

Blue Bottle® Technology for CFC Recycling

“From the beginning Halozone recognized that to reduce the emission of ozone depleting substances you had to have practical solutions and these solutions had to make sense both technically and economically. It is only this combination that would encourage ozone depleting substance (ODS) users to make ODS management and reduction a priority.”

Dusanka Filipovic
Halozone Technologies Inc.
Mississauga, Ontario

THE COMPANY

Halozone, a Canadian company, was established to market proprietary refrigerant capture, reduction and reclamation technologies. Building from the base of its Blue Bottle technology, the company has expanded to offer a variety of environmentally sound solutions to problems associated with ozone depleting substances (ODS).

The company is recognized for its leadership and commitment to providing innovative, economically viable solutions to the problem of ozone depletion. Halozone has annual sales of about \$5 million in Canada and more than \$2 million in exports. The company currently employs 40 people.

THE CHALLENGE

Every year thousands of tonnes of ODS are vented into the atmosphere.

Halozone saw that there were two steps to solving this problem. The first step was to eliminate the venting by recapturing the ODS during normal operation, servicing and decommissioning of air conditioners, refrigerators and chillers. The second step was to process the recaptured ODS so that they fit the specifications of the original manufacturer and could be used again.



Double Charge Guard capable of storing 2400 lb. of low pressure refrigerant.

THE SOLUTION

There are two keys to the Blue Bottle technology:

1) Halozite™ — This is a proprietary molecular sieve which selectively adsorbs halogenated hydrocarbon gases such as chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs).

2) Halozone's proprietary process for desorbing the gases from the Halozite without chemical breakdown.

Halozone's Blue Bottle cylinders adsorb halogenated hydrocarbons in gas streams with concentrations as low as 50 parts per million. Halozite, the active ingredient in the Blue Bottle cylinder, is highly selective, does not deteriorate with time and repeated use and can capture virtually 100 per cent of the refrigerant gas.

Halozone's reclamation plant operates a patent protected process for desorbing the halogenated hydrocarbons from the Halozite. There is no chemical breakdown in the process and the ODS are returned to an ARI-700-93 level of purity.

The cylinders and Halozite are regenerated in the process. Both are immediately reusable.

The plant is capable of handling up to 500 tonnes of ODS annually. Further, it offers distillation processes for reclaiming large quantities of used or contaminated refrigerants from conventional pressurized containers,

Results of demonstrations show that the Blue Bottle technologies work for CFC 11, 12, 113, 500, 502; HCFC 141b, 22; HFC 134a and halon 1301.

TECHNOLOGY APPLICATIONS

Halozone has marketed this technology successfully. Further, the company has developed commercial products and services to help technicians capture refrigerant when they are servicing refrigeration and air conditioning equipment.

Purge Capture System —

It monitors and captures purge emissions from low pressure centrifugal chillers.

Zero Emission Purge Canister —

It captures chiller refrigerant from the dilute air stream of a high efficiency purge so that no emissions escape.

Charge Guard —

It transfers liquid refrigerant from a low-pressure centrifugal chiller to a high-pressure secured vessel. The Charge Guard starts working when it senses that the pressure is building up in the chiller so that the liquid is transferred before a burst disk or ruptured relief valve vents refrigerant. The Charge Guard may also be used to transfer liquid

refrigerant safely back and forth from chiller to container during major service work.

Refrigerant Monitoring

Systems — They feature microprocessor-based control circuits with four to 16 field sensors which are capable of sensing CFC, HCFC and HFC refrigerants. This ensures an accurate early warning of refrigerant gases escaping in the mechanical room.

More than 100 customers, many of them blue chip companies, are using Halozone's refrigerant capture products and reclamation services regularly.

Halozone's On-Site Division has taken the Halozite sieve and used it to capture another ODS, methyl bromide. The Bromosorb™ unit captures the methyl bromide used in agricultural fumigation chambers.

The company applied a similar design to the Halosorb™ unit. A large American chemical manufacturer has bought this unit to capture CFC emissions in the manufacturing process. Halozone is negotiating with many other companies which are interested in buying Bromosorb and Halosorb units for their industrial processes.

ENVIRONMENTAL SIGNIFICANCE

The products and services built around the Blue Bottle technology are helping to reduce the volume of ODS released into the atmosphere.

PARTNERSHIP IN POLLUTION PREVENTION & RESOURCE CONSERVATION

The initial phase of the development of this technology was funded partially by the Ontario Ministry of Environment and Energy. Subsequent commercialization of the technology was supported in part by Industry Canada.

Industrial companies located in Ontario may participate in ministry/industry programs which will help them to:

- * reduce, reuse and recycle solid waste;
- * remediate historic pollution and destroy hazardous contaminants;
- * reduce or eliminate liquid effluent and gaseous emissions;
- * use energy and water more efficiently.

Equipment and service supply companies can benefit from the information provided on technologies identified for business development.

FOR FURTHER INFORMATION, PLEASE CONTACT

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For information on the Ministry of Environment and Energy assistance to industry, please contact the Industry Conservation Branch at (416) 327-1492 or Fax (416) 327-1261.

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This project profile was prepared and published as a public service by the Ontario Ministry of Environment and Energy. Its purpose is to transfer information to Ontario companies about a new technology or product.

