

# The 'good oil' on R32 refrigerant



In this edition's Technical Section we thought we'd get some expert advice on R32 refrigerant from Fujitsu and Daikin – manufacturers who are both currently producing split-system air conditioners charged with R32.

Peter Cashel, National Product Manager at Fujitsu General and Blake Mortimer, Engineering Support at Daikin kindly provided valuable answers to some frequently asked questions.

## What are some of the differences between systems that work with R32 and R410A?

### Flammability

*Daikin* R32 is classified as Mildly Flammable. As a result, the electrical / electronics of the air conditioner must be designed so that any potential "source of ignition" (i.e. arc or spark) is not present in areas of the equipment where refrigerant could leak.

### Operating Pressure and piping

*Fujitsu* R32 has a very similar operating pressure to R410A with R32 only being a slightly higher value. Because of this, there are suitable copper pipes already available at trade outlets. The pressure vessel ratings are higher meaning vessels in products such as the compressor and accumulator must be specifically designed and manufactured for use with R32 Refrigerant.

### Cylinders

*Daikin* The required refrigerant cylinder design pressure for R32 is 5.481 MPa which is just above the 5.4 MPa design pressure of current R410A cylinders and as such existing R410A cylinders are not suitable for R32. New cylinders are being manufactured and they will be fitted with a Left Hand Thread valve outlet to differentiate them from current A1 class refrigerants such as R410A and R22.

*ARC* It would also be recommended to check the 'transportation of dangerous goods' requirements around the transportation of cylinders containing flammable refrigerants.

### Tools

*Fujitsu* Many tools used for R32 air conditioners are common with R410A, for example gauge manifolds, charging hoses, weighing instruments, pipe benders, pipe cutters, flaring tools and torque wrenches. It's also recommended that technicians and installers check that their vacuum pump and electronic leak detector are compatible with systems that use R32. A refrigerant recovery unit or vacuum pump suitable for use with R32 can also be used with R410A but not necessarily the opposite way. Always check the statement of the supplier.

## Can a R32 system be charged with R410A or vice versa?

*Daikin* The simple answer is no. The operating characteristics of both refrigerants are different and the systems have been designed accordingly. One example is that the compressor runs hotter for a R32 system so the compressor design will be different.

## Safety precautions – as they differ from systems with R410A

*Daikin* In general the installation of an R32 system is very similar to the installation of a system containing R410A. However some extra caution is needed to ensure no ignition of a flammable mixture of air and refrigerant can occur through safe handling (avoiding of leaks), ventilation (avoiding of concentrations) and a safe work area (elimination of potential sources of ignition).

*Fujitsu* The main issues will be for technicians to follow their normal safe work procedures that should already be in place when working on any refrigeration system containing a Hydro Fluoro Carbon. This includes the use of nitrogen while brazing and checking for sources of ignition prior to handling the refrigerant.

*Daikin* A ventilation unit may be required during installation works indoors or in confined spaces to avoid a flammable mixture of air and refrigerant.

*Daikin* As required by State Work, Health and Safety Regulations, technicians must perform a risk assessment of the required works (i.e. installation or repair) before commencing. When repairing or installing R32 equipment the assessment must include consideration of risks associated with flammable refrigerants.

*Daikin* As with any air conditioner or refrigerating equipment the maximum refrigerant charge per room volume requirements of AS/NZS 1677.2 need to be observed. For R32 the practical limit is currently 54 grams per cubic metre.

*ARC* *The Flammable Refrigerants Safety Guide* is available for download from the AIRAH website – [www.airah.org](http://www.airah.org)

## Do technicians need extra training to handle R32?

*ARC* The characteristics of R32, being a mildly flammable refrigerant, are different to many of the mainstream refrigerants currently in use. Accordingly, technicians are well advised to undertake training consistent with the properties and characteristics of mildly flammable refrigerants, like R32.