VATIS UPDATE

Ozone Layer Protection

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Apprise yourself with the latest technological innovations

Highlights

- Thunderstorms cause depletion of the ozone layer
- Innovative cryogenic transportation system
- A true green solvent
- Inflator-based fire suppression apparatus
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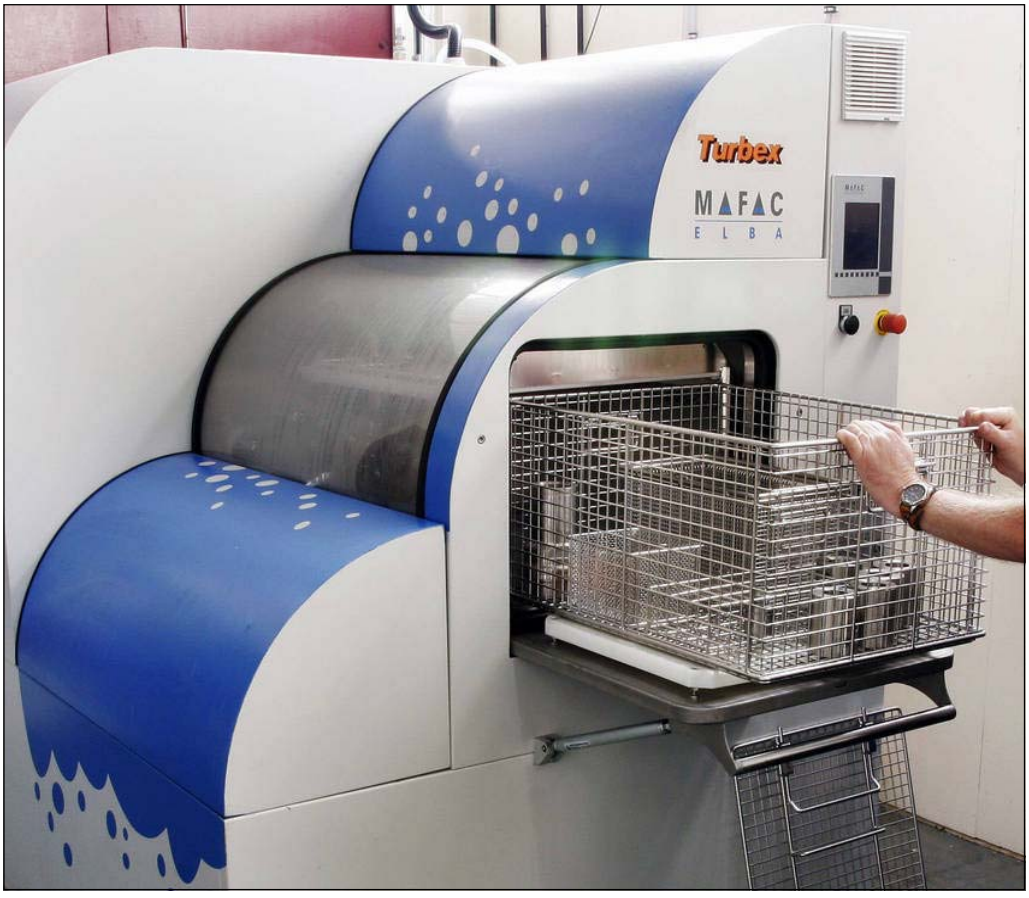
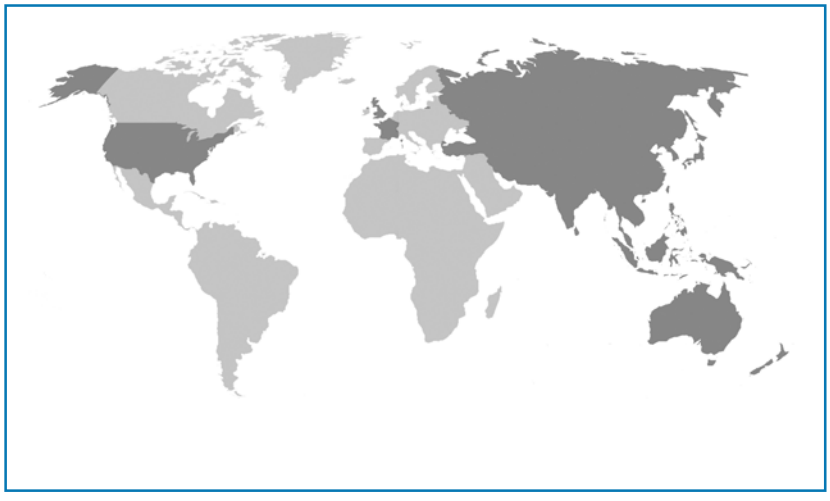


UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific
Asian and Pacific Centre for Transfer of Technology (APCTT)
Ozone Cell
Ministry of Environment and Forests
Government of India

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

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

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



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

Cover Photo

Aqueous Cleaning System for industrial products cleaning from Turbex

(Credit: Turbex Limited, the United Kingdom)

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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Gases from volcanic eruption can deplete ozone layer

Giant volcanic eruptions in Nicaragua over the past 70,000 years could have injected enough gases into the atmosphere to deplete the ozone layer temporarily, according to new research. A similar explosive eruption today could do the same, releasing more than twice the amount of ozone-depleting halogen gases currently in stratosphere due to manmade emissions. Ms. Kirstin Krüger, a meteorologist with Helmholtz Centre for Ocean Research Kiel (GEOMAR), Germany, and her colleagues found that the volcanic eruptions were explosive enough to reach the stratosphere, and spewed out enough bromine and chlorine to have an effect on the protective ozone layer.

Previous studies have estimated that in large, explosive eruptions – the type that sends clouds of ash kilometres high – up to 25 per cent of the halogens ejected can make it to the stratosphere. For this study, the research team used a more conservative estimate of 10 per cent reaching the stratosphere, to calculate the potential ozone layer depletion. Taking an average from 14 Nicaraguan eruptions, the researchers found bromine and chlorine concentrations in the stratosphere jumped to levels that are equivalent to 200 to 300 per cent of the 2011 concentrations of those gases. The Upper Apoyo eruption 24,500 years ago, for example, released 120 megatonnes of chlorine and 600 kilotonnes of bromine into the stratosphere.

Because the effects occur in the stratosphere, where the volcanic gases can be carried across the globe, eruptions of tropical volcanoes could lead to ozone depletion over a large area, Ms. Krüger said, potentially even impacting the ozone over polar regions. Some volcanic gases can remain in the stratosphere for up to six years, Ms. Krüger said, although the most significant impacts from eruptions like Mount Pinatubo in the Philippines, occurred within the first two years. The next step in the study, Ms. Krüger said, is to investigate how much damage to the ozone layer the volcanic gases caused in the past – and what the damage could be from future volcanic eruptions in the active Central American region.

The Apoyo Caldera in Nicaragua, site of a major eruption

Source: www.agu.org

Clouds seed the ozone hole

Atmospheric ozone depletion can take place within newly forming polar stratospheric clouds (PSCs), which serve as the battleground for human-made ozone depleting substances (ODS) to attack and destroy ozone. These clouds form when clusters of frozen water "pick up" other atmospheric molecules such as methane, nitrogen oxides and water molecules, similar to the way a snowball's girth grows as it rolls down a mountainside.

An international team of scientists has uncovered new evidence that these clusters can attract and capture molecules from a much larger volume than the space the clusters physically occupy. The scientists discovered this discrepancy in expected size by mimicking the growth process of cloud seeds in laboratory experiments performed at the J. Heyrovský Institute of Physical Chemistry, Academy of Sciences, the Czech Republic. A beam of water clusters was sent through a chamber filled with a typical atmospheric gas such as methane or water vapour, and the team measured how many molecules the clusters picked up as they passed. They found that the clusters were able to pick up molecules even when those molecules didn't collide directly with the clusters. Theoretical studies supported these results.

The researchers hope that their findings will allow for more accurate models to predict the dynamics of ice particle formation in PSCs, which will in turn impact scientists' understanding of atmospheric chemistry processes like ozone depletion, which increases the amount of harmful ultraviolet light from the Sun that enters the Earth's atmosphere.

Source: www.sciencedaily.com

Massive biofuel production could affect ozone layer

Some of the fertilizers used in biofuel production can release ozone-destroying chemicals, says a new study at the National Institute of Water and Atmospheric Research in New Zealand. If the rate of carbon dioxide (CO_2) emissions were to come down as biofuels replaced fossil fuels, those chemicals could be even more damaging and stall any ozone recovery achieved via cutting back on other gases that deplete ozone. The new research examined possible negative effects from a combination of increased nitrous oxide (N_2O) emissions from biofuel fertilizers and the somewhat

restrained growth of atmospheric CO_2 concentrations because of replacement of considerable fossil fuels by biofuels.

N_2O is well known for its harmful effects in the atmosphere – it destroys stratospheric ozone, can linger for up to 120 years, and ranks above both methane and CO_2 in the potency with which it contributes to global warming. Burning of fossil fuel releases CO_2 that warms the lower atmosphere, trapping the heat. When that happens, the heat doesn't go farther up, into the stratosphere, as it otherwise would. With the stratosphere losing heat to the vacuum of space, but not gaining it from the lower atmosphere, it cools down. This cooling slows down the frequency with which N_2O reacts with ozone. If, however, there was less CO_2 trapping heat in the lower atmosphere, then the stratosphere would be warmer, and N_2O would react with ozone molecules more frequently.

The researchers led by Ms. Laura Revell, a PhD candidate, treated biofuels as if they don't add net carbon emissions to the air from land-use conversion and crop production. They ran simulations to explore the effects on the atmosphere of three greenhouse-gas emissions scenarios over the next century. They adapted two of the scenarios – one a relatively high CO_2 emission scenario, the other with a more modest rate of CO_2 output – from the United Nations Intergovernmental Panel on Climate Change (IPCC). To create their third scenario, the scientists adjusted the more modest of their scenarios to include a lower CO_2 emission rate but also a higher N_2O emissions rate – both from the use of biofuels.

In the high-emissions scenario, atmospheric CO_2 increases by 77 per cent (up to 700 parts per million, ppm), and N_2O increases by 14 per cent (up to 370 ppm) by the end of the century. While CO_2 in greater amounts would increase the greenhouse effect, the scenario is actually a plus for ozone, the simulation indicates. Ozone's concentration would grow by 3 per cent over its current level due to a cooling upper atmosphere. If biofuels production and consumption became widespread by 2100, while CO_2 increases only by a smaller amount (by 35 per cent, up to 525 ppm), an accompanying 36 per cent rise (up to 440 ppm) in the concentration of N_2O would take an unwelcome toll on stratospheric ozone: an almost 1 per cent drop in its average global concentration.

Source: blogs.agu.org

Thunderstorms cause depletion of the ozone layer

Strong summer thunderstorms that pump water high into the upper atmosphere pose a threat to the protective ozone layer, scientists have warned, drawing one of the first links between climate change and ozone loss. Researchers from Harvard University in the United States, who studied the ozone layer over the country, found that thunderstorms send water vapour into the stratosphere which is normally drier than a desert and pose a threat to the ozone layer. The risk of ozone damage, scientists said, could increase if global warming leads to more such storms.

"It is the union between ozone loss and climate change that is really at the heart of this," explained Dr. James G. Anderson, an atmospheric scientist and lead author of the study. For years, Dr. Anderson said, he and other atmospheric

Higher frequency of thunderstorms could deplete the ozone layer

scientists were careful to keep the two concepts separate. "Now, they are intimately connected," he declared. While there is conclusive evidence that strong warm-weather storms have sent water vapour to a height of more than 19 km – by a process called convective injection – and while climate scientists say one effect of global warming is an increase in the intensity and frequency of storms, it is not yet clear whether the number of such injection events will rise.

When Dr. Anderson produced data about five years ago clearly showing these strong injections of water vapour, "I didn't believe it at first," said Dr. Kerry Emanuel, an atmospheric scientist at the Massachusetts Institute of Technology (MIT), the United States. "But we have come to see that the evidence is pretty strong that we do get them." Although the data for the current study was collected in the United States, the researchers pointed out that similar conditions could exist at other mid-latitude regions. More alarmingly, the researchers also believe that this effect on the ozone layer is "irreversible" as the chemical reaction continues and cannot be halted.

Source: www.nytimes.com

Status of India Chiller Energy Efficiency Project

The objectives of the India Chiller Energy Efficiency Project (ICEEP), which started from June 2009 and will run up to June 2014, are to reduce greenhouse gas emissions while simultaneously supporting the completion of the phase-out of consumption of ozone depleting substances (ODS) required under the Montreal Protocol. There are four components to the project. The first component is provision of incentives for investment in energy-efficient chillers. Measurement, monitoring and verification form the second component of the project. As per the methodology approved by the Clean Development Mechanism (CDM) Executive Board, the project is required to monitor data related to the power-output function of the chiller to be replaced, electrical consumption of the new chiller, and cooling output in order to measure energy savings and emission reductions achieved. The third component is technical assistance, which aims to support project readiness and sustainability. The fourth component of the project is project management.

Project implementation has been critically impacted due several externalities, which include:

- Accelerating CFC production phase-out by India by 17 months, which had a significant impact on the number of eligible CFC-based chillers available for conversion;
- Complexities and stringent conditions imposed by CDM and reluctance of beneficiaries to access CDM in uncertain global scenario;
- Delay in approval by Global Environment Facility (GEF), thereby reducing the number of years under the existing CDM regime; and
- Availability of lower cost options such as retrofitting that were considered ineligible under CDM.

The poor performance of the CDM component resulted in the termination of the Emissions Reduction Purchase Agreement (ERPA) in November 2011. Of the estimated 1,000 CFC-based chillers as identified during the chillers survey undertaken in 2001, majority had retrofitted or replaced the chillers, and by October 2011, only 54 chillers had been registered under the programme, with 35 of these having signed the financial agreements. Of these, 21 CFC-based chillers have been replaced to date.

The termination of the component under the CDM – which was an integral part of the project design, implementation modalities as well as financing structure – necessitates a recast of the project design. A task team has held discussions with the Ministry of Environment and Forests (MoEF), Bureau of Energy Efficiency (BEE), IDBI Bank and chiller manufacturers. A mid-term technical mission will review the project shortly.

Source: documents.worldbank.org

India promotes South-South cooperation

Under a South-South co-operation initiative, the Government of India provided support to the Government of the Islamic Republic of Iran on the phase-out of metered dose inhalers (MDIs) propelled by chlorofluorocarbons (CFC)s. The co-operation was on CFC MDI-related technical information exchange associated with the implementation of a phase-out project with assistance from Cipla Ltd., India. Further, in 2011, the United Nations Environment Programme (UNEP) organized a discussion between China and India to discuss how India was able to successfully phase out the production of CFC MDIs. The meeting concluded that China has a strong potential for policy replication, particularly by fast-tracking the regulatory approval processes for CFC-free MDIs, leading to the accelerated transition to CFC-free technologies in China under its National Strategy.

Source: www.multilateralfund.org

A revolution in green air-conditioners

Godrej Appliances has commissioned a new air-conditioner (AC) line to start the commercial production of green ACs for the first time in the world, and with that has launched the Godrej EON Green Balance range of 5 Star ACs. The new range not only exceeds the energy saving rating specified by the Bureau of Energy Efficiency (BEE) for 2012 but surpasses the ratings specified for 2014 standards.

Godrej inaugurated the new production line on 31 March 2012, in Satara district, Maharashtra, for the manufacture of split and window-type ACs with natural, non-ozone depleting and climate-friendly cooling agent (R290). The new R290 (propane) technology is an ideal hydrochlorofluorocarbon (HCFC) alternative for environment-friendly cooling even in high ambient temperatures. The project is implemented by GIZ Proklima under the International Climate Initiative of German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety in co-operation together with the Government of India, represented by the Ozone Cell, Ministry of Environment and Forests.

Source: www.giz.de/en/

Innovative online tool to promote ozone treaty

The United Nations Environment Programme (UNEP) has released a new online version of Informal Prior Informed Consent on Trade of Ozone Depleting Substances (iPIC). iPIC is a voluntary and informal mechanism of information exchange on the intended trade of ozone depleting substances (ODS) between the authorities in importing and exporting countries which are responsible for issuing import/export licenses for the chemicals controlled under the Montreal Protocol on Substances that Deplete the Ozone Layer. Managed and maintained by UNEP OzonAction, this mechanism helps the authorities facilitate and monitor ODS trade and avoid illegal or unwanted shipments.

The new online iPIC system was launched during the Joint Network Meeting of Ozone Officers of South Asia and Southeast Asia and the Pacific, during 15-17 May in Paro, Bhutan. It provides participating countries with real-time, 24-hour, 7-days-a-week personalized access to key licensing system data in each of the participating countries. As of today, the iPIC system holds data from 44 countries including details on more than 950 licensed ODS trading companies to information on equipment or products with trade restrictions. The online iPIC has several useful features including item-specific search and multi-language capability. C*ontact: Mr. Saiful Ridwan, eGroup Coordinator, OzonAction Programme, United Nations Environment Programme (UNEP), Paris, France. Tel: +33 (1) 4437 1624; E-mail: saiful.ridwan@unep.org.*

Source: www.unep.org

Fumigation training for Sri Lankan quarantine officers

Sri Lankan Agriculture Department and Australian Agriculture, Fisheries and Forestry Department have signed a Memorandum of Understanding (MoU) on co-operative biosecurity initiatives. Participating in the MoU signing, Mr. Mahinda Yapa Abeywardane, Sri Lanka's Agriculture Minister, said that the agreement would facilitate the training of quarantine officers of the Ministry of Agriculture and treatment providers of the private sector, by imparting the required skills on methyl bromide (MBr) fumigation to prevent the spread of diseases and introduction of and plant products when exchange of commodities takes place among the countries.

The critical use of MBr for quarantine and pre-shipment applications has to be conducted under the direct supervision of the official organization of the respective country. In Sri Lanka, this responsibility is entrusted to the quarantine officers of the Seed Certification and Plant Protection Centre of the Agriculture Department. The supervision and regulatory activities pertaining to MBr fumigation was hampered by the lack of trained officers. Training is also important to establish a central mechanism to streamline activities relating to MBr fumigation effectively.

Source: www.dailynews.lk

Bhutan takes action to check ODS

Bhutan celebrated the 25th Anniversary of the Montreal Protocol with global partners in Thimphu. Her Majesty Gyaltsuen Jetsun Pema Wangchuck graced the occasion. Since 2004, when Bhutan signed the Montreal Protocol on Substances that Deplete the Ozone Layer, the country has achieved some milestones in environment protection activities. Bhutan made a historic commitment to phase out hydrochlorofluorocarbons (HCFCs) through its HCFC Phase-out Management Plan (HPMP), ten years ahead of schedule.

In addition, Bhutan has committed to support the commitment of carbon neutrality already announced through ensuring that the implementation of HPMP would result in further greenhouse gas (GHG) mitigation of 9.5 per cent of the annual emissions of 1.5 million tonnes of carbon dioxide equivalent. This would be the first step in the comprehensive strategy being unveiled for preserving the unique status of our country in terms of being a large sink of GHG emissions.

Source: www.undp.org.bt

Mongolia moves to control ODS consumption

In June 2012, China, the Islamic Republic of Iran and Mongolia cooperated to conduct a three-day "Enforcement Training on the Montreal Protocol" in Ulaanbaatar, Mongolia. The workshop aimed to build the capacity of enforcement officers in Mongolia, mainly from the Customs department, to prepare them for the nationwide training programme. The national training aims to strengthen Mongolian enforcement officers to monitor and control trade in hydrochlorofluorocarbons (HCFCs) efficiently, especially until 2020 when Mongolia is committed to phase out 35 per cent of HCFC consumption under the Montreal Protocol.

Two officials from China Customs and an officer from the Islamic Re-

public of Iran participated in the workshop as trainers and resource persons. Representatives of Mongolia's Customs and Enforcement departments, the Ministry of Nature, Environment & Tourism, General Agency for Specialized Inspection, General Customs Administration, Customs Divisions and Points and Customs Central Laboratory participated in the training. The United Nations Environment Programme (UNEP) OzonAction's Regional Office for Asia and the Pacific (ROAP) organized the event, in cooperation with the Government of Mongolia.

Mongolia's HCFC import and export licensing system has been in place and operational since 2011, but there is a need to strengthen control and build the capacity of Customs officials and other key stakeholders to enforce the system, and ensure that illegal trade of HCFCs is prevented. Contact: *Mr. Atul Bagai, Senior Regional Coordinator, OzonAction Programme, Compliance Assistance Programme, UNEP Regional Office for Asia & Pacific, United Nations Bldg., Rajdamnern Nok Avenue, Bangkok 10200, Thailand. Tel: +66 (2) 288 1662; Fax: +66 (2) 288 3041; E-mail: atul.bagai@unep.org.*

Source: www.unep.org

Nepal ratifies ozone treaty amendments

On 18 May 2012, Nepal became an official Party to the Copenhagen, Montreal and Beijing Amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer. "This action demonstrates Nepal's extraordinary commitment to phase out ozone-depleting substances (ODS) and guarantees the country the continued technical and financial support for the implementation of the Montreal Protocol," stated Mr. Marco Gonzalez, the Executive Secretary of the United Nations Environment Programme (UNEP) Ozone Secretariat.

The ratification of the amendments, especially the Copenhagen Amendment, was of great importance to Nepal because it is a prerequisite for the country to receive about US$2 million worth of financial and technical assistance for hydrochlorofluorocarbon (HCFC) phase-out activities in the country. Nepal's HCFC Phase-out Management Plan (HPMP) had long been approved but the Multilateral Fund could not release the funds prior to the ratification of the Amendment.

Stating that the country's National Ozone Unit had been very active in promoting ozone layer protection, Mr. Krishna Gyawali, Secretary to Nepal's Ministry of Environment, Science and Technology, said that Nepal was one of the first countries to implement a pilot project for ODS destruction. *Contact: Mr. Atul Bagai, Senior Regional Coordinator, OzonAction Programme, Compliance Assistance Programme, UNEP Regional Office for Asia & Pacific, United Nations Bldg., Rajdamnern Nok Avenue, Bangkok 10200, Thailand. Tel: +66 (2) 288 1662; Fax: +66 (2) 288 3041; E-mail: atul.bagai@unep.org.*

Source: www.unep.org

Philippines pushes non-ODS foam technologies

The Department of Environment and Natural Resources (DENR) of the Philippines is using a grant from the Multilateral Fund (MLF) and the government of Japan, through its Ministry of Economy, Trade and Industry (METI), to push for the phase-out of ozone-depleting substances (ODS) in the foam production sector. With United Nations Industrial Development Organization (UNIDO) as the implementing agency, the Philippine Ozone Desk of DENR's Environmental Management Bureau (EMB) organized a demonstration of the use of supercritical carbon dioxide ($SCCO_2$) in polyurethane foam (PUF) production. The PUF made using the non-ozone depleting $SCCO_2$ was then applied on the roof of an EMB building. Spraying of roofs with PUF has benefits such as lower power consumption, protection of roofing materials and elimination of leaks.

According to DENR Secretary Mr. Ramon Paje, the foam manufacturing sector has shown the most rapid growth, associated with the construction of warehouses, malls, industrial and commercial buildings, and other similar facilities in the country. "For the past ten years or so, spray polyurethane foam has been applied using harmful chemicals such HCFC-141b that deplete the ozone layer. Now, we are finding better alternatives that the sector can use without destroying the environment," Mr. Paje said.

The Philippines had secured the approval of the Executive Committee of the Montreal Protocol in January 2011 for assistance in the implementation of the Foam Sector Plan. A total of US$ 2.26 million was granted for the project. Some 35 companies were identified as potential beneficiaries. The Foam Sector Plan calls for the national phase-out of hydrochlorofluorocarbons (HCFCs), used mainly by the foam, commercial and domestic refrigeration and air-conditioning, solvent, fire extinguishing, and servicing sectors. The plan includes exploring available non-HCFC alternatives such as cyclopentane, $SCCO_2$, all-water, and $SCCO_2$-assisted water blown technologies.

Source: www.gov.ph

Sustainable range of air compressors

An oil-injected screw air compressor from Atlas Copco

Atlas Copco Comptec, the United States, has introduced the next generation of its 40 to 125 hp oil-injected screw air compressor range, featuring improved components that enhance performance, sustainability, efficiency and reliability. The range has three options: the GA 37-90 VSD (50 to 125 hp), the GA 30+-75+ (40 to 100 hp) premium fixed-speed variant, and the GA 37-90 (50 to 125 hp), which delivers solid performance and free air delivery (FAD) in a base package. The GA 30+-75+ can deliver an average 35 per cent energy savings, while eliminating compressor idle time and blow-off loss. The premium efficiency, fixed-speed variant GA 30+-75+ claims industry-leading efficiency and best-in-class FAD.

An improved layout beneath the GA's "cool canopy", combined with its single-ducting principle, help drive performance, efficiency and serviceability. Atlas Copco has also introduced premium efficiency motors, in combination with high-efficiency screw elements, for all ranges. As a result of these features, temperatures at the GA's element have decreased by about -8°C. An integrated dryer option for all machines in the range uses an environmentally friendly refrigerant (R410A) that reduces the dryer's power consumption by up to 50 per cent and does not contribute to ozone depletion.

An integrated design and low-noise operation of the GA range allows the compressor to be placed right at the heart of the production environment. Combined with the integration of the air and condensate treatment equipment, the new GA range offers high versatility. The air compressor's condensate can be safely disposed of directly into a sewage treatment system, due to the GA's integrated condensate treatment, making it suitable for ISO 14001 certified companies. Up to 50 per cent less oil use and lower maintenance demands are the other notable features.

Source: www.sustainableplant.com

Environment-friendly air-conditioning technology

OxiCool, the United States-based developer of environment-friendly air-conditioning technology, has raised US$2.5 million in venture capital to develop its new energy-efficient air-conditioning technology for commercial and military markets. The company is currently working in a joint R&D agreement with the United States Navy, as well as with a large corporation. The company's "solid adsorption-based, heat-actuated cooling system" operates under a continuous, closed-loop cycle, using molecular sieves and water as a refrigerant.

According to OxiCool, its technology generates zero direct emissions, uses no toxic components, does not require a compressor, and is free of harmful refrigerants. In addition, the technology has the ability to store heat energy for later use with almost zero losses, and thus, can allow the cooling to continue after the heat source is shut down, drawing minimal power to run the blower and controls. It has few moving parts and can be retrofitted to many existing applications, according to the company.

Source: smartenergynews.net

Innovative cryogenic transportation system

Linde Gases, a division of the Linde group based in Germany, has announced the launch of a ground breaking cryogenic transportation system called FROSTCRUISE®. The system is a highly innovative in-transit refrigeration system that will provide a more environment-friendly, efficient and reliable cryogenic alternative to diesel-powered mechanical refrigeration. It employs a powerful cooling technology that indirectly uses the cryogenic effect of liquid nitrogen at a temperature of -196°C to provide rapid as well as evenly distributed temperature pull-down.

FROSTCRUISE has the ability to maintain accurate product temperature throughout the truck compartment despite multiple delivery stops, reducing food spoilage and improving food safety. It also provides notable environmental benefits that include substantial noise reduction during deliveries and a much lower carbon footprint than traditional mechanical transportation systems. Unlike existing diesel operated refrigeration systems, FROSTCRUISE mitigates the need for vehicle engines to perform the cooling process and so is substantially quieter than diesel systems, which need to remain running in order to maintain a low compartment temperature. The lack of need to rely on a vehicle engine means also that the refrigeration system can run independently in the event of a mechanical breakdown, pro-

tecting the compartment contents. The feature also results in lower fuel consumption and no emissions released in urban environments.

Source: www.gasworld.com

HFC-free grocery refrigeration system

In the United States, Hill Phoenix, manufacturer of commercial refrigeration equipment, has helped Fresh & Easy Neighbourhood Markets to open a GreenChill Platinum Award-winning store – a store that reduces refrigerant use by 98 per cent and eliminates hydrofluorocarbons (HFCs). While a typical supermarket in the United States uses about 1,590 kg of refrigerant, the new store in Folsom uses just 32 kg. This 98 per cent reduction in refrigerant use helped it earn the highest award from GreenChill, a United States Environmental Protection Agency (EPA) partnership with food retailers aimed at reducing refrigerant emissions and decreasing their impact on the ozone layer and climate change.

The new store uses Hill Phoenix Second Nature medium temperature fixtures and walk-ins running on glycol, as well as low temperature fixtures and walk-ins running on carbon dioxide (CO_2). Glycol and CO_2 are environmentally friendly, natural alternatives to harmful HFC refrigerants. The grocery effectively eliminated HFCs from the store's refrigeration system by using medium temperature glycol to condense the CO_2. The Hill Phoenix Second Nature Compact Chiller (SNCC) employs a unique heat exchanger technology that allows engineers to design typical medium temperature supermarket systems with the lowest refrigeration charge of any commercial refrigeration system on the market. The company says that it enables retailers to achieve a sustainable zero leak rate. SNCC is composed of multiple compact chiller modules, each a stand-alone refrigeration system.

Source: www.appliancemagazine.com

Transcritical CO_2 system for food refrigeration

The luxury store Harrods in London, the United Kingdom, has installed an innovative parallel carbon dioxide (CO_2) compression refrigeration system in its food department in order to replace its ageing R22 and R404A systems. The plant room has three low-temperature/high-temperature transcritical R744 systems that deliver 160 kW each, enough to cool all the cold rooms and more. In a normal CO_2 transcritical system, the flash gas is passed through a pressure reducing valve and fed to the main compressor suction port at a pressure of 27 bar. In this parallel compression system, the gas is fed into a separate compressor operating a suction pressure of 37 bar, resulting in 40-45 per cent of the total refrigerant flow being compressed through a pressure ratio of 2.43:1 instead of 3.33:1 with a significant overall reduction in compressor power input. Waste heat generated by the system is used to heat water for the store.

Source: www.iifiir.org

Intelligent use of heat pumps with natural refrigerants

For its meat processing centre in Landquart, Switzerland, the Swiss meat drying plant Fleischtrocknerei Churwalden AG, used the expertise of SSP Kälteplaner AG, Switzerland, for a sustainable heating and cooling system, using heat pumps and refrigerating machines run on natural refrigerants, ammonia (NH_3) and carbon dioxide (CO_2). The key aspect of the system is that it makes good use of a groundwater stream from the Alpine Rhine valley. Groundwater pumps take water from the stream and then return it in a thermally changed state. The energy gained in this way, by refrigeration or heating, is brought to the required temperatures by refrigerating machines and heat pumps for a wide range of uses.

Using groundwater at 12° and 8°C, a two-stage NH_3 pump is used for heating purposes. The NH_3 charge in the heat pump is around 300 kg. The motor-waste heat and heat from the compressed air and vacuum generation is fed directly into the system, while the NH_3 heat pump discharges the necessary remaining energy. Consistent use is made of any generated waste heat. The two NH_3 refrigerators are cooled with groundwater. The 'warm' groundwater basin acts as a heat source. When the need arises, the heat pump can bring the waste heat from the basin up to a higher temperature.

CO_2 used in the deep-freeze storage rooms is evaporated directly with electronic expansion valves in the room chillers, before passing to the reciprocating compressor where it is liquefied to subcritical state in a cascade condenser. The waste heat from the systems is dissipated to the glycol network at a temperature of -8°C where the heat can be used indirectly. The energy needed for cooling is taken from the 'cold' groundwater basin and used directly for cooling rooms, ceiling, ventilation systems, etc. Apart from the pump conveying energy, no primary energy is used for air-conditioning refrigeration.

Source: www.frigairexpo.co.za

Non-toxic degreaser for metals

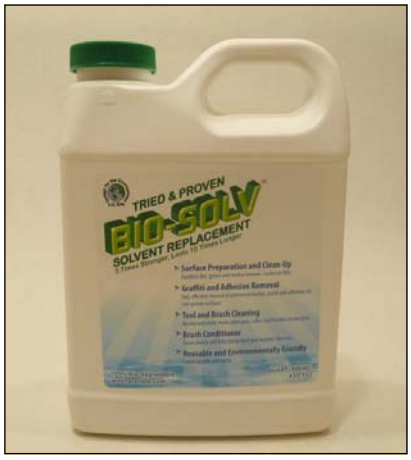
Quick drying D-Greeze 1000 from Solvent Kleene Inc., the United States, addresses the need for a non-toxic, quick-drying degreaser/cleaner that removes lubricating oils and other soils from metal substrates prior to bonding with polyurethane, epoxy and rubber. Metal surfaces cleaned with D-Greeze 1000 are free of contaminants that can jeopardize the integrity of the bonding process.

D-Greeze 1000 is non-toxic, non-corrosive, non-carcinogenic and dries faster than most safe alternatives to chlorinated solvents. It can be used with most existing cold-cleaning equipment, including metal dip tanks, and can outperform trichloroethane without the need for heating. The degreaser is quick-penetrating and functions at room temperature. It dissolves and emulsifies hydraulic oils, stamping oils, greases, lubricating oils and adhesives. It is suitable for use with most ferrous and non-ferrous metals. D-Greeze 1000 is free of ozone depleting components and halogens. *Contact: Solvent Kleene Inc., 119 Foster Street, Bldg #6, Peabody, MA 01960, United States of America. Tel: +1 (978) 531 2279; Fax: +1 (978) 532 9304; E-mail: sales@solventkleene.com.*

Source: news.thomasnet.com

A true green solvent

Bio-Solv™, from Phoenix Resins Inc., the United States, is a proven green solvent replacement that does not contain any ozone depleting, global warming or hazardous substance. It is ideally suited for a variety of marine and industrial cleaning and surface preparation applications, including resin solving, paint and adhesive clean-



Environment-friendly Bio-Solv

up, parts cleaning and degreasing. Bio-Solv performs better than traditional solvents such as acetone, xylene, MEK and thinners. It can be easily recycled though simple filtering or distillation for repeated reuse. The low evaporation rate and high solvency formula can significantly reduce the overall solvent usage. Bio-Solv contains no water and is completely reactive, unlike other green solvents which may contain up to 50 per cent water.

Bio-Solv was developed in conjunction with the Design for the Environment programme of the Halon Alternative under the Significant New Alternative Policy (SNAP) of the United States Environmental Protection Agency (EPA). Its physical properties include:

- Flash point of 65°C, ASTM D93;
- Boiling point of 149°C;
- Specific gravity of 0.988;
- Evaporation rate of 0.14; and
- Vapour pressure of 0.54 mmHg at 20°C; and
- Vapour density of 4.6.

Bio-Solv is a non-inflammable liquid and leaves no residue after drying. It cleans polyester, vinyl ester and epoxy resins from tools and guns, and is effective against polyurethanes, varnishes, enamels and ultraviolet curable coatings. It has a high solvency and can effectively replace all petroleum-based solvents. *Contact: Phoenix Resins Inc., 602 Union Landing Road, Bldg #3, Cinnaminson, NJ 08077, United States of America. Tel: +1 (856) 303 9245; Fax: +1 (856) 303 2889.*

Source: www.greenacetone.com

Duster and freeze sprays with eco-friendly propellant

Eco-Duster and Eco-Freezer from Techspray Inc., the United States, are formulated with HFO-1234ze propellant, to offer eco-friendly drop-in replacements for products based on HFC-134a. Duster blows away dust, microscopic contaminants, lint, metallic oxide deposits and other soils that can cause heat build-up or short circuit in sensitive electronics. Freeze spray employs a rapidly evaporating liquid that super-chills isolated areas. Both products are non-inflammable and non-ozone depleting with zero residue or odour.

HFO-1234ze has a global warming potential (GWP) of 6, compared with 1,300 for HFC-134a and 140 for HFC-152a. As HFO-1234ze is lighter than HFC-134a, there is also 8 per cent more volume and blasts per can. Both Eco-Duster and Eco-Freezer are fully compliant with European Registration, Evaluation, Authorization and Restriction of Chemical Substances (REACH) and Waste Electrical and Electronic Equipment (WEEE) directives. *Contact: Techspray Inc., #1001 Northwest 1st Street, Amarillo, TX, 79107, United States of America. Tel: +1 (806) 372 8523; Fax: +1 (806) 372 8750; E-mail: tsales@techspray.com.*

Source: news.thomasnet.com

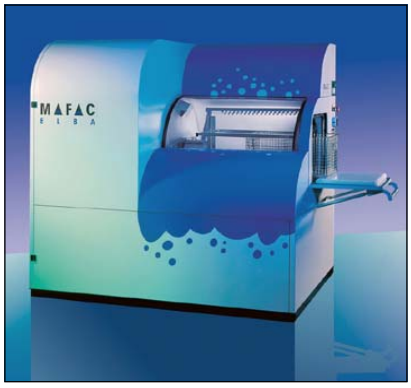
Composition for cleaning printing presses

Explorer Pressroom Solutions Inc., the United States has patented a composition – comprising a hydrocarbon solvent, an aromatic solvent, a methylated siloxane and a surfactant – that is useful in cleaning printing presses. The patent also covers a method of preparing an emulsion for cleaning purposes, comprising mixing the solution of the above composition at a rate of greater than 500 rpm for at least two hours. It also describes a method of contact-cleaning a printing machine's rollers, plates and blankets using the cleaning solution.

Source: www.freepatentsonline.com

New aqueous cleaning systems

Turbex Limited, the United Kingdom, offers aqueous cleaning systems that do not use solvents that are ozone-depleting. The model Elba is a batch cleaning machine that is very versatile in operation. It has a dual wash tank, integrated warm air drying and an easy to use control that stores cleaning programmes without complicated codes. The programmable Elba has the ability to use three types of cleaning cycle for components. First, to prevent components clashing together, the loading basket is held stationary in its home position while water jets run around it, spraying water from every angle. This is ideal for cleaning light and simple parts, particularly those with turned diameters that need to be protected. A second cleaning programme involves rocking the basket through ±10°, offering extra access to components for better cleaning, while still keeping the components



Turbex aqueous cleaning system

away from each other to prevent potential damage. Third, one or several larger parts are fixed into a basket and rotated through 360°.

The AC-1.7-2-LD is a heavy duty aqueous washing machine in the Turbex range of front-loading, spray washing and rinsing models. It is popular for degreasing, precision cleaning, phosphating, de-rusting, de-scaling and paint removal. Manufactured from stainless steel, the model has both single- and multi-stage units with options for one, two or three process tanks. While standard sizes range from 1-2 m in diameter, larger machine sizes are available. *Contact: Mr. John Huntingdon, Managing Director, Turbex Limited, Unit 1, Riverwey Industrial Park, Newman Lane, Alton, Hampshire GU34 2QL, United Kingdom. Tel: +44 (1420) 544909, 544909; Fax: +44 (1420) 542264; E-mail: john.huntingdon@turbex.co.uk; Website: www.turbex.co.uk.*

Source: news.thomasnet.com

Solvent cleaning of oxygen regulator components

Novaline Critical Cleaning Technologies, Australia, offers Novaline KineticKleen™ Degreaser system for pre-assembly cleaning of various oxygen regulator components. The system employs DuPont specialty fluid Vertrel® MCA. DuPont Vertrel specialty fluids are a family of hydrofluorocarbon-based solvents with zero ozone depletion and low global warming potential, ideal for use in vapour degreasing equipment for cleaning, rinsing, drying and carrier-fluid applications. Vertrel MCA is suited for medium- to heavy-duty precision cleaning application, light soil removal from solvent-sensitive substrates, oxygen system cleaning, etc.

The cleaning process comprises the following steps:

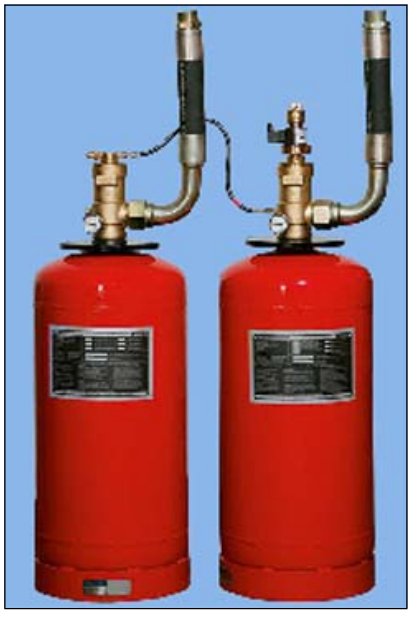
- A basket load of components is first lowered into the degreaser vapour zone for a vapour rinse to remove soluble contaminates;
- An ultrasonic wash in the immersion sump removes particulate matter to comply with the stringent standards required on oxygen equipment;
- Final vapour rinse ensures that pure vapour has the final contact with parts; and
- Freeboard dwell retains solvent vapours within the equipment minimizing consumption and workshop vapour.

The KineticKleen Degreaser system is suitable to clean components made of brass, steel and polychlorotrifluoroethylene (PCTFE). It cleans machining fluids, particulates, swarf, oils and fingerprints off the components. The advantages claimed include: improved cleaning; smaller equipment footprint; lower solvent consumption; lower operational costs; and solvent recycling and reclamation. *Contact: Novaline Critical Cleaning Technologies, Unit 6, Taren Point Industrial Estate, No. 7 Production Road, Taren Point, NSW 2229, Australia. Tel: +61 (2) 9527 7050; Fax: +61 (2) 9527 7051.*

Source: www.novaline.com.au

Waterless fire suppression system

With the introduction of its new VK-1230 clean agent system, Viking Corporation, the United States, has extended its leading portfolio of innovative fire protection systems to include waterless suppression technology. The VK-1230 system is designed to protect even the most sensitive environments, including hospitals, server rooms, security command areas, telecommunications equipment, museums, data centres, libraries and other properties where the potential for water damage is a concern. Using 3M® Corporation's Novec™ 1230 extinguishing agent, the VK-1230 system provides effective, specialized protection while leaving valuable and critical assets unaffected.



VK-1230 clean agent system

Combined with fire detection/warning systems, the VK-1230 clean agent system can provide very early suppression of a fire in its pre-combustion stage. After discharge, the Novec 1230 extinguishing agent will not damage electronics and leaves behind no residue, which dramatically reduces clean-up and minimizes downtime. Novec 1230 also has a higher safety margin compared to other extinguishing agents, making it safer for people working in the protected area. Furthermore, with its low toxicity, zero ozone depletion potential (ODP), short atmospheric lifetime, and minimal global warming potential (GWP), Novec 1230 is safe for the environment and a long-term, sustainable alternative to halons.

The new VK-1230 clean agent systems – which are suitable for class A, B, and C fires – are uniquely designed to match the specific requirements of each application, delivering a precisely calculated concentration of clean agent gas to the protected area. Each system is designed with considerations for the type of detection, control panel, tank arrangement, actuation, distribution piping, discharge nozzles, notification devices, and other components. *Contact: Viking Corporation, 210 N. Industrial Park Road, Hastings, MI 49058, United States of America. Tel: +1 (269) 945 9501; Fax: +1 (269) 945 449; E-mail: techsvcs@vikingcorp.com; Website: www.vikinggroupinc.com.*

Source: news.thomasnet.com

Inflator-based fire suppression apparatus

In the United States, Alliant Techsystems Inc., together with three inventors, is patenting an improved fire suppression apparatus, which employs an inflator-type gas generator device, and associated or corresponding methods of or for fire suppression. The invention aims to provide an effective alternative to halocarbons, which are ozone depleting substances (ODS), for fire suppression and associated applications. The fire suppression apparatus includes a housing that has a first chamber containing a quantity of gas generating device. It also includes an initiator that is operatively associated with the first chamber and initiating a reaction in the gas generating substance. The initiator, upon actuation, acts or serves to ignite at least a portion of the quantity of gas generating substance to form gas. The housing also has a second chamber, situated adjacent to the first chamber, that contains a quantity of an endothermically alterable material, and a piston assembly. The housing has at least one discharge opening for the cooled gas to exit the housing.

In one method of operation, at least a portion of the gas generating substance is ignited to form gas. The piston moves to expel at least a portion of the quantity of endothermically alterable material from the second chamber such that the expelled material contacts and cools gas formed by the ignition of the gas generating substance. The cooled gas is then directed onto an area of the fire to suppress the fire. *Contact: Alliant Techsystems Inc., #7480 Flying Cloud Drive, MN05-1WMinneapolis, Minnesota 55344, United States of America.*

Source: www.sumobrain.com

Study on ultra-fine water mist

In China, a team of researchers from State Key Laboratory of Fire Science, University of Science and Technology of China, and Department of Building and Construction, City University of Hong Kong, has studied the fire extinguishing performance of ultra-fine water mist in cup burner. Two simplified models for predicting minimum extinguishing concentration (MEC) of ultra-fine water mist (UFM) (<10 μm)

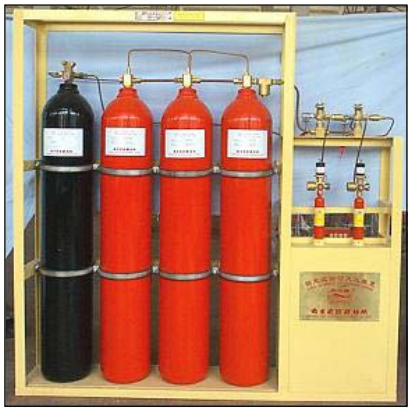
were developed based on limiting oxygen concentration (LOC) and combustion limit temperature (CLT), respectively. Experiment was conducted using a modified cup burner that can reduce the surface adsorption of UFM. Two typical liquid fuels, n-heptane and ethanol, were used in the experiment.

Tests using the same scenario were repeated 20 times or 10 times according to the variance of extinguishing time. The average and the standard deviations of extinguishing time were used to evaluate the fire extinguishing performance of UFM. Experimental results agree well with the model based on LOC, and disagree with the model based on CLT. The disagreements were explained by analysing flow behaviour of UFM. It was concluded that the primary mechanism of fire extinguishment with UFM was oxygen dilution. *Contact: Ms. XiShi Wang, State Key Laboratory of Fire Science, University of Science and Technology of China, Hefei, 230026, China. E-mail: wxs@ustc.edu.cn.*

Source: rd.springer.com

Water mist fire extinguishing system

Nanjing Fire Protection Technology Co. Ltd., China, offers a fire extinguishing system based on dispersion of water mist. The system has the advantage of a high fire fighting efficiency while not being hazardous to the environment. It can replace gas fire extinguishing systems that employ halocarbon products (halons), which are harmful for the environment, or water spray systems, which cause water damage to assets. The company offers pump type water mist system and tank stored pressure type water mist system. *Contact: Nanjing Fire Protection Technology Co. Ltd., 12, Shiyang Road, Nanjing, Jiangsu, 210007 China.*



Nanjing Fire Protection Technology Co.'s fire protection system

Source: www.made-in-china.com

Inert gas fire suppression system

Argonite™ System from Kidde Fire Systems, the United States, is an engineered system for total flooding of enclosed spaces. It uses Argonite – a simple, inert blend of 50 per cent argon gas and 50 per cent nitrogen gas with a density similar to that of air – that suppresses fire by depleting oxygen in the protected space. Argonite has zero ozone depletion potential (ODP) and zero global warming potential (GWP). The agent is cost-effective produces no secondary products of combustion when exposed to flame.

The system is environmentally safe and requires only minimal post-fire clean-up. It can be used to extinguish Class A, Class B or Class C fires. The system is particularly suited for leaky enclosures such as flight simulators, sub-stations and control rooms, and for applications with multiple hazards. It includes detectors, a control unit, storage cylinders, piping and discharge nozzles. *Contact: Kidde Fire Systems, 400 Main Street, Ashland, MA 01721, United States of America. Tel: +1 (508) 881 2000; Fax: +1 (508) 881 8920; E-mail: eric.moore@fs.utc.com; Website: www.kiddefiresystems.com.*

Source: products.construction.com

HFC-227ea clean agent fire suppression system

Power Shield Science Technology Inc., China, offers a clean agent fire suppression system that uses HFC-227ea to extinguish Class A, B, C and electric fires using a fast discharge in eight seconds. HFC-227ea, also called heptafluoropropane, is a colourless, odourless, environmentally safe, gaseous halocarbon extinguishing agent. The agent has zero ozone-depletion potential (ODP), low global warming potential (GWP) and a comparatively short atmospheric lifetime (31-42 years). The non-polluting, non-conducting fire suppression agent is designed for working pressures 2.5 MPa, 4.2 MPa and 5.6 MPa, and requires only low working pressure pipe network. *Contact: Power Shield Science Technology Inc., Power Shield industry Park, Chibi City, Hubei Province, China 437300. Tel: +86 (715) 590 3027; Fax: +8 (715) 590 1333.*

www.alibaba.com

Vital Ozone Graphics 2.0

Vital Ozone Graphics 2.0 - Climate Link, Resource Kit for Journalists, provides the essential visuals, facts, links and contacts to develop ozone story ideas. For more information, contact:

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Fax: +33 1 4437 1474
Email: ozonaction@unep.org

HCFO-1233zd and polyol composition

Arkema Inc., the United States, has applied for patenting a composition comprising HCFO-1233zd and polyol blends for use as blowing agent in the production of polyurethane and polyisocyanurate foams. The HCFO-1233zd blowing agent is mixed with polyol blends consisting at least one polyether polyol and at least one polyester polyol. The ratio of polyether polyols and polyester polyols in the composition can vary from 1:99 to 99:1.

It is preferred that a major portion of HCFO-1233zd blowing agent component is the trans-isomer, which exhibits a significantly lower genotoxicity than the cis-isomer. In the most preferred ratio, the cis-isomer is less than about 3 per cent of the HCFO-1233zd blowing agent. HCFO-1233zd was evaluated in different ratio of polyether polyols and polyester polyols and benchmarked against HCFC-141b and HFC-245fa. HCFO-1233zd allows a significantly wide window of selection of polyether polyols and polyester polyols, which is essential for safe handling, transportation and storage of polyol blends, as well as the use of resultant foam. The patent cites a series of polyether polyols and polyester polyols that the composition can include.

One or more optional compounds or components could be present in the composition. Such optional additional compounds include other blowing agents, surfactants, polymer modifiers, toughening agents, colorants, dyes, rheology modifiers, solubility enhancers, plasticizing agents, flame retardants, antibacterials, viscosity reduction modifiers, fillers, vapour pressure modifiers, nucleating agents and catalysts. In certain preferred embodiments, dispersing agents and cell stabilizers may also be incorporated into the composition.

Source: www.freepatentsonline.com

Elongated ethylenic foam structure

Bay Foam Products Inc., the United States, has patented a method for forming an extruded, low-density, ethylenic polymer foam including from about 86 to 98 per cent by volume open cells and a continuous, impervious surface skin. The foam is claimed to possess superior compression recovery and lower compression resistance when compared with similarly constituted ethylenic closed-cell foams and superior moisture resistance and handling characteristics when compared with open-cell foams. A precursor composition and method for making the extruded, low-density, ethylenic polymer foam also forms part of the patent.

According to one embodiment, the method of forming includes feeding a foamable polyethylene composition into an extruder, extruding that composition at an elevated temperature as a foam rod having a certain open-cell content and an external, substantially continuous, impervious skin, compressing the extruded foam rod laterally before the foam is fully cured to increase the open-cell content, and then curing the foam to form an open-celled foam rod having an integral surface skin covering it. The unique compression step following extrusion of the open-cell/closed-cell foam structure is advantageous in increasing the open-cell content to pre-determined vakue. The step permits the production of open-cell/closed-cell foam structure having characteristics unattainable by elevated temperature extrusion alone.

The precursor composition for forming the extruded foam includes an ethylenic polymer material selected from the group consisting of polyethylene, soft ethylenic copolymers and blends thereof, and from about 2 to 20 wt per cent of at least one of ethylene vinyl acetate, GMS and talc. The blowing agents used are those typically used in the industry, such as isobutene, propane, n-butane, neopentane, hexane and hydrofluorocarbon. The nucleating agents used are also those typically used in the industry, such as talc or calcium silicate. The foam can also contain other additives.

Source: www.freepatentsonline.com

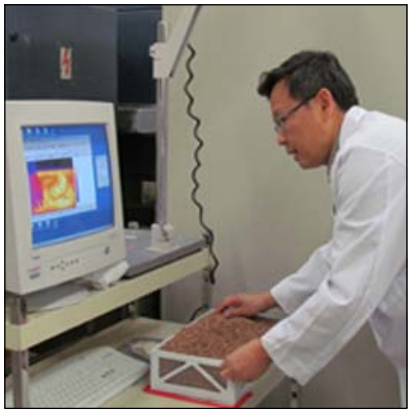
Polymer foam from fluorinated alkene blowing agents

Dow Global Technologies LLC, the United States, has patented a production method for quality alkenyl aromatic polymer foam using one or more fluorinated alkene blowing agents that have a zero ozone depletion potential (ODP) and a global warming potential (GWP) of less than 50. The foam comprises a polymer matrix containing one or more polymer and cells having an average cell size in a range of 0.02 mm to 5 mm (at less than 30 per cent variation), a density of 64 kg/m^3 or less, and an open cell content less than 30 per cent. The invention employs a blowing agent containing one or more specific fluorinated alkene having three or four carbons and has solubility in alkenyl aromatic polymers, particularly polystyrene, containing at least 50 wt per cent, preferably 75 wt per cent and more preferably 100 wt per cent, of one or more fluorinated alkene.

Source: www.freepatentsonline.com

Radio frequency treatments against stored nut pests

In the United States, a group of researchers led by Washington State University food engineer Mr. Juming Tang continues to make progress on a quick way to treat dry commodities, such as nuts, for storage pests. Since 2000, the group has been looking at radio frequency and how it might be a possible alternative to methyl bromide to disinfest legumes and nuts. In the treatment, high-frequency electromagnetic waves are used to rapidly heat agricultural products and the pests inside. Lethal exposure times are minutes, rather than days that some of the other alternative treatments require. Because the exposure time is comparatively short, product quality is not compromised.



Mr. Juming Tang examines a thermal of image of lentils treated with radio frequency waves

The group has conducted several studies that examined mortality of codling moth, navel orange worm, Indian meal moth and cowpea weevil through all life stages. Their research showed complete insect mortality in 4-10 minutes at temperatures of 50°-60°C. The group then expanded the work and validated the treatment for insect control of in-shell walnuts at a large commercial facility. They have now expanded the research to include legumes, raisins and other dry commodities. The research also had the participation of scientists from University of California-Davis and the United States Department of Agriculture's Agricultural Research Service (USDA-ARS).

Source: www.thegrower.com

Bio-pesticides from cassava leaves

A bio-fumigant plant started operation recently at the Central Tuber Corps Research Institute, India. The bio-fumigant plant, which extracts a fumigant pesticide from the leaves of cassava plant (*Manihot esculenta*), was built following a decade of research work by Dr. C.A. Jayaprakash, who heads the Crop Protection Board at CTCRI, and his team members. The product is named 'Nanma', meaning 'goodness'. A bottle capful of the pesticide is mixed with one bottle of mineral water and sprayed over the infected spot in the plant. Pea plants are commonly attacked by a kind of sucking pest that is resistant to normal doses of chemical pesticides. Mr. Jithin V. Prakash, a research student, claims that the enzymes in 'Nanma' can easily kill these parasites in matter of a few minutes.

The dry rot disease that occurs in yam is one of the most devastating storage diseases in yam production. To eliminate a persistent bug that attacks yam, CTCRI scientists have developed another bio-pesticide, 'Shreya', which too is sprayed on the tuber as an aqueous solution. 'Shreya' contains enzymes that specifically target the female bug, which is more resistant to chemical pesticides. 'Menma' – another strong, efficient and very volatile bio-pesticide extracted from cassava – is effective against banana stem borer, one of the most resilient pests that has developed immunity to almost all chemical pesticides available in the market, says Mr. Harish V.R., a scientist at CTCRI. 'Menma' is injected into the stem from where it would spread through all layers, killing every pest that has infested the plant, says Mr. Harish.

The bio-fumigant plant prepares volatile extracts obtained from the cassava leaves, compresses and filters them, and stores them in gas cylinders for easy transportation. The gaseous pesticide could be later mixed with water and directly applied to the infected portions, or used for fumigation. Once the toxic content is removed, the residue of treated cassava leaves contains about 40 per cent of proteins and is a very good cattle feed. The gaseous bio-pesticide also leaves behind no harmful residue.

Source: www.yentha.com

Oxygen-phosphine fumigation to control insect pests

The fumigant phosphine is more effective at controlling insects when combined with oxygen, according to research findings by the United States Department of Agriculture (USDA). The oxygen-phosphine combination could be an environment-friendly alternative to methyl bromide for combating pests like the western flower thrip on harvested fruits and vegetables. Entomologist Mr. Yong-Biao Liu, with USDA Agricultural Research Service (ARS) found that oxygenated phosphine fumigation effectively controlled several insect pests during laboratory studies.

In the ARS Crop Improvement and Protection Research Unit, Mr. Liu

tested phosphine fumigation under high levels of oxygen against four pests: western flower thrips adults and larvae, leaf miner pupae, grape mealy bug eggs, and Indian meal moth eggs and pupae. The four species represent insect types and life stages for which quarantine treatments are needed. In five-hour fumigations with 1,000 parts per million (ppm) of phosphine at 5°C, control of western flower thrips on lettuce increased from 80 per cent to 98 per cent when oxygen was increased from 21 per cent to 40 per cent. When the oxygen level was increased to 80 per cent, 99 per cent of the western flower thrips were killed. Mr. Liu used varying concentrations of oxygen at 5°C and 10°C and found that oxygenated phosphine fumigation was also effective in controlling leaf miner pupae, grape mealy bug eggs, and Indian meal moth eggs and pupae.

Source: www.ars.usda.gov

Paladin as a commercial soil fumigant

In the United States, Arkema and United Phosphorus Inc. are commercializing Paladin, the soil fumigant, effective 1 September 2012, with Arkema assuming all sales and marketing responsibilities for the United States and Mexico. Paladin soil fumigant, developed by Arkema, is an innovative, pre-plant soil fumigant, which is very effective against nematodes, parasites, weeds and soil-borne plant pathogens. In the United States, Paladin is registered for use on tomatoes, peppers, eggplants, cucurbits, strawberries, blueberries, ornamentals and forestry nursery crops.

Dimethyl disulphide (DMDS), a substance derived from sulphur and naturally present in the environment, is the active ingredient of Paladin soil fumigant. Paladin has no ozone depletion potential (ODP), low global warming potential (GWP), and is short-lived in the atmosphere. Since 2004, extensive research studies and more than 250 field trials in 15 counties have been carried out to assess the efficacy of Paladin soil fumigant and its potential impact on the environment and human health, particularly as a methyl bromide alternative. In a fumigation programme, Paladin soil fumigant can provide pest control comparable to methyl bromide.

Source: www.agprofessional.com

Soil fumigant testing yields mixed results

Methyl bromide alternatives are used in many places to protect tomato crop. But just because something may be referred to as an alternative doesn't mean it will work as well as methyl bromide. "There is nothing in our testing or in the grower experience where we can say across the board that it is just as good as methyl bromide," states Mr. Andrew MacRae, an assistant professor of weed science at the Gulf Coast Research and Extension Centre of University of Florida, the United States. For a while, a combination of methyl iodide plus chloropicrin was used as an alternative. But Arysta LifeScience, its manufacturer, voluntarily withdrew the registration "based on its economic viability" in the marketplace.

Mr. MacRae, however, has developed two-way and three-way chemical combinations that have proved to be effective substitutes – depending on where they are used. The two-way combination consists of about 40 per cent Telone and 60 per cent chloropicrin. Growers can also use the two products separately, either in the same pass or individually in two passes. The combination is excellent on nematodes and good on diseases, but only fair on weed control, notes Mr. MacRae. That calls for additional weed control measures, such as adopting a fallow programme that includes glyphosate and using herbicides under plastic mulch. Application of a herbicide over the top of the mulch may be needed before planting, depending on weed pressures.

The three-way combination uses 1,3-dichloropropene, chloropicrin and either metam potassium or metam sodium. 1,3-dichloropropene is effective in nematode control as well as some weed control; chloropicrin for disease control and some weed control; and metam potassium or metam sodium for weed control, some disease control and some nematode control. Metam potassium or metam sodium can be ploughed into the bed about 10 cm deep or applied via drip tape irrigation.

Mr. MacRae estimates that, overall, the two-way combination can be up to 85 per cent as effective as methyl bromide, and the three-way combo can be 95 per cent as effective. But those numbers are not as impressive as they may seem. With a 5-15 per cent reduction in effectiveness annually, the number of pest and disease incidences will increase each year, he says. With the fallow programme, additional herbicides and impermeable mulches, fumigating a field can cost much more than in the past. The industry needs to build a cultural programme of fumigant application, along with other measures to control weeds, nematodes and diseases to keep fields clean and profitable, Mr. MacRae says.

Source: www.thegrower.com

Low GWP Alternatives to HFCs in Refrigeration

The ban on hydrofluorocarbons (HFCs) by Denmark has led to a remarkable decline in the consumption of fluorinated greenhouse gases (F-gases). The new report *Low GWP Alternatives to HFCs in Refrigeration* describes the use of climate-friendly alternatives to HFCs in different refrigeration sectors. It provides data, retrieved from the national report from the Danish Environmental Protection Agency (EPA), on the Danish consumption/emission of potent greenhouse gases (GHGs). The report examines current technologies for reducing consumption/emission of potent GHGs, and evaluates the rate of implementation of new technology. For each consumption area, it lays down a scenario when the new technology can be implemented by the most advanced part of the industry. The report describes Danish initiatives for emission reduction, and identifies the areas where Denmark is in a strong position with regard to HFC alternatives.

Contact: Ms. Mariam Mosen, Head, Press Department, Danish EPA, Strandgade 29, DK-1401, Copenhagen K, Denmark. Tel: +45 7254 4462, 4131 8570; E-mail: marmo@mst.dk.

Methyl Formate as Blowing Agent in the Manufacture of Polyurethane Foams

This report was prepared by United Nations Development Programme (UNDP) based on the results of a project funded by the Multilateral Fund (MLF) for the Implementation of the Montreal Protocol. It highlights the urgent need to assess potential alternative technologies for replacing the hydrochlorofluorocarbon HCFC-141b in terms of properties, costs, availability, sustainability and environmental performance. Decision 55/43 by the Executive Committee of MLF for the Implementation of the Montreal Protocol reflects this by promoting pilot projects aimed at validating technologies in a developing country context, it points out. In addition, the report describes the result of an assessment on the safe use of methyl formate to replace HCFC-141b in polyurethane foams.

Contact: United Nations Development Programme, One United Nations Plaza, New York, NY 10017 United States of America. Tel: +1 (212) 906 5000, 906 5000; E-mail: publications.queries@undp.org.

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9th International Conference on Controlled Atmosphere and Fumigation in Stored Products
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Faculty of Agriculture,
Department of Plant Protection,
Ankara University,
06110 Ankara, Turkey.
Tel: +90 (312) 596 1136;
Fax: +90 (312) 318 7029;
Website: www.caf2012.org.

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Annual International Research Conference on Methyl Bromide Alternatives & Emissions Reductions
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United States of America.
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Fax: +1 (559) 449 9037.

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