VATIS Update Ozone Layer Protection . Jan-Feb 2004

Content

TECH EVENTS

THE SCIENCE OF OZONE LAYER

New data pours cold water on ozone recovery

Recent data obtained from the European Space Agencys Earth observation satellite Envisat reveal that the Antarctic ozone hole is at a near record size, dashing hopes of a speedy recovery. The 30 million km2 ozone hole of 2000 had shrunk by about 40 per cent in two years and had even split into two. Latest data, generated by the Belgian Institute for Space Aeronomy, show that the two holes have combined and currently cover an area of some 26 million km2. Moreover, it is unlikely that the hole will split again.

Website: www.esa.int

Website: www.dbs.cordis.lu

Researchers identify methyl halide gene in plants

In the United States, researchers at the University of California have identified a gene that controls the production of ozone-destroying methyl halides (MHs) in terrestrial plants. This discovery provides a genetic tool to understand how and why plants produce MHs, to determine the extent to which plants emit MHs into the atmosphere, and to find out why certain plants increase their MH emissions in high salt environments. Named HOL, short for Harmless to Ozone Layer, the gene was found in Arabidopsis, a mustard plant in the cabbage family used commonly in genetic studies. The team also found closely related variants, or homologues, of the HOL gene in the genetic databases of rice, cotton, corn and barley. However, scientists stress that the ubiquity of the HOL gene in plants and their results cannot be inferred to suggest that plants are to be blamed for ozone layer depletion.

The team uncovered that the HOL gene controls the production of an enzyme that catalyses the production in plants of methyl bromide, methyl chloride and methyl iodide. Addition of bromide salts to a substrate on which the Arabidopsis plants grew led to a more than thousandfold increase in methyl bromide. However, plants with a mutant, non-working copy of the HOL gene produced only 15 per cent of methyl chloride, 4 per cent of methyl bromide and 1 per cent of the methyl iodide of normal, wild-type plants. The enzyme produced by HOL gene may function to metabolize plant compounds that are presumed to serve as insect repellents, suggesting that plants may have initially evolved the biochemical pathway that produces methyl halide emissions to ward off insects. This discovery could pose an additional obstacle for scientists seeking to genetically engineer salt-tolerant crops that can minimize methyl halide production without compromising their natural immunity to insects.

Website: www.seedquest.com

Ozone-eating gases affect weather conditions on Earth

In the United States, scientists report that human-caused pollution, which is destroying stratospheric ozone, could trigger down-to-earth variations in weather conditions. Computer models have proved suspicions that gases gnawing a hole in the ozone layer each Antarctic spring, affect weather patterns on Earth during summer. Ozone reduction inhibits absorption of ultraviolet rays. As a result, in the summer season, most of Antarctica cools and westerly winds strengthen in the stratosphere and troposphere, the lowermost layer of the earths atmosphere. And, the trickle-down effect may not be restricted in the high latitudes only.

Website: www.denverpost.com

Salt marshes: Major source of atmospheric methyl bromide

Researchers at Scripps Institution of Oceanography at the University of California, the United States, have identified salt marshes as a major natural source of the environmentally and economically important compound, methyl bromide (MB). The study also implicates salt marshes as a source of methyl chloride. Research for this study was funded by the University of California Natural Reserve System, the National Science Foundation Graduate Research Fellowship Programme, the Methyl Bromide Global Coalition and NASAs Upper Atmosphere Research Programme.

Scientists estimate that 20 per cent of MB reaching the atmosphere can be attributed to fumigation, about 10 per cent to vegetation burning and roughly 30 per cent to production from the oceans. But the balance of this MB budget, a significant 40 per cent, was missing. Although salt marshes make up only 0.1 per cent of the earths surface, they may be responsible for producing approximately 10 per cent of the total MB and methyl chloride budget. Researchers found that salt marshes emit MB at rates greater than any other natural environment, on a per unit area basis. Further studies will seek to expand these findings and correspond the data to other salt marshes and different environments, like mangrove forests.

Contact: Ms. Mario Aguilera/Ms. Cindy Clark, Scripps Institution of Oceanography, United States of America. Tel: +1 (858) 5343 624

E-mail: maguilera@ucsd.edu ; cclark@ucsd.edu

Website: www.sio.ucsd.edu

Website: www.scrippsnews.ucsd.edu

Ozone hole disappears

A report by the World Meteorological Organization (WMO) states that the seasonal ozone hole grew rapidly during August 2003, attained a record size in September before finally disappearing in mid-November. The ozone hole peaked at 17.4 million km2 in mid-September, matching the record size set three years ago.

Website: www.ananova.com

Record loss over Antarctica

An analysis of satellite-based measurements by the National Institute of Water and Atmospheric Research (NIWA) reveals that a record amount of ozone was destroyed over Antarctica in September 2003. Every day, from 23 to 26 September, the amount of ozone loss exceeded the previous daily record of 45.5 million tonnes in 2000. An ozone loss of 47.3 million tonnes was measured on 25 September 2003 . These calculations are based on data received from satellite-based instruments operated by NASA as well as the European Space Agency. NIWA scientists compared these figures with that from ground-based instruments, including those operated by NIWA at Scott Base, Antarctica, and at NIWAs Atmospheric Research Laboratory in Central Otago, and combined them to create a single, global, long-term database on ozone. It is expected that the ozone hole will recover over the coming decades following international restrictions on CFCs, but the turning point has not yet been reached.

Website: www.scoop.co.nz

ODS PHASE-OUT IN INDIA

Sniffing out ODS

The Ministry of Environment and Forests (MoEF) plans to arm border enforcement agencies with hi-tech gadgets imported from Germany. The new identifiers trigger an alarm whenever a gas cylinder containing harmful CFCs is brought within its vicinity. According to Ms. Usha Chandrashekar, the Director of Ozone Cell, MoEF is closely coordinating implementation of the phase-out programme, with assistance from customs officials, who play a key role in preventing cross-border trade in ODS. While addressing a national workshop, organized by the National Academy of Customs, Excise and Narcotics (NACEN) and MoEF, Ms. Chandrashekar assured enforcement officers from different border points, such as Indo-Nepal and Indo-Bangladesh, that the phase-out was being carried out as a proactive preventive exercise. She also clarified that this programme, adopted as per the Montreal Protocol, involved a multi-pronged approach to develop a comprehensive and achievable plan to phase out technologies without undue economic burden on customers and industry.

Website: www.thehindubusinessline.com

Call to prevent illegal ODS trade

At a national workshop organized by the National Academy of Customs, Excise and Narcotics, and the Ministry of Environment and Forestry, Mr. S. C. Wadhwa reported that over the last four years about 3,000 t of CFCs were smuggled into India. Mr. Wadhwa is a key functionary of the Refrigerant Gas Manufacturers Association. Making a presentation on How to combat illegal trade of ODS like CFCs, Mr. Wadhwa stated that by mislabelling gas cylinders, smugglers were able to bring CFCs into the country through the porous borders of Nepal and Bangladesh. He also expressed that high import quantities (as per UNEP data) by the two neighbouring nations find the excess landing in India illegally. He also envisioned a major role for transit countries as at present there is no clear mechanism to check the end-user destinations of CFC consignments.

Website: www.thehindubusinessline.com

Funds for projects approved by ExCom

The following list of projects and activities have been approved for funding at the 39th, 40th and 41st meetings of the Executive Committee of the Multilateral Fund:

Click here to see the list (PDF File)

Phase-out of CFCs in the refrigeration manufacturing sector

ExCom has approved US$476,536 plus agency support costs of US$43,243 to UNDP and US$173,200 plus agency support costs of US$19,052 to UNIDO for the plan for phase-out of CFCs in the refrigeration manufacturing sector in India. This decision was made after considering recommendations of the Sub-Committee on Project Review.

41st Meeting of ExCom, Montreal, Canada

IN THE NEWS

Exemption for methyl bromide undecided at UNEP meeting

Delegates attending a meeting in Nairobi, Kenya, at the United Nations Environment Programmes (UNEP) headquarters, have agreed to postpone until next year a decision on whether to grant so-called Critical Use Exemptions for methyl bromide (MB) under the 1987 Montreal Protocol. Under the terms of the treaty, developed nations had agreed to progressively eliminate their consumption of MB by 1 January 2005. However, farmers from some developed nations including strawberry, melon, pepper and tomato growers predominantly in North America and Europe have requested exemptions from the protocol, amounting to 15,000 t for 2005, saying that no feasible alternatives to the pesticide exist. The next meeting on MB is scheduled to take place in Montreal, Canada, during March 2004.

Contact: Mr. Nick Nuttall, UNEP Head of Media, Kenya. Tel: +254 (20) 623 084

E-mail: nick.nuttall@unep.org

Website: www.unep.org

Website: www.uneptie.org

Concerns reiterated over unscrupulous trade in CFCs

In response to a report released by the Environmental Investigation Agency (EIA) detailing several instances of illegal trade in CFCs by Singapore-based companies, the Singapore National Environment Agency (NEA) has stated that its investigations did not reveal any evidence of misconduct. NEA stated that Leempeng Enterprise Pte. Ltd., Sing Swee Bee Enterprise Pte. Ltd., and Forance Air-Con and Refrigeration Parts Supplies Pte. Ltd. hold valid licences to import and export CFCs.

EIAs probe was reported to have uncovered that Leempeng supplied CFCs to Viet Nam and Japan in the full knowledge that the buyers did not have the necessary import licences. Forance admitted sending CFC shipments to Indonesia, knowing that such shipments are prohibited by the Indonesian authorities. Sing Swee Bee supplied virgin CFC-12 in small cans to the United States. Despite lacking a licence, Mega-Tech offered to supply a container full of CFCs to EIA undercover investigators, stating that it would switch the shipping documents to conceal the company name. All four companies highlighted in EIAs report were not selected at random, but have a history of suspicious dealings in CFCs. All these firms offered various methods to supply EIAs front company with CFCs in South Africa. Weak enforcement and loopholes presented by transit trade

facilitate unscrupulous activities by businesses in search of quick profit, but these have serious consequences for other countries where oversupply and illegal imports undermine their efforts to adhere to their ODS phase-out schedules.

Website: www.eia-international.org

Illegal ODS trade rampant

Environmental Investigation Agency (EIA), a non-profit organization, reports that illegal international trade in ODS is thriving and as such hindering efforts to phase out these harmful substances. EIA has identified Singapore and Dubai as the major transit points in the illegal trade of CFCs, which are used in refrigeration and air-conditioning. The report, based on a three-month investigation, has unveiled that Singaporean chemical dealers make about 75-225 per cent profit on each kilogram of CFCs, depending on where they are sold.

According to Mr. Alexander von Bismarck, an EIA investigator, in the mid-1990s the illegal trade was estimated at around 20,000-30,000 t/y. EIAs latest report states that at least four Singaporean firms re-export CFCs to the United States, a major market, either directly or through southern Africa using false documentation and packing. Other major markets include Russia, Viet Nam, Nepal, Cambodia and China.

Website: www.enn.com

Efficient alternative to HFCs

A pilot study undertaken in the United States, by researchers at the University of Illinois, has unveiled that apart from being more environment-friendly, carbon dioxide (CO_2) is also more energy efficient than HFC-134a. Comparative tests, involving two types of mobile air-conditioners, have shown that the coefficient of performance (COP) of CO_2 is 10-30 per cent higher than that of HFC-134a. Also, fuel use of the CO_2 system is significantly lower than the HFC system, even in warm climates. When compared with HFC-134a system, the Life Cycle Climate Performance of CO_2 system is 20-40 per cent lower. The study was carried out by several of the worlds leading suppliers of components for the automobile industry.

Website: www.shecco.com

China to eliminate freon

In China, the north-eastern province of Jilin is striving to phase out freon by May 2005. This ozone depleting refrigeration agent, presently used in automobile air-conditioning systems, industrial and commercial refrigeration equipment and home appliances, would be replaced with new alternatives that conform to international standards. Starting from 1 May 2004, the new rule will be applicable to automakers, the food and beverage sector as well as manufacturers of home appliances. In the meantime, the provincial government has banned the sale and storage of freezing equipment with freon as a refrigerant and even the chemical itself in the cities of Changchun and Jilin.

Website: www1.chinadaily.com.cn

CFC use reduced in Viet Nam

The Ministry of Natural Resources and Environment, Viet Nam, reports that the use of CFCs has been reduced by half and would be completely phased out in seven years. Viet Nam is complying with its commitment in accordance with the Vienna Convention and the Montreal Protocol. Projects funded by the Multilateral Fund are being implemented to eliminate various ODS.

Website: www.vnagency.com.vn

Brunei Darussalam to phase out refrigerant gases

As a signatory to the Montreal Protocol, Brunei Darussalam will start phasing out ozone depleting refrigerant gases from 2005. Refrigerant gases are commonly used in air-conditioners, freezers, refrigerators and cold storage rooms in domestic, commercial and industrial sectors as well as in the mobile air-conditioners (MAC) sector.

The Department of Environment, Parks and Recreation, under the Ministry of Development (MoD), organized a Refrigerant Management Plan workshop to ensure compliance with the protocol. More than 30 participants, technicians from both the government and private sector, attended the workshop while two guest speakers presented a preliminary assessment of the refrigerant consumption. Future plans include identification and implementation of measures to lower consumption of the refrigerants, in the form of training for both government and private sector. Possible training for government organizations may include the Royal Customs and Excise Department, Department of Electrical Services and MoD. Proposals for such training could be coordinated with assistance from certain educational institutions under the Ministry of Education. Training for the private sector will focus on servicing technicians for air-conditioners, refrigerators, freezers, cold rooms and the MAC sector.

Website: www.brudirect.com

Sri Lanka: Efforts to help ozone

In Sri Lanka, the National Ozone Unit (NOU) under the Ministry of Environment and Natural Resources plans to develop safety standards for the use of hydrocarbons as a refrigerant. An Air-conditioning and Refrigeration Association will also be formed as part of the NOUs efforts to protect the ozone layer. At present, eight recycling centres and 95 recovery centres have been set up. The NOU has conducted several technical training programmes, custom officer training programmes, schools and teacher training programmes, besides various awareness creation campaigns. Additionally, the government has decided to advance the ODS phase-out deadline from 2010 to 2005.

Website: www.dailynews.lk

New additions to non-CFC range of refrigerators

In the Republic of Korea, LG Electronics has embarked on full-scale mass production of its side-by-side refrigerators adopting state-of-the-art linear technology compressors. Mr. M.B. Shin, President, LG Electronics Middle East and Africa, states that Linear side-by-side compressor technology activates direct linear movement, unlike existing compressors, which convert rotational movement into linear. Apart from lowering energy requirements by 30 per cent, the new refrigerators use natural refrigerants and a next-generation blowing agent, thus ensuring zero ozone depletion potential and global warming potential.

Ozonaction Newsletter, No. 45, October 2003

REFRIGRATION/AIR-CONDITIONING

New range of refrigerants

Novec HFE-7000, HFE-7100 and HFE-7200 refrigerants are the latest from the United States-based 3M company. These non-inflammable, low toxic organic compounds are suitable for use in low-temperature applications, as a secondary refrigerant medium, and have a low GWP and zero ODP.

Website: www.reito.co.jp

HC refrigerant

Matsushita Electric Industrial Co. Ltd. (MEI), Japan, has completed introduction of hydrocarbon (HC) refrigerant in all its domestic refrigerator models exceeding 300 litres. MEI intends to follow up this switch-over with a line of of HC household refrigerators of lower capacities. As such, MEI will be the first to introduce HC units in the 120 l and 160 l classes, and launch personal use refrigerators in Japan, featuring ultra-low sound and power consumption.

Contact: Matsushita Electric Industrial Co. Ltd., Japan.

Website: www.panasonic.co.jp

Website: www.matsushita.co.jp

Vapour absorption machines

Voltas Ltd., India, is offering vapour absorption machines (VAMs) that incorporate state-of-the-art technology from Hitachi. In absorption refrigeration, an absorber, generator, pump and recuperative heat exchanger replace the compressor. Non-toxic lithium bromide solution is used as an absorbent. Lithium molibdate and lithium nitrate as inhibitors and water as refrigerant are harmless.

For double-effect VAM, Voltas offers parallel-flow technology originally patented by Hitachi. The unique advanced Paraflow design along with high-performance tubes assure higher cycle efficiency and low fuel consumption than competing products. The double-effect VAM ensures lowest steam consumption when compared with others at identical operating parameters. The system incorporates Hitachis patented SS nozzles for pressurized soft spray of refrigerant and absorbent for excellent heat transfer coefficient and full coverage of heat transfer areas. The use of high-performance finned tubes of seamless grade Cu-Ni 70/30 or SS-316L enhance heat transfer, thereby raising efficiency. Sight glass assemblies are provided at strategic spots on the unit. Fused glass construction ensures no leakage from these ports for lifetime and eliminates replacements. Advanced PLC-based system is a standard feature, with user-friendly keyboard, LED facia and LCD display system.

The single effect steam/hot water fired VAM works on low-pressure steam or hot water as the heat source to drive the lithium bromide absorption cycle effectively. Direct fired absorption machines use oil, gas or kerosene.

Website: www.voltasacnr.com

Air cycle refrigeration

Earthship Inc., the United States, has developed an air cycle refrigeration system that produces air as low as -77C. AIRS50 is a state-of-the-art system that utilizes only air and is completely devoid of any CO2 emissions. This safe and cost-effective unit can reach temperatures of -30C and below. Two models with a capacity of 5 RT will be available soon: AIRS50-30 provides -30C air (March 2004) while AIRS50-60 yields -77C air (July 2004).

The patented air cycle system comprises few highly advanced components (turbine, booster, heat exchanger, defroster and controller) that significantly reduce installation time and maintenance costs. Maximum pressure

inside the refrigeration system is less than two atmospheric pressure. The system is easy to maintain and ensures low operating costs. AIRS50 can be used in various industries such as refrigerated/frozen warehouses, grocery delivery centres, ship containers, air cargo, rapid-food freezing, pharmaceutical production and air-conditioning systems.

Website: www.jarn.co.jp

Green-friendly refrigerator

Autosal, Argentina, has succeeded in developing an ozone-safe refrigerator that uses isobutane as the refrigerant. This model also replaces HFCs, used as a foaming agent in insulation, with cyclopentane. Although the new refrigerators are slightly expensive to manufacture, they will be priced on par with Autosals other refrigerators.

Website: www.ipsnews.net

AEROSOLS

Liquid nitrogen-based MDIs

Boehringer Ingelheim Pharma has implemented a new cost-effective and environmentally friendly solution for filling metered dose inhalers (MDIs) by equipping four filling lines with a nitrogen cooling system. Aerosols in MDIs are suspensions comprising a propellant gas with a mixture of active substances. These substances are not dissolved, but remain as solid particles suspended in the propellant gas. To fill MDIs, the mixture is first homogenized in a mixing vessel and then held in suspension by a stirrer. During this process the pressure of the mixing vessels adjusts itself to the vapour pressure of the propellant gas at ambient temperature, creating hurdles as the suspension must be filled at atmospheric pressure. To avoid spontaneous vaporization of the propellant gas during the filling process, the suspension must be cooled between the mixing vessel and filling units.

Boehringers system provides a unique solution for this problem. Liquid nitrogen is the ideal refrigerant for low-temperature applications. With a boiling point of 2,196C at atmospheric pressure, it provides an almost unrestricted potential to reach low temperatures. The practically inert nitrogen is eco-friendly. Liquid nitrogen used for cooling is stored in a vacuum-insulated storage tank. From here it flows through a vacuum-insulated pipe to the product cooler where nitrogen transfers its cold energy to the product indirectly and vaporizes without being contaminated. The nitrogen gas is then injected into the existing nitrogen inerting network. The application is particularly economical because of this double use of nitrogen. Three control circuits are needed to regulate the process.

Website: www.ptemag.com

Propellant-free inhaler for pulmonary disease patients

Boehringer Ingelheim GmbH, Germany, offers a unique inhaler for delivering medication accurately and effectively to all patients with asthma or chronic obstructive pulmonary disease who require inhaled respiratory therapy. The propellant-free Respimat Soft Mist inhaler (SMI) delivers a metered dosage of medication as a fine mist. The Soft Mist generated by the inhaler provides good lung deposition. The SMI is easy to use and offers several benefits over currently available inhalers. The SMIs components and features are listed below:

Spring: A simple 180 twist of the inhalers base compresses the spring and builds up mechanical power;
Cartridge: Medication is stored in a collapsible plastic bag in a sealed plastic container inside the cartridge.

With each actuation, the correct dosage is drawn from the inner reservoir and the flexible bag contracts accordingly;
Transparent base: The base slides off to allow for easy insertion of the cartridge;
Capillary tube: The tube slides into a canal in the cartridge and the dosage is drawn through this tube into a micro pump;
Dose-release button: The instant this button is pressed, energy released from the spring forces the solution through the uniblock and the unique, slow-moving, long-lasting Soft Mist is released;
Uniblock: This nozzle system, the core element of the inhaler, provides the Soft Mist;
Dosing chamber: The space where the exact dose is present before the dose-release button is pressed; and
Dose indicator: Tells how many doses are left. Once it reaches the red zone, about 30 doses are left. On reaching the end of the scale, the inhaler locks automatically.

Website: www.respimat.com

New asthma inhaler uses HFA

The United States Food and Drug Administration (FDA) has approved King Pharmaceuticals Inc.s new Intal HFA (cromolyn sodium) formulation for the long-term management of asthma. The inhaler uses environment-friendly hydrofluoroalkane (HFA) propellant. This product features positive differentiating attributes, which include its unique mechanism of action and excellent safety profile, the latter of which is extremely important for paediatric patients and in other patient sub-populations for whom safety is of particular concern.

Contact: King Pharmaceuticals Inc., 501, Fifth Street, Bristol, Tennessee 37620, United States of America. Fax: +1 (423) 9898 786.

Website: www.kingpharm.com

CFC-free inhaler

Alphapharm Pty. Ltd., Australia, is offering Asmol inhaler for treating symptoms of asthma, bronchitis, emphysema and other breathing problems. The CFC-free inhaler contains the active ingredient salbutamol (sulphate), which belongs to a group of medicines known as bronchodilators or beta-2 agonists, and HFA-134a as the propellant. Each puff contains 100 g of salbutamol. When inhaled, Asmol works rapidly to open up air passages in the lungs. The normal dose is one or two puffs every four hours, if required, while elderly patients may need smaller doses.

Contact: Alphapharm Pty. Ltd., Chase Bldg. 2, Wentworth Park Road, Glebe NSW 2037, Australia. Tel: +61 (2) 9298 3999.

New dry powder inhaler

ac-Pharma AG, Germany, offers new CFC-free dry powder inhalers (DPIs) to administer budesonide, formoterol, budesonide/fenoterol and fluticasone. Germany, South Africa, Slovakia and Australia have already granted patents for the DPI, while patent applications have been filed in nearly 50 countries worldwide. A significant product advantage is the reproducible high lung deposition of the therapeutic active substance. Other benefits of this product include:

Effective overdose protection;
Breath-activated release of each dose eliminates problems related to coordination of dose release and inhalation;
Easy handling;
After activation, inhalation is possible in every position;
Good separation of active ingredient from carrier by strong air flow;
Protection against humidity and exhalation by patient into the device;
Biofeedback (feeling of powder and audible click);

Indicator window for powder filling control;
Hinged protection cap fixed to the device; and
Depending on the product, about 200-400 doses can be accommodated in the reservoir.

Contact: ac-Pharma AG, Weg im Esterholz 6, 82064 Strasslach, Germany. Tel: +49 (89) 666 496-0; Fax: +49 (89) 619 346

E-mail: info@ac-pharma.de

Website: www.ac-pharma.de

Website: www.acemed.de

Aerosol albuterol sulphate

Boehringer Ingelheim Vetmedica Inc., the United States, offers Torpex aerosol albuterol sulphate metered dose inhaler for horses. The medication is contained in a hand-held, manually-actuated dispensing device for drug administration to the animals lungs. Each drug canister contains a microcrystalline suspension of albuterol sulphate in propellant HFA-134a, ethanol and oleic acid. Key features of the easy-to-use inhaler include:

An airflow valve synchronizes delivery with inhalation;
Hand-held activator;
Trigger releases controlled, standard dose; and
Patented bulb design.

Torpex is the first and only FDA approved aerosol drug device for treating equine respiratory disease. The portable device provides rapid onset of action and is recommended for immediate relief of bronchospasm and bronchoconstriction associated with reversible airway obstruction in horses. A patented aerodynamic bulb synchronizes with inhalation to provide optimal drug delivery. A low dose is needed for drug efficacy and allows for controlled therapy.

Contact: Boehringer Ingelheim Vetmedica Inc., 2621, North Belt Highway, St. Joseph, Missouri 64506 2002, United States of America. Fax: +1 (816) 2362 717.

Website: www.bi-vetmedica.com

Albuterol HFA inhaler approved in the United States

In the United States, IVAX Corp. has obtained approval from the Food and Drug Administration (FDA) for its new drug application for albuterol sulphate using a non-ozone depleting hydrofluoroalkane (HFA) propellant in a metered dose inhaler (MDI). Albuterol is a widely used beta-agonist bronchodilator for the relief of asthma symptoms and is the primary rescue medication for asthma sufferers. IVAX has also submitted a new drug application to FDA for approval to market a CFC-free formulation of albuterol in IVAXs patented Easi-Breathe inhaler.

Website: www.hoovers.com

FOAMS

New cushioning product for use in furniture

Foamex International Inc., the United States, offers Reflex cushioning product developed by employing patented Variable Pressure Foaming (VPFSM) process, also known as Chamber TechnologySM. Reflex provides more buoyancy and spring-like feel without the sinking sensation associated with traditional flexible foams. VPF is the latest innovation in flexible polyurethane foam and does not use CFCs or any potentially harmful blowing agents. Instead of producing foam at ambient pressure, the new eco-friendly process employs a series of sealed chambers to manufacture the foam. Cushioning with high performance properties is obtained. Flexible polyurethane foam is produced by mixing a resin with an activator. The resulting reaction generates gas bubbles that quickly expand to create foam. Benefits offered by Reflex include:

Extended performance life;
Combines the luxurious feel of spring-formed cushions with exclusive straight-line support;
Greater styling flexibility; and
Remarkable consistency.

Contact: Foamex International Inc., 1000, Columbia Avenue, Linwood, Pennsylvania 19061, United States of America.

E-mail: foamexinfo@foamex.com

Website: www.foamex.com

Polyols from soya bean oil

Urethane Soy Systems Co., the United States, has developed and patented soya bean oil-based polyol products known as SoyOyl. These polyols can easily replace petroleum-based polyols used in the manufacture of polyurethanes (PUs). They have been commercialized in PU formulations that are used to produce elastomers, flexible moulded foams, structural and rigid PU foams. The spray foam being commercialized currently is an open cell foam blown with water and has a density of about 0.5 pcf.

Bayer Corp. has used SoyOyl polyol in the formulation of reaction injection moulded (RIM) structural foams. Chemical and Universal Textile Technologies have also incorporated SoyOyl polyol in their Bioblance polymers used in commercial carpet backing. Finally, elastomeric coatings containing SoyOyl, for use as truck bed liner coatings, are presently undergoing field tests. Potential uses for the elastomeric coatings are storage tanks, boat decks, etc.

Website: www.asajapan.org

CO2 gas entrainment system

Linden Industries Inc., the United States, is offering a carbon dioxide (CO2) Gas Infusion Blending unit to entrain gaseous CO2 in polyurethane, resulting in a reduction of chemical use, part weight and improved acoustical properties. Low levels of CO2 are used as an aid to improve tool wetability, mixing quality, material flow and eliminate surface defects in high-density polyurethanes (PUs).

Lindens gas infusion system provides homogeneous dissolution and distribution of CO2 into the polyol component of the urethane formulation, thus enabling minimum consumption of CO2. This unit can introduce gaseous, instead of liquid, CO2 and does not require sampling to regulate the level of CO2 in the PU. A unique patented mechanism, which continuously monitors and updates the level of CO2, is much more accurate than periodic sampling. Processing is feasible with day tank blanket pressures as low as 40 psi and CO2 tank pressures as low as 100 psi. In addition, CO2 is non-inflammable, environment friendly and an abundant natural resource.

The gas infusion system is available as a component of new equipment or adapted to existing processing equipment as a stand-alone add-on system. Optional accessories include high shear agitator, variable speed agitator, precision regulator, disconnect switch, control transformer and custom control interfacing.

Contact: Linden Industries Inc., (Corporate Headquarters and Operations), 137, Ascot Parkway, Cuyahoga Falls, Ohio 44223, United States of America. Tel: +1 (330) 9284 064; Fax: +1 (330) 9281 854

E-mail: info@lindenindustries.com

Website: www.linden-emb.com

New cyclopentane facility

Haldia Petrochemicals Ltd., India, has established a 15,000 t/y facility to manufacture cyclopentane, with technology supplied by IFP France. Cyclopentane is a premium high-value product and is used primarily to replace CFCs as a blowing agent for insulating foams. The new blowing agent has been proved to be the optimal replacement for CFCs. Cyclopentane blown foams were found to perform better than even CFC-11 blown foams. Benefits provided by cyclopentane include:

Zero ozone depletion potential;
High insulation efficiency;
High blowing efficiency;
Excellent adhesion to facia;
Easy handling at room temperature; and
Chemically stable.

The 1994 UNEP report on the Elimination of CFC from Domestic Refrigeration Manufacturing states as follows: Insulating properties of cyclopentane do not deteriorate with time as fast as do those of CFC-11 blown foam. In a standard test, cyclopentane foam and CFC-11 foam may both have initial values of 19 m W/mK. With a few days or weeks of ageing cut samples at 60 or 70C, the CFC-11 foam will have deteriorated to be worse than the cyclopentane foam. Its final value may be 2-3 m W/mK worse than the cyclopentane version.

Contact: Mr. Asesh Deb, Sr. Marketing Manager, Haldia Petrochemicals Limited, 1, Auckland Place, Kolkata 700 017, West Bengal, India. Tel: +91 (33) 2283 1629; Fax: +91 (33) 2283 1646; Mobile:919831054722.

Website: www.haldiapetrochemicals.com

Low-pressure pentane foam processor

Decker Industries Inc., the United States, offers D-IS series of low-pressure, mechanical mixing equipment to safely and efficiently process an isocyanate component and polyol/pentane blend component used in the manufacture of integral skin flexible foams and rigid foams used for insulation. The D-IS system is designed to meet requirements of the UL Class 1, Division 2 codes covering operation in hazardous locations. Key features include:

Proven mix head with air actuated ball valves, liquid pressure balance controls, dynamic mix chamber with dual speed mixer motor;

8 ft boom assembly with air piston for vertical control;
Variable ratios from 5:1 to 1:5;
Positive displacement, rotary gear pumps with variable speed AC drive motors;
All motors are rated for hazardous duty;
Recirculation wet lube for isocyanate pump or optional magnetic drive coupling for either pump, assures a leak-free environment;
Patented PulsePurge for hot water and surfactant rinse of mix chamber;
Dual filtration for isocyanate component;
Stainless steel heat changers for each component features direct heating and hook-up for main or chilled water cooling;
Isolation circuits to prevent electrical sparks;
Operator friendly touch screen interface; and
Non-arcing mechanical mix head components.

Contact: Decker Industries Inc., 3030 SW, 42nd Avenue, Palm City, Florida 34990, United States of America. Tel: +1 (561) 2834 004; Fax: +1 (561) 2834 007

Website: www.deckerinc.com

Foam stabilizer

Dearmate Shichuang Chemical Co. Ltd., China, offers new foam stabilizer products for rigid foam, flexible foam, HR flexible foam and sole shoes, etc. These products can be used in various systems along with blowing agents like c-pentane, HFC-245fa, HFC-365/227, etc. The company has a production capacity of 2,500 t/y and its products are cost-competitive.

Contact: Dearmate Shichuang Chemical Co. Ltd., 3A01-5 Fine Chemical Zone, Nanjing Economic and Technical Development Zone, Nanjing, Jiangsu 210046, China. Tel: +86 (25) 8557 0505; Fax: +86 (25) 8557 6548

Website: www.demasc.com

Website: www.kellysearch.com

HALONS

New halon-free fire suppression system

Firemaster Extinguisher, the United Kingdom, is offering Novec1230 automatic fire suppression system based on 3Ms clean and environmentally friendly Novec 1230 drop-in replacement for halons pressurized with nitrogen. Novec 1230 fluid is heavier than water and an effective fire extinguishing agent in standard fire scenarios where damaging halons were historically used. It has zero GWP and ODP, and a low atmospheric life.

Manufactured under BS EN ISO 9002 Quality Management and CE marked, the new system operates automatically at temperatures of 685C. It is also available with optional single or dual facility, enabling remote manual operation, both electrically and mechanically. The stored pressure systems facilitate easy and low maintenance. The new unit has been designed for use in diverse enclosed areas such as plant rooms, machinery spaces, switchgear and engine rooms. It is suitable for B and C fire classifications and are safe for use on

electrical equipment.

Contact: Firemaster Extinguisher, Firex House, 174-176, Hither Green Lane, London SE13 6QB, United Kingdom. Tel: +44 (20) 8852 8585; Fax: +44 (20) 8297 8020.

Website: www.processingtalk.com

Special hazard fire extinguishing systems

Hatsuta Seisakusho Co. Ltd., Japan, is offering an automatic fire fighting system based on Argonite, a 50:50 mixture of air and nitrogen. The eco-friendly Argonite Cabinex system has zero ODP and GWP. Argonite has been recognized by NFPA 2001 (IG-55). It has been widely utilized and acknowledged as an International Standard Fire Extinguishing agent. Argonite depletes the oxygen level to 13 per cent for extinguishing a fire and does not have any adverse effect on the material after discharge. It can be effectively used on various kinds of combustibles and is especially appropriate to subjects for which water type or foam type fire extinguishing systems are not compatible. Argonite Cabinex is ideally suitable for various kinds of industrial equipment as the detection system circuit is selectable for AND/OR operation. Using various sensors, the system is compatible with almost all equipment installation.

Compact Foam 3S is an easy-to-use, reliable fire extinguishing system that allows users to put out fires rapidly. This system brings together a high level of rationality and safety, and is the optimum package for the requirements of the future. It is ideal for installation in petroleum stations and can be set up at large petroleum stations with up to 12 selectable areas, enabling selection of an area on the control panel to distribute the foam only to the desired location. In case of a fire breaking out, the supervisor presses the activate button for the fixed foam fire extinguishing equipment installed on-site. The electromagnetic selector valve is released when a signal is detected and fire-fighting foam is released from the discharge points. Foam is discharged from the sides of the islands where vehicles are stopped to ensure effective fire extinguishing at close quarters. Outstanding sealing properties of the suppression foam extinguish fires rapidly and reliably through smothering and cooling actions.

Contact: Hatsuta Seisakusho Co. Ltd., Japan.

E-mail: hatsuta@hatsuta.co.jp

Website: www.hatsuta.co.jp

New fire extinguishing unit

R-Amtech International Inc., the United States, offers Aero-K systems to ensure highly effective and environment-friendly fire suppression in enclosed facilities and local spaces. This systems patented potassium-based agent is five times more effective than halon and ten times more effective than halon replacements. The effectiveness of the Aero-K aerosol generator is a function of its patented design, unique chemical composition and the ultra-fine particles produced.

Aero-K generators do not require pressure vessels, pipe work and extensive installation associated with halon, carbon dioxide, dry chemical and halon replacement systems. These self-contained units incorporate a solid-state charge and cooling blocks that are not pressurized until activated. When activated, Aero-K generators produce an aerosol of ultra-fine particles (~2 m), which is dispersed under pressure (~45 psi). The aerosol thus produced has flow characteristics similar to gaseous agents and can remain suspended in air for an extended period of time, providing a hold time of up to an hour. The primary suspension mechanism of the aerosol is chemical interference with free radicals of flame that interrupts the propagation of fire. The secondary mechanisms include dilution of inflammable medium with inert gases and cooling.

Aero-K systems are eco-friendly, non-toxic (with levels similar to halon-1301), non-corrosive and have no global warming potential. Also, it does not harm electronic equipment and magnetic tapes. Some of the potential application areas include telecommunication facilities, general industrial hazards, marine engine rooms, high-value mobile equipment, data processing facilities, storage vaults, inflammable liquid storage areas, turbine enclosures, power plants, warehouses, boats, aircraft engines, etc.

Contact: R-Amtech International Inc., 2101, 112th Avenue NE, Suite 210, Bellevue, Washington 98004 2944, United States of America. Tel: +1 (425) 8658 085; Fax: +1 (425) 4620 622.

Website: www.r-amtech.com

Racetrack fire suppression equipment

FireCharger, the United States, is offering patented systems to protect against fire hazards that may occur on racetracks. These units employ AFFF with carbon dioxide (CO_2) propellant to produce an expanded foam discharge that outperforms any other AFFF system currently available. AFFF and CO_2 are both approved extinguishing agents and environment friendly. A FireCharger system cylinder is totally filled with a 6 per cent AFFF and 94 per cent water mixture.
The system is activated by a pull cable, which releases CO_2 propellant into the cylinder where it mixes with and aerates the AFFF mixture. Concurrently, the sudden increase in pressure opens the non-fragmenting rupture disc, which enables complete and total discharge through the piping to the extremely wide coverage nozzles found only on a FireCharger system. Also, this system is more economical and the only system that can be refilled/recharged at the racetrack by the user.

Contact: FireCharger, 1300, Vista Way Building E, Red Bluff, CA 96080, United States of America. Tel: +1 (530) 5275 862; Fax: +1 (530) 5275 813

E-mail: mdoty@firecharger.com

Website: www.firecharger.com

FUMIGANTS

Methyl bromide alternative approved in the United States

Aberco Inc., the United States, has been approved by the California Department of Pesticide Regulation (DPR) to use 100 per cent propylene oxide, as an alternative to methyl bromide (MB), in the fumigation of in-shell nuts to eliminate insects as well as reduce bacterial and mould contamination. DPR has also approved a 48 h exposure time for a mixture of 8 per cent propylene oxide with 92 per cent inert gas, like carbon dioxide or nitrogen, when made in the sterilizer. Additionally, DPR has authorized the use of propylene oxide for fumigating non-food products such as packaging, cosmetics, pharmaceutical ingredients and discarded nut shells prior to disposal.
Aberco is the sole registrant permitted to use propylene oxide as a food fumigant or sterilant.

Contact: Aberco Inc., 9430, Lanham Road, Seabrook, MD 20706, United States of America. Tel: +1 (301) 4597 090; Fax: +1 (301) 5779 041

Website: www.aberco.com

Website: www.uneptie.org

Natural fumigants

Nor-Natur ApS, Denmark, has introduced natural alternatives to methyl bromide (MB). Quiponin BS Powder and Quiponin BS Liquid are based on extracts and dried milled parts of the tree Quillaja saponaria, growing wild in Chile and Peru, and different vegetable and clay-mineral carriers. The Quiponin products also possess growth stimulating effects, apart from the ability to enhance the plants natural defence mechanism.

Contact: Nor-Natur ApS, Denmark. Tel: +45 3677 1902; Fax: +45 3677 0266

E-mail: nornatur@norgroup.dk ; office-nornatur@nornatur.net

Website: www.norgroup.dk

Controlling insects in wood

In the United States, researchers at Virginia Polytechnic Institute and State Universitys (Virginia Tech) College of Natural Resources have recently developed a vacuum drying insect control project for wood. According to Virginia Tech researcher Mr. Zhangjjng Chen, low pressure achieved by applying vacuum to a system will create an oxygen-poor environment that can eliminate insects in several hours to days without using methyl bromide. The system, if successful, stands to benefit wood pallet and container manufacturers and hardwood sawmill businesses. Contact: Ms. Lynn Davis, Virginia Tech, United States of America. E-mail: davis1

Compounds zap grapevines worm enemy

Researchers at the Agricultural Research Service, the United States, have been testing an array of compounds that might prove to be effective, affordable and environmentally acceptable alternatives to methyl bromide. Ms. Sally M. Schneider et al. explored the power of alternative chemicals to zap root-knot nematodes. These nearly-transparent worms feast on plant roots, causing the plant to form small knots or galls that can interfere with the roots ability to take up water and nutrients. The team found that nematode control in nursery beds fumigated with chloropicrin, iodomethane plus chloropicrin, or 1,3-dichloropropene plus chloropicrin, then covered with a plastic tarp for 16 days, was about the same as that in nursery beds treated with methyl bromide and tarped. Moreover, the grapevines were nematode-free, when scrutinized at harvest nine months later.

Website: www.ars.usda.gov

Chemical alternatives to methyl bromide in Italy

Different substances have been registered as alternatives to methyl bromide (MB) for soil disinfestation (refer table) in Italy. An emulsifiable formulation of 1,3 D (1,3 D EC, 94 per cent p.a. - Dow AgroSciences), a formulation of metham potassium (Tamifum - 50 per cent a.i. - Taminco) and an emulsifiable formulation of chloropicrin (Tripicrin - 94 per cent a.i. - Triagriberia SL) have been registered since November 2001, June 2002 and July 2002, respectively. 1,3 D EC and metham potassium are registered for annual and perennial crops. 1,3 D EC has now been registered for protected crops, while the old formulation of 1,3 D was registered for open field applications only. Chloropicrin formulation can be applied only by professional licensed workers and is registered for open field and protected tomato, pepper, melon, eggplant, strawberry, watermelon and zucchini crops. The application of EC formulations of 1,3 D and chloropicrin is now permitted through drip irrigation systems.

Among non-fumigant MB alternatives, carbofuran, fenamiphos, fosthiazate, oxamyl, cadusafos and ethoprophos could be applied against nematodes alone or integrated with soil solarization before and after crop

transplant.

Contact: Ms. Maria Lodovica Gullino, Centre of Competence for Innovation in the Agro-environmental Sector, University of Turin, Via L. Da Vinci 44 10095 Grugliasco (To), Italy

E-mail: marialodovica.gullino@unito.it

Website: www.mbao.org

PUBLICATIONS

IRC 2003 Conference Proceedings: Serving the Needs of Mankind

The 21st IIR Congress of Refrigeration provided scientists and engineers an opportunity to work with their colleagues from around the world and share ideas that may shape refrigeration technology for decades to come. Topics discussed at this event included carbon dioxide systems, advanced heat exchange techniques, absorption systems and cold chain. The proceedings of the Congress, available on CD, contains 440 papers by 1,031 authors from 46 countries.

Residential Split-System Cooling: Mechanical Refrigeration Troubleshooting R-22/R-410a

This CD publication starts with a basic introduction to refrigerants and ends with troubleshooting for R-22 and R-410a refrigeration circuit problems. It provides detailed information on heat transfer and saturated refrigerants, evaporators, condensers, specific service practices relating to R-22 and R-410a. Topics covered in-depth include introduction to refrigerants, mechanical refrigeration cycle, evaporator coil, condenser coil, diagnostics and interactive practices on R-22/R-410a.

For the above CDs, contact: American Society of Heating, Refrigeration and Air-conditioning Engineers Inc., 1791, Tullie Circle, N.E. Atlanta, GA 30329, United States of America. Tel: +1 (404) 6368 400; Fax: +1 (404) 3215 478.