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.

# # #

# # #

Questions? Contact our Tech-2-Tech experts at 1-866-433-TECH (8324)