VATIS UPDATE

Ozone Layer Protection

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Apprise yourself with the latest technological innovations

Highlights

- Impact of ozone recovery on global warming
- HFC-32 refrigerant for use in residential AC units
- Solar cooling system keeps water at 9°C
- Dry steam vapor cleaners
- Extrusion foaming with dry ice
- Essential oils and melocon for managing lesion nematode

APCTT
Asian and Pacific Centre for Transfer of Technology

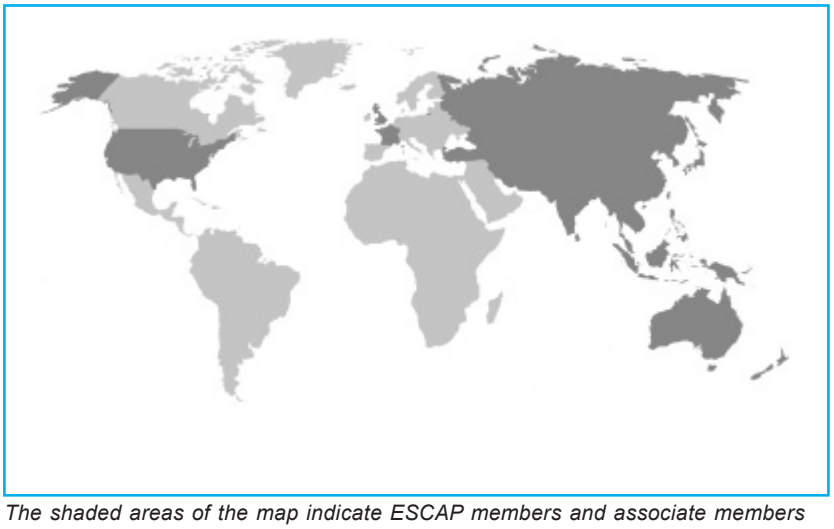
UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific

Ozone Cell
Ministry of Environment, Forests & Climate Change
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

The Air Force Research Laboratory (AFRL) Energy and Environment Program has identified ethyl-3-methylimidazolium (EMIM) acetate as a replacement industrial cleaner. Here the EMIM is used in immersion cleaning with use of ultrasonic agitation.

(Credit: Air Force Research Laboratory (AFRL), USA)

VATIS* Update
Ozone Layer Protection
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CONTENTS

Vol. 5 No. 129 Mar - Apr 2015

Japan's earthquake may have weakened our ozone

New research has revealed that during the Japan earthquake disaster, tons of harmful gases were released into the atmosphere, tearing a worrying hole in the ozone layer above Japan. That is according to a study recently published in the journal *Geophysical Research Letters*, which details how the destruction and damage in Tōhoku released a surprising 6,600 metric tons (7,275 US tons) of gases stored in insulation, appliances, and other equipment – called halocarbons – into the atmosphere, which is equivalent to 19.2 million metric tons (21.2 million US tons) of carbon dioxide.

Takuya Saito, a senior researcher at the National Institute for Environmental Studies in Tsukuba, Japan, explained in a recent release that this work describes a new source of potential harmful emissions never before considered. According to the study, a worrying number of those halocarbons were chemicals that are notably thin Earth's protective ozone shield – a layer of our atmosphere that absorbs most of the Sun's harmful ultraviolet (UV) radiation. Some of the gases were even identified as outdated means of insulation – materials banned in Japan and other developed parts of the world for that very effect.

CFC-11, for instance, is a powerful ozone-depleting chemical that was used in foam insulation till it was phased out in 1996. In addition, the researchers found that this was a chemical in the gaseous cocktail that ate into the ozone shield just over Japan in 2011. Depending on the region, typical halocarbon levels spiked anywhere between 21% and 91%. What is more is the emissions totaled up to the equivalent of 1,300 metric tons (1,433 US tons) of CFC-11 alone that is equal to the amount of CFC-11 found in 2.9 million refrigerators manufactured before the chemical was banned. Saito et al. also determined that emissions of CFC-11 alone were 72% higher than emissions before the quake, confirming that the spike in halocarbons was a direct result of building and appliance damages. The consequence was that Japan saw a surge in ozone thinning by ~38% between March 2011 and February 2012 when compared with the same time period the year before.

A 91% hike in carbon emissions for <1 year in a Japanese region is nothing but a drop in the bucket as compared to what climatologists are worried about. However, Saito et al. are quick to point out that this data could severely change emission estimates and thus climate change modeling.

As things stand, national emission estimates conducted by the Japanese government take a "bottom–up approach," where data is based on generic estimates and inventories of annual chemical use. Saito argues that this is an outdated and backwards approach. "It is apparent that there are unreported emissions," he said. "Atmospheric scientists often say that relying solely on bottom–up inventories to tell you how greenhouse gas emissions change is like going on a diet without weighing yourself," added Steve Montzka, a research chemist with the NOAA, who was not involved in the research. He praised Saito's work, calling it a strong example of why nations should pay more attention to halocarbons and other unconsidered emissions even as they work to help cull global influences on climate change.

Source: http://www.natureworldnews.com/

Ozone-depleting hydrogen chloride on the rise

Atmospheric levels of a key ozone-depleting chemical are on the increase, but the rise appears to be a symptom of climate change rather than additional sources of the destructive substance, according to international researchers from the University of Wollongong, New South Wales, Australia.

Investigations were prompted when scientists identified levels of hydrogen chloride had began rising in 2007 – but only in the northern hemisphere – when they should have been falling because of curbs agreed under the Montreal Protocol to protect the ozone layer. Hydrogen chloride releases chlorine in the stratosphere, depleting ozone and allowing more UV radiation to reach the Earth, increasing skin cancer and damaging crops and other species.

Findings based on satellite observations and model simulations and published in *Nature* rule out any "rogue" source of emissions from undisclosed sources because the abundance of the chemical is falling at other layers of the atmosphere and in the southern hemisphere. "The overall burden of chlorine is still decreasing," said David Griffith, Director of the University of Wollongong's Centre for Atmospheric Chemistry, and a co-author of the report. "It's a good news story about ozone."

It is not so positive news on the climate change front, however, since the increased abundance of chlorine in the northern hemisphere's stratosphere is attributed to a slowdown in atmospheric circulation leading to slower mixing at some levels. Climate change, through increased greenhouse gas emissions, "is changing the way radia-

tion is absorbed in the atmosphere and distributed, which would drive things such as this circulation," Professor Griffith said.

Although it was beyond the scope of the study to examine how long the circulation slowdown will last, or other possible consequences, Professor Griffith said the study showed the recovery of the ozone layer would be a slow process, taking decades.

"Our results show that atmospheric variability and perhaps climate change can significantly modify the path towards full recovery," he said. "It will be a bumpy ride rather than a smooth evolution." Professor Griffith said the work also underscored the general success in tackling ozone depletion and a range of chemicals that were phased out in a matter of years in contract to dealing with global warming.

For ozone, it was a "problem created by man, problem recognized, solution proposed, solution implemented," he said. "For climate change, the culprits have been recognized but no-one's prepared to stop producing [carbon dioxide]."

Source: http://www.smh.com.au

Impact of ozone recovery on global warming

In a study published in the *Quarterly Journal of the Royal Meteorological Society*, Previdi and Polyani (2014) from Columbia University, the United States, begin by briefly describing the initial discovery of the Antarctic "ozone hole" and what may have caused it, which shortly thereafter led to the 1987 ratification of the "Montreal Protocol on Substances that Deplete the Ozone Layer," which had been designed to protect the ozone layer by the phasing out of the production and use of various ozone-depleting substances, because of concerns that depletion of stratospheric ozone would lead to increased levels of harmful UV radiation at the Earth's surface. In addition, the feat has been largely accomplished, and they move on to review what is expected to occur as a result of stratospheric ozone recovery.

Focusing their attention on responses of Earth's atmosphere, oceans, and cryosphere, the scientists address the subjects of atmospheric circulation changes, tropospheric and surface temperature changes, cloud and precipitation changes, ocean circulation changes, southern ocean CO_2 uptake changes, Antarctic sea-ice changes, and Antarctic ice sheet mass balance changes, after which they go on to consider the ultimate impact of these several changes on Earth's climate system, concluding – in the final sentence of their paper's abstract – that "ozone recovery will figure prominently in future climate change, with its impacts expected to largely cancel the impacts of increasing greenhouse gases during the next half-century," which would clearly suggest that we need not implement *any* significant programs designed to reduce anthropogenic CO_2 emissions.

Source: http://www.co2science.org

Unexplained gap in global HFC emissions resolved

Reported emissions of a group of potent greenhouse gases, such as hydrofluorocarbons (HFCs), from developed countries are shown to be largely accurate, but for the wrong reasons, according to new findings from an international team, led by researchers at the University of Bristol. Until now, there has been little verification of the reported emissions of HFCs, gases that are used in refrigerators and air conditioners, resulting in an unexplained gap between the amount reported and the rise in concentrations seen in the atmosphere. This study shows that this gap can be almost entirely explained by emissions from developing countries.

The study, led by Mark Lunt from Bristol's School of Chemistry, used HFC measurements from the international Advanced Global Atmospheric Gases Experiment (AGAGE), in combination with models of gas transport in the atmosphere, to evaluate the total emissions that are reported to the UNFCCC each year. The researchers note that although their estimates of total emissions from developed countries are broadly consistent with the reports that they compile, this does not necessarily mean that the emissions of each gas are being accurately reported. In fact, the results suggest that the most commonly used HFC is significantly over-reported while some other HFCs are under-reported.

Dr. Matt Rigby from the University of Bristol, who co-authored this work, said: "It appears as if the apparent accuracy of the aggregated HFC emissions from developed countries is largely due to a fortuitous cancellation of errors in the individual emissions reports." Professor Ron Prinn from the Massachusetts Institute of Technology (MIT), who leads the AGAGE network, added: "This study highlights the need to verify national reports of greenhouse gas emissions into the atmosphere. Given the level of scrutiny these reports are under at the moment, it is vitally important that we improve our ability to use air measurements to check that countries are actually emitting what they claim."The research is published this week in the journal *PNAS*.

Source: http://www.bris.ac.uk

India agrees to phase down HFC, seeks more time

India has made a formal proposal to amend the Montreal Protocol to bring phasing down of climate-damaging refrigerant hydrofluorocarbon (HFC), which is used in air-conditioners, refrigerators and insulating foam, under its ambit.

Although India was not opposed to phasing down of HFC *per se,* the country did not agree to do so under the Montreal Protocol. India, in fact, wanted the world to deal with this issue under the Kyoto Protocol so that phasing out the refrigerant remained the responsibility of rich industrialized nations.

The change in stand is attributed to what India had promised to the United States during Prime Minister Narendra Modi's visit to Washington in September 2014. India's proposal, therefore, is completely in tune with what both the countries agreed as part of their bilateral agreement where the United States will help India financially and through technological support during the transition phase.

Source: http://timesofindia.indiatimes.com

Godrej forging new pathways for hydrocarbons

After developing India's first commercially available R290 split air-conditioner in 2012, Godrej & Boyce Mfg. Co has continued to work with the Indian government to implement change regarding the use of hydrocarbon refrigerants in ACs.

Given the lack of national standards for hydrocarbons in India, Godrej developed its propane technology in collaboration with German development agency GIZ and the Indian government. Since launching the product in 2012, Godrej has sold over 100,000 RACs and now has an annual capacity of 180,000 units at its manufacturing facility near Pune. Godrej upgraded its manufacturing facility to incorporate additional safety alarms and procedures for dealing with flammable refrigerants.

Godrej's Green Balance technology was designed to strike a balance between electricity consumption and environmental impact. With an Energy Efficiency Ratio of 3.9 compared to R22 and R410A (both 3.5) systems, the R290 RACs also save up to 10% compared to five-star air-conditioners. The company has since gained a market share of 13% in the five-star AC segment in India, propelling Godrej to the number three brand.

Current models are restricted to 12,000 and 18,000 Btu (British thermal units) but Godrej is seeking technological cooperation with other manufacturers to achieve higher capacities, such as 24,000 Btu.

Source: http://www.hydrocarbons21.com/

New Publications from OzonAction Programme

The Montreal Protocol and Human Health – This booklet summarizes how the successful implementation of the Montreal Protocol has protected human health. It describes how ozone depletion would have led to increases in UV radiation and, based on current understanding of the mechanisms by which UV affects biological processes, how that would have led to a dramatic increase in skin cancers, cataracts and affected human health in other ways. It also covers recent progress in understanding the 'World Avoided' – that is the world we would have lived in without a successful Montreal Protocol.

Financing the Climate Co-Benefits of the HCFC Phase-out: A guide for Low Volume Consuming Countries – The Montreal Protocol's Multilateral Fund encourages developing countries to explore potential financial incentives and opportunities for additional resources to maximise the environmental benefits from HCFC Phase out Management Plans (HPMPs). This booklet explains how Ozone Officers in low volume consuming countries can explore such opportunities for climate co-benefits.

Informal Prior-Informed Consent (iPIC): Supporting Compliance Through prevention of Illegal and Unwanted Trade in ODS – This short booklet briefly describes how the iPIC system works and its advantages, it provides some information on results and successes from iPIC in 2014 and encourages countries which are not yet members to join and to begin to reap the benefits of this initiative.

Safe use of HCFC Alternatives in Refrigeration and Air Conditioning: An Overview for Developing Countries – This publication provides an overview of the alternatives, their general characteristics and their application in the context of the safety issues. It provides guidance for National Ozone Units (NOUs) and other interested parties in developing countries on how they can advise and assist their national stakeholders in the selection and implementation of alternative refrigerants.

Phasing-out HCFCs in Small and Medium-Sized Enterprises – This booklet aims to assist foam enterprises, especially SMEs, to better understand policies on HCFC phase-out, access to assistance from the Multilateral Fund for the Implementation of the Montreal Protocol and access alternative technologies in different foam applications taking into account challenges in converting to alternative technology. It also discusses some tips on how to identify enterprises that may use HCFCs and verify the HCFCs consumption of enterprises.

International Standards in Refrigeration and Air-Conditioning – This guide provides an introduction and simple overview of the issues related to international standards in the refrigeration and air-conditioning sector and how they can be useful in the context of the phase-out of hydrochlorofluorocarbons (HCFCs) in developing countries as required by the Montreal Protocol on Substances that Deplete the Ozone Layer.

For more information, access:

http://www.unep.org/ozonaction/

UNEP organizes "Ozone2Climate" Technology Roadshow

The 3rd "Ozone2Climate" Technology Roadshow and Industry Roundtable under the UNEP–USEPA grant partnership project was organized by UNEP OzonAction ROAP team in association with Korean Refrigeration and Air-Conditioning Industry Association (KRAIA). The Technology Roadshow was organized as a part of the 13th Heating, Air-conditioning, Refrigeration and Fluid Exhibition – Korea (HARFKO) held from 10th to 13th March 2015 in the Kintex Exhibition Center II, Goyang City, Republic of Korea (ROK). UNEP's Technology Roadshow was inaugurated by Mr. Eduardo Ganem, Chief Officer, Multilateral Fund Secretariat; Ms. Tina Birmpili, Executive Secretary, Ozone Secretariat; Ms. Shamila Nair-Bedoulle, Head of Branch, UNEP OzonAction; Mr. Hyukjoong Kwon, Acting President, KRAIA; and Ms. Elisa Rim, Environment Protect Specialist, United States Environment Protection Agency (USEPA). The "Ozone2Climate Technology Roadshow Zone", as a part of HARFKO 2015, had 20 exhibitors that promoted ozone and climate-friendly alternative technologies to HCFCs in the refrigeration and air-conditioning (RAC) sector. About 20,000 delegates visited the HARFKO 2015 exhibition and this was the first time the Ozone2Climate Technology Roadshow was organized as a part the biennial HVAC/R exhibition of KRAIA. The National Ozone Officers (NOOs) from 25 countries and National Procurement Officers from 17 countries of South Asia (SA) and South-East Asia and Pacific (SEAP) also visited the Technology Roadshow and gained information on state of the art HCFC/HFC (hydrofluorocarbon) alternative technologies.

Source: http://www.unep.org

Workshop on public procurement of HFC alternatives

In order to foster a dialog between public procurers and ozone agencies in Asia Pacific, and to build their capacity to integrate alternatives to high-global warming potential (GWP) HFCs into public procurement activities, USEPA and UNEP organized a 1-day workshop in Goyang, ROK (13th March), back-to-back with the Ozone2Climate Technology Roadshow and Industry Roundtable and the Joint Thematic Meeting of the SA and South-East Asia Ozone Officers networks. The workshop, the first of its kind, was organized by UNEP OzonAction in partnership with USEPA under the UNEP–USEPA grant partnership project. The objective of the workshop was to enhance the understanding of National Ozone and Procurement Officers of the Asia Pacific region on the opportunities of using government/public sector's substantial purchasing power as an effective policy instrument to promote ozone and climate friendly alternative technologies. NOOs from 25 countries and National Procurement Officers from 17 countries of Asia Pacific region attended the workshop. The workshop provided information to the Ozone and Procurement Officers on Montreal Protocol and Green Procurement programs of the region and highlighted the best practices. The workshop had an interactive format with emphasis on group discussions of Ozone and Procurement Officers from the region. The workshop also facilitated institutional stakeholders' coordination between Ozone and Procurement Officers for working on a common objective to encourage public procurement of zero-ODP (ozone depletion potential) and low-GWP alternatives to HFCs.

Source: http://www.unep.org

Management of ODS import in Afghanistan

The Afghanistan National Ozone Unit (NOU) and Afghanistan Customs Department (ACD) celebrated "International Customs Day" at the ACD Headquarters in Kabul. Following the 2015 theme "Coordinated Border Management". The NOU utilized the opportunity to focus on the management of Ozone Depleting Substances (ODS) and their imports and transits from neighboring countries. The Deputy Finance Minister for Customs and Revenue, Mr. Gul Maqsood Sabit, acknowledged that the "jungle goods" mechanism of importing will be banned in the near future. This will enhance the ODS import/transit data collection mechanism. During the event, the NOU also distributed publications and materials such as the UNEP OzonAction customs training manual and "customs officer quick tool" and other publications providing information about the ozone layer to the participants to raise the awareness.

Source: http://www.unep.org

Bhutan launch ozone depleting substances manual

Customs administrations around the world celebrated 26th January as the International Customs Day with a dedicated theme under the auspices of the World Customs Organization. The theme for 2015 is "Coordinated

Border Management – An inclusive approach for connecting stakeholders". […] Considering the theme for 2015, the relevant stakeholders, border enforcement agencies, and cross-border Customs officials of India, Nepal, and Bangladesh also joined the celebration. The Customs Department of Bhutan also launched a ODS manual publication on this day. The ODS manual has been published in collaboration with National Environment Commission under the financial assistance of UNEP and UNDP Multilateral Fund. The ODS manual will facilitate and assist Customs officials as first hand reference in controlling illegitimate trade mainly focusing on controlling ODS import into the country.

Source: http://www.unep.org

China Refrigeration 2015

China Refrigeration, organized 8–10 April 2015 in Shanghai, brought together more than 1,000 exhibitors and was attended by over 60,000 visitors. This year, there was a greater variety of R290 and R600a product applications on show. Reporters from hydrocarbons21.com, who were at the event, saw a growing interest in hydrocarbons (HCs), in particular in the Chinese light commercial refrigeration sector, a trend driven in part by the high-energy efficiency of R290 and R600a products.

At China Refrigeration 2015, a series of compressors using R600a and R290 for light commercial use were showcased by leading manufacturers such as Embraco, Huayi, Tecumseh, and Secop. In addition, R290 solutions for RAC (room air conditioning) and in industrial refrigeration could be found at the show.

Embraco (Brazil) has demonstrated a newly launched ice cream freezer using R600a, a joint project with leading Chinese cabinet manufacturer, Hiron. The model features inverter technology and adopts the compact EM series VEMT9C compressor. Embraco reached an agreement with Hiron in 2014 to promote HCs in light commercial cabinets in the Chinese market. Embraco also showcased their latest VEGT8U model, using R600a, which was selected as an "Innovation Product" from China Refrigeration 2015.

Secop, Germany, has on show several compressor models using R600a and R290. It introduced its KXV95KX using R600a, also chosen as a China Refrigeration 2015 "Innovation Product", as well as its XV8.0KX, using R600a.

Haier, China, has demonstrated the first of their R290 RACs. The model has already received the "Low-GWP Label" jointly authorized by UNIDO, UNEP, FECO (Foreign Economic Cooperation Office, Ministry of Environmental Protection), CHEAA (China Household Electrical Appliances Association), and GIZ in 2015. Low-GWP Label was launched in March 2015, targeting products with GWP (global warming potential) lower than 150 and are highly energy efficient. These include RAC and heat pump water heaters for residential application. The label is designed to accelerate the uptake of natural refrigerant-based solutions in the Chinese market.

Another local manufacturer Chunlan showcased an RAC unit using propane as the refrigerant. Propane has a zero ODP and a three GWP. The unit has a high-density filter made of high-density organic fibers that can remove up to 78.6% of dust. It also features high quality internal thread copper tubing and a blue multi-stage evaporator to enhance heat exchange efficiency. The product is available in China and also abroad, in countries like Australia.

A Chinese company Snowman has introduced a semi-hermetic screw compressor, the SRC-S-353LOS, which uses R290, has a cooling capacity of 323.4 kW. Designed for medium and high evaporative temperature refrigeration applications, it has an evaporating temperature of 2°C and a condensing temperature of 40°C. The unit uses a special explosion-proof design to ensure safety.

Source: http://www.hydrocarbons21.com

AIRAH launches R22 phase-out guide online

Australian Institute of Refrigeration, Air-conditioning and Heating (AIRAH) has released the *Management guideline for the phase-out of refrigerant R22.*

The free online guide, which offers advice on audit and asset management, as well as on technical options, was developed by AIRAH and the Queensland Department of Housing and Public Works.

R22 is being phased out in accordance with Australia's obligation to the Montreal Protocol on Substances that Deplete the Ozone Layer. As of next year, import quotas will be kept at a stable minimum level until 2030 when the phase-out will be complete.

"Over the next 15 years, the amount of R22 available for servicing systems will dwindle, until complete phase-out in 2030," says AIRAH CEO Phil Wilkinson. "We all need to be informed and prepared to provide system owners with a management plan that exposes them to the least financial risk."

With the import quota of R22 dropping 75% between 2013 and 2014, and further restrictions set to come in the next year, it is crucial that building owners, facility managers, system operators, and technical service providers are all on the same page when it comes to the phase-out.

"The continued use of R22 presents a risk to owners or managers of building assets, with the reduced availability pushing up the price of the refrigerant, where available," Wilkinson says. "Indeed, availability of the refrigerant is expected to be highly constrained from 2016 onwards."

For more information or to download the free guide, visit www.airah.org.au/R22PhaseoutGuide

Source: http://www.racplus.com

Fluorocarbon producers launch new website

The Global Fluorocarbon Producers Forum (GFPF) representing worldwide fluorocarbon producers has launched a new website.

The website (http://www.gfpf-forum.org) features sections on fluorocarbon uses in everyday life. These include refrigeration, air conditioning, respiratory inhalers, and foam-blowing agents for insulation products. It also presents the GFPF's official positions on a number of key strategic issues, including the UN Montreal Protocol on ozone-depleting substances and lower GWP materials. GFPF chairman Rich Rowe says the website will highlight the organization's participation in scientific, technical, and regulatory forums and "represent our viewpoint to industry regulators, and NGOs around the world".

Members of the GFPF include: Arkema, Daikin, DuPont, Gujarat Fluorochemicals Limited (GFL), Honeywell, Japan Fluorocarbon Manufacturers Association (JFMA), Mexichem, and Solvay.

Source: https://chemicalwatch.com

HFC-32 refrigerant for use in residential AC units

HFC-32 (R-32), a chlorine-free, single-component refrigerant, has received approval from the United States Environmental Protection Agency (EPA) for use in home air conditioning. The approval comes as part of President Obama's Climate Action Plan and is a result of the EPA's Significant New Alternative Policy (SNAP), which identifies and approves additional climate-friendly chemicals.

The HFC-32 (R-32) refrigerant is contained in an estimated 8 million units in Japan. It will be approved for use in equipment such as package-terminal air conditioners, window-room air conditioners, and portable air conditioners that meet the requirements of UL Standard 484 and the use conditions of the EPA SNAP approval.

Source: http://www.hpacmag.com

HCFC control policy consultation for DPR Korea

The UNEP OzonAction Compliance Assistance Program in the Regional Office for Asia Pacific organized a consultation for the inter□ministry delegation from the Democratic People's Republic of Korea with the aim of accelerating national efforts to reduce production and consumption of hydrochlorofluorocarbons (HCFCs) which are ozone□depleting substances (ODS) controlled under the Montreal Protocol.

The DPR Korea delegation was headed by Mr. KIM Yong U, special Ozone Senior Adviser from the National Coordinating Committee for Environment and consisted of representatives from multiple agencies, including the Ministry of Land and Environment Protection, the General Bureau of the Customs, and the Ministry of Chemical Industry, demonstrating the country's commitment to meet its obligations as a Party to the multilateral environmental agreement. During the two-day consultation, the delegates carried out an in-depth and multiagency analysis of the existing and future policies and their enforcement to control both the production and the import of HCFCs. Like all developing countries in the world, DPR Korea must reduce HCFCs consumption by 35% by 1st January 2020. Moreover, the discussions were enriched by remote participation of the China ODS Import and Export Management Office – the authority responsible for ODS export license in the People's Republic of China – and the United Nations Industrial Development Organization (UNIDO). Based on a collective review of the existing ODS control policies and the advice offered for improvements, the delegation will strengthen the licensing systems with a quota to control HCFCs through screening of the trade registry and more cross-checking of information between the authorities involved. This activity was supported by UNEP and UNIDO as part of the Institutional Strengthening project and the HCFCs Phase-out Management Plan in DPR Korea.

Source: http://www.unep.org

Solid state refrigerator

Louisiana State University researchers in the United States say that future refrigerators absolutely need to be more efficient than the current, and a new solid-state element could be the key to a more efficient home.

Refrigeration has gone through various stages, each of them more efficient and more effective than the earlier, but the demand for refrigeration is set for a big expansion, something on the order of $8 billion more by 2018, says Louisiana State University physics professor and lead researcher Shane Stadler.

Because patents are still pending, and the breakthrough appears to be truly groundbreaking, Louisiana State University is keeping things under wraps regarding the actual materials involved and the processes. They have not even released a paper on the subject, but state that the new technology could lead to a future solid-state refrigeration system which requires less power to run the system than current designs. Of course, using less energy will result in reduction of household emissions, which is even better for the environment.

The solid-state material responds to magnetism, changing its temperature in relation to ambient temperature, which is why it belongs to a class of materials known as magnetocaloric materials. When the magnetic field activates, the new material heats up, releasing this heat to air or water. Then, when the magnetic field dissipates, the new material cools off, absorbing heat. The process repeats, transferring heat energy from one side to the other, and is, at least according to Louisiana State University researchers, significantly more energy efficient than compressed gas systems currently on the market. How soon we could see a solid-state refrigerator or solid-state air conditioner on the market is still not known.

Source: http://www.greenoptimistic.com

Eco-friendly refrigeration solution

Frozen food specialist, Farmfoods has chosen cooling expert Star Refrigeration to deliver an environmentally conscious refrigeration package using zero carbon ammonia at their brand new facility in Bristol, London, United Kingdom (PRWEB).

The new distribution centre will supply the southern retail stores and requires exceptional efficiencies across a wide range of operating conditions, as well as the capability to increase refrigeration capacity for future potential requirements.

Star Refrigeration, the largest independent cooling and heating contractor in the United Kingdom, designed and installed two modular coldstore Azanechiller packages and a chillstore Azanefreezer package, both with spare refrigeration capacity to accommodate future additional load.

The total installation offers numerous benefits including low maintenance and reduced energy consumption, as well as the environmental advantages associated with ammonia as a natural refrigerant.

James Ward, Star's Director of Food Sales, states that "The Azanechiller offers a significant increase in performance compared with standard HFC chillers. Its packaged design and careful industrial component selection results in an ultra low-refrigerant charge, with all ammonia contained within the chiller and outside the production facility. This means a refrigerant charge of as little as 0.1 kg per kW."

Suitable for cooling direct refrigerant, water, and glycol, these packages are ideally suited to applications in food processing, temperature-controlled storage, building services, and process cooling.

Source: http://www.prweb.com

Improvements in magnetic refrigeration

Scientists from the University of Connecticut, the United States, in collaboration with other researchers, have recently solved the mystery behind a distinct property in a unique magnetic metal. Ultimately this discovery could pave the way for the development of several new technologies such as more practical magnetic refrigeration and improved cooling systems for magnetic response imaging systems.

The research was in collaboration with Brookhaven National Laboratory and it was led by UConn Assistant Professor of Physics, Jason Hancock and Brookhaven researcher, Dr. Ignace Jarrige.

The investigation dealt primarily with the Kondo effect, which describes how magnetic impurities

lead to scattering of electrons in different metals in response to changes in temperature. The material which was studied was ytterbium–indium–copper-four (YbInCu4), which has unique properties related to how its magnetism radically changes in response to a certain temperature.

Using a groundbreaking synchrotron-based analysis technique, researchers were able to prove that the cause of the switching behavior observed in YbInCu4 is caused by gaps in its energy spectrum.

The magnetic change associated with the Kondo effects occurs at a very low temperature (42K or –231°C) for YbInCu4, which makes this particular material impractical for commonplace refrigeration techniques. However, the insight into the cause of the observed switching behavior may allow researchers to discover materials where the switching occurs much closer to room temperature.

Source:
http://www.iifiir.org

Integrated heat pump

SystemAir, the United Kingdom, presents a new highly energy-effective, fully integrated heating and cooling solution named that uses a reversible heat pump system together with a rotary heat exchanger. The heat pump and the heat exchanger are integrated in one section built into SystemAir's air-handling units DV and DV TIME.

The DVU-HP is equipped with two scroll compressors with stepless regulation from 5% to 100% offering EER values up to 9.6. The heat pump uses R410A refrigerant and can provide a supply air temperature of maximum 15ºC in cooling mode. With the DVU-HP, a cost-effective, quality cooling solution suited for all ventilation projects is obtained.

Source:
http://www.racplus.com

Solar cooling system keeps water at 9°C

Maintaining food in places where high temperatures prevail, using little energy at a low cost is now possible with Mexican technology, thanks to the creation of a solar cooling system designed by Susana Elvia Toledo Flores.

The BUAP design is inexpensive, easy to manufacture, and environmentally beneficial. "Normal cooling systems use chlorofluorocarbon chemicals that destroy the ozone layer and contribute to greenhouse gases, ours is friendly to the environment," explains Toledo Flores. It works with solar radiation and the cooling is achieved by means of a thermodynamic adsorption–desorption cycle lasting 24 hours. Methanol is used as a refrigerant and zeolite (mineral) as an adsorbent.

Toledo Flores says the system has two stages, during the day "warming, desorption, and the period of condensation happens. Solar energy heats the zeolite and increases the methanol vapor pressure, the refrigerant is condensed, and stored in a tank flowing to the evaporator."

Furthermore, the system "is not only designed to cool foods. It may also serve as an air conditioning, for example, in communities like Tecali de Herrera, Puebla, where there are areas without electricity and the system could adapt well to preserve their foods and medicine, bringing them better quality of life," says Toledo Flores. The project was presented at the International Congress of Solar Energy at Germany.

Source:
http://www.sciencedaily.com

Refrigeration units that reduce GWP

Thermo King, Ireland, has announced that its SLXe trailer refrigeration units are available with the next generation refrigerant, R-452A, in Europe. The units combine the same high performance and reduced sound levels but with an improved environmental performance courtesy of the lower GWP of new refrigerant.

The new solutions offer the same high level of performance as the current product's portfolio including the same cooling capacity, pull-down, and fuel efficiency and provide pre-emptive compliance with 2020 F-GAS regulations. In addition, microchannel condensers allow for even lower refrigerant charge and minimize the risk of leakage, further adding to the lower environmental impact of Thermo King trailer refrigeration units.

This commitment is estimated to result in the avoidance of ~20,850,000 metric tons of CO_2 globally by 2020, which is equivalent to the energy used by nearly two million homes for 1 year.

Source:
http://www.irishtrucker.com

Replacement industrial cleaner

The Air Force Research Laboratory Energy and Environment (AFRL E2) Program, the United States, has identified 1-ethyl-3-methyl-imidazolium (EMIM) acetate as a replacement industrial cleaner. Here, the EMIM is used in immersion cleaning with use of ultrasonic agitation.

A wide range of Air Force platforms and components undergo industrial cleaning processes that are routinely performed at military maintenance, repair, and overhaul facilities, including air logistics complexes (ALCs).

To adhere to US Environmental Protection Agency guidelines for solvents containing volatile organic compounds (VOCs), hazardous air pollutants (HAPs), and ozone-depleting substances, these facilities have transitioned to less hazardous cleaning chemicals.

However, several of those substances are now subject to reporting, largely because of emitting greenhouse gases (GHGs). As a result, the Air Force Research Laboratory (AFRL) is looking at new technological solutions for VOC-, HAP-, and GHG-containing solvents that include ionic liquid (IL) solvents as a potential alternative.

The AFRL E2 Program has identified and critically evaluated IL solvents as replacement technology for current cleaning processes at ALCs. AFRL E2 completed a preliminary analysis of ALC requirements and current baseline processes, and a technology assessment was conducted to document currently available IL solvents recommended for cleaning processes.

Testing was performed to evaluate alternative solvents in both wiping and immersion cleaning applications. In addition, substrate and process compatibility testing was conducted with the most promising alternative solvents.

The solvents were subjected to the US Army solvent cleaning power test for immersion cleaning with the use of ultrasonic agitation. The EMIM acetate outperformed the other alternatives and baseline products.

It also produced a byproduct of skimmable grease, indicating a potential for solvent recycling at military cleaning facilities that equates to reduced procurement costs. As a result, EMIM acetate is being considered as a safer alternative solvent to vapor degreasing operations at ALCs.

Source: http://science.dodlive.mil

Vapour degreasing fluids

MicroCare, the United States, has developed vapor degreasing fluids for precision cleaning purposes. The company showcased updates to its family of precision cleaning, coating, and lubricating products at the PMTS conducted on April 21–23, 2015 in Columbus, Ohio, United States.

The company focused on the variety of new vapor degreasing fluids just coming to market as well as on the benchtop cleaners, wipes, and other tools available. Compared to older technologies, these new products offer important economic and environmental benefits for visitors to the show, especially as operators migrate from the ozone-depleting HCFC-225 or *n*-propyl bromide. Tom Tattersall, Chief Operating Officer, cites the company's extensive vapor degreasing experience as an added benefit to customers in this regard.

Highest on the list will be the DuPont Vertrel Sion degreasing fluid, which is compatible with almost all vapor degreaser cleaning systems. According to the company, it is a good replacement for both HCFC-225, which is being phased out, and *n*-propyl bromide, which causes toxicity concerns. Already available in Europe and Asia and expected soon in the United States, it will set a new benchmark for cost effectiveness and environmental sensitivity, MicroCare says.

Source: http://www.pfonline.com

Dry steam vapor cleaners

AmeriVap Systems, the United States, recently announced the addition of two new commercial dry steam vapor cleaners to its industry leading line of steam cleaners. Both dry vapor cleaners feature dry steam combined with wet/dry vacuums and the ability to inject a sanitizing agent or germicidal into the steam wand.

The Blitzer Combi is a 220 V commercial and industrial steam cleaner that heats up in a scant for 7 minutes. This dual fill unit achieves pressures up to 120 psi and tip temperatures of 212F – the magic degree where water becomes steam and unleashes incredible cleaning and sanitizing power. This steam vapor cleaner is ideal for degreasing, machine maintenance, and deep cleaning. In addition, with its vacuum attachment, it performs extremely well on floors and walls.

The AmeriVap Systems' Envirosteam UVC is a revolution-

ary commercial vapor cleaner. This cleaner uses the cleaning power of dry steam vapor enhanced with a UVC light to sanitize soils captured by the vacuum for critical cleaning procedures. The vacuum itself uses a proprietary water filtration system for unparalleled power.

The Envirosteam UVC features a compact maneuverable design with locking wheels, an easy to access attachment container to increase productivity, and a collapsible handle that allows for easy storage. The unit is constructed with a laser cut inox stainless steel that results in a completely smooth cabinet. The internal boiler produces dry steam up to 145 psi and internal temperatures of 365F. Machine operation is controlled by a digital readout.

The AmeriVapEnvirosteam UVC is suitable for any cleaning application, but is ideal for critical cleaning applications like Hospital sanitation, durable medical good cleaning, as well as nursing home and assisted living cleaning and sanitation.

AmeriVap Systems, the industry pioneer in dry steam vapor cleaning, is committed to delivering environmentally friendly fully sustainable cleaning solutions to industries as diverse as food processing and packaging to the pharmaceutical industry.

Source: http://news.thomasnet.com

Aqueous cleaner for electronic assembly

KYZEN, the United States, has introduced a new AQUANOX® A4708 pH neutral electronic assembly cleaning chemistry technology. The product rapidly cleans under densely populated, low-gap PWB assemblies and is effective on all flux types, including no-clean and water-soluble residues. A4708 is specifically formulated for enhanced metal compatibility and is safe for delicate gold and aluminum bonding pads. The specialized pH chemistry provides bright solder joints, even after multiple wash exposures.

"This is a product that the industry needed and it solves an important problem for our customers. I'm delighted to feature it at APEX as a fresh example of how KYZEN connects science with care to create the most effective cleaning technologies for your specific needs," said Kyle Doyel, KYZEN's President and CEO. "AQUANOX® A4708 is available now in 1, 5, and 55 gallon containers directly from KYZEN locations around the world.

Source: http://news.thomasnet.com

Vapor degreasing system

Baron Blakeslee, the United States, has released a benchtop degreaser for Honeywell's Solstice® PF solvent, the latest advancement in solvent technology developed by Honeywell. As of January 1, 2015, most uses of AK-225 (HCFC-225ca) were prohibited in the United States, and Equinox provides an ideal solution for users of AK-225 who are considering Solstice® PF as a replacement solvent.

Honeywell's Solstice® solvent is a highly effective cleaning solution that is nonflammable, has favorable toxicity properties, a low global-warming-potential of 1,negligible ozone depletion, does not contribute to ground-level smog, and is not a volatile organic compound as determined by the U.S. EPA . It has low surface tension and is suitable for cleaning electronics, metal parts, medical devices and precision cleaning of mineral, silicone, cutting, vacuum, and fluorinated oils as well as silicone and heavy grease. Equinox Benchtop Degreaser was created exclusively for Solstice® PF Solvent, and is an ideal solution for new Solstice® PF users wanting to begin cleaning with Solstice® PF in a low-risk, low-cost way.

Equinox is a fully featured benchtop vapor degreasing system with a unique design made specifically for efficient and effective use of Solstice® PF. It provides a solvent-efficient benchtop equipment solution for former AK-225 users, an HCFC degreasing solvent, prohibited for most uses by the Clean Air Act under the Montreal Protocol. In many cases, Solstice® PF is an ideal replacement for AK-225, and Equinox provides an affordable, efficient means to use this new, more environmentally-friendly solvent. Equinox is also compatible with any fluorinated or brominated vapor degreasing solvent.

Source: http://www.prweb.com

Trade names of chemical products containing ODS and their alternatives

This service is designed to help customs officials and National Ozone Units control imports and exports of ozone depleting substances (ODS) and prevent their illegal trade. It is a worldwide database of the commercial trade names of chemical products containing ODS controlled under the Montreal Protocol and their alternatives.

For more information, access:

http://www.unep.org/ozonaction/InformationResources/Tradenames/

Automatic fire suppression

Sea-Fire Marine, the United States, has introduced automatic pre-engineered marine fire suppression systems which use 3MNovec1230 fire protection fluid. Each fixed-installation Sea-Fire pre-engineered system with Novec 1230 is designed and tested for a specific compartment space volume, from 25 cu. ft. to 1,800 cu. ft. Individual cylinders are sized and super-charged with nitrogen for maximum efficiency, and the nozzles are tuned for the exact discharge rate. Installations can utilize manual release or automatic thermal activation. The latter is critical for high-risk areas where crew spends little time, such as engine and machinery rooms.

The systems are equipped with a pressure switch for cylinder supervision and to control other functions, such as fans and engine shutdowns. The pre-engineered solutions easily incorporate with other Sea-Fire equipment, such as detection modules and sensors.

Source: http://www.fireengineering.com

Halon-replacement extinguisher

In Germany, Diehl Aerosystems' division AOA is demonstrating its FIREX water-mist fire-suppression system for aircraft cargo compartments, which is the only halon replacement system to have passed all US FAA proof-of-concept tests.

FIREX comprises a water tank and nitrogen bottles linked to a common pipe and several spray nozzles that distribute water vapor and nitrogen throughout the cargo hold to extinguish fires. It has been developed as an alternative to existing halon fire suppression systems, which are to be excluded from new European Aviation Safety Agency aircraft program certifications from 2018 because of environmental concerns.

FIREX is at technology readiness level three and has passed all of the FAA trials carried out at Diehl's specialist Munich testing facility. The next step is to begin the development of aircraft components before achieving full certification for the system.

Source: http://www.flightglobal.com

Dual-agent fire protection system

Cease Fire LLC, the United States, has produced a new generation product known as the Cease Fire CFF series, a dual-agent fire protection system that combines environmental and personnel safety with unbeatable fire extinguishing abilities.The CFF Series utilizes the modern day halon-replacement gas manufactured by DuPont known as FE-227, or alternately, FM-200. FE-227 gained industry attention and acceptance immediately with its zero ozone depletive qualities, as well as its ability to be safely used around people, gaining classification by both the EPA and the NFPA as safe for completely covering a normally occupied space. FE-227's ability to interfere with the combustion process of a fire as well as absorb heat from the fire at a molecular level makes it an incredibly efficient product, requiring much less volume than traditional competing fire suppressant chemicals which rely on limiting oxygen.

Combined with the FEE-227 is a proprietary blend of powder (Cease Fire's ABC Powder), which utilizes monoammonium phosphate and other additives to form a thixotropic gel in our CFF models. This powder, released in combination with the fire extinguishing FE-227 gas, settles into the area, covering all surfaces to prevent reignition of the fire. Safe, nontoxic, and proven to not induce corrosion or electrical conductivity, this powder is easily removed at the time of clean-up, leaving your sensitive equipment and technology safe from water and fire damage.

Source: http://www.ceasefire.com

High-pressure water mist

DanfossSemco A/S, Denmark, has introduced the SEM-SAFE® water mist firefighting system. The system works by forcing water at high pressure through nozzles, thus producing an extremely fine mist. The water is supplied via a pump unit. The SEM-SAFE® pump unit can supply all water mist applications.

On stand-by, the system maintains a pipe pressure of ~12 bar. When the temperature exceeds e.g. 57°C, the heat-sensitive glass bulbs mounted in the nozzle heads melt. At this point, the high-pressure pump is automatically activated and water is forced through nozzles at high pressure (60 or 100 bar depending on nozzle type) to create a fine mist. Only nozzles with melted bulbs are activated. This means that only the heat-affected area will be actively sprayed.

During operation, the high-pressure pump draws water from the tank on unit (a nonpressurized stainless steel tank) and forces it through a nonreturn valve to a high-pressure manifold. From here, it is distributed to the relevant section(s) via the section valve. A pressure relief valve controls the pump pressure and is designed to return the full pump capacity to the tank on unit.

Source: http://www.danfoss-semco.com

A new way of creating cellular polyurethane materials

Researchers from Institut Charls Gerdt, France, and Cracow University of Technology, Poland, describe the synthesis of polyurethane (PU) foams from the reaction between cyclic carbonates and diamines to yield nonisocyanatepolyurethane (NIPU) foams. A poly(methylhydrogenosiloxane) was used as a blowing agent to foam the NIPU by reaction with diamines. The raw materials were characterized to determine reaction stoichiometry. NIPU foams were characterized by scanning electron microscopy (SEM) and by measurement of their swelling index and apparent density.

Nowadays, the alternative NIPU constitutes a significant opportunity to replace isocyanate in the formulation of PU materials. This study reports the synthesis of PU foams without isocyanate. NIPU foams were prepared from carbonate, i.e., poly(propylene oxide) biscarbonate and trimethylolpropane tricarbonate and two amines. The blowing reaction proceeded between amine and SiH groups of MH15 by releasing dihydrogen. NIPU foams were then studied by characterizing the structure (apparent density, SEM, DMA), the degree of crosslinking (swelling index), and thermal properties (TGA and DSC). All these characterizations showed that the synthesized foams were high-apparent density flexible foams and their structure and thermal properties depend on degree of crosslinking provided by the difference in functionality of cyclic carbonate and the structure of amine.

Source: http://specificpolymers.fr

Alternative foam blowing agents

Foaming has long been a tried and true route to reducing part weight, particularly in the vehicle manufacturing industry. The MuCell foaming process, developed and patented by Trexel, the United States, offers particular advantages in this respect. A physical process for foaming thermoplastics that uses nitrogen or carbon dioxide as blowing agents has gained popularity becauseof the shorter cycle times and, importantly, minimal sink marks caused by expansion of the blowing agent, among others.

During the process, the gas is transformed into a supercritical fluid (SCF), fed into the plastic melt toward the front of the barrel, and mixed with the melt. The SCF expands during the injection process to produce a part with a mainly microcellular foam structure (<100 µm).

In combination with special mold concepts and in cooperation with partners, KraussMaffei, Germany, has now succeeded in creating additional high-gloss surfaces for the components foamed using this process.

However, the molds and mold heat-balancing are not the only critical factors for the success of the MuCell process. Special screws, plasticizing units, barrels, and process control systems are also required for the process. They are an important component of the KraussMaffei CellForm technology, which was developed specifically for the MuCell process.

Source: http://www.plasticstoday.com

Extrusion foaming with dry ice

The Institute of Plastics Processing (IKV) in Industry, Aachen, Germany, and the Skilled Crafts at RWTH Aachen University have recently developed process technology that uses CO_2 in the solid state – so-called dry ice – to produce medium-heavy foamed extrusions. The newly developed process combines the advantages of physical foaming with those of chemical foaming, researchers say.

Like the masterbatch in chemical foaming, the dry ice is fed into the extruder in pellet form. No extruder modifications are needed. Moreover, being a physical blowing agent, dry ice does not leave behind any reaction residues such as water in the extrudate, making the process suitable for hydrolysis-sensitive materials, IKV states.

With the new process technology, foam densities of a minimum of 350 kg/m³ with LDPE can be achieved, which are comparable with those of chemical foaming, IKV says. In addition, by adjusting the process temperatures, the technique can also reportedly be applied to materials such as PP.

Despite the comparatively high sublimation losses in the metering of the blowing agent, IKV maintains, the process can compete with chemical blowing agents because of the lower cost of CO_2.The process allows an inexpensive entry into foam extrusion because of the fact that any retrofitting is confined to the metering technology, say the researchers.

Source: http://www.ptonline.com

Alternative soil treatment for growing strawberries

A research project in the United States aims at finding better ways to grow strawberries has some of those test berries showing up in the production departments at local stores.

The Strawberry Sustainability Research and Education Center at California Polytechnic State University (Cal Poly) is working on alternatives to the earlier industry standard for soil fumigation called methyl bromide (MeBr). The chemical is being phased out in California, and therefore Central Coast berry growers are looking for viable alternatives, including the option of using no fumigants at all.

The test strawberries were planted back in November and harvest began last week. The berries can be found for sale on campus and at Von's Supermarkets in San Luis Obispo.

Source: http://kcbx.org

Efficacy and economics of herbicide programs compared to MeBr

In the absence of an effective alternative to MeBr, weeds cause a significant economic loss in bell pepper production. A study was conducted by researchers from Purdue University and University of Arkansas, the United States, to evaluate the efficacy and economics of pre-emergence (PRE) followed by post-emergence-directed (POST-DIR) herbicide programs compared with MeBr for weed control in low-density polyethylene (LDPE)-mulched bell pepper production. Imazosulfuron at 0.112, 0.224, and 0.336 kg ai/ha and S-metolachlor at 1.6 kg ai/ha were PRE-applied followed by POST-DIR applied mixture of trifloxysulfuron + halosulfuron at 0.008 and 0.027 kg ai/ha, respectively, at 4 weeks after transplanting (WATP).

The standard MeBr treatment (67% and 33% mixture of MeBr + chloropicrin) was applied at 390 kg ai/ha. In addition, a weed-free (hand weeding) and a non-treated control were used for comparison. S-metolachlor-containing herbicide program controlled Palmer amaranth ≥90%, large crabgrass ≥78%, and yellow nutsedge ≥90%, which were comparable to MeBr. After POST-DIR herbicide application, bell pepper was injured ≥17% with the S-metolachlor-containing herbicide program at 6 WATP; however, the crop later recovered. Marketable bell pepper yield in plots treated with S-metolachlor (≥29.9 ton/ha) was comparable to those treated with MeBr.

Economic evaluation of the imazosulfuron herbicide programs demonstrated the loss of ≥$7,300/ha. In contrast, the S-metolachlor-containing herbicide program was profitable with a net return of $9,912/ha. In addition, the S-metolachlor herbicide program generated a net profit of $173/ha compared to the MeBr application. Therefore, PRE-applied S-metolachlor followed by POST-DIR applied trifloxysulfuron + halosulfuron is a potential alternative to MeBr for weed management in LDPE-mulched production.

Source: http://wssajournals.org

Float trays as an alternative to MeBr in tobacco production

The study was carried out by researchers from Zimbabwe Open University, in Hurungwe district, Zimbabwe, to evaluate the feasibility as well as the challenges of using float trays as an alternative to the use of MeBr in tobacco production. The study made use of the qualitative and quantitative research design. Questionnaires, interviews, economic analysis, and field observations were used as data collection instruments. Descriptive analysis was used in the research.

The results of the study indicated that floating trays can effectively substitute the use of MeBr in tobacco seedling production. This is because of their accessibility, ability to produce excellent quality seedlings because of reduced insect pest, weeds, and disease attack, and also a reduction in labor requirement. The float trays maintain or improve productivity because the transplanting shock is reduced; when the seedlings are ready for transplanting, a reduction land is required for seedling production as well as the cost effectiveness of the float trays.

There are, however, challenges that affect the float tray system, although the challenges are outweighed by the advantages. The challenges include the technicalities that are associated with the float tray system. Furthermore, the unavailability of additional substrates, the distance to the float tray distributors where the trays are procured, high initial establishment costs, and the need for farmer to stay on the farm till the seedlings are transplanted onto the field are the

factors affecting the adoption of the float trays. From the results of the research, it can be concluded that float trays can substitute MeBr in insect pest, weeds, and disease control while being environmental friendly. It is recommended that there is a need for farmer training on the use of float trays, government subsidies in initial establishment of the technique, ready supply of the float trays, and decentralization of the manufacturers of float trays into tobacco growing areas.

Source: http://journals.abc.us.org

Ethanedinitrile: a potential MeBr alternative

Export of timber products from New Zealand is a major and growing sector of the economy, and the search for an effective ozone-safe fumigant is needed to support this trade. Ethanedinitrile (EDN Fumigas®; C_2N_2) is a colorless, pungent gas that has been proposed as an alternative to replace MeBr for phytosanitary treatment of logs, sawn timber, and wood packaging materials. EDN has been recently registered in Australia for soil and wood treatments and is now available for testing in New Zealand. To be considered as a viable alternative fumigant to MeBr, fundamental aspects of the efficacy of EDN, including its toxicity to key quarantine insect pests and its sorption characteristics, need to be defined.

In a study, researchers from the New Zealand Institute for Plant & Food Research, evaluated (i) the toxicity of EDN for the control of adult burnt pine longhorn beetle (*Arhopalus ferus*), a quarantine insect found in association with pine logs and sawn timber exports in New Zealand, and (ii) a range of factors which might influence EDN sorption by logs and sawn timber. Results indicate that EDN is a promising phytosanitary treatment alternative to MeBr for quarantine insect pests associated with logs and sawn timber. It is highly toxic to burnt pine longhorn adults (LD99 = 12.6 g/m^3) and its sorption by logs and sawn timber is high but acceptable. Future work will include measuring EDN toxicity to other *A. ferus* life stages and key insect forest pests and additional fumigant characteristics including penetration and desorption.

Source: http://mbao.org

Essential oils and melocon for managing lesion nematode

Easter lily bulbs for greenhouse forcing are produced in Del Norte County, California, and Curry County, Oregon, United States. Lesion nematode, *Pratylenchus penetrans*, infestation of roots seriously affects growth of field-grown bulbs. During a two consecutive years of field trials carried out by researchers from the University of California, Davis, and Easter Lily Research Foundation, the United States, commercially prepared formulations of essential oils and of a nematode parasitic fungus were compared to an untreated control, and a chemical standard combination of 1,3-dichloropropene (Telone II, Dow AgroSciences, Indianapolis, IN), plus metam sodium (Vapam, Amvac, Los Angeles, CA) [FU] applied pre-plant followed by Thimet at-planting, to determine their value in improving plant health in the presence of lesion nematode.

Three essential oil products from US AgriTech (Paso Robles, CA): (i) Duogard, (ii) EF400 All Purpose Fungicide, and (iii) EF300 All Purpose Insecticide; and Cinnamite (Mycotech, Butte, MT) were tested as pre-plant dips to bulblet planting stock. MeloCon (the fungus *Paecilomyceslilacinus*, Certis, Columbia, MD) was tested at two rates as a soil treatment applied at-planting. The essential oils and MeloCon were tested either alone, in combination with Thimet at-planting, at-planting following FU, or in combination with Thimet at-planting following FU. The organophosphates Ethoprop (Mocap, Amvac, Los Angeles, CA) and Fosthiazate (Nemathorin, Syngenta International AG, Basel, Switzerland) were also tested either alone, at a reduced rate combined with a reduced rate of Thimet, or in combination with Thimet and FU.

In both trials, 13 treatments consistently had a greater bulb circumference at harvest than the control, and six treatments had a greater foliage weight at harvest than the control. In consecutive years, four treatments had healthier appearing roots than the control and two treatments produced larger stem bulblets than the control. Nine treatments consistently had lower levels of lesion nematode within roots at harvest than the control. The new products tested show promise for use in integrated pest management programs for management of lesion nematode on field grown Easter lily bulbs.

Source: http://mbao.org

RECENT PUBLICATIONS

Guide on Good Practices: Phasing out HCFCs in the Refrigeration and Air-conditioning Servicing Sector

The main purpose of this Guide on Good Practices: Phasing-out HCFCs in the Refrigeration and Air-conditioning Servicing Sector is to provide National Ozone Units and refrigeration and air-conditioning training institutes with a standardized module for delivering training programs under HCFC Phase-out Management Plans.

Phasing out HCFCs in small and medium-sized foam enterprises

This booklet aims to assist foam enterprises, especially small and medium-sized enterprises, to better understand policies on HCFC phase-out, access to assistance from the Multilateral Fund for the Implementation of the Montreal Protocol, and access alternative technologies in different foam applications taking into account challenges in converting to alternative technology.

For the above two publications, contact: OzonAction Branch, UNEP DTIE, 15 rue de Milan, 75441 Paris CEDEX 09, France. Tel: +331 4437 1455; Fax: +331 4437 1474; E-mail: ozonaction@unep.org; Web: http://www.unep.org/ozonaction/.

Technical guide on "CO_2 as a refrigerant"

A first edition, the IIR guide "CO_2 as a Refrigerant" highlights the application of carbon dioxide in supermarkets, industrial freezers, refrigerated transport, and cold stores as well as ice rinks, chillers, air-conditioning systems, data centers, and heat pumps.

Topics covered in the guide include: thermophysical properties of CO_2, exposure to CO_2, safety precautions, CO_2 plant design, CO_2 applications, future prospects, and standards and regulations.

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; Web: www.iifiir.org.

TECH EVENTS

2015

14–16 Aug
Bangkok, Thailand

BANGKOK RHVAC '2015
Contact: Thai Trade Fair, 44/100 Nonthaburi 1 Road, Bang KraSor, Nonthaburi 11000, Thailand
Tel: +66 2 507 7842
Fax: +66 2 547 5683-4

16–22 Aug
Yokohama, Japan

ICR 2015 – The 24th IIR International Congress of Refrigeration
Contact: Secretariat of ICR2015, C/o ICS Convention Design, Inc., Chiyoda Bldg., 1-5-18 Sarugakucho, Chiyoda-ku, Tokyo 101-8449, Japan
Tel: +81-3-3219-3541
Fax: +81-3-3219-3577
E-mail: icr2015@ics-inc.co.jp
Web: http://www.icr2015.org

10–11 Sep
Kyoto, Japan

13th International Conference on Advances in Foam Materials & Technology (FOAMS® 2015)
Contact: Professor Masahiro Ohshima, Conference Chair
Tel: +81-75-383-2666
E-mail: foams15@cheme.kyoto-u.ac.jp
Web: http://www.cheme.kyoto-u.ac.jp/foams15/

20-23 Oct
Dalian China

8th International Conference on Cold Climate-Heating, Ventilation and Air-Conditioning (Cold Climate HVAC 2015)
Contact: Dalian University of Technology
Tel: +86-411-84709612
Fax: +86-411-84674141
E-mail: hvac@dlut.edu.cn
Web: http://www.coldclimate2015.org/

8–11 Nov
Manila, Philippines

HVAC/R PHILIPPINES 2015
Contact: Global-Link (Global-Link Marketing and Management Services Inc.), Unit 1003 Antel 2000 Corporate Center, 121 Valero, St. Salcedo Village, Makati City, Philippines
Tel: +632-750-8588
Fax: +632-750-8585

9–11 Nov
San Diego, USA,

2015 Annual International Research Conference on Methyl Bromide Alternatives and Emissions Reductions
Contact: Methyl Bromide Alternatives Outreach, 6556 N. Dolores Ave., Fresno, CA 93711, USA
Tel: +1-559-449-9035;
Fax: +1-559-449-9037
E-mail: gobenauf@agresearch consulting.com
Web: http://www.mbao.org

PUBLICATIONS from APCTT

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(Free access at www.techmonitor.net)

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- ❑ VATIS Update (4 issues/year)
  - ❍ Biotechnology — (e-version)
  - ❍ New and Renewable 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
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❍ Volume 3: Least Developed and Pacific Island Countries and Economies in Transition, 1999	600.00	30.00
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