

MARKET SPOTLIGHT: DOMESTIC REFRIGERATION

#14

No Margin for Error: VTech in the Domestic Refrigeration Market

VTech was recently awarded with two major contracts in the Domestic Refrigeration market, one in the USA. The installation in the US is for HFC refrigerant, while the installation in Asia will feature a complete equipment line for Hydrocarbon refrigerants. Keys to entry into the Domestic refrigeration market include fast process time (typically around 30 sec), automation, and accuracy as well as, of course, product support. In such a fast-paced environment such as Domestic Refrigeration there is little margin for error.

In the case of the HC machines, charges are 30% smaller than an average HFC charge, which is already small (usually less than 5-6 oz), so charging accuracy is even more important.

Please contact Gordon Purkis at (404) 432-1629 or g.purkis@vtechonline.com for more information.

Domestic Refrigeration Spearheads Visibility in Environmentally-Conscious Consumers

Despite being responsible for only 2% of the energy used in the world and contributing similar percentages for Ozone depletion prior the adoption of the Montreal protocol in 1996, the Domestic Refrigerator is the most visible home appliance and is therefore the focus for manufacturers wanting to attract an environmentally-conscious consumer with technological innovations intended to contribute to a cleaner, more energy-efficient world.

Alternative refrigerants to CFC's were developed and adopted differently throughout the world in the mid 90's. While HFC and HCFC Refrigerants (e.g. R134a) were adopted predominantly in the US, Europe quickly turned to Hydrocarbons such as Isobutane R600. Japan and developing nations used both.

However, Hydrocarbons are beginning to be implemented in North America due to the global warming potential (GWP) of HFC and HCFC's (see [previous article in VTech e-news on GWP](#)). A domestic refrigerator using R600 may, at least initially, cost the consumer more than its R134a counterpart, somewhere between \$35-70, however to the environmentally-conscious consumer, this cost increase may appear negligible.

Primary Source: <http://www.arap.org/adlittle-1999/4.html>

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Domestic Refrigerator Production: Sameness is Beautiful

Domestic Refrigeration Cold Facts:

- Global Output rates top 100 million units annually.
- There are estimated to be 1 Billion Domestic Refrigerators in the world today.
- A domestic refrigerator has a lifespan of 15-20 years.
- Only 1.5% of all domestic refrigerators require service and repair to the sealed refrigeration circuit in their lifetime.
- A typical charge of 5 ounces only results in emissions of 0.5 oz (14g) in the refrigerator's lifetime.

Find VTech on AHAM

The Association of Home Appliance Manufacturer's website features a useful supplier guide, in which you can find VTech's enhanced profile with direct links to our website. To view our profile, [click here](#).



AHAM is an organization solely concerned with the domestic appliance market, which serves to inform and educate its members, providing essential services including assistance with:

- Government regulations
- Appliance Standards
- Certifications
- Industry Communications
- Technical Research/Support

Visit www.aham.org for more information.

TECHNICAL RESOURCES

Pre-evacuation Best Practices and Pump Quantification

Pre-evacuation Best Practices

The importance of adequate pre-evacuation in refrigeration systems cannot be stressed enough. We have, in previous articles, discussed in detail pumpdown time and sizing vacuum pumps (see our [VTech Technical Resources](#) section for these articles). Before we take a look at determining the number of pumps that are required to meet your productivity levels, it is helpful to take a look at a “Best Practice” list for evacuation, which primarily concerns components usually supplied to refrigeration manufacturers by outside vendors. None of this may be new to you but it can’t hurt to review:

- Compressor should be dried to a moisture content below 80 ppm and is pre-charged with nitrogen to keep it protected from outside moisture.
- The lubricating oil for the compressor is purified and degassed to reduce water content to 25 ppm.
- The filter drier is new, pre-treated and sealed.
- The evaporator, condenser and expansion capillary tube must be clean and dry (normally heated in an oven with an internal circulation of dry, hot air prior to being sealed by the manufacturer).
- The refrigerant is supplied in cylinders by quality manufacturers with low admissible moisture content (e.g. 0.001 ppm for R134a compared to 10ppm for R12).
- Components should be unsealed only just prior to brazing, exposed to the air no more than 10 minutes.



Vacuum pump Quantification: How many do you need?

The chart at right shows an estimate of the number of pumps needed to maintain certain productivity levels. It is assumed that each system is evacuated individually with a single pump (as opposed to a manifold type system). Longer times are recommended when the quality condition of the components, as given above, is in doubt and for lower temperature applications such as deep freezers. It is also advisable to add 1 or 2 pumps as backups on the carousel due to routine maintenance procedures.

Productivity in units/hour	Qty. of pumps based on evacuation time		
	10'	15'	20'
200	33	50	~66
150	25	~37	50
100	~16	25	~33
80	~13	20	~26
60	10	15	20
50	~8	~12	~16
40	~6	10	~13
30	5	~7	10
20	~3	5	~6

CUSTOMER FOCUS

Railcorp Climbs Aboard



A recent installation of a VTech 102 Automatic Dual Refrigerant Charging Machine in Australia at RailCorp further illustrates the versatility of the VTech charging equipment. RailCorp repairs and reprocesses air conditioning systems for commuter trains – a relatively large industry in Australia.

The particular issues with this application included high ambient temperatures to compensate for and large charge sizes – 4.5 to 17 kg/charge from 65 kg bottles. We were able to expand our normal size heater system to accommodate. Portable Reclaim units were also purchased to reclaim the old refrigerant from the system. While the productivity is low, 1-2 systems/day, the VTech 102 decreases their process time appreciably.

Our agent Rene Betschart of QS Australia Pty Ltd handled the sale and installation of the VTech Charging System. QS Australia Pty Ltd provides sales and service of HVAC equipment in the continent. “This was our very first entry into the Australian market with the VTech equipment,” said Mr. Betschart. “The VTech 102 was easy to install and train the operators on. Air conditioning and Refrigeration is a small but diverse industry, and while RailCorp is a niche application for sure, we’re happy to partner with them on this project.”

Electrofreeze Served

Demo Program Delivers Results at Electro Freeze

H. C. Duke & Son LLC of East Moline IL, who is also well known by their brand name Electro Freeze, recently participated in our demo equipment program and consequently installed a VTech 102 Automatic Evacuation and Refrigerant Charging machine.



Electro Freeze is a worldwide industry leader of frozen treat equipment and has been in business for over 80 years. Visit their website at www.electrofreeze.com

Initially, Electro Freeze contacted us in 2010 with the need to explore some increased automation in their production facility, to be budgeted for 2011.

We started with the basic VTech 100 system and were able to customize the equipment to meet their specific requirements.

This is essentially what we know: how to apply technology to a set of circumstances.

“We are very pleased with the experience of working with VTech,” says John Sacco, Business Unit Manager for Electro Freeze, who personally oversaw the project. “They delivered the machine, set it up, trained us and we were running on our own the next day. This led to us purchasing the machine and another identical unit a couple of months later.”

VTech’s demo equipment program is just what the word “demo” implies: a *demonstration* of our technical capabilities and application expertise, with eliminating risk to the end user. For more information, please contact Gordon Purkis at (404) 432-1629 or g.purkis@vtechonline.com

Product Minute: Got Options?

Available Options Allow Customers to Customize

Using Electro Freeze’s system as an example, the VTech 100’s standard features can be enhanced to improve its capabilities. Please see the table below:

Heated Refrigerant Supply	Movable Cart	Low Side Evacuation	Larger Vacuum Pump	Vapor Detection	Stack Light	Barcode Scanning	Data-Logging Software