VATIS UPDATE

Ozone Layer Protection

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Highlights

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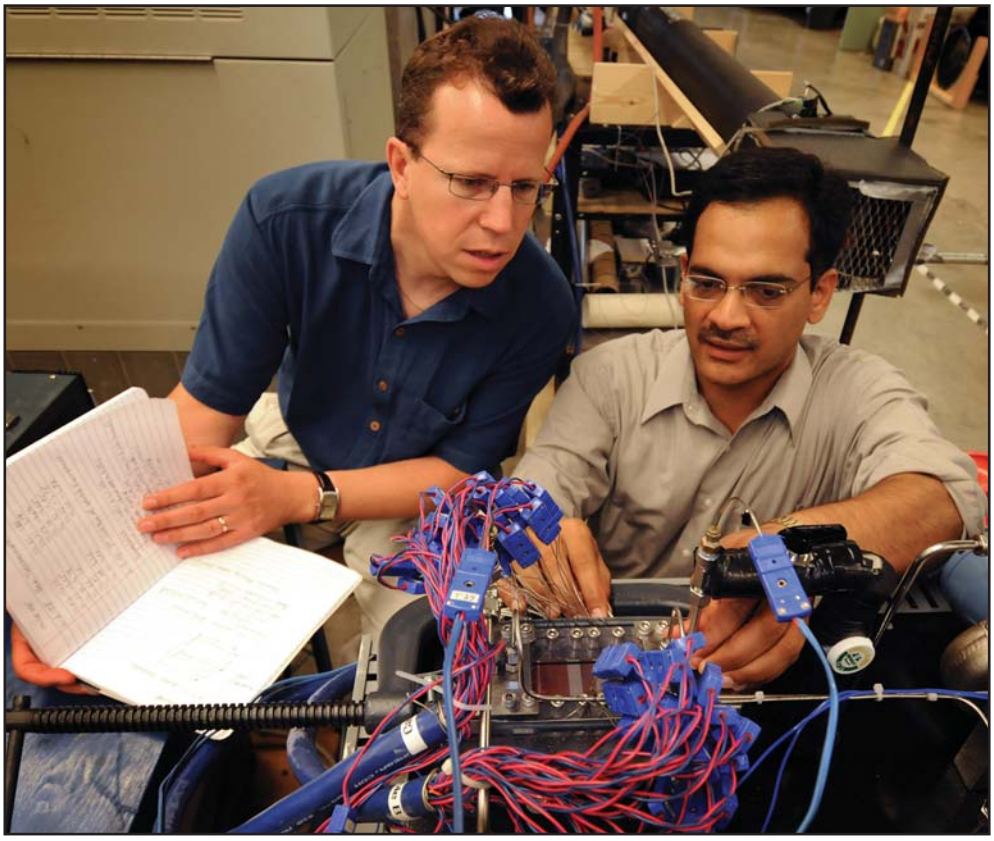

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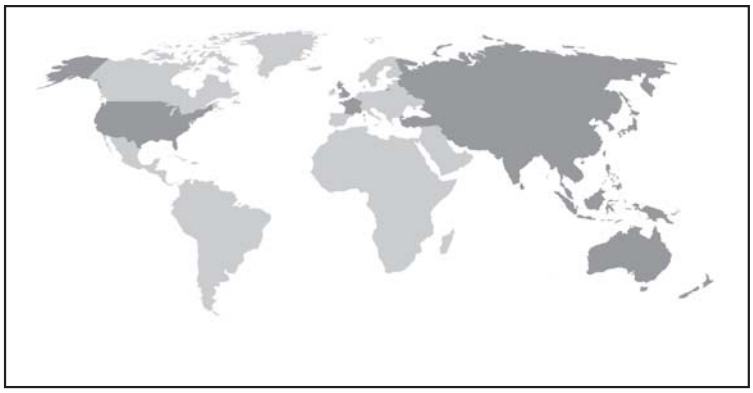
APCTT
ASIAN AND PACIFIC CENTRE FOR TRANSFER OF TECHNOLOGY

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

Miniature refrigeration system using HFC 134A refrigerant for laptops and personal computers
(Credit: Purdue News Service/David Umberger, USA)

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.

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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@del3.vsnl.net.in
Website: http://www.ozonecell.com

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SCIENCE OF THE OZONE LAYER

Ozone hole over Antarctica grows again

The ozone hole over Antarctica grew to the size of North America in 2008 – the fifth largest on record – according to the latest satellite observations. Scientists from the National Oceanic and Atmospheric Administration (NOAA), the United States, say the ozone hole reached its maximum level on 12 September 2008, extending to 27.2 million sq. km and 6.4 km deep. That is bigger than 2007 but smaller than 2006, when the hole covered over 29.5 million sq. km.

Expressing the same fear, Mr. Geir Braathen, ozone specialist at the World Meteorological Organization, said the ozone hole will reach at least a size of 27.9 million sq. km in area. He noted that although there has been a notable decrease in ozone-depleting substances, their atmospheric concentration was still high. "Even if chlorine and bromine are coming down, there is still for many years to come enough of these substances to deplete all the ozone in this height range," he opined.

Scientists blamed colder-than-average temperatures in the stratosphere for the ozone hole's unusually large size this year. "Weather is the most important factor in the fluctuation of the size of the ozone hole from year to year," said Mr. Bryan Johnson, a scientist with NOAA's Earth System Research Laboratory, which monitors ozone, ozone-depleting chemicals and greenhouse gases around the globe. "How cold the stratosphere is and what the winds do determine how powerfully the chemicals can perform their dirty work."

Starting in May, as Antarctica moves into a period of 24-hour-a-day darkness, winds create a vortex of cold, stable air centred near the South Pole that isolates CFCs over the continent. When the spring sunshine returns in August, the sun's ultraviolet light sets off a series of chemical reactions inside the vortex that consume the ozone. The colder and more isolated the air inside the vortex, the more destructive the chemistry. Then, by late December the southern summer returns in full swing, the vortex crumbles, and the ozone reforms – the process begins anew the following winter. (Source: www.guardian.co.uk and www.msnbc.msn.com)

Oceanic carbon sink could be weakened by the ozone hole

Evidence presented in France seems to indicate that the hole in the ozone layer above Antarctica impairs the ability of the Southern Ocean to absorb carbon dioxide of the earth's atmosphere. The oceans of the Earth are the largest absorbers of carbon dioxide on Earth, and the Southern Ocean is thought to take up more than 40 per cent of the carbon dioxide absorbed by oceans, according to Mr. Andrew Lenton, a marine biologist at the Pierre and Marie Curie University in Paris, France.

Theoretically, the more carbon dioxide the atmosphere contains, the more the oceans should absorb. However, recent measurements have shown that the surface waters of the Southern Ocean actually contain more carbon dioxide than expected. This also makes them more acidic. The amount of carbon dioxide that is being absorbed also flattens out at this time. Mr. Lenton says that stratospheric ozone damage was missing from the models made thus far. Yet, it is thought to have an effect on the strengthening of the Southern winds, alongwith the effects of greenhouse gases on the climate. He thinks that these stronger winds are causing ocean currents that bring carbon that is stored in the deep ocean up to the surface.

Mr. Lenton and his colleagues have built simulations of the Southern Ocean that take the effect of ozone into account. By including the ozone hole in the model, they were able to reproduce the feeble absorption of carbon in the Southern Ocean that oceanographers have measured. However, researchers from the Leibniz Institute of Marine Sciences in Kiel, Germany, say that they question the changes in ocean currents shown by models such as those made by Mr. Lenton and that oceanographic data provides no hard evidence for these changes. (Source: www.digitaljournal.com)

ODS PHASE-OUT IN INDIA

GTZ assistance in India's CTC phase-out

Since 2005, production and supplies of CTC have seen a sharp decline. With supplies falling well below the demand, prices have risen. Procurement of CTC is becoming increasingly difficult and it is imperative to identify suitable alternatives rapidly. A host of alternative options may exist for every application, and the best one needs to be identified. The German Agency for Technical Cooperation (GTZ), an international co-operation enterprise for sustainable development, lends assistance to Indian industries in this regard.

Evaluation of requirements: In consultation with affected industries, GTZ evaluates the requirements of processes in which CTC is currently used. High emphasis is placed on dialogue with users to ensure that technical and economical dimensions of the processes involved are well understood.

Substitute identification: The identification of suitable substitutes is in full swing. For most industry segments, one or more alternative products have already been found. In many cases, GTZ can learn from existing experiences of industries using alternative products for the benefit of all.

Substitute testing: In order to address critical parameters such as performance, cost, and health and safety risks, GTZ conducts testing of substitute products, either in the laboratory or in the industry. The aim is to provide relevant information that industries can rely upon.

Sharing of results: Information on substitute products and processes is made available free of charge to industries. In addition to publications, GTZ holds technical seminars for the industries concerned and engages in capacity building wherever required.

Solvent alternatives: GTZ has identified a range of solvents available on the Indian market. Their cost, properties, industrial applications and health hazards were researched and compiled in the booklet "Solvent Alternatives". *Contact: National CTC Phase-out Plan, GTZ Proklima Country Office, A-33 Gulmohar Park, New Delhi 110 049, India. Tel: +91 (11) 2661 1021.* (Source: www.ctc-phaseout.org)

Northern Indian Railway plans to reclaim CFC

As support to save the ozone and address the need of CFCs after 1 August 2008, the Northern Indian Railways will reclaim CFC and use the reclaimed CFC for servicing the air-conditioners of the railway coaches. The Indian Railways at present consume around 80 tonnes CFC-12 annually for maintenance. To meet CFC phase-out targets, it must employ good servicing practices, including recovery, recycling and reuse of reclaimed refrigerant during maintenance of AC coaches. Indian Railways is making proactive efforts to phase-out CFCs by converting the under-slung units from CFC-12 to HFC-134a. A number of units have already been successfully converted thus by different railway units. The activity is co-ordinated and monitored by Research Designs and Standards Organization (RDSO). (Source: www.nccopp.info)

NCCoPP training

Training constitutes one of the main activities under the National CFC Consumption Phase-out Plan (NCCoPP). Training is offered to Refrigeration and Air-conditioning technicians in all the major states in India. Training focuses on: mobile air-conditioning servicing; retrofitting for large commercial appliances using open-type compressors; retrofitting for domestic and small commercial appliances; and recovery and recycling of CFC refrigerants.

Good practice in handling CFCs is the primary focus. In addition, technicians are also trained in non-CFC technologies to ensure customer satisfaction, on which their survival depends. Safety aspects are also an issue, especially with regard to use of hydrocarbons.

NCCoPP operates through a network of training cells. The training cells are managed through Quest Consulting and Training, which leads the

training initiatives in India and coordinates all training programmes. Industry partners such as Godrej & Boyce Mfg. Ltd., Whirlpool and Kirloskar Copeland Ltd. also participate in the programme and provide their resources to train refrigeration servicing enterprise technicians in addition to training their own service networks and franchisees. The training institutions are given initial support, through training-of-trainers workshops and equipment, to reinforce their capacity and infrastructure.

The number of training cells will reduce over the project's lifetime. For example, in the South, a very high coverage of the sector has already been achieved under the HIDECOR project and hence, the training cells in these areas and the number of training programmes in this region will gradually reduce. (Source: www.nccopp.info)

NCCoPP update

Under NCCoPP, up to March 2008, 6,988 technicians had been trained. During the coming season, more technicians will benefit from the training programmes.

INFRAS has announced the launch of an Excellence Award Scheme for trainer of the year to honour outstanding performance of trainers under NCCoPP. Training Cell organizers and industry partners are encouraged to submit their voluntary nominations, which are then scrutinized by a jury. Under this scheme, one excellence and six outstanding awards were announced for 2008. The winners received a Certificate of Excellence & cash award of Rs 10,000 or Rs 5,000, respectively. (Source: www.nccopp.info)

Fridoc Database

Fridoc is the most comprehensive refrigeration database in the world. It holds more than 82 000 entries of international scientific and technological literature covering all refrigeration spheres. Fridoc is available online via the IIR's website and has a search engine to perform searches in natural language.

For more information, contact:

International Institute of Refrigeration
177, boulevard Malesherbes
75017 Paris, France
Tel: +33 (1) 42 27 32 35; Fax: +33 (1) 47 63 17 98
E-mail: iifiir@iifiir.org
Website: www.iifiir.org

IN THE NEWS

Nations for link between ozone layer and climate change efforts

The United Nations should twin its efforts to combat ozone depletion and climate change to reap the greatest economic and environmental benefits, governments concluded at a global gathering. The call for greater cooperation between United Nations treaties on ozone and global warming was issued in November, at the end of a meeting in Doha, Qatar, of the 193 governments that are party to the Montreal Protocol and the Vienna Convention.

Participants asked the Executive Secretary of the Montreal Protocol to pursue closer ties with the UN Framework Convention on Climate Change (UNFCCC) and explore how best to slash the release of hydrofluorocarbons (HFCs), one of the six greenhouse gases controlled under the Kyoto Protocol of UNFCCC. They also suggested that phasing out hydrochlorofluorocarbons (HCFCs) would be mutually beneficial in addressing both the ozone layer and climate change.

HCFCs were earlier considered as transitional substances to replace more ozone-damaging substances in some applications such as refrigeration and foam because of low ODP, but they themselves are to be replaced by new ozone- and climate-friendly chemicals. The participants also discussed the best means to destroy harmful substances stored in old equipment, as well as funding to help developing countries to eliminate ozone-damaging chemicals. (Source: www.un.org)

Military experts enlisted to dispose of ODS

Military experts from Australia, the Netherlands and the United States will help save the ozone layer and fight global warming under a unique partnership between the United Nations, national governments and the armed services. The new programme, spearheaded by the United States Environmental Protection Agency and the United States Department of Defence, will make use of technical experts in the military already on the ground. The initiative was announced to delegates

from more than 150 governments at the conclusion of a five-day meeting in Doha of Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer.

Mr. Marco Gonzalez, Executive Secretary of the United Nations Environment Programme (UNEP) Ozone Secretariat, said, "The military in many countries have been at the forefront of efforts to phase out ozone depleting substances. Their experience can be invaluable for developing countries facing similar challenges." The military experts are offering to assist countries in the safe collection of stockpiles and banks of unwanted, ozone-depleting substances (ODS). They will give support and advice on the shipping, labelling and other procedures needed to fast-track the chemicals to disposal centres around the world.

The partnership could dramatically cut the costs of the disposal of ozone-depleting chemicals such as halons, hydrofluorocarbons and chlorofluorocarbons to a third or less of the current market cost. The partners hope that by joining forces, civilian ODS destruction programmes will be able to benefit from these low-cost contracts, making them cheaper and more attractive to undertake. Argentina will be one of the first countries to take advantage of this opportunity to safely dispose of the obsolete chemicals.

The Ozone Secretariat will act as co-ordinator with the Secretariat of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, as well as other conventions to ensure the transport of unwanted ODS to countries with destruction facilities is correctly permitted. Officials say this co-ordination will streamline the shipments of chemicals to proper destruction facilities. (Source: www.ens-newswire.com)

Philippines committed to Montreal Protocol

As a party to the Montreal Protocol, the Philippines is on schedule in its commitment to phase out the use of ozone-depleting substances (ODS) by 2010. Dr. Ella Deocadiz, programme manager of the Philippine Ozone Desk Institutional Strengthening Project, said the country is committed to eliminate the production and use of ODS following an ODS Phase-out schedule.

The regional ozone network, a multi-agency task force created to promote information on ozone layer protection in the Philippines, has already decided to reach out to the grassroots for intensified information dissemination, Dr. Deocadiz said. In terms of awareness, she cited government agencies as moderately informed. However, awareness is high among manufacturing sector because they are the ones importing and using ODS. Her team is meeting with stakeholders to work on their communication strategies to widen the dissemination of information on ODS and their effects on the ozone layer. (Source: www.balita.ph)

Malaysia expects to phase out HCFCs by 2030

Malaysia is expected to completely phase out the consumption of hydrochlorofluorocarbons (HCFCs) by 2030 as scheduled, according to Datuk Douglas Uggah Embas, the Natural Resources and Environment Minister. The Ministry would develop a national HCFCs Phase-Out Management Plan (HPMP) that would outline the overall framework and strategies of implementation to achieve the objective, he said.

"The plan will detail actions to be taken to phase out the use of HCFCs in all sectors, namely in refrigeration, foam, solvent and fire-fighting," Datuk Douglas said, opening the HPMP inception workshop organized by the Ministry's Department of Environment and the United Nations Development Programme (UNDP) recently. He called upon all stakeholders, especially in the industries, to give their full cooperation and assistance by providing the relevant and necessary data and information on the consumption of HCFCs so that a comprehensive HPMP could be developed.

The Minister said that to develop the HPMP, the Executive Committee (EXCOM) of the Multilateral Fund for the Implementation of Montreal Protocol had approved a sum of US$173,750 for Malaysia through the UNDP. He also said that Malaysia was looking into the possibility of freezing the production and consumption of HCFCs from 1 January 2013 to achieve a 10 per cent gas reduction by 2015. HCFCs consumption in Malaysia had increased from 841 tonnes in 1996 to 5,635 tonnes in 2005, he informed. (Source: www.bernama.com.my)

Pakistan to Co-Chair Montreal Protocol's Working Group

Pakistan has been elected as the Co-Chair of the Open Ended Working Group for 2009 at the 20th Meeting of the Parties to the Montreal Protocol on the Substances that Deplete the Ozone Layer.

Ministers, deputy ministers for environment, ambassadors and delegates of 193 member states to the Montreal Protocol attended the meeting held at Doha, during 16-20 November 2008. The Pakistani delegation, headed by Pakistan's Ambassador to Qatar Mr. Muhammad Asghar Afridi, included Mr. Khizar Hayat Khan, Joint Secretary for Environment and Mr. Muhammad Maqsood Akhtar, Programme Manager, Ozone Cell. It advocated specifically the case for funding from the Multilateral Fund of the Montreal Protocol for the conversion of CFCs-based MDI manufacturing pharmaceutical firms into ozone-friendly technology. (Source: www.thenews.com.pk)

Viet Nam needs US$15 million to cut HCFC gas use

Viet Nam requires about US$15 million to eliminate hydrochlorofluorocarbons (HCFCs) in accordance with the Montreal Protocol over the next 15 years, a climatologist said. Mr. Le Cong Thanh, acting head of the Department for Hydrometeorology and Climate Change under the Ministry of Natural Resources and Environment, stated this at a recent seminar to launch a programme to phase out the use refrigerant-22 (R22), used mainly in refrigeration and air-conditioning (RAC) equipment.

According to the Montreal Protocol, Viet Nam will begin to phase out HCFCs, including R22, from 2010. By 2025, the country aims to cut the use of HCFCs by 67.5 per cent. Mr. Thanh said that his department conducted a general survey of HCFCs use in Viet Nam and co-operated with international organizations to map out programmes and projects to seek finance and technology for a total phase-out of HCFCs in Viet Nam. The quantity of HCFCs, particularly R22, used in the RAC industries is on the increase, Mr. Thanh said, adding that finding an ideal alterative refrigerant is a major challenge facing the industry. (Source: english.vietnamnet.vn)

REFRIGERATION/ AIR-CONDITIONING

A "cool and dry" idea

In Michigan, the United States, two researchers have won the Boston Innovation Prize for the design of a low-cost, energy-efficient method of cooling and dehumidifying residential and small commercial spaces. Mr. Norbert Müller, assistant professor in Michigan State University's Department of Mechanical Engineering, and Mr. John Barrie, of the Appropriate Technology Collaborative, collaborated on the award-winning project.

"The technology used for this air-conditioner is radically different," Mr. Müller said. The appliance uses as the refrigerant water vapour, referred to as R-718. Water vapour can be more efficient than traditional refrigerants, but engineering the compressor is difficult and usually expensive. The researchers invented a way to make an economical compressor that is small and lightweight by designing a novel turbo compressor woven out of high-strength fibres and integrated with a motor. "It gives wonderful control. It is efficient and compact," said Mr. Müller. "Another plus for the new R-718 technology is that by experience it is surprisingly quiet." The contribution of Mr. Barrie, an architect and industrial designer, was on how air-conditioning functions in the real world.

Mr. Müller and Mr. Barrie want to develop prototypes of the air-conditioner as additional funding for development becomes available. *Contact: Mr. Russ White, University Relations, Public Relations Office, Michigan University, 403 Olds Hall, East Lansing, MI 48824-1047, United States of America. Tel: +1 (517) 432 0923; E-mail: russ.white@ur.msu.edu.* (Source: news.msu.edu)

Combatting CFC effects with nitrogen recycling

A large proportion of refrigerators contain harmful chlorofluorocarbons (CFCs), which, if not disposed of properly, can have a devastating effect on the atmosphere. Messer Group, Germany, is supplying liquid nitrogen to combat this problem,

advocating its ability to freeze condensed CFC vapours and leave only pure air as a by-product. Liquid nitrogen has a temperature of -196ºC and this is used to freeze condensed CFC vapours, in turn leaving pure air behind as a by-product. The CFCs are then converted into hydrofluoric and hydrochloric acid, through a means of controlled destruction.

Messer supplies liquid nitrogen to Noex AG, one of Germany's most modern refrigerator recycling plants a company. This state-of-the-art recycling plant disposes of almost half a million refrigerators a year, a large percentage of which contain the environmentally harmful CFCs. The plant, near Cologne, can recover 99.9 per cent of these CFCs. Nitrogen is also used at the plant as a gas which is injected into the shredder to displace air, preventing explosions and fires. *Contact: Messer Group, Gahlingspfad 31, Krefeld 47803, Germany. Tel: +49 (2151) 781 1442; Fax: +49 (2151) 781 1501; E-mail: communications@messergroup.com. Website: www.messergroup.com.* (Source: www.gasworld.com)

The environmental benefits of a new refrigerant

The Society of Automotive Engineers International Cooperative Research Programme, which is sponsored by major automotive manufacturers, recently released a report summarizing results of its industry evaluation of hydrofluoro olefin (HFO)-1234yf, a low global warming potential (GWP) refrigerant co-developed by DuPont. The report validated that HFO-1234yf is safe to use in mobile air-conditioning, and that, of all the proposed alternatives considered, HFO-1234yf has significant environmental benefits. The report concluded HFO-1234yf offers "the greatest potential to meet environmental and consumer needs."

HFO-1234yf has a dramatically lower GWP than the R-134a refrigerant used currently, and the best overall lifecycle climate performance globally, which makes it the preferred environmental solution. Since it is a near drop-in replacement for R-134a, it is also a practical choice, keeping costs down for both automakers and consumers. An agreement is expected in early 2009 to accelerate the commercial introduction of improved air-conditioning systems using HFO-1234yf.

DuPont estimates the use of HFO-1234yf refrigerant in new cars has the potential to save more than 2,200 million litres of fuel annually – the equivalent of taking approximately 1.5 million cars off the road each year, based on equivalent cooling and energy performance and global adoption of HFO-1234yf by the year 2017. HFO-1234yf is expected to replace R-134a in automotive air-conditioning systems as early as 2011, when a European Union directive comes into effect requiring the phase-out of R-134a in all new type vehicles. (Source: www.prweb.com)

Air-conditioning goes green

Panasonic Malaysia Sdn. Bhd. has introduced 10 new air-conditioner models featuring exceptional air purifying capabilities and eco-friendly characteristics, including efficient cooling and a new eco-inspired design. The eco-friendly attributes of the Envio 12 and Envio P2 series include an ozone-friendly R-410A refrigerant and inverter technology that can save energy by up to 50 per cent.

"The savings are made possible by regulating compressor rotation speeds with precision to deliver the right amount of cooling power adjusted to meet changes in room temperature. The inverter also assures quick and powerful cooling upon start-up, making comfortable cooling achievable 1.5 times faster, with less energy spent on reaching a set temperature," said Mr. Tony Endoh, the Managing Director of Panasonic Malaysia.

Both series feature the Advanced Plus e-ion Air Purifying System with a new sensor that monitors and indicates air quality. The air purifying process is triggered automatically by the release of active e-ions when the number of air-borne particles rises to an unhealthy level, deactivating 99 per cent of these particles for cleaner and healthier air. (Source: www.thesundaily.com)

Water heaters help reduce energy costs via reclamation

The Templifier™ water heaters, from McQuay International in the United States, reduce energy costs by recovering waste heat and making it available for space heating and domestic hot water. Suitable for hotels, hospitals, healthcare centres, schools, athletic facilities and manufacturing plants,

McQuay Templifier units with scroll compressors range from 500 to 3,000 MBh and can heat water up to 71ºC compared with 60ºC for competitors.

The Templifier's hermetic scroll compressors use R-134a refrigerant, which has no ozone-depletion potential, and feature low sound levels. An optional hot-gas bypass allows unit operation down to 10 per cent of the full-load capacity. As Templifier units heat water more economically than fossil fuel or electric-resistance heaters, they can reduce the burden on boilers and/or cooling towers, thereby eliminating or delaying a capital equipment expense when increased heat production is needed. *Contact: McQuay International, P.O. Drawer 1551, Minneapolis, MN 55440, United States of America. Tel: +1 (763) 5535 330; Fax: +1 (763) 5535 177.* (Source: news.thomasnet.com)

A compressor-free refrigerator

The coolants commonly used in refrigerators or air-conditioners are either harmful to people or the environment. Almost all coolants available require energy-eating compressors and lots of heating coils. Engineers at Pennsylvania State University, the United States, have developed a new method of refrigeration that doesn't require a compressor. The method uses the change from disorganized to organized that occurs in some polar polymers when placed in an electric field. In natural state, the molecules of these materials are randomly positioned (disorganized). When electricity is applied, these molecules become highly ordered and the material gives off heat and becomes colder. When the electricity is turned off, the material reverts to its disordered state and absorbs heat.

The researchers reported a change in temperature of about -5ºC. Repeated randomizing and ordering of the material combined with an appropriate heat exchanger could provide a wide range of heating and cooling temperatures. While the actual temperature where these experiments were performed was around 70ºC, which is a little high to use in a refrigerator, the researchers indicate that there are many different types of polar polymers, and at least some of these could be functional at lower temperatures. (Source: www.peswiki.com)

SOLVENTS

Solvent meets aerospace criteria

Banner Chemicals Group, the United Kingdom, has announced that the Evolve range of solvents – originally developed as an alternative to 1,1,1, trichloroethane for cold-cleaning applications by ICI – meets the needs of aerospace applications. Its ability to match the strict criteria of aerospace applications has resulted in companies including BAE, Rolls-Royce, British Airways, UKMOD and Leica approving Evolve for use.

A rapidly evaporating, no-residue and odourless product, Evolve removes oils, greases, shop soils and related contamination from all types of metals. Being odourless, worker comfort is enhanced and a high occupational exposure limit enables a range of uses. *Contact: Banner Chemicals Group, Hampton Court, Manor Park, Runcorn WA7 1TU, United Kingdom. Tel: +44 (1928) 597 000; Fax: +44 (1928) 597001; E-mail: info@bannerchemicals.com.* (Source: www.manufacturingtalk.com)

Ozone-safe metal cleaning fluids

Aragorn Resources, the Philippines, offers ozone-safe paraffinic hydrocarbon cleaners. Hydroclin cleaners are specifically developed for ultrasonic and heated washing machines. This high-quality product will not leave any residue, is non-reactive and non-staining to metals. The cleaning efficiency is comparable to chlorinated solvents and chlorofluorocarbons minus the ozone depleting potential, as the vapours naturally decompose upon exposure to sunlight. Hydroclin has excellent distilling and recovery properties, and retains its quality even after considerably long thermal exposure. It is available in different grades, drying time and boiling point or distillation ranges for customer preference.

Isoclin cleaners are super premium quality paraffinic hydrocarbon cleaners, which are virtually odourless, 100 per cent volatile and residue-free for spotless drying. They are for the same applications as Hydroclin cleaners, as well as for highly sensitive applications requiring the highest possible quality and lowest odour levels. The product is environment-friendly and does not contribute

to ozone layer degradation. Ionic micro corrosion is virtually impossible with the use of this product. It is available in several grades with different boiling ranges and drying times to suit particular applications. *Contact: Aragorn Resources, 5-B Poblete Compound, 343 West Service Road, Sun Valley, Paranaque City, The Philippines. Tel: +63 (2) 776 1358; Fax: +63 (2) 541 9735; E-mail: info @aragornchem.com.* (Source: www.aragornchem.com)

Ultrasonic cleaning tanks for soft metals

Industrial quality Kerry ultrasonic tanks, from Guyson International in the United Kingdom, provide speedy cleaning for welded metal joints on a variety of materials including aluminium and copper. These are suitable particularly where the raw metal material is being used without paint or other coating to mask any discolouration on the components.

Pulsatron UCR and KS tanks are used to rid the components of weld discolouration. These tanks allow the user to preset exact cleaning times and temperatures, ensuring that consistent levels of cleanliness are kept from batch to batch and providing an affordable way to improve cleaning quality. All functions are controlled by a simple four-button membrane keypad. An LCD panel displays the temperature and time set by the user, the time elapsed since the start of the cleaning process, and the status of the power supply, heater and ultrasonics.

Each unit works within operating temperatures from 20º to 80ºC, which can be set in 1º increments, allowing the optimum temperature to be selected for a particular combination of component material, cleaning solution and contaminant. Sonics time may be set in the range 0.1-99.9 min in 0.1 min increments, or to constant when sonics may be switched on and off manually. KS and UCR ultrasonic clean and rinse systems come in a range of sizes: Standard KS ultrasonic tanks come in a range of sizes up to 248 litre capacity, while UCR ultra clean and rinse tanks come in capacities to 117 litres. *Contact: Guyson International, Snaygill Industrial Estate, Keighley Road, Skipton, North Yorkshire, BD23 2QR, United Kingdom. Tel: +44 (1756) 799 911. E-mail: leeds@guyson.co.uk.* (Source: www.manufacturingtalk.com)

N-propyl bromide-based machining fluid formulations

Garrett Services, the United States, has patented a machining fluid admixture – comprising a major amount of n-propyl bromide and a minor amount of a lubricant – for cooling and lubricating a tool/workpiece interface. The machining fluid consists of about 30.0 to about 99.99 weight per cent n-propyl bromide, about 0.01 to about 30.0 weight per cent of a lubricant, and optionally up to about 70.0 weight per cent of a fluorinated chemical.

The lubricant component of the machining fluids may be a mineral oil, a synthetic lubricating oil or a mixture thereof. The synthetic lubricating oil may or may not have a halogen constituent, and may be selected from a polyol ester, a polyalkylene glycol, a glycol ether, an isoparaffin or a mixture thereof. The polyalkylene glycol may be ethylene glycol monobutyl ether, propylene glycol methyl ether or their mixture, while the isoparaffin may be 2,2,4-trimethylpentane. The fluorinated chemical component of the inventive machining fluids may have the formula $C_aF_bH_cN_dO_e$ wherein a = 2 to 8, b = 5 to 18, c = 0 to 13, d = 0 to 2 and e = 0 to 2; for example, 1,1,1,2,3.4,4,5,5,5-decafluoropentane, 1-methoxy-nonafluorobutane or a mixture thereof. (Source: www.freepatentsonline.com)

Cosmetics with hydrofluoroether

Daikin Industries Ltd., Japan, has been assigned a United States patent on a cosmetic containing at least 1 per cent by weight of hydrofluoroether having a viscosity of less than 5 mPa·s at 25ºC. The HFE is represented by the general formula $C_nH_mF_l–O–C_xH_yF_z$ wherein n is a number from 1 to 12, m is a number of 0 to 25, l is a number from 0 to 11 and m+1 = 2n = 2x+1, and x is a number from 1 to 12, y is a number from 0 to 25, z is a number from 0 to 11 and y+z = 2x+1, provided that m and y, and l and z, are not zero simultaneously.

The inventors have found that a partially fluorinated fluorine-containing solvent (HFE) is highly safe for the skin and has low or no influence on the environment. The HFE has high solubility in a fluorine-containing oil used frequently in cosmetics and high dispersibility in fluorine compound-treated powders. (Source: www.freepatentsonline.com)

Dry cleaning compositions containing hydrofluoroether

A major concern in solvent cleaning is the tendency (especially where solvent is used at a high temperature) for solvent vapour loss from the cleaning system into the atmosphere. Although care is generally taken to minimize such losses (for example, through vapour recovery systems), most cleaning applications result in some loss of solvent vapour into the atmosphere. Furthermore, solvent cleaning methods have traditionally utilized chlorinated solvents, alone or in admixture, linked to ozone depletion.

Partially fluorinated ethers have been suggested as alternatives to chlorinated solvents. 3M Innovative Properties Company, the United States, has patented dry cleaning compositions containing hydrofluoroethers (HFEs), a co-solvent, a detergent, and water in an amount of less than 1 per cent by weight. The patent also describes a method of cleaning fabric articles using the patented dry cleaning composition. The co-solvent is selected from the group consisting of alkanols, ethers, glycol ethers, perfluoroethers, perfluorinated tertiary amines, alkanes, alkenes, perfluorocarbons, terpenes, glycol ether acetates, hydrofluorocarbons, hydrochlorofluorocarbons, non-ionic fluorinated surfactants, cycloalkanes, siloxanes, ketones and combinations thereof.

HFEs suitable for use in the process are low-polarity chemical compounds, minimally containing carbon, fluorine, hydrogen and catenary (that is, in-chain) oxygen atoms. HFEs can optionally contain additional catenary heteroatoms, such as nitrogen and sulphur. Their molecular structures can be linear, branched or cyclic, or a combination thereof. They are preferably free of ethylenic unsaturation, having a total of about 4-20 carbon atoms. Such HFEs are readily available, either as essentially pure compounds or as mixtures.

Preferred HFEs can have a boiling point in the range from about 40º to 275ºC, preferably 50º to 121ºC, and have a higher vapour pressure than that of perchloroethylene, thus increasing the dry time of the cleaned fabric. *Contact: 3M Innovative Properties Company, 3M Centre, P.O. Box 33427, St. Paul, MN 55133-3427, United States of America.* (Source: www.freepatentsonline.com)

FOAMS

Silicone stabilizer for liquid CO_2 processes

Momentive Performance Materials Inc., the United States, has the launched Niax™ silicone L-655, a silicone stabilizer for use in manufacturing flexible polyether foam. The new stabilizer can offer a 10-30 per cent reduction by weight of flame retardant (FR) use in slabstock foam applications compared with conventional stabilizers. Niax silicone L-655 may also be applied in conventional foam manufacturing processes, and those that use carbon dioxide (CO_2) as an auxiliary blowing agent.

When used in FR grades of foam used in furniture, bedding and automotive products, the new stabilizer can help minimize the amount of FR required for passing small-scale tests. In addition to its typically outstanding FR improvement, use of Niax silicone L-655 may also help reduce material costs for manufacturers using Momentive's Niax silicones.

The new product provides excellent froth formation and stability (as required in CO_2 processes) to make soft and low-density foam grades. Compared with Niax silicone L-650, Niax silicone L-655 can also deliver wide processing latitude and improved cell structure in CO_2 processes. It may also help substantially boost FR performance for flexible polyurethane foam at reduced use levels. *Contact: Momentive Performance Materials Inc., 22 Corporate Woods Boulevard, Albany, NY 12211, United States of America. Tel: +1 (607) 786 8131; Fax: +1 (607) 786 8309.* (Source: www.marketwatch.com)

SPF roofing system

Spray polyurethane foam (SPF) is a spray-applied insulating foam plastic. The two chemical components are combined as they pass through the spray gun and contact the substrate as a liquid. As the two components chemically react, they expand in volume by 20 times and form a strong, rigid material with a density of 40 to 48 kg/m^3 and a compressive strength of 275 to 345 kN/m^2.

Central Coating Company, the United States, offers SPF roofing system claimed to be a "green", renewable and sustainable roofing insulation solution. SPF has an aged R-value of approximately 6.4 per 1-inch thickness (depending on the particular formulation and application, higher values can be achieved), enabling it to provide more thermal resistance with less material than any other type of commercial insulation material. Other benefits claimed include:

- Stops air and moisture infiltration;
- Makes a building more comfortable;
- Saves on energy costs;
- Adds strength to the building structure; and
- Reduces capacity requirements, maintenance and wear of HVAC equipment.

SPF roofing is applicable for new constructions, re-roofing projects, for cold storage facilities and for rooftop photovoltaics installations. *Contact: Central Coating Company, 670 S. Pine Street, Madera, CA 93637, United States of America. Tel: +1 (559) 673 0074; +1 (559) 673 8243.* (Source: www.peswiki.com)

New developments in polyisocyanurate laminate foam

Increasing insulation in buildings is a universally accepted way to improve energy efficiency. The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) recently increased the minimum required prescriptive R-value for roof and wall insulation levels in Standard 90.1 – the national model energy code for commercial buildings. Polyisocyanurate (polyiso) laminate board is perhaps the most widely used insulation for commercial roofing, as it has consistently met the structural and fire requirements of the building codes at the lowest installed cost per unit R-value.

Mr. Sachchida N. Singh and colleagues at the Huntsman Advanced Technology Centre in the United States have reported on new development in the formulation and processing of polyisocyanurate laminate foam. One such trend was the use of bio-renewable materials, which has led to widespread experimentation with vegetable oil-based polyols in polyurethane formulations. New aromatic polyester polyols incorporating renewable resource content have been introduced by polyol suppliers. The lipophilic nature of vegetable oils used to make these aromatic polyester polyols increase the hydrocarbon solubility. This improved solubility opens a wider spectrum of hydrocarbons, such as pure iso-pentane, as a blowing agent and/or iso-butane as a low boiling co-blowing agent. The average functionality of renewable content polyester polyol is claimed to be higher, as the vegetable oils present the possibility of providing many reactive sites. Higher polyol functionality gives opportunities to reformulate to improve performance and/or reduce cost.

The new study demonstrates that polyiso boards with up to 17 weight per cent bio-renewable content along with up to 7 per cent recycled content (or up to 12 weight per cent bio-renewable content along with up to 10 per cent recycle content) can be made while meeting the fire and structural property requirements. It also appears that use of bio-renewable polyol in polyiso foam would lead to a slight reduction in thermal resistance of the board. It has been demonstrated that the use of bio-renewable polyols can lead to more robust processing, especially expanding the processing window to higher temperatures. Bio-renewable polyols will expand the versatility of polyurethane chemistry as well as the breadth of its application. *Contact: Sachchida N. Singh, Huntsman Advanced Technology Centre, 8600 Gosling Road, The Woodlands, Texas, TX 77381, United States of America. Tel: +1 (281) 719 7400; Fax: +1 (281) 719 7500.* (Source: www.huntsman.com)

Ozone Layer Production Awards

The ABU-MAE Production Awards Programme provides small awards of up to US$1,000 to help motivate and underwrite the development and production of local radio and television programming on Ozone Layer Protection and related issues in Asia-Pacific. ABU member broadcasters are encouraged to submit ozone-related themed public service announcements for consideration under the Awards Programme. All UNEP-ABU Production Award Funds will be allocated directly to broadcasters for production of Ozone-themed content.

For additional information, please contact:
Ms. Patricia Sim
Asia-Pacific Broadcasting Union
Tel: +60 (3) 2282 3592, ext 395
Fax: +60 (3) 2282 5292
E-mail: patricia@abu.org.my

AEROSOLS

Air-propelled asthma medication inhaler

Most inhalers used for delivering the bronchial dilator albuterol currently use propellants such as ozone-depleting chlorofluorocarbons (CFCs) or their replacement hydrofluoroalkanes (HFAs). Both propellants, which are also employed as industrial refrigerants, eject albuterol at near-supersonic speeds. Another method is the nebulizer, a large compressor-driven device that essentially sprays droplets of albuterol. This is cumbersome and often not available to an asthmatic when a fast-acting dose of albuterol is needed.

Next Safety Inc., the United States, has brought out a device that supplies medication in a stream of air by ejecting it from a microfluidic pump automatically as the patient breathes. The Next Safety device solves three problems:

- Propellants are eliminated;
- The medicine is not ejected at high speeds, when it could easily get deposited on the back of the throat and ingested; and
- Patients do not need to time their inhalation to match the push of a button – something critical when administering albuterol to children.

The device delivers the droplets at the same speed of the patient's inhalation and in the correct size range for bronchial delivery. It also provides an electronic output to PDAs to enable doctors to monitor the results of specific doses of medications in addition to patient compliance. *Contact: Mr. George Colvard, COO, Next Safety Inc., 676 S. Main Street, Jefferson, NC 28640, United States of America. Tel: +1 (336) 246 7700; Fax: +1 (336) 846 3978; E-mail: georgecolvard@nextsafety.com.* (Source: www.marketwatch.com)

Dose counter for HFA-based MDIs

The transition of pressurized metered dose inhalers (pMDIs) from CFC to HFA propellant has opened up new avenues of business to makers of associated equipment. In one such case, Trudell Medical International, Canada, has ramped up production of its Aerocount® Dose Indicator in preparation to supply Forest Laboratories Inc., the United States, with commercial volumes to support the latter's transition from CFC to HFA on Flunisolide inhalation aerosol.

Flunisolide, a CFC-based inhaled corticosteroid, has been reformulated with a non-ozone depleting propellant. The integration of Aerocount Dose Indicator to Forest's Flunisolide HFA product would remind patients how much medication remains in their inhaler. The Aerocount Dose Indicator is designed to maintain the same look and feel of the pMDI. *Contact: Trudell Medical International, 725 Third Street, London, Ontario, Canada N5V 5G4. Tel: +1 (519) 455 7060; Fax: +1 (519) 455 7858: E-mail: tmi@trudellmed.com.* (Source: www.businesswire.com)

HFA propellant with anticholinergic formulations

Boehringer Ingelheim Pharma GmbH, Germany, has patented an invention relating to suspensions of crystalline tiotropium bromide monohydrate in the propellant gases HFA 227 and/or HFA 134a. The propellents may be optionally in an admixture with one or more other propellant gases, preferably selected from the group comprising alkanes, branched chain alkanes, dimethylether, fluorocarbons, trifluoroethane, etc. The propellant-driven inhalation suspension formulations may also contain other ingredients such as surfactants, adjuvants, antioxidants or flavourings.

Preferred suspensions according to the invention are those that contain as propellant gas HFA 227 on its own, HFA 134a on its own or a mixture of the two. If one or more other propellant gases are used in the suspension formulations in addition to the propellant gases HFA 227 and/or HFA 134a, the proportion of this other propellant is preferably less than 30 per cent. The suspensions may preferably contain from 0.25 to 0.50 per cent tiotropium bromide monohydrate.

For administration by inhalation, it is necessary to prepare the active substance in micronized form. After micronization, the crystalline tiotropium bromide monohydrate preferably has an average particle size of 1.5 to 5 µm. The propellant gas-

containing suspensions according to the invention mentioned above may be administered using pressurized metered dose inhalers. (Source: www.freepatentsonline.com)

Medicinal aerosol composition containing HFA propellants

Chiesi Farmaceutici S.p.A., Italy, has patented for use in pressurized metered dose inhalers (pMDIs) a composition that comprises an active material, a propellant containing a hydrofluoroalkane (HFA), a co-solvent and optionally a low-volatility compound. The use of a mixture of HFA 134a and HFA 227 allows modulation of the mass median aerodynamic diameter (MMAD) of aerosol particles on actuation of the inhaler to target specific regions of the respiratory tract.

Active materials that could be used include anti-leukotrienes, bronchodilators, corticosteroids and anti-allergics that ate administered by inhalation. Co-solvents that may be used in these formulations include alcohols such as ethanol and polyols such as propylene glycol. HFAs – in particular, HFA 134a and HFA 227 – are acknowledged to be the best candidates for non-CFC propellants. *Contact: Chiesi Farmaceutici S.p.A., Via Palermo, 26/A, I-43100 Parma, Italy.* (Source: www.freepatentsonline.com)

Pharmaceutical aerosol formulation containing HFA

Baker Norton Pharmaceuticals Inc., the United States, has patented an aerosol formulation that is adapted for use in a pressurized metered dose inhaler. The aerosol formulation comprises Budesonide, Formoterol, one or more hydrofluoroalkane (HFA) propellant, and a co-solvent present in an amount that dissolves or solubilizes the Budesonide and Formoterol in the mixture. Any HFA propellant suitable for inhalation can be used, but HFA-134a or HFA-227ea is preferred. Aliphatic and/or hydrocarbon gases may be added to modify propellant characteristics. The propellant is normally present in an amount of about 60-94 per cent by weight, based on the total weight of the aerosol formulation. Preferably, the aerosol formulation is substantially free of chlorofluorocarbons. (Source: www.freepatentsonline.com)

FUMIGANTS

Hot water to sterilize nursery pots and trays

Wet heat treatment provides the best alternative to methyl bromide for sterilizing plastic pots and containers in plant nurseries, a study by Horticultural Development Company, the United Kingdom, has found. Scientists found that wet heat treatment (via a hot water bath) proved to be the most effective method for controlling the test organisms, which included two fungi *Rhizoctonia solani* and *Pythium intermedium,* the seeds of weeds hairy bittercress and pearlwort, bud and leaf nematodes, and western flower thrips.

Control was achieved with minimal risk of carry-over when pots were exposed to 10 minutes wet heat treatment at 60ºC. The report also states other nursery material such as capillary matting can also be treated this way. *Contact: Horticultural Development Company, Bradbourne House, East Malling, Kent ME19 6DZ, United Kingdom. Tel: +44 (1732) 848383; Fax: +44 (1732) 848498; E-mail: hdc@hdc.org.uk.* (Source: www.hortweek.com)

Green alternatives to chemical pesticides

Root-knot nematodes are parasitic, microscopic and omnipresent worms that cause considerable damage to horticultural and field crops in sub-tropical regions, resulting in significant financial losses to growers and gardeners. Until recently, fumigation of the soil with methyl bromide (MBr) before planting was the primary method for controlling root-knot nematodes in valuable vegetable crops. However, since the discovery that it has severe negative effects on the stratospheric ozone layer, the use of MBr has been phased out in the United States.

To combat parasites like root-knot nematodes without the use of chemical pesticides, scientists are focusing more research on developing new, parasite-resistant varieties of vegetables. Dr. Judy Thies, a research plant pathologist at the United States Department of Agriculture's Agricultural Research Service, was part of a research team

that developed the Charleston Belle variety of bell pepper, the first nematode-resistant bell pepper. Dr. Thies and her colleagues tested the stability of two types of bell peppers – Charleston Belle and Carolina Wonder, the only nematode-resistant varieties available to commercial growers and home gardeners. They tested the peppers for resistance to nematodes in sub-tropical climates to determine if the cultivars were stable when grown in Florida under high soil temperatures.

The study results showed that nematode-resistant varieties such as Charleston Belle and Carolina Wonder are viable alternatives to MBr for managing southern root-knot nematode in bell pepper in sub-tropical environments. *Contact: Mr. Michael Neff, American Society for Horticultural Science, 113 South West Street, Suite 200, Alexandria, VA 22314-2851, United States of America. Tel: +1 (703) 836 4606; Fax: +1 (703) 836 2024; E-mail: mwneff@ashs.org.* (Source: www.eurekalert.org)

Usage and results update on iodomethane

Arysta LifeScience, the United States, registered its iodomethane product Midas® soil fumigant with the United States Environmental Protection Agency (EPA) in October 2007, and received approval for the pre-plant uses of Midas on: strawberries; tomatoes; peppers; field-grown ornamentals (including turf); tree fruit, nuts and vines; and nurseries (strawberry, conifer tree and vine).

Several novel requirements and practices have been implemented during the registration and commercial phase-in with uses for Midas. Requirements such as the Midas Qualified Applicator Training Programme, implementation of national buffer zones utilizing specific buffer zone credits, and the use of personal protective equipment. Ongoing practices include the use of a selection of highly retentive films (VIF, SIF, TIF, etc.) as an option to reduce rates and buffer zones, updating and modifying commercial application equipment for accurate Midas applications.

Commercial applications are underway in key growing regions of the United States, with positive results. Midas technical feasibility in fields with a variety of pest pressure, as well as various soil and moisture conditions has now been tested on more than 3,000 acres. A wide variety of labelled crops has been planted in soil treated with Midas. Commercial double cropping conditions have been evaluated following Midas applications. Results of commercial applications indicate that economic returns for crops planted into soil treated with Midas are cost-effective based on rates and cost per acre. (Source: www.mbao.org)

Researchers seek replant disease solutions

GPS-guided, shank-applied, spot treatments with fumigants are among experiments by the United States Department of Agriculture (USDA) and the University of California Davis (UCD) scientists seeking solutions to long-standing problems with replant disease in almond and stone fruit orchards. Without soil fumigation and/or other steps before planting, severe Prunus replant disease (PRD) kills or prevents growth in about half of replacement almond or stone fruit trees in California.

PRD is associated with a complex including soil conditions, fungi, bacteria and moulds from the preceding crop. Parasitic nematodes can also play a role. "We sometimes find aggressive pathogens such as *Armillaria, Phytophthora* or *Verticillium*," said Dr. Greg Browne, a USDA plant pathologist at UCD, who leads the Pacific Area-Wide Pest Management Programme for Integrated Methyl Bromide Alternatives. Dr. Browne's team is probing several practices to find alternatives in view of regulations on methyl bromide (MBr), Telone formulations and other fumigants. Results, based on tree growth indicated by trunk diameter, of research in orchards have revealed findings that may contribute to solutions, including:

- Chloropicrin and mixtures of it and iodomethane, Telone or MBr are more effective than the latter three alone.
- Short-term rotations with Sudan grass, wheat followed by mustard, or a single fallow season can reduce effects of PRD.
- Over- or under-irrigating almond trees replanted without pre-plant soil fumigation after removal of almond on peach rootstock can worsen PRD.
- GPS-controlled shank treatments applied to tree sites before planting with chloropicrin/Telone, or drip irrigation-applied spot treatments with a

formulation of the two chemicals, appear nearly as effective as strip or broadcast treatments.

The spot-fumigation system, developed by Prof. Shrini Upadhyaya, UCD Agricultural and Biological Engineering Department, in co-operation with TriCal Inc. is basically a conventional shank-rig mounted on a tractor. It is controlled by a GPS computer for automatic and precise injection of fumigant in a prescribed grid of rectangular areas where trees will be planted. The method saves considerable material compared with broadcast application. (Source: westernfarmpress.com)

Efficacy of ethanedinitrile against cereal pathogens

Scientists from CSIRO Entomology of Australia and Agricultural Research Service of the United States Department of Agriculture have jointly assessed the efficacy of ethanedinitrile (EDN) at low temperatures (3-22ºC) against pathogens in cereal feed grains. EDN, patented by CSIRO as a new fumigant against insects and micro-organisms, is being investigated by CSIRO Australia as an alternative to methyl bromide (MBr) for a range of other uses, including soil and timber fumigation.

The study reported preliminary assessment of efficacy at low temperatures against target pathogens including *Tilletia indica* Mitra, *Peronosclerospora sorghi* (sorghum downy mildew), *Tilletia controversa* Kühn (dwarf bunt) and *Ustilago maydis* (DC) Corda (boil smut). EDN has a threshold limit value (TLV) of 10 ppm, which compares favourably with 5 ppm for MBr. Treatments included: (1) naked spores; (2) bunted seed, when present as a propagule in the pathogen life cycle; and (3) spores dusted on maize.

EDN-treated material and untreated control spores of *T. indica*, *T. controversa* and *U. maydis* were seeded onto water-agar medium to assess viability based on spore germination. As oospores of *S. sorghi* germinate poorly on artificial medium, a bioassay on susceptible plants was used. Treated oospores were mixed into the upper layer of soil in a plastic pot and planted with seeds of a highly susceptible sorghum cultivar, and placed in a growth chamber for disease development.

In general, though data indicate EDN was more toxic at higher temperatures, good control was obtained at the lowest temperature of 3ºC. Overall, *T. indica*, with its large teliospore, was the most tolerant of the smut fungi. Naked teliospores were more easily controlled than spores still contained within the fungal structure of *T. indica* and *T. controversa*. All three smut species treated were controlled to a high level at all temperatures and at dosages likely to be useful in treatment schedules. No vital stains were shown to be effective with oospores of *P. sorghi*, which could be because of annual dormancy of the oospores. *Contact: Mr. J. E. van Someren Graver, CSIRO Entomology, G.P.O. Box 1700, Canberra, ACT 2615, Australia.* (Source: www.mbao.org)

Soil disinfestation with steam and solarization

Researchers at the University of California Davis, the United States, studied the efficacy of a soil disinfestation system comprising steam treatment and solarization as a methyl bromide (MBr) alternative for field-grown cut flowers and strawberry. High energy costs and lack of appropriate steam applicators have limited the use of steam in commercial fields. Injecting steam into finished plant beds with a mobile steam generator under clear polyethylene mulch would allow steam to supplement solarization as needed. The research aim was to develop an economical combined solarization and steam heat, soil disinfestation system.

Pathogen (*Verticillium sp.)* and weed seed (common chickweed, knotweed, purslane, little mallow and yellow nutsedge) samples were first installed in the planting beds. Viability of the weed propagules was determined using tetrazolium tests. Treatments included drip application of MBr + chloropicrin (MBrPic, 67:33) at 350 lb/acre, control (no MBrPic, solarization or steam), solarization alone, steam alone, and steam + solarization. For steam + solarization treatments, beds were solarized before and after steam application. For steam treatments, steam was injected to raise the bed temperature to 70ºC for 30 min.

Solarization alone did not have the same efficacy as MBrPic. Steam, with or without solarization, resulted in weed control similar to MBrPic. Peak temperatures of >78ºC in the steam treatments did eliminate weeds as well as MBrPic. (Source: www.mbao.org)

RECENT PUBLICATIONS

8th IIR Gustav Lorentzen Conference on Natural Working Fluids

The proceedings of the 8th IIR Gustav Lorentzen Conference on Natural Working Fluids held in Copenhagen on 7-10 September 2008 comprise 130 papers. They provide a wealth of information on a broad range of natural refrigerants and their applications. Fifty papers deal with CO_2, 15 are on heat pumps, 8 cover ammonia, 8 deal with hydrocarbons, 8 are on sorption and 10 deal with secondary refrigerants including two-phase and slurry technology.

Main topics covered include: hydrocarbons; micro-channels; sorption; not-in-kind technologies; heat pumps; secondary refrigerants and slurries; CO_2; ammonia; safety issues; and refrigerant combinations and novel fluids.

Refrigerant Cycle Data: Thermophysical Properties of Refrigerants for Applications in Vapour-Compression Systems

The aim of this booklet is to give the most important thermophysical property data for a number of different refrigerants with applications to vapour-compression systems in an easily accessible form. Tables provided cover basic cycles at different evaporating and condensing temperatures, the pressure ratio, volumetric capacity and isentropic compression work. The coefficients of performance of cycles with isentropic compression are given, as is the thermodynamic efficiency of each cycle. Data given cover the following refrigerants: R-32, R-125, R-134a, R-152a, R-290, R-404A, R-407C, R-410A, R-507, R-508A, R-600a, R-717, R-744 and R-1270.

For the above two publications, contact: International Institute of Refrigeration, 177 boulevard Malesherbes, 75017 Paris, France. Tel: +33 (1) 4227 3235; Fax: +33 (1) 4763 1798.

TECH EVENTS

18-21 Mar
Koyang City
Korea

Heating, Air-Conditioning, Refrigeration and Fluid Exhibition
Contact: HARFKO Secretariat, Korea Refrigeration and Air-Conditioning Industry Association (KRAIA), 161-7, Samsung-dong, Kangnam-gu, Seoul, 135-090, Republic of Korea.
Tel: +82 (2) 5582 541;
Fax: +82 (2) 3697 515;
E-mail: yhk@ref.or.kr;
Website: www.harfko.com.

31 Mar-2 Apr
Ho chi Minh
Viet Nam

HVACR Viet Nam 2009
Contact: IIR Exhibitions Pte. Ltd., 205 Henderson Road, #03-01, Henderson Industraial Park, Singapore 159549.
Tel: +65 6319 2668;
Fax: +65 6319 2669;
E-mail: sharon.lim@iirx.com.sg.

19-20 May
Hamburg
Germany

Blowing Agents and Foaming Processes 2009
Contact: Conference Department, Smithers Rapra Technology Limited, Shawbury, Shrewsbury, Shropshire SY4 4NR, The United Kingdom.
Tel: +44 (1939) 250 383;
E-mail: conferences@rapra.net.

20-22 May
Taiwan
China

The 4th Asian Conference on Refrigeration and Air-conditioning 2009
Contact: Prof. Yang-Cheng Shih, Secretary General of ACRA 2009, Department of Energy and Refrigerating Air-conditioning Engineering, National Taipei University of Technology, 1, Sec. 3, Chung Hsiao E Road, Taipei 10608, Taiwan province of China.
Tel: +886 (2) 2771 2171, ext. 3501;
Fax: +886 (2) 877 33713;
E-mail: acrataipei@acrt.org.tw.

23-26 Jun
Boulder
United States

IIR Conference on Thermophysical Properties and Transfer Processes of Refrigerants
Contact: Conference Secretariat, United States of America.
Tel: +1 (301) 9755 868;
E-mail: david.yashar@nist.gov.

7-11 Sep
Bangkok
Thailand

RHVAC 2009
Contact: Thai Trade Fair, 22/77, Rachadapisek Road, Chatuchak, Bangkok 10900, Thailand.
Tel: +66 (2) 5116 020;
Fax: +66 (2) 5116 008-10;
E-mail: titfd@depthai.go.th.

PUBLICATIONS from APCTT

PERIODICALS

(Free access at www.techmonitor.net)

- ❑ Asia Pacific Tech Monitor (6 issues/year) (e-version)
- ❑ 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		
❍ 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.*

[#] Print version supported by the Ozone Cell, Ministry of Environment & Forests, Government of India, for distribution to a select target group.

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