

ENVIRO **REFRIGERANTS Industry Update**

Facing The Facts - The Simple Science Behind Using Hydrocarbon Components in HFC Blends

It is a well-known fact that HFC refrigerants, and HFC based refrigerant blends, are not miscible with mineral oil. Therefore, many HFC blends, like R-404A, R-410A, R-407C, R-421A and R-427A, require the use of synthetic POE oil in the compressor to insure proper oil return. Even though these refrigerants may be used in some mineral oil based, close coupled systems, and systems with oil separators, they are very limited in application unless the system is converted to POE oil. To confirm this, one only needs to review the refrigerant manufacturers guidelines that are usually found on their company websites. Some individuals that represent the HFC refrigerants mentioned above, acting out of desperation to gain market share, have attempted to subdue the facts and convince prospective distributors, and refrigerant users, that their products can be used without converting the system to POE oil. Even worse, there are numerous reports of people being told they could mix a particular brand of HFC alternative with R-22. Both practices are highly irresponsible and can lead to reduced system performance and compressor longevity.

Using small amounts of hydrocarbons to enhance oil return is a common practice in our industry that dates back several decades. When you add a hydrocarbon component to an HFC blend, the high solubility rate of the hydrocarbons in the hydrocarbon-based mineral oil, improves oil return by providing additional viscosity and reducing resistance. Therefore, after many years of comprehensive lab and field testing, and thousands of successful system conversions, the mainstream HVACR industry has concluded that HFC blends that incorporate a hydrocarbon component can be used in a wider range of mineral oil based systems and do not require the addition of POE oil. Today, the most widely distributed, and successfully used, ozone safe R-12, and R-22 direct replacements, like R-422B, R-422C, R-414B, R-417C, R-422D, R-438A, and R-424A, all contain one or more hydrocarbon components. It is also important to note that all of these refrigerant blends use a very low percentage of hydrocarbon and therefore received an A1 safety classification from ASHRAE (A = Non-Toxic / 1 = Non-Flammable) .

R-414B has been the leading industry replacement for R-12 for over 20 years. R-422B was developed and brought to market with the same principles in mind - superior performance over other alternatives and ease of use. R-422B has been successfully used in a wide range of mineral oil based ACR systems. From basic residential AC and heat pumps, to large tonnage industrial process cooling applications, R-422B has the most proven record of successful field performance. This is due to its ability to closely mimic R-22's operating characteristics, and the addition of a hydrocarbon component which enables it to be used in mineral oil based systems.

The accelerated phase out of R-22 that began in 2012, gave R-22 users and equipment owners much greater incentive to switch to an alternative refrigerant. With the support of nearly 4,000 stocking wholesale distributor locations in North America, R-422B is the most widely available R-22 replacement on the market today.