

NASA technology harnessed by Oceanair at new training centre



Pipe joining technology used by NASA is being harnessed at Oceanair Distribution's new state-of-the-art training centre

The "hot method" of joining pipes, using a gas-powered brazing torch, is the conventional way of connecting up the sometimes complex runs of copper tube that make up an installed air conditioning system.

On larger distributed systems, there can be scores – possibly hundreds – of joints that need brazing. With joints often in difficult to reach locations, connecting the circuit can take a significant amount of time – and add to installation cost.

In an age when refrigerant containment and system integrity is uppermost in people's minds, getting it wrong can be expensive – and not just in terms of the bottom line.

With hot working there are also health and safety issues to take into account. Some installations are "sensitive", such as in hospitals, clean-room applications, and hotel refurbishments – where work needs to be carried out while occupancy continues.

For these reasons, an alternative to hot joining may be desirable – and indeed mandatory.

COLD JOINTS

A "cold method" of joining refrigerant pipe work has been in use for some time, but with the rise in concern over leakage and health and safety issues, it is coming to the fore as an attractive alternative to brazing.

The Reflok pipe joining system uses high compression fittings to produce a hermetic, metal-to-metal seal. For details on how it works, see the panel. The system is used by NASA for critical, high pressure joint applications on the Space Shuttle – operating at pressures far in excess of those experienced in air conditioning. It is also used by BMW on its high performance cars.

Closer to home, the system has recently been used extensively at Oceanair Distribution's new state-of-the-art training facility at Bristol. The installation, based on a Sanyo gas-driven, three-pipe heat pump, simultaneous heating (63kW) and cooling (56kW) VRF air conditioning system, was completed without the use of brazing – using Reflok compression fittings throughout.

The application required a total of more than 100 joints, and includes 13 highly compact solenoid valve boxes. Using the Reflok cold-joining system is estimated to have saved more than a full day's labour.

The time-saving can be even greater if hot works permits are required or restricted working is imposed due to site restrictions, as on the London Underground. This 'out of hours' working can impact significantly on the project cost with extended projects, additional labour, access and

security issues, plus the need for additional insurance. All of which are avoided with Reflok.

The technology also overcomes potential problems arising from the Pressure Equipment Directive (PED). Although it is a compression fitting, it cannot be 'undone' like a mechanical joint and requires to be 'cut out' for removal, thus avoiding any directive problems.

Bob Cowlard, managing director of Oceanair Distribution, said: "Reflok has been around for some time, and it is a proven system. With leakage concerns, health and safety issues, and time pressure to complete projects ever increasing, we believe it is a technology whose time has come. By avoiding the need to use oxyacetylene, the chances of having a 'clean' system are also greatly improved – lengthening the life expectancy of equipment."

The installation at the Bristol office of Oceanair is unique for another reason. It is the only application in the UK that has every type of Sanyo indoor unit represented in a single installation.

HOW REFLOK TECHNOLOGY WORKS

Reflok uses a proven method of producing hermetically sealed, metal-to-metal tube connections. It does not use soldering, welding, brazing, or epoxy to create the joint.

It can be used for tube diameters from 6mm (1/4") up to 35mm (1 3/8"), and with specialty parts for VRF (variable refrigerant flow) refrigeration applications.

Reflok takes advantage of the basic laws of physics, material properties and engineering principles to create hermetically sealed joints in tubes of similar or dissimilar materials.

A connection consists of two Reflok pipes combined with the corresponding Reflok connector, which is compressed with special pliers to create the sealed joint. This quick, simple method eliminates fire hazards of brazing.

The special inner profile of the Reflok Connector causes the diameter of the body to be reduced, until it is in intimate contact with the outer surface of the Reflok pipe being connected.

This powerful mechanical grip creates a metal-to-metal hermetic seal - with a slight reduction of the pipes. This reduction causes no detectable drop in pressure or flow rate.



Metal to metal joints without brazing