

# Trade in Counterfeit and Poor Quality Refrigerants Still Thrives

*A Special Report from Linde Gases*

A few years ago, the global refrigerants supply chain suffered production shortages. Prices went sky high and trade in counterfeit and poor quality refrigerant gases increased dramatically. Although refrigerant supply subsequently stabilized, today another driver has taken center stage and has the potential to impact on the refrigerants market in a not dissimilar way. This latest protagonist is the parallel environmental legislation being rolled out to phase out the future supply and use of substances with ozone depleting potential (ODP) and global warming potential (GWP).

This legislation has the risk of creating market shortages and price rises, leading to increased trade in counterfeit or poor quality refrigerants with subsequent potential consequences ranging from poor process performance, to costly damage to capital equipment and, in extreme circumstances, injuries or even loss of life.

## Environmental Legislation

Chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) were originally hailed as highly efficient refrigerants, but when the extent of their ODP was identified, they were forced to give way to later generation alternatives such as hydrofluorocarbons (HFCs). However, while HFCs provide a non-ozone depleting solution, they still have a relatively high global warming potential (GWP). This is leading to the increasing use of next generation hydrofluoroolefins (HFOs) and natural refrigerants.

Every country in the world is currently facing a degree of refrigerant supply restriction as global and national agreements begin to phase down the use of these environmentally damaging substances. Under the Montreal Protocol, it was agreed that ozone-depleting compounds, including CFCs and HCFCs, would be phased out globally. CFCs have already been fully phased out around the world and governments are now implementing local legislation in line with international agreements



New environmental legislation is being rolled out to phase out the future supply and use of substances with ozone depleting potential and global warming potential.

to phase out the supply and use of HCFCs.

The European Union (EU) will have totally eradicated the use of HCFCs by the end of this year, while other geographies, such as the US, Japan, and Australia, are making substantial progress through usage and supply quotas. Many other parts of the world, including most emerging markets, have started the phase down process. In most of these countries, the first quotas came into force in 2013, with supply of HCFCs capped at 2010 levels. Further reductions will come into force in 2015 (10% reduction) and 2020 (25% reduction) onwards towards the aim of total phase-down by 2040.

The issue of global warming is now the leading environmental concern of the 21<sup>st</sup> century and additional corporate sustainability on carbon footprints is placing robust emphasis on this issue. Refrigerant gases contribute to global warming upon their leakage to atmosphere. Therefore a key area of focus is the reduction of leakage of these gases, and the use of lower GWP alternatives.

These alternatives include HFOs, a new generation of refrigerant gases, and natural refrigerant gases, which include ammonia, carbon dioxide, and hydrocarbons. Although both HFOs and natural refrigerant gases have zero ODP and very low GWP, they bring other challenges into the arena,

notably pressure characteristics, flammability, toxicity, efficiency, and cost.

In addressing global warming, among other measures, the EU has introduced what are now known as the “f-gas” regulations. See our related story, “Global Warming Debate Highlights F-Gases,” on page 30 of this issue.

In the US, on July 9, 2014, EPA Administrator Gina McCarthy signed a proposed rule to prohibit the use of certain chemicals that significantly contribute to climate change where safer, more climate-friendly alternatives exist. This is the agency’s second action aimed at reducing emissions of HFCs under President Obama’s Climate Action Plan. The proposed action would change the status of certain high GWP HFCs that were previously listed as acceptable under the Significant New Alternatives Policy (SNAP), to be unacceptable. SNAP is the EPA’s program to evaluate and regulate substitutes for the ozone-depleting chemicals that are being phased out under the stratospheric ozone protection provisions of the country’s Clean Air Act (CAA).

See related story, US Government and Private Industry Partners on New Commitments to Catalyze Global HFC Phase Down, on p. 26 of this issue.

Risk of increased use of counterfeit or poor quality refrigerants

Jon Black, Global Head of Chemicals and Refrigerants, Linde Gases Division, cautions that buyers of refrigerant gas will need to become increasingly vigilant as this type of legislation drives down the permitted use of compounds with high ODP and GWP.

“The refrigeration and air conditioning industry is primarily serviced by a pool of reputable global manufacturers and distributors of refrigerant gases, but the phase down of the substances that make up these gases creates a very real risk of price increases and the consequent incentive to smuggle in poor quality refrigerant gas via the black market,” he says. “Although the EU is being tightly regulated, other countries bordering EU states have no such restrictions. The burgeoning trade in counterfeit and poor quality refrigerants brings with it a host of potential consequences, ranging from poor process performance, to costly damage to capital equipment. In extreme circumstances, counterfeit and inferior refrigerants can also lead to loss of life.”

### The Counterfeiting Challenge

Counterfeit products infringe trademarks of other companies. Many refrigerants are manufactured by large international companies, marketed under brands such as Suva®, Isceon®, Forane®, Solkane®, and Genetron®. Additionally, major distributors such as Linde sell refrigerants under their own brand, providing customers with assurances over quality and reliability.

“Here the challenge is to address the substantial problem of counterfeit products marketed with packaging that has been copied, providing false promises to the customer,” Black continues. “This has become a real concern worldwide. On the simplest level, as with a fake Rolex watch, it might work well, but it also may not. The product may also contain environmentally damaging HCFCs or CFCs. Critically, the product doesn’t come with the usual guarantees. Both trademark protection and brand reputation is being violated and the customer has a false understanding of what’s been purchased.”

In early 2013 Saudi Arabia authorities seized nearly 3,500 cylinders of counterfeit refrigerant being fraudulently sold under the Honeywell Genetron brand name.



As leading gas supplier, Linde emphasizes that complacency is never acceptable. Correct processes must be in place to ensure product quality remains high.

The counterfeit refrigerant was marked as Honeywell’s Genetron 134a and was seized at Saudi Arabia’s Dammam Port en route from China.

### Gas quality

Black stresses however, that the bigger area of concern is poor quality of refrigerants. Driven by the expiration of many sales patents, global product shortages, and all the changes in legislation, there’s been a rise in the supply of poor quality refrigerant gases — many of which are smuggled into countries to avoid environmental supply quotas.

When an unexpected or poor quality gas is introduced to the system, the end user could experience performance issues such as poor energy consumption, leading to substantially higher energy costs. More seriously however, poor quality refrigerants may cause system failures. The refrigerant may consist of unexpected chemicals that are incompatible with the refrigeration system, causing damage to hoses, seals, and the like. In addition, the pressure temperature characteristics of the gas may be different to what is expected, leading to major issues such as flooding of the compressor and irreversible damage. Below par performance is also very damaging for chillers and refrigeration plants, as well as industrial, domestic, and tower air conditioning systems.

Black says as little as two percent of the wrong chemicals being present in a refrigerant mix can cause costly system failure. Methyl chloride, or chloromethane (R40), has been named by German compressor manufacturer GEA Bock as a constituent in poor quality refrigerants responsible for an increasing number of compressor breakdowns. GEA also warns of refrigerants found to be a cocktail of a refrigerant gas called 1,1,1,2-tetrafluoroethane (R134a), R22, and sometimes propane, that carry operational and safety risks.

There have also been a number of cases in which imitation products contain flammable gases such as propane, despite being labelled as containing non-flammable HFCs. While hydrocarbons such as propane and isobutane can be used in refrigeration applications and are indeed used in most domestic refrigerators and freezers, installers and service engineers must ensure that the installation has been designed to accommodate such highly flammable gases.

Incidents associated with poor quality refrigerants have made the headlines. The most serious in recent times occurred in 2011 when “reefers,” or refrigerated shipping cars, caused worldwide panic after multiple units exploded in Vietnam and Brazil, killing three dockworkers. Investigations revealed that the explosions had been caused by contamination of R134a with methyl chloride (R40). This refrigerant was in use in up to 8,000 container cars that underwent maintenance in Vietnam during that year. Two thousand of these units were grounded as a result.

According to ACR News, an information resource for air conditioning and refrigeration professionals, illegal imports of refrigerants from China via its bordering countries of Ukraine and Kazakhstan are also becoming a problem for Russia. While R22 is a key issue, it appears that the country still has problems with CFCs. Last year a Toyota Land Cruiser stopped at the Russia/Ukraine border was found to be carrying 20 cylinders of long-ago banned CFC refrigerant gas R12.

The American Air Conditioning, Heating and Refrigeration Institute (AHRI) suggested in a white paper that same year that the R40 contamination is not restricted to R134a and was also found in some counterfeit brand products. Refrigerants

contaminated with R40 pose the risk of explosion. The AHRI revealed that in addition to R40 and R22, R142b, R152a, and R12 also have been found mixed with R134a in newly filled refrigerant cylinders marked as containing R134a. There have also been instances of counterfeited brand name R134a cylinders being found to contain refrigerants other than R134a. Cylinder labels and packaging have also been counterfeited, making them unreliable. The AHRI recommended that end users should only purchase refrigerants from reputable, reliable sources.

“Additionally the use of inferior cylinders also has a bearing on the quality of the refrigerant. Inferior quality cylinders, sometimes falsely stamped as CE or DOT approved, bring with them the very real risk of explosion, leading to injury, loss of life, costly damage to capital equipment, and plant downtime,” stated Black.

All this points to the fact that the only way an end user can be confident that the refrigerant gases being used in an operation are of an acceptable quality, is to purchase these products from a reliable source.

“In addressing the scourge of counterfeit

and poor quality products out there, the message to customers is very clear,” Black concludes. “You should only source your refrigerants from well-known providers or companies who distribute the products for these main manufacturers. If a new distributor appears on the market, audit this com-

**You should only source your refrigerants from well-known providers or companies who distribute the products for these main manufacturers.**

pany well and be suspicious if the price appears too good to be true.

“We’re seeing the impact of counterfeit and poor quality refrigerants across the full spectrum, from poor plant operation to system breakdowns, environmental damage, and even fatalities. Unscrupulous operators have seen an opportunity to profit in a market that is being increasingly impacted by environmental legislation. Refrigerant supply shortages and pricing

volatility have provided an opportunity for these dealers to smuggle gas in order to circumvent the supply quotas. This gas is supplied outside of the usual high quality supply chains, providing real quality and safety issues, and breaking international environmental law.

“As suppliers, we can never be complacent. We must have processes in place that ensure product quality remains high. We must audit our supplier base to ensure only high quality providers are used and operate product quality management systems such as ISO 9001 that prove our operations, including storage and filling processes, are of high quality.

“Linde Gases Division has been a leading supplier of refrigerants to the refrigeration and air conditioning market for more than 50 years and sells these refrigerants in more than 40 countries throughout Europe, as well as in North America, Africa, Asia, and the South Pacific. Linde is an organization that prides itself on quality and we want to be a part of the solution.”

For more information contact [press@linde.com](mailto:press@linde.com)

**We specialize in providing the right equipment at the right time for industrial gas transport.**

# Tube Trailers for Lease

## Our 400+ Fleet Is Ready When You Are

P-Leasing is proud to offer the compressed gas industry a wide range of compressed gas transport equipment from our 400+ fleet.

- Variety of industry-standard specification tube trailer configurations
- Flexible lease terms from 1 to 120 months
- Equipment and service capabilities in Texas, North Carolina and Pennsylvania

**WESTERN GROUP**

- P-Leasing, Inc.
- Western Sales and Testing of Amarillo, Inc.
- BKC Industries, Inc.
- TEA Technologies, Inc.
- Portersville Sales and Testing, Inc.
- Western Valve, Inc.

**P- LEASING, INC.**

(806) 373-6811 • [www.westernsalesinc.com/P-Leasing](http://www.westernsalesinc.com/P-Leasing)  
 Amarillo, TX • Portersville, PA • Creedmoor, NC

Our fleet also includes ISO modules and ground storage units.