

TECHNICAL BULLETIN

R-22 Replacements and POE Oil

July 11, 2018 – There is no pure-HFC replacement for R-22 on the market today that is compatible with mineral oil. The most widely accepted replacements, NU-22B®, Freon™ MO99, and R-422D, include hydrocarbon (HC) components and carry A1 safety designation. It is essential that distributors, refrigerant users and equipment owners follow conversion guidelines precisely to avoid adverse effects on equipment.

Since introduction of the ozone safe R-22 direct replacement, NU-22® in 2001, several refrigerant producers have entered the market with their own R-22 replacement. These alternatives are typically comprised of two or three HFC components. After years of lab testing and field evaluation, refrigerant manufacturers determined that an HC component would be necessary since a pure HFC is not soluble in nor miscible with mineral oil. The practice of using HCs to improve oil return dates back several decades in refrigeration applications.

Commonly accepted R-22 alternatives that contain an HC component are designed to carry an ASHRAE Safety Classification of A1 (low-toxicity and non-flammable), where 'A' is the toxicity grouping and '1' is the flammability number. This means the refrigerant is assigned a safety group classification of A1 based on the worst case of fractionation, therefore cannot sustain a flame as formulated.

There are a few R-22 alternatives that are purely comprised of HFCs. However, when pure HFC alternatives such as R-427A, R-407A-F, R-421A and R-404A are used in mineral oil based systems, the mineral oil MUST be replaced with POE oil since the refrigerant lacks the critical HC component. If the oil is not changed when using a pure HFC refrigerant, system performance will be reduced and the compressor life can be shortened. Split systems, which account for tens of millions of R-22 systems in service today throughout the world, are especially vulnerable.

Pure HFC blends have been far less appealing to the mainstream industry compared to those that contain an HC component, due to the additional conversion cost. Before using any R-22 replacement, consult the manufacturer's written guidelines and follow proper conversion procedures to prevent potential losses from the misapplication of products.

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About The Chemours Company

The Chemours Company (NYSE: CC) helps create a colorful, capable and cleaner world through the power of chemistry. Chemours is a global leader in titanium technologies, fluoroproducts and chemical solutions, providing its customers with solutions in a wide range of industries with market-defining products, application expertise and chemistry-based innovations. Chemours ingredients are found in plastics and coatings, refrigeration and air conditioning, mining and general industrial manufacturing. Our flagship products include prominent brands such as Teflon™, Ti-Pure™, Krytox™, Viton™, Opteon™, Freon™ and Nafion™. Chemours has approximately 7,000 employees and 26 manufacturing sites serving approximately 4,000 customers in North America, Latin America, Asia-Pacific and Europe. Chemours is headquartered in Wilmington, Delaware and is listed on the NYSE under the symbol CC. For more information please visit chemours.com, or follow us on Twitter [@Chemours](https://twitter.com/Chemours), or [LinkedIn](https://www.linkedin.com/company/chemours).

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