VATIS UPDATE

Ozone Layer Protection

Vol. 4 No. 97 ● Nov - Dec 2009
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Highlights

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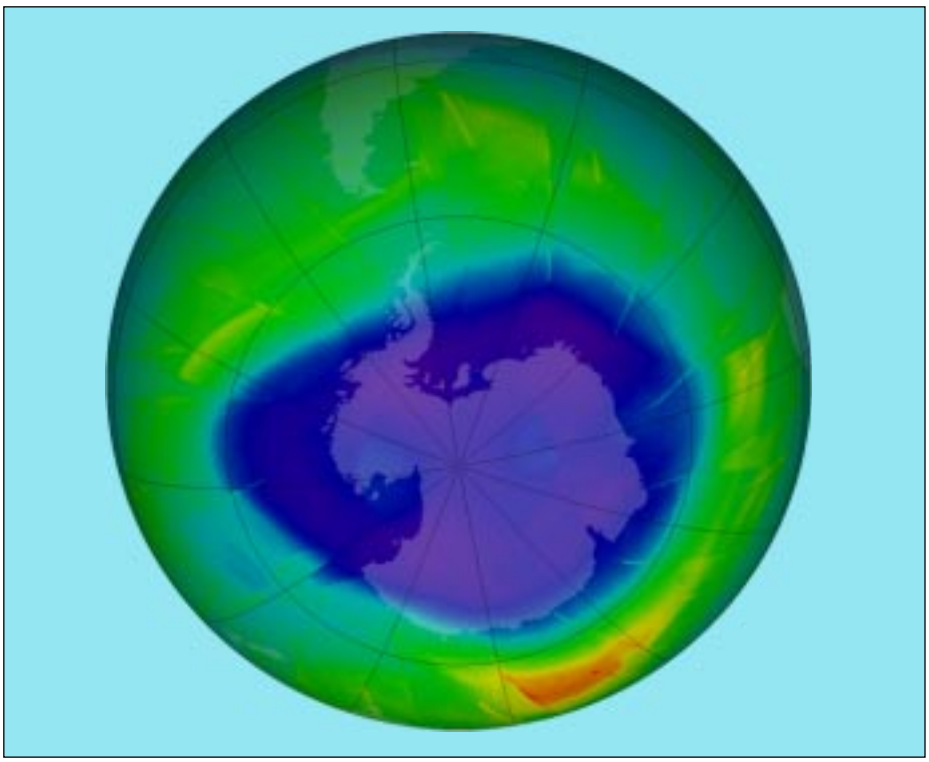
- Fluorocarbon-free heating/cooling technology
- Eco-friendly liquid laundry detergent
- Spray PU foam insulation from recycled plastics
- Inert gas fire suppression system
- Biofumigants for pest control in grains



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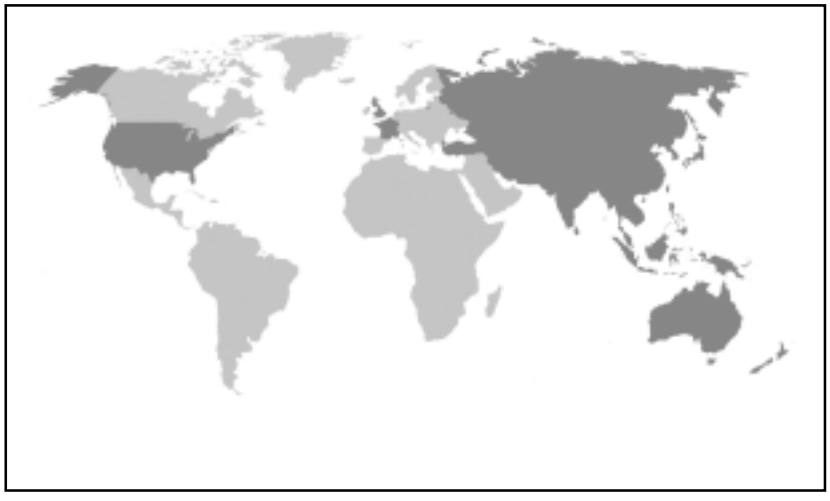
ASIAN AND PACIFIC CENTRE FOR TRANSFER OF TECHNOLOGY

OZONE CELL
MINISTRY OF ENVIRONMENT AND FORESTS
GOVT. OF INDIA

The **Asian and Pacific Centre for Transfer of Technology (APCTT)**, a subsidiary body of ESCAP, was established on 16 July 1977 with the objectives: to assist the members and associate members of ESCAP through strengthening their capabilities to develop and manage national innovation systems; develop, transfer, adapt and apply technology; improve the terms of transfer of technology; and identify and promote the development and transfer of technologies relevant to the region.

The Centre will achieve the above objectives by undertaking such functions as:

- Research and analysis of trends, conditions and opportunities;
- Advisory services;
- Dissemination of information and good practices;
- Networking and partnership with international organizations and key stakeholders; and
- Training of national personnel, particularly national scientists and policy analysts.



The shaded areas of the map indicate ESCAP members and associate members

Cover Photo

This composite image from 10 September 2009 depicts ozone concentrations in Dobson Units, with purple and blues depicting severe deficits of ozone.

(Credit: NASA, the United States)

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Ozone Layer Protection
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ASIAN AND PACIFIC CENTRE FOR TRANSFER OF TECHNOLOGY
Adjoining Technology Bhawan
Qutab Institutional Area
Post Box No. 4575
New Delhi 110 016, India
Tel: (91) (11) 2696 6509
Fax: (91) (11) 2685 6274
E-mail: postmaster@apctt.org
Website: http://www.apctt.org

OZONE CELL
Ministry of Environment and Forests
Government of India
Zone IV, East Court, 2nd Floor
India Habitat Centre, Lodhi Road
New Delhi 110 003, India
Tel: (91) (11) 2464 2176
Fax: (91) (11) 2464 2175
Telegram: PARYAVARAN NEW DELHI
E-mail: ozone-mef@nic.in
Website: http://www.ozonecell.com

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SCIENCE OF THE OZONE LAYER

Satellite data show progress of 2009 Antarctic ozone hole

The annual ozone hole has started developing over the South Pole, and it appears that it will be comparable to ozone depletions over the past decade. Scientists are tracking its size and depth with observations from the ozone monitoring instrument on the Aura spacecraft of the United States National Aeronautics and Space Administration (NASA), the Global Ozone Monitoring Experiment on the European Space Agency's ERS-2 spacecraft, and the Solar Backscatter Ultraviolet instrument on the NOAA-16 satellite of the United States National Oceanic and Atmospheric Administration.

Recent observations and several studies have shown that although the size of the annual ozone hole has stabilized and the level of ozone-depleting substances has decreased by 4 per cent since 2001, a recovery of atmospheric ozone is not likely to be noticeable until 2020 or later. (Source: www.physorg.com)

Ozone layer depletion appears levelling off

By merging more than a decade of atmospheric data from European satellites, scientists have compiled a homogeneous long-term ozone record that allows them to monitor total ozone trends on a global scale – and the findings are promising. The scientists merged monthly total ozone data derived from the vertically downward-looking measurements of the Global Ozone Monitoring Experiment (GOME) instrument on the ERS-2 satellite of European Space Agency (ESA), the scanning imaging absorption spectrometer for atmospheric cartography (SCIAMACHY) on ESA's Envisat, and GOME-2 on the European Meteorological Satellite Organization's MetOp-A.

A team of scientists led by Mr. Ashley Jones and Mr. Jo Urban from Sweden's Chalmers University of Technology combined the limb (sideways) measurements from United States' backscatter ultraviolet instrument (SBUV), Stratospheric Aerosol Gas Experiment (SAGE) I+II and Halogen Occultation Experiment (HALOE) with data from optical spectrograph and infrared imager system (OSIRIS), sub-millimetre radiometer (SMR) and SCIAMACHY on the European satellites Odin and Envisat to analyse the long-term evolution of stratospheric ozone from 1979 to the present. These data show a decrease in ozone from 1979 until 1997, followed by a small increase.

"Our analysis shows that upper stratospheric ozone declines at northern and southern midlatitudes at roughly 7 per cent per decade during 1979-97, consistent with earlier studies based on data from satellites and ground networks. A clear, statistically significant change of trend can be seen around 1997. The small increase (of 0.8–1.4 per cent per decade) observed thereafter, from 1997 to 2008, is however not yet statistically different from a zero trend," Mr. Urban said.

Using SCIAMACHY data in limb-viewing observation mode from 2002 to 2008, Mr. François Hendrick from the Belgian Institute for Space Aeronomy (BIRA/IASB) and his colleagues from the University of Bremen, Germany, performed a trend analysis of bromine monoxide (BrO) in the stratosphere. BrO is a highly efficient catalyst in ozone destruction. The results show a falling trend in BrO in the stratosphere during this period, marking the first such decline reported from a space-borne observation. "These findings provide strong evidences that the Montreal Protocol restrictions on brominated substances have now reached the stratosphere," Mr. Hendrick said, at ESA's Atmospheric Science Conference held in Spain, during 7-11 September. (Source: www.sciencedaily.com)

Nitrous oxide dubbed monster ozone slayer

Nitrous oxide (N_2O), known as the laughing gas, is no laughing matter once it enters the atmosphere. New data indicate that it has become the leading threat to the future integrity of stratospheric ozone. The surprise is not that N_2O is ozone-toxic – that has been known for decades – but the measure of how its ozone-destroying potential (ODP) compares to chlorofluorocarbons (CFCs), specifically to CFC-11. Calculations by a trio of scientists from the National Oceanic and

Atmospheric Administration (NOAA) of the United States indicate that each N_2O molecule is almost 1/50th as effective at depleting ozone as CFC-11.

Owing to its roughly 100-year survival time in the atmosphere (comparable to CFCs) and the huge quantities released each year, N_2O stands poised to become a potent player in the thinning of global stratospheric ozone. In the online paper posted in *Science,* team leader Mr. A.R. Ravishankara notes that N_2O will be the largest ozone-depleting emissions for the rest of the century. NOAA calculations now suggest that gains made under the Montreal Protocol will slow or halt, owing to the huge and rising contributions of N_2O that also imperils ozone, but remains ignored by the treaty. Ironically, the treaty's success in limiting CFC emissions will begin intensifying N_2O's potency. "Nitrogen oxides and chlorine oxides kind of oppose each other in destroying stratospheric ozone," the scientist explains. In other words, N_2O offsets the ability of chlorine oxides to destroy ozone, and vice versa. The scientists calculate that the ODP of N_2O would be roughly 50 per cent larger when chlorine levels return to the year-1960 level.

Emissions from natural sources – such as animal wastes, deforestation and bacterial decomposition of plant material that emit up to two-thirds of atmospheric N_2O – appear fairly static, Mr. Ravishankara said. However, N_2O releases from processes fostered by human activity – such as the nitrogen fertilization of agricultural soils and fossil-fuel combustion – have grown steadily to boost atmospheric N_2O concentrations by about 1 per cent every four years. NOAA scientists say that N_2O could eventually destroy 40 per cent as much stratospheric ozone each year as CFCs did at their peak. (Source: www.usnews.com)

Technical Advisories for CTC Phase-out

Several technical advisories for CTC phase-out in different industries are available from the National CTC Phase-out Plan of India. For more information, contact:

National CTC Phase-Out Plan
GTZ Proklima Country Office
A-33 Gulmohar Park, New Delhi 110 049, India
Tel: +91 (11) 2661 1021
Web: www.ctc-phaseout.org

ODS PHASE-OUT IN INDIA

International Ozone Day

The 15th International Ozone Day was celebrated on 16 September 2009 at the FICCI Golden Jubilee Auditorium in New Delhi to commemorate the signing of the Montreal Protocol on Substances that Deplete the Ozone Layer. The theme for this year was "Universal participation – Ozone protection unifies the World". Speaking as Chief Guest on the occasion, Mr. Jairam Ramesh, Minister of State for Environment & Forests (Independent Charge), said that India was one of the first developing countries to join the Montreal Protocol and pledge its commitment to protect the Ozone Layer. As a part of the accelerated phase-out of CFCs, India has completely phased out the production and consumption of Chlorofluorocarbons (CFCs) by 1 August 2008, 17 months prior to the agreed schedule.

The Minister said the Montreal Protocol is hailed as one the most successful examples of an international environmental treaty. With Timor-Leste ratifying as the 196th state, it has become the first ever treaty to achieve universal participation. At a time when the world is trying to solve the problem of climate change, the International Ozone Day provided a timely reminder of how international cooperation can help to solve major global environmental problems.

Mr. Ramesh informed that a comprehensive Road Map and Action Plan to phase out the production and consumption of Hydrochlorofluorocarbons (HCFCs) in various sectors in India has also been developed. The Government of India has taken a number of policy measures, fiscal as well as regulatory, to encourage the early adoption of alternative technologies in this area by existing and new enterprises. The Ministry of Environment & Forests, with support from the Global Environment Facility and the World Bank, also launched recently the "India: Chiller Energy Efficiency Project" to accelerate the conversion of CFC-based chillers using new, more energy-efficient technologies. (Source: pib.nic.in)

Road map for phase-out of HCFCs in India

India will be phasing out hydrochlorofluorocarbons (HCFCs), used in refrigeration and air-conditioning, by 2013 in line with the Montreal Protocol. "By 2013, we are going to freeze the production and consumption of HCFCs at the average level of 2009 and 2010 production and consumption respectively in 2013. We will do this by reducing their use by 10 per cent by 2015, as compared with the baseline levels, and bring it to zero by 2013," said Minister of State for Environment & Forests, Mr. Jairam Ramesh, recently while launching a roadmap for phasing out HCFCs.

Boosted by sustained growth in demand for consumer, commercial and industrial products, the consumption of HCFCs has grown at an average annual rate of over 11 per cent in the past 15 years. HCFCs have replaced chlorofluorocarbons (CFCs), which was phased out in August 2008. However, CFCs – required for inhalers used by patients suffering from asthma and chronic obstructive pulmonary diseases – are still available in India and a national transition strategy to phase these out by 2013 is under implementation.

"HCFC phase-out is challenging for an emerging economy like India owing to issues related with technology and funding to facilitate the transition without burdening the economy and constraining consumers and industry. India should develop its own technology, rather than relying on other countries," said Mr. Ramesh. (Source: www.business-standard.com)

Project to implement chiller energy efficiency

IDBI Bank recently signed a project agreement with the World Bank for implementing Chiller Energy Efficiency Project (CEEP) in India. The objectives of CEEP are to reduce greenhouse gas (GHG) emissions and to support the phase-out of use of chlorofluorocarbons (CFCs). CEEP will achieve this by stimulating the acceleration of replacement of old CFC-based centrifugal chillers, with more energy-efficient, non-CFC centrifugal chillers.

The project will also provide financial incentives directly to chiller owners to encourage them to overcome barriers such as up-front capital costs and perceived technology risks. CEEP aims to strengthen the national capacity for carbon finance intermediation and to demonstrate viability for implementing other low-cost and/or no-cost energy conservation measures in large buildings.

The Global Environment Facility (GEF) Grant Agreement for US$6.3 million and the Ozone Trust Fund (OTF) Grant Agreement for US$1.0 million for India's CEEP were signed at New Delhi on 26 August 2009. Dr. Anuj Pujari, Joint Secretary, Ministry of Finance, Government of India, Mr. B.K. Batra, Executive Director & Group Head-Corporate Banking, IDBI Bank and Mr. Roberto Zagha, Country Director, India, World Bank, signed the CEEP agreements. (Source: economictimes.indiatimes.com)

Inhalant-dependents advised to adopt CFC-free inhalers

To phase out the ozone-depleting chlorofluorocarbons (CFCs) used in inhalers for asthma and chronic obstructive pulmonary diseases (COPD) patients, the government has asked people to adopt environment-friendly CFC-free inhalers. "Environment-friendly asthma and COPD inhalers are being introduced across the country as phasing out of CFCs has been aimed at by January 2010," said India's Drug Controller General, Mr. Surinder Singh, addressing a workshop titled "Phasing out CFC in Metered Dose Inhalers".

All asthma and COPD inhalers in India will now be either dry powder-based or will be using a hydrofluoroalkane (HFA) propellant. "Research has shown that the HFA solution produces very small particles, which penetrate the small airway in the lung better than the older CFC formulation," Mr. Singh revealed.

According to statistics, there are about 300 million people worldwide suffering from asthma and over 210 million with COPD. As inhalers are the best way to treat the condition, a lot of efforts went into the development of CFC-free inhalers. "These CFC-free inhalers provide the same health benefits as the old CFC-containing inhalers, without damaging the ozone layers," said Dr. R.C. Deka, Director of the All India Institute of Medical Sciences (AIIMS). (Source: timesofindia.indiatimes.com)

IN THE NEWS

Montreal Protocol achieves universal ratification

The Montreal Protocol on Substances that Deplete the Ozone Layer has become the first environmental treaty to attract universal participation by all the 196 governments of the world, with Timor-Leste, the world's youngest nation, ratifying the treaty on 16 September 2009, the International Day for the Preservation of the Ozone Layer.

"Timor-Leste is very pleased to be joining the rest of the world in the fight against the depletion of the ozone layer and the effort towards its recovery," Mr. Xanana Gusmao, Prime Minister of Timor-Leste, said. "We are proud to be part of this important process to protect the ozone layer and undertake to implement and comply with the Montreal Protocol like all other states that preceded us in this important journey."

"The ratification by Timor-Leste makes this special day even more special and a signal that when the world fully and wholly unites around an environmental challenge there can be multiple and transformative effects," said Mr. Achim Steiner, Executive Director of the United Nations Environment Programme that hosts the Ozone Secretariat.

Established to phase out pollutants damaging the layer of stratospheric ozone that shields the planet from the Sun's damaging ultraviolet rays, the treaty will within a few months place close to 100 chemicals linked to ozone damage on the list to be retired. (Source: www.ens-newswire.com)

North American proposal to reduce use of HFCs

The United States Department of State has announced a North American proposal between the Governments of the United States, Canada and Mexico to phase down the use of hydrofluorocarbons (HFCs) under the Montreal Protocol on Substances that Deplete the Ozone Layer. This North American proposal represents a significant down payment on efforts to be pursued at the United Nations Framework Convention on Climate Change in Copenhagen, Denmark, this December. The joint effort addresses the mounting threat of global climate change and represents a new resolve by the three governments to address shared environmental problems collectively.

The new proposal builds on the amendment package put forward this spring by Mauritius and the Federated States of Micronesia for consideration by Montreal Protocol Parties. The proposal calls on all countries to take action to reduce their consumption and production of HFCs, although developed countries would take the lead in this effort.

The problem of HFCs is closely linked to the accelerated phase-out of hydrochlorofluorocarbons (HCFCs). As the demand for air-conditioning and refrigeration increases globally, and as countries accelerate their efforts to phase out HCFCs to protect the ozone layer, producers of such products will turn increasingly to HFCs unless suitable alternatives can be identified. While HFCs pose no threat to the stratospheric ozone layer, they risk aggravating the problem of climate change as potent greenhouse gases. Phasing down consumption and production of HFCs will send an important signal about the need for alternatives that pose no problem either for the ozone layer or for the climate system. (Source: www.state.gov)

Customs and the Montreal Protocol: a fruitful partnership

To a large degree, the successful implementation of the Montreal Protocol on Substances that Deplete the Ozone Layer since its adoption in 1987 is due to the substantial efforts by Customs administrations worldwide. The Secretary General of the World Customs Organization (WCO), Mr. Kunio Mikuriya, said, "Protecting the environment is a priority for WCO. All Customs authorities have a very important role to play in ensuring a greener and safer world, as they are on the frontline and primarily responsible for dealing with goods at borders."

With respect to ozone depleting substance (ODS) in particular, the international community is aware that very often non-producer countries and free-trade zones are abused as transit locations for further distribution of these substances, thereby bypassing the Montreal Protocol Licensing System.

False declarations and mislabelling make it even more difficult for Customs to detect these goods. The task of curbing smuggling in developing countries, particularly those falling within Article 5 of the Protocol, is considerable because the bulk of production and consumption now occurs in these countries due to the fact that their scheduled phase-out of ODS is still to be completed.

This year has, thus far, witnessed a number of significant interceptions of ODS by Customs, including more than 85 used refrigerators and almost 19,000 kg of refrigerator compressors containing CFCs. WCO will continue to invest heavily in building the capacity of Customs administrations to stop all forms of environment crime. In addition, it will step up its efforts to enhance cooperation with other international organizations, such as the United Nations Environment Programme (UNEP), which, together with the WCO, form part of the Green Customs Initiative. (Source: www.uneptie.org)

Experts hail Nepal's ozone-friendly efforts

Nepal has effectively implemented the Montreal Protocol 1987 by doing a remarkable work in the field of minimizing the use of chlorofluorocarbons (CFCs), say experts. Nepal aims to decrease the consumption of CFCs including CFC-11 and CFC-12 to 10 per cent annually and finally eradicate the use of CFCs and other chemicals causing ozone depletion by 2010.

Speaking during a programme on the "International cooperation in ozone layer protection and achieving ozone layer protection with minimum green house gas emission impact", organized to mark the International Ozone Day, Mr. Stephen O. Andersen, a scientist from the United States, said that Nepal has taken the leadership among all other developing countries around the world in implementing the Montreal Protocol. "Nepal has celebrated the enforcement of ozone depleting substances import control to an exemplary level and has become the only country to successfully implement the Montreal Protocol in South East Asia," he claimed.

Mr. Sitaram Joshi, the Director General at the Nepal Bureau of Standard and Metrology (NBSM), said the country is going to declare itself CFC-free by 2010. NBSM is the implementing body of the Montreal Protocol, which Nepal ratified in 1994. Nepal has already been awarded with 'The Montreal Protocol Implementers Award' in 2007 by the United Nations Environmental Programme (UNEP) for its exemplary contribution in effective implementation of the protocol and protecting the ozone layer. (Source: www.ekantipur.com)

Indonesia to crack down on illegal CFC suppliers

The Indonesian government is concerned about suppliers of ozone-depleting chlorofluorocarbons (CFCs), who continue to defy a 2007 ban on the import of the once commonplace chemicals. An investigation conducted by the Office of the State Minister for the Environment found that at least 300 high-rise buildings, including star hotels and state buildings, regularly refill their air-conditioning (AC) systems with illegal CFCs. Centrifugal chillers in 300 high-rise buildings were found to contain about 150 tonnes of CFCs. "We also believe that hundreds of cold storage units, including those in supermarkets, are still using CFCs," said Ms. Sulistyowati, an assistant to the Deputy Minister for Climate. "We are still hunting those illegal importers and the suppliers," she added. The investigation team also found that many automotive workshops in Bali inject CFCs into cars' AC systems. (Source: www.thejakartapost.com)

International Ozone Day observed in the Philippines

Environment Secretary of the Philippines, Mr. Jose L. Atienza Jr., led the country's celebration of the International Day for the Preservation of the Ozone Layer on 16 September. The event also marked the 22nd anniversary of the Montreal Protocol on Substances that Deplete the Ozone Layer. The Protocol is hailed as a landmark agreement that has successfully reduced the global production, consumption and emissions of ozone-depleting substances (ODS).

A statement from the Department of Environment and Natural Resources (DENR) said: "Because of ODS phase-out, the world has avoided the equivalent of 135 billion giga tonnes of carbon

dioxide equivalent between the 1990 and 2010, equivalent to about 13 per cent of accumulated emissions of carbon dioxide from human activities and delaying climate change by 7 to 12 years."

The statement went on to add: "Many countries, both developed and developing, have met their phase-out targets well ahead of schedule. In the Philippines, the substances chlorofluorocarbons (excluding CFC-12), halons, methyl bromide, methyl chloroform and carbon tetrachloride were all phased out even before their Protocol phase-out deadline." (Source: www.pia.gov.ph)

Viet Nam looks to clean up ODS

Viet Nam needs US$20 million to wean the country off ozone-depleting substances (ODS), according to officials from the Ministry of Natural Resources and Environment. Viet Nam's industries could be free of chlorofluorocarbons (CFCs) by next year and of hydrochlorofluorocarbons (HCFCs) in two decades, the Deputy Director of the Ministry's Meteorology, Hydrology and Climate Change Department, Mr. Nguyen Khoa Hieu, said during a recent seminar.

"So far, expelling CFCs has cost US$7.3 million in bilateral funds on ozone, but getting rid of HCFCs by 2030 is a more expensive proposition," said Mr. Luong Duc Khoa of the Ministry's Climate Change Division. This year, Viet Nam imported only 10 tonnes of R-12, a CFC-group substance.

In 2005, the government had issued a decree requiring approval from the Ministry of Industry & Trade and the Ministry of Natural Resources & Environment to import CFC/HCFC and CFC/HCFC-related equipment, in an attempt to limit them. However, the country still uses certain CFCs and HCFCs: CFC-11 and CFC-12 in individual housing and old car air-conditioners; Halon-2402 and Halon-1301 in fire-fighting systems produced by Vietsopetro Company; carbon tetrachloride; HCFC-22, HCFC-122, HCFC-123 and HCFC-141b in heat-proof board and shoe production; and methyl bromide in agricultural pesticides.

Mr. Khoa said the Department would work with World Bank to launch a publicity campaign on the dangers of ODS and to provide modern equipment for 850 facilities that install and repair freezers and air-conditioners. (Source: english.vietnamnet.vn)

Kyrgyzstan to be free from ODS by 2010

Kyrgyzstan will completely abandon use of ozone depleting substances from 1 January 2010, Mr. Mars Amanaliev, Director of the Ozone Centre in Kyrgyzstan said at a recent briefing. Delivery of Freon to Kyrgyzstan and use of chlorofluorocarbons will be stopped. The use of methyl bromide in agriculture, except preshipment use, and halons for fire fighting was completely stopped in 2008. Mr. Amanaliev said that the Ozone Centre is working with people engaged in the repair of refrigerating equipment and has taken measures to license their activity. "Employees of Customs Service have been supplied with special equipment for detection of ozone depleting substances in cargos," he said. (Source: eng.24.kg)

Bangladesh stresses on complete phase-out of CFCs

The International Ozone Day 2009 was observed in Bangladesh, laying emphasis on making the country's pharmaceutical sector free from chlorofluorocarbons (CFCs), a highly potential ozone-depleting substance. Speakers at a seminar held in connection with the event said that the pharmaceutical sector still remains a challenge for Bangladesh in stopping use of CFC, as the sector still consumes around 100 tonnes of CFC per year for producing metered-dose inhalers (MDI) used by the asthma patients.

Bangladesh, with the support of Montreal Protocol Multilateral Fund, has phased out the use of CFCs in the aerosol, as well as refrigeration, air-conditioning and other cooling sectors. As a signatory of Montreal Protocol, Bangladesh cannot import and use any CFCs after December 2009, except for essential uses.

Department of Environment observed the day with various programmes to make people aware about ozone layer protection. President Mr. Zillur Rahman, Prime Minister Mrs. Sheikh Hasina and State Minister for Environment and Forests Dr. Hasan Mahmud in separate messages urged the people to be careful about protecting the ozone layer through reducing the use of ODS. (Source: nation.ittefaq.com)

REFRIGERATION/ AIR-CONDITIONING

Greener freezers on the make

Some of the world's largest consumer product companies are promoting in the United States freezers and refrigerators that use coolants that don't trap heat in the atmosphere as much as Freon and other conventional refrigerants. The new hydrocarbon coolers are being tested by some outlets of Ben & Jerry's ice cream company. Meanwhile, General Electric is seeking approval to market in the United States a home refrigerator that uses a hydrocarbon refrigerant.

The new freezers take advantage of the way hydrocarbon gases absorb heat when they change from a liquid to a gas. The hydrocarbon refrigerant is compressed and expanded, as it flows through the compressor and tubes surrounding the freezer. The appliances cost about the same as similar conventional freezers and use about 10 per cent less electricity. "And that turns out to be a huge gain in terms of your carbon footprint, that 10 per cent gain in efficiency," said Mr. Pete Gosselin, Director of Engineering for Ben & Jerry's. "Every kilowatt hour that comes in the wall, comes in with a certain amount of carbon dioxide footprint with it and if you can knock 10 per cent off that, that is huge."

On the negative side, if hydrocarbons are accidentally released into the atmosphere, their effect on trapping heat is about 1,400 times less than conventional refrigerants, said Mr. Gosselin. Also, they are inflammable, although the current models use only the amount contained in two or three cigarette lighters. Electronic components are designed to prevent igniting a possible leak.

Coca-Cola spokesperson Ms. Lisa Manley said the company decided on using carbon dioxide (CO_2) because their equipment requires more cooling capacity and would require using more hydrocarbon refrigerant, which they decided against partly out of safety concerns. While CO_2 equipment is more expensive, Coca-Cola is hoping to convince others to adopt the technology and drive the price down through increased demand.

The multinational giant Unilever, which has more than 2 million ice cream cabinets worldwide, now has more than 400,000 hydrocarbon-based units in Europe, Latin America and Asia, Mr. Gosselin said. About 42,000 bottle vending machines using hydrocarbons or CO_2 as refrigerant also have been installed in China, Europe and Latin America by Coca-Cola, Carlsberg and PepsiCo. McDonald's has opened two pilot restaurants in Denmark that don't use traditional refrigerants.

The Environmental Protection Agency (EPA) of the United States, which allowed Ben & Jerry's to test the new coolers, has already completed a preliminary review on the freezers, as well as the new GE refrigerator. It expects to make a proposed rule on the machines available for public comment later this year, and a decision could be issued by early next year, said Ms. Drusilla Hufford, Director of the EPA's Stratospheric Protection Division. (Source: www.google.com)

Secondary loop CO_2 refrigeration system

In the United States, secondary loop carbon dioxide (CO_2) systems, manufactured by Hill Phoenix, recently received approval from the Environment Protection Agency (EPA) under the Significant New Alternatives Policy (SNAP) programme, which evaluates alternatives to substances being phased out to protect the stratospheric ozone layer. The system, which received approval for the use CO_2 as a hydrochlorofluorocarbon (HCFC) replacement in retail refrigeration, replaces the ozone-depleting refrigerants R-22, R-507A and R-404A with CO_2.

Conventional refrigerants are known to leak up to 20-25 per cent of their charge annually, according to Hill Phoenix, while CO_2 is not as prone to leakage. Additionally, use of CO_2 as a secondary refrigerant means that the HCFC charge can be reduced 60-90 per cent. (Source: www.environmentalleader.com)

Solar-powered air-conditioner

An Australian company is reportedly developing a solar-powered air-conditioner that is claimed to be 12 times more energy-efficient than conventional air-conditioners. Air Change – a maker of heating, ventilation and air-conditioning systems –

has received an A$458,000 (US$377,800) grant from the federal government to help put its solar-powered invention into commercial production by 2011.

Air Change says its Green Machine air-conditioner eliminates the need for compressors and ozone-depleting refrigerants. Instead of using an electrical compressor found in conventional models, the technology uses a solar-powered thermal compressor. The compressor uses ejector cooling technology in which compressed air expands out of a jet that sucks refrigerant and air into a line. The jet then expels the air at a much cooler temperature. The refrigerant is recirculated and recompressed. Any form of refrigerant, including water, can be used. (Source: www.environmental-expert.com)

First R-410A titanium twisted tube heat exchanger

Turbotec Products Inc., the United States, has introduced the first Underwriters Laboratory-listed, titanium twisted tube heat exchanger for R-410A applications. The Pool-Safe® R-410A is the next generation of Pool-Safe products utilizing the superior efficiency of Tru-Twist® technology and the reliability of Pool-Safe's titanium-and-plastic design. Pool-Safe is designed to withstand the effects of chlorine and other chemicals typically found in swimming pools.

Working in accordance with the United States Environmental Protection Agency (EPA) and the Montreal Protocol for the phase-out of chlorofluorocarbons, such as R-22, Pool-Safe R-410A meets and exceeds NSF 50 standards, assists in meeting the 4.0 coefficient of performance (COP) requirement and is designed to handle the higher pressures of R-410A up to 600 psi refrigerant side and 75 psi waterside.

The equipment is available in 2 inch and 1½ inch plastic jacket diameter, in a size range of 40,000 to 150,000 Btu/hour. *Contact: Floyd Lewis, Director of Sales and Marketing, Turbotec Products Inc., Division of Thermodynetics, 651 Day Hill Road, Dept. 1010, Windsor, CT 06095, United States of America. Tel: +1 (860) 731 4200; Fax: +1 (860) 683 2133; E-mail: flewis@turbotecproducts.com.* (Source: news. thomasnet.com)

New ozone-saving technology for refineries

Two chemistry teachers from India, Mr. Ratnadip R. Joshi and his wife Mrs. Smita R. Joshi, have developed a model refrigeration plant with cryogenic thermodynamic system for the oil refineries, which is not only environment-friendly but also ensures safety by preventing leakage of gases from the refineries.

"Traditionally, the oil refineries have been using chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs) as cooling agents in the oil refineries. But they are not only ozone-depleting chemicals, but also contribute to the global climate change. As an alternative, we developed a composition of refrigerant and model refrigeration plant with cryogenic thermodynamic system," informed Mr. Joshi, an Assistant Professor in the Department of Chemical Engineering, Maharashtra Academy of Engineering. Mr. Joshi said that this technology will provide cooling and refrigeration by replacing chlorine with an additive called "R370a". This is a non-ozone depleting and non-greenhouse gas (GHG) substance.

The technology thus conforms to both the Montreal Protocol, which aims to phase out ozone depleting substances, and Kyoto Protocol, which calls for cutting down GHGs. "This is a Clean Development Mechanism (CDM). It integrates climate change and sustainable development considerations in concrete projects. This system requires little more power for compression. But the cooling effect is slightly better than the conventional refrigerants, as it reduces emission of chlorine by almost 4.4 per cent and carbon dioxide by 13.2 per cent," Mr. Joshi said.

A special feature of this technology is the Model Predictive Controller (MPC), which shuts off the valves immediately after detecting deviation from ideal parameters. (Source: www.sakaaltimes.com)

Fluorocarbon-free heating/cooling technology

Sixty-five per cent of the world's production of ozone-depleting chemicals comes from the heating, ventilation, air-conditioning and refrigeration

(HVAC/R) sector, the largest source of ozone-depleting fluorocarbons. Dais Analytic Corp., a nanotechnology company in the United States, is prototyping a fluorocarbon-free heating/cooling system called "NanoAir", which uses water as refrigerant instead of traditional refrigerants that deplete the ozone layer.

NanoAir's breakthrough is to eliminate the use of fluorocarbons, and Dais expects that it will reduce energy consumption by 50 per cent or more with projected Seasonal Energy Efficiency Ratings (SEER) greater than 30, and Energy Efficiency Ratings (EER) in the mid-20s. NanoAir uses key Dais nanotechnology in commercial use in the Company's ConsERV energy recovery ventilator being marketed in North America. *Contact: Ms. Melissa Willis, Dais Analytic Corporation, 11552 Prosperous Drive, Odessa, FL 33556, United States of America. Tel: +1 (727) 375 8484; Fax: +1 (727) 375 8485; E-mail: melissa.willis@dais analytic.com.* (Source: www.businesswire.com)

Non-ODP, desiccant-based dehumidification system

Munters Corporation from the United States has introduced its new DryCool HD dehumidification system, which uses a combination of desiccants and non-ozone-depleting refrigerant to deliver cool, dry air for light commercial applications. Unlike typical dehumidifiers, the DryCool HD does not use heat to dry the air, a method that increases the air-conditioning load. Instead, it employs a desiccant dehumidification wheel and environmentally friendly refrigeration (R-410a) to remove heat and moisture from incoming air. This process uses 40 per cent less energy than competing technologies, claims the company.

DryCool HD helps to prevent indoor air-quality problems associated with moisture, such as mould, mildew, biological allergens and odours. Because the refrigerant does not deplete ozone, it is more environmentally responsible than dehumidifiers that use R-22 refrigeration, which is considered harmful to the atmosphere. *Contact: Munters Corporation, 79 Monroe Street, P.O. Box 640, Amesbury, MA 01913, United States of America. Tel: +1 (978) 241 1100; E-mail: info @munters.us; Website: www.munters.us* (Source: www.insideselfstorage.com)

SOLVENTS

Eco-friendly liquid laundry detergent

Daimer Industries, a United States-based supplier of green cleaners, has introduced Eco-Green® liquid laundry concentrate, a free-rinsing and all-natural laundry cleaner designed to remove tough dirt and stains while leaving clothes bright and soft. "The produce is ideal for healthcare facilities, the hospitality industry, salons, gyms and pools," said Eco Green spokesman Mr. Matthew Baratta. Developed from vegetables and plants and excluding ozone-depleting chemicals, synthetics or hazardous volatile organic compounds, Eco-Green products are readily biodegradable. The green cleaners are biodegrade by over 90 per cent in 28 days, or nearly 50 per cent quicker than competitors, according to laboratory tests.

Eco-Green Liquid Laundry Concentrate features Daimer's patented Micro-Blasting® technology, which employs microscopic particles – 1/80,000 as thick as a human hair – to penetrate and eliminate grease, dirt, stains and other residues. The green cleaning products in this laundry formulation clean without harmful soaps or detergents, and will not irritate skin. The highly concentrated product is available in 19 litre-pails. *Contact: Daimer Industries Inc., 16 Tower Office Park, Woburn, MA 01801, United States of America. Tel: +1 (781) 393 4900; E-mail: info@daimer.com; Website: www.daimer.com.* (Source: www.onlineprnews.com)

Non-hazardous degreaser

D-Greeze ES-150D from Solvent Kleene Inc., the United States, is a quick-acting, fast-drying non-hazardous degreaser/cleaner that cleans parts at ambient temperature. It is a cold cleaner that quickly evaporates from the surface after cleaning, eliminating the need for heating and drying equipment. It also features a high flash point.

D-Greeze ES-150D is ideally suited for cleaning/degreasing difficult to reach surfaces such as intricate part shapes and the inner surfaces of blind holes and tubes. It offers a unique combination of low surface tension and high KB value, enabling it to penetrate quickly narrow orifices

and complex part geometries to dissolve soils. Non-inflammable, non-carcinogenic and non-toxic, D-Greeze ES 150D creates a safer workplace without sacrificing performance.

D-Greeze ES-150D, which is efficient in removing oils, flux, grease and other soils, is suitable for use with all ferrous and non-ferrous metals, such as titanium, magnesium, aluminium, copper, zinc, stainless steel and carbon steel. It is a drop-in replacement for any degreaser/cleaner and is compatible with most existing degreasing equipment and methods. It has a non-offensive minimal odour and does not contain any ozone depleting components or hazardous air pollutants. *Contact: Solvent Kleene Inc., 131 1/2 Lynnfield Street, Peabody, MA 01960, United States of America. Tel: United States of America: Tel: +1 (978) 531 2279; Fax; +1 (978) 532 9304; E-mail: sales@solventkleene.com; Website: www.solventkleene.com.* (Source: news.thomasnet.com)

Aqueous cleaner for fibre-optic connectors

Illinois Tool Works Inc., the United States, has applied for joint patent with inventor Mr. Paul M. Blair on an aqueous cleaner formulation for fibre-optic connectors. The application claims that the end faces of fibre-optic connectors are cleaned effectively by exposing them to the invented predominantly aqueous solution and wiping them dry. The solution contains, approximately by weight, 4 per cent propylene glycol n-butyl ether, 2 per cent propylene glycol methyl ether, 1.2 per cent tripropylene glycol methyl ether, 1.5 per cent isopropanol and 91.3 per cent deionized water.

A salient aspect of the solution is that it is an effective cleaner dilutable with a very low-cost component: water. The water content of the solvent allows for the solution to be a fraction of the cost for pure isopropanol. The company is considering a more concentrated form of the solution – which will greatly reduce the storage space necessary and increase the portability – that an end user can dilute by adding water to its desired concentration. The solution contains no fluorinated solvents, is non-inflammable and fast drying. *Contact: Illinois Tool Works Inc., 3600 West Lake Avenue, Glenview, IL 60026, United States of America.* (Source: www.wipo.int)

ASTM's Asphalt Solubility Standard for TCE alternative

ASTM International has issued ASTM D7553 – Test Method for Solubility of Asphalt Materials in n-Propyl Bromide. This standard on asphalt solubility is intended to provide an alternative for a solvent, trichloroethylene (TCE), that was banned as an ozone-depleter by the Kyoto Protocol. The main impetus for developing ASTM D7553 was that almost all asphalt specifications have the requirement for a maximum amount of insoluble matter to ensure that undesirable materials are not blended into the products. However, the specified test to verify conformity (ASTM D2042 – Test Method for Solubility of Asphalt Materials in Trichloroethylene) is rarely used, as TCE is a chlorofluorocarbon (CFC) banned by the Kyoto treaty.

The solvent covered by ASTM D7553, n-propyl bromide, was approved by the United States Environmental Protection Agency (EPA) under its Significant New Alternatives Policy (SNAP) as an alternative to CFCs. N-propyl bromide had been earlier approved as a TCE replacement in ASTM D2172 – Test Methods for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures. (Source: engineers.ihs.com)

Azeotropic-like compositions with 1-methoxy-2-propanol

In some applications involving a solvent, it is desirable to provide azeotrope-like compositions that have good solvent strength. In another application, it is desirable to have azeotrope-like compositions with low flammability. Azeotrope-like compositions that are non-ozone depleting, and/or have a relatively short atmospheric lifetime, are required in some other uses. 3M Innovative Properties Co., the United States, is patenting some such azeotrope-like compositions comprising 1-methoxy-2-propanol and a hydrofluoroether. The application describes several embodiments of the invention, such one composition that includes a lubricious additive and/or hydrofluoric acid, a coating formulation, a process for lubricating metal, cermet or composite, etc. *Contact: 3M Innovative Properties Company, 3M Centre, Post Office Box 33427, Saint Paul, Minnesota 55133-3427, United States of America.* (Source: www.wipo.int)

FOAMS

Spray polyurethane foam insulation from recycled plastics

Polyurethane Foam Systems Inc., Canada, has presented Polarfoam PF-7300-0 Soya, a new generation of spray polyurethane foam insulation. The non-ozone-depleting product is made from renewable vegetable oils and recycled plastics. Polarfoam PF-7300-0 Soya meets all the requirements of the National Building Code of Canada (NBC) and exceeds the quality Standard CAN/ULC S 705.1 "Standard for Thermal Insulation Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification". This new ecological spray foam insulation gives, in a one-step application, a high long-term thermal resistance, an air-barrier material exceeding 500 times the NBC requirements, as well as a vapour-barrier. *Contact: Polyurethane Foam Systems Inc., 440 Conestogo Road, Waterloo, ON N2L 4E2, Canada. Tel: +1 (519) 884 0688; Fax: +1 (519) 884 7300; Website: www.polyurethanefoamsystems.com.* (Source: www.sprayfoam.com)

Environment-friendly process to produce low-density foam

In the United States, scientists from Virginia Polytechnic Institute and State University of Virginia have developed an environment-friendly process to produce low-density foam from poly(arylene ether sulfone) (PAES). Carbon dioxide (CO_2) and water, as well as nitrogen and water, were used as physical blowing agents in a one-step batch process.

A large amount of blowing agents (up to 7.5 per cent) could be diffused into PAES in a 2-hour saturation time. Water and CO_2 gave the foam better properties than nitrogen and water because both water and CO_2 are plasticizers for PAES. The PAES foam produced from CO_2 and water had a large reduction in foam density and a small cell size, while maintaining a primarily closed cell structure. The small cell size and closed cell structure enhanced the mechanical properties of the foam when compared with the PAES foam produced from nitrogen and water.

The lower compression strength of 39 MPa and lower compression modulus of 913 MPa of the new PAES foam is comparable to those of polyetherimide and polyvinylchloride structural foams. The foam density was 250 kg/m^3, an 81 per cent reduction in foam density, which is comparable to several commercially available structural foams. The cell size was 54 lm and the cell nucleation density was 1.85 × 107 cells/cm^3, both of which are better than the PAES foam produced from nitrogen and water. (Source: www.plastemart.com)

Eco-friendly foam board extrusion line

Krauss Maffei Extrusion, Germany, has successfully installed the first Krauss Maffei Berstorff ZE75/KE250 'foam-tandem' line to a Chinese extruded polystyrene (XPS) producer. The foam-tandem line is designed for the production of thermal insulation boards made of extruded polystyrene foam in different thicknesses using the eco-friendly blowing agent carbon dioxide.

This new technical solution will phase out chlorofluorocarbons (CFCs) and partly halogenated hydrochlorofluorocarbons (HCFCs). The ZE75 line is a twin-screw extruder combined with a KE250 secondary single screw extruder. The ZE75 compounding extruder is rated for an output capacity of up to 1,000 kg/hour. The twin screw extruder's excellent mixing performance allows processing of recipes composed of up to eight components. The cooling extruder KE250 ensures optimum cooling of the blowing agent containing melt.

The board processing line is designed for continuous treatment of boards with different lengths and thicknesses and milled edge profiles on both sides. The production capacity of the new line amounts to 200,000 m^3 per year. (Source: www.manmonthly.com.au)

Foaming agents containing fluorine-substituted olefins

In the United States, Honeywell International Inc., along with inventors Mr. James Bowman and Mr. David J. Williams, has patented blowing agent compositions, foamable compositions, foams, foaming methods and foamed articles comprising one or more C2-C6 fluoroalkenes. The

compositions would preferably have one or more C3-C5 fluoroalkenes, and even more preferably one or more compounds having the formula XCF_zR_{3-z}, where X is a C_1, C_2, C_3, C_4 or C_5 unsaturated, substituted or unsubstituted radical, each R is independently chlorine (Cl), fluorine (F), bromine (Br), Iodine (I) or hydrogen (H), and z is 1 to 3. It is generally preferred that the fluoroalkene have at least four halogen substituents, of which at least three are F and, even more preferably, none of which are Br.

For embodiments in which at least one Br substituent is present, the compound preferably has no H. It also preferred that the Br substituent is on an unsaturated carbon and, even more preferably on a non-terminal unsaturated carbon. One particularly preferred compound in this class is $CF_3CBr=CF_2$, including all of its isomers. The compounds of the formula are preferably propenes, butenes, pentenes and hexenes having 3 to 5 F substituents, with other substituents being present or not present. In certain embodiments, pentafluoropropenes are preferred. The invention provides also methods and systems that utilize the invented compositions, including methods and systems for foam blowing. *Contact: Honeywell International Inc., Law Department AB/2B, 101 Columbia Road, Morristown, NJ 07962, United States of America.* (Source: www.wipo.int)

Isopropyl chloride with HFC or HFE as foam blowing agent

Vulcan Chemicals, the United States, has applied for a European patent on a composition useful as a blowing agent. The composition has zero flash point or reduced combustibility, and comprises 2-chloropropane and a gas selected from the group consisting of a fluorohydrocarbon, perfluorocarbons, fluoroethers, hydrofluoropolyethers and their mixtures. The application also covers a polyisocyanurate or a polyurethane-modified polyisocyanurate foam, having a mainly closed cell structure, and also a method for preparing this foam. The HFC compounds that could be used are pentafluoropropane, pentafluorobutane, heptafluoropropane, hexafluoropropane or pentafluoroethane. Azeotropic mixtures in which 2-chloropropane is an ingredient are also disclosed in the application. (Source: www.freepatentsonline.com)

HALONS

Liquid level indicators for alternative fire extinguishants

ULLC2001 Ultrasonic Level Comparator, from Link Instruments Ltd., the United Kingdom, is designed for indicating the liquid level contents of a fire extinguisher, particularly for liquefied gas extinguishant alternatives to Halon. The instrument is for testing fire extinguishers installed as part of an industrial or marine fire-fighting system. ULLC2001 is extremely easy to use and micro-plc-controlled for high precision in measurement.

The transducer is placed against the cylinder body 120 mm below the calculated liquefied gas level (normally mathematically calculated). While retaining the transducer at this point, the Comparator's ultrasonic level is set to around two or three divisions by use of the 0-10 tune control. This gives a reference level against which the signal at the gas level/air interface is compared. Slowly sliding the transducer up the cylinder body will bring the reading to the gas level/air interface. At this point, the signal will rise sharply and this is visible on the Comparator, as all 16 divisions appear due to the enhanced propagation of the surface acoustic wave across the liquefied gas. *Contact: Link Instruments Ltd., The Courtyard, Steepmarsh, Petersfield, Hampshire, GU32 2BJ, United Kingdom. Tel: +44 (1730) 897 100; Fax: +44 (1730) 897 103.* (Source: www.linkinst.com)

Inert gas fire suppression system

The N2 Generator from N2 Towers Inc., Canada, utilizes automotive car airbag propellant technology to generate 100 per cent clean nitrogen inert gas, which is fully environment-friendly and is safe for use in fire suppression in occupied spaces. The automatic fire detection and suppression system is a halon alternative.

In a fire test and extinguishment, N2 Generator completed the task in 100 ms, which is about 800 times faster than conventional inert gas fire suppression systems, using high-pressure cylinders and discharge piping networks, which put out

similar test fires in approximately 80 s from point of system actuation. N2 Tower fire suppression systems are pre-engineered to allow for protection of all types of enclosures. Each 61 cm long N2 Generator protects 11.3 m^3 space. *Contact: Mr. Adam Richardson, N2 Towers Inc., 10 Forin Street, Belleville, Ontario, K8N 2H6, Canada. Tel: +1 (613) 962 2401; Fax: +1 (613) 968 3519; E-mail: adam.richardson@N2Towers.com.* (Source: www.n2towers.com)

Halon recycling system

Model H1301 is the smallest, fastest and lowest-cost complete halon recycling machine available on the market, says its manufacturer Neutronics Refrigerant Analysis from the United States. H1301 is capable of extracting Halon-1301 (and Halon-1211 with an upgrade) from high-pressure vessels, purifying it to MIL-M-12218C or ISO 7201, and pumping the purified halon into storage containers. It provides affordable halon recycling to a variety of industries such as fire protection, oil refineries, military applications, industrial plants and computer rooms.

Model H1301 is totally automated. It recovers in excess of 98 per cent of system-charged halon. The user just connects a vessel of contaminated halon to the unit, and the system automatically regulates input pressure for high-pressure liquid, high-pressure gas and low-pressure gas. It automatically vents the nitrogen from the cylinder. Model H1301 has an internal capacity of 55 kg and a maximum input pressure of 1,000 psig. A cascaded refrigeration system provides cooling temperatures as low as -73ºC, to assure complete halon liquefaction.

The filtration performance is 688 cm^3 with acid filter and 1,376 cm^3 with moisture filter. Model H1301 retains 98 per cent of 1 micron liquid and 98 per cent of 0.4 micron gas. The halon output purity parameters are:

- 99.6 Mole per cent purity in liquid phase;
- 0.4 Mole per cent other halocarbons in liquid phase;
- 3.0 ppm (by weight) acids;
- 10.0 ppm (by weight) water; and
- 1.5 per cent (by volume) fixed gases in vapour phase.

The system also removes (vented into the air) 99 per cent of dissolved nitrogen at the rate of 0.9-1.8 kg/minute. *Contact: Neutronics Refrigerant Analysis, 456 Creamery Way, Exton, PA 19341, United States of America. Tel: +1 (610) 524 8800; Fax: +1 (610) 524 8807; E-mail: info@ntron.com.* (Source: www.refrigerantid.com)

Halon fire extinguisher service and repair

Kidde Aerospace and Defence (KAD), the United States, offers expanded facilities and capabilities for the complete repair, overhaul and restock of its range of Halon-1211 and Halon-1301 fire extinguishers in the Australasian and Asean regions. These offers stem from KAD's recent tie-up with Champion Compressors, Australia. The company also offers to recycle halons to the original manufacturer's specifications – a critical capability, as Halon can no longer be manufactured.

Using the advanced REACH System manufactured by Walter Kidde Aerospace Inc., the United States, KAD reprocesses Halon-1211 and Halon-1301 to within Mil-m 12212C standards. The REACH system filters and cryogenically reprocesses the halon, removing both particulate matter and dissolved nitrogen, ensuring that the agent will be contamination-free. Recovery efficiency is better than 98 per cent. Spare parts, product and technical support are available. (Source: www.ferret.com.au)

Clean agent fire extinguisher

Safex Fire Services Limited, India, offers Saclon II Eco, also known as HFC Blend A. The product is a blend of hydrofluorocarbon (HFC) and an organic detoxificant essence P 26. It is suggested as a substitute for Halon-1301 in total flooding applications. HFC Blend A is approved by Italian government as a non-ozone depleting and environmentally safe option, with approvals as a clean agent from the Ministry of Health and the Interior Ministry. The product is suitable for A, B and C class and electrical fires. It is a non-corrosive, odourless, colourless and non-residual clean agent. *Contact: Safex Fire Services Limited, No. 202-A Dhanraj Industrial Estate, Mumbai, 400 013, India. Tel: +91 (22) 2493 8129.* (Source: trade.indiamart.com)

FUMIGANTS

Methyl bromide alternatives on tomato crop

In Romania, tomato is the most important greenhouse crop, grown generally as a continuous monoculture. Since crop rotation is rarely done, the reduction of yield in both quantity and quality affects the crop, making it necessary to adopt soil disinfestation or other practices. Investigations at Horting Institute, Romania, showed that after four years of continuous tomato monoculture, a yield reduction up to 48 per cent occurred.

Methyl bromide (MeBr) is, probably, the only fumigant that is effective against nematodes, weeds, pathogens, insects and rodents. In view of the phase-out of MeBr, however, researchers from ICDIMPH-Horting, Romania, AGROINNOVA, Italy, and United Nations Industrial Development Organization (UNIDO), Austria, studied the efficacy of the chemical fumigants metham sodium (100 ml/m^2), 1.3-dichloropropene +chloropicrin (45 g/m^2) and a non-chemical method (grafting tomatoes) and compared with that of MeBr (75 g/m^2) (standard control).

Results of the demonstrative plots in 2007 indicated that the following MeBr chemical alternatives were suitable for soil disinfection: metham sodium, grafting tomatoes, 1.3-dichloropropene +chloropicrin. Owing to European Union's environmental policy on the medium or long term, the 1.3-dichloropropene +chloropicrin utilization in Romania is uncertain. (Source: www.pubhort.org)

Biofumigants for pest control in grains

Mr. Eli Shaaya and Mr. Moshe Kostyukovsky from the Department of Food Science of the Agricultural Research Organization, the research arm of Israel's Ministry of Agriculture and Rural Development, have evaluated the potential use of essential oils from aromatic plants as fumigants to protect stored grain and dry food from insect infestations. They also evaluated the toxicity of the known isothiocyanates (ITCs) as compared with a new ITC isolated from *Eruca sativa* (salad rocket) as fumigant. In addition, the biological activity of carbon disulphide (CS_2), methyl iodide (CH_3I) and benzaldehyde (C_7H_6O) was evaluated.

The toxicity of the various fumigants was assessed against adults, larvae and pupae of six major stored-product insects. Two essential oils isolated from *Lamiaceae* plants were found to be the most potent fumigants as compared with a large number of other essential oils. ITCs are also potential candidates, especially methylthio-butyl isothiocyanate, the main bioactive component in *E. sativa*, owing to its low toxicity. Comparative studies with CH_3I, CS_2, and C_7H_6O showed that CH_3I was the most active compound against pests of stored products, followed by CS_2 and C_7H_6O. CH_3I was also found to be less sorptive and less penetrative in wheat than CS_2. *Contact: Mr. Eli Shaaya, Department of Food Science, Agricultural Research Organization, Volcani Centre, Bet Dagan 50250, Israel. E-mail: vtshaaya@volcani.agri.gov.il.* (Source: www.springerlink.com)

Methyl bromide substitutes for melon crop

In Guatemala, melon monoculture has caused widespread appearance of plants with an analogous syndrome for the disease commonly called melon collapse, or vine decline, with significant crop losses. Methyl bromide is commonly used to sterilize soil prior to planting in Guatemala, but the chemical must be phased out by 2015. In this background, crop systems researchers from the Advanded Polytechnic School of University of Almería, Spain, carried out an evaluation of the grafting of melon on *Cucurbita* hybrids (*C. maxima* × *C. moschata*), as an alternative to using chemical soil disinfectants (such as metam sodium, 1,3-dichloropropene and methyl bromide) for the control of melon collapse. The results suggested that both soil disinfection and grafting were not necessary in these locations, since there were no statistical differences in terms of yields between the treatments and the control. Furthermore, these results show that decisions to disinfect the soil must be based on the firm identification of the causal agents. *Contact: Mr. M. Díaz-Pérez, Department of Plant Production, Mediterranean Crop Systems Research Group, Advanced Polytechnic School, University of Almería, Almería, 04120, Spain.* (Source: www.ncbi.nlm.nih.gov)

RECENT PUBLICATIONS

Roadmap for Phase-out of HCFCs in India

Roadmap for Phase-out of HCFCs in India provides a detailed roadmap for the phase-out of ozone depleting and greenhouse gases from the groups of hydrochlorofluorocarbons (HCFCs).

Contact: Director, Ozone Cell, Ministry of Environment & Forests, Core 4B, 2nd Floor, India Habitat Centre, Lodhi Road, New Delhi, 110 003, India. Tel: +91 (11) 2464 2176; Fax: +91 (11) 2464 2175; E-mail: ozone-mef@nic.in; Website: Source: www.ozonecell.com.

Blowing Agents and Foaming Processes 2009

"Blowing Agents and Foaming Processes" is a well established conference – and the only event world-wide offering such a prestigious range of academic, practical and industrial papers – on the topic. This publication covers the 2009 conference proceedings. All technical papers presented at this event are included in the proceedings.

Solvents Database (CD) v.3.0

The solvents database was developed to contain data vital in any solvent application in one comprehensive source. It covers 1,627 solvents, with about 60 per cent solvents being generic and the remaining industrial solvents, which are mixtures of component solvents. The solvent database is divided into five sections: General, Physical, Health, Environmental and Use. Data on the selected solvent can be accessed by just clicking on a tab. The database has 140 data fields. Each screen contains solvent name and its chemical structure. The data can be viewed on screen and printed in a pre-defined format.

For the above two publications, contact: ChemTec Publishing, 38 Earswick Drive, Toronto, Ontario M1E 1C6, Canada. Tel: +1 (416) 265 2603; Fax: +1 (416) 265 1399; E-mail: info@chemtec.org.

TECH EVENTS

18-20 Mar
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REFRIGERATION VIET NAM 2010
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Singapore 159549.
Tel: +65 6319 2668;
Fax: +65 6319 2669;
E-mail: sharon.lim@iirx.com.sg.

07-09 Apr
Beijing
China

CHINA REFRIGERATION EXPO 2010
Contact: Mr. Zhou Jinglong,
Beijing International Exhibition Centre (BIEC),
Suite 601, Floor 6,
Henghua International Mansion,
26, Yuetanbeijie, Xicheng District,
Beijing 100045, China.
Tel: +86 (10) 58565888;
Fax: +86 (10) 58566000;
E-mail: jinglong@biec.com.cn.

05-08 May
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ISK/SODEX Istanbul 2010 International HVAC & Refrigeration Exhibition
Contact: Hannover-Messe Sodeks Fuarcilik A.S.,
Beybi Giz Plaza,
Dereboyu Cad. Meydan Sok.,
No:28 Kat:2 Daire:3-4,
Maslak - Istanbul, Turkey.
Tel: +90 (212) 290 3333;
Fax: +90 (212) 290 3331-32;
E-mail: info@sodex.com.tr.

19-20 May
Cologne
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Blowing Agents & Foaming Processes 2010
Contact: iSmithers,
Shawbury, Shrewsbury,
Shropshire SY4 4NR,
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Tel: +44 (1939) 252 421;
E-mail: conferences@ismithers.net.

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PUBLICATIONS from APCTT

PERIODICALS

(Free access at www.techmonitor.net)

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- ❑ VATIS Update (6 issues/year)
  - ❍ Biotechnology (e-version)
  - ❍ Non-conventional Energy (e-version)
  - ❍ Food Processing (e-version)
  - ❍ Ozone Layer Protection [#] (e-version)
  - ❍ Waste Management (e-version)

BOOKS

	Indian Rupees* (India, Bhutan and Nepal)	US Dollars*
❑ Managing Innovation for the New Economy: Training Manual, 2002 Volume 1: How to Guide & Quick reference materials Volume 2: Articles & Lectures	1,000.00	50.00
❑ Regional Capacity-building for the Adoption of ISO-14000 and Transfer of Environmentally Sound Technology: Training Manual, 2000	600.00	30.00
❑ Small Rural Industries in the Asia Pacific Region: Enhancement of Competitiveness of Small Rural Industries in a Liberalized Economic Environment and the Impact of Poverty Alleviation, 2000	600.00	30.00
❑ Technology Transfer and Technological Capacity-building in Asia and the Pacific		
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❑ Institutional Development for Investment Promotion and Technology Transfer, 1999	500.00	25.00
❑ Ozone Depletion Substances Phase-out Technologies: Problems & Issues on Technology Transfer, Absorption and Generation, 1998	300.00	15.00
❑ Development and Utilization of S&T Indicators: Emerging Issues in Developing Countries of the ESCAP Region, 1998	300.00	15.00
❑ ODS Phase-out: A Guide for Industry, 1998	500.00	25.00
❑ Proceedings of the Consultative Meeting on Technology Management Education and Training for Developing Countries, 1997	800.00	40.00

Notes: Amount less than Rs 500 should be sent through a demand draft only. Otherwise, payment should be made by cheque/ demand draft/UNESCO coupon in favour of the Asian & Pacific Centre for Transfer of Technology, payable at New Delhi.

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** Amount to be sent to APCTT with the order for covering costs and handling charges.*