VATIS UPDATE

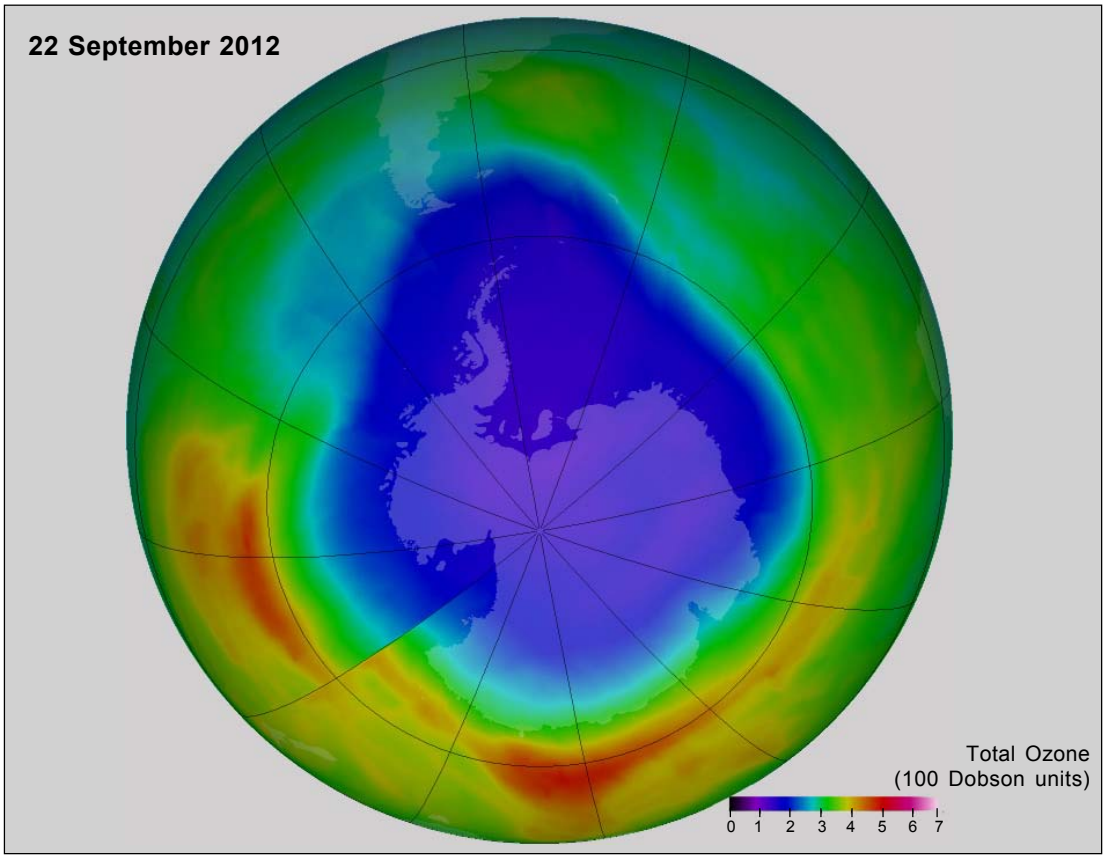
Ozone Layer Protection

Vol. 4 No. 115 • Nov - Dec 2012
ISSN 0971-5657

Apprise yourself with the latest technological innovations

Highlights

- Shrinking ozone hole, growing hopes
- Chemists crack fluoroform challenge
- Environment-friendly solvent series
- Water-nitrogen fire suppression system
- Multi-functional nanocomposite foam
- Mustard-based soil amendment for zero fumigant cropping



UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific
Asian and Pacific Centre for Transfer of Technology (APCTT)
Ozone Cell
Ministry of Environment and Forests
Government 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

In 2012, the ozone hole reached its maximum size on 22 September, covering 21.2 million square kilometers – the area of Canada, Mexico and the United States combined.

(Credit: NASA/Goddard Space Flight Centre, the United States)

VATIS* Update
Ozone Layer Protection
is published 6 times a year to keep the readers up to date of most of the relevant and latest technological developments and events in the field of Ozone Layer Protection. The Update is tailored to policy-makers, industries and technology transfer intermediaries.

Website: http://www.techmonitor.net

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) 3097 3700
Fax: (91) (11) 2685 6274
E-mail: postmaster.apctt@un.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

*** Value Added Technology Information Service**

CONTENTS

Vol. 4 No. 115 Nov - Dec 2012

Shrinking ozone hole, growing hopes

Argentinean scientists report that there are signs of recovery of the ozone layer, but they are cautious about saying whether the problem is on its path to a solution. Mr. Gerardo Carbajal, who heads the Department of Atmospheric Monitoring and Geophysics (VAyGEO), states, "This year was benign, but the problem has not been solved. The ozone hole could expand to a record size in 2013." Mr. Carbajal's department is part of the National Meteorological Service of Argentina. While this year's ozone hole was one of the smallest ever and it closed up earlier than expected, scientists have adopted a wait-and-see approach before concluding that this is the beginning of a trend.

Ms. Susana Diaz, an engineer with the Southern Centre for Scientific Research (CADIC), stated that "in recent years we have observed a slight decrease of the ozone deficit within the so-called hole." Ms. Diaz is a member of the National Scientific and Technical Research Council (CONICET) and heads the CADIC Ozone and Ultraviolet (UV) Radiation Laboratory in Ushuaia, the capital of the province of Tierra del Fuego. In this most southerly part of Argentina, measurements are made of UV rays that filter down over the city, to record the impact of UV radiation during the season of ozone hole expansion in the stratosphere, which occurs from September to mid-November. "This year the ozone hole season was much shorter than in earlier years, and lasted only two days above Ushuaia. In other seasons it has lasted for 10 days, and it has been felt further north, in Patagonia," said Mr. Guillermo Deferrari, a biologist at CADIC. "The levels are stable now, with no observed increase in the destruction of the ozone layer." Mr. Deferrari agreed with his colleagues that this improvement cannot be taken as a trend, and that the ozone hole could grow again next year because it depends on meteorological conditions in Antarctica as well, while adding that there are clear "signs of recovery".

These observations confirm the findings of the latest report on the issue by the United Nations Environment Programme (UNEP) and World Meteorological Organization (WMO), published in 2010. The study, "Scientific Assessment of Ozone Depletion 2010", concluded that chlorofluorocarbon (CFC) elimination was having an effect and the ozone hole was not growing – a sign of recovery. However, Mr. Deferrari points out that "we have not yet returned to the radiation levels we had in 1980," since the chemicals that destroy ozone take 10 years to reach the stratosphere, and then the ozone layer takes time to recover. Complete recovery of stratospheric ozone over Antarctica will take another 40-60 years, different studies say.

Source: www.trust.org

Ozone hole of 2012 smallest in the recent past

According to Antarctic Ozone Bulletin of the World Meteorological Organization (WMO), this year's Antarctic ozone hole was smaller than in recent years, in terms of both area and depth. Based on information gathered from weather balloons satellites and the ground, the ozone hole area was reported to have reached zero on 10 November 2012 – earlier than in recent years. The reason for the small ozone hole this year is twofold: Firstly, relatively warm temperatures in the stratosphere (around 20 km altitude) limited the formation of polar stratospheric clouds, which, through a chemical chain reaction between water, nitric acid and halogenated reservoir gases, cause ozone loss. In this respect, the 2012 ozone hole was similar to the one in 2010, when a sudden stratospheric warming in July/August gave rise to smaller amount of polar stratospheric clouds than usual. Secondly, the polar vortex – a large low-pressure system where high-speed winds (polar jet) in the stratosphere circle the Antarctica – was also relatively perturbed and led to ozone-rich air being transported in from the lower latitudes. This transport of ozone-rich air in particular affected the stratosphere at around 25 km altitude, which is above the region where most of the ozone loss takes place (typically 14-20 km). Ozone loss in the 14-20 km region took place at nearly the same extent as in recent years.

According to the Bulletin, in the first half of August 2012, the ozone hole area increased more slowly than at the same time in many of the recent years. However, from mid-August the increase more or less followed the same development as in 2011. From early September, the ozone hole area levelled off but increased a little again after mid-September. Starting in early October, the ozone hole area dropped rapidly. The Antarctic Ozone Bulletin monitors the development of the ozone hole in order to inform policymakers about the changing environment. The information comes from WMO's Global Atmosphere Watch network's observations from satellites, weather balloons and ground observations from some of the world's most remote and inhospitable terrains.

Source: www.wmo.int

Systems with refrigerants other than HFC-410A

Three companies that manufacture and market room air-conditioners (ACs) in India currently plan to offer AC systems with refrigerants other than the hydrofluorocarbon HFC-410A.

- Godrej Industries is now selling all its split ACs with the low-global warming potential (GWP) hydrocarbon refrigerant HC-290 (GWP <5) and achieving the highest five-star energy efficiency rating and superior life-cycle climate performance.
- Daikin, based in Japan, is focusing on a split AC with medium-GWP HFC-32 (GWP = 675) that achieves high energy efficiency and superior life-cycle climate performance compared with HFC-410A. Daikin will allow companies in India and other developing countries to use basic HFC-32 air-conditioning patents at no charge through "non-assertion contracts". Daikin will allow companies using its patents to sell in both Indian and export markets (including to developed countries).
- Panasonic, also from Japan, will offer split ACs with medium-GWP HFC-32, similar to Daikin.

Certain foreign companies that are manufacturing ACs in India (such as LG and Samsung from the Republic of Korea) or are importing ACs into India (like Carrier and GE of the United States) have selected HFC-410A for the first stage of transition. This is because that is what they produce at present for other markets – such as Europe, Japan and the United States – where HCFC-22 phase-out has already occurred. By contrast, in China, half of the companies making room ACs are using either HC-290 or HFC-32.

HC-290 and HFC-32 are inflammable compounds but can be safely used with appropriate design and safety standards. Europe has established safety standards for room ACs using these refrigerants and safety standards are in the final stages of approval in Japan, the United States and other countries. India needs to adopt similar safety standards to ensure that inadequately designed products using these refrigerants are excluded from the market. Further, it is important that installation and service technicians receive adequate training and tools. The majority of Indian companies that are planning to offer HFC-410A room ACs make the case that:

- Alternative refrigerants available today (HC-290 and HFC-32) do not yet have a proven commercial track record;
- Consumers place higher priority on initial price and overlook both lifetime electricity costs and environmental impacts;
- The Indian government has not discouraged the use of HFC-410A and has allowed each company to make the choice; and
- Safety standards are not yet in place in the country for inflammable refrigerants.

Source: docs.nrdc.org

Commercial banks asked to discourage ODS units

The Reserve Bank of India (RBI) has directed all Scheduled Commercial Banks (SCBs) to refrain from extending financial assistance to industries producing/consuming ozone depleting substances (ODS). In its circular to SCBs, RBI has listed the sectors and ODS covered in the Montreal Protocol's ODS phase-out programme:

- CFC-11 (foam and aerosol products);
- CFC-12 (aerosol products and refrigerators and air-conditioners);
- CFC-113, carbon tetrachloride and methyl chloroform (solvents in cleaning applications); and
- Halons-1211, 1301 and 2402 (fire extinguishers).

www.rbi.org.in

New refrigerants for energy efficiency improvements

In India, the Refrigeration and Air-conditioning Manufacturers' Association (RAMA) and the Society of Indian Automobile Manufacturers (SIAM) are effective technology and policy focal points for room and vehicle air-conditioners. RAMA and SIAM work closely with government ministries on policies to replace ozone depleting substances with sustainable and affordable technology, particularly with the National Ozone Unit (NOU) in the Ministry of Environment and Forests (MoEF), the Ministry of Transportation and the Bureau of Energy Efficiency (BEE). Both the room and vehicle air-conditioning sectors are well informed about alternatives to refrigerants with high global warming potential (GWP), and understand that both developed and developing country markets are beginning to move to low-GWP with superior life-cycle climate performance. The government has allowed companies to choose the technology alternatives to replace chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs). The government has not clearly signalled a direction for industry on leapfrogging.

RAMA and its members report that phasing out HCFCs and simultaneously upgrading air-conditioner appliance energy efficiency are their

highest priority. The policy signals from the government by way of the recent tightening of the BEE star labelling programme for air-conditioners will make Indian appliance manufacturers invest in upgrading technologies to meet the higher energy-efficiency standards. Leap-frogging HFC-410A is a priority for three of its member companies, but others are planning to use HFC-410A primarily because the next-generation technology is not yet seen as widely commercialized and access to and affordability of new refrigerants and technology remain uncertain. Manufacturers of room air-conditioners understand that hydrofluorocarbons (HFCs) are a transition substance that ultimately will be phased down. The Indian mobile air-conditioning sector has already changed from CFC-12 to HFC-134a and is now considering the timing of a second transition to HFO-1234yf. However, currently no Indian manufacturer has access to the technology to produce this chemical.

Source: docs.nrdc.org

Comparative study of eco-friendly refrigerants

A research team led by Ms. Hadya Boda at the University College of Engineering, Osmania University, studied the possibility of using R32 and R290 refrigerants in a vapour compression refrigeration and compared them theoretically with R22. R22 is a hydrochlorofluorocarbon (HCFC), with an ozone depletion potential (ODP) of 0.05 and global warming potential (GWP) of 1700, which adversely affects the environment. The overall evaluation in terms of energy efficiency, safety and economic aspects was made with 1 refrigeration tonne (RT) air-conditioning systems. R32 has zero ODP and 675 GWP, while R290 has zero ODP and 3 GWP.

The Coefficients of Performance (COPs) for R290 and R32 closely matched for higher condensing temperatures: R290 gives better COP than that of HCFC-22 per RT. Pressure ratio of R32 was 25 per cent higher and that of R290 was 14 per cent more than that of R22. Because of the high pressure ratio, R32 required very high power per RT. R290 has two disadvantages as a refrigerant: one is fire hazard and the other is the larger size of the compressor (like R32). R290 matched R22 in COP, but with low power consumption. R32 has lower molecular weight, and therefore low mass flow rate and higher latent heat but takes more power per TR, while having low inflammability like R290.

psrcentre.org

Recent Reports from UNEP Ozone Secretariat

Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer – Ninth Edition (2012)

The ninth edition of this handbook is updated to include all relevant information from 2009 to 2011. Section 1, which contains the text of the Montreal Protocol and a summary guide to its control measures, of course remains unaltered. Section 2, on decisions of the Meetings of the Parties, now includes all the decisions adopted at the twenty-first, twenty-second and twenty-third Meetings. Section 3 is also updated to present information from the relevant annexes to the decisions. These cover destruction procedures for ozone-depleting substances, essential-use exemptions, and critical-use exemptions for methyl bromide, approved by the Meetings of the Parties, the Assessment Panels (especially their terms of reference), the non-compliance procedure of the Protocol, the Multilateral Fund, finance, and declarations by the Parties. UNEP has reintroduced, in a new Section 5, the information on the evolution of the Montreal Protocol which appeared in some earlier editions of the Handbook. Finally, Section 6 contains updated sources of information and contact details for relevant organizations.

Handbook for the Vienna Convention for the Protection of the Ozone Layer - Ninth Edition (2012)

The ninth edition of the Handbook for the Vienna Convention contains the full text of the Vienna Convention for the Protection of the Ozone Layer (1985) in Section 1. Section 2 updates the text of the decisions of the Conferences of the Parties by incorporating the decisions adopted at the Ninth Conference of the Parties in Bali, Indonesia, in November 2011. The decisions are presented in sub-sections relating to each article of the Convention. Section 3 contains the Rules of Procedure for meetings of the Conference of the Parties to the Vienna Convention and the Meetings of the Parties to the Montreal Protocol. Finally, the General Index, in Section 4, covers important information on key words and terminologies used in the Handbook. The Handbook has continued to be a useful reference guide and will continue to be updated as necessary.

For more information, contact:

United Nations Environment Programme
PO Box 30552-00100
Nairobi, Kenya
E-mail: ozoneinfo@unep.org
Website: http://ozone.unep.org

Ozone statue marks Montreal Protocol anniversary

Statue of Nuwa, the Chinese God, representing ozone

As part of the celebrations to mark the 25th anniversary of one of the world's most successful environmental agreements, a statue dedicated to protecting the ozone layer was unveiled at the Vienna International Centre, Austria. The 3.9 m high sculpture, which depicts the Chinese goddess Nuwa, was produced by celebrated artist Mr. Yuan Xikun, who also acts as a Patron for Arts and Environment for the United Nations Environment Programme (UNEP). In Chinese mythology, Nuwa smelted a seven colour stone to block a hole in the sky to repair the wall of heaven. Mr. Xikun chose the figure of Nuwa to draw parallels with the modern day challenges of ozone depletion and climate change.

The unveiling of the statue was hosted by the United Nations Industrial Development Organization (UNIDO), in partnership with UNEP's OzonAction Branch. UNIDO and UNEP, as implementing agencies of the Montreal Protocol, have been assisting developing countries and countries with economies in transition to achieve and sustain compliance with the Montreal Protocol.

Source: www.unep.org

UNDP bags award for helping to protect the ozone layer

The United Nations Development Programme (UNDP) has been recognized for its two decades of support to developing countries to phase out the use of harmful substances that deplete the ozone layer. The Executive Secretary of the Vienna Convention for the Protection of the Ozone Layer and its Montreal Protocol on Substances that Deplete the Ozone Layer, Mr. Marco Gonzalez, presented a special award to UNDP administrator Ms. Helen Clark in New York, accompanied by the Chief Officer of the Multilateral Fund for the Implementation of the Montreal Protocol, Ms. Maria Nolan. The award recognizes UNDP's exceptional contribution to the success of the Montreal Protocol, which this year marks its 25th anniversary.

Since setting up a dedicated Montreal Protocol Unit in 1991, UNDP has been supporting developing countries to implement their commitments under the Montreal Protocol, alongside other multilateral organizations. UNDP, by October 2012, had assisted 118 countries to avoid over 4 Gt of carbon dioxide equivalent emissions on a cumulative basis and eliminate more than 68,500 t of ozone depleting substances (ODS). It has also helped developing countries access US$ 671 million in funding from the Montreal Protocol's Multilateral Fund (MLF) as well as US$ 33.5 million from the Global Environment Facility (GEF) for ODS elimination.

Source: www.undp.org

New partnership by UNEP aims to reduce MeBr emissions

On 14 November 2012, the United Nations Environment Programme (UNEP) signed a new partnership with the International Plant Protection Convention (IPCC) to help improve the management of methyl bromide (MeBr), a ozone destroying fumigant gas used to prevent the spread of pests and diseases. In a new memorandum of understanding, IPCC, which is located at the United Nations Food and Agriculture Organization's (FAO) headquarters in Rome, and UNEP's Ozone Secretariat committed to work closely to promote existing recommendations on the use of MeBr, as well as support efforts to develop alternative treatments to replace MeBr where possible.

For decades, MeBr was a potent tool to combat plant pests and diseases. However, in 1991 it entered the list of substances controlled under the Montreal Protocol. The Protocol discourages the use of MeBr for non-quarantine purposes during production but does make an exception for its utilization as a quarantine treatment, given its effectiveness in stopping diseases and pests. The Protocol also calls for alternative practices, which require plant protection authorities to have information on and access to other treatments that are affordable and effective according to their needs. The new partnership aims to facilitate this transition to alternative treatments through improved regional and international coordination on MeBr management, fostering information exchanges and cooperative research on alternative treatments, promoting best fumigation practices, etc.

Source: www.un.org

Asia-Pacific celebrates 25 years of "Ozone Family"

Participants of the Joint Network Meeting of Ozone Officers of Asia and the Pacific on 15-19 October 2012 remembered the history of how international agencies, governments, the scientific community and individuals involved in the Montreal Protocol implementation evolved into the "Ozone Family" for the Asia-Pacific Celebration of the 25th Anniversary of the Montreal Protocol organized by the Compliance Assistance Programme of UNEP Regional Office for Asia and the Pacific (ROAP). The celebration began with the opening of the exhibition of the Asia-Pacific 2012 International Ozone Day and 25th Anniversary of the Montreal Protocol, where 29 countries displayed photos and products of their activities (posters, shirts, pins, brochures, stickers, folders, etc.) that had also been exhibited during International Ozone Day on 16 September. The exhibition was followed by a programme where the UNEP's Public Service Announcements (PSAs) on the Montreal Protocol's 25th anniversary were displayed. China and Mongolia also launched their new PSAs.

The highlight of the programme was the commendation of Ms. Trisha Co Reyes, a 14-year-old girl from the Philippines, for her contribution to ozone layer protection efforts. Ms. Reyes, offered three of her paintings to the Asia-Pacific countries for use in national ozone advocacy programmes. A winner of the 2011 UNEP International Painting Competition, Ms. Trisha was commissioned by UNEP OzonAction to prepare paintings on ozone layer preservation. The paintings were converted into posters and distributed to countries for Ozone Day.

The participants relived memories of the Montreal Protocol history, as some representatives of the Multilateral Fund (MLF), implementing agencies, Article 5 countries and Article 2 countries shared anecdotes of their experiences over the past years. However, in the midst of underlining the achievements and successes, it was also noted that there is still a lot to be done, especially with the upcoming hydrochlorofluorocarbon (HCFC) freeze commitment by 1 January 2013.

Source: www.unep.org

China gets funding to phase out HCFC

The World Bank has approved a US$73 million grant from the Montreal Protocol Investment Fund to China to support its efforts to meet its hydrochlorofluorocarbon (HCFC) consumption and production phase-out obligations. The Montreal Protocol requires gradual phase-out of HCFCs starting from 2013 and leading to a complete phase-out of HCFC consumption and production by 2030 for developing countries known as Article 5 countries. China is the world's largest producer and consumer of HCFCs. In 2009, China produced more than 70 per cent of the global HCFC supply and accounted for more than half of the global HCFC consumed for manufacturing foam and refrigeration products, producing solvents as well as servicing existing equipment. Therefore, phase-out of HCFCs in China is critical for the successful implementation of the Montreal Protocol.

Designed to help the country phase out both its production and consumption of HCFCs in the polyurethane foam (PUF) sector, the China HCFC Phase-out Project provides support to HCFC-141b consumption reduction. Besides investment in HCFC-141b consumption reduction, the project will also provide support to initiate efforts to reduce production of HCFCs, technical assistance, policy support and project management to ensure timely and sustainable phase-out of HCFCs and preparation of HCFC phase-out activities beyond 2015. The World Bank is one of the implementing agencies for the Multilateral Fund for Implementation of the Montreal Protocol. The Bank has been engaged in ozone depleting substances (ODS) phase-out activities in China since the early 1990s, and served as partner in the CFC Production Closure Sector Plan and the Foam CFC Phase-out Sector Plan under the ODS IV Project.

Source: www.china.org.cn

Cambodia law enforcement officers gets training

A team of international law enforcement specialists provided training to 45 Cambodian law enforcement officers over a two-week period in Phnom Den and Trapeang Plong in Cambodia, on the border with Viet Nam. The training targeted illegal trafficking of environmental commodities such as ozone depleting substances (ODS) and hazardous waste and the illegal trade in endangered wildlife. It also addressed drug trafficking, human trafficking and smuggling of migrants – all of which are serious crimes that threaten security in the region. Participants included the Border Police, Gendarmerie, and officers of the Customs and Immigration Department, Forestry Administration and the Ministry of Environment.

The course was an initiative of the Partnership Against Transnational Crime through Regional Law Enforcement (PATROL), which works

on multiple fronts to help governments fight transnational crime in the Greater Mekong Sub-region. As a result of regional infrastructure and development projects, the region is expected to increase opportunities for trade, in both legal and an unfortunate proportion of illicit trade. The two courses, each of which took place over five days, provided officers with input on smuggling methods and trends and how to combat these issues using techniques such as surveillance, controlled deliveries, search methods and investigative interviewing. An important objective was to encourage agencies to cooperate more effectively with their counterparts in neighbouring countries and to exchange information and engage in cross-border investigations. The participants also received specialized training on intelligence sources and informants. To better equip officers with tools to detect illegal trade, UNEP donated a Refrigerant Identifier to be used within Border Liaison Offices.

Source: www.unep.org

Plans afoot to phase out use of HCFCs in Nepal

The Nepal government is preparing for technical human resources to reduce excessive consumption of hydrochlorofluorocarbons (HCFCs), which have been in use as refrigerants in the country for more than three decades in the refrigerant and air-conditioning servicing sector. Nepal does not produce HCFCs. The government is developing a strategy to limit the consumption of HCFCs to 23.4 t in 2013 and reduce consumption gradually. The government is planning to totally phase out HCFC consumption by 2030. The National Ozone Unit under the Nepal Bureau of Standards and Metrology (NBAM) oversees national issues related to HCFC reduction at the national level.

Source: www.myrepublica.com

World Bank helps Viet Nam slow ozone depletion

The World Bank has approved a US$9.76 million grant to support Viet Nam's efforts in phasing out ozone depleting hydrochlorofluorocarbons (HCFCs). This initiative, which will extend from 1 January 2013 to 1 January 2015 with funding from the Multilateral Fund for the Implementation of the Montreal Protocol, builds on an existing programme in addressing other ozone depleting substances. The project, designed to help Viet Nam reduce its consumption of HCFCs in the polyurethane foam sector, will introduce in its first stage the most current technologies to phase out about 1,275 t of HCFC-141b in 12 large foam production enterprises. The project will also offer support to policies and regulations as well as technical assistance activities. Viet Nam consumes several types of HCFCs for various industrial applications – including HCFC-22 in refrigeration and air-conditioning equipment manufacture and service, HCFC-141b in foam production, and HCFC-123 for servicing cooling equipment.

The HCFC phase-out in Viet Nam will be done so as to maximize the climate co-benefits through the introduction of alternatives with zero to very low global warming potential (GWP). This is in line with Viet Nam's policy on industrialization and modernization to meet the overall objectives of continued economic growth and sustainable development.

Source: english.vietnamnet.vn

Philippines takes part in the 24th MOP

The Philippines participated in the 24th Meeting of the Parties (MOP) to the Montreal Protocol on Substances that Deplete the Ozone Layer, held in Geneva, Switzerland, during 12-16 November. The MOP event was divided into preparatory and high-level segments, which included presentations of experts, contact group and plenary discussions on various issues of interest to the parties, and the approval of 22 decisions. The MOP decisions covered various topics including: organizational matters, data reporting by Parties, evaluation of the financial mechanism and issues that affect the compliance status of the Parties.

Of particular interest to the Philippines are the quarantine and pre-shipment uses of methyl bromide, use of ozone depleting substances (ODS) in ships, additional information on ODS alternatives and the financial mechanism. The Department of Environment & Natural Resources (DENR) Undersecretary, Mr. Demetrio L. Ignacio, emphasized the Philippine approach to phasing out ODS, through a combination of policy and regulatory measures, capacity building, public awareness and implementation of investment projects by the private sector to gradually phase out ODS consumption and shift to ozone-friendly substances, practices and technologies. Mr. Ignacio raised certain concerns related to Philippine compliance with ODS phase-out, including the proliferation of mislabelled and adulterated ODS; possible diversion of ODS use from the manufacturing sector to the servicing sector; and undocumented use of ODS in ships and other sectors.

Source: www.pia.gov.ph

New compressor technology

Semi-hermetic compressor introduced by Tecumseh

Tecumseh Products Company, the United States, has launched a new range of condensing units equipped with semi-hermetic compressors. "To complement our existing ranges, we have selected high- and low-pressure HFC-404A compressors from 3 to 13 hp," a company statement said. The SH line has semi-hermetic compressors with interchangeable components, an air-cooled twin-fan condenser, a liquid collection tank, suction and discharge valves, electronic protection module, discharge vibration absorber and crankcase heater. With these units, one can fit a frequency converter (inverter), a power regulator and/or a no-load start-up system for improved energy consumption, increasing the lifetime of Tecumseh's products. The semi-hermetic compressor lets the user to monitor changes in refrigerants and access the mechanics of the system. The accessories provide help in developing the installation, regulating power and reconfiguring the compressor.

According to the company, the new AE² range offers "maximum power in a smaller package". The range with 49 models offers refrigerating capacities running from 150 to 750 W in low brake power (LBP) and 750 to 2,300 in high brake power (HBP). The commercial refrigeration compressor and condensing units boast a new, more compact design and are well suited to ice machines, refrigerated displays and cabinets, bottle coolers, etc. The compressors and condensing units operate with HFC-134a, HFC-404A, and R-290 (propane).

The company also announced the expansion of its AG line of hermetic compressors. In motors, Tecumseh has brought out a fan motor variable-speed kit Wintsys and AJ Silence. The technology offers "control of condensing pressure to optimize performance of the expansion valve and therefore of the cold room, noise level reduction at night and during low-consumption time, direct connection between the liquid line and the fan without electronic interface, and facilitated operation with easy adjustment of manual variation trimming." The company has also introduced the Silensys® high-efficiency range of rotary and scroll compressors.

Source: www.achrnews.com

Chillers help fruit growers offer fresh fruits at lower costs

In the past six years, packaged air-cooled chillers adopting the hydrocarbon refrigerant R-1270 have been installed at several fruit growers in the United Kingdom, Ireland and the United States. The chillers' performance, especially in assuring long-term preservation of quality and the flavour of fruits while having minimal energy consumption, is praised by fruit growers. R-1270 chillers have a proven economic track record in terms of low capital costs and reduced energy consumption, making them one of the preferred technologies among fruit growers.

In hydrocarbon chillers, R-1270 is usually used as primary refrigerant and Hycool as a secondary refrigerant. Hycool potassium formate is food-safe, biodegradable and used as circulating heat transfer fluid to rapidly remove heat in the product field. The Off Cycle Defrost (OCD) method also assures low energy consumption during long-term storage of fruit. For apple storage at +2°C, the method eliminates the need for expensive forced defrost as it allows the fluid temperature to rise, thus effectively melting ice from within the coil with minimal disturbance to the pre-existing temperature and humidity balance. Thus, such systems can assure the long-term preservation of fruit quality and flavour. In the United Kingdom, several installations operate at low temperatures of -0.5°C for the long-term storage of pears, with minimal energy consumption. Some R-1270 chillers cover capacities from 29-400 kW at +7°C flow temperature and 15.6-280 kW at -8°C flow temperature.

Source: www.hydrocarbons21.com

DesertMaster package for rooftop launched

Carrier, with its headquarters in the United States, has launched its Desert Master series of packaged rooftop units in the Middle East. The Desert Master air-conditioners – featuring high efficiency, reliability, optimal lifecycle performance and ease of installation – are designed for high ambient temperatures and have an Energy Efficiency Ratio (EER) of approximately 11. The units leverage Carrier's Puron (R-410A) refrigerant, offering minimal environmental impact. A key component of Desert Master series is the high-efficiency indoor fan motor that saves energy all year round even when there is no cooling demand.

The 15-28 t DesertMaster series has been tested for operation at 51.66°C ambient temperature with advanced electrical safeties that protect the compressor against current phase loss and short cycling. Two independent refrigeration circuits provide backup capacity, and a highly reliable hermetic scroll compressor includes internal current overload and high-pressure protections. The product is available with many add-on features that can be tailored for particular applications. The lightweight Desert Master has an adjustable motor pulley that can adapt to the characteristics of the ductwork, making it ideal for replacement or new construction. The units are ideal for supermarkets, clinics, warehouses, substations and switchgear rooms.

Source: www.ameinfo.com

R-1234yf refrigerant makes a debut

A new automobile air-conditioning refrigerant, R-1234yf, has been introduced in the new 2013 Cadillac XTS and ATS. R-1234yf is a new environmentally friendly refrigerant that has a Global Warming Potential (GWP) 99.7 per cent lower than R-134a. The new refrigerant received final approval from the United States Environmental Protection Agency (EPA) in 2011. It does not require major design alterations of R-134a automotive air-conditioning systems. It also can be handled in service centres in much the same way as R-134a, although it does require dedicated service equipment.

The biggest advantage of the new refrigerant is that it breaks down faster in the atmosphere than R-134a. On average, R-134a has an atmospheric life of more than 13 years (GWP above 1,400), while R-1234yf stays in the atmosphere for only 11 days (GWP 4). R-1234yf refrigerant is mildly inflammable and has thermodynamic properties similar to R-134a. R-1234yf standards require service equipment and evaporators with safety features that cover this concern.

Source: sandyblogs.com

Chemists crack fluoroform challenge

Scientists report the solving of a long-standing problem in organofluorine chemistry – how to find a simple and efficient way to use the abundant and low-cost compound fluoroform (CF_3H) as a trifluoromethylation agent. The work opens the way to tap the thousands of tonnes of fluoroform, a by-product of the synthesis of materials such as refrigerants and the non-stick coating Teflon (polytetrafluoroethylene, PTFE). Fluoroform is a greenhouse gas several thousand times more potent than carbon dioxide (CO_2). However, because no one has yet been able to adequately harness the chemical potential of the molecule, the large volumes of fluoroform produced each year is mostly decomposed by expensive methods such as thermal oxidation or catalytic hydrolysis. Stabilizing the CF_3 anion that results from breaking the powerful C–H bond in fluoroform had proved too tricky for the molecule to be of wide usage.

Mr. Surya Prakash and his team at the University of Southern California, the United States, report a way to use fluoroform for the direct nucleophilic trifluoromethylation of silicon, boron, sulphur and carbon centres. The resulting fluorinated species are all useful for subsequent organofluorine chemistry, which is playing an increasingly prominent role in the development of new drugs and agrichemicals. Trifluoromethylation is a key synthetic step in many organofluorine syntheses and is usually achieved using bromotrifluoromethane. This, however, is a potent ozone depleting gas, the use of which is strictly regulated by the Montreal Protocol. Mr. Prakash and his team developed a protocol that generates and stabilizes the CF_3 anion to allow direct trifluoromethylation of a range of targets. Mr. Gunter Haufe, an expert in organofluorine chemistry at University of Munster in Germany, opines that Mr. Prakash's new methods are important for the further development and production of very versatile and frequently used building blocks to construct more complex organic molecules such as agrochemicals, pharmaceuticals or materials. Mr. Haufe adds that the use of a waste by-product to replace ozone depleting reagents is also a key advantage.

Source: www.rsc.org

New air-conditioner runs on water

AC-Sun, Denmark, reports a new system that has potential to create a massive energy reduction on air-conditioning costs. According to The Force Institute, Denmark, the technology will save 86 per cent on carbon dioxide (CO_2) emission compared with an average conventional air-conditioning (AC) unit. The system focuses on tapping solar energy, using a patented AC system developed for minimal use of electrical power consumption – only 10 per cent of a conventional system. It uses a combination of low-pressure turbines and water as the refrigerant, with the solar energy creating the steam to drive the turbine. The system also integrates a traditional cooling circuit with compressor for energy efficient climate regulation.

climatesolutions.com

Low-VOC degreaser

G-49 orange degreaser

LPS Laboratories from the United States offers non-ozone depleting G-49 orange degreaser. This low-volatile organic compound (VOC), non-hazardous product is an excellent alternative to methyl ethyl ketone (MEK) for cleaning equipment. A high solvent strength ensures instant cleaning action with zero residue. The degreaser is excellent for removing grease, grime, oil and adhesives. *Contact: LPS Laboratories, 4647, Hugh Howell Road, Tucker, Georgia, GA 30084, United States of America. Tel: +1 (770) 243 8800; Fax: +1 (770) 243 8899.*

Source: www.lpslabs.com

Adhesive chain lubricant to inhibit corrosion

CRC Industries, the United States, offers an exceptional lubricant with a tough adhesive quality. Supporting continuous operation in up to 176°C, CRC TAC 2™ will bond to chain/wear surfaces to keep them in peak operating condition by reducing friction and wear that cause metal fatigue. The lubricant contains a tackifier that enables it to cling tenaciously to metal surfaces without increasing the viscosity, which allows the product penetrate and coat vital chain pin and bushing areas. While molybdenum content provides cling-ability to avoid sling-off or excess dripping, blue colour fosters identification of lubricated parts and equipment. Regular use of CRC TAC 2™ will help inhibit corrosion, reduce load stress and help increase chain life, claims the company. *Contact: CRC Industries Inc., 885, Louis Drive, Warminster, Pennsylvania, PA 18974, United States of America. Fax: +1 (215) 674 2196; E-mail: crcwebmaster @crcindustries.com; Website: www.crcindustries.com.*

Source: news.thomasnet.com

Environment-safe vapour degreaser

The B252R ultrasonic vapour degreaser from Branson Ultrasonics Corporation, the United States, is one of a series of environmentally sound and cost-effective precision degreasers. Integrating state-of-the-art controls with maintenance practicality and small footprint in a standard ultrasonic vapour degreaser, B252R incorporates all of the important environmental and safety features typically found in larger units. The B252R features an offset boiling chamber for reducing the solvent/air interface – reducing solvent emissions and footprint. It is ideal for use with traditional solvents like trichloroethylene and methylene chloride, as well as many of the newer materials. With 18 L solvent capacity, the compact B252R is ideal for use at individual production workstations or as a tool to develop processes for larger equipment. All controls are clustered on a compact front-mounted digital control panel.

The B252R is designed to comply with the environmental regulations on solvent emissions of the United States Environmental Protection Agency (EPA). Some of its features also facilitate compliance with Occupational Safety and Health Administration (OSHA). The unit includes number of engineered improvements designed specifically to minimize solvent losses. Standard features include 24 V controls for safety, digital temperature readout, 40 kHz industrial ultrasonics, full peripheral cooling coils and 304 stainless steel construction. Optionals include desiccant dryer kit for azeotropic solvents, stainless steel mesh baskets and vertical lift mechanism with power cover.

Source: www.amsmaterials.com

Degreaser that evaporates without drying equipment

Solvent Kleene, the United States, offers D-Greeze ES-150D cleaner/degreaser designed to evaporate quickly from the cleaned surface, leaving no residue and thus eliminating the need for rinsing and drying equipment. The product is especially suited for degreasing/cleaning difficult-to-reach surfaces, such as intricate part shapes and the inner surfaces of blind holes and tubes, at ambient temperatures. The degreaser/cleaner features a combination of low surface tension and high Kauri-butanol (KB) value that enables it to quickly penetrate narrow orifices and complex part geometries to dissolve soils.

Unlike conventional solvents, D-Greeze ES-150D has a high flash-point and is non-inflammable. It also is non-carcinogenic and non-toxic; has minimal odour; and does not contain ozone depleting components, hazardous air pollutants or SARA-listed components. Efficient in removing oils, flux, grease and other soils, D-Greeze ES-150D is suited for use with virtually all ferrous and non-ferrous metals, including titanium, zinc, magnesium, aluminium, copper, stainless steel and carbon steel. It can be used as a drop-in replacement for most

degreaser/cleaners and is designed to be compatible with most existing degreasing processes and equipment. *Contact: Solvent Kleene Inc., 119 Foster Street, Building #6, Peabody, MA 01960, United States of America. Tel: +1 (978) 531 2279; Fax: +1 (978) 532 9304.*

Source: www.pfonline.com

Non-inflammable, fluorinated chemical compositions

Solvay Fluor GmbH, Germany, is patenting an invention related to non-inflammable compositions comprising fluorinated compounds selected from the group consisting of hydrofluoroalkanes, hydrofluoroalkenes, partially or perfluorinated aromatic compounds, hydrofluoroethers or fluoroketones, 1,2-dichloroethylene (especially trans-1,2-dichloroethylene or TCDE) and a stabilizer. These non-inflammable compositions preferably contain 1,1,1,3,3-pentafluorobutane and can be used especially as solvents for cleaning and defluxing electronic components, as well as for degreasing metals. The compositions may also comprise a propellant such as, for example, 1,1,1,2-tetrafluoroethane, and are especially suitable as flushing agents.

The hydrofluorocarbon and 1,2-dichloroethylene contents in the compositions according to the invention can vary within wide limits, depending on the use envisaged; especially because compositions containing even 95 per cent by weight of TCDE and almost 0.5 per cent by weight of isopropanol has no flashpoint. Thus, these compositions can comprise HFC-365mfc and TCDE within broad ranges. For example, the compositions may comprise HFC-365mfc in a quantity equal to or higher than 1.5 per cent, preferably equal to or higher than 4.5 per cent by weight. Likewise, compositions can comprise TDCE in an amount equal to or higher than 1.5 per cent, preferably equal to or higher than 4.5 per cent by weight. They can comprise HFC-365mfc in an amount of equal to or lower than 98 per cent, preferably equal to or lower than 95 per cent by weight, and TDCE in an amount equal to or lower than 98 per cent, preferably equal to or less than 97.5 per cent by weight. Additionally they may contain a stabilizer preferably in an amount up to 0.5 per cent by weight. Isopropanol is a preferred stabilizer.

Source: www.freepatentsonline.com

Non-aromatic solvent cleaner

Travena Ltd., the United Kingdom, offers Safety Solvent Cleaner, a highly refined blend of aliphatic hydrocarbons that can be used as a safe alternative to degreasers that are based on the ozone-depleting 1,1,1, trichloroethane where rapid drying is not a key requirement. Safety Solvent Cleaner does not contain any ozone depleting substances (ODS) and is non-toxic and virtually odourless. The product is suitable for precision cleaning operations, electrical and mechanical cleaning, including printed circuit boards and motor windings.

Safety Solvent Cleaner has a high flash point of 60°C and although classified inflammable, it is considerably less hazardous than many of the other alternatives. The solvent is effective on oils, silicones and greases leaving surfaces clean and without residues when dry. It is safe on metals, alloys, plastics, electronic and electrical components, elastomers, most rubbers, as well as painted surfaces including chlorinated rubber finishes. The cleaner can be used manually with sprayer/brush or in ultrasonic bath or dip-tank. *Contact: Travena Ltd., 5a Chester Court, Chester Park, Alfreton Road, Industrial Estate, Derby DE21 4AB, United Kingdom. Tel: +44 (845) 257 9123; E-mail: info@travena.co.uk.*

Source: www.cleanamarina.com

Environment-friendly solvent series

Genesolv® S Series solvents from Honeywell, the United States, are based on the new, environmentally friendlier hydrofluorocarbon HFC-245fa. These new products selectively replace solvents based on CFC-113 and HCFC-141b in air-conditioner flushing, industrial aerosols, specialty cleaning and some deposition applications.

At present, Genesolv S comes in three grades: Genesolv SF (standard grade), Genesolv S-TZ (enhanced solvency – azeotropic blend) and Genesolv S-T (maximum solvency). Genesolv SF is a mild, non-inflammable solvent with excellent plastics compatibility, a low order of toxicity and good environmental properties. It has no ozone depletion potential, a low GWP and has been designated as a non-volatile organic compound (VOC) by the United States Environmental Protection Agency (EPA). The S-TZ and S-T blends – which contain HFC-245fa and trans 1,2-dichloroethylene – are recommended when greater solvency and cleaning power are required. In addition to the performance benefits, the Genesolv S products are more cost-effective than other non-inflammable 141b alternatives. Genesolv S fluorocarbon-based solvents are a blend of effectiveness, economy and environmental care.

Source: www51.honeywell.com

Water-nitrogen fire suppression system

Victaulic Vortex 500 fire suppression system

Victaulic, the United States, has introduced the Victaulic Vortex® 500 fire suppression system designed specifically for information technology spaces such as data rooms and server spaces. This innovative technology utilizes both water and nitrogen in a combined suspension to both cool the hazard area, and removes oxygen that sustains the fire using high velocity and low pressure. The swirling distribution fills the hazard space at 64 kmph and quickly extinguishes the fire with little to no water presence. The Victaulic Vortex 500 system's unique hybrid technology releases a water droplet of around 10 µm in size, eliminating any appreciable wetting of equipment or surrounding space. The heat-absorbing surface area of these ultrafine water particles is 90 times more than that of the particles generated by standard sprinklers.

The Victaulic Vortex 500 system can be utilized in a sealed or open space with no requirement of room integrity and can be rapidly reset after discharge to minimize facility down time. Additionally, the system seamlessly integrates with alarm and detection systems as well as facility security technology, and unlike other technologies that use toxic agents, it can activate rapidly upon detection of a fire, even before evacuation. This unique technology is 100 per cent green and its homogenous suspension discharge is identified by the United States Environmental Protection Agency as a suitable replacement for Halon 1301.

Source: www.prweb.com

Condensed aerosol fire extinguishing

DOPING® and TOR® are condensed aerosol fire extinguishing systems from Epotos Group, Russia. These fire extinguishing systems are eco-friendly and cost-effective alternatives to fire extinguishing systems based on halons, inert gases, halocarbons and chemical powder. They are intended for extinguishing fires of solid combustible materials, inflammable gases and liquids, and electrical equipment – Class A, B, C and E. Both TOR and DOPING systems consist of a steel or stainless steel body, a solid aerosol forming compound, a solid chemical coolant and an activation system. The aerosol generators are unpressurized.

At the heart of the system is an aerosol-forming compound. When activated thermally or electrically, this compound produces combustion products – micron-sized dry chemical particles (mainly potassium carbonates) and gases (carbon dioxide, nitrogen and water vapour). This aerosol mixture then propels itself through a chemical coolant and discharges from the generator. The high rate of aerosol discharge and small size of the particles allow the agent to be distributed very rapidly throughout the protected area. Homogeneous distribution of aerosol achieved in a few seconds and a long holding time help prevent fire re-ignition. The extinguishing density of aerosol discharged from the systems is about 90 g/m^3 for Class A fires and 75 g/m^3 for Class B fires. The systems comply with international standards for condensed aerosol generators: ISO 15779:2011 and MSC.1/Circ. 1270 (IMO). They have a wide range of operating temperatures (-50°C to +90°C) and high strength under impact loads and vibration stress. *Contact: Epotos Group, 127566, 1-49, Vysokovoltny Proezd, Moscow, Russia. Tel/Fax: +7 (495) 789 6414; Tel: +7 (495) 789 9122; E-mail: pojtehexport@mail.ru.*

Source: www.epotos.com

Nitrogen-based fire suppression system

Bristol Fire Engineering, United Arab Emirates, offers NN100 fire system that employs nitrogen gas as extinguishing agent, thereby ensuring environmental protection. The NN100 system has zero ozone depletion potential and zero global warming potential. There is no possibility of producing hydrofluorine, a toxic gas, even in contact with heat or flame. The system provides a high level of safety to humans and a cost-effective performance, while not harming equipment and property.

The NN100 system poses no technical difficulties to refill. Pressure is adjustable for existing piping. The capability of pressure control on the discharge side of the storage vessels allows the NN100 system to replace existing halon systems in many applications without replacing existing piping and related equipment. This new system has been patented in the United States. *Contact: Bristol Fire Engineering, P.O. Box: 74582, Dubai, United Arab Emirates. Tel: +971 (4) 3472*

426; Fax: +971 (4) 3472 363; Website: www.bristol-fire.com.

Source: www.bristol-fire.com

Total flooding clean agent fire-fighting system

Fireboy-Xintex, the United States, offers total flooding clean agent-engineered systems for suppressing surface burning fires in Class A, B and C hazards. Fireboy® fire systems are specifically designed for protecting enclosed areas up to 500 m^3, such as engine rooms on boats. It consists of extinguishing agent stored in high-strength steel cylinders. Manual or automatic actuators release the agent into the protected space. The agent is distributed and discharged into the protected space through fixed piping and nozzles. Each nozzle is designed to deliver a uniform discharge of agent into the protected area. Cylinders can be manifolded together to protect large spaces. The cylinders are connected to the manifold using a flexible discharge bend and check valve. Cylinders can be mounted inside or outside the protected space.

The agent storage tank consists of a high-pressure steel tank filled with a valve and internal siphon tube, factory filled with HFC-227ea extinguishant, super-pressurized with dry nitrogen to 25 bar at 21°C. Tanks are available in eight sizes, ranging from 8 L to 343 L. Optional liquid level indicator is available on larger size tanks. HFC-227ea is a clean, gaseous fire extinguishant. It leaves no residue or oily deposits on delicate electronic equipment and can be removed from the protected space by ventilation.

HFC-227ea fire extinguishant is distributed within the protected area by the discharge nozzle that is sized to ensure the correct flow of agent for the hazard. Nozzles are available with seven or eight ports to allow for either 180° or 360° horizontal discharge patterns. Ports are drilled in 0.1 mm increments to the specified system design. Nozzles, supplied in brass with NPT threads, are available in six sizes, ranging from 9.5 mm to 50.8 mm. *Contact: Fireboy-Xintex Inc., O-379, Lake Michigan Drive, NW Grand Rapids, Michigan, MI 49534, United States of America. Tel: +1 (616) 735 9380; Fax: +1 (616) 735 9381.*

Source: www.fireboy-xintex.com

HFC-227ea/FM-200 fire suppression system

Fire Tech VietNam, Viet Nam, offers a fire suppression system for fast suppression of fires with reduced damage and floor space requirement. Fike's clean agent fire protection system uses HFC-227ea and FM-200, leaving no residue and eliminating the need for costly clean-ups, unlike sprinklers and other fire protection systems. The system discharges in 10 s or less, extinguishing a fire quickly and effectively. Fike's clean agent system uses Fike's patented rupture disc valve design offering additional flexibility, effectiveness and speed. That translates into minimal facility or equipment damage. Fike's clean agent fire suppression systems can be used in applications ranging from telecommunications and data processing to switch gear rooms, military applications and cell sites to high-tech medical applications. HFC-227ea is a widely accepted alternative to Halon-1301. *Contact: Fire Tech Viet Nam, 105 Truong Chinh, Thanh Xuan Dist, Hanoi, Viet Nam. Tel: +84 (4) 3629 1277; Fax: +84 (4) 3629 1277; E-mail: sales@firetechvietnam.com; Website: www.chuachayoto.com.*

Source: www.firetechvietnam.com

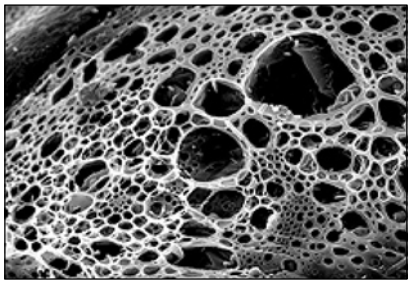
Inert gas fire-fighting system

Flamefast, the United Kingdom, supplies Fike's ProInert® gas fire extinguishing systems. Widely accepted as one of the best performing, environment-friendly and cost-effective inert gas fire extinguishing systems, ProInert offers all the benefits of other inert gas systems with several significant design improvements – enhancements that not only mean a superior product but savings to your bottom line! Most inert gas systems discharge from the nozzle into the protected space with a high surge flow rate, creating a hazardous pressure peak. These systems use pressure reducers further down the pipe network in order to mitigate safety issues but also require both high-pressure and low-pressure piping.

Because of its unique, patented valve assembly, the ProInert agent enters the protected room within the industry required 60 s but at a steady flow rate. This constant flow rate enables the use of small-diameter, low-pressure piping from the inert gas container, all the way to the nozzle. The venting area requirement is also much smaller, reducing installation costs by as much as 60 per cent on venting hardware. ProInert patented constant flow rate valve translates into a system that is not only safer for people and facility but also saves money. *Contact: Flamefast Fire Suppression, Unit 9, Brunel Close, Park Farm Industrial Estate, Wellingborough, Northants, NN8 6QX, United Kingdom. E-mail: Sales South@flamefast.co.uk.*

Source: www.flamefast.co.uk

Multi-functional nanocomposite foam



Magnified view of graphene nanocomposite foam

One novel nanomaterial with multi-functional capabilities is graphene, which consists of sp2 covalently bonded carbon atoms arranged in a planar hexagonal structure. The graphene structure has excellent mechanical, thermal, barrier, inflammability reducing and electrical properties. A procedure developed at Michigan State University (MSU), the United States, is able to create graphene sheets 1-5 layers thick in diameters ranging from less than 1 µm to over 100 µm. These graphene nanoplatelets show properties comparable to single graphene layers but are in a more robust form and can be produced at cost-competitive prices compared with other additives and fillers.

The addition of graphene nanoplatelets to a polymer foam offers the potential for improved mechanical, thermal and electrical properties, at an overall lower cost that allows the foam to maintain its low density and unique cellular structure. Such a foam material has potential applications in space technology, as the resulting nanocomposite foam would have ranges of stiffness and resilience that are outside the limits of pure polymer foams, be flame resistant, have electrical and thermal conductivity and yet be both light weight and cost-effective.

Source: www.printedelectronicsworld.com

Foaming without blowing agent

In Germany, a research team led by Dr. Francisco Garcia-Moreno at Helmholtz Zentrum Berlin reports pressure induced foaming (PIF) of metals as a novel foaming method based on the powder metallurgical (PM) foaming route. In contrast to the traditional PM route, PIF does not need any blowing agent mixed to the metal powders. The precursor can be produced by uniaxial hot-compaction, extrusion and so forth. The method consists of heating up the precursor above its melting temperature in a gas-tight furnace under a certain gas overpressure – for example, aluminium (Al) to 680°C under 9 bar. After the precursor is melted, foaming is induced easily through controlled release of overpressure, for example, to atmospheric pressure. In this manner, the gas contained in the precursor nucleates during melting and expands as a consequence of the outer pressure decrease, producing a metallic foam. Different cover gases like air or argon, different alloys like Al99.7 and AlSi7 and different overpressures up to 9 bar were successfully tested.

In situ X-ray radioscopy allowed the team to follow the melting, gas nucleation and foaming phases during the process and perform quantitative analysis. It was found that adsorbates on the powder surfaces provide the most gas volume to PIF. Advantages of this new method are very homogeneous pore size distributions and a very precise and easy adjustment of expansion, density and pore roundness. In addition, the pressure reduction rate (dp/dt) allows controlling the foaming time, from less than one second to several minutes. The PIF method has been patented and seems to be relevant from the application point of view. From the scientific angle, it helps to understand the role of the blowing agent during foaming by way of comparison. *Contact: Dr. Francisco Garcia-Moreno, Helmholtz Zentrum Berlin, Lise Meitner Campus, Hahn-Meitner-Platz 1 (formerly Glienicker Str. 100), 14109 Berlin, Germany. Tel: +49 (30) 8062 42761; Fax: +49 (30) 8062 43059; E-mail: info@helmholtz-berlin.de.*

Source: www.helmholtz-berlin.de

Approval for new foam blowing agent

In the United States, Honeywell Performance Materials and Technologies has reported the approval of its new blowing agent for foam insulation from the Environmental Protection Agency (EPA). Solstice liquid blowing agent – a chlorotrifluoropropene called HFO-1233zd – is aimed at foam insulation in refrigerators, construction, insulated metal panels, etc. Solstice has a global warming potential (GWP) well under that of conventional hydrofluorocarbon blowing agents. Whirlpool Corp., the first appliance manufacturer planning to use Solstice, stated that the new blowing agent offers an 8-10 per cent efficiency improvement over hydrocarbon blowing agents tested and a 2 per cent improvement over HFC-245fa, the standard blowing agent for appliances in the country. Solstice's GWP over 100 years is 4.7 to 7, a 99 per cent improvement over HFC-245fa. Whirlpool expects to begin using Solstice commercially in 2013. *Contact: Honeywell Performance Materials and Technologies, Morristown, New Jersey, United States of America. Tel: +1 (973) 455 5168; E-mail: bryan.magnus@honeywell.com.*

Source: www.plasticsnews.com

Steam-based soil fumigant solution

A technology that replaces methyl bromide (MeBr) with steam to fumigate and disinfect soil before new plants are planted is now available in South Africa. Non-profit organization Timbali Technology Incubator, which develops small-scale agriculture businesses, is the first to introduce the technology, known locally as 'Moeschle boiler'. MeBr has been used as a soil fumigant in various agriculture sectors, including the flower and vegetable farming practised by Timbali's agribusinesses. The technology entails a mobile boiler, which generates steam that goes directly into the soil – a process that takes up to four hours. While passive steaming is used, the technology packaging of this machine delivers the same or better results as when a chemical fumigant is used, at 95 per cent efficiency. The equipment generates an income stream for Timbali.

Source: www.engineeringnews.co.za

Weed management alternative for mulched tomato

At University of Arkansas in the United States, researchers have investigated the use of allyl isothiocyanate (ITC) as a methyl bromide (MeBr) alternative for weed management in tomato crop mulched with polyethylene. Field experiments were conducted in 2007 and 2009 to determine whether allyl ITC would provide substantive weed control in tomato along with crop tolerance. Two mulch types – low-density polyethylene (LDPE) and virtually impermeable film (VIF) – and six rates of allyl ITC (0, 15, 75, 150, 750 and 1,500 kg/ha) were included as treatment factors. A standard 67:33 per cent treatment of MeBr:chloropicrin at 390 kg/ha under LDPE mulch was also established. Allyl ITC was broadcast-applied and incorporated in the soil before preparing raised beds and laying plastic mulch. Tomatoes were transplanted three weeks after applying allyl ITC or MeBr treatments.

Tomato injury was 8 per cent in all treatments at two weeks after transplanting (WATP). Allyl ITC at ~913 kg/ha was required to control yellow nutsedge, Palmer amaranth and large crabgrass equivalent to MeBr at 6 WATP and maintain marketable tomato yield equivalent to MeBr treatment. VIF mulch was not effective in increasing weed control or improving marketable yield of tomato over LDPE mulch. This research demonstrates that allyl ITC under an LDPE mulch can have practical application for weed control in LDPE-mulched tomato in the absence of MeBr. *Contact: Mr. Jason Norsworthy, Associate Professor, Department of Crop, Soil, and Environmental Sciences, University of Arkansas, 1366 West Altheimer Drive, Fayetteville, AR 72704, United States of America. E-mail: jnorswor@uark.edu.*

Source: wssajournals.org

Mustard-based soil amendment for zero fumigant cropping

Green biomass of many brassicacious crops such as canola, field mustards, etc. is known to contain glucosinolates that degrade in soils to active forms of naturally produced soil fumigants. These include several degradation by-products, but the most important and abundant are allyl isothiocyanate (AITC) and methyl isothiocyanate (MITC). Both of these compounds exhibit powerful fumigant properties and have demonstrated control of soilborne plant pathogens, nematodes and weeds. In commercial soil management programmes, AITC and MITC are usually supplied by rotational mustard cover crops in off-season plantings. Limitations of this approach include variations in resulting pest intensity in post-treatment soils and economic feasibility. Hence, any product that can provide glucosinolates to soil as a single short-term event in large amounts, and achieve natural fumigant concentrations similar to metam sodium or metam potassium, has great commercial potential in agricultural production.

Pelletized mustard extracts were formulated by Mustard Products & Technologies, Canada, and studied as a methyl bromide (MeBr) alternative in high-value cropping systems. Beginning in early 2011, field trials were initiated in several test crop systems, including strawberry and tomato. Overall, results from field trials are promising for commercial viability. While nematode control data were similar to other fumigant products, control of soilborne fungi did not follow any predictable trend. Crop growth and yields were significantly improved without corresponding reductions in soil fungi, or a dramatic reduction in root injury. Also, in almost all cases, yields with the mustard-based solid fumigant Mustgrow at rates of 1,680 and 2,240 kh/ha were comparable to or greater than fumigant standards. Soil solarization together with Mustgrow treatments showed increased yields in later experiments in 2012. *Contact: MPT Mustard Products and Technologies Inc., 101 - 111 Research Drive, Saskatoon, Saskatchewan S7N 3R2, Canada. Tel: +1 (306) 668 2692; Fax: +1 (306) 975 1966.*

Source: mbao.org

Guidelines for the Safe Use of Inflammable Refrigerants in the Production of Room Air-Conditioners

Drawing on their experience and involvement in the conversion of a room air-conditioner (AC) production plant in China from fluorinated refrigerants to R290, GIZ Proklima has published a new technical handbook for the safe use of inflammable refrigerants in the production of room ACs. The handbook examines the technical, safety and administrative concerns related to the use of inflammable gases in the production process.

Climate-Friendly Insulation (XPS foam)

This handbook for engineers, technicians, trainers and policy-makers examines the technical, safety and administrative problems related to the use of inflammable blowing agents in the production of extruded polystyrene (XPS) boards. It focuses on the production of XPS rather than the design and certification of the XPS boards itself. The explanations, descriptions and examples provided herein are specifically focused on safety elements required for a proper production.

For the above two books, contact: Deutsche Gesellschaft fur Internationale Zusammenarbeit (GIZ) GmbH, Dag-Hammarskjold-Weg 1-5, 65760 Eschborn, Germany. Tel: +49 6196 79-0; Fax: +49 6196 79-11 15; E-mail: info@giz.de.

2012 Annual International Research Conference on Methyl Bromide Alternatives and Emissions Reductions

This book contains the proceedings of the 2012 Annual International Research Conference on Methyl Bromide Alternatives and Emissions Reductions, and is a useful information source on state-of-the-art methyl bromide alternatives for use by users of methyl bromide, researchers, legislators, government policy officials and all other interested parties.

Contact: Methyl Bromide Alternatives Outreach, 6556 N. Dolores Ave., Fresno, CA 93711, United States of America. Tel: +1 (559) 4499 035; Fax: +1 (559) 4499 037; Website: mbao.org.

06-09 Apr
Hangzhou
China

The 5th International Conference on Cryogenics and Refrigeration
Contact: Prof. Q. Wang,
ICCR2013 Office,
Institute of Refrigeration and Cryogenics, Zhejiang University,
Hangzhou 310027, China.
Tel: +86 (571) 8795 3195;
Fax: +86 (571) 8795 2793;
E-mail: ICCR2013@zju.edu.cn;
Website: www.doe.zju.edu.cn/ICCR2013.

14-15 May
Mainz
Germany

Blowing Agents and Foaming Processes 2013
Contact: Smithers Rapra,
Shawbury, Shrewsbury,
Shropshire, SY4 4NR,
United Kingdom.
Tel: +44 (1939) 252421;
E-mail: conferences@smithersrapra.com.

03-04 Jun
Vienna
Austria

UNIDO ATMOsphere Technology Summit 2013
Contact: Mr. Halvart Koeppen,
Regional Officer (Europe & Central Asia),
UNEP DTIEOzonAction Programme,
15 rue de Milan
75441 Paris Cedex 09, France.
Tel: +33 (1) 4437 1432;
Fax: +33 (1) 4437 1474;
E-mail: halvart.koppen@unep.org.

25-27 Sep
Bad Krozingen
Germany

5th International Conference on Solar Air-Conditioning
Contact: Ostbayerisches Technologie-Transfer-Institut e.V.
Wernerwerkstr. 4,
93049 Regensburg, Germany.
Tel: +49 (941) 296 88 29;
Fax: +49 (941) 296 88 17.

09-13 Oct
Bangkok
Thailand

BANGKOK RHVAC 2013
Contact: Thai Trade Fair,
44/100 Nonthaburi 1 Road,
Bang Kra Sor, Nonthaburi 11000,
Thailand.
Tel: +66 (2) 507 7842;
Fax: +66 (2) 547 5683-4;
E-mail: rhvac@ditp.go.th;
Website: www.bangkok-rhvac.com.

12-14 Nov
Jakarta
Indonesia

HVACR INDONESIA 2013
Contact: Informa Exhibitions Pte. Ltd.,
111 Somerset Road #11-08,
TripleOne Somerset,
Singapore 238164.
Tel: +65 6411 7777;
Fax: +65 6411 7778;
E-mail:info@psseries.com.

PUBLICATIONS from APCTT

PERIODICALS

(Free access at www.techmonitor.net)

- ❑ Asia Pacific Tech Monitor (4 issues/year) — (e-version)
- ❑ VATIS Update (4 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		
❍ Volume 1: Big Countries and Developed Economies, 1999	600.00	30.00
❍ Volume 2: ASEAN, NIEs, SAARC and the Islamic Republic of Iran, 1999	600.00	30.00
❍ Volume 3: Least Developed and Pacific Island Countries and Economies in Transition, 1999	600.00	30.00
❍ Volume 4: Emerging Issues in Regional Technological Capability-building and Technology Transfer, 1999	600.00	30.00
❑ Rural Industrialization as a Means of Poverty Alleviation: Report of the Regional Seminar on the Enhancement of Partnerships among Governmental, Non-governmental and Private Sector Entities for the Promotion of Rural Industrialization for Poverty Alleviation, 1999	600.00	30.00
❑ 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.

 # Six issues per year. A print version for distribution to a select target group is supported by the Ozone Cell, Ministry of Environment & Forests, Government of India.

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