Sustainable Cooling

An overview from refrigeration component manufacturer Tecumseh on the switch to mildly-flammable refrigerants.

For many years the refrigeration industry has played a key role in supporting food processing, storage and distribution. This has led to greater efficiencies in food production with refrigeration components and products becoming an essential part of the cold chain.

Air conditioning has also improved the comfort, health and safety of people around the world in domestic and commercial environments. Refrigerants have been at the heart of this, ensuring that the end user has the most effective and efficient refrigerant to use for each individual system.

Refrigerants have evolved as the world we live in has changed. Working together, government and industry have reacted professionally and responsibly to the challenges we face globally. CFC refrigerants were banned after their role in damaging the ozone layer was recognised.

Climate change is having a huge effect on how we live and work. Global warming is forcing us to reduce the amount of virgin HFC refrigerants that we manufacture and use. In Europe, we have responded to this through the F-Gas Regulation which aims to curb our use of high GWP refrigerants.

Tecumseh manufactures and supplies hermetically-sealed compressors for commercial refrigeration, residential and speciality air conditioning. Tecumseh also supplies indoor and outdoor condensing units, coolers, heat pumps, complete refrigeration systems and authorised spare parts and accessories.

At Tecumseh we have met the climate change challenge fully by reviewing how we operate across the European Union market.

Tecumseh's commitment:

- We are fully committed to reducing carbon dioxide emissions and using low-GWP refrigerants by seeking innovative solutions through research and development.
- We are aiming for a sustainable and environmentally friendly solution and do not wish to contribute to the proliferation of refrigerants.
- In addition to our F-Gas commitment, all Tecumseh added-value products meet eco-design efficiency requirements and will be optimised for use with low-GWP refrigerants.
- We recognise that given the diversity of markets and applications, different options are needed to make it possible to evaluate the best appropriate alternatives.

No compromise with safety

For several years Tecumseh has been investing heavily in research and development, preparing for this transition by developing new equipment and working with new, low GWP alternatives.

Care is taken in selection and the key criteria applied are:

- Safety: flammability, pressure and toxicity.
- Reliability: temperature (operating window), compatibility and lubrification.
- Performance: volumetric capacity, energy efficiency and glide.
- Environment: GWP/TEWI, standards, approvals (federal, state and local laws).

A2L alternatives

Equipment running on A2L alternatives to the currently most-used refrigerants is available from Tecumseh. R454C and R455A are a response to the use of R404A. R134a will be replaced by R1234yf. This makes it possible to offer our customers the best alternatives.

The use of these new refrigerants

From a contractor's perspective working with A2L alternatives is similar to working with HFC refrigerants but to comply with the F-Gas Regulation a risk analysis is important before work begins.

As with any other refrigerant, A2Ls should only be handled by a qualified refrigeration technician and the relevant safety criteria should apply to the volume of refrigerant and the equipment used for each job. A2L refrigerants are not suitable for retrofitting to existing installations.

There are also restrictions on transporting A2Ls, different charge calculations and new tools needed. For more information on this turn to Pages 24-25.

The partner of choice in the transition

Tecumseh will continue to evaluate sustainable alternatives and limit the proliferation of refrigerants on the EU market. Tecumseh believes that now is the time for engineers to start training to use new A2L refrigerants.

The company offers components compatible with redesigned and qualified sustainable refrigerant alternatives – including low-GWP synthetic refrigerants as well as naturals such as CO_2 or propane.

Changing from HFCs to HFOs

Making the switch can be relatively easy on commercial refrigeration systems ranging from 1Kw to 15Kw. A2Ls can be employed on direct expansion cooling systems and are fine alternatives for good technical and economic reasons.

SILENSYS® Advanced condensing units

The SILENSYS® range offers acoustically engineered, streamlined, fully featured and ready to install condensing units. They have exceptionally low noise levels, regardless of the installation conditions. The design means that they can be installed easily and be floor or wall mounted.

All accessories are supplied as standard. The main components can be accessed immediately, ensuring easy maintenance as well as ease of installation for additional control or command components.

The units are suitable for cold rooms, display cases, fermentation rooms, reach-ins, wine cellars and ice machines.

Features and benefits

The units offer a sustainable solution and run on low GWP refrigerants R455A, R454C and R1234yf. SILENSYS® Advanced condensing units address all requirements for stationary refrigeration systems. They are COP & SEPR compliant according to the Eco-design Directive for stationary refrigeration systems and condensing units.

The units are designed to the highest safety standards and should be installed by a qualified contractor. Their design helps prevent refrigerant leaks and the units are tested on an assembly line before being sold. They are appropriate for systems with cooling capacities ranging from 1Kw to 15Kw, are suitable for direct expansion systems and are simple to install.

Acoustics

The compressor compartment of SILENSYS® Advanced condensing units is insulated and the fan blades benefit from optimised geometry.

Compliance

SILENSYS® Advanced condensing units are designed to meet standard series EN378 of systems, ISO5149 and all the directives and applicable regulations. As with all jobs in refrigeration and air conditioning, it is the responsibility of the installer to conduct a risk analysis of the system in its environment before starting work.