VATIS UPDATE

Ozone Layer Protection

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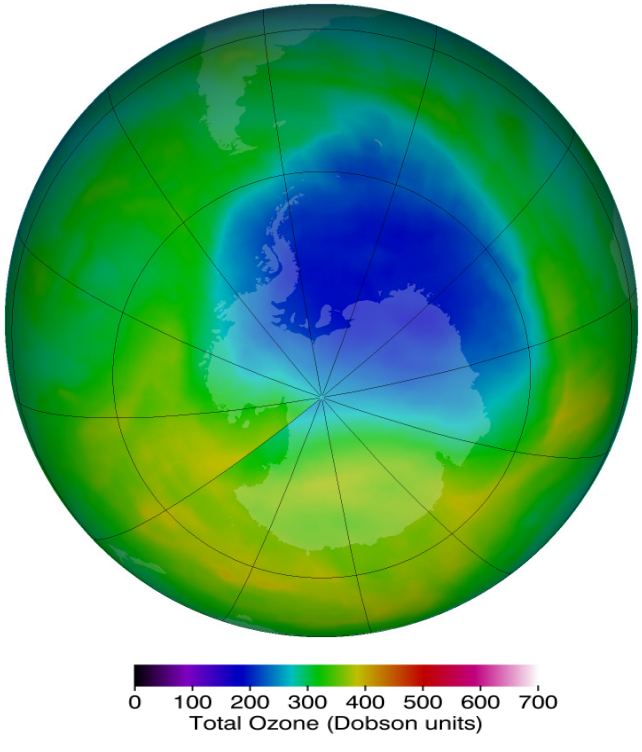
Apprise yourself with the latest technological innovations

Highlights

- Scientists invent substitutes for CFC gases
- Ozone-safe geothermal heat pump
- Environmentally friendly citrus cleaners
- Low global warming potential engineered systems
- New organic compound invented to aid sustainability
- Evaluation of an automatic steam applicator in strawberry



APCTT
Asian and Pacific Centre for Transfer of Technology

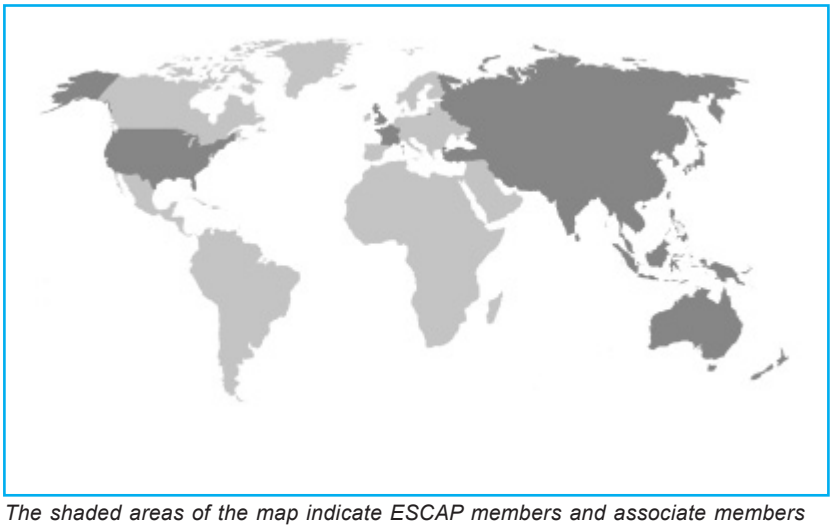
UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific

Ozone Cell
Ministry of Environment, Forests & Climate Change
Government of India

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

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

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



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

Cover Photo

The latest false-color view of total ozone over the Antarctic pole as on 21 November 2014. The purple and blue colors are where there is the least ozone, and the yellows and reds are where there is more ozone.

(Credit: NASA, USA)

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Ozone Layer Protection
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CONTENTS

Vol. 4 No. 127 Nov - Dec 2014

THE SCIENCE OF OZONE LAYER 4

☐ Ozone hole remains size of North America ☐ Researchers found high levels of ozone-depleting chemicals ☐ Researchers found increase in hydrogen chloride in air ☐ Nitrous oxide emissions could double by 2050 ☐ Scientists discover unexpected increase in stratospheric HCl

ODS PHASE-OUT IN INDIA 6

☐ India demands country-wise report on HFCs ☐ Water-mist to help fight fire

IN THE NEWS 7

☐ World fluorochemical demand to accelerate by 2018 ☐ New UNIDO refrigeration industry project in Viet Nam ☐ A new phase for countering ozone-depleting substances ☐ Kazakhstan became party to the Beijing amendment ☐ New system to streamline issuing import control licences ☐ Ozone-depleting substance phase-out in Philippines ☐ Viet Nam eliminates use of ozone-depleting chemicals

REFRIGERATION/AIR-CONDITIONING 10

☐ Ozone-safe geothermal heat pump ☐ Eco-friendly natural ammonia freezers ☐ Scientists reach near absolute zero cooling ☐ New HFO refrigerants for commercial refrigeration

SOLVENTS 12

☐ Degreaser that leaves protective coating after cleaning ☐ Environmentally friendly citrus cleaners ☐ Oxygen system for pipe cleaning ☐ Cost-efficient inline solvent defluxers ☐ Canadian firm recognized for eliminating toxic solvents

HALONS 14

☐ Low global warming potential engineered systems ☐ New water mist sprinkler systems ☐ Fighting fires with high-tech mist

FOAMS 15

☐ New organic compound invented to aid sustainability ☐ Ice-cold foam extrusion technology

FUMIGANTS 16

☐ Nematicide received federal registration in US ☐ Evaluation of an automatic steam applicator in strawberry ☐ New nematicide alternative to restricted fumigants in US ☐ Float trays as an alternative to methyl bromide ☐ Natural pest solutions on basis of essential oils

RECENT PUBLICATIONS 18

TECH EVENTS 18

Ozone hole remains size of North America

According to a study from National Aeronautics and Space Administration (NASA), the Antarctic ozone hole, which was expected to reduce in size swiftly when man-made chlorine emissions were outlawed 27 years ago, is stubbornly remaining the size of North America. The hole in the thin layer of gas, which helps shield life on Earth from potentially harmful ultraviolet solar radiation that can cause skin cancers, grows and contracts throughout the year but reached its maximum extent on 9 September when monitors at the south pole showed it to cover 24.1m square km (9.3m sq miles). This is about 9% below the record maximum in 2000, but almost the same as in 2010, 2012 and 2013. But scientists remain unsure why the hole has not reduced more since the Montreal Protocol agreement was signed by countries in 1987.

This global treaty is considered one of the world's most successful, having been pushed through in record time. It bans the use of ozone-depleting chlorofluorocarbons (CFCs), substances that were widely-used in household and industrial products such as refrigerators, spray cans, insulation foam and fire suppressants. "The ozone hole area is smaller than what we saw in the late-1990s and early 2000s, and we know that chlorine levels are decreasing. However, we are still uncertain about whether a long-term Antarctic stratospheric temperature warming might be reducing this ozone depletion," said Paul A. Newman, chief scientist at NASA.

"It's broadly on track [to reduce in size]. We knew it was always going to take a long time to recover because the CFCs were long-lived. The reason why it was not healing more quickly was because the interaction between climate change and the ozone hole was complex. The ozone hole itself is affecting the climate of Antarctica and Australia, and is being affected by it. It is changing the wind systems. As the ozone hole [gradually] fills in, so we can expect, over the next 50 or so years, the effects of climate change to increase," said Dr. Jonathan Shanklin, at the British Antarctic Survey, the United Kingdom. The UN Environment Programme (UNEP) and the World Meteorological Organisation (WMO) said that without the Montreal Protocol atmospheric levels of ozone-depleting substances (ODS) could have increased tenfold by 2050.

Source: http://www.theguardian.com

Researchers found high levels of ozone-depleting chemicals

According to international researchers including three from the University of Wollongong (UOW), Australia, atmospheric levels of a key ozone-depleting chemical are on the increase, but the rise appears to be a symptom of climate change rather than additional sources of the destructive substance. Investigations were prompted when scientists identified levels of hydrogen chloride had begun rising in 2007 – but only in the northern hemisphere – when they should have been falling because of curbs agreed under the Montreal Protocol to protect the ozone layer. Hydrogen chloride releases chlorine in the stratosphere, depleting ozone and allowing more ultraviolet radiation to reach the Earth, increasing skin cancer and damaging crops and other species.

Findings based on that satellite observations and model simulations and published in the journal Nature rule out any "rogue" source of emissions from undisclosed sources, because the abundance of the chemical is falling at other layers of the atmosphere and in the southern hemisphere. It's not so positive news on the climate change front, however, since the increased abundance of chlorine in the northern hemisphere's stratosphere is attributed to a slowdown in atmospheric circulation leading to slower mixing at some levels. Climate change, through increased greenhouse gas emissions, "is changing the way radiation is absorbed in the atmosphere and distributed, which would drive things such as this circulation," said Professor David Griffith at UOW.

Although it was beyond the scope of the paper to examine how long the circulation slowdown will last, or other possible consequences, the study showed the recovery of the ozone layer would be a slow process, taking decades. The study also underscored the general success in tackling ozone depletion and a range of chemicals that were phased out in a matter of years in contract to dealing with global warming. For ozone, it was a "problem created by man, problem recognised, solution proposed, solution implemented. For climate change, the culprits have been recognised but no-one's prepared to stop producing [CO_2]," said Griffith.

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

Researchers found increase in hydrogen chloride in air

A research from the University of Leeds, the United Kingdom, and an international team of scientists has shown a recent increase in atmospheric hydrogen chloride (HCl), a substance linked to destruction of

the ozone layer. It was anticipated that there would be a decline in HCl under the Montreal Protocol, the international treaty designed to protect the ozone layer by phasing out the production of ozone-depleting substances (ODS). "It's important to say that the Montreal Protocol is still on track, and that this is a transient reversal in the decline of HCl, which can be explained through a change in atmospheric circulation, rather than rogue emissions of ODS," said Dr. Emmanuel Mahieu from the University of Liège, Belgium.

The study published in the journal *Nature*, explains that the unexpected increase is caused by a temporary, but prolonged anomaly in atmospheric circulation, changing the balance between chlorofluorocarbons (CFCs) and their breakdown product HCl. The recent increase in HCl concentrations was only observed in the Northern Hemisphere, whilst in the Southern Hemisphere, HCl continues to decrease, as expected, in line with the Montreal Protocol. The findings are based on measurements by a network with stations in Spitsbergen, Greenland, Sweden, Switzerland, Japan, Tenerife, Australia and New Zealand. These are backed up by satellite observations and model simulations.

"Atmospheric variability and perhaps climate change can significantly modify the path towards full recovery and, ultimately, it will be a bumpy ride rather than a smooth evolution. The recovery of ozone-depleting chemicals in the atmosphere is a slow process and will take many decades. During this time the ozone layer remains vulnerable," said Professor Peter Bernath, from the University of York, the United Kingdom.

Source: http://www.azocleantech.com

Nitrous oxide emissions could double by 2050

A new research study by Carbon Brief, the United Kingdom, brings together all the projections for future nitrous oxide emissions from different researchers. The results shows that on average emissions will increase 83 per cent by 2050, if we carry on with business as usual. The study also looks at how emissions might be curbed between now and the middle of the century. If 'moderate' attempts are made, nitrous oxides would still increase by around 26 per cent. But emissions could reduce by as much as 22 per cent if we really get our act together. The study has been published in the journal *Environmental Research Letters*.

All the projections were made using a starting point of 2005. This means the researchers are able to see how actual nitrous oxide emissions in recent years compare to the different scenarios. And the bad news is that we're currently on the business-as-usual path, the researchers said. Bacteria release nitrous oxide naturally by breaking down nitrogen in the soil and oceans. Total emissions from natural sources are currently around twice those of emissions from human activities. But while natural emissions have not changed significantly since the industrial revolution, manmade emissions have. This increase has caused nitrous oxide concentrations in the atmosphere to rise steadily since the the mid-19th century.

The study draws attention to nitrous oxide emissions and acts a reminder that carbon dioxide isn't the only greenhouse gas that needs to be addressed. While the research doesn't discuss what action can be taken, it does flag some upcoming problems. For example, the potential impact of expanding biofuel production isn't currently included in nitrous oxide projections, but it "could become the most significant source to date". The study examines what might happen if we have a future biofuel boom. However, with so many uncertainties in predicting adoption of biofuels, the estimates of nitrous oxide emissions cover a wide range.

Source: http://www.carbonbrief.org

Scientists discover unexpected increase in stratospheric HCl

An international team of scientists with the help of SCISAT, a Canadian satellite designed to make observations of the Earth's atmosphere, has discovered a recent and unexpected increase in stratospheric hydrogen chloride (HCl) in the Northern Hemisphere. Information from SCISAT along with other satellite data and ground-based measurements showed the scientific team that the increase in stratospheric HCl is due to a slowdown in the atmospheric circulation of the Northern Hemisphere. This discovery could impact how scientists will analyze the evolution of the stratospheric ozone layer going forward.

Since 1989, the implementation of the UN's Montreal Protocol has led to a reduction in chlorofluorocarbons (CFCs) around the globe. These CFCs are responsible for the depletion of the ozone layer that protects us from ultraviolet radiation. CFCs break-up in the stratosphere and release chlorine atoms that then form HCl. Under certain conditions, HCl can be transformed into other chlorine-containing molecules that destroy ozone.

Source: http://www.news.gc.ca

India demands country-wise report on HFCs

At a high-level ministerial segment at the UN conference on Montreal Protocol, India took a positive stand at a multilateral forum on the issue of phasing down of climate damaging hydroflurocarbons (HFCs) but asked the UN to produce reports of country-wise production and consumption of the greenhouse gas over last decade.

"India doesn't want estimates. We need actual figures. That's what we did in case of CFCs (ozone-depleting chloroflurocarbons) decades back," the minister said making clear the stand of the country, which was accused by the developed world of blocking their move to discuss the issue of HFCs under Montreal Protocol. India needs in its every 29 states "immediate demonstration of projects for alternatives to HFCs in refrigerators and air conditioners to tell the viability, affordability and energy efficiency" and asked the developed countries, and research institutes to initiate "immediate collaborations" to develop and improve the affordability of HFC alternatives.

India demanded that the negotiation of HFCs should "proceed on the principle of grace period – that is differentiated responsibility, financial assistance, including that for research and development, technology transfer without the clause of confidentiality". Javadekar noted that India introduced the HFCs as substitutes of CFCs and now hydrochloroflurocarbons are also being substituted by the greenhouse gas in many places. India made its position clear as the nations started informally debating the issue of management of HFCs – the climate-damaging refrigerant gas. Till last year, India, had been opposing the discussion of HFCs under the Montreal Protocol, arguing that it does not have the mandate to deal with the greenhouse gas.

Source: http://www.business-standard.com

Water-mist to help fight fire

The Fire and Emergency Department, Bengaluru, India, has come up with 'water-mist fire protection' to fight fires. The new technology is not only more effective than traditional fire fighting methods, but also saves large amounts of water. The department is planning to roll out 50 motorbikes fitted with two water-mist tanks on each vehicle to fight fires. Already, 20 bikes are in operation in Bengaluru and the new technology has been used in four fire accidents.

"Since the city does not have the luxury of emergency lanes to reach the site of fires, the department is planning to increase the number of bikes, which are Royal Enfield Bullet vehicles, to respond quickly to emergencies. We are procuring about 30 more bikes which will have 2 water mist tanks of 9-litre capacity each. Nine litres of mist water is equivalent to 500 litres of conventional water," said Om Prakash, DG and IGP (Fire and Emergency Services).

Under the second phase, the department has fabricated a jeep and mounted a 300-litre tank of water-mist on it. It will set up trolleys fitted with mist water tanks in government buildings. "As motorbikes reach the site earlier, the first team of fire personnel can start fighting the fire, and also send a message back on the requirements at the site. We hope to use jeeps to fight even bigger fires," said D. Rashid, Deputy Director of Fire and Emergency Department.

Source: http://www.deccanchronicle.com

ODS phase-out in South Asia – Key achievements

The United Nations Environment Programme (UNEP), in its capacity as an implementing agency of the Multilateral Fund for the Implementation of the Montreal Protocol, and through its Compliance Assistance Programme (CAP), enables countries to make informed decisions about alternative technologies and ozone-friendly policies. Some of the key achievements under the CAP in South Asian countries are listed below:

- The Queen of Bhutan, Her Majesty The Druk Gyaltsuen Jetsun Pema Wang chuck, launched the first formal national curriculum for refrigeration and air-conditioning servicing in June 2014.
- By the end of 2013, China successfully reduced their HCFC consumption by 9% against the baseline of 2009/2010 average through robust action plans. The Foreign Economic Cooperation Office (FECO) of the Ministry of Environmental Protection (MEP) of China is coordinating the national efforts, working with over 100 enterprises and numerous other stakeholders in the central and the local governments, the academic sector and non-governmental organisations. During the Ozone Day celebration meeting, FECO announced the bidding results for the closure of five HCFC production lines for the 2015 deadline for the 10% reduction of HCFCs. The refrigeration industry's operation training has just kicked off in all six training centres in accordance with the requirements of the environmental protection department. The programme will target more than 1,500 technicians (including the trainers) per year from 2014-2015.
- With technical assistance from GIZ, India has shown the world their innovative leap frogging in the room air-conditioning sector by starting commercial production of R290-based room air-conditioners.
- The Maldives, a member of the Climate and Clean Air Coalition (CCAC), aims to advance its HCFC phase-out by 10 years ahead of schedule as part of attaining carbon neutrality, and wants to find alternatives to HCFCs that have low-GWP.
- In 2013, the first pilot project on ODS disposal in Nepal was completed. The project demonstrates how unwanted ODS can be disposed of safely and cost-effectively in collaboration with the private sector, leveraging state-of-the-art technologies, operational systems, and when the credits are ultimately sold, carbon finance.
- Sri Lanka has completely phased out using methyl bromide in all tea plantations. Its US$ 1.5 billion tea industry now uses ozone-friendly substitutes, and proudly serves the world's first ozone friendly tea. The government launched its "Ozone Friendly Pure Ceylon Tea" logo with which the Ceylon tea industry aims to market the tea as a premium product.

Source: UNEP OzonAction CAP Achievements 2014

World fluorochemical demand to accelerate by 2018

In a new study from research firm The Freedonia Group Inc., the United States, global demand growth for fluorochemicals is forecast to accelerate, rising 3.8% per year to 3.8 million metric tons in 2018. Above average growth in higher value products will help drive increases in value demand more than seven percent annually to $25 billion. Environmental regulations will continue to be the strongest force acting on the industry, shaping demand in both positive and negative ways. While regulations and consumer concerns have reduced demand for some fluorine-based products, particularly ozone-depleting fluorocarbons, they have also opened up opportunities for products such as newer fluorocarbons with low global warming potential (GWP).

While fluoropolymers are the smallest product in volume terms, they account for a disproportionate share of market value due to their higher average prices. "The fluorocarbons market remains the most dynamic sector of the fluorochemical industry for two reasons: first, the evolving regulations aimed at protecting the ozone layer and reducing global warming, and, second, a sharp contrast in the outlook between developed and developing countries," said analyst Ryan Sullivan. In developed countries, the phase-out of HCFCs is nearly complete, with most end users switching to HFCs. However, even HFCs now face restrictions due to their global warming potential (GWP), with new laws in developed countries expected to limit future demand.

China will continue to be the largest and one of the fastest growing markets for fluorochemicals, accounting for over 40% of global volume demand in 2018. Only India will experience faster growth, although from a much smaller base. Developing countries in general are expected to see faster growth in fluorochemical demand as healthy economic growth drives rising commercial and household refrigeration penetration rates and countries increasingly adopt more advanced manufacturing technologies that employ fluoropolymers. Demand growth in North America will rebound due to healthy advances in the automotive industry and an improving housing market in the US. *Contact: Corinne Gangloff, The Freedonia Group, USA. Tel: +440.684.9600; E-mail: pr@freedoniagroup.com; freedoniagroup.com*

Source: http://www.investorideas.com

New UNIDO refrigeration industry project in Viet Nam

The United Nations Industrial Development Organization (UNIDO), has launched a project in Viet Nam that will help the country to contribute to tackling the challenges of climate change and the depletion of the ozone layer. The objective of the project is to change the country's industrial refrigeration scene, which heavily depends on hydrochlorofluorocarbon (HCFC-22), a refrigerant gas that depletes the ozone layer and contributes to climate change. UNIDO will help Viet Nam's cold storage industry convert away from refrigerant gases such as HCFCs towards low global warming potential (GWP) refrigerants.

The project, titled "Reducing greenhouse gas and ozone-depleting substance (ODS) emissions through technology transfer in industrial refrigeration", is funded by the Global Environment Facility (GEF) and was officially approved by the Ministry of Natural Resources and Environment (MONRE) of Viet Nam. More than 100 participants from government agencies, national private companies, associations, UN agencies, donors, partner technology providers, and refrigeration experts met during the project's inception workshop.

The project will be based on a combination of technical assistance, policy and regulatory support, technology transfer, capacity building and awareness raising activities. Within its technology transfer component, sustainable and affordable cold storage plants will be promoted in selected demonstration sites, serving as pilot plants for cold storage facilities in Viet Nam and elsewhere. Funds will also be provided by international partners such as Zanotti, Italy, and Shecco, Belgium, as well as the Vietnamese Environmental Protection Fund (VEPF), which will provide soft loans for companies undertaking technological conversion. *Contact: Nguyen Thi My Hoang, UNIDO National Project Coordinator. Tel: +844-377-57109.*

Source: http://www.unido.org

A new phase for countering ozone-depleting substances

China has launched the second phase of the "Anti-smuggling

ODS program", to counter the smuggling of ozone-depleting substances (ODS), as part of the expanded effort to complement China's promise towards fulfilling their Montreal Protocol commitments. The UNDP China Assistant Country Director Carsten Germer witnessed the official launch of this project, along with representatives from FECO and the General Administration of Customs (GAC). ODS such as HCFC (Hydrochlorofluorocarbons) and CFC (chlorofluorocarbons) contain elements like chlorine and bromine, which cause the thinning of the ozone layer when they react with the stratospheric ozone.

Continued ozone layer depletion could have negative impacts on human health as well as ecosystems since the ultraviolet radiation would damage the human immune system and increase the risk of skin cancer, deplete the numbers of small organisms in the sea and thence negatively affect the whole marine food chain. "Since China ratified the Montreal protocol (on substances that deplete the ozone layer), China has made great achievements in compliance to the Protocol," said Mr. Germer. China has achieved the goal of completely phasing-out CFC usage two years ahead of the deadline and had committed to accelerating phase-out of HCFCs in the 19th meeting of Montreal Protocol parties. By 2013, China had already successfully met the target of freezing HCFC consumption and is expected to reduce a further 10% of its consumptions by 2015.

Despite the Montreal Protocol's successes in tackling ozone layer depletion, the architects of the protocol, which designed the phase-out system by incorporating different schedules between developed and developing countries, had inadvertently created conditions for a black market in ODS. China, as the biggest developing country in terms of ODS origin, is facing an urgent need to tackle this illegal ODS trade. In the first phase of the ODS anti-smuggling program, four customs offices had been funded to receive training in identifying ODS smuggling as well as upgrade to technical detecting devices, resulting in 14 cases of illegal trades being discovered by the customs offices. The second phase of the project will be expanded to all 11 regional customs offices in China.

Source: http://www.cn.undp.org

Kazakhstan became party to the Beijing amendment

Kazakhstan has become a party to the Beijing Amendment to the Montreal Protocol on 19 September 2014, making the amendment one country short of achieving universal ratification. 196 parties have already ratified the Beijing Amendment. Efforts are under way to assist the last remaining party to ratify the Amendment as soon as possible. Out of the four amendments to the Montreal Protocol, the London, Copenhagen and Montreal Amendments have achieved universal ratification.

Universal ratification of all the Amendments is the next aspiration, as global environmental protection can only be truly effective with global participation and action. The Vienna Convention and the Montreal Protocol achieved universal ratification in 2009 and they are the first and only global environmental treaties to realize that aspiration.

Source: http://www.unep.org

New system to streamline issuing import control licences

During the National Ozone Day celebration held on September 16, in Sri Lanka, an 'Automated Monitoring System for Import of Ozone Depleting Substances (ODS) Control' was officially launched integrating the National Ozone Unit (NOU), Import and Export Control Department and Sri Lanka Customs. The theme was 'Ozone Layer Protection: The Mission Goes On'. The new system has been developed to streamline and fast track the process of issuing Import Control Licences to importers when importing Ozone Depleting Substances (ODSs). The system has been developed by officials of Information Communication and Technology Agency (ICTA).

Under the first stage of the project, the recommendation issuing process by the NOU to obtain import licence will be carried out through the new computerised network. Under the second and third stages, Import and Export Control Department and Sri Lanka Customs will be connected to the system. Financial support for the project has been provided by the United Nations Environment Program (UNEP). "Refrigerant reclaim centres to recover the collected refrigerants would be set up in six selected location in the island, adding that it would benefit those involved in refrigerators and air conditions manufacturing sector," Susil Premajayantha, Environment and Renewable Energy Minister. The

program for phasing out of Hydro Chloro Fluoro Carbon (HCFC) is progressing very successfully in the island.

The 20th anniversary of the establishment of National Ozone Unit was also commemorated during the event. Sri Lanka became a signatory to the Montreal Protocol on Substances that Deplete the Ozone Layer and the Vienna Convention for the Protection of the Ozone Layer in 1989. Sri Lanka has already phased out 54 out of 96 ozone depleting substances in harmony with the Montreal Protocol to which 197 countries have been signatory. Sri Lanka could successfully phase-out Chlorofluorocarbon (CFC) by 2010, and it has set targets to completely phase-out HCFC, which has 40 varieties, by 2030.

Source: http://www.dailynews.lk

Ozone-depleting substance phase-out in Philippines

Philippines is going to start the phase-out of Hydrochlorofluorocarbons (HCFC) in compliance with the Montreal Protocol starting from January 1, 2015. HCFCs, while a better alternative to chlorofluorocarbons (CFCs), are compounds, gases or liquids that hurt the ozone layer that prevents direct exposure of human to harmful ultraviolet radiation from the sun. These are used in refrigerators, freezers and air conditioning systems, cooling agents in domestic and commercial transportation, cleaning agent or solvent, fire extinguishing agent, and insulator foams. The Department of Environment and Natural Resources-Environmental Management Bureau (DENR-EMB) has set a target to reduce by 10% HCFC importation by January.

The Philippines started freezing HCFC importation level since January 2013. Succeeding targets for importation reduction are 35% by January 2020; 67.5% by 2025; 97.5% by 2030, and zero import by 2040. Base importation level in 2013 was placed at 2,644 metric tons (MT). According to the DENR, HCFCs are considered only temporary alternative to CFCs. HCFCs have lower ozone-depleting potential (ODP). At a global warming potential of 600 to 2,200 carbon dioxide (CO2)-equivalent, this is lower compared to CFC's ODP of 6,000 to 10,000 CO2 equivalent. CFCs, popularized by the name "freon" by multinational Du Pont, was totally phased out in the country in 2010. "Both groups of CFC and HCFC chemicals are greenhouse gases which contribute to climate change," said DENR.

Other ODSs are found as propellants in aerosols, as solvents for cleaning printed circuit boards and precision parts and degreasing metal parts including methyl chloroform, as inks and coatings and medical applications and as fumigant (methyl bromide). The World Bank's Global Environment Coordination and its Ozone Operations Resource Group have been studying alternatives for CFCs and HCFCs including those used as halons, solvents, aerosols, refrigerants, mobile air-conditioning, foam blowing and chemical production. According to the International Finance Corp. (IFC), alternatives should be compatible with existing equipment and have good health and safety properties.

Source: http://www.mb.com.ph

Viet Nam eliminates use of ozone-depleting chemicals

The Ministry of Natural Resources and the Environment, Viet Nam, has announced that it will completely abolish the use of more than 500 tonnes of HCFC-141b, a chemical that damages the ozone layer, in the production of thermal insulation foam by the end of 2014. "The move is part of the country's efforts to reduce the use of hydrochlorofluorocarbon (HCFC) substances by 10% from January 1, 2015 onwards," said Nguyen Van Tue, Director of the Department of Meteorology, Hydrology and Climate Change. Between now and 2019, Viet Nam plans to cut the use of HCFC substances, mainly HCFC-22, by 900 tonnes from 3,600 tonnes at present.

The chemical is mainly used in refrigeration facilities that the country had already successfully eliminated the import and use of CFCs, halons and CTCs, which are also ozone-depleting substances (ODS), between 1995 and 2010. As part of the project, Viet Nam will choose alternative technologies and substances that are considered safe for the ozone layer and the climate system, as set out by the Montreal Protocol on ODS. To assist the country's efforts, the United Nations Industrial Development Organisation (UNIDO) worked with the department to design the project. As a party to the Montreal Protocol since January 1994, Viet Nam is obliged to eradicate the use of the ODS and is entitled to financial and technological assistance.

Source: http://www.en.vietnamplus.vn

Ozone-safe geothermal heat pump

WaterFurnace International, Inc., the United States, the leading manufacturer of geothermal and water source heat pumps, has introduced the 3 Series 300A11 geothermal heat pump, offering efficiencies up to 22.3 EER and 4.1 COP. The 3 Series features Copeland UltraTechTM two-stage scroll compressors and five-speed ECM blowers for high efficiency and quiet operation. The 3 Series 300A11 is WaterFurnace's first residential unit to come standard with durable all-aluminium air coils for corrosion protection and extended system life.

"The 3 Series was designed to balance value and performance, thanks to technology that's been refined through more than 30 years of research, engineering advancements and manufacturing experience. It is a great complement to our 5 Series and 7 Series geothermal heat pumps, giving homeowners another highly efficient option at a lower price," said Tim Litton, at WaterFurnace International, Inc. The 3 Series can be used in conjunction with WaterFurnace's IntelliZone2 24 volt zoning system to precisely control the temperature in up to four zones for the ultimate in comfort. An optional soft starter – IntelliStart – reduces start-up amperage by up to 60 percent of normal draw and reduces noise, eliminates light flicker and increases compressor life.

WaterFurnace's Aurora communicating controls platform provides simple setup, troubleshooting and diagnosis. Additionally, WaterFurnace's Aurora Interface Diagnostic (AID) tool simplifies service and diagnostics for contractors, thanks to its external communication port. All models are ENERGY STAR rated and utilize ozone-safe R410A refrigerant that meet stringent EPA requirements. *Contact: WaterFurnace International, Inc., 9000-T Conservation Way, Fort Wayne, IN, 46809, USA.*

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

Eco-friendly natural ammonia freezers

Star Refrigeration, the United Kingdom, one of Europe's leading independent contractors of industrial cooling and heating solutions, has launched a new subsidiary Azane Inc. to manufacture its climate friendly and high performance low charge ammonia freezers for the US market. Azane Inc has been launched to provide a natural solution for the US cooling industry, who are currently affected by the prospect of the upcoming R22 phase out and potential HFC phase down. The company specializes in low charge packaged ammonia refrigeration systems, including the energy efficient air cooled Azanefreezer that is designed for use in freezer warehouse. The Azanefreezer, essentially an ammonia condensing unit, is a complete refrigeration package housed in one unit with two separate ceiling mounted coolers arranged for reverse cycle defrost.

The unit contains two screw compressors, designed for industrial installations and located for easy maintenance access. Its low pressure receiver offers efficient operation and allows for a low charge of ammonia. The enhanced aluminium evaporator design provides better performance from the lowest amount of ammonia, without the need for any pumps as found in traditional ammonia systems.

The utilization of low charge, natural refrigerant ammonia, a zero global-warming potential (GWP) and non ozone-depleting substance (ODS), should safeguard Azanefreezer from future environmental legislation. The system has a life cycle of 25+ years at maximum operational performance. It also uses reverse cycle defrost – currently the only system to offer this – which defrosts more efficiently.

"All Azanefreezer components have been selected to minimize the risk of refrigerant leakage, reduce refrigerant charge, simplify maintenance and prolong plant life expectancy. The Azanefreezer has been installed in public warehouses across Europe for over 20 years due to the phase out of R22. It is a fully tested and proven technology which has now been made available to US customers to aid the transition from ozone depleting refrigerants by 2020," said Derek Hamilton at Azane US. The ammonia packaged unit has been specifically designed to operate with as little as one tenth of the charge of a traditional refrigeration system, therefore avoiding the burden of OSHA's PSM and the EPA RPM requirements.

Source: http://www.environmentalleader.com

Scientists reach near absolute zero cooling

An international team of six scientists from Bielefeld University,

Germany, the University of Manchester, the United Kingdom, and the Universidad de Zaragoza, Spain, have become the first ever researchers to successfully reach temperatures below –272.15°C – only just above absolute zero – using magnetic molecules. The new investigation has been published in the scientific journal *Nature Communications*. Scientists usually express temperatures on the Kelvin scale. Minus 272.15 C is precisely one Kelvin. This is why the researchers call their development 'sub-Kelvin cooling'. Cold temperatures are generally obtained by using an effect that anyone can observe with an aerosol can.

"The very rare helium-3 isotope with which one can also get down to a few tenths of a Kelvin is now practically unaffordable," said Professor Dr. Jürgen Schnack, at Bielefeld University. Magnetic substances can also be used as refrigerants. These particularly include paramagnetic salts. Their cooling has nothing to do with pressure. They cool down when the external magnetic field generated by, for example, an electromagnet decreases. When the electric current is reduced in the coil, the magnetic field also decreases and the paramagnetic salts cool down. In their article, the scientists reported on successful sub-Kelvin cooling with an alternative medium – magnetic molecules. These are molecules containing magnetic ions such as gadolinium.

The magnetic molecule with which scientists have been experimenting is called 'Gd7' in short. Very appropriately, it has the geometric structure of a snowflake. As the computer simulations by research team showed, it starts of by cooling down in a decreasing magnetic field; then it warms up again before finally cooling down once more as the magnetic field disappears. "We were really excited when the theoretical computations were able to explain this complex behaviour in detail. Compared to paramagnetic salts in which the temperature drops continuously as the magnetic field declines, molecules such as Gd7 behave in more complex ways," said Schnack.

Source:
http://www.rdmag.com

New HFO refrigerants for commercial refrigeration

DuPont Fluorochemicals, Japan, has announced the introduction of three new refrigerants in its DuPont™ Opteon® family, based on hydrofluoroolefin (HFO) technology. According to DuPont, these refrigerants have far lower global warming potential (GWP) than the products they are designed to replace and will enable compliance with a growing number of regulations that limit the use of high-GWP refrigerants. "The new refrigerants are developed for commercial refrigeration applications, under the names Opteon XP40, Opteon XP44, and Opteon XP10. "Opteon XP40 is designed to effectively replace the refrigerant R-404A, which has one of the highest GWPs of the common HFCs and is extensively used in commercial refrigeration. In addition to providing a more than 60% reduction in GWP, said DuPont.

Opteon XP44 is a lower GWP replacement for the refrigerant R-404A and has been designed specifically to meet the demanding operating conditions of transport refrigeration. Opteon XP10 is a lower GWP replacement for R-134a for refrigeration and other applications. DuPont also has additional Opteon products in its pipeline, including high-performance fluids for targeted applications such as chillers, high-temperature heat pumps, and organic rankine cycles. "We anticipate that our new family of products will reduce greenhouse gas content of refrigerants by some 245 million tons CO2 equivalent worldwide by 2025. The new Opteon refrigerants enable the industry to meet regulatory demands without giving up efficient, safe, and cost-effective refrigeration and air conditioning," said Thierry F.J. Vanlancker, at DuPont Chemicals & Fluoroproducts.

The company noted that a number of regulatory drivers are demanding a transition away from hydrofluorocarbons (HFCs) toward alternatives with lower global warming potential. The European Union has passed regulations that drive this transition in commercial refrigeration and air conditioning as well as in automotive air conditioning. The U.S. Environmental Protection Agency (EPA) has also proposed new rules to limit the use of certain HFCs and announced a number of actions and agreements to accelerate the transition away from HFCs. In addition to such actions by specific governmental authorities, there is growing support for an amendment to the Montreal Protocol to create a framework for global action to phase down HFCs.

Source:
http://www.achrnews.com

Degreaser that leaves protective coating after cleaning

Developed by Solvent Kleene Inc., the United States, the new 'Kleeneze 408' is a cleaner/ protectant that offers one-step cleaning, film lubrication and rust protection. The cleaner has an aggressive cleaning action that dissolves grease and grime, lifts carbon soils, stop rust in progress and leaves a protective coating that repels moisture and water. This protective coating prevents the formation of rust.

A low surface tension enables the cleaner to penetrate narrow openings and hard-to-reach surfaces. Performing at room temperature, the protectant is designed to meet a broad range of cleaning requirements. It can be used with spray bottles, parts washers, brushes or wipes.

When used in a parts washer, contaminants can be filtered out. Filtering allows the solvent to be used for an extended period of time reducing the need to replace the solution.

When used to clean ball bearings, soiled grease gets removed while the bearing is lubricated. Designed to minimize health and environment risks, Kleeneze 408 is non-flammable and non-carcinogenic. It has a low order of toxicity, no ozone-depleting components or air pollution potential and does not have an offensive odor. It is compatible with most ferrous and non-ferrous metals including titanium, copper, brass, stainless steel, carbon steel, aluminium, anodized aluminium and magnesium. The protectant is available in both 55-gallon drums and five-gallon pails.

Source: http://www.pfonline.com

Environmentally friendly citrus cleaners

Florachem, the United States, a leading supplier in citrus and pine derivatives, has introduced a fresh approach to environmentally responsible solvent cleaning. Combining their many years of terpene production and precision cleaning experience, Florachem have developed a new line of high performance, low odor cleaning agents. CitraFlor™ cleaning products improve cleaning performance, operator safety and regulatory compliance using Florachem's proprietary low odor, low NVR citrus terpene technology.

Marketed under the CitraFlor brand, these "nature renewable" solvent products are designed to clean precision parts, such as electronics, aerospace parts and medical devices, where cleanliness is considered critical for reliability.

CitraFlor™ is a citrus terpene cleaner to replace IPA and other hazardous handwipe solvents. In addition, VaporFlor™ 4.5 nPB Solvent can be used to replace chlorinated solvents, n-propyl bromide, hydrochlorofluorocarbon (HCFCs), HFEs or other HFCs vapor degreasing operations. *Contact: Florachem Corp., Performance Products, 5209 San Jose Blvd., Jacksonville, FL 32207 USA. Tel: +1-904-733-5759; Fax: +1-904-733-5950; E-mail:cleaning@florachem .com.*

Source: http://www.cleaning.florachem.com

Oxygen system for pipe cleaning

The Defence Science and Technology Organization (DSTO), Department of Defence, Australia, in collaboration with Aircraft Maintenance Process Technologies and Standards (AMPTS), has developed new pipe cleaning system. The cleaning system that was developed was a multi-stage process, fully incorporated into one transportable cleaning unit.

Dry breathing oxygen is extensively used in RAAF aircraft. It provides oxygen to pilots in non-pressurised cabins and as an emergency supply in all other fixed wing aircraft. Oxygen is a strong oxidiser and does pose a substantial fire hazard in aircraft. To manage this risk, the pipes and components used in oxygen system must be cleaned to rigorous cleanliness specifications.

Historically CFC-113 was used to clean oxygen systems, but with the ban on chlorofluorocarbons (CFCs), due to the ozone depleting properties of CFCs, new cleaning methods were required. RAAF oxygen system pipes in the size range 1/8 inch to 1/2 inch, in stainless steel, copper and aluminium showed that the above cleaning system meets RAAF oxygen system cleanliness specifications for both non-volatile residue and particulate contamination.

The recommended final cleaning procedures comprises a five minute flush in both directions for both HFE-71DE and HFE-7100 at flowrates above the onset of turbulence, calculated using a Reynolds Number of 4000; followed by a final rinse with 600ml

of clean HFE-7100 at one litre/min. The pipes were dried with high purity nitrogen until a refrigerant leak detector no longer signalled the presence of any HFE solvents.

Source: http://www.solutions.3m.co.uk

Cost-efficient inline solvent defluxers

Developed by Baron-Blakeslee, the United States, the new 'Aeterna Series' in-line cleaner uses the latest technology to remove rosin fluxes and pastes from electronic assemblies. Unlike other inline cleaners, the Aeterna Solvent Inline Defluxer provides a very high throughput, high precision defluxing process while requiring minimal floor space. This system allows for processing of a high volume of printed circuit boards and electronic assemblies, and it can be used with a variety of halogenated hydrocarbon defluxing solvents, including nPB and HFC/HFE fluorinated chemistries.

The halogenated hydrocarbon solvents used in the Aeterna provide superior conventional inline defluxing systems. The Aeterna series inline cleaning system can easily be assimilated in between upstream and downstream operations on an electronic manufacturing line. The Aeterna Solvent Inline Defluxer allows a smaller and more cost-efficient method for PCB cleaning. Unlike with a conventional defluxing process, the Aeterna defluxing system does not require extremely large machinery or a very expensive material handling system.

Unlike conventional inline defluxing systems, the Aeterna does not require deionized water, a floor drain or exhaust. Also it uses a fraction of the power of a conventional inline defluxing system, less than 20%. This defluxing system can easily be integrated into existing manufacturing line. It is ideal for use within both the aerospace and medical industry for high precision cleaning of sensitive products. This system provides a safe, effective spray under immersion cleaning and utilizes a special tunnel design with integral condensing and sub-zero refrigeration coils. *Contact: Baron-Blakeslee, Manufacturing Facility, 200 Armstrong Avenue, Williamstown, WV 26187, USA. Tel: +1-304-716-4411.*

Source: http://www.baronblakeslee.net

Canadian firm recognized for eliminating toxic solvents

TBF Environmental Technology Inc., Canada, that has developed several ground-breaking non-polluting solvent formulas – has been recognized with a prestigious environmental award by the Surrey Board of Trade. The accolade is only given to companies that demonstrate a consistent respect for the environment. "We're delighted and honoured to be recognised by the Surrey Board of Trade for our work. TBF's green solvents have been developed to provide safe, effective replacements for conventional toxic solvents used in a variety of industries. Over 10 million US workers are exposed to toxic solvents every day. We want to improve working conditions and worker health by replacing toxic solvents with our environmentally-friendly substitutes," said David W. Rowat, CEO of TBF.

TBF's leading solvent ZemaSol© is certified as a Clean Air Solvent by California's South Coast Air Quality Management District (SCAQMD), the first such certification in more than 20 years. ZemaSol does not emit Volatile Organic Compounds (VOC's), ozone creators or depletors or hazardous air pollutants into the environment and does not contribute to global warming. VOC's are found in most industrial solvents. VOC's are known to damage human health both in the short and long term. Effects include tremors, impaired memory, severe hearing loss and central nervous system damage. TBF's alternate solvents work effectively across a range of applications and are designed to be safe for people and the environment.

TBF Environmental Technology (TBF) manufactures innovative industrial solvents which reduce environmental impact by reducing or eliminating the emission of Volatile Organic Compounds (VOCs), Hazardous Air Pollutants (HAPs), and greenhouse gases compared to conventional solvents. TBF solvents do not contribute to ozone creation or depletion. All TBF solvents reduce the risk to the health and safety of workers by replacing conventional toxic solvents. *Contact: Amanda Bates, Curve Communications, Canada. Tel: +1-604-248-4204; E-mail: amanda@curvecommunications.com.*

Source: http://www.tbfenvironmental.com

Low global warming potential engineered systems

Firetrace International Ltd., the United States, has announced the launch of the "Firetrace 1230" system, bringing the Firetrace engineered total flood technology into the European market. These systems, introduced earlier this year into the North American and Middle Eastern markets, have quickly gained popularity with users in the region. Engineered for use with 3MTM NovecTM 1230 Fire Protection Fluid, the 25 bar Firetrace 1230 system boasts all the benefits that Novec 1230 has to offer. With exceptional environmental credentials, Novec 1230 has a zero ozone-depletion potential (ODP) a global warming potential (GWP) of just 1, and maximum atmospheric lifetime of only five days. Novec 1230 is stored as a fluid and discharged as a gas.

"Our engineered Novec systems have been very well received around the world, and with the introduction of Firetrace 1230 systems we are looking forward to extending that success into the European market," said Mark Cavanaugh at Firetrace. With seven cylinder sizes ranging from 15 to 180 liter capacity, the Firetrace 1230 system hardware offers customers a choice of fill capacities to meet specific requirements, ensuring maximum economy in installation. All cylinders are manufactured from high strength alloy steel and are both Transportable Pressure Equipment Directive (TPED) and Conformité Européenne (CE) marked.

Source: http://ifpmag.mdmpublishing.com

New water mist sprinkler systems

Ultra Fog AB, Sweden, has developed a high pressure sprinkler system for fighting fires with water mist. Water mist sprinkler systems are more effective than conventional sprinklers and all kinds of fires are extinguished rapidly. Ultra Fog AB offers customized systems for water mist sprinkler systems to fit all needs. Extinguishing fires with water fog is a method superior to most alternatives through its efficiency and cleanness. There are different system solutions for water sprinkler systems and water fog is one method. Ultra Fog AB has developed different systems depending on the application in which the system is to be used that are all based on products and components developed and manufactured by Ultra Fog AB.

Ultra Fog specialises in delivering high pressure water fog sprinkler systems for fire protection across a wide range of marine applications. The Ultra Fog system is designed to meet the existing worldwide marine safety regulations. Upon fire detection, water is sprayed through special nozzles at high pressure and creates tiny water fog micro droplets. These are converted into vapour by the fire, greatly reducing oxygen and creating an over-pressure. The fire is suffocated and the water fog itself provides extremely effective cooling of the fire and surrounding area.

When installed for use on land, it achieves a highly reliable and efficient fi re extinction system which works well in sensitive and valuable environments. The Ultra Fog system can be connected to various different forms of surveillance for early fire detection and immediate activation. Together, fast response with low water consumption saves valuable buildings, occupants and property. *Contact: Ultra Fog, Backa Strandgata 18, 422 46 Hisings Backa, Sweden. Tel: +46-0-31-979-870.*

Source: http://www.ultrafog.com

Fighting fires with high-tech mist

NASA's Glenn Research Center in collaboration with ADA Technologies, Inc., the United States, through multiple, related Small Business Innovation Research (SBIR) contracts is working to develop a novel fire suppression technology for use in both space and ground applications. The Fine Water Mist Portable Fire Extinguisher works like a standard fire extinguisher, but leverages the unique thermal properties of micro-atomized water droplets and is designed to operate in any orientation.

Successful on a wide range of fires, this fire extinguishing technology can be used with great effectiveness on a variety of materials, including electronics, composite materials, and lithium-ion batteries. Intended for use on board the International Space Station (ISS) and next-generation, astronaut-occupied spacecraft, this unique technology is also ideal for use in commercial aircraft and in other enclosed spaces such as mines, clean rooms, hospital labs, and historic buildings.

Contact: Technology Transfer Office, NASA's Glenn Research Center, USA. Tel: +1-216-433-3484; E-mail: TTP@grc.nasa.gov.

Source: https://technology.grc.nasa.gov

New organic compound invented to aid sustainability

After 10 years of hard work, scientists from Zibo Zhenghua Foam Materials Co. Ltd., China, and Shandong University of Technology (SDUT), China, have invented a new type of environmentally friendly chemical blowing agent of polyurethane rigid foam, called CFA-A8, which is expected to replace the prevailing physical blowing agents that contains ozone-depleting substances and super greenhouse gases.

Polyurethane is an emerging organic polymer material, which is often used for thermal insulation and as waterproof materials in a wide range of sectors such as buildings, vehicles, refrigerators, color steel panels, sandwich panels and pipes.

Various physical foaming agents have been used as the main foaming technology for polyurethane rigid foam, in which hydrofluorocarbons (HFCs), potent global warming and ozone-depleting substances (ODS), are the main ingredients. Statistics showed that the global warming increased and ozone layer thinned dramatically in recent years because of the use of HFCs, which exacerbate the enhanced greenhouse effect when they are released into the atmosphere. “Scientists around the world had been trying to find a way to eliminate HFCs from the polyurethane blowing agents, but in vain. After millions of experiments, we finally found the way to make a new organic compound that is CFA-A8,” said Bi Yusui, professor at SDUT.

At a technology evaluation meeting in Beijing in February 2013, the new green organic compound was recognized as an international advanced product by academicians from the Chinese Academy of Sciences and Chinese Academy of Engineering. The sugar-based chemical produced no ODS and only had one thousandth of the global warming potential (GWP=1) of the physical blowing agent. The CFA-A8 is the first chemical blowing agent for polyurethane rigid foam in the world and is expected to accelerate the phase-out of the current physical foaming agents contain substances such as HFC-245fa and HFC-365mfc and the other kinds of HFCs.

Source: http://www.chinadaily.com.cn

Ice-cold foam extrusion technology

Researchers from the Institute of Plastics Processing (IKV) in Industry and the Skilled Crafts at RWTH Aachen University, Germany, in collaboration with motan-colortronic Germany, has developed a new process technology that uses CO_2 in the solid state – so-called dry ice – for the production of medium-heavy foams.

The newly developed process combines the advantages of physical foaming with those of chemical foaming. Like the master batch in chemical foaming, the dry ice is fed into the extruder via the hopper in the form of pellets. Modifications to the extruder itself are therefore not needed.

Another advantage is that, being a physical blowing agent, dry ice does not leave behind any reaction residues such as water in the extrudate.

It is thus also suitable for hydrolysis-sensitive materials. The new metering technique is able to feed dry ice pellets via a metering screw and gravity mixer directly into the feed zone of the extruder. In this way, the IKV research team is able to avoid premature sublimation of the dry ice and cooling of the plastics granules. Through rapid melting of the plastic and fast pressure build-up, the dry ice becomes dissolved in the melt. IKV has since widely tested the new metering technique and drawn up relevant process windows. With the new process technology, foam densities of min. 350 kg/m³ (e.g. LDPE) can be achieved, which are comparable with those of chemical foaming.

By adjusting the process temperatures, the method can also be applied to other plastics such as polypropylene. Despite the comparatively high sublimation losses in the metering of the blowing agent, the process can compete with chemical blowing agents due to the lower cost of CO_2. The process allows an inexpensive entry into foam extrusion because of the fact that any retrofitting is confined to the metering technology. *Contact: Institut für Kunststoffverarbeitung (IKV) in Industrie und Handwerk an der RWTH Aachen, Seffenter Weg 201, 52062 Aachen, Germany. Tel: +49-241-80-28354; Fax: +49-241-80-22316; E-mail: hendriks@ikv.rwth-aachen.de*.

Source: http://www.ikv.rwth-aachen.de

Nematicide received federal registration in US

ADAMA Agricultural Solutions Ltd., the United States, has announced that their fumigant 'NIMITZ™' nematicide has received federal registration on cucurbits and fruiting vegetables and registered with the U.S. Environmental Protection Agency (EPA). For years, commercial vegetable growers have been confined to using restricted use pesticides, primarily fumigants, for nematode management. And while waiting for a new resolve to an old problem, growers have lost use of methyl bromide and a few other carbamate and organophosphate nematicide products. With nematode control options depleting, growers have been forced into battle with tools that are hard to use, increasingly expensive and loaded with use restrictions.

Of the seven main nematode control alternatives used in the last five years on high value crops, six are soil fumigants, including methyl bromide, and the seventh is a carbamate. All seven are restricted use pesticides, which the EPA has cited as posing a greater risk to human health than fluensulfone, the active ingredient in NIMITZ. Unlike older chemistries, NIMITZ is not just a fumigant. The active ingredient is distributed through the soil and into contact with nematodes through water movement via irrigation or rainfall following application. Applied by drip-injection, and broadcast or banding with mechanical incorporation, NIMITZ creates a protective zone for early root establishment and ongoing plant development.

NIMITZ is a true nematicide which kills the target through direct contact rather than temporary paralysis (nematostatic) as seen with older organophosphate and carbamate chemistry. After one hour of contact, target nematodes cease feeding. Within 24 to 48 hours they become paralyzed and then die. Killing nematodes versus immobilizing them is a new paradigm for commercial vegetable growers and an important market upgrade for strategic nematode management. NIMITZ has been evaluated in more than 1,000 field trials – demonstrating successful control, and often times with an increase in marketable yields. And, control extends to the major nematode species on vegetable acres.

Source: http://www.seedquest.com

Evaluation of an automatic steam applicator in strawberry

In a study done by researchers from University of California (UC), the United States, Reiter Affiliated Companies, the United States, and Driscoll's Strawberry Associates, the United States, steam-disinfestation of soil as an alternative to chemical fumigation was evaluated in commercial strawberry production fields using a prototype steam applicator that rapidly heated raised beds by physically mixing steam with the soil. Comparisons were made with anaerobic soil disinfestation (ASD) a non- fumigant soil treatment. Steam suppressed weeds and soil borne pathogens.

Development of more efficient and economic steam application equipment, currently in progress, suggested that the steam approached commercial feasibility. Also, the combination of steam treatment with soil amendments of mustard seed meal (MSM), showed very favorable strawberry production in terms of yield, quality, weed and pathogen control. Steam, and steam plus MSM treatments consistently gave higher yields than non-treated strawberry beds. Treatment effects were also noted with respect to available soil nitrogen. Economic analysis showed returns far exceeded costs of steam treatment.

As a result, season-long fruit yields with steam and steam plus MSM were 58 to 107% higher than the non-treated. Steam application costs for a two-bed commercial applicator were estimated at $3,500/acre (MSM not included), thus comparable to methyl bromide/chloropicrin fumigation. Control of emerged weeds, weed seed and Pythium spp. was good with steam and steam plus MSM. Available soil nitrate was increased by steam and steam plus MSM treatments, and small increases in ammonium were detected (not shown). At ranch 1, heavy soil resulted in large clods remaining during bed formation preventing good mixing of rice bran, and inadequate anaerobic conditions being generated for ASD.

Source: http://www.mbao.org

New nematicide alternative to restricted fumigants in US

The U.S. Environmental Protection Agency (EPA) has registered a new active ingredient, 'fluensulfone', a non-fumigant nematicide that provides lower-risk chemical control of nematodes than methyl bromide and other Restricted Use soil fumigants. Under the Montreal Protocol, EPA has phased out methyl bromide because its use depletes the ozone layer. Nematodes are difficult to control and can

cause significant economic damage by reducing crop yield and quality. Fluensulfone is a nematicide for pre-plant, bare-soil application on fruiting vegetables and cucurbits – cucumbers, melons, squash, tomatoes, okra, eggplant and peppers.

Of the seven main alternatives to fluensulfone used in the last five years, six (including methyl bromide) are soil fumigants and the seventh is a carbamate. All seven are Restricted Use Pesticides, which may pose a greater risk to human health than fluensulfone. Restricted use pesticides require special applicator training and certification, reporting and record-keeping and additional restrictive labeling to protect against human exposure. Soil fumigants can be labor intensive, requiring tarping and posting of fields. With its evaluation, EPA confirms that when used in accordance with the newly approved label, fluensulfone meets the safety requirements in the law. *Contact: Cathy Milbourn, Environmental Protection Agency, USA. Tel: +1-202-564-7849; E-mail: Milbourn.cathy@epa.gov.*

Source: http://www.yosemite.epa.gov

Float trays as an alternative to methyl bromide

Recently a study was carried out by the Department of Agricultural Management, Zimbabwe Open University, Zimbabwe, to evaluate the feasibility as well as the challenges of using float trays as an alternative to the use of methyl bromide in tobacco production. The study made use of the qualitative and quantitative research design. Questionnaires, interviews, economic analysis and field observations were used as data collection instruments. Descriptive analysis was used in the research. The results of the study indicated that floating trays can effectively substitute the use of methyl bromide in tobacco seedling production. The study has been published in *Asian Journal of Applied Science and Engineering*.

This is because of their accessibility, ability to produce excellent quality seedlings because of reduced insect pest, weeds and disease attack and also a reduction in labor requirement. The float trays maintain or improve productivity because the transplanting shock is reduced; when the seedlings are ready for transplanting, there is a reduction land required for seedling production as well as the cost effectiveness of the float trays. There are, however, challenges that affect the float tray system, although the challenges are outweighed by the advantages. The challenges include the technical knowhow that is associated with the float tray system.

The unavailability of additional substrates, the distance to the float tray distributors where the trays are procured, high initial establishment costs and the need for farmer to stay on the farm until the seedlings are transplanted onto the field are also factors affecting the adoption of the float trays. From the results of the research, it was concluded that float trays can substitute methyl bromide in insect pest, weeds and disease control while being environmentally friendly. It was recommended that there is need for farmer training on the use of float trays, government subsidies in initial establishment of the technique, ready supply of the float trays and decentralization of the manufacturers of float trays into tobacco growing areas.

Source: http://ajase.weebly.com

Natural pest solutions on basis of essential oils

Botanical Innovations, Australia, manufactures of natural solutions for the agricultural industry on the basis of essential oils, have developed a bio fumigant and a bio fungicide and are geared up for the horticultural industry, which currently includes mostly greenhouse, potato and vegetable growers.

The company's range of products includes FUNGI Plus, which is suitable against powdery mildew. This product can be either directly sprayed on or introduced in the irrigation system. The product is currently under trials, which will last for about two months, and case studies will be applicable to both greenhouse and open field production. Such natural solutions are obviously popular amongst organic growers, although they are gradually also catching the attention of conventional growers.

Botanical Innovations is currently highly interested in establishing contact with Australian growers or companies that may be interested in trialling its products to compare their effectiveness with that of already available solutions. "Numerous studies already confirm that our products do not cause any long-term harm or remain in the soil for a long period of time," concludes Kerry. *Contact: Kerry Ferguson, Botanical Innovations, PO Box 184, Molong NSW 2866, Australia. Tel: +02-6366-8667; E-mail: Kerry.F.Ferguson@bigpond.com*.

Source: http://www.freshplaza.com

RECENT PUBLICATIONS

NAMAs in the refrigeration, air conditioning and foam sectors: A technical handbook

This handbook aims to serve policy makers and practitioners in developing countries as a comprehensive guideline for the preparation and implementation of nationally appropriate mitigation actions (NAMAs) in the refrigeration, air conditioning and foam (RAC&F) sectors. To date it is the only comprehensive compendium addressing the RAC&F sectors with respect to NAMAs, or, more generally, cost-effective mitigation actions on a sectoral level. The approach of this handbook is sector specific for the RAC&F sectors and its subsectors.

Contact: GIZ Proklima, Dag-Hammarskjöld-Weg 1-5, 65760 Eschborn, Germany. Tel: +49-619-679-1022; Fax: +49-619-679-801-022; E-mail: proklima@giz.de

The Chilling Facts VI

This book has been released by EIA International, UK, and spells good news for the natural refrigerant market. The report reveals that in the past two years, the number of stores in the UK and Europe using natural refrigerants has risen from 730 to 1,889 among surveyed retailers. The Chilling Facts VI details the ways that the market will change in the future and advises retailers to stay ahead of the curve. Notably, the report details the impact of the newly revised EU F-Gas Regulation, which will restrict HFC use.

Contact: EIA International; 62-63 Upper Street, London, N1 0NY, U.K. Tel: +44-207-354-7960; E-mail: ukinfo@eia-international.org

Phasing-out Methyl Bromide in Developing Countries: A success story and its challenges

This booklet addresses the efforts undertaken to phase-out Methyl Bromide in developing countries, the lessons learned and what is pending to reach final phase-out. It further analyses factors that may impact or put at risk the continuity of the phase-out and possible ways to mitigate them.

Contact: UNEP DTIE OzonAction branch, 15 rue de Milan, 75441 Paris CEDEX 09, France. Tel: +331-4437-1450; Fax: +331-4437-1474; E-mail: ozonaction@unep.org

TECH EVENTS

2015

3-5 Feb
Tokyo, Japan

ATMOsphere Asia 2015 – "Natural Refrigerants – Solutions for Asia"
Contact:
Tel: +81-332-877-330
E-mail: info@ATMO.org
Web: http://www.atmo.org

26-28 Feb
Bangalore, India

ACREX India 2015
Contact: ISHRAE
502, DDA Building District Centre
Laxmi Nagar, New Delhi -110092
Tel: +91-11-22540537
Fax: +91-11-43001814
E-mail: acrex2015@ishraehq.in

8-10 Apr
Shanghai, China

China Refrigeration Expo 2015
Contact: Ms. Zhang Ping/Mr. Zhong Weiqin
Chinese Association of Refrigeration (CAR), Fl.10, Yindu Tower,
67, Fucheng Rd., Haidian District,
Beijing, 100142, China
Tel: +86-10-68719984
Fax: +86-10-68420694
E-mail: wqzhong@car.org.cn
Web: http://www.cr-expo.com

25-27 May
Montreal, Canada

4th Climate Change Technology Conference (CCTC 2015)
Contact: Dr. John Plant, Conference Secretary,
Engineering Institute of Canada,
1295 Hwy 2 East, Kingston,
ON K7L 4V1, Canada
Tel: +1-613-547-5989
Fax: +1-613-547-0195
E-mail: prahimi@ualberta.ca
Web: http://www.cctc2015.ca

16-22 Aug
Yokohama, Japan

The 24th IIR International Congress of Refrigeration (ICR 2015)
Contact: Secretariat
C/o ICS Convention Design, Inc.
Chiyoda Bldg., 1-5-18 Sarugakucho,
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