



The Mulvaney Pipeline

COOL UPDATE!

NEW REFRIGERANTS ARE CLOSER THAN YOU THINK

The need to reduce hydro fluorocarbon (HFC) refrigerant charge and emissions from supermarket refrigeration systems has become increasingly clear over the past ten years. By the end of the last decade, the next generation of Second Nature systems began entering the market and the key to the success of these systems was their use of carbon dioxide (CO₂) as a working fluid.

A number of reasons have factored into the search for alternatives to HFCs. Foremost among these were environmental concerns that lead initially to international agreements (i.e., Montreal and Kyoto Protocols) and then to regulations such as Section 608 of the Clean Air Act that banned the venting of CFC (e.g., R-11, R-12, etc.), and HCFC (e.g., R-22, R-401A, etc.) refrigerants. More recently proposed rule changes by governments at home and abroad (i.e., European Union F-gases regulations) have sought to even further reduce emissions of all synthetic refrigerants including HFCs (e.g., R-404A, R-410A, R-507, etc.). The impact of these regulatory pressures on system operators has added economic justifications to the move away from their use as not just the penalties for leaks has increased, but the taxation on their use (in Europe) has directly added to their cost.

As of 2010, no new equipment using R-22 could any longer be produced for sale in the US. By 2015, R-22 Domestic production will be by limited by 90% to 1989 levels, all but curtailing the use of any equipment except with existing or reclaimed stocks of R-22. Finally, in 2020, what little remaining production of R-22 there is will cease. In the years ahead, these trends are only expected to intensify with a more aggressive phasing-out of HCFCs and phasing-down of HFCs likely.

Clearly, the overarching need for sustainable approaches to refrigeration has strengthened as these forces upon the market have intensified. Consequently, refrigerant manufacturers have responded with a number of alternative approaches intended to address the environmental challenges supermarkets face. But despite various advances made by new synthetic alternatives such as R-1234yf that have no ozone depletion potential and very low global warming potential, costs for these options are expected to be high. For many, therefore, a more promising path points toward natural alternatives.

Favorable Characteristics of (R-744) has several key characteristics that make it an ideal choice as a refrigerant. To start with it is colorless, odorless, and naturally available in the atmosphere where as of mid-2011, it was measured at 392 ppm (0.039% by volume). Approximately 50% heavier than air, it is produced through natural processes including the carbon cycle in which it occurs as a product of respiration in animals and from fermentation of organic compounds. The most common means by which it is produced is through the liquefaction of air.

As a refrigerant, its high volumetric cooling capacity means that small pipe dimensions and small compressor swept volumes can be used. Because of its low liquid and gas viscosity, only small pressure losses occur in piping systems. Other R-744 benefits include high heat transfer coefficients and compatibility with most materials since it is noncorrosive and nontoxic. For companies that are focused on sustainability, responsible corporate citizenship, and smaller carbon footprints, CO₂ is an attractive choice.

The rationale for choosing CO₂ include these qualities:

- Colorless, odorless, and naturally occurring in the atmosphere
- Approximately 50% heavier than air
- Non-flammable and actually suppresses combustion
- High volumetric cooling capacity (small pipe dimensions and small compressor swept volume)
- Low viscosity in liquid and gas pipes (small pressure losses)
- High heat transfer coefficients
- Compatible with most materials: noncorrosive, nontoxic
- Companies are increasing sustainability, responsible corporate citizenship, and smaller carbon footprints.

Compared to other refrigerants, CO₂ is extremely affordable. At 2011 prices around \$1 per pound, it is truly an inexpensive refrigerant. Coleman grade (99.99% pure) used for refrigeration must be dry, but it can readily be obtained from welding companies and other industrial gas suppliers. As of late 2010, a fifty-pound cylinder of Coleman grade CO₂ from one supplier was priced at around \$61.

CO₂ Systems Manufacturers have pursued a number of different approaches to using CO₂ in commercial refrigeration systems. In addition to low-temperature secondary systems like those already in use in the U.S., other approaches include those that use subcritical cascade and trans critical refrigeration. Subcritical systems have been around for more than ten years in various configurations. More recently, European trans critical systems have grown from just a few in 2006, to more than a

thousand since then. Trans critical systems, particularly booster systems, continue to gain in popularity.

In North America over the past decade, supermarkets have begun adopting some of these approaches to CO₂. So far, CO₂ secondary fluid systems have been used for low-temperature applications. Following on the success of these systems, subcritical cascade (DX) systems have seen increasing use in low-temperature applications and some retailers have now begun to look even further at trans critical booster systems. Early in 2012, for instance, Canadian retailer Overwaita Food Group became the first user on the continent of a new generation of trans critical booster systems in one of their Vancouver, British Columbia stores.

The overwhelming success of CO₂ as a refrigerant and the different types of systems in which it is used has convinced more and more companies that it is a tremendously effective approach to sustainable and efficient refrigeration.

VW's new 261 MPG car – Sign me up now!

Volkswagen is now producing its futuristic-looking, fully functional carbon-fiber two-seater vehicle that is expected to return 261 mpg. In Volkswagen's own words, the XL1 is the most fuel-efficient production car in the world, with a European combined fuel consumption rating of 261 mpg. It uses clean diesel technology combined with electric hybrid drive systems. Production numbers will be low and this two-seater will be initially only available in Europe.



PHCC Archive Material at the Smithsonian Museum

The Smithsonian's National Museum of American History acquired archival materials from the Plumbing-Heating-Cooling Contractors (PHCC) National Auxiliary. The materials tell the story of both women's history and small business. The collection includes organizational records and 27 scrapbooks documenting the organization's 92-year-old history.

Originally named the Women's Auxiliary-National Association of Master Plumbers, the group was formed in 1919, just one year before the 19th amendment that gave women the right to vote in 1920. The collection, housed in the museum's Archives Center, includes photographs, charter books for state chapters and committees, financial records, various iterations of the by-laws, verbatim transcripts of annual meetings accompanied by reports from committee chairs and officers as well as ledger books detailing expenditures and income. The materials date from 1919 through 2011.

35 TRUISMS AND GOOD QUESTIONS

- 1 - I'd kill for a Nobel Peace Prize.
- 2 - Borrow money from pessimists -- they don't expect it back.
- 3 - Half the people you know are below average.
- 4 - 99% of lawyers give the rest a bad name.
- 5 - 82.7% of all statistics are made up on the spot.
- 6 - A conscience is what hurts when all your other parts feel so good.
- 7 - A clear conscience is usually the sign of a bad memory.
- 8 - If you want the rainbow, you got to put up with the rain.
- 9 - All those who believe in psychokinesis, raise my hand.
- 10 - The early bird may get the worm, but the 2nd mouse gets the cheese.
- 11 - I almost had a psychic girlfriend ... But she left me before we met.
- 12 - OK, so what's the speed of dark?
- 13 - How do you tell when you're out of invisible ink?
- 14 - If everything seems to be going well, you have obviously overlooked something.
- 15 - Depression is merely anger without enthusiasm.
- 16 - When everything is coming your way, you're in the wrong lane.
- 17 - Ambition is a poor excuse for not having enough sense to be lazy.
- 18 - Hard work pays off in the future; laziness pays off now.
- 19 - I intend to live forever... So far, so good.
- 20 - If Barbie is so popular, why do you have to buy her friends?
- 21 - Eagles may soar, but weasels don't get sucked into jet engines.
- 22 - What happens if you get scared half to death twice?
- 23 - My mechanic told me, "I couldn't repair your brakes, so I made your horn louder."
- 24 - Why do psychics have to ask you for your name?
- 25 - If at first you don't succeed, destroy all evidence that you tried.
- 26 - A conclusion is the place where you got tired of thinking.
- 27 - Experience is something you don't get until just after you need it.
- 28 - The hardness of the butter is proportional to the softness of the bread.
- 29 - To steal ideas from 1 person is plagiarism; to steal from many is research.
- 30 - The problem with the gene pool is that there is no lifeguard.
- 31 - The sooner you fall behind, the more time you'll have to catch up.
- 32 - The colder the x-ray table, the more of your body is required to be on it.
- 33 - Everyone has a photographic memory; some just don't have film.
- 34 - If at first you don't succeed, skydiving is not for you.
- 35 - If your car could travel at the speed of light, would your headlights work?



WHAT THE HECK IS IT?
If you can name the item pictured, you may
WIN A MULVANEY MECHANICAL LEATHER JACKET

If you e-mail your entry, you must write "NEWSLETTER CONTEST" in the subject line to avoid our SPAM filter. Please mail to janette@mulvaneyinc.com

***JUST LIKE THIS ONE!**



If multiple correct answers are received, a winner will be selected at random.

We received many great guesses, but only 3 contestants had the correct answer. The item pictured is an early 1940's wall to wall carpet stretcher that sold for a whopping 37 cents each! The final winner will be selected at random.
Rod Griffith
of Griffith Contracting
Jeffrey O. Brown
of Kalman Floor Company
Carl G. Russell of
Pearce/George J. Smith Realtors



WHAT'S GOIN' ON?

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|--------------------------|----------------------------|----------------|
| May 3- 5 th | NRA Expo and Conference | Houston, TX |
| May 5- 8 th | WINDPOWER Conf. and Expo | Chicago IL |
| May 7- 9 th | National Hardware Show | Las Vegas, NV |
| May 14- 17 th | SME EASTECH Conference | Springfield MA |
| Jun 20-22 nd | AIA Conference | Denver, CO |
| Jun 23-25 th | BOMA Conference & Expo | San Diego, CA |
| Oct 1-3 rd | ICUEE Expo | Louisville, KY |
| Oct 13-15 th | NECA Electrical Trade Show | Washington, DC |

About 2,000 people are injured in the U.S. each year from trying to pry frozen foods apart.



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