

# ***Technical Bulletin #R-100***

## ***Refrigerant: R410a vs. R407c***

There are some dehumidification systems manufacturers using R407c refrigerant vs. the industry standard R410a. We occasionally receive calls from engineers and contractors inquiring what the difference in the two refrigerants are and how they affect the costs and operation of dehumidification systems.

When the rules requiring the total phase out of R22, the refrigerant manufacturers put a blend of three refrigerants that became a temporary R22 replacement, giving compressor manufacturers time to re-tool and build more robust equipment to handle R410a. There are a few equipment manufacturers that have chosen not to make the changes or re-tool their manufacturing facilities and they will continue to use the R407c.

In many seminars, industry forums and information from other manufacturers of HVAC equipment, it is made clear that 407C is a "short term" replacement. In addition, PED (Pressure Equipment Directives) requires manufacturers to fit extra pressure relief components into their products for safety. Companies bypass the new regulation by passing off products with 407C which does not require this. There are several reasons that this is bad news for the customer. Future problems-where a replacement condensing unit is required- this will require a whole system replacement as 'spares' are not being manufactured any longer.

### **SERVICING:**

R410a is a 50/50 blend of R32 and R125 and they boil off at very similar temperatures so if you have a leak on a R410a system, you in all likelihood, will not have to evacuate the system and charge from vacuum.

R407c is a blend of three refrigerants, 52% R134a, 23% R-32, and 25% R-125. If a system were to develop a substantial leak you cannot just recharge the system once the leak was repaired because the three refrigerants boil off at drastically different rates making the blend ratio of the refrigerant all wrong once the system is recharged. You would have to pull a full system evacuation and recharge by weight but there is more.

Following is an application bulletin from the Bristol compressor manufacturer:

- **"CAUTION: Do not leave compressor or system open to atmosphere for longer than 15 minutes maximum. Polyester lubricants are at least 100 times more hygroscopic (ability to absorb moisture) than mineral oils. It is almost impossible to remove the moisture absorbed by the lubricant even with heat and vacuum."**

Following is an application bulletin from the Tecumseh compressor manufacturer:

- **"The refrigeration effect of R407c is less than that of R22 requiring more refrigerant for a given capacity."**
- **"R407c uses POE oil which means it is NOT a "drop in" for R-22. A proper flush of the line set would still be required as it is when converting from R22 to 410a."**
- **"Cap tubes for R22 will work with 407c, but with a slight loss of efficiency, but if using an expansion valve you will have to replace it with one compatible with 407c."**

Costs for purchasing R407c are approximately 30-40% higher than R410a.