

VTech e-news

Industry News

Kyoto Protocol proposed legislation: What it could mean for the future

As you probably know, Europe has agreed to the Kyoto protocol for the reduction of emissions on greenhouse gases. Most of the refrigerants currently used are heavily polluting substances with very high GWP (Global Warming Potential) and it is of the highest importance to control their leakage into the atmosphere. For this reason the European Union is preparing a legislation to regulate their usage which will require fine leak detection on refrigeration components. It is of interest to all to read the proposed legislation. You may request a copy of the document by contacting your local VTech office.

Global Warming Potential

Definition: "The Climatic warming potential of a fluorinated greenhouse gas relative to that of carbon dioxide. The global warming potential (GWP) is calculated in terms of the 100 year warming potential of one kilogram of a gas relative to one kilogram of CO₂"

Common Fluorinated Greenhouse Gases

Gas	Chemical Formula	GWP
Suphur hexafluoride	SF ₆	22,000
R 32 (contained in the mixtures R407 and R410)	CH ₂ F ₂	550
R125 (contained in the mixtures R404, R407 and R410)	C ₂ H ₂ F ₅	3,400
R134a	CH ₂ FCF ₃	1,300
R143a (contained in the mixture R404)	C ₂ H ₃ F ₃	4,300

Company News

Massimo Lasagni is the Engineering Manager of VTech, based out of the VTech (Galileo) plant in Italy.

A native of Florence, he holds an advanced degree in Electronic Engineering from the University of Florence. His career at Galileo began in 1986, within the "Process Equipment for Refrigeration and Air Conditioning" division.

His first endeavor was the development of the electronic engineering for the "new generation" Refrigerant Charging machines that, up to that point, were totally electro-mechanical. With the phasing-out of the CFC refrigerants, Massimo designed the

new equipment able to handle the environmentally friendly refrigerants such as hydrocarbons and HFCs.

Later, he was involved in the development of the automatic fluid filling equipment for automotive applications, which were initially developed for FIAT and later adopted in all the FIAT plants worldwide.

Within the VTech organization, Massimo works in close contact with his US counterpart Bill Wright Jr. He enjoys visiting the VTech plant in Syracuse, NY, but only in the summer time!



Technical Focus

The Pros and Cons of Leak Detection methods

There are many methods and types of test equipment for leak detection; all have merits as well as drawbacks, but unfortunately there is no one technique that fits every situation.

The three basic functions of leak testing are:

- 1) leak detection
- 2) measurement of leak rate
- 3) leakage location

Which leak detection method is right for you?

Methods of Leak Detection		
Method	Pros	Cons
Water immersion "Bubble test"	Simple Technology	Small leaks difficult to find; sensitivity limited; operator dependent.
Pressure decay test	Fast gross leak detection	No leak location (pass/fail); limited sensitivity
Vacuum decay / Pressure rise test	Less sensitive to pressure changes (vs. pressure decay)	Moisture/Solventfreezing, causing leak-stuffing; influenced by residual-moisture; no leak location (pass/fail)
Tracer gas sniffing (see table below)	Locates leak	Operator dependent; recovery system may be required to limit gas waste
Vacuum chamber inside-out leak testing	Fully automatic; high sensitivity	Gas consumption; equipment cost; pass/fail; no leak detection
Outside-in leak testing	Fully automatic; high sensitivity; reduced consumption of helium	No leak location (pass/fail)

Which tracer gas to use?

If you've decided that you need a highly sensitive, tracer gas leak-detection system, which gas is most suitable? Weigh the pros and cons...

Tracer Gases: Helium vs. Hydrogen		
Gas	Pros	Cons
Helium	Inert gas; small molecular mass; easily detected	Mass-spectrometer expensive and high-maintenance; slow to disperse (contamination)
Hydrogen (5% mixture)	Easy to fill, evacuate and dissipate; lowest molecular mass; equipment inexpensive to own and operate	Currently not suitable for automatic leak detection

Technical Focus continued

Which type of equipment is best for your needs?

That all depends on the application, production rate and many other factors including environmental impact, operator dependency and equipment cost.



The Equipment: Which type of leak detector is best?

Equipment

Halogen leak detectors

Inside-out helium sniffer detectors

Manual Outside-in helium spraying (mass spectrometer)

Automatic Outside-in helium testing (mass-spec/containment hood)

Automatic Inside-out helium vacuum chamber leak testing

Manual Inside-out hydrogen sniffer detectors

Pros

Simple to use

Easy to locate leaks with skilled operator

Finds small leaks

High sensitivity due to gas penetrability; reduces use of gas to a minimum; global leak test; short test time; low cost compared to vacuum chamber

Automatic; not operator dependent;

Gas easy to fill, evacuate and dissipate; lowest molecular mass; equipment inexpensive to own and operate

Cons

Sensitivity reduced in contaminated environment

Trade-off between sensitivity and response time; issues related to helium gas contamination (see gas table); operator dependent

Operator dependent; area contamination

Pass/fail (no leak location)

Contamination; expensive equipment; pass/fail

Operator dependent

VTech can offer many of these solutions and types of test equipment and will help you to find the solution that best fits your production requirement.

To find out more about each leak detection method, request a copy of our extensive paper that studies each method and the equipment in detail.

Tradeshow Spotlight

AHR Expo, Chicago USA

VTech took part in the annual AHR Expo in Chicago this past January, performing live demonstrations of leak detection and refrigerant charging equipment.

There was particular interest in the VTech 75, shown here testing some small coils. The system is very easy to use; with a press of a button the machine pressurizes the coils to a set pressure, performs a pressure decay test, and if the coils are within a set parameter, it automatically evacuates and back-fills them with a Hydrogen/Nitrogen tracer gas mixture so the operator can begin sniffing for fine leaks.

Also on display was the VTech 200 series Refrigerant Charging machine, shown here with three refrigerant fillers.



VTech at the China Refrigeration Trade Show

VTech participated in the China Refrigeration Trade Show in Shanghai from April 11th to 13th

Visitors focused mainly on the latest versions of leak detectors developed by VTech and the opportunity to increase the quality of their products thanks to the highly innovative techniques proposed. Among these the VTech 75 and the VTech CombiTester outside-in helium leak detector.

Lots of interest was also expressed towards the Hydrocarbon refrigerant charging machines.

Upcoming Tradeshows: AHR Mexico, IKK (Nuremburg, Germany)



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