (R-449A)?

A. Opteon™ XP40 (R-449A) is approved/listed for a growing number of OEMs in the commercial refrigeration market, including industry leaders Bitzer and Emerson (Copeland). Please visit our website for the most recent information on OEM approvals.

Q. Is Opteon™ XP40 (R-449A) a drop-in replacement for R-404A and R-22?

A. Chemours has published detailed retrofit guides for converting R-404A and R-22 systems that are available at Opteon.com.

In general, when converting from R-404A to Opteon™ XP40 (R-449A), equipment and oil changes are not required. However, filter driers should be replaced and thermal expansion valves (TXVs) may need to be adjusted or replaced if non-adjustable.

R-22 to Opteon™ XP40 (R-449A) retrofits will likely require an oil change from mineral oil to POE, filter drier, and elastomeric seal replacements.

In all cases, it is recommended that superheat settings be checked and adjusted as necessary after conversion.

Q. If there are non-adjustable values on a system, will there be any difficulty in retrofitting to Opteon™ XP40 (R-449A)?

A. Some adjustment to the TXV will be required to obtain the desired superheat after a retrofit to Opteon™ XP40 (R-449A). There are conversion kits available from manufacturers of non-adjustable TXVs that can be installed to make the TXV adjustable. It is recommended that these conversion kits be installed on all non-adjustable TXVs to allow adjustment of superheats following the retrofit.

Q. What kind of adjustments to valves will be needed when retrofitting to Opteon™ XP40 (R-449A)?

A. For a properly sized R-404A TXV set for a specific superheat for R-404A, typically a 1-2 turn adjustment closed will be required in both low and medium temperature applications to increase the superheat to the desired amount for Opteon™ XP40 (R-449A).

For a properly sized R-22 TXV set for a specific superheat, a slight adjustment may be needed in low temperature applications and up to a 1-2 turn adjustment may be required in medium temperature applications to decrease the superheat to the desired amount for Opteon™ XP40.

Q. Do powerheads need to be replaced during the retrofit (R-404A/507 or R-22 to Opteon™ XP40)?

A. For R-22 systems, over common low temperature and medium temperature evaporator conditions, the dew point of Opteon™ XP40 (R-449A) is only a few pounds different than the saturated pressure of R-22. Powerheads will not need to be changed.

For R-404A systems, TXV OEMs are currently testing Opteon™ XP40 (R-449A) to see if changing the powerheads is necessary. Please contact the valve OEM for an official recommendation.

Q. As a blend, will Opteon™ XP40 (R-449A) fractionation cause any problems?

A. No, fractionation is not expected to cause any problems. Like all zeotropic blends, fractionation can occur; however, the impact is expected to be minimal. For example, if 10% system charge was lost and then the system was recharged, there would theoretically be a 2% loss in capacity and no loss in COP or mass flow.

Q. Is demand cooling/liquid injection required on a system that is operating on Opteon™ XP40 (R-449A)?

- A. Opteon™ XP40 (R-449A) has a lower discharge temperature than R-22 and higher discharge temperature than R-404A. Opteon™ XP40 is expected to behave similar to R-407A with respect to the need for demand cooling/liquid injection. For retrofit of R-22 systems, it is recommended to leave demand cooling in place, although it will likely run less often. It is always recommended to consult with the compressor manufacturer for specific guidance on demand cooling.

Q. Can you top off Opteon™ XP40 (R-449A) with any other refrigerant?

- A. No, mixing refrigerants is not recommended. If Opteon™ XP40 (R-449A) were to be topped off with a different refrigerant, the resulting mixture would no longer be Opteon™ XP40. The pressure-temperature characteristics and performance would be impacted.

Q. Can you retrofit an R-502 system to Opteon™ XP40 (R-449A)?

- A. Yes. However, R-502 systems could be upwards of 30 years old and the equipment may need to be replaced; therefore, we recommend a thorough system evaluation and consultation with an OEM.

Q. What kind of energy efficiency improvement can I expect by retrofitting to Opteon™ XP40 (R-449A)?

- A. The observed energy efficiency increases when retrofitting an R-404A system to Opteon™ XP40 (R-449A), up to 12% for medium temperature racks and up to 5% for low temperature racks.

Q. If a refrigeration system has capillary tubes instead of TXVs, will Opteon™ XP40 (R-449A) work? Is it different for R-404A vs. R-22 systems (i.e., will our answer be any different for R-22 system conversions vs. 404A)?

- A. For an existing R-22 system with a capillary tube, the mass flow rate and operating pressures of Opteon™ XP40 (R-449A) are a close match and will likely perform adequately; however, for optimal results, it is recommended to replace the cap tube with a TXV when possible. R-404A has somewhat different properties than Opteon™ XP40. Therefore, it is recommended for optimal results to replace the capillary tubes with TXVs.

Q. Can I change an R-22 chiller with a flooded evaporator over to operate on Opteon™ XP40 (R-449A)?

- A. Zeotropic refrigerant blends, including Opteon™ XP40 (R-449A), R-407C, etc., are not recommended for use in chillers with flooded evaporators.

Q. Can Opteon™ XP40 (R-449A) be used in screw compressors?

- A. Yes, Opteon™ XP40 (R-449A) has been used in screw compressors. It is always recommended to consult with the compressor manufacturer for specific guidance on refrigerant retrofits, especially concerning elastomeric components and lubricant recommendations.

Opteon™ XP10

Q. In the past, some R-134a systems would develop plugged capillary tubes; do we know if Opteon™ XP10 (R-513A) will be less likely to do this?

- A. In the early days of HFC/POE use, there were issues with plugging in some capillary tubes. The 134a/POE tended to gunk up capillary tubes, because the drawing lubricants used in making the capillary tubes had compatibility issues with POE. In recent years, manufacturers have resolved most of these issues and cap tube plugging issues with HFCs and HFC-containing blends, including XP10 (R-513A), are expected to be extremely rare.

For more information on the Opteon™ family of refrigerants, or other refrigerants products, visit opteon.com or call (800) 235-7882.

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