



VATIS UPDATE Ozone Layer Protection

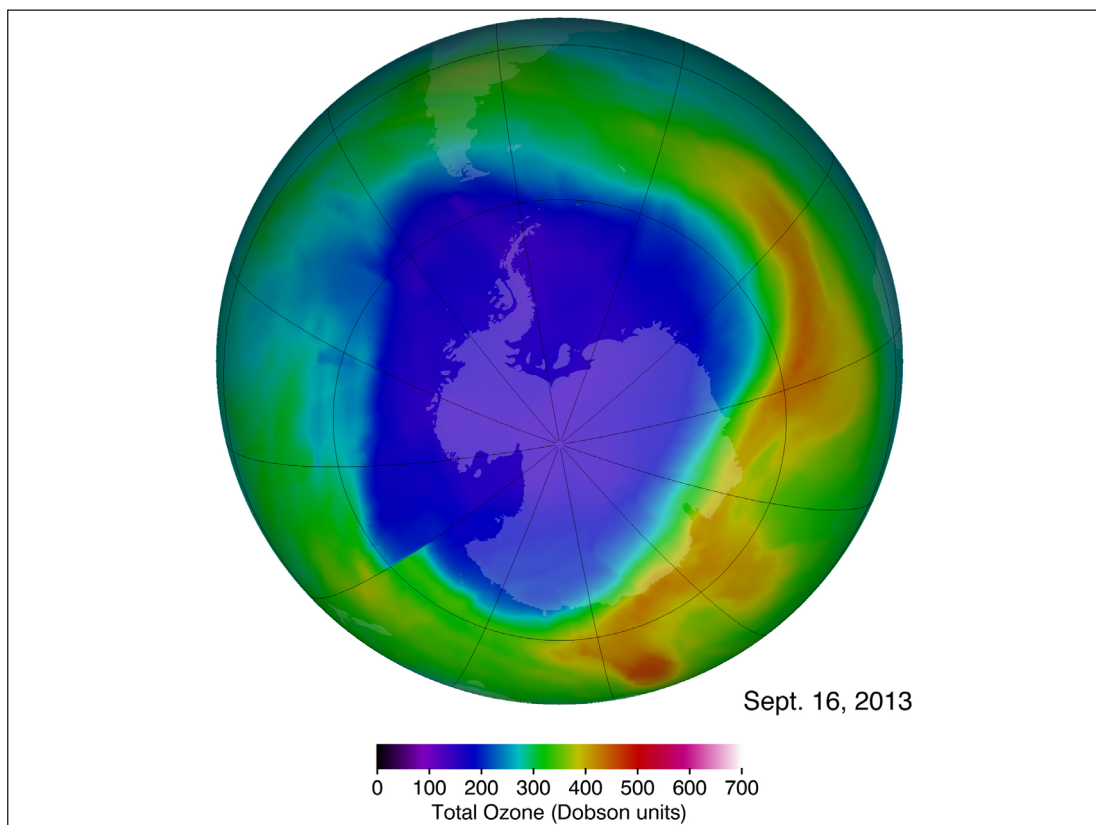
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Apprise yourself with the latest technological innovations

Highlights

- Ozone hole might slightly warm planet
- Ban on second hand refrigerators in Sri Lanka
- MHI develops lubricant oil-free centrifugal chillers
- Methyl Soyate: Eco-friendly with performance potential
- The world's first 100% water blown closed-cell spray foam
- Reformulation of Stmerin® D CFC formulation
- Vegetable growers manage without methyl bromide



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 Antarctic ozone hole reached its maximum single-day area for 2013 on Sept. 16. The ozone hole (purple and blue) is the region over Antarctica with total ozone at or below 220 Dobson units (a common unit for measuring ozone concentration).

(Credit: NASA's Goddard Space Flight Center, 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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Relationship between the ozone depletion and the extreme precipitation

A new study by Prof. Sarah Kang from Ulsan National Institute of Science and Technology (UNIST), Republic of Korea, showed that the ozone depletion over the South Pole has affected the extreme daily precipitation in the austral summer, for December, January, and February (DJF). This work was published in the journal *Geophysical Research Letter*. This research study has also been highlighted in the journal *Nature Geoscience* in September.

The research team led by Prof. Kang focused on a carefully conceived set of multi-model integrations forced only with observed stratospheric ozone changes. This single-forcing approach allows the research team to show extremes, in response to stratospheric ozone depletion and that these changes are likely of a dynamic rather than thermodynamic nature. The ozone layer is a layer in the Earth's atmosphere which absorbs most of the UV radiation and contains relatively high concentrations of ozone (O₃). This ozone layer had been broken by the widespread use of man-made compounds containing chlorofluorocarbons (CFCs). After the discovery of the ozone hole, 1989 Montreal Protocol signed by 196 countries to reduce global CFC production to protect the ozone hole.

In this research scientists discovered that the ozone depletion in the Antarctic area is associated with extreme rain in the austral summer and it would be used to forecast heavy rain and the natural disasters in the future. "We would expand our research to see

the correlation of the ozone depletion of the North Pole and the climate changes in the Northern Hemisphere," said Prof. Kang, showing her future research plan.

Source: <http://www.phys.org>

Ozone hole might slightly warm planet

A detailed work is published in *Geophysical Research Letters*, a journal of the American Geophysical Union. Kevin Grise, a climate scientist at Lamont-Doherty Earth Observatory of Columbia University in New York City, collaborated on the study with Lorenzo Polvani of Columbia University, George Tselioudis of NASA Goddard Institute for Space Studies, Yutian Wu of New York University, and Mark Zelinka of Lawrence Livermore National Laboratory, all in the United States.

A lot of people mix up the ozone hole and global warming, believing the hole is a major cause of the world's increasing average temperature. Scientists, on the other hand, have long attributed a small cooling effect to the ozone shortage in the hole. Now a new computer-modeling study suggests that the ozone hole might actually have a slight warming influence, but because of its effect on winds, not temperatures. The new research suggests that shifting wind patterns caused by the ozone hole push clouds farther toward the South Pole, reducing the amount of radiation the clouds reflect and possibly causing a bit of warming rather than cooling.

In the 1980s, scientists discovered thinning of the ozone layer above Antarctica during the Southern Hemisphere's spring months. An actual consequence of the ozone hole is its odd effect on the Southern Hemisphere polar jet

stream, the fast flowing air currents encircling the South Pole. Despite the ozone hole only appearing during the spring months, throughout each subsequent summer the high-speed jet stream swings south toward the pole. "Because the jet stream shifts, the storm systems move along with it toward the pole," said Grise. "If the storm systems move, the cloud system is going to move with it." High- and mid-level clouds, the team discovered, traveled with the shifting jet stream toward the South Pole and the Antarctic continent. Low-level cloud coverage dropped in their models throughout the Southern Ocean. Looking toward the future, the jet stream should do less and less shifting to the south during the summer months as the ozone layer above the South Pole recovers. However, increasing levels of greenhouse gases can also change mid-latitude wind patterns and push the jet stream poleward, creating a complicated scenario which Grise said he plans to study in future work.

Source: <http://www.sciencedaily.com>

Unusual Southern Hemisphere tree growth

Earth's climate system includes several patterns of climate variability at the hemispheric scale. One of the best known of these is the El-Nino/Southern Oscillation, which influences weather across much of the globe. Another important feature of the climate system is the Southern Annular Mode (also known as the Antarctic Ocean Oscillation), which is an index of the pressure gradient between the mid- and high-latitudes in the Southern Hemisphere. A study was carried out by Adam Wilson, a postdoctoral associate at the Yale University, in the United States.

Over the last few decades, the dominance of the positive phase of the Southern Annular Mode has been increasing. This is due, in large part, to anthropogenic stratospheric ozone depletion. In a study of tree rings across the southern hemisphere over the last few centuries, Dr. Villalba and others found that tree growth over the period 1950–2000 was significantly different than the previous 250 years and that up to half (12–48%) of the variation in tree growth could be explained by variability in the SAM. For example, tree growth was higher than average in the sub-alpine forests of Tasmania and New Zealand, but lower in the dry forests of Patagonia. Global change biologists tend to focus on the impacts of CO₂-induced climate change, but this research reveals other ways anthropogenic emissions can affect climate and ecosystems.

Source: <http://www.climate.yale.edu>

Antarctic ozone hole slightly smaller than average in 2013

Science teams from NASA and the National Oceanic and Atmospheric Administration (NOAA), the United States, have been monitoring the ozone layer from the ground and with a variety of instruments on satellites and balloons since the 1970s. The ozone hole that forms each year in the stratosphere over Antarctica was slightly smaller in 2013 than average in recent decades, according to NASA satellite data.

The ozone hole is a seasonal phenomenon that starts to form during the Antarctic spring (August and September). The September–October 2013 average

size of the hole was 8.1 million square miles (21 million square kilometers). For comparison, the average size measured since the mid-1990s when the annual maximum size stopped growing is 8.7 million square miles (22.5 million square kilometers). However, the size of the hole in any particular year is not enough information for scientists to determine whether a healing of the hole has begun. The ozone hole forms when the sun begins rising again after several months of winter darkness. Polar-circling winds keep cold air trapped above the continent, and sunlight-sparked reactions involving ice clouds and chlorine from manmade chemicals begin eating away at the ozone. Most years, the conditions for ozone depletion ease before early December when the seasonal hole closes.

Levels of most ozone-depleting chemicals in the atmosphere have gradually declined as the result of the 1987 Montreal Protocol, an international treaty to protect the ozone layer by phasing out production of ozone-depleting chemicals. As a result, the size of the hole has stabilized, with variation from year to year driven by changing meteorological conditions.

Source: <http://www.nasa.gov>

Evolution of ozone depletion on Antarctic and sub-Antarctic regions

At the middle eighties, strong stratospheric ozone depletion during spring was discovered over Antarctica. Since then, the scientific community has put large efforts in performing studies directed to evaluate the magnitude and consequences of this depletion

and to take the necessary measures to revert the situation to the scenarios before 1970. In 1987, the Montreal Protocol established a list of ozone depleting products and phase-out policies. As consequence of these restrictions on ozone depleting substances, the ozone layer should start to recover in the 21st century. In order to study the evolution of the Antarctic ozone depletion, a team of scientist comprising S. B. Diaz, A. A. Paladini, G. A. Deferrari, J. Vrsalovic, of the Consejo Nacional de Investigaciones Científicas y Técnicas, Argentina, analyzed the ozone hole area and mass deficit and seasonal total ozone column (TOC) minimum.

They also performed a seasonal and bi-monthly analysis for TOC time series (1979–2012), at twenty Antarctic and Sub-Antarctic stations. The number of days inside the vortex (TOC below 220DU) per season (September–December) and for September–October and November–December were analyzed, fitting the time series with a second degree polynomial. According to this study, ozone hole area would have peaked between 2001 and 2002 ($R=0.91$, $p<0.01$), while the minimum TOC would have occurred between 2000 and 2001 ($R=0.91$, $p<0.01$). Mass deficit is only provided since 2005 and it showed a decrease since then, although of statistically significant as consequence of the short time series. From the 20 analyzed stations, 80% showed that the number of days per season inside the vortex peaked between 2000 and 2003 and for 55% of the stations the number of days inside the vortex for September–October peaked between 1999 and 2004.

Source:
<http://www.proceedings.spiedigitallibrary.org>

Ozone-depleting gas seized

Sleuths attached to the Special Intelligence and Investigation Branch (SIIB) of Tuticorin Customs seized 1,305 cylinders containing Chlorodifluoromethane gas — (R-22) — a refrigerant used in air conditioners.

The undeclared R-22 gas, an ozone-depleting substance could be imported by the actual users only with a valid import licence issued from the Directorate General of Foreign Trade, said N.J. Kumaresh, Additional Commissioner, Custom House, Tuticorin, who took stock of the seized contraband at a container freight station here. The Indian Government had imposed restrictions on the import of R-22 gas via actual user licence in a bid to protect the ozone layer and safeguard the environment. In contravention of the provisions of the Customs Act and in violation of the DGFT EXIM policy, the cylinders, each weighing 13.6 kg, were concealed to evade duty.

Meanwhile, the Additional Commissioner said a mobile scanner would be installed at Tuticorin Custom House in two months and a stationary scanner would be established in January at a cost of Rs. 30 crore. Assistant Commissioner D. Ranjith Kumar, Superintendents of Customs T. Maruthaiah, N. Muruganandam, S. Santhana Marimuthu and Customs Inspectors S. Manoj Kumar, D. James Armstrong and C. S. Saravanan accompanied the Additional Commissioner during the inspection.

Source:
<http://www.thehindu.com>

CFC free refrigeration for the Indian market

Responding to the growing demand in India for reliable and cost-effective cooling units that also deliver efficient cold chain protection, Carrier India launched the Citimax™ range of light commercial vehicle (LCV) and truck refrigeration units at the India Cold Chain Show 2013 in Mumbai. The Citimax units are ideal for LCVs and trucks carrying loads up to 30 cubic meters.

Carrier Transicold helps improve global transport and shipping temperature control with a complete line of equipment for refrigerated trucks, trailers and containers. Carrier is a part of UTC Climate, Controls & Security, a unit of United Technologies Corp., the United States.

In a country as large and geographically diverse as India, refrigerated road transport is crucial for the safe circulation of fresh and frozen perishables. The need for efficient and reliable cooling technology for urban deliveries is rapidly increasing.

Initially available in two versions, the Citimax 500, using non-ozone-depleting refrigerants R134a or R404A, delivers refrigeration capacity up to 5100 Watts in high ambient temperatures. The units also offer precise temperature control with set points maintained within 1°C of the pre-determined temperature, ensuring that perishable goods are maintained in the proper condition from depot to destination. Thanks to quick pre-cooling and rapid recovery after each door opening, the Citimax range is capable of reaching the set point 20% faster than previous direct-drive units, enabling reduced load times.

As with all Carrier Transicold products, the Citimax range comes with the security and peace-of-mind of an extensive aftermarket service network. A highly-skilled team of certified technicians, regularly trained in the installation, maintenance and repair of Carrier Transicold refrigeration products, are ready to support customer fleets across a network of 35 service centres in India.

Source: <http://www.carrierindia.com>

India-US Task Force on HFCs

Moving a step forward to resolving the tussle over phasing out HFCs, US President Barack Obama and Indian Prime Minister Manmohan Singh have agreed to immediately convene the India-US Task Force on hydrofluorocarbons (HFCs) to discuss ways to use the Montreal protocol to phase-out HFC — gases used in refrigerators and air conditioners that contribute to global warming but are not ozone depleting.

India's Ministry of Environment & Forests has so far held that HFCs should be dealt with under the UN Framework for Climate Change (UNFCCC) and the Kyoto Protocol that address the issue of green house gas emissions and not the Montreal Protocol that is specific to ozone depleting substances.

The green ministry's contention is that bringing HFCs — of which India besides other developing nations is a major consumer — under the Montreal Protocol will compel the country to switch to alternative, expensive and inadequately tested technology from developed nations.

Source:
<http://www.indianexpress.com>

Opportunities in transition to hydrocarbons

During the 33rd Open-Ended Working Group (OEWG) meeting of the Parties to the Montreal Protocol a side-event was organised by the UNEP Ozon Action to discuss the special challenges of small-island developing states (SIDS) in phasing out ozone depleting substances (ODS) as well as in their efforts to transition to climate-friendly alternatives. Out of 197 Parties to the Montreal Protocol, 39 are recognised by the United Nations to be part of the group of small islands developing countries.

While different specific challenges apply to each of the island states the speakers agreed that the unavailability and difficult accessibility of ozone- and climate-friendly alternatives is one of the most significant challenges.

Several thoughts on the way forward were shared:

- Public education and awareness raising;
- Capacity building — training;
- Financial incentives to encourage transition to low-GWP alternatives; and
- Building regulatory infrastructure — codes and standards.

In his presentation, Mr Leslie Smith from the National Ozone Unit in Grenada suggested the following approaches to 'leap-frogging':

- Avoid HFC technology selection for new equipment as much as possible;
- Replace HFC equipment in service with low-GWP alternative where possible;
- Improve training, recovery and recycling;

- Introduce or amend to codes and standards; and
- Introduce disposal and destruction technologies.

Mr. Rajenda Kumar Foolmaun from the Ministry of Environment & Sustainable Development of Mauritius highlighted that the objective is to implement the HCFC phase-out programme 5 years ahead of the deadline period of 2030 and explained that this will be possible especially as a result of a good collaboration among all stakeholders in Mauritius. In addition, since there are only two entry points (airport and harbour) to the country, the control of imported goods is very effective.

Source:

<http://www.hydrocarbons21.com>

China's ODS control

On 7 August, the China's Ministry of Environmental Protection (MEP) has released a circular (Notice 179 of 2013) to instruct manufacturers, users and sellers (inclusive of importers and exporters) of hydrochlorofluorocarbons (HCFCs) operating details for HCFC quota license application and/or record-keeping with the local environmental authorities.

HCFCs are a group of volatile organic compounds with similar chemical structure to Chlorofluorocarbons (CFCs), Hydrobromofluorocarbons (HBFCs) and Halons. HCFCs are normally used as refrigerants in refrigerators, freezers and air conditioning systems and also in insulative foams.

Since the release of these substances can destroy the ozone layer and contribute to global warming, their use in industry is being phased out in most of the developed countries. In China, all of the four categories of chemicals (HCFCs, CFCs, HBFCs and

Halons) have been included in the MEP issued national controlled ODS list in 2010. As stipulated in Decree 573, China has established since June of 2010 the system of volume control and quota management for the manufacture, use, import and export of ODS.

Detailed requirements for the HCFC quota application (for manufacturers and users) and the record-keeping application (for users, sellers, importers and exporters) can be downloaded from China's official website, "Ozone Action in China" (www.ozone.org.cn).

Source: <https://www.chemlinked.com>

Ban on second hand refrigerators in Sri Lanka

The National Ozone Unit (NOU), of the Ministry of Environment and Renewable Energy, Sri Lanka, will ban all imports of second hand refrigerators and air conditioners to stop Ozone depleting substances (ODS) entering the country.

National Ozone Unit Director G. M. J. K. Gunawardana said that the impending ban would include the import of second hand high cooling racks in Sri Lankan super markets as some of them contained ODS.

The official said that all developed countries had started to remove refrigerators, air conditioners and other ODS emitting electrical goods in order to eliminate such destructive gases by 2020. Gunawardana said unfortunately developing countries such as Sri Lanka imported those goods at a low price. "That was the reason for planning to ban second hand imports of refrigerators and air conditioners," he said adding that no Ozone depleting substances were produced in Sri Lanka but all imported perfumes,

aftershaves, hair spray, deodorants, pesticides etc. were based on chlorofluorocarbon (CFC), which caused Ozone depletion.

Source: <http://www.island.lk>

Tajikistan's national HCFC phase-out strategy until 2020

Hydrochlorofluorocarbon (HCFC), a group of ozone-depleting chemicals, is used in a variety of applications such as refrigerants, foam-blowing agents, solvents, fire extinguishers and aerosols. In some cases HCFCs have replaced CFCs use due to their lower ozone depleting potential (ODP). The use of HCFCs is controlled by the Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal protocol). The Montreal Protocol was designed to reduce the production and consumption of ozone depleting substances in order to reduce their abundance in the atmosphere, and thereby protect the earth's fragile ozone Layer. The original Montreal Protocol was agreed on 16 September 1987 and entered into force on 1 January 1989. The Montreal Protocol includes a unique adjustment provision that enables the Parties to the Protocol to respond quickly to new scientific information and agree to accelerate the reductions required on chemicals already covered by the Protocol.

Republic of Tajikistan ratified Montreal Protocol in 1998 and since that time active work on phasing out ozone depleting substances (ODS) is being carried out. In 2002, a Country Programme on ODS Phase-out was developed and endorsed by the Government of the Republic of Tajikistan.

The UNDP/GEF Project "Initial Implementation of Accelerated

HCFC Phase-Out in the CEIT Region" is a response to the obligations incurred by Tajikistan under the phase-out schedule for HCFCs of the Montreal Protocol. It is a timely capacity building effort (with investment elements for the servicing sector) that is designed to improve regulatory measures to help address the accelerated HCFC phase-out in the medium and longer term, and to strengthen the country's preparedness for the complete phase-out of HCFCs from current use.

One of the main components of the project is development and endorsement of the HCFC Phase-out Strategy until 2020. The main objective of the strategy was to help ensure that the country would be in respect of the obligations assumed under Decision XIX/6 of the Parties to the Montreal Protocol on the accelerated phase-out of HCFCs. To this end, Inter-agency Task Force Group from number of the Committee on Environmental Protection under the Government of the Republic of Tajikistan, Ministry of Energy and Industry of the Republic of Tajikistan, Ministry of Economic Development and Trade of the Republic of Tajikistan, Agency on Statistics under the President of the Republic of Tajikistan, Customs Service under the Government of the Republic of Tajikistan and Ministry of Education of the Republic of Tajikistan as well as Association of Refrigeration has been established.

Source: <http://www.undp.tj>

Largest test center for flammable refrigerant R290

In July, the Shanghai Quality Supervision, Inspection and Quarantine Bureau in China established a testing centre for the

R290 refrigerant. The centre is part of the government's efforts to promote hydrocarbons as refrigerants in room air conditioner production in China.

China's largest explosion proof laboratory for refrigerant R290 air conditioner testing will be the main explosion-proof center. The lab is the first official explosion proof laboratory for R290 air conditioners in China. Its key function will be to undertake safety and energy efficiency tests for air conditioners using flammable refrigerants like R290. The center will exam the safety of R290 ACs produced by major air conditioner manufacturers in China.

In order to promote the use of hydrocarbons as the main alternative refrigerant in the production of domestic air conditioners, China has officially allowed the use of R290 in the production of air conditioners, as decreed by the National Safety Standard for Flammable Refrigerants, which came into effect on May 1st 2013. The advances in R290 AC technology have been seen by some Chinese AC manufacturers as an opportunity to establish their dominance in the global air conditioner market. Several major domestic air conditioner manufacturers, such as Haier, Midea and Gree, have established a mature R290 air conditioner production capacity. Others are accelerating their R&D efforts in order to develop R290 air conditioners.

Source:

<http://www.hydrocarbons21.com>

Maldives to ban import of goods containing ODS

The Maldives will ban the import of goods containing ozone

depleting substances, including environmentally harmful hydro-chlorofluorocarbons (HCFC), reports local media.

Environment Minister Mariyam Shakeela signed a memorandum of understanding with the Maldives Customs Service Commissioner General Mohamed Aswan to facilitate the implementation of the “Montreal Protocol on Substances that Deplete the Ozone Layer”. Shakeela noted that imports of air conditioning, freezers, mini-bars and water coolers containing HCFC would soon be banned. “We are now getting ready for that. But such moves aren’t possible without the assistance of institutions such as customs,” she said.

Source: <http://www.minivannews.com>

Media workshop on protecting the ozone layer

A workshop to inform journalists on the importance of protecting the ozone layer and other scientific facts was held on August 22 and 23 at the Kanneliya Forest Resort in Sri Lanka. It was organized by the National Ozone Unit of the Ministry of Environment and Renewable Energy, Government of Sri Lanka.

On its first day the keynote address was made by the Director of the National Ozone Unit G.M.J.K. Gunawardena on protecting the ozone layer and relevant scientific information. A documentary film on protecting the ozone layer was also screened. The special characteristic of this workshop was that it practically introduced the importance of trees, rocks, animals

and peculiarly reptiles by visiting the Kanneliya National Park.

Source: <http://www.news.lk>

Subsidy for environment-friendly cooling systems

The Peninsula Manila in Philippines has received a P1.3-million subsidy from the Department of Environment and Natural Resources (DENR) for converting its air conditioning system into an environmentally-friendly one. The subsidy represents 15 percent of the acquisition cost of Peninsula’s newly-installed chiller that uses ozone-friendly refrigerants that comply with the requirements of the Philippine Chiller Energy Efficient Project (PCEEP) which is assisted by the World Bank. The project, implemented by the DENR, aims to speed up the replacement of inefficient chillers and other cooling equipment that contains ozone-depleting substances (ODS). The project is funded by a grant of \$2.6 million from the Global Environment facility (GEF) and the Ozone Trust Fund worth \$1 million.

The Peninsula Manila is the first beneficiary of the PCEEP. “We hope that hotels, and manufacturing industries can follow this project so they can contribute to the reduction of ozone depleting substances,” said DENR Secretary Ramon Paje during the recent ceremonial turnover of the subsidy to Peninsula Manila at the Ninoy Aquino Parks and Wildlife in Quezon City. A chiller is the main component in refrigeration and air cooling systems in buildings. The DENR said old chillers use as refrigerants ODS and greenhouse gases such as

chlorofluorocarbons (CFCs) and hydrofluorocarbons (HFCs).

The Peninsula Manila enrolled in the PCEEP its 577 tons of refrigeration in December 2010. In May 2011, a sub-grant agreement was signed between DENR and the hotel to formalize its participation in the project. In July 2012, the new energy efficient chiller was installed in the hotel to serve its air conditioning needs. PCEEP is carried out in support of the country’s commitment to the Montreal Protocol on Substances that Deplete the ozone layer and the Kyoto Protocol to the United Nations Framework on Climate Change.

The primary objective of the project is to reduce greenhouse gas emissions by replacing old chillers with energy efficient ones. The project ends on Jan. 1, 2017. Throughout its lifespan, a total of 20 sub-agreements are expected to be signed. Owners of new chillers enrolled in the program can turn their savings from electricity into revenues by selling these in the carbon finance trading under the Clean Development Mechanism.

Aside from the Peninsula Manila, also enrolled in the PCEEP are SM Malls, Trinoma, Greenbelt, Manila Pavilion, Waterfront Insular Davao Hotel, Marco Polo Davao, Philamlife, Bank of the Philippine Islands, Security Bank, Philippine National Bank, and Lufthansa Airlines. Government offices also enrolled in the program are the Bangko Sentral ng Pilipinas, Ninoy Aquino International Airport, Mactan Cebu International Airport Authority, Social Security System, and Cultural Center of the Philippines.

Source: <http://www.philstar.com>

The next generation hydrocarbon compressor

Tecumseh, a global manufacturer of hermetic compressors, condensing units and systems for use in commercial refrigeration applications has introduced its AE² compressor. The AE² compressor, optimised for hydrocarbon refrigerant R290 (propane), has an expanded capacity range. The product is designed for space-restricted environments, allowing for optimisation of the refrigerated cabinet and ease of service for the field technician.

The launch of the AE² compressor was of particular importance in 2011 as the U.S. Environmental Protection Agency (EPA) had authorized hydrocarbon refrigerants for use in commercial and residential applications in the U.S. that very same year, with approval of the Significant New Alternatives Policy (SNAP). With fifteen (15) plus years of design and application experience related to hydrocarbon refrigerants, Tecumseh continues to strengthen its position in commercial refrigeration for small and medium-size capacities.

Basic specifications of the AE² compressor include:

- Reduced Energy Consumption.
- Efficiency of 9+ EER with R290 applications in HBP conditions.
- Evaporating Ranges:
 - High Temperature: +5°F to +59°F (–15°C to +15°C)
 - Low Temperature: –40°F to +10°F (–40°C to –10°C)
- Capacity: 1/5 HP through 3/4 HP.
- Connections: Copper braze suction and discharge connections.

- Agency Approvals required to support customer and regional requirements.

Source:

<http://www.hydrocarbons21.com>

MHI develops lubricant oil-free centrifugal chillers

Mitsubishi Heavy Industries Ltd. (MHI) has developed two models of highly efficient centrifugal chillers featuring a totally lubricant oil-free magnetic bearing system. The new models, which use HFC-134a, a chlorine-free and zero ozone depletion potential (ODP) refrigerant, achieve higher energy-saving performance than the pre-existing ETI-40 models, and will enable further reductions in energy consumption for customers while at the same time contributing to efforts to prevent global warming through lower CO₂ emissions. The adoption of the new magnetic bearing system — the first application in Japan in commercial-use centrifugal chillers — eliminates the need for lubricant oil. As no oil changes are required, significant reductions are realized in maintenance work and related costs. The two newly developed models — the “ETI-40MB and 50MB” — offer cooling capacities ranging from 350 to 500 refrigeration tons*1 (RT). They will be launched into the Japanese domestic market this fall as new additions to the company’s “ETI Series” of compact centrifugal chillers with built-in inverters.

In the compressor of the new models — which is the core component of centrifugal chillers — MHI has adopted a magnetic bearing system for the rotation shaft of the impeller; this system causes the shaft to float, enabling reduction in friction drag to a minimal level. The

impeller blades have also been newly designed. Through these innovations, the new models have achieved even higher compressor efficiency. Adoption of the magnetic bearing configuration also significantly reduces both maintenance work and related costs by eliminating the need for lubricating oil and oil filter changes.

Source:

<http://www.youroilandgasnews.com>

Development of natural refrigerant heat pump

A highly energy efficient technology, the S-RAM heat pump will also reduce energy consumption for commercial and industrial customers by more than 50 percent when compared to other common refrigeration and heating systems. The system is being developed in coordination with Purdue University, in the United States, and performance testing will be done at DOE’s Oak Ridge National Laboratory, a leading innovator of heat pump technology in the United State.

“This is a big award for us. Energy efficiency and greenhouse gas emissions are major concerns, and the DOE recognized the potential impact of the new heat pump using our company’s proprietary compressor and expander technology,” said S-RAM President Lee Jestings.

Heat pumps offer the most energy-efficient way to heat and cool buildings in many applications. They do this by removing or adding heat from the desired area or application using other natural renewable heat sources like the ground, air and water. Most heat pumps use hydrofluorocarbons (HFCs) to accomplish this, but

S-RAM's heat pump replaces these chemicals with a natural refrigerant, eliminating any greenhouse gas emissions.

Dr. Eckhard Groll, the Reilly Professor of Mechanical Engineering at Purdue University says, "This technology can eliminate the use of high global warming refrigerants and improve energy efficiency while providing comfortable and productive indoor environments for occupants."

Source: <http://www.prnewswire.com>

Industrial refrigeration and deep-freezing

Installed in a meat processing plant in Osnabrück (Germany) is a propane-CO₂ cascade system for refrigeration and deep-freezing in processing and cold storage applications. The technical and constructional innovation of this system is the combination of propane (R290) and CO₂ in one loop. The new, integrated solution reduces the required space as well as installation costs.

The majority of commercial and industrial refrigeration systems using natural refrigerants have previously been used for high capacity ranges. With the new combination, using propane for higher temperature ranges and CO₂ for lower temperature ranges, almost all applications can be covered. Operators and users of refrigeration installations are no longer faced with technical limitations and can take full advantage of natural refrigerants in all capacity ranges. The system installed in the meat processing plant in Osnabrück, Germany, uses propane as a refrigerant in the plant room and propylene glycol to distribute the cold in temperatures ranging between -3°C (return temperature) to -8°C (flow-temperature). The

refrigeration supply in the deep-freezing unit features CO₂ direct evaporation at -32°C. The cooling capacity is 80 kW for refrigeration and 8 kW for deep-freezing.

The technically most appropriate and most efficient power range of the system is:

- For refrigeration: between 50 to 400 kW, in the temperature range from 6 to -10°C;
- For deep-freezing: 10 to 150 kW, in the temperature range from -25 to -45°C.

The technical and constructional innovation of the integrated system is the combination of propane and CO₂ in one loop for refrigeration. Former plants required two separated units to be connected on site with control and piping technology. The new integrated CO₂/propane system reduces the required space and assembly efforts, leading to reduced investment costs.

Source:

<http://www.hydrocarbons21.com>

A heat pump using carbon dioxide as the refrigerant

A new generation of CO₂-based heat pumps developed by Mayekawa Unimo, Japan, could avoid the high global warming potential of standard refrigerants and generate much higher temperatures.

Over the past 35 years, refrigerants have come under fire — both for their impact on the Earth's protective ozone layer and for their global warming potential (GWP). HCFC-22 (R-22), a hydrochlorofluorocarbon, has long been the most common refrigerant. But it is being phased out according to the international treaty to protect the Earth's protective ozone layer.



A Mayekawa Unimo air-to-water heat pump installation in Australia.

Photo Credit: Mayekawa

R-22 is both a significant ozone depleter and a significant greenhouse gas.

Concerns with HCFC and HFC refrigerants have led to interest in other chemicals that can be used as refrigerants, one of which is carbon dioxide (CO₂). Mayekawa has been selling commercial-scale CO₂-based heat pumps in North America for several years.

Mayekawa offers three different CO₂ heat pumps, the EcoCute water-to-water heat pump, the Unimo air-to-water heat pump and the Sirocco water-to-air heat pump. All three of the Mayekawa heat pumps have 25 kilowatt (kW) motors, so they are considerably larger than the heat pumps used for homes. High efficiency is an important benefit of such systems; they operate at a coefficient of performance (COP) of about 4.0. If they are configured to provide space cooling in addition to hot water (just the water-to-water and air-to-water models), the COP can be as high as 8.0.

Source:

<http://www2.buildinggreen.com>

Paint and coating stripper designed to Remove CARC

Chemical Agent Resistant Coatings (CARC) are claimed to be ODS-free and formulated to resist penetration and damage by the harsh chemicals used to decontaminate equipment returning from combat operations. As a result, these highly resistant coatings also resist penetration by many paint and coating strippers. To prepare the surface when repainting becomes necessary, the difficulty of removing CARC often requires multiple steps and processes.

D-Zolve CARC Remover from Solvent Kleene, Inc., USA, has a special formulation which enables it to break through a highly chemical resistant CARC coating, separating the coating from the substrate and providing a one-step removal of CARC. Because D-Zolve completely removes CARC, it eliminates the need for costly and time consuming additional processes such as sand or shot blasting and high temperature methods. When stripping CARC, D-Zolve will not damage intricate surface details or polished surfaces.

Designed for energy efficient use at low temperatures, D-Zolve CARC Remover performs by immersion. Environmental friendly, it is non-flammable, has very low order of toxicity and does not contain any ozone depleting components or carcinogenic compounds. D-Zolve CARC Remover provides safe stripping of paints and coatings from ferrous and non-ferrous metals including aluminum, copper, brass, stainless steels and carbon steels as well as plastic and silicon substrates. *Contact: Tom Kutai, Solvent Kleene Inc., 119*

Foster Street, Bldg #6, Peabody, MA 01960, USA. Tel: +1-978-531-2279; Fax: +1-978-532-9304; E-mail: sales@solventkleene.com.

Source: <http://www.news.thomasnet.com>

Environmentally compatible fluorinated solvents

AGC Chemicals Americas, USA, is launching a new line of fluorinated solvents that has no flash point, no ozone depletion potential and low global warming potential, making them safer and more environmentally friendly than traditional halogenated solvents. The AsahiKlin AE-3000 Series is designed for use as precision cleaning solvents, moisture displacement fluids, defluxing agents for electronics, and carrier solvents for lubricants.

Developed by the makers of AsahiKlin AK-225, the AE-3000 Series comprises four products that are nonflammable and non-corrosive. They have low surface tensions, low viscosities and high liquid densities, and they are chemically and thermally stable.

"The AE-3000 Series is going to be a significant improvement for manufacturing OEMs of medical devices, electronics, aerospace and optics," said Jim Scott, AGC technical manager for the product line. "Metal fabricators, the military, they're all going to find that

they can improve worker health and safety, and find it much easier to be compliant with environmental regulations even as those regulations become more stringent." *Contact: AGC Chemicals Americas, Inc., 55 E. Uwchlan Avenue, Suite #201, Exton, PA 19341, Tel: +1-610-423-4300.*

Source: <http://www.sustainableplant.com>

ODS-free adhesive

THIXON™ OSN-2-EF one-coat solvent-based adhesive is formulated without reportable levels of lead, chlorinated solvents or ozone-depleting chemicals and is used to bond elastomers to metals. It is used in automotive vibration-control elements, seals and gaskets, bearing elements for buildings and bridges, rollers, solid tires, truck pads for caterpillar vehicles, linings and protective coverings.

Its advantages are: no reportable levels of lead, other heavy metals, chlorinated solvents, or ozone-depleting chemicals, range of products to bond all types of elastomers to a variety of substrates. It can be used with compression, transfer, and injection molding techniques. It is resistant to mold sweep, with good resistance to in-mold prebake. Its bonds resist abrasion, corrosion, oil, water, and solvents.

Source: <http://www.dow.com>

HFC-based solvent

Rx11-flush is a unique solvent that has been engineered for flushing refrigeration and air conditioning systems. Its patented HFC based solvent formulation is powerful enough to flush away sludge, carbon residue, oils, acids, water and other particulate. This makes it ideal for system flushing after burnouts, retrofits and for flushing line sets for R-410A conversions. It is non-toxic, non-flammable and is non-ozone depleting.



AE-3000 series fluorinated solvent

From time to time, refrigeration and air conditioning systems suffer failures which result in contamination. The most common such failure is a compressor burnout. During such an event, the refrigeration system becomes contaminated with large quantities of unwanted particulate, sludge, acids, carbon residues and possibly moisture. All of these contaminants must be removed before the system can be returned to duty. *Contact: NuCalgon, 2008 Altom Court, St. Louis, MO 63146, Tel: +1-800-554-5499; Fax: +1-800-221-6302, E-mail: info@nucalgon.com.*

Source: <http://www.nucalgon.com>

Methyl Soyate: Eco-friendly with performance potential

The rising price of petroleum and increasing concerns about the environmental impact of chemical cleaners and strippers has sparked an interest in bio-based solvents. Methyl soyate, a methyl ester derived from soybean oil, is the key ingredient in an eco-friendly mix. This low-cost, readily biodegradable alternative could replace some of the 460 million pounds of traditional chlorinated and petroleum solvents. Ongoing efforts by the United Soybean Board and the soybean check off seek to increase the methyl soyate utilization as an ingredient or carrier solvent.

Methyl soyate has a high solvency with a Kauri-butanol (KB) value of 58 and has low toxicity when compared to other common substances. In comparison to most commercial solvents, methyl soyate is safer to handle and store due to its high flashpoint of approximately 360°F and high boiling point of well over 400°F. In addition, the Environmental Protection Agency (EPA) does not list me-

thyl soyate as an ozone-depleting chemical (ODC), hazardous air pollutant or volatile organic compound. Methyl soyate's slow evaporation time can be seen as a disadvantage, but in certain applications methyl soyate outperforms other traditional solvents when longer settle times are needed.

An increasing number of companies are beginning to offer multiple formulations of methyl soyate. For example, Soy Technologies, the United States, offers SoyFast, SoyGreen 5000 and SoyGreen 6000, which utilize methyl soyate in the production of industrial cleaners and strippers. In testing, these products have demonstrated effectiveness equal to or exceeding their petrochemical counterparts.

Source: <http://www.soynewuses.org>

Solvent alternatives demonstration project

Zhejiang Kindly Medical Devices Co. Ltd, as the largest manufacturer of one off injection needles, was selected to conduct the demonstration off project for phase-out HCFCs consumption in medical devices sub-sector of solvent sector in China.

KC-6 solvent is a new generation of environment-friendly solvent (zero ozone depleting potential and low global warming potential). It is developed by Beijing Aerospace Technology Innovation Co. Ltd. and Zhejiang Kindly Medical Devices Co. Ltd. A Combination of siloxanes and Isoparaffin etc., the components are easily available on the market at favorable cost through domestic production. It can be used for both silicone oil thinner and cleaning agent of the silicification tooling. Good performance on biocompatibility and drug compatibility.

KC-6 was evaluated better than 141b and KC-3000 by the indicators of puncture force of the siliconized needles. For example, the results on 20G (outer diameter 0.9mm) needles are: KC-6, 0.51N < KC 3000, 0.53 N.

KC-6 featured properties:

- Slight Flammability;
- Higher boiling point;
- Higher cost, about 2 times of cost than 141b and KC-3000.

Source: <http://www.unep.fr>

ODS-free specialty fluid

DuPont-Mitsui, Japan, has developed an ODS-free specialty fluid which performs where maximum cleaning power is needed. The Vertrel® SDG delivers the highest value, offering the following:

- excellent solvency power for a wide range of soils;
- fast drying; low surface tension; nonflammable; and safe to use;
- significantly safe choice vs. TCE and nPB;
- designed to replace ozone-depleting HCFCs such as HCFC-225;
- designed to replace nPB.

Its applications are:

- Medium and Heavy Soil Removal;
- Light Soil Removal;
- Silicone Deposition and Tube Swelling;
- Precision Cleaning;
- Carrier Fluid/Lubricant Deposition.

Contact: DuPont-Mitsui Fluorochemicals Co. Ltd., Chiyoda Honsha Building, 1-5-18 Sarugaku-cho, Chiyoda-Ku Tokyo. 101, Japan. Tel: +1-302-774-1160; Fax: 03-5281-5885.

Source: <http://www2.dupont.com>

High performance, low GWP blowing agent

Arkema, a leader in innovative chemistry, announces a new molecule, Forane(r) 1233zd, for use as a low global warming potential (GWP) blowing agent for polyurethane foams. The new molecule, known in its development phase as AFA-L1, is high purity trans-1-chloro-3,3,3-trifluoropropene, a liquid halogenated olefin.

The development of the Forane® 1233zd blowing agent, in addition to Arkema's recent announcement of planned production for the next-generation refrigerant, HFO-1234yf, are the latest milestones. Forane® 1233zd blowing agent is a liquid, non-ozone depleting, non-flammable, high performance blowing agent with a global warming potential of 7.

Target markets for Forane® 1233zd blowing agent include polyurethane foams used in the manufacture of household refrigerators and freezers, commercial refrigeration, spray foam, and polyurethane panels for commercial and residential building and construction applications.

Source: <http://www.globenewswire.com>

Large-celled extruded foams with zero ODP

Scientists from the Dow Chemical Company, USA, have researched large-celled extruded foams with zero ozone depletion potential. Phase-out of specific refrigerant use within extruded polystyrene foam requires reformulation to meet ever-evolving regulatory considerations; elimination of hydrochlorofluorocarbon-based blowing agents is one such example. Reformulation, however, cannot result in unacceptable changes which impact desired performance.

Further, the differences inherent to hydrochlorofluorocarbon and hydrofluorocarbon blowing agents require additional attention around appropriate co-blowing agent and resin selection strategies. Large-celled hydrofluorocarbon-based foams with zero-ozone depletion potential that can perform in a manner consistent with hydrochlorofluorocarbon predecessors are demonstrated.

Source: <http://www.cel.sagepub.com>

The world's first 100% water blown closed-cell spray foam

Icynene, Canada, has unveiled its latest innovation — Icynene ProSeal Eco™ — a 100% water-blown medium-density closed-cell spray foam. Icynene ProSeal Eco™ does not include any ozone-depleting blowing agents and is considered a smarter replacement for chemically-based medium density, closed-cell spray foam insulation products for architects and designers seeking a more environmentally sound option. In addition to its positive environmental footprint, Icynene ProSeal Eco™ has significantly expanded the number of commercial assembly approvals allowing it to maximize the use of closed-cell spray foam insulation in commercial applications.

It has been comprehensively tested in a range of ASTM E119 approved wall assemblies with cost effective materials resulting in a wider range of commercial application possibilities. With an excellent R-Value and superior adhesion performance, Icynene ProSeal Eco™ is suitable for projects in any climate zone across North America. Contact: Icynene, 6747, Campobello Road, Mississauga ON, L5N 2L7, Canada, Tel: +1-905-363-4040; Fax: +1-905-363-0102.

Source: <http://www.icynene.com>

Owens Corning offers zero ozone-depleting foam insulation

Owens Corning, a global leader in building materials and energy efficiency solutions, has announced it has started manufacturing zero ozone-depleting FOAMULAR(R) Extruded Polystyrene (XPS) rigid foam insulation. The new blowing agent technology developed by Owens Corning meets the requirements of the Montreal Protocol which requires the phase-out of the hydrochlorofluorocarbon (HCFC) 142b, an ozone-depleting compound, by January 1, 2010.

Owens Corning's new Gresham plant is the first facility in the Western U.S., to meet the requirements of the Montreal Protocol and expands the company's XPS foam production capabilities. The company also has converted its Rockford, Ill., insulation plant to use the new blowing agent, and all FOAMULAR products will meet the requirements of the conversion deadline.

Benefits of FOAMULAR insulation include:

- Insulating performance of R-5 per inch, based on real-time aging;
- Virtually impervious to moisture penetration, preventing loss of R-value;
- Twenty-year thermal performance warranty;
- Recyclable and reusable;
- Minimum of 20 percent certified recycled content; and
- GREENGUARD Indoor Air Quality Certified(R) and certified under the even more stringent GREENGUARD Children & Schools (SM).

Source: <http://www.prnewswire.com>

Propellant-free Combivent® Respimat® inhalation spray

Combivent® Respimat® (ipratropium bromide and albuterol) inhalation spray will become the only available short-acting bronchodilator offering two different medicines in a single inhaler. As part of the company's commitment to chronic obstructive pulmonary disease (COPD) patients, Boehringer Ingelheim Pharmaceuticals, Inc., USA, a leader in respiratory health, is updating healthcare professionals (HCPs) and patients that the transition to the inhalation spray for the maintenance treatment of COPD is nearly complete.

Combivent® Respimat® was developed in response to the Montreal Protocol. "We are excited to offer a medication for COPD patients that uses an inhaler which has the ability to convert liquid medication into a slow-moving mist without the need for chlorofluorocarbon-propellants," said Tunde Otulana, M.D., Acting Head, Clinical Development and Medical Affairs, Respiratory, Boehringer Ingelheim Pharmaceuticals, Inc. "Combivent® Respimat® is an example of Boehringer Ingelheim's commitment to providing unique products to help people living with respiratory conditions effectively manage their disease."

The recommended dose for Combivent® Respimat® is one inhalation four times a day as compared to combivent MDI, which is administered as two inhalations four times a day. The total number of inhalations for C Combivent® Respimat® should not exceed six in 24 hours.

Source:
<http://us.boehringer-ingelheim.com>

Reformulation of Stmerin® D CFC formulation

Scientists from Japan have reformulated Stmerin® D using hydrofluoroalkanes (HFA-134a and HFA-227) as alternative propellants instead of chlorofluorocarbons (CFCs), where the active ingredients were suspended in mixed CFCs (CFC-11/CFC-12/CFC-114). Here, we report the suspension stability and spray performance of the original CFC formulation and a reformulation using HFAs.

The scientists, Saburo Murata, Takashi Izumi and Hideki Ito of the Pharmaceutical Research and Technology Laboratories, Astellas Pharma Inc., Yaizu, Japan, prepared metered dose inhalers (MDI) using HFAs with different surfactants and co-solvents, and investigated the effect on suspension stability by visual testing. We found that the drug suspension stability was poor in both HFAs, but was improved, particularly for HFA-227, by adding a middle chain fatty acid triglycerides (MCT) to the formulation. However, the vapor pressure of HFA-227 is higher than a CFC mixture and this increased the fine particle dose (FPD). Spray performance was adjusted by altering the actuator configuration, and the performance of different actuators was tested by cascade impaction. We found the spray performance could be controlled by the configuration of the actuator. A spray performance comparable to the original formulation was obtained with a 0.8 mm orifice diameter and a 90° cone angle. These results demonstrate that the reformulation of Stmerin® D using HFA-227 is feasible, by using MCT as a suspending agent and modifying the actuator configuration.

Source: <http://informahealthcare.com>

Co-polymer stabilizers for pMDIs

A series of novel co-polymer surfactants with the general structure LAmEOnLAm were developed along with a Colloidal Probe Microscopy (CPM) method to optimize the surfactant composition using adhesion forces to improve stabilization of drug dispersions at the Wayne State University, USA. This expands the range of biomolecules and micronized drug particles that can be formulated with pMDIs. New pharmaceutical compositions can be tested and the ideal co-polymer surfactant composition optimized through quantitative measurement of cohesive forces. The biodegradable and biocompatible lactide-based amphiles chosen can stabilize drug dispersions in HFA propellants used in pressurized metered dose inhaler (pMDIs) formulations better than existing excipients.



Surfactant stabilized drug particles

pMDIs are still the most frequently prescribed inhaler device in the world and various spacer combinations and breath-actuated devices have recently improved patient compliance. The technology directly addresses the challenge of reformulation pMDI drugs from traditional CFC propellants to more environmentally friendly Hydrofluoroalkane (HFA) propellants. *Contact: Nicole Grynaviski, Commercialization Principal, Wayne State University, USA, E-mail: nicole.grynaviski@wayne.edu*

Source: <http://www.wayne.technologypublisher.com>

Researchers help growers to optimize MeBr alternatives

California growers have used methyl bromide to effectively sterilize fields before planting since the 1960s. But now this soil fumigant is about to be phased out under an international ban. To help growers find workable substitutes, University of California, the United States, researchers are part of a team working to optimize methyl bromide alternatives for western crops including almonds, strawberries and nursery stock.

A special collection of original research on methyl bromide alternatives is part of the July-September 2013 issue of California Agriculture, University of California's peer-reviewed journal of agricultural, natural and human resources (<http://californiaagriculture.ucanr.edu>). Related articles will appear in the October-December 2013 issue.

Methyl bromide contributes to ozone depletion high in the atmosphere and was banned by developed countries in 2005 under the Montreal Protocol, an international treaty to protect the stratospheric ozone layer. Since then, the treaty has allowed limited use of methyl bromide for certain crops, but many of these exemptions are gone and the rest will end soon.

"One goal of the program was to identify methyl bromide alternatives that were immediately useful and economically feasible," says Greg Browne, a USDA plant pathologist at UC Davis who coordinates the PAW-MBA program. "Another was to foster development of nonfumigant strategies for managing soilborne pests."

The team has identified methyl bromide alternatives that are both effective and economical for key California crops. When the best alternative is another fumigant, the researchers found ways to use less and to cut emissions. In addition, the researchers are developing alternatives that go beyond fumigants, including steam sterilization and other nontoxic approaches.

Source: <http://www.ucanr.edu>

Soil disinfection with ozone (O₃)

Methyl bromide (MeBr) is an effective pre-plant soil fumigant, highly efficient herbicide, nematocide, insecticide, and fungicide, and it is used for many high-input, high-value crops to control soil pests. Being identified as a substance that depletes the ozone layer, MeBr was scheduled under the Montreal Protocol to be completely phased-out by 2005 in developed countries and 2015 in developing countries. In a paper published by the American Society of Agricultural and Biological Engineers, USA, ozone was experimented on three soil pests: *Fusarium oxysporum*, *Phytophthora sojae* and nematodes, to test its potential as an alternative to methyl bromide in soil disinfection. Samples of conidial suspensions of *F. oxysporum* treated with ozone, resulted in total killing of the pathogen with a dose as low as 0.84 mg O₃/L at high ozone gas concentrations, while 31.8 mg O₃/L killed 41% of spores in suspension at a lower gas concentration.

These findings reveal the importance of gas-phase concentration (GPC), which means that at higher GPC (using oxygen as ozone carrier) the ozonation

is much more efficient in killing the pathogen. The bioassay on *Phytophthora* resulted in 100% inhibition of the disease at a dose of 0.47 mg O₃/kg soil. The ozonation of nematode-infected soil showed that ozone LD50 on nematodes is less than 0.5 mg O₃/kg soil. The findings of this research imply that ozone might be an efficient and sustainable alternative to MeBr, especially that it degenerates quickly into oxygen, an environmentally-safe, non-toxic residue.

Source: <http://www.elibrary.asabe.org>

Australian first non-ozone depleting fumigant

Leading gases and engineering company BOC Australia has enabled the logging and timber industries to engage in more sustainable export practices with the launch of an Australian-first non-ozone depleting fumigant.

BOC is pleased to announce that it has achieved official registration with the Australian Pesticides and Veterinary Medicine Authority (APVMA) for its non-ozone depleting EDN fumigant, which will be marketed as STERIGAS® 1000.

BOC's Business Manager, Gas Applications, Chris Dolman, said the new fumigant would help provide certainty for the agriculture and timber sectors, with ozone depleting methyl bromide being phased out due to environmental concerns and international obligations under the Montreal Protocol. It has been found that Tasmanian and New Zealand markets are particularly keen on embracing the non-ozone depleting ethanedinitrile-based STERIGAS®-1000 as an alternative to methyl bromide.

BOC is working with Biosecurity Australia to have STERIGAS®-1000 approved for quarantine pre-shipment as well as further registrations as a soil fumigant for the Australian fruit and vegetable industries. Under BOC's stringent safety standards it will only supply STERIGAS®-1000 to licensed fumigators under its product steward programme. *Contact: BOC Australia, 10 Julius Avenue, North Ryde NSW-2113, Australia. Tel: +61-288-744-400; Fax: +61-298-869-000.*

Source:
<http://www.boc-limited.com.au>

Vegetable growers manage without methyl bromide

For decades, Georgia vegetable farmers in the United States, relied on the soil fumigant methyl bromide to control weeds, insects and nematodes, but recent changes in environmental regulations have led them to find replacements.

Stanley Culpepper, a weed scientist with the College of Agricultural and Environmental Sciences in the United States has been working to find alternatives to the potentially ozone-damaging pesticide. The challenge has been finding something that is as easy to use and as effective as farmers' old standby, methyl bromide. "Since 2007, growers have displaced methyl bromide rapidly because effective alternatives have been developed that are far more economical," Culpepper said.

In fact, vegetable growers have advised Culpepper not to seek a request for methyl bromide use in 2014, due to its high cost and the availability of alternatives. Finding

the right alternatives to methyl bromide has been a challenge for Culpepper, who's devoted almost 10 years to the research project.

One alternative to methyl bromide being used is the UGA 3-way system that uses Telone II, metam sodium, and chloropicrin; each applied at the appropriate place in the soil profile to maximize pest activity. This is the most economical but, it is a very complex system, Culpepper said. He estimates it has replaced methyl bromide on about 70 percent of the acres in Georgia.

Another option is Trifecta, a much easier application that combines Telone II, chloropicrin and DMDS. Culpepper points out that Trifecta is still in development, but he is optimistic 2013 research will result in better, yet economical pest control. The third alternative is the Paladin Pic that includes a 79:21 mixture of DMDS: chloropicrin. It is highly effective in controlling nutsedge and nematodes, but herbicides are needed to control annual grasses and broadleaf weeds.

Source:
<http://www.ipmsouthnews.com>

Researchers study organic alternatives to soil fumigants

University of California (UC), the United States, researchers and national team are examining alternatives to methyl bromide and other soil fumigants. Methyl Bromide depletes the ozone-layer but produces billions in agricultural produce and exports. Organic methods are examined.

The UC California Agriculture magazine reported on field research into alternatives to Methyl

Bromide and other dangerous soil fumigants. Soil fumigation is needed in large scale agriculture for production of strawberries, nut crops and nursery stock. The fumigants commonly used include Methyl Bromide, a soil sterilant tied to ozone layer depletion and chloropicrin, a chemical linked to cancer. These and other sterilants are volatile and drift away from the fields, often into adjacent housing.

The UC report examined everything from reducing exposure to eliminating MB use entirely. They examined films covering the fields to retain the vapors released. These films reduced the chemicals needed and reduced, but did not eliminate emissions. One promising, but expansive, method is steam-sterilization. Heating the soil to 150 degrees for a short period seems to work as well as fumigation, but is 5 times as expensive as chemical treatments. Research has shown a promising and organic method of soil sterilization that rivals the nastiest of ag chemicals but is 100% organic and toxin free. This is called 'anaerobic soil disinfestation'. The method has had varying success in wide-spread trials but is somewhat dependent on technique, soil and weather. The ground to be cleaned is charged with a high-carbon diet. In trials conducted in Modesto, rice chaff was available and what was used. In the Oxnard area, onion processing waste could be used as well as other agricultural waste products. This material is incorporated into the soil which is then saturated with water. Once it is saturated, the soil is covered with a clear poly cover. The carbon material quickly consumes the available oxygen and the soil goes into an anaerobic state.

Source: <http://www.newswire.net>

Blowing Agents and Foaming Processes 2013

Today there are numerous solutions on offer — new methods, resins, technology, processes and additives and it seems that demand for higher performance and lower costs is set to once again drive technical developments in polymeric foams.

Those involved in the manufacture of blowing agents, PU foam insulation and packaging, foam extrusion and equipment manufacture were able to hear, discuss and understand the ways in which they can continue to develop and grow within the market and how our leading panel of speakers addressed such topics and issues.

These proceedings cover all the presentations from Smithers Rapra's fifteenth internationally renowned Blowing Agents and Foaming Processes conference.

Contact: Smithers Rapra, Shawbury, Shrewsbury, Shropshire, SY4 4NR, United Kingdom, Tel: +44-193-925-0383; E-mail: info@smithersrapra.com.

2013 ASHRAE Handbook — Fundamentals

The *2013 ASHRAE Handbook: Fundamentals* covers basic principles and data used in the HVAC&R industry. Updated with research sponsored by ASHRAE and others, this volume includes 1,000 pages and 39 chapters covering general engineering information, basic materials, climate data, load and energy calculations, duct and pipe design, and sustainability, plus reference tables for abbreviations and symbols, I-P to SI conversions, and physical properties of materials.

Principles of Heating, Ventilating, and Air Conditioning

A textbook based on the 2013 ASHRAE Handbook — Fundamentals, provides an attractive text for air-conditioning courses at engineering colleges and technical institutes. The text has been developed to give broad and current coverage of the heating, ventilation, and air-conditioning field when combined with the 2013 ASHRAE Handbook — Fundamentals.

The book should prove most suitable as a textbook and subsequent reference book for (a) undergraduate engineering courses in the general field of HVAC, (b) similar courses at technical institutes, (c) continuing education and refresher short courses for engineers, and (d) adult education courses for nonengineers.

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2014

27-28 Jan
Bhopal,
India

National Conference on Advances in Refrigeration and Air Conditioning (NCARAC-2014)

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27 Feb-1 Mar
New Delhi,
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ACREX India 2014

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Website: <http://www.acrex.in>

9-11 Apr
Beijing,
China

China Refrigeration Expo

Contact: Mr. Jeff Malley
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Website: <http://www.cr-expo.com>

18-21 May
Jeju Island,
Republic of
Korea

The 7th Asian Conference on Refrigeration and Air Conditioning

Contact:
E-mail: acra2014@nate.com
Website: <http://www.acra2014.org>

10-12 Jun
Kuala Lumpur,
Malaysia

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50450 Kuala Lumpur, Malaysia
Tel: +603-217-687-88
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E-mail: revac@ubm.com
Website: <http://www.revac.org>

31 Aug-Sep 2
Hangzhou,
China

IIR Gustav Lorentzen Conference on Natural Refrigerants

Contact:
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Website: <http://www.car.org.cn>

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