VATIS UPDATE

Ozone Layer Protection

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Apprise yourself with the latest technological innovations

Highlights

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APCTT
Asian and Pacific Centre for Transfer of Technology

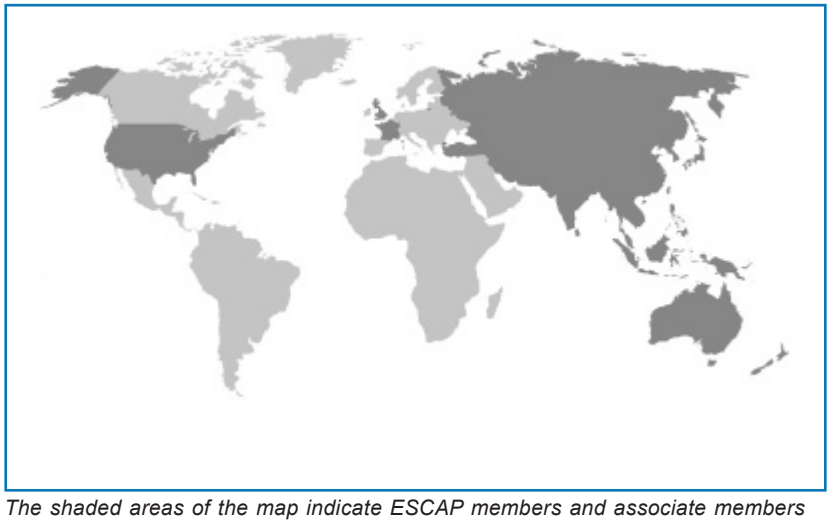
UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific

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

Demonstration of quick response vehicle using water mist fire extinguishing technology

(Credit: Directorate of Fire & Emergency Services, Govt. of Goa, India)

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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Depleting ozone may lead to increased ultraviolet radiation

A team of researchers from the United States and Germany, has measured the highest level of ultraviolet radiation ever recorded on Earth's surface – in the Bolivian Andes – and their study indicates that depleting ozone may be what caused such harmful radiation levels. Only 1,500 miles from the equator, the Bolivian Andes boasted levels far above those normally considered to be harmful to both terrestrial and aquatic life. Using the European Light Dosimeter Network (Eldonet), researchers came to the surprising realization that South America, of all places, demonstrated record ultraviolet (UV) fluxes in the summer of 2003 and 2004.

"These record-setting levels were not measured in Antarctica, where ozone holes have been a recurring problem for decades," said Nathalie A. Cabrol of the SETI Institute, the United States, and NASA Ames Research Center said in a statement. The measurements were taken as Cabrol's team was investigating high altitude Andean lakes as part of an astrobiology study of Mars-like environments. The combination of midday sun and high elevation of these Bolivian mountains–some 20,000 feet above sea level–produced higher irradiance levels because of naturally low ozone in such locations." A UV index of 11 is considered extreme, and has reached up to 26 in nearby locations in recent years," But on December 29, 2003, we measured an index of 43. You simply do not want to be outside when the index reaches 30 or 40," Cabrol noted.

Researchers speculate that this increased UV flux may have been caused by ozone depletion–a result of increased aerosols from both seasonal storms and fires in the area. Also, a large solar flare occurred just two weeks before the highest UV fluxes were registered. While the evidence linking the solar event to the record-breaking radiation is only circumstantial, particles from such flares are known to affect atmospheric chemistry and may have increased ozone depletion." While these events are not directly tied to climate change, they are sentinels of what could occur if ozone thins globally. The thinner and more unstable the ozone, the more prone we will be to this kind of event," Cabrol explained. The study has been published in the journal *Frontiers in Environmental Science*.

Source: http://www.theguardian.com

Effects of ozone depletion in Australia

A new climate model has found that southwestern Australia's long-term decline in fall and winter rainfall is caused by increases in man-made greenhouse gas emissions and ozone depletion. Researchers from the National Oceanic and Atmospheric Administration (NOAA), the United States, conducted several climate simulations using their global climate model to study long-term changes in rainfall in various regions across the globe. One of the most striking signals of change emerged over Australia, where a long-term decline in fall and winter rainfall has been observed over parts of southern Australia. Simulating natural and man-made climate drivers, scientists showed that the decline in rainfall is primarily a response to man-made increases in greenhouse gases as well as a thinning of the ozone caused by man-made aerosol emissions.

Several natural causes were tested with the model, including volcano eruptions and changes in the sun's radiation. But none of these natural climate drivers reproduced the long-term observed drying, indicating this trend is due to human activity." This new high-resolution climate model is able to simulate regional-scale precipitation with considerably improved accuracy compared to previous generation models. This model is a major step forward in our effort to improve the prediction of regional climate change, particularly involving water resources," said Tom Delworth, a research scientist at NOAA, who helped to develop the new model and is co-author of the paper.

Southern Australia's decline in rainfall began around 1970 and has increased over the last four decades. The model projects a continued decline in winter rainfall throughout the rest of the 21st century, with significant implications for regional water resources. The drying is most severe over southwest Australia where the model forecasts a 40% decline in average rainfall by the late 21st century." Predicting potential future changes in water resources, including drought, are an immense societal challenge," said Delworth. This new climate model will help more accurately and quickly to provide resource planners with environmental intelligence at the regional level. The study of Australian drought helped to validate the new model, and thus builds confidence in the model for ongoing studies of North American drought.

Source: http://www.science20.com

NASA's satellite and the ozone layerr

The first instrument to study ozone was Christian Friedrich Schonbein's nose. While conducting an experiment on the electrolysis of water, the German-Swiss chemist noticed a pungent smell and determined the smell was the "odor of electricity," calling it ozone from the Greek word "ozein" meaning to smell. Since this find in 1839, scientists learned that the "odor of electricity" was the product of a chemical reaction that produced O3, or ozone. Now researchers from NASA, the United States, have learned that Schobein's olfactory discovery has large implications for our health and climate, and they now conduct science investigations with more than just their noses.

On its 10th anniversary, NASA's Aura satellite, has provided key measurements to improve our understanding of ozone. With its four instruments, Aura helps researchers understand how the chemistry in the atmosphere influences life on the ground.Scientists used Aura's Microwave Limb Sounder (MLS) instrument to obtain a comprehensive, inside look of the ozone hole from year to year. The MLS instrument measures ozone and other trace gases, or chemicals present at low concentrations, in the stratosphere to study the chemical composition in and around the ozone hole.In 2006 and 2011, Aura's instruments revealed two of the largest and deepest ozone holes in the past decade. Surprisingly, however, Aura data showed that the holes were large and deep for different reasons.

In 2006, ozone fell to low levels over a broad area due to reaction cycles involving chlorine monoxide, a key ozone-destroying chemical that MLS measures. In 2011, MLS measurements implied that inorganic chlorine was 10% lower than in 2006. Computer simulations of the two years showed that chlorine was not the only difference. The 2011 ozone hole was large and deep like 2006 in spite of lower chlorine because of meteorological differences in the two years. In 2011, the winds transported less ozone to the Antarctic.A series of NASA satellites, including Aura, have observed the stratosphere for more than 30 years, helping scientists identify ozone variations that are apparent on a decadal timescale but undetectable on a shorter timescale. With help from ground-based measurements and airborne missions, Aura and its satellite predecessors observed the effect of the Montreal Protocol on the ozone layer as scientists could start to see a decline of chlorine compounds.

Source: http://www.nasa.gov

No 'ozone hole' in the Arctic

Researchers from the Massachusetts Institute of Technology (MIT), the United States, has found that the extremes in Antarctic ozone holes have not been matched in the Arctic. Since the discovery of the Antarctic ozone hole, scientists, policymakers, and the public have wondered whether we might someday see a similarly extreme depletion of ozone over the Arctic.But according to the MIT study ozone levels in the Arctic haven't yet sunk to the extreme lows seen in Antarctica, in part because international efforts to limit ozone-depleting chemicals have been successful."While there is certainly some depletion of Arctic ozone, the extremes of Antarctica so far are very different from what we find in the Arctic, even in the coldest years," said Susan Solomon, Professor at MIT.

Frigid temperatures can spur ozone loss because they create prime conditions for the formation of polar stratospheric clouds. When sunlight hits these clouds, it sparks a reaction between chlorine from chlorofluorocarbons (CFCs), human-made chemicals once used for refrigerants, foam blowing, and other applications. After the ozone-attacking properties of CFCs were discovered in the 1980s, countries across the world agreed to phase-out their use as part of the Montreal Protocol treaty. As a result, atmospheric concentrations have peaked and are now slowly declining, but it will be several decades before CFCs are totally eliminated from the environment."It's really a success story of science and policy, where the right things were done just in time to avoid broader environmental damage," said Solomon, who made some of the first measurements in Antarctica that pointed toward CFCs as the primary cause of the ozone hole.

To obtain their findings, the researchers used balloon and satellite data from the heart of the ozone layer over both polar regions. They found that Arctic ozone levels did drop significantly during an extended period of unusual cold in the spring of 2011. While this dip did depress ozone levels, the decrease was nowhere near as drastic as the nearly complete loss of ozone in the heart of the layer seen in many years in Antarctica. The MIT team's work also helps to show chemical reasons for the differences, demonstrating that ozone loss in Antarctica is closely associated with reduced levels of nitric acid in air that is colder than that in the Arctic."We'll continue to have cold years with extreme Antarctic ozone holes for a long time to come. We can't be sure that there will never be extreme Arctic ozone losses in an unusually cold future year, but so far, so good — and that's good news," said Solomon.

Source: http://wattsupwiththat.com

HCFC phase-out plan for Stage-II servicing sector

A Stakeholders Workshop on HCFC Phase-Out Management Plan (HPMP) Stage-II was organized on 28th July, 2014 in New Delhi, India. The workshop discussed and deliberated on several critical aspects such as: preparation methodology of HPMP Stage-II; Implementation of HPMP Stage-I in India; Overview of Refrigeration and Air-Conditioning (RAC) Industry structure and current & future use of HCFCs in India; Foam manufacturing industry structure and current & future use of HCFCs in India; Profile and use of HCFCs in the Servicing Sector in India; Awareness, information outreach and training of enforcement officers; and Lessons learnt during Implementation of HPMP Stage-I and strategy for preparation of HPMP Stage-II.

The workshop was attended by representatives of the Ozone Cell, Ministry of Environment, Forests and Climate Change (MoEFCC), United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), GIZ, Proklima, Refrigeration and Air-Conditioning Manufacturers Association (RAMA), Indian Polyurethane Association (IPUA), and industry experts. In the presentation, Proklima outlined a number of key lessons learnt during Implementation of HPMP Stage-I, as listed below:

- Trainings focus on servicing technicians to follow Good Servicing and Installation Practices;
- Technicians require good better equipment and tools for servicing and installation;
- Technicians undergoing training spread the message to their colleagues;
- A team of trained trainers is necessary, these trainers if sent for refresher trainings can further sharpen their skills with the updates;
- Availability of standard training facilities (especially for practical training) in cities and town needs to be ensured;
- More sets of equipment and tools required for training to facilitate hands on training for technicians;
- Regular maintenance of these equipment and tools is required due to excessive handling;
- Continuous development of an accurate and relevant database for evidence based decision making; and
- Regular review of the systems developed.

Source: http://www.ozonecell.com

A discussion for ozone layer protection

The 34th meeting of the Open-Ended Working Group (OEWG 34) of the 197 Partiesto the Montreal Protocol, was conducted from 14 to 18 July in Paris, France, which discussed various issues regarding the protection of the earth's fragile ozone layer. The Parties considered the appropriate funding requirement for the replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol for the 2015. Since 1991, the Fund has provided over US$3 billion to support developing countries to phase-out ozone-depleting substances (ODS). The Parties developed draft decisions on exemptions for various uses of ODS, an extension of the global exemption for certain laboratory and analytical uses; a nomination for an essential-use exemption for chlorofluorocarbon-113 for aerospace applications in the Russian Federation; and an exemption for using carbon tetrachloride in testing water quality in China.

The Parties also developed draft decisions on the import and export of used halons for civil aviation, monitoring trade in hydrochlorofluorocarbons (HCFCs) and their substitutes, and emissions. OEWG 34 also discussed alternatives to ozone-depleting substances in various sectors, current and future demand for those alternatives, their economic costs and implications, as well as the environmental benefits of avoiding alternatives to ODSs with high-global warming potential (GWP). The Parties sought from the Scientific Assessment Panel of the Montreal Protocol Parties information on four newly detected ODS that are small but increasing in concentration in the atmosphere. For the fifth consecutive year, the Parties also discussed proposed amendments to the Montreal Protocol to phase down hydrofluorocarbons (HFCs), which are not ODS, but are global-warming gases.

The proposed amendments and other issues discussed at OEWG 34 will be considered further at the 26th Meeting of the Parties to the Montreal Protocol (MOP 26), which takes decisions. MOP 26 will be held jointly with the 10th Meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer from 17-21 November, 2014. Interesting side events also occurred, focused on various issues related to ozone protection, including the progress achieved in phasing out methyl bromide for controlled uses in developing countries, the role of international standards in refrigeration and air-conditioning in the context of HCFC phase-out in developing countries, and the applications of natural refrigerant solutions in developed and developing countries.

Source: http://www.unep.org

Consumption of ODS down by 10% in Bhutan

The National Environment Commission (NEC), Bhutan, has recorded a reduction in consumption of ozone depleting substance (ODS), hydrochloroflurocarbons (HCFC), by 10%. Bhutan is obligated to phase-out some ozone-depleting substances (ODS), as required by the Montreal protocol, a treaty that addressed the depletion of ozone layer in the atmosphere, the consequences of which would lead to serious health and environmental damages. "Some of the major users of ODS, are servicing workshops, equipment importers, hotels, industries and larger institutes," said NEC officials. Through the HCFC phase-out management plan (HPMP), Bhutan has committed to phase-out HCFCs by January 1, 2025 and progress towards zero consumption.

"To achieve the targets, we'll limit the supply of HCFCs by restricting imports through import quotas, controlling sales of HCFC appliances, and through information exchange and advocacy programs. We'll also reduce the demand of HCFCs for servicing existing equipment and limiting new demands of HCFCs," said PeldonTshering, national ozone officer at NEC.To reduce demand of HCFCs for servicing equipment, a two-year course on refrigeration and air-conditioning (RAC) will be put in place to introduce the course as a part of green skills, and to reduce ODS as a part of the phasing out of HCFCs and CFCs.The purpose of the course, which is to be implemented by the labour ministry, is also to train adequate number of manpower in RAC repairing and servicing for sustainable human resource capacity in the long run. It is also expected to enhance employability of youth in the labour market.

The RAC curriculum module includes fundamentals of RAC, service domestic refrigeration system, installing and servicing mobile air conditioning and carrying out tools and equipment, among others. The institute for implementing the course would either be the technical training institute in Samthang, Khuruthang or Thimphu."The biggest challenge

is the availability of substitutes in the market, there are substitutes, but the price always plays a major role, given that a consumer who goes to buy the equipment will always choose the cheapest one. For the long run, it's more sustainable to have a non-ODS equipment, but the upfront cost may be 10-15% higher,"said Tshering.

Source: http://www.kuenselonline.com

Pakistan progressing on ozone layer protection

Pakistan has successfully completed four out of five projects of Stage-I of HCFC Phase-out Management Plan (HPMP), which will keep the country in compliance with the current targets of Montreal Protocol that relates to the Ozone layer. These projects were funded by Multilateral Fund with UNIDO as implementing agency. This was disclosed at a consultative meeting arranged by the Ozone Cell, a climate change division, in collaboration with Ministry of Commerce and Customs Collectorate, Lahore. The meeting discussed the progress of Pakistan's compliance to Montreal Protocol (MP) for protection of Ozone layer. The phase-out of hydrochloroflurocarbons(HCFC), future actions plans, and queries and reservations of stakeholders also came under discussion.

The meeting was moderated by UNIDO consultant Iqbal P. Sheikh and other attendees included representatives of Haier Pakistan, Varioline Intercool, Pakistan, commercial importers and traders of ozone-depleting substances (ODS).Pakistan is a signatory of Montreal Protocol for the protection of Ozone layer.One of the suggestions was to reduce the custom duty on the Ozone and Climate friendly alternatives to HCFC to encourage the use of these gases which would help meet Pakistan's MP targets and discourage illegal trade of HCFC. It was also discussed that quotas of HCFCs shall be strictly implemented to prevent illegal import of HCFC.The meeting concluded with recommendation that such meetings shall continue in future at larger scale and seminars shall also be conducted to raise awareness among the general public.

Source: http://www.nation.com.pk

Indonesia bans industrial usage of HCFC

The Ministry of Trade and Industry, Indonesia, has banned the use of hydrochlorofluorocarbons (HCFC) in industrial practices, which are usually used by manufacturers as raw materials, because they have been classified as ozone-depleting substances (ODS). The ministry issued a regulation on the ban on June 4, based on the Vienna Convention and the Montreal Protocol on ozone-harming substances that call for developing countries to ban usage of ODS. The chemical compounds exist in products such as air conditioners, refrigerators, foam machines, fire extinguishers and solvents. Manufacturers that defy the ban will face administrative sanctions, such as the pulling of their Industrial Business License (IUI) or Industrial Registration License (TDI).

Source: http://www.thejakartapost.com

Pakistan to keep checking import of HCFC

The Federal Board of Revenue (FBR), Pakistan, has to immediately put in place an effective mechanism under the Web Based One Customs (WeBOC) clearance system to automatically maintain the record of imports of hydrochlorofluorocarbons(HCFC) to prevent illegal/excessive imports of the said ozone-depleting substances (ODS). The issue of necessary changes in the WeBOC by the FBR was discussed threadbare during a consultative meeting of HCFC importers and industrialists arranged by Ozone Cell, Climate Change Division Karachi. At present the clearance of the HCFC has been done manually at ports, which needs to be replaced with the WeBOCcomputerised clearance system to automatically debit cleared HCFC from the allocated quota to avoid misuse of the quote regime for HCFC imports in the country.

To prevent illegal/excess imports of HCFCs, Ministry of Commerce has requested FBR to develop the mechanism for the WeBOC system, which will automatically maintain the record of imports of HCFC. It is expected that the FBR would complete the process by end August 2014, to check clearance of the HCFC through WeBOC system. Compliance to Montreal Protocol on the consumption of HCFCs being used in refrigeration and foam industry was the main point of discussion at the meeting. The issues discussed included illegal imports of HCFC, gradual phase-out plan of HCFC and implementation of new HS Codes of HCFC. One of the suggestions was to reduce the

customs duty on non-HCFC to encourage the use of ozone friendly gases which will also help in preventing illegal trade of HCFC. The meeting concluded with the recommendations that such meetings will continue in future at broader level and seminars will also be conducted to raise awareness among general public.

Source: http://www.brecorder.com

Progress in green shale gas technologies

eCORP Stimulation Technologies, LLC (ecorpStim), the United States,has announced that it has further improved the cost effectiveness of its non-water, non-chemical, Non-Flammable Propane (NFP) stimulation technology, which is offered along with the proprietary Pure Propane Stimulation (PPS) stimulation technology. Both technologies eliminate the large quantities of water and chemical additives typically used in today's hydraulic fracturing. With NFP, efforts are proceeding to dramatically reduce the cost of ecorpStim's non-flammable stimulation fluid, Heptafluoropropane (HFP). HFP is a non-flammable, non-toxic, non-ozone-depleting gas commonly used in medicinal inhalers and fire extinguishers. For these uses, HFPsterility and purity are of utmost importance.

ecorpStim and scientists at the Energy Safety Research Institute(ESRI) at Swansea University, the United States, and the Department of Chemistry Rice University,the United States, have an ongoing all-encompassing multi-disciplinary applied research program to enable HFP to be a cost effective stimulation fluid in common practice. "To date HFP has been manufactured for specific applications requiring an extreme focus on purity of one isomer of the HFP compound. This novel application brought to our research team by ecorpStim opens the door for examining a less costly manufacturing process. We are excited to have the opportunity to contribute to a new technology which is in concert with responsible energy development," said Andrew R. Barron, professor at Swansea University.

"Today we are confident that this multi-disciplinary approach will make it possible to reduce the cost of HFP as used in this industrial application to a level at least one full order of magnitude lower than the current cost of pharmaceutical grade HFP, much like the difference between the cost of drinking water versus the cost of water used for intravenous injection, a difference of many orders of magnitude. If HFP can be employed in full scale operations at this lower cost, in combination with ecorpStim's development of highly efficient capture and recycling systems, the effective cost in the field of NFP stimulation should prove to be equal if not less than the cost to produce gas utilizing presently available water fracing methods," said John Francis Thrash, M.D., CEO of ecorpStim. *Contact: Mark Stauss, eCORP International, LLC., USA. Tel: +1-713-520-0993; E-mail: info@ecorpStim.com.*

Source: http://www.en.starafrica.com

New technology to convert non-ozone-depleting refrigerant

Representatives from United Nations Development Programme (UNDP) Montreal Protocol Unit, the United States, the UNDP Asia-Pacific Regional Centre (APRC), Bangkok, and UNDP China, visited the Tsinghua Tongfang Company, China,on 18 April 2014. The group observed a small-sized commercial air-source chiller/heat pump, which was developed and demonstrated by the company through financial assistance from the Multilateral Fund. The demonstration project, a joint venture between Tsinghua Tongfang, the Foreign Economic Cooperation Office (FECO) of the Ministry of Environmental Protection, China, and UNDP, aimed at producing a new chiller/heat pump, which uses R32 technology instead of the R-22 used in previous models.

While the new model is estimated to be 10% more expensive than its predecessor, government subsidies in the initial stages will minimize the overall extra cost to consumers. The real benefit from the conversion comes from changes in refrigerant, as R32 is a non-ozone-depleting substance (ODS) compared to R-22, which has ozone-depleting potential (ODP). In addition, R32 has a global warming potential (GWP) of 675, more than 2.5 times less than R-22's GWP of 1810. "We decided to engage in the demonstration project to align to a greener development path, including increased corporate social responsibility and environmental consciousness. We are now awaiting the finalization of a set of national standards, which will enable us to bring a new product to the market," said Mr. Liu, general manager of Tsinghua Tongfang.

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

Solar-powered cooling for data centres

Mobile telecommunication company MTN, South Africa, has announced, that it has built a concentrating solar cooling system to provide power to its data centres, claiming it as a first for Africa.The system was designed by Reach Renewable and AOS Consulting Engineers, South Africa, and implemented jointly with Industrial Solar, Voltas Technologies, South Africa,and LuftTechnik, Germany. According to MTN, the system is driven by technology called Linear Fresnel Concentrating Solar Power (CSP) that uses heat generated from the sun and has a peak cooling capacity of 330kW.

The system consists of 242 solar mirrors covering a total area of 484 square metres, which can generate pressurised hot water at 180ºC.This hot water powers an absorption chiller that produces chilled water, which is circulated into the data centre for cooling IT equipment.MTN said the mirrors follow the movement of the sun based on their GPS location, orientation, and the date and time. This information guides the system to track the sun to concentrate on the central absorber tube where heat is generated.

When it rains, the mirrors move into a self-cleaning position, while on cloudy days the mirrors turn down into a protective stow position.The absorption chillers themselves use a lithium bromide water solution, which uses water as the refrigerant."This is a completely green solution that has zero global warming potential (GWP=0) and no ozone depletion potential (ODP=0)," MTN said.

Source: http://www.africanbrains.net

Air heat exchangers for CO_2 refrigerants

Heat exchange specialist Alfa Laval, Sweden, has launched the Optigo range of air heat exchangers, optimised for CO_2 refrigerant and consisting of three distinct lines to deliver optimal cooling for different areas and tasks:The Alfa Laval Optigo CC is built to be compact, with a high capacity, ideal for cold rooms with fresh unpackaged food or frozen packaged food and delivers dual-discharge air-cooling for areas that demand increased cooling airflow, such as working rooms.

The Alfa Laval Optigo CS is a low-silhouette, high performance plug-and-play series that can easily fit into areas with high space constraints thanks to its slim build. The range has been optimised to make the most efficient use of CO_2 as a refrigerant, with the tubes designed to handle the high-pressure operation of CO_2. The products are pressure tested in Alfa Laval's nitrogen testing facility to ensure maximum quality and reliability. Equipped with EC fans, the highly efficient range helps save up to 50% in energy costs over the lifecycle of the product.

The Alfa Laval Optigo range has been developed according to the Hazard Analysis Critical Control Point (HACCP) guidelines, and is certified by Eurovent, ensuring that the highest industry standards have been met. "The Optigo range is a testament to our company's continuous efforts to create future-ready solutions for our customers. We are positive that worldwide retailers will soon start to consider our range as an integral part of their operations,"said Harald Hoogendoorn, Market Manager for Alfa Laval.

Source: http://www.racplus.com

Low charge ammonia as a replacement for R22

Azane Inc., the United States, a subsidiary of Star Refrigeration, the United Kingdom, showcased their revolutionary low charge ammonia refrigeration technology to industry professionals and leading end-users at the most influential conference "Atmosphere America 2014"in North America. Discussions focused on the US Environmental Protection Agency (EPA) driven R22 phase-out and the state of the US refrigeration industry, which has been forced to follow Europe's lead on a complete elimination of ozone-depleting refrigerants by 2020. In contrast, the Montreal Protocol's targets for the phase-out of R22 throughout Europe are to be reached by the end of the year, when a total ban on the use of this potent greenhouse gas comes into effect as of 1st Jan 2015.

"Different alternatives are readily accessible, but only natural refrigerants ensure a regulatory free, environmentally friendly and long-term solution," said Derek Hamilton, Business Development Manager at Star Refrigeration. Natural refrigerants such as ammonia are refrigerants that occur naturally. They are not man-made and do not have the detrimental impact on the environment that is associated with synthetic refrigerants.Ammonia is the natural refrigerant used in all Azane products. It has a zero global warming potential (GWP) and a zero ozone-depleting potential (ODP), meaning that it causes no harm to the ozone layer and does not contribute to global warming.

The low charge, packaged design has catapulted the Azanechiller and

Azanefreezer into the spotlight and distinguished them as the natural choice for R22 replacement. They use an equivalent of just 20% of the ammonia charge of a traditional ammonia refrigeration system, which makes them a particularly safer and energy efficient solution. Low charge ammonia reduces the regulatory burden on businesses, as facilities using Azane low charge systems will not be listed in federal and national emphasis programs since this requirement applies to systems with a charge of 10,000 lbs of ammonia or more. Although new to the US industry, low charge ammonia is a proven natural technology that can alleviate the financial burden associated with the compulsory R22 phase-out as Star have demonstrated over the last 20 years by installing hundreds of low charge ammonia systems throughout Europe.

Source:http://www.florida.hvacinsidernews.com

New refrigerant with lower climate impact

The New Energy and Industrial Technology Development Organization (NEDO), Japan, has announced that Asahi Glass Co. (AGC), Japan, a manufacturer of glass, electronic components, chemicals, and other products, had successfully developed a new air-conditioning refrigerant that has one-sixth the global warming potential (GWP) of conventional refrigerants while delivering performance on par with that of HFC-410A, a conventional hydrofluorocarbon(HFC) refrigerant.

Since HFC is a chlorine-free and non-ozone depleting substance, it is used as an alternative to chlorofluorocarbon (CFC); however, its GWP – a relative measure of how much heat a gas traps in the atmosphere – is high and it therefore has a large environmental impact. Regulations have already been imposed on HFC in Europe and the use of HFC is to be restricted in Japan starting in 2015.

AGC developed the new refrigerant in a NEDO project aimed at developing new technologies for high-efficiency non-fluorinated air-conditioning systems. It is an environmentally efficient mixed refrigerant whose main ingredient is HFO-1123, which has an extremely low GWP. It has about half the GWP of HFC-32 (an alternative refrigerant that has begun to be used in some fields), while providing performance equivalent to conventional refrigerants. AGC plans to start commercial production in 2016.

Source:http://www.japanfs.org

Environmentally friendly choice for indoor comfort

Daikin Industries Ltd., Japan, an one of the world's leading companies in air-conditioning, has developed "R32", a Daikin-patented refrigerant which has low carbon dioxide (CO_2) emission, no ozone-depleting potential (ODP), and very low global warming potential (GWP)."As Daikin is present in 145 countries across continents, has 74 production bases, has more than 56,000 employees and has around $1.7 trillion in sales, we have a big impact to the environment, so it is important for us to be environmentally conscious," said TadafumiMikoshi, Assistant Director at Daikin.R32 is a single-component, zero-ODP gas with a GWP of around 650, significantly less than R410A's 1,980. Likewise, this new line of products has very high energy efficiencies. Clients can choose from its four variants: R32 D Smart series, R32 D Smart Elite series, European Design series and Urusara 7.

The R32 D Smart and R32 D Smart Elite seriesare residential-type air conditioners utilizing the R32 refrigerant with inverter technology. Inverter air conditioners are well known for their precise control. In fact, their outstanding efficiency can cut energy bills compared to non-inverter models.These series have a wide range of functions and features to suit the people's everyday comfort needs. From a wide range of airflow patterns, to flexible sound level and air purifying, any weather could be comfortable with just a push of a button.Both series have improved performance over non-inverter models, optimal control of temperature, advanced comfort features including 3D airflow, and titanium apatite photocatalytic air purifying.It also comes with the Outdoor Unit Quiet Operation function, which decreases the sound pressure level by three to six db (A) below the rated operation.

Unlike other air conditioners, Urusara 7 – the world's first to use next-generation R32 refrigerant, is an air conditioner, air purifier and dehumidifier–all in one unit. It puts the latest Japanese air-conditioning technology at your fingertips, offering a unique comfort experience for any lifestyle.Urusara 7, which was particularly designed for the ASEAN market, has a redesigned air intake and heat exchanger, precision circulation airflow, reliable streamer discharge air purification, and convenient automatic filter cleaning system, which allows the unit to function more efficiently. These give users an additional 28% energy savings. Along with its other energy-saving features, Urusara 7's use of the R32 refrigerant gives it an unrivaled energy efficiency.

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

Solvent designed for environmental standards

Users of industrial solvents are currently faced with finding a balance between effective cleaning and favorable environmental properties when seeking an alternative to AK-225 (HCFC-225ca). This popular solvent is used for cleaning, drying and lubricant deposition applications in a variety of end-use markets. Production and import of HCFC-225ca/cb is prohibited after January 1, 2015. Providing alternatives to products with high ozone-depletion potential (ODP) and high global warming potential (GWP) continues to be a key environmental focus for cleaning industry solvent suppliers. Now Honeywell, the United States, has developed a platform of fluorinated solutions based on hydrofluoro-olefin (HFO) technology. The HFOs developed and commercialized by the company have a very low GWP and have tested highly effective in a variety of applications. Solstice Performance Fluid (PF) is the company's latest development in solvent technology.

Solstice PF cleaning solution is nonflammable, has favorable toxicity properties (OEL of 800 ppm), a low global warming potential of 1, negligible ozone depletion, does not contribute to ground level smog and is not a volatile organic compound (VOC) as determined by the U.S. Environmental Protection Agency (EPA). It has low surface tension and is suitable for electronics, metal, medical and precision cleaning. It can be used in vapor degreasing equipment and aerosols. Honeywell is working with aerosol manufacturers to develop formulations that can be used with the product.Solstice PF has range compatibility with a host of plastics, elastomers and metals, including high Ni and Al alloys. As with any product, though, compatibility testing is recommended prior to use.

The product is compatible with many commonly used polymers and elastomers such as PET, PTFE, polycarbonate, Viton and Neoprene. It is also compatible with metals such as aluminum, copper, titanium and magnesium/aluminum alloy. The solution can be recovered or recycled by simple flash distillation or through carbon absorption with stream desorption. Resistant to thermal and hydrolytic breakdown, the nonflammable solvent can be used in vapor degreasing and aerosols.

Source http://www.productionmachining.com

Highly effective and inexpensive fluorinated solvent

Enviro Tech International Inc., the United States, has developed Solvex HDwhich is a highly effective and inexpensive High-Trans Fluorinated solvent. Solvex HD is a more environmentally friendly alternative to HCFC-225, which contributes to the depletion of the ozone layer and will be unavailable in the United States starting in 2015. Unlike many older alternatives, Solvex HD has zero ODP and a very low impact on global warming. In addition, Solvex HD is non-flammable, non-explosive, and safer for employees and the workplace. Solvex HD and other High-Trans Fluorinated Azeotropes are extremely effective for precision cleaning in high-tech industries such as aerospace, aviation, and medical due to the use of an additive called Trans-1,2-DiChloroEthylene. This makes Solvex HD fluorinated cleaning solvents clean more effectively at a lower cost.

Solvex HD can be used in existing vapor degreasers or sprayed from an aerosol container. Our fluorinated solvents are ideal for the cost-effective, precise cleaning and vapor degreasing of electronics, metals and glass. Solvex HD can be used to clean adhesives, fluxes, pastes, buffing compounds, greases, silicone oils, particulate, resins, waxes and much more.*Contact: Enviro Tech International, Inc.,1800 N. 25th Ave., Melrose Park, IL, 60160, USA. Tel: +1-708-343-6641.*

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

Non-flammable solvent system

ZYP Coatings, Inc., the United States, has developed a new uniquenon-flammable aerosol spray Boron Nitride Aerosol Lubricoat®-NF based on the Necosolv™ nonflammable solvent system with the new, "green" Solstice™ HFO-1234-ze propellant.Thus, the useful properties of Boron Nitride (BN) can be achieved with a nonflammable, fast-drying solvent-based aerosol-can.Coatings are applied at room temperature and dried, after which they can be used from cryogenic temperatures up to 1000°C in air, 1400°C in vacuum, and 1800°C in inert/nitrogen atmospheres.Boron Nitride is chemically inert – nonreactive/nonwetting with most molten metals, glasses, and slags – providing non-stick, release, and barrier-layers to reactive materials.

The specialty uses of this non-flammable aerosol-spray BN are

almost unlimited for researchers, engineers, scientists, designers, chemists, maintenance personnel in most every field. *Contact: ZYP Coatings, Inc, 120 Valley Court Rd., P.O. Box 2590, Oak Ridge, TN 37830, USA. Tel: +1-865-482-5717; Fax: +1-865-482-1281.*

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

New stencil cleaning line solution from Kyzen

Kyzen, the United States, showcased its new stencil cleaning line for the first time at the IPC APEX EXPO, which took place on March 25-27, 2014 at the Mandalay Bay Resort & Convention Center in Las Vegas, the United States. The new line addresses the most common stencil cleaning processes. These products have been designed from the ground up to meet the tough challenges of cleaning no-clean, lead-free residue from small, 01005 apertures while being compatible with modern nano-coatings as well as with all the modern offline cleaning equipment currently used in the industry. The new line includes: AQUANOX® A8820, AQUANOX® A8830 and CYBERSOLV® C8882.

AQUANOX® A8820 effectively removes common solder pastes and fluxes, and demonstrates a favorable compatibility profile with stencil cleaning systems. It works well with spray-in-air and select ultrasonic cleaning machines, and is also effective on uncured adhesives. Additionally, the no-foaming property of A8820 is compatible with all materials commonly used in electronic assembly manufacturing and cleaning processes. AQUANOX® A8830 is an ultra-low VOC, environmentally progressive formulation that does not damage stencils and is highly effective at removing all types of solder pastes (water soluble, rosin, and no-clean) from fine-pitch apertures.

CYBERSOLV® C8882 is a fast-acting stencil cleaning solvent designed for the under-stencil on printer wipe cleaning process. C8882 instantly dissolves all flux types within the solder paste, including water soluble, rosin and low residue no-clean fluxes. C8882 dries quickly, eliminating the streaking and smearing experienced with traditional cleaning solvents. *Contact: Kyzen Corporation, 430 Harding, Industrial Drive, Nashville, TN 37211, USA. Tel: +1-615-831-0888; Fax: 615-831-0889.*

Source: http://www.kyzen.com

Environment friendly vapour degreaser

The new Ultrasonic Vapour Degreaser (UVD) from Soniclean, Australia, provides precision cleaning of various components including oxygen, nitrogen, hydraulic, gyrosystems, airframe and engine parts. The UVD has been designed to be used with solvents that have been made to impact minimally on the environment, prevent pollution and conserve resources. Soniclean's UVD uses pulse swept power to clean with superior penetration, precision and reliability. This technology uses pulsed ultrasonics to ensure powerful, reliable, uniform cleaning to fine parts without the risk of damage to delicate items.

Our commitment to excellence means that all of our units are made to the highest standards. The units are designed to exceed the Australian Standards 2661 and to provide software driven precision cleaning process control, with an incredible small footprint powered from a standard 15 amps electrical supply. *Contact: Soniclean, 38 Anderson Street, The barton, South Australia - 5031. Tel: +61-8-823-483-98; Fax: +61-8-823-483-91; E-mail: sales@soniclean.com.au.*

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

New precision cleaning agent

Developed by DuPont, the United States, Vertrel® XH specialty fluid is a proprietary azeotrope of Vertrel® XF and heptane. Vertrel® XH has zero ozone depletion potential (ODP), ideally suited for use in a vapor degreasing equipment for precision cleaning and rinsing for removal of particulate and light soils from metal, glass, and plastic parts. It is used to replace current hydrochlorofluorocarbon (HCFC) and perfluorocarbon (PFC) fluids in most applications.

Because there are multiple Vertrel® specialty fluid products that can be used for the same application depending on the specifics of your application, please contact us so we can guide you to the best solution for your specific needs.Vertrel® XH is compatible with most plastics and elastomers and can be used to clean a wide variety of soils, including cutting oils, gear oils, heavy greases, hydraulic oils, stamping oils, vacuum oils, waxes, and mineral oils. Vertrel® XH is non-flammable and does not become flammable during normal operation.

Source: http://www2.dupont.com

Fine water mist fire suppression system

NASA's Glenn Research Center, the United States, has collaborated with ADA Technologies, Inc., the Unites States, through multiple, related Small Business Innovation Research (SBIR) contracts 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 onboard theInternational 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://www.technology.grc.nasa.gov

Water mist system for maritime applications

Autronica Fire and Security AS, Norway, has developed a new water mist nozzle for the FlexiFOG® water mist system based on the concept LESS IS MORE. FlexiFOG® micro accommodation water mist system protecting public space, cabins, corridors and storage areas is the number one solution providing a highly efficient water mist fire suppression system with low weight, easy installation and state-of-the-art design.

FlexiFOG® can be integrated into a single-supplier fire detection and suppression system. This water mist fire suppression system can protect accommodation areas, machinery space areas as total flooding and local protection with one single pump package. Additionally, the control system can be integrated with AutroSafe fire detection system including AutroMaster 5000 presentation system. This means the bridge can have total control of the vessel's entire fire protection system on one single computer screen.

Contact: Autronica Fire and Security AS, Haakon VII´s Gate 4, Trondheim, 7483, Norway. Tel: +47-7358 2500; Fax: +47-7358-2501.

Source: http://www.thebigredguide.com

Water-mist may prevent rain of sparks

Fire researchers have shown that sparks from a burning house can be prevented from spreading if the loft is fitted with an extinguishing system based on water-mist, i.e. tiny water droplets that turn into steam. An eleven-year-old report from the Norwegian Fire Research Laboratory (SINTEF), has become highly relevant, after a catastrophic fire in Lærdal in Western Norway, which destroyed 40 buildings. When fire crews obtained permission to set fire to an old timber house, then under construction, SINTEF's fire researchers were given the chance to test the effects of a water-mist system that they had installed in the loft.

Water-misting is a relatively new extinguishing method, which so far has mainly been used in ships, offshore platforms and industrial buildings, etc.The method consists of drenching the site with tiny droplets of water, much of which is turned to steam by the heat of the fire. This has a number of fire-restricting effects: the water's own uptake of heat, particularly when it evaporates, cools down the flames. The water that reaches the surface of the fuel also helps to cool it down. At the same time, the volume of the water increases dramatically as it turns into steam, displacing oxygen that would otherwise feed the flames.

Source: http://www.sciencedaily.com

Water mist based extinguishing system

The Aquatech® from TemaSistemiS.p.A., Italy, is a highly innovative high-pressure water mist fire extinguishing system, characterized by a high level of modularity and by advanced operational performance in order to be able to extinguish the most dangerous fires due to the generation of a fog through the turbulent motion of directional water droplets. The technological solutions based on water mist are contained in two product lines Aquatech® which uses only high-pressure water and Aquatech® Plus which operates at a low pressure and uses water mixed with a special additive wetting agent type.

Contact: TemaSistemiS.p.a., 48123, Via Romagnoli, 4, Italy. Tel: +39-0544- 4550-65; Fax: +39-0544-4591-40; E-mail: info@temasistemi.com.

Source: http://www.temasistemi.eu

A blowing agent for spray foam insulation system

Lapolla Industries, Inc., the United States, a global supplier and manufacturer of spray polyurethane foam insulation, reflective roof coatings, and equipment designed to reduce energy consumption in the residential, industrial and commercial markets, has announced that it is the first company globally to develop the technology and commercially release Honeywell's new Solstice®Liquid Blowing Agent (LBA) in spray foam insulation wall system in the USA.

Solstice LBA allows Lapolla closed-cell spray foam insulation to expand and contribute to the foam's superior insulating properties. Solstice LBA is a next-generation blowing agent from Honeywell that not only improves foam performance, but also delivers environmental benefits including enhanced energy efficiency. Solstice LBA has an ultra-low global warming potential (GWP) of 1, which is 99.9% lower than today's most commonly-used blowing agent, HFC-245fa, a hydrofluorocarbon, while retaining its insulating performance. *Contact: 5402 Vantage Pkwy E. Ste. 322, Houston, TX 77032, USA. Tel: +1-281-219-4100; E-mail: info@lapolla.com.*

Source: http://www.azobuild.com

Method of producing metallic foams without blowing agents

Researchers at North Carolina State University (NCSU), the United States, have developed a novel method of producing metallic foams without the use of any blowing agents. Using this method, metal can be foamed in a solid state, allowing lower processing temperatures and therefore higher energy efficiency. Since there is no melting involved, metastable and non-equilibrium mictrostructures may be maintained through the foaming process, thus allowing the possibility of finer grain sizes and much higher pore density, resulting in superior strength and other physical properties, and allows pore size and distribution to be more finely controlled. Porosity may be open, closed, or mixed, depending on processing conditions.

Furthermore, the solid state of this process allows for microstructure and process design that could not be achieved otherwise. Currently, most metal foams are produced by introducing blowing agents into molten metals. The chemical decomposition of these blowing agents in the molten metal creates bubbles of gas which form the cellular structure of the foam. These blowing agents can be hazardous chemicals and the products left by their decomposition have a propensity to undesirably react with the metal matrix. In addition, the melting point of these blowing agents must be matched to the specific metal alloy being used.

Inert gases used in processing are 100% recyclable, as no chemical decomposition occurs in foaming, and are non-toxic and environmentally safe, unlike some of the hazardous chemicals used as blowing agents. The process is not specific to any particular alloy and should work with any alloy with some minor adjustments to processing conditions. Since there is no melting involved, metastable and non-equilibrium mictrostructures may be maintained through the foaming process, thus allowing the possibility of finer grain sizes for superior strength and properties. Process can be done without a crucible, in the solid state.

Source: https://www.webaccess.wipo.int

Light weighting foam process

At Chinaplas 2014, held on April 23-26 in China, the Massachusetts Institute of Technology (MIT), the United States, showcased a lightweighting technology "MuCell", which is being commercialized by Trexel, the United States. "Growth of the microcellular foaming technology has taken off since Trexel removed licensing fees on its use, and instead is making money on the sale of equipment used in the process,"said Steve Braig, CEO at Trexel.The theme of the show was "Greenovation – Solution to Sustainability", and featured events included "The City of Tomorrow" and "Green Conference".

Trexel partner Engel based at Florida, demonstrated foam melting on a duo 900 injection molding machine with integrated viper 20 linear robot as the focus of its automotive exhibition. Oil sumps are produced on the large-scale machine with 9,000 kN (918 metric tons) of clamping force. In the MuCell process, the plastic melt is loaded with nitrogen or carbon dioxide (CO_2) and then injected into the mold, during which time the gas expands in the mold cavity. The use of raw materials and the component weight are reduced, while at the same time the rheological properties of the melt improved. This is said to result in dimensionally stable injection molded parts that are free from sink marks.

Source: http://www.themoldingblog.com

Mustard to battle against wireworms

The wireworms have spread across Prince Edward Island (P.E.I.), Canada, these days and costing potato growers millions of dollars by damaging crops, farmers are turning to a new rotation crop for the fight.Wireworms, the larval form of the click beetle, have become a serious agricultural pest on the Island in the last couple of years."It's the population increase. That's what really shocked me, is how fast they have increased in number," said Christine Noronha, a pest control specialist with Agriculture Canada. Wireworms live in the ground, beyond the reach of insecticides sprayed on the surface. The insects dig holes in potatoes as they grow, making them unfit for sale. The pest cost the industry on the Island $6 million in 2013.

"The problem is spreading to other crops as well.We're seeing it this year in strawberries and grain crops and root crops like potatoes and carrots for sure. It is a serious threat," said Brian Beaton, potato coordinator with P.E.I. Department of Agriculture.Beaton said thousands of hectares of brown mustard have been planted this year as part of the battle against wireworm. Last year just a few hundred hectares were planted.The plants are toxic to wireworms and studies have shown brown mustard and buckwheat are effective as natural fumigants, especially when planted two years in a row.

"The brown mustard produces a bio-fumigant in its roots. As you mulch up the whole plant and the plant gets broken down, there's a reaction that takes place and gives off the bio-fumigant into the soil to basically help to control and kill any disease and insects that may be present in the soil," said Beaton. There are multiple studies going on this year into controlling wireworm, including more research into brown mustard and the best way to use the crop to keep wireworm populations in check.

Source: http://www.cbc.ca

Fumigants for strawberry production

Scientists from the University of California, the United States, have studied the minimum application rates of allylisothiocyanate (IRF-135) and dimethyl disulfide (Paladin) applied under totally impermeable film (TIF) for strawberry production. Allylisothiocyanate was bed shank applied at 170, 255, and 340 lbs/acre. Two mixtures of dimethyl disulfide with chloropicrin were applied at 500 lbs/acre (79% dimethyl disulfide + 21% chloropicrin) and 400 lbs/acre (50% dimethyl disulfide + 50% chloropicrin).

Fumigants were applied in October, 2012. Strawberry (Albion variety) was transplanted in November, 2012. Each treatment was 100 feet long. Each treatment was replicated 4 times. Yield data were taken weekly throughout the production season and were graded into marketable and nonmarketable yields. Weed data were collected three times and combined.

Results suggested that 340 lbs/ac of allylisothiocyanate applied under totally impermeable film(TIF) can produce fruit yields equivalent to PicClor-60. Also, 400 to 500 lbs/ac of DMDS mixtures with chloropicrin can be effective soil treatments for strawberry production.

Source: http://www.mbao.org

A new soil fumigant

MustGrow™ developed by Mustard Products & Technologies Inc. (MPT), Canada, offers a broad range of soil borne nematodes such as Root Knot, Sting, Ring and Spiral along with the management of soil diseases such as Verticillium, Fusarium, and Pythium. The majority of MPT field studies have focused on the use of the product as a pre-plant plant granular treatment applied 14 days prior to transplanting the crop. Although any crops can follow a MustGrow™ treatment, MPT has focused on it's use in strawberry, raspberry and tomato crops.

It is the performance of MustGrow™ in the field that is truly intriguing, especially when looking at yields; quite often it out performs those obtained from Methyl Bromide and InlineR. MPT the manufactures of MustGrow™ have been adamant about launching the product on a solid foundation of scientific research and product performance data. MPT has committed an extensive amount of research across North America, most significantly in California.

Soil disease control was recorded in 10 trials 14-28 days after application. Results as expected with MustGrow™ alone were not as good as with the synthetic products but no disease systems were evident in the crop and yields were not affected. Additional trials found that reduced MustGrow™ rates with a sequential application of Chloropicrin, also at low rates, resulted in outstanding soil pathogen and disease control.

Source: http://www.mbao.org

Effects of fumigants on the biology of root-knot nematodes

Progressive withdrawal of Class 1 synthetic nematicides from world markets creates an urgent demand

for the exploitation and investigation of environmentally-friendlier products to manage plant-parasitic nematode population levels in agricultural/horticultural cropping systems. Although various plant-derived- and other biological-control products have been studied to date to determine their effect on the biology and mortality of plant-parasitic nematodes, baseline knowledge about the mode of action of furfural-based products, such as MultiGuard Protect® and CropGuard® as well as other sugarcane-based test products are lacking. Now researchers fromNorth-West University, South Africa, have studied the effects of MultiGuard Protect®, CropGuard® and four sugarcane-based test products, using a range of concentrations, which were evaluated in vitro (in a temperature-regulated growth chamber) as well as in vivo (in a greenhouse) at 26°C. Freshly-hatched second-stage juveniles (J2) of M. javanicaand M. incognita, respectively, were suspended in 2ml-aliquots of MultiGuard Protect®, CropGuard® and the test products and their concentrations in separate trials. Data on J2 motility, mortality, ultrastructure and specific oxygen consumption rate (ṀO2) were recorded 24, 48, 72 and 96 hours after onset of trials. M. javanicaJ2 that were exposed for 96hours to different concentrations of one of the test products were inoculated on roots of two-leaf-stage tomato seedlings (cv. Rodade), planted in 4-ℓ capacity plastic pots that were filled with a Telone II-fumigated, sandy-loam soil (4% clay, 0% silt and 96% sand) with a pH (KCl) of 4.69. N.

Scanning Electron Microscopy results indicated that the lateral line structures of J2 suspended in the CropGuard® showed a “sunken” appearance. Ultimately, ṀO2 measurements confirmed that the respiratory physiology of J2 was adversely affected after suspension in CropGuard® and the other test products. The latter results thus supported motility studies that showed a similar trend with regard to the biology of these organisms. Partial respiratory recuperation of only Meloidogyne incognita J2 occurred when transferred to sterile tap water after being suspended in the lowest CropGuard® concentrations. Also, magnetic stirring during ṀO2 measurements of J2 did not affect the oxygen consumption rates during a 20 minute period, using 5,000 individuals in the respiration chamber .The ṀO2 stayed at a constant rate (30.2 micromole O2 hr-1 g-1) at 25ºC with speeds varying from 25 rpm up to 1,000 rpm.

Source: http://www.mbao.org

Disinfestation of pome fruits

According to a study by scientists from Washington State University, the United States, Vivafresh Technologies, the Unites States, and the Northwest A&F University, China, the U.S. apples, pears and cherries may be infested with codling moth, Cydiapomonella, an important quarantine pest, require fumigation with methyl bromide before export to certain markets. Whereas quarantine and pre-shipment (QPS) treatments are currently allowable under the Montreal Protocol, there is growing concern that the QPS exemption will eventually be lost. Consequently, alternative treatment protocols are being considered. Low pressure treatments, coupled with low temperatures and carefully regulated humidity, have been shown to prevent product deterioration caused by fungal decay, and prevent shriveling and fruit ripening during storage.

For this project a lab scale low pressure and low temperature (LPLT) system was used, consisting of two 0.152m3 insulated aluminum chambers (VivaFresh™ Model RDC-0005, Atlas Technologies, USA) and a two-stage rotary vacuum pump regulated by an inline vacuum regulator coupled with a sub-atmospheric regulator. Chamber pressure was monitored with a digital pressure gauge. A rotameter adjusted the air exchange rate, and ingoing air was humidified in order to keep the humidity near saturation (98-99%). Data from temperature, humidity and pressure sensors were sent to a computer control and recording system. The chambers were held in cold rooms set at the desired treatment temperature (10-13°C). Efficacy studies were done using lab-reared codling moth eggs, 7 days old larvae, 14 days old larvae and pupae.

Resultsfound that there was little difference noted between codling moth mortality after 12 days of intermittent exposure and 12 days of continuous exposure. Eggs were found to be the least tolerant to 10 mm Hg and 10°C. Subsequent probit analysis of the remaining life stages showed that there was no significant difference between 5th instar larvae and pupae, but that 2nd-3rd instar larvae were significantly less tolerant. Because 5th instar larvae had the highest LT values, they were selected for further studies. Dose response results for 5th instar larvae exposed to 12 mm Hg pressure and 13°C showed that lethal times were considerably reduced from those treatments at 10 mm Hg and 10°C. In particular, probit 9 for 5th instar larvae treated at the higher temperature was 14.7 (13.3-16.7) days, much lower than the 20.5 (16.9-28.9) days needed for probit 9 at the lower temperature.

Source: http://www.mbao.org

RECENT PUBLICATIONS

Low-GWP Alternatives in Commercial Refrigeration: Propane, CO_2 and HFO Case Studies

This booklet is the first of a series of case studies on alternatives to hydrofluorocarbons (HFC). The booklet provides information on energy efficient, zero to low-GWP alternatives to HFCs in the Commercial Refrigeration sector. This information resource is intended to assist relevant decision makers, especially those in developing countries, in selecting the most appropriate climate-friendly alternatives. This document has been developed by the United Nations Environment Programme (UNEP), OzonAction Branch, as part of UNEP's work programme under the Climate and Clean Air Coalition (CCAC).

Contact: UNEP DTIE OzonAction Branch, 15 rue Milan, 75441 Paris Cedex 09, France. Tel: +33-1-4437 1450; Fax: +33-1-4437-1474; E-mail: ozonaction@unep.org

2014 ASHRAE Handbook — Refrigeration

The 2014 ASHRAE Handbook–Refrigeration, covers refrigeration equipment and systems for applications other than human comfort.The 51 chapters in this volume include information on cooling, freezing, and storing food; industrial applications of refrigeration; and low-temperature refrigeration.

The ASHRAE Handbook is published in two editions: inch-pound (I-P) units of measurement and the International System of Units (SI). The new 2014 volume is also available as one of the four current volumes included in the ASHRAEHandbook Online. Updates and changes to the 2014 volume include:

- Reworking of insulation tables in Chapter 10, Insulation Systems for Refrigerant Piping, to comply with ASTM Standard C680-10.
- Extensive reorganization of Chapter 2, Ammonia Refrigeration Systems, to reflect current practices.
- Addition of new sections on additives and process chemicals to Chapter 6, Refrigerant System Chemistry.

Contact: Jodi Scott, ASHRAE Customer Contact Center, USA. Tel: +1-800-527-4723; Fax: +678-539-2129; E-mail: jscott@ashrae.org

TECH EVENTS

4-6 Nov
Orlando, USA

Annual International Research Conference on Methyl Bromide Alternatives and Emissions Reductions
Contact: Methyl Bromide Alternatives Outreach
6556 N. Dolores Ave.
Fresno, CA 93711, USA
Tel: +1-559-449-9035
Fax: +1-559-449-9037
E-mail: gobenauf@agresearchconsulting.com

5-8 Nov
Pasay City, Philippines

HVAC/R PHILIPPINES 2014
Contact: Global-Link
Unit 1003 Antel 2000 Corporate Center, 21 Valero St. Salcedo Village, Makati City, Philippines
Tel: +632-750-8588
Fax: +632-750-8585

20-21 Nov
Kobe, Japan

The International Symposium on New Refrigerants and Environmental Technology 2014
Contact: The Symposium Secretariat
The Japan Refrigeration and Air Conditioning Industry Association
Kikai Shinko Bldg. 201, 3-5-8, Shibakoen, Minato-ku,
Tokyo 105-0011, Japan
Tel: +81-3-3432-1671
Fax: +81-3-3438-0308
E-mail: kobesympo2014@jraia.or.jp

2015

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: Mr. ZhongWeiqin
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

1-3 Jul
Ho Chi Minh, Viet Nam

RAHV VIET NAM 2015
Contact: Top Repute Co., Ltd.
2403, Fu Fai Commercial Centre
27 Hillier Street, Sheung Wan, Hong Kong
Tel: +852-2851-8603
Fax: +852-2851-8637

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- ❑ VATIS Update (4 issues/year)
  - ❍ Biotechnology (e-version)
  - ❍ Non-conventional Energy (e-version)
  - ❍ Food Processing (e-version)
  - ❍ Ozone Layer Protection# (e-version)
  - ❍ Waste Management (e-version)

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