VATIS Update Ozone Layer Protection . Jul-Aug 2007

Contents

THE SCIENCE OF OZONE LAYER

Antarctic ozone scenario

As of 27 July, the winter polar vortex at Rothera, Halley and Vernadsky/Faraday stations was in place with high ozone values, exceeding 400 DU in places outside the vortex. Inside the vortex, ozone values were around 250 DU. Owing to the cold temperature of the ozone layer, stratospheric clouds have formed. Some areas of Antarctica saw ozone values down to ozone hole levels (less than 220 DU) in mid-June, suggesting the possibility of early chemical depletion, combined with some dynamic processes. In mid-July the minimum temperature of the Antarctic stratosphere at 70 and 50 hectopascal (hPa) was near the normal, although that at 30 hPa was below the normal, suggesting the likelihood of another strong ozone hole year.

Source: www.antarctica.ac.uk

New clues to ozone depletion

Large quantities of ozone-depleting chemicals have been discovered in the Antarctic atmosphere by researchers from the University of Leeds, the University of East Anglia and the British Antarctic Survey. The atmospheric chemists carried out an 18-month study of the make-up of the lowest part of the earths atmosphere on the Brunt Ice Shelf, about 20 km from the Weddell Sea. They found high concentrations of halogens bromine and iodine oxides which persist throughout the period when there is sunlight in Antarctica (August through May). Using hi-tech equipment, a beam of light was projected across the ice shelf and the spectrum of the reflected light analysed and chemical levels measured. The work was carried out in a new atmospheric observatory at Halley Station, operated by the British Antarctic Survey, and was supported by funding from the United Kingdoms Natural Environment Research Council.

An unexpected finding was the large quantities of iodine oxide, since this chemical has not been detected in the Arctic. The iodine oxides form tiny particles (a few nanometres in size) which can grow to form ice clouds, with a consequent impact on the local climate. Recent satellite observations by one of the team, Dr. Alfonso Saiz-Lopez, have affirmed that iodine oxides are widespread throughout coastal Antarctica.

Source: www.sciencedaily.com

ODS PHASE-OUT IN INDIA

Solvent sector: conversion of CTC and CFC-113

The following are among the projects implemented in the solvents sector by the United Nations Industrial Development Organization (UNIDO):

Replacement of CFC-113 as cleaning solvent to trichloroethylene (TCE)

The project, with a budget of US$150,607, will phase out the use of 20 MT of CFC-113 at Bharat Electronics Limited, Bangalore, Karnataka. CFC-113 is used as cleaning solvent in the manufacture of vacuum interrupters required for power supply and distribution. The major cost item of about US$150,000 is for a closed ultrasonic cleaning unit with TCE solvent, attached with dryer and solvent/wastes recovery unit. Incremental annual operating savings are US$21,779. About 16 ODP tonnes of CFC-113 consumption from the solvent sector will be eliminated, which constitutes 0.57 per cent of the ODS solvent consumption.

Conversion of carbon tetrachloride (CTC) as cleaning solvent to TCE

The US$238,709 project will phase out the use of 18.33 MT of CTC at Engineer Industries in Mazgaon, Maharashtra. CTC is used as cleaning solvent in the manufacture of coils, tanks and condensers required for cooling and refrigeration equipment. The major cost item is US$150,000 for two top-loading degreasers with TCE as solvent. Incremental annual operating costs are US$16,246. The project will eliminate 20.16 ODP tonnes of CTC consumption from the solvent sector, which constitutes 0.50 per cent of the ODS solvent consumption.

Another project, with a budget of US$244,879, will phase out the use of 20.69 MT of CTC at Sapna Coils Ltd., Palghar, Maharashtra. CTC is used as cleaning solvent in the manufacture of coils and condensers necessary for refrigeration and air-conditioning. The major cost item is US$197,000 for two closed degreasers, one compressed air/nitrogen flushing unit with TCE as solvent, and solvent/wastes recovery unit. Incremental annual operating costs are US$10,394. The project will eliminate 22.76 ODP tonnes of CTC consumption from the solvent sector.

Replacement of CTC as process solvent to ethylene dichloride (EDC)

A US$288,181 project will phase out the use of 86 MT of CTC at Doctors Organic Chemicals Limited, Tanuku. CTC is used as process solvent in the manufacture of ibuprofen. The total capital costs are US$287,745. The major cost items are US$224,229, consisting of two new glass-lined reactors, one quencher, two twin condensers, one high vacuum set up with steam jet ejectors, electrical and effluent treatment facilities. The incremental operating cost calculated on a one-year basis is US$6,580. The project will eliminate 94.6 ODP tonnes of CTC consumption from the solvent sector, which currently constitutes 40 per cent of the countrys ODS consumption.

Another project, with a budget of US$259,063, will phase out the use of 25.38 MT of CTC at Satya Deeptha Pharmaceuticals Ltd., Humnabad, Karnataka. CTC used by the unit as process solvent in ibuprofen production will be replaced with EDC without increasing the production capacity. The major items to be procured are: new reactors for US$53,203, a high-vacuum distillation system for US$35,700, a refrigeration plant for US$17,440, US$10,326 for civil construction and US$23,256 for an effluent treatment plant. The incremental operating cost for one year is US$37,882. When completed, this project would have eliminated 25.38 tonnes of CTC consumption (27.92 ODP tonnes) from the solvent sector in the country.

Source: www.unido.org

IN THE NEWS

ASHRAE partners with United Nations on emission reduction

Two international organizations focused on the environment have teamed up to reduce emissions and encourage energy-efficient refrigeration and air-conditioning systems and building designs. As the 20th anniversary of the Montreal Protocol approaches, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the United Nations Environment Programme, Division of Technology, Industry and Economics (UNEP-DTIE) have formalized a pact to co-operate in several technical issues such as assessing and addressing the remaining CFC-based chillers.

According to the president of ASHRAE, Mr. Terry Townsend, ASHRAE and the heating, ventilating, air-conditioning and refrigerating (HVAC&R) industry are responding to growing global demand for new technologies, which do not contribute to ozone depletion and are energy efficient. Energy efficiency is a key issue because the burning of fossil fuels to generate electric power is considered a major greenhouse gas emitter. By partnering with UNEP-DTIE, we can further our respective work by mutual exchange of technical guidance. ASHRAE and UNEP had previously collaborated on a smaller scale with the signing and implementation of a regional co-operation agreement between the UNEP regional office in West Asia and ASHRAEs local chapters.

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Source: www.ashrae.org

DuPont measures to strengthen intellectual property

In an effort to protect the intellectual property of its non-ozone-depleting refrigerants, DuPont has announced enforcement actions in four countries against local companies infringing on its patents. Suva 407C and Suva 410A are the leading hydrofluorocarbon (HFC) refrigerants for air-conditioning and heat pump applications, for which DuPont has patents in various countries including China, India, Malaysia and Spain, among others.

In China, DuPont recently reached a settlement with a leading equipment manufacturer regarding the infringement of the DuPont patent for HFC-407C in Spain. The refrigerant was exported to Spain in equipment manufactured in China. This settlement is part of an ongoing programme to gather evidence on Chinese equipment makers suspected of exporting air-conditioning equipment containing HFC-407C, without proper licences from DuPont, to European Union nations covered by DuPont patents. The company has also filed legal action in the Chinese courts for HFC-410A patent infringement against two local Chinese fluorochemical producers.

Apart from the actions initiated in China, DuPont filed an infringement suit and was granted an interim interlocutory injunction against refrigerant re-sellers in Malaysia, where DuPont owns a patent covering HFC-

407C. The injunction, issued by the High Court of Malaysia at Kuala Lumpur, restrains two re-sellers from selling and importing the product into Malaysia for the period of the interim injunction. Additional actions include a legal filing in the High Court of Delhi for both products in a patent infringement case against a refrigerant re-seller in India. DuPont estimates the global fluorochemicals market for refrigerants at more than US$2 billion, with 20-30 per cent representing refrigerants for air-conditioning and heat pump applications.

Source: www.azom.com

Campaign to lower ODS emissions shifts to higher gear

In the Philippines, efforts to decrease harmful emissions of ozone-depleting substances into the atmosphere gained momentum with the recent groundbreaking of the countrys first refrigerant reclamation facility at Delsa Chemicals and Multi-Products Inc. in Cupang, Muntinlupa City. DENR Secretary Mr. Angelo T. Reyes said that the establishment of the reclamation facility is part of the implementation of the Philippines National Chlorofluorocarbon Phase-out Plan (NCPP). The NCPP outlines the strategy adopted to phase out the remaining local CFC consumption, in compliance with the Montreal Protocol. Also, establishment of the facility would cushion the effects of the implementation of the CFC phase-out plan, which is expected to result in an undue increase in the pricing of CFCs in the market.

The reclamation project is a joint undertaking of the Philippine Association of Refrigerant Importers Inc. (PARII) and the DENR. PARII will lead the operation of the facility under a usufruct agreement with the DENR. PARII comprises six companies Abomar Sales Inc., Delsa Chemicals and Multi-Products Inc., Genetron Refrigeration Industries, Manhattan Chemicals, Wise and Company Inc., and Thermo Engineering Supply duly registered as importers of a wide range of refrigerants and other industrial gases. The reclamation facility, expected to be operational by the end of this year, will accept used and recovered refrigerants such as CFC-11, CFC-12, HFC-134A, HCFC-22 and HCFC-502. These materials will be reprocessed to obtain products that conform to the standards of the Air-Conditioning and Refrigerants Institute-700 before they are allowed to re-enter the market.

Source: www.denr.gov.ph

CFC-free products promoted

In the Philippines, Mr. Raul Aguilos, Director of the Land Transportation Office (LTO), Regional Office 8, and Ms. Maribel Munsayac of the Environmental Management Bureau (EMB) have advised consumers planning to buy new cars, refrigerators and residential air-conditioning units to go in for CFC-free models. They informed that by the year 2010, equipment based on Freon (CFC-12), will have to be phased out.

Mr. Aguilos expressed that the Department of Transportation and Communication LTO and EMB and the Department of Environment and Natural Resources (DENR) are implementing a regulation, under DOTC-DENR Joint Administrative Order No. 3 series of 2006, to inspect car air-conditioning systems as a requirement for renewal and registration. Moreover, vehicles manufactured from 1999 onwards should have HFC-134a air-conditioning systems. Any vehicle from among the said models found to have been converted back to CFC-12 would not be allowed to register or renew registration with the LTO unless the air-conditioning system is changed back to a non-CFC system.

Source: www.pia.gov.ph

China shuts down CFC-producing plants

China, one of the worlds largest producers of two ozone-depleting chemicals, has fulfilled its promise to phase out these substances ahead of schedule by banning the production and import of CFCs and halon. The remaining six factories involved in the production of CFCs have ceased operations, marking the end of the manufacture of ODS in the country. This step has put China two-and-a-half years ahead of the Montreal Protocols 2010 deadline for the phase-out of CFCs and halon. As the biggest producer and consumer of CFCs and halon among developing nations, China has disposed of about 100,000 t of CFCs and about 80,000 t of halon since it signed the Montreal Protocol in 1991.

Source: www.chinadaily.com.cn

Conference on ODS

Delegates from 11 countries gathered in Mongolia to review enforcement of the Montreal Protocol, which calls for combating the usage of ozone-depleting substances (ODS). The conference was mainly attended by Asia-Pacific nations, as well as a few European countries. This year marks the 20th anniversary of the Montreal Protocol. The Ulaanbaatur conference focused on working to halt the illegal use and trade of ODS and seeking environment-friendly alternatives for governments to promote. Since the Montreal Protocol was created, 150 countries have signed the treaty, including China.

Source: www.mongolia-web.com

ODS phase-out in the Philippines

The Philippines, which ratified the Montreal Protocol in 1991, is committed to reduce and eventually eliminate the production and consumption of ODS. To this end, the government conducts orientation briefings nationwide through the Environmental Management Bureau (EMB) of the Department of Environment and Natural Resources (DENR).

In Region 8, EMB recently conducted an orientation briefing on establishing a Regional Information Centre (RICN). This programme was attended by representatives of the target members of the RICN government entities, local government units, members of the media and school administration. The participating agencies have committed their involvement in the campaign, for example, by conducting information dissemination activities to raise awareness of traders and users of ODS.

According to Mr. Bienvinido Lipayon, the DENR 6 EMB OIC Regional Director, one of the most effective ways to reduce the demand for ODS is through intensive information, education and communications (IEC) campaign. The RICN has been identified as a cost-effective method to deliver these ozone protection messages by multipliers, one of the target audience of the IEC campaign against ODS. They are the direct recipients of the message who re-echo the message to other targets. Most common examples of multipliers are non-government organizations, journalists, teachers and information officers of different organizations.

Source: www.pia.gov.ph

Progress of Malaysias commitment to the Protocol

The Natural Resources and Environment Minister of Malaysia, Mr. Azmi Khalid, has stated that the decline in both imports and consumption of CFCs, from 3,442 MT in 1995 to 662 MT in 2005, is clear evidence supporting the countrys success in implementing the Montreal Protocol. According to Mr. Khalid, sound policies, legislation and building of smart partnerships between industries and government agencies led to this success. Malaysia is to completely phase out the consumption of CFCs by 2010.

Source: www.bernama.com.my

EPA allows use of nPB in place of ODS

The Environmental Protection Agency (EPA), the United States, allows the use of n-propyl bromide (nPB) through its Significant New Alternatives Policy (SNAP) programme. The non-inflammable organic solvent has been permitted for use as an alternative to ODS in metals, electronics, and precision cleaning. EPA is also proposing to allow the use of nPB in specific coating applications while prohibiting its use in aerosol solvents and as a carrier solvent in adhesives. At elevated exposure levels, nPB causes reproductive and neurological toxicity.

The SNAP programme reviews ozone-depleting chemicals and determines acceptable alternatives. In aerosol solvents and adhesive end uses, other alternatives are readily available that do not damage stratospheric ozone and pose less risk overall to human health and the environment. As required by the Clean Air Act, this regulation considers alternatives to ODS that contribute to the success of the Montreal Protocol. Contact: Environmental Protection Agency, United States of America.

Website: www.epa.gov /ozone/snap.

Source: www.newsblaze.com

HFC-134a is not a sustainable refrigerant!

A new study has revealed that the amount of HFC-134a leaking into the atmosphere in 2004 equals the total amount of all HFC-134a produced until 2000. Car manufacturers at the SAE Alternate Refrigerant Symposium, organized in the United States, were thus urged to choose a sustainable refrigerant. Mr. Frank Wolf from Obrist Engineering stated that while producing a certain amount of a toxic, ozone depleting or high global warming refrigerant, 50 per cent of it is present in the atmosphere with all associated environmental and health risks.

Mr. Wolf presented a recent study undertaken by the chemical industry proving that, as HFC-134a air-conditioning systems worldwide are getting older, leakage of this refrigerant is increasing steadily, accelerating climate change. The study shows that in 2004, the accumulated amount of produced HFC-134a was equivalent to nearly 2,000 million metric tonnes. In the same year, the total amount of HFC-134a produced until 2000 approximately 1,000 million metric tonnes of CO_2 equivalents was already completely released to the atmosphere. This release equals more than 50 per cent of the production. Moreover, the total amount produced in 2004 is the same as four times the annual emissions of California, or 20 per cent the annual emissions in the United States. Despite efforts to limit refrigerant leakage through better servicing or tighter components, the leakage of HFC-134a will still increase, the study predicts. Although better engineering may slow down the release of refrigerants, it will never completely halt this process.

Source: www.r744.com

REFRIGRATION/AIR-CONDITIONING

Compressed air dryer range

In-Sullair Corp., the United States, has introduced SRC refrigerated cycling air dryer that utilizes Montreal Protocol-compliant and environmentally green R-407C refrigerant. R-407C is also more efficient than other refrigerants, offering lower power consumption, reduced refrigerant needs and smaller refrigerant compressor requirements. Designed to lower the cost of drying compressed air, the dryer is available in 10 models ranging from 150 to 1,000 scfm. These dryers offer a wide range of operating and performance features to help users reduce energy consumption for greater cost savings by matching power consumption to actual operating conditions. The SRC dryers feature a control system that monitors thermal mass and dew point temperature. System includes single panel for access to all components and condenser section positioned separate from the main body of the dryer, allowing proper air flow and condenser cooling during maintenance.

Standard on SRC-250 to SRC-1000 models, Sullair employs the reliable and energy-saving scroll compressor. Other standard features on dryer models SRC-400 to SRC-1000 include a unique zero-loss drain integrated into the heat exchanger to collect condensate. While the Sullair SRC-150 through SRC-200 cycling air dryers are equipped with simple analogue indicators and controls, models SRC-250 and above feature advanced, user-friendly microprocessor controls. These controls include such features as digital multifunctional display and dew point temperature read-out, multiple alarm safety and extensive programmability. For those who require remote monitoring capabilities, Sullair offers an optional RS-485 connection in the SRC dryer that provides remote start, stop, alarm reset, and dew point, temperature, alarm and hour counter monitor. The SRCs advanced control system also monitors both the thermal mass and dew point temperature for more accurate control and anticipated load variations.

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Source: www.news.thomasnet.com

Eco-friendly and energy-efficient air-conditioner

Evolution 180A air-conditioner from Bryant Heating and Cooling Systems, the United States, provides quiet, luxurious comfort, and years of environmentally sound, energy-efficient performance. With energy efficiency available up to 20 SEER, its savings on cooling costs directly benefits the consumer by reducing long-term energy costs. The model recently bagged the prestigious Consumers Digest Best Buy award. This is the third Consumers Digest Best Buy recognition that Bryant has received in the premium category. The companys trio of award-winning heating and cooling products now includes the Evolution 180A air-conditioner, the Evolution Plus 90i/Plus 95i or 95i gas furnace, and the Evolution 288A heat pump. The criteria for awarding the Consumers Digest Best Buys include a combination of performance, durability, warranty coverage, styling, efficiency, ease-of-use, and maintenance and servicing requirements.

Puron refrigerant from Bryant keeps homes cool without using ozone-depleting HCFCs. The top-of-the-line unit also features a variable-speed outdoor condenser fan motor and an exclusive AeroQuiet System II for sound as low as 70 dBA, ensuring quiet operation inside and out. The 180A system raises the bar for humidity control with Bryants Perfect Humidity function, which enhances home comfort with maximum humidity control over that of standard air-conditioners.

Contact: Bryant Heating and Cooling Systems, United States of America.

Website: www.bryant.com

Source: www.sev.prnewswire.com

R-22 alternatives

The use of non-ozone-depleting R-417A as a direct replacement for R-22 has been discussed in a paper prepared by Mr. Muhammad Ali Khalid, an R&D Engineer at S.a Bros. Pvt. Ltd., Pakistan. R-417A replaces R-22 in multiple applications, saves time and money. This non-inflammable long-term replacement for R-22 is a zeotropic three-component blend. It does not require any unit modification and can be used in compressors designed for R-22.

R-417A can be used with mineral, AB or POE oils and is rated A1 by ASHRAE. It is comparable to R-22 in terms of performance across the R-22 temperature range. R-417A can be topped off following repair of a system leak. Application areas include air-conditioning, split systems, dairy chillers, refrigerated transport, cold stores, reach-in storage, self-contained display cabinets, walk-in coolers, bakery applications, etc. R-417A is an effective refrigerant for process cooling and has proven its effectiveness at higher temperatures, giving the added benefit of lower discharge temperatures. It is a well-suited and proven refrigerant for cold store applications. It works well from margarine and fruit storage at 3C, to medium temperature storage at -30C.

R-290, a hydrocarbon, is an efficient naturally occurring refrigerant with properties similar to R-22, but without the ozone depletion potential and an extremely low global warming potential. Though this alternative is environment-friendly, it is highly inflammable and should only be used after utmost consideration has been given to safety. Ammonia, another substitute, is a highly efficient refrigerant that has been successfully utilized in industrial applications for many years. It is, however, toxic and careful consideration must be given to any design or application.

Contact: Mr. Muhammad Ali Khalid, R&D Engineer, S.a Bros. Pvt. Ltd., Pakistan.

E-mail: abbasi@sabro.com.pk

Source: www.refrigeration-engineer.com

Geothermal and water-source heat pumps

Climatemaster Inc., the United States, recently added 6 t units to its Tranquility 27 product line, a series of geothermal and water-source heat pumps that utilize EarthPure (HFC-410A) zero ozone depletion refrigerant.

Unique Tranquility 27 features such as double-isolated compressor mounting and ECM variable-speed fan motor make it one of the quietest units on the market. Standard features include foil-backed air handler insulation, MERV11 pleated 2-inch filters (standard on residential units) and dehumidification mode. Tranquility 27 heat pumps are available in sizes 2 t (7.6 kW) through 6 t (21.1 kW) with efficiencies up to 31.5 EER and 5.1 COP.

Tranquility 27 heat pumps are rated for water loop heat pump, ground loop heat pump and ground water heat pump applications in upflow, downflow, horizontal and split system configurations.

Contact: Climatemaster Inc., 7300 SW 44th St., Oklahoma City, OK 73179, United States of America. Tel: +1 (405) 7456 000.

Source: www.renewableenergyaccess.com

Refrigerant composition and refrigerating circuit

In Japan, Sanyo Electric Co. and Sanyo Electric Biomedical Co. Ltd. have been involved in the development of a green refrigerant composition that is capable of maintaining the performance of a conventional refrigerating circuit without any modification. Such a refrigerant composition and a refrigerating circuit using the said composition has been investigated. The refrigerant composition comprises R-245fa, R-125, R-508A and R-14. This composition has no possibility of causing depletion of the ozone layer. Further, since the composition is non-combustible, possible combustion can be prevented even if it leaks. The refrigerating circuit is a single ultra low-temperature unit substantially comprising a condenser, evaporator, compressor, and heat exchangers, and gas-liquid separators disposed in a multi-stage manner, wherein any of the above non-azeotropic mixed refrigerant blends is used.

Source: www.freepatentsonline.com

Automotive CO2 technology

The Austrian company Obrist Engineering GmbH, a specialist on R-744 technology for mobile air-conditioning systems, focuses primarily on the promotion of R-744 technology for the automotive sector. The company delivers cost-effective and environmentally friendly solutions that cater to the high demands of the automobile industry. Obrists services range from the calculation of system performance coefficients, and the execution of necessary safety tests, to the control and tuning of complete R-744 systems in cooperation with an external engineering office specializing in measurement instrumentation and cybernetics.

Source: www.r744.com

AEROSOLS

Foam and process for a CO2 blowing agent

Cryovac Inc., the United States, has developed a process for producing thermoplastic foam. The process includes melting a thermoplastic polymer to produce a polymer melt; introducing a carbon dioxide (CO2) blowing agent into the polymer melt; adding to the polymer melt one or more additives selected from the

group consisting of polysiloxane and mineral oil; and extruding and foaming the melted polymer melt, blowing agent, and one or more additives to produce thermoplastic foam. The resultant thermoplastic foam can be thermoformed into various foamed articles, e.g. foam packaging trays.

The quality of foams made from a CO2 blowing agent, and particularly 100 per cent CO2, has been found to substantially improve with the addition of one or more of the foregoing additives, i.e. polysiloxane, mineral oil and, optionally, polyolefin to the polymer melt during the extrusion and foaming process. Such foams have far less ruptured cells, surface cracks and corrugation than comparable foams made with a CO2 blowing agent but which lack the additives of the present method.

Source: www.freepatentsonline.com

Blowing composition and method for producing foam

Daikin Industries Ltd., Japan, have studied a blowing composition comprising at least one member selected from the group consisting of difluoromethane (HFC-32), 1,1-difluoroethane (HFC-153A) and 1,1,1-trifluoroethane (HFC-143A), and at least one member selected from the so-called second component group consisting of propane, i-butane, n-butane, pentane, isopentane, cyclopentane and dimethylether. A method for producing foam using the composition has also been investigated.

Studies have resulted in a blowing composition comprising 95-5 per cent of at least one member selected from the first group and 5-95 per cent of at least one member selected from the second component group. The investigation further offers a method to produce foams using the said blowing composition. The blowing composition and the foam obtained by using the composition can be applied to a thermoplastic resin and polyurethane.

Website: www.freepatentsonline.com

Heat-insulating foam board

Three Japanese companies Asahi Fibre Glass Company, Prime Polymer Company and Kawata Manufacturing Company have jointly developed a constructional heat-insulating foam board of a polyolefin resin composition. The foam board exhibits excellent extrusion foamability and heat insulation performance. It is recyclable and can be produced at a low cost continuously and stably. The board is produced by expanding a polyolefin resin composition containing a linear polypropylene resin with a melt tension of 5-30 g at 230C with a blowing agent containing supercritical carbon dioxide as the essential component at an expansion ratio of 10 or above.

Source: www.wipo.int

Greener and cooler insulation

Precision, the United Kingdom-based company, has become the first to use a new greener foam insulation across its commercial range of fridges, freezers, prep counters and back-bar coolers. Unlike conventional polyurethane foams, which are manufactured utilizing polymers derived from petrochemicals, the new Envirofoam R2007 from IFS Chemicals is largely sourced from renewable vegetable materials such as rapeseed oil, which accounts for more than 70 per cent of its polyol content. The new foam also requires only 10 per cent of the energy needed for producing petrochemical-based polyols, while the blowing agent

contributes little to global warming and has no adverse effect on the earths ozone layer.

Source: www.catererresearch.com

HALONS

Clean agent systems

Fenwal Protection Systems, the United States, offers a high-performance fire suppression system developed to provide economic fire protection for large projects and specialized applications. The Fenwal Phoenix system utilizes FM-200 and is considered the best alternative as a drop-in replacement for halon systems. It is widely used in the protection of museums, telecom facilities, and data storage systems for banks and financial institutions. Key features of this system include:

Increased flow performance allows for remote location of cylinders;

Provides active fire protection when coupled with Fenwals various 24 h detection and control systems;

Increased performance deems it a virtual drop-in replacement for installed halon-1301 systems;

Listed and approved with 3-way directional valves for the economic protection of multiple enclosures;

Uses a patented fan type nozzle for immediate vaporization of the agent as it discharges;

Uses separate nitrogen storage as a propellant to obtain higher mass flow rates; and

Can be designed to achieve 140 per cent agent in pipe and still achieve a 10 second discharge at the nozzle.

Contact: Fenwal Protection Systems, 400 Main St., Ashland, MA 01721, United States of America. Tel: +1 (508) 8812 000.

Source: www.fenwalfire.com

Method for extinguishing fire

In Japan, the Agency of Industrial Science and Technology has studied a method to extinguish fires utilizing a gaseous fire-extinguishing agent having as an active component a polyfluoro-tertiary amine represented by (CF3)2NRf, where Rf stands for a polyfluoroalkyl group of 1-4 carbon atoms or a polyfluoroalkenyl group of 1-4 carbon atoms. The thermally and chemically stable polyfluoro-tertiary amines are generally synthesized through electrolytic fluorination of the concerned amines. Moreover, they are more readily decomposable than PFCs.

Source: www.freepatentsonline.com

Extinguishing fires by generating nitrogen gas

NAWCWD China Lake, the United States, has developed a novel method for extinguishing fires by generating nitrogen gas. The new pyrotechnic fire-extinguishing method uses solid compositions that generate large amounts of nitrogen gas when brought into contact with fire. This technology can be used to fight fires confined to an area that is not easily accessible or where the occurrence of fires is potential but unpredictable, such as in plane crashes or oil-refinery accidents.

Pyrotechnic fire extinguishing is also suitable in situations where it is impractical to store and maintain traditional carbon dioxide extinguishers, which are under high pressure and should be periodically checked for leakage. The pyrotechnic extinguishers gas can be generated at the fire site or the composition can be stored in a reservoir equipped with an ignition device and the gas transported from there through ducting to the fire site. Newer gas generators with comparable performance to halon but of lower weight would be particularly useful in applications where weight is a critical factor, such as in aircraft.

Contact: Commander Naval Air Warfare Centre Weapons Division (NAWCWD), Technology Transfer Office, Administration Circle Stop 1002, China Lake, CA 93555-6100, United States of America. Tel: +1 (760) 9391 074

E-mail: chlk-tech-trans@navy.mil

Source: www.nawcwd.navy.mil

Effective halon-alternative fire extinguisher

Fireaway LLC, the United States, offers Stat-X family of fire suppression systems for extinguishing fires safely and effectively. The fire extinguishant is a patented potassium-based aerosol that suppresses fire by chemically interfering with the free radicals of flame. It is ecologically safe, 10 times as effective as halon replacements with nil ozone depletion and no global warming potential.

The Stat-X application technology requires no pressure vessels, manifolds, nozzles or pipe work, factors that result in significant installation and maintenance savings. This halon alternative is based on aerosol technology developed and applied to fire protection by a team of engineers and manufactured to ISO 9001:2000 standards.

Contact: Fireaway, 11503 K-Tel Drive, Minnetonka, MN 55343-8845, United States of America. Tel: +1 (952) 9359 745; Fax: +1 (952) 9359 745

E-mail: info@statx.com

sales@statx.com

Source: www.statx.com

Eco-friendly fire inhibitor

MSE Enviro-Tech Corp., the United States, is focusing its Hartindo AF21 marketing strategy on the critical need for an effective, environmentally friendly fire inhibitor for mattresses, including those found in all conventional beds, sofa beds, futons, cribs, fold-out beds, etc. Mattresses have conventionally been treated with fire inhibitors/retardants containing polybrominated diphenyl ethers (PBDEs), which are increasingly being recognized as a serious environmental threat. The AF21 fire inhibitor is said to be the perfect replacement solution to PBDEs.

Hartindo AF21 is a 100 per cent effective, water-based, colourless, non-toxic, non-corrosive and environmentally friendly fire inhibitor. All natural materials protected with AF21 will carbonize (char) when subjected to high heat. However, they will not ignite, burn or spread flame. Thermal transfer is also greatly reduced. AF21 can be applied to any natural, water-absorbent material and various synthetic materials. Hartindo AF21, unlike many available fire retardant solutions that only delay the start of fires, is a complete fire inhibitor that renders all water-absorbent and many synthetic materials non-inflammable.

MSE Enviro-Tech is in the process of developing relationships with potential users of AF21 while establishing a nationwide network of agents and distributors for the entire Hartindo product line, including not only the AF21 Flame Inhibitor, but also AF11E as a 1:1 halon replacement alternative and AF31 fire extinguishing products, and the Titan 21 Fire Blanket.

Contact: MSE Enviro-Tech Corporation, #330 Franklin Road, Suite 135A, Brentwood, TN 37027, United States of America. Tel: +1 (615) 3765 601; Fax: +1 (615) 3730 472.

Source: www.earthtimes.org

Non-halon fire suppression

Fike Corp., the United States, has developed a method to convert halon-based fire suppression systems by substituting HFC-125 for the halon without changing the existing distribution piping. An amount of HFC-125 greater than the amount of halon utilized in the fire suppression system is provided, which is under a pressure to effect exhaustion of the HFC-125 of the system within a time range exceeding about 10-25 s, and which meets the standard extinguishing requirements for Class A and Class B fires. The method also permits retrofitting existing halon-1301 suppressant agent systems with a minimum extinguishing concentration of the agent taking into account a requisite safety factor as required by a controlling regulatory body.

Source: www.freepatentsonline.com

Clean-agent fire suppression system

Tyco Fire Suppression offers Pyro-Chem Shurout clean-agent fire suppression system that has been designed for small out-of-the-way hazards like electrical enclosures, video drop boxes, small switching rooms, paint lockers, ATMs, etc. The Shurout units, available in two capacities, are self-contained and UL/ULC listed to provide total flooding protection for small enclosures. Effective, yet simple in design, the Shurout system utilizes the latest in chemical clean agent technology 3M Novec 1230 fire protection fluid. Proven in current engineered fire suppression systems, Novec 1230 fluid is a chemical clean agent that has an environment-friendly profile.

Source: www.fs-world.com

SOLVENTS

CFC-free precision cleaning systems

Precision Cleaning Facility, the United States, offers F-100, F-300, F-400 and F-500 series of CFC-free precision cleaning systems. Systems in the F-100 compact solvent cleaning have been designed to safely employ all non-inflammable and EPA-approved solvents. The fully contained system provides an economical solution to solvent precision cleaning applications. A typical process includes immersion into the latest Crest ultrasonic technology that produces unrivalled cleaning with HFC, HFE, NPB and HCFC solvents.

The F-300 and F-400 series super-heated ultrasonic vapour degreasers contain dual solvent immersion tanks with the patented Crest 40, 58, 132 or 192 kHz ceramically enhanced ultrasonics. Unrivalled cleaning is provided by the F-300 series with HFC, HFE, NPB and HCFC solvents, while the F-400 series uses isopropyl alcohol, cyclohexane, acetone and other inflammable solvents. Applications for both these series can be found in most industrial facilities. The patent-pending F-500 bi-solvent cleaning system is ideal for the removal of organic residues such as fingerprints, mould releases, waxes and pitches, lubricants, heavy greases, adhesives, inks and other difficult substances, all without the use of ozone depletors, hazardous air pollutants, or Proposition 65 listed substances.

Contact: Precision Cleaning Facility, Forward Technology, 3050 Ranchview Lane North, Plymouth, Minnesota 55447, United States of America. Tel: +1 (763) 5591 785; Fax: +1 (763) 5593 929.

Source: www.forwardtech.com

Vapour degreaser

DuPont Vertrel SMT is a proprietary azeotrope of DuPont Vertrel XF with trans-1,2 dichloroethylene and methanol. It is ideal for use as a vapour degreaser with solvency power for cleaning ionic soils and flux residues from electronic assemblies. Application areas include aerosol, defluxing, heavy soil removal, light soil removal, medical devices/silicone removal, rinsing for co-solvent systems, precision cleaning, etc.

DuPont Vertrel SMT is compatible with most plastics and elastomers. It can be used to clean a wide variety of soils including flux residue, gear oils, cutting oils, heavy greases, hydraulic oils, stamping oils, synthetic oils, vacuum oils, waxes and mineral oils. With low global warming potential and zero ozone-depletion potential, Vertrel SMT is used extensively to replace CFC-113, methyl chloroform, HCFCs and PFCs in several areas.

Vertrel SMT has been accepted by the United States Environmental Protection Agency under the Significant New Alternatives Policy programme, as an ODS substitute. Its components are listed in the TSCA inventory and it does not exhibit closed-cup flash point in accordance with the Pensky-Martens Closed Cup Tester (ASTM D-93). Though it is not classified as an inflammable liquid by NFPA or DOT, the product does exhibit vapour inflammability limits in air.

Contact: DuPont-Mitsui Fluorochemicals Co. Ltd., Chiyoda Honsha Bldg., 1-5-18 Sarugaku-cho, Chiyoda-Ku Tokyo 101, Japan. Fax: +81 (3) 5281 5885.

Source: www.2.dupont.com

ODS-free mould release products

EMI Plastics Equipment, the United States, offers a variety of ODS-free cleaning products. The all-natural cleaner degreaser can be used to clean metals, tools, machinery, engines and auto parts. Made entirely from a highly refined extract of citrus fruits, this product often replaces 1,1,1-trichloroethane, methylene chloride, mineral spirits and fluorocarbons. It dries fast without leaving behind any residue. The degreaser has a pleasant odour, is safe to use and virtually harmless to metals.

The silicone mould release supplied by EMI complies with FDA regulation 21 CFR 181.28 as a release agent in the manufacture of food-contacting materials. It offers fast and easy part removal from moulds, improves part appearance and lowers defects caused by sticking. Formulated to provide high levels of user and environmental safety, the non-inflammable, colourless and non-staining mould release does not contain CFC propellants or solvents.

A thin-film anti-rust spray that is ideal for overnight and weekend rust protection of plastic and rubber moulds and tooling is also available. This product does not contain any silicone, Class I or II ODS, CFC/HCFC propellants or solvents. It protects steel and other metals. Contact: EMI Plastics Equipment, 28300 Euclid Avenue, Wickliffe, Ohio 44092, United States of America. Tel: +1 (800) 543 6169

E-mail: Sales@EMIplastics.com

Source: www.emiplastics.com

ODS-free cleaners

Miller-Stephenson, the United States, is offering a range of ODS-free products for use in cleaning applications. These include:

Safezone: a high-quality cleaner especially suitable for non-streak cleaning of glass, ceramic, metal, polycarbonate, acrylic and plastic including Plexiglas. Excellent for use on dials, gauges and oscilloscopes, this product has also been recommended for aircraft windshields. It does not contain ammonia or ODS.

Quik-Freeze: used for hot-cold intermittence testing of electronic components and protection of components during soldering. Excellent for cooling epoxy in composite forming and reducing tack in prepreg applications, Quik-Freeze is also utilized for freezing biological specimens. This product is also available with an antistatic agent, Quik-Freeze Antistatic, to help dissipate any static charge that may build up during spraying.

Media head cleaner: a non-inflammable blend containing a hydrofluoroether (HFE). It removes contaminants and oxide build-up on magnetic tape systems, memory systems and read/write heads.

A precision cleaning agent containing a HFE is offered to safely and quickly clean electronic components and circuits, precision instruments, switches, relays and contacts. It removes oils, oxidation and operating erosion dust. Safe for most plastics including acrylic, polycarbonate, polystyrene and ABS, it does not leave any residue and replaces CFC-113 in many applications.

Vertrel XF cleaning agent is a very mild, non-inflammable solvent featuring excellent compatibility with most plastics. Typical applications include cleaning and rinsing, drying, particulate removal, fluorocarbon lubricant carrier, heat transfer and replacement for many HCFC, PFC and CFC-113 uses. Unique physical traits include a high boiling point and low surface tension than CFC-113.

Contact: Miller-Stephenson, 12261 Foothill Blvd., Sylmar, CA 91342, United States of America. Tel: +1 (818) 8964 714; Fax: +1 (818) 8966 086.

Source: www.miller-stephenson.com

CFC-free solvent for solvating solder flux

JNJ Industries Inc., the United States, is offering an efficient methodology for cleaning misprinted assemblies utilizing a non-ozone-depleting solvent that is non-toxic, non-inflammable and formulated for the chemistry of the materials being cleaned. The solvent is impregnated in a cloth, which is fabricated using a lint-free non-woven material capable of cleaning the substrate of all materials while leaving behind no residue or lint.

The pre-saturated wipe makes use of an improved formulation saturated in a disposable cloth. The cloth can be used for cleaning flux, solder paste, inks and adhesives (uncured) from surface mount printed circuit boards and electronic assemblies, screens, stencils, tools, squeegees, and benchtops. The impregnated cloth is low in odour and toxicity, non-inflammable and biodegradable. The specific cleaning composition is non-hazardous and free of CFCs. The composition dries fairly quickly without leaving a residue.

Source: www.freepatentsonline.com

Decontamination of sensitive equipment

Argos Associates Inc., the United States, offers a method and apparatus for cleaning sensitive equipment from biological and chemical pollutants (such as chemical warfare agents). The method uses cleaning solvents or decontamination liquids such as HFCs, including HFEs, that have physical properties similar to those of CFC-113. The main commercially available products are DuPonts Vertrel-XF (HFC 43-10mee) and 3Ms Novec HFE-7100. In addition to fluorine, these materials contain carbon, hydrogen and oxygen (for HFEs), but no chlorine, and therefore have no known ozone depletion potential. The presence of a minority of hydrogen atoms results in a molecule that has many of the characteristics of a perfluoroalkane molecule, but also some characteristics of a hydrocarbon molecule.

Source: www.freepatentsonline.com

FUMIGANTS

Nematode control using fosthiazate

Researchers at ISK Biosciences Corp. report that fosthiazate offers excellent nematicidal activity, controlling nematodes both by contact and through ingestion of treated plant parts. Fosthiazate, O-ethyl S-(1-methylpropyl)(2-oxo-3-thiazolidinyl)phosphonothioate, belongs to the organophosphate class of chemistry. The unique chemistry of this methyl bromide (MB) alternative contributes to its relatively low human and non-target avian and aquatic toxicity. Unlike MB, fosthiazate is not a fumigant but degrades in soil rapidly through a series of metabolites that result in a significant percentage of the residue being fully mineralized.

Source: www.mbao.org

Low-energy solar kiln drying

In Australia, Australian Choice Timber Supplies (ACTS) and Enviro-Forest Solutions Ltd. offer new environmentally friendly timber processes for delivering sustainable and technically superior timber products. Through innovation and its major R&D programmes, ACTS has taken a massive step towards making the solar drying kilns best-practise technology for drying materials, particularly timber products on a global basis. The patented solarola drying kiln technology has many unique attributes along with its exceptional and simple solar heat collection system. Combined with highly developed modified drying schedules that cycle kiln conditions with daily solar cycles, the low cost and superior energy efficiency of this technology underpins its amazing success.

ACTS was approached in 2006 by representatives of the United Nations, the Department of Ozone and Heritage (Australia) to develop an environmentally safe technology for heat-treating timber and other products for phytosanitary control. Phytosanitary control basically involves killing insects and pathogens that may be contained in products being shipped from one country/region to another. This measure helps in the prevention of some of the catastrophic results caused by introduced pests and hazards into new environments. Where industrial scale does not allow for the option of using large, high capital cost gas kilns to heat treat products as a means of killing insects and pathogens, the established process is to expose timber and other products to very nasty ozone depleting methyl bromide gas in a way that trades off one environmental problem for another. ACTS developed a solar-heated fully sustainable heat-treatment kiln based on the innovative practical design of its more complex full-specification kiln units.

Contact: Mr. Greg Weir, CEO, Enviro-Forest Solutions Ltd., Australia. Tel: +61 (3) 9761 6645

E-mail: greg@choicetimber.com.au

Source: www.clickpress.com

Nematode-resistant habanero

In the United States, researchers at the Agricultural Research Service (ARS) have investigated a new habanero that is resistant to nematodes. The super-hot, bright orange TigerPaw-NR habanero offers extreme pungency for pepper aficionados. The firm, shiny pepper gets its name from its tiger-paw-like appearance. The NR initials stand for nematode resistant, a prized trait. This is the first commercial habanero pepper resistant to attack by microscopic, soil-dwelling worms known as root-knot nematodes, according to scientists. The nematodes are named for the knots, or galls, that form on damaged roots. TigerPaw-NR fends off the southern root-knot nematode Meloidogyne incognita, the peanut root-knot nematode M. Arenaria and the tropical root-

knot nematode M. Javanica. Natural resistance offers a economical, safe and earth-friendly alternative to applying methyl bromide, a soil fumigant that is being phased out.

Source: www.farms.com

Phytochemicals: fumigants and repellents

Researchers in Israel and Kenya have studied the use of phytochemicals as insecticides and fumigants against stored product insect pests. Phytochemicals like essential oil components are known to possess insecticidal or repellent activities and show low toxicity to mammals, which positions them favourably for use in pest management. Most of these potential methyl bromide alternatives are used as flavours and fragrances in the food industry, perfumery and aromatherapy.

Scientists have successfully screened a large number of essential oils as well as essential oil components from aromatic plants originating in Israel and Kenya for fumigant insecticidal and repellent activities against a number of main stored product insects. Essential oil P62 obtained from the Kenyan aromatic plant Labiataei spp. showed both insecticidal and repellent activity. Two stereoisomers a- and -thujone (a monoterpene ketone) that occur together in the essential oils of many herbs, including Artemisia and Salvia spp. were very active against adults of R. dominica and O. surinamensis. Insecticidal and repellent properties of Lantana camara and Tephrosia vogelii from Kenya were found against S. zeamais.

In addition, effective mortality at low concentrations and exposure time were achieved utilizing the essential oils as well as the oil constituents against quarantine insects attacking cut flowers such as Frankliniella occidentalis (thrips) and Bemisia tabaci (whitefly).

Contact: Mr. Moshe Kostyukovsky, Department of Food Sciences, ARO, The Volcani Centre, P.O. Box 6, Bet Dagan 50250, Israel.

E-mail: inspect@volcani.agri.gov.il

Source: www.mbao.org

Structural fumigation

In the United States, researchers have investigated structural fumigation models to ensure that costly methyl bromide (MB) substitutes are economically competitive. The key for successful adoption of the MB alternatives lies in the efficiency of their application during fumigation. It is recognized that the fumigation process can be better optimized only if the dynamics of gas movement in the fumigated space and the effects of environmental conditions on the process are well understood.

The team developed computational fluid dynamics (CFD) models and established a methodology that could be used for fumigation process modelling in any type of structure. For any given weather conditions, the models can be used to predict fumigation characteristics like fumigant movement paths, concentration distributions and leakage rate. The effects of fumigation variables such as wind speed and direction, capacity and placement of circulation fans, and fumigant release time on the efficacy of the fumigation process are currently being evaluated.

The study was funded by the USDA-CSREES Methyl Bromide Transition Programme under project grant 2004-51102-02199 Fumigation Modeling, Monitoring and Control for Precision Fumigation of Flour Mill and Food Processing.

Contact: Mr. Watcharapol Chayaprasert, Agricultural and Biological Engineering Department, Purdue University, West Lafayette, IN 47907, United States of America.

Source: www.mbao.org

New disinfestation treatment

Scientific Horticultural P/L, Australia, investigated CATTS disinfestation treatment for maintaining the quality of apple fruits without using methyl bromide. The CATTS treatment involves tempering fruits to 20C for 24 h prior to treatment and then placement in the chambers. Carbon dioxide in the chamber is increased to 10 per cent, which results in a drop in the oxygen content, due to displacement, to 15 per cent. Next, the chamber sealing is completed using an external breather bag to allow for air expansion and contraction with the operation of the heating elements. Air temperature is then raised at 12C/h until it reaches 47C and this temperature is maintained until the core temperature of the fruit reaches 45C for 15 min. A relative humidity exceeding 80 per cent is maintained for the duration of the treatment by placing a water tray directly on top of the heating elements. After treatment, the fruit is cooled using heat exchangers within the chamber at 12C/h until a core temperature of below 30C is achieved. At this time, the chambers are opened and fruits exposed to fresh air and static cooling to 1C.

Results have shown that fruit damage was greatly increased in fruit stored prior to treatment. However, the level of internal browning in the fruit treated after harvest was still above the 2 per cent threshold of market acceptance. Other than internal browning, the only other fruit parameter affected by CATTS treatment was fruit greasiness, where it was reduced from 2.4 to 1.0. Further research is necessary to verify the results and in particular those relating to the rate of heating and increased air temperature response. Data suggests that a commercially feasible treatment for stored apple fruit may be developed without the need to lower oxygen to 1 per cent.

Contact: Mr. Gordon S. Brown, Scientific Horticulture P/L, Tasmania, Australia.

Source: www.mbao.org

PUBLICATIONS

Report on UNEP Workshop on Alternatives to Halon Gas to Conserve Ozone

This report is a result of a workshop held in India on ozone layer protection and integration of ozone and climate protection. The aim was also to seek the defence sectors support in reducing halons.

Ozzy Ozone, Defender of our Planet Ozzy Goes Farming

This comic book focuses on alternatives to methyl bromide. Ozzy and Zoe Ozone travel around the world with Mona the Monarck butterfly. In every continent, they observe how methyl bromide can be replaced with more environmentally friendly alternatives. Developed as part of UNEPs work programme under the Multilateral Fund for the Implementation of the Montreal Protocol, this booklet is part of a suite of educational materials linked to the global Ozzy Ozone campaign. The booklet is suitable for dissemination in schools as part of national awareness campaigns.

For the above two publications, contact: UNEP DTIE OzonAction Branch, 15 rue Milan, 75441 Paris Cedex 09, France. Tel/Fax: +33 (1) 4437 1450/1474

E-mail: ozonaction@unep.fr

Scientific Assessment of Ozone Depletion: 2006

This recent WMO/UNEP assessment contains the most up-to-date understanding of ozone depletion and reflects the thinking of scientific experts who contributed to its preparation and review. The 2006 assessment aims to have focused, short chapters that build from the 2002 assessment and provide a cogent assessment of the current state of scientific understanding.

Contact: World Meteorological Organization, AREP Global Atmosphere Watch, Case postale 2300, Geneva 2, CH-1211, Switzerland.