ECO-COOL™

Bulletin for Refrigeration Technicians

Issue No. 20 September 2007

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Contents

Editorial

Dear Reader,

September 2007 marks the 20th anniversary of the Montreal Protocol, regarded as one of the most successful international treaties that came into existence on 16th September 1987. This happily coincides with the 20th issue of the Eco Cool, the only newsletter catering to the Refrigeration Technicians in the framework of India's final project (NCCoPP) to phase-out CFCs. Over the years, Eco Cool has provided insightful technical articles and updates on the phase-out efforts of the country and will continue to do so in the coming years.

This being a special issue on the Montreal Protocol, we take a look at the Protocol, its evolution and achievements over the years. We also take a look at the various activities planned for the 20th anniversary with a specific focus on India.

Today, along with protection of the ozone layer, global warming is an equally pressing environmental issue. Although the focus of the Montreal Protocol has been on the protection of the ozone layer, it has also helped in the reduction of greenhouse gases, which contribute to global warming. We take an in-depth look at this phenomenon in "The Montreal Protocol and the Protection of the Ozone Layer".

The Indian customs department also plays an important role in the protection of the ozone layer and we have an article detailing their contribution.

The FAQ section caters to the technical interest of the technicians and provides them tips on "Servicing Practices". As usual, we also have a brief update on NCCoPP and its activities. The Ozone Newsflashes section looks at a new firefighting compound, which can be used in place of the damaging halons.

In the ongoing celebrations of the 20th Anniversary of the Montreal Protocol, Eco Cool celebrates and salutes the world's efforts, especially India's efforts in successfully phasing out CFCs!

Contact: Manisha Dolia
Email: md@itpi.co.in

Montreal Protocol Implementers Award goes to the Ozone Cell

On the occasion of the 20th Anniversary of the Montreal Protocol, the Ozone Cell of India has been selected to receive the Montreal Protocol Implementers Award. The Award Ceremony took place on Monday, 17th September 2007 at Montreal. The Ozone Secretariat has expressed its pleasure to have the opportunity to recognize the contributions of key participants in the ozone process and is pleased to honour the Ozone Cell of the Ministry of Environment and Forests (MoEF), Government of India for the work that it has done to protect the ozone layer.

The Ozone Cell, a special directorate established within the Ministry of Environment and Forests, acts as a national focal point for managing and coordinating the implementation of the Montreal Protocol in India. The Ozone Cell also functions as the Secretariat for the multi-stakeholder Empowered Steering Committee established by Government of India to formulate, monitor and coordinate all policy actions pertaining to the Montreal Protocol, comprising of stakeholder from various ministries, scientific and technical institutions and regulatory agencies.

The Ozone Cell has built sustainable partnerships with the private sector, according it meaningful representation in policy and decision-making, through industry and trade associations. The Ozone Cell has also sustained a robust public awareness programme to highlight ODS phase-out activities and their relevance into consumer consciousness. The Ozone Cell maintains an extensive updated website with substantive downloadable information and publications.

Contact: Ozone Cell, MoEF, India

NCCoPP contributes to CFC Phase-out

NCCoPP contributes to the phase-out of CFCs in the RAC servicing sector by 2010 through:

- Targeting CFC-consuming RAC servicing sector firms
- Encouraging good servicing practices for CFC-based appliances
- Training the servicing sector technicians in handling new non-CFC technologies

NCCoPP 2-day practical training programmes 2004 to 2009 cover:

- CFC and ODS phase-out processes
- Servicing new HFC-134a and HC-based refrigerators and other commercial appliances, including retrofitting
- "Recovery & Reclamation" (R&R) of CFC refrigerants
- Updates on technology and market changes, appropriate tools/equipment
- Best Practices in servicing of Mobile Air-Conditioners (MAC)
- Retrofitting, review of retrofit options and good servicing practices for large commercial appliances using Open-Type Compressors (OTCs).

All domestic and commercial Refrigeration Servicing Enterprises can apply for training. Specialised 1 day training workshops will be held for MAC service enterprises. Training programme schedule and contacts can be found on pages 6 & 7 respectively.

The Montreal Protocol and protection of the global climate

The Montreal Protocol celebrates its 20th anniversary this year and it is widely acknowledged that this multilateral environmental agreement has been remarkably successful. Production of the most damaging ozone-depleting substances (ODS) will be eliminated by 2010 (except for a few critical uses). Without the Protocol, the levels of ODSs would have been five times higher than they are today, and surface UV-B radiation levels would have doubled at mid-latitudes in the northern hemisphere. The Montreal Protocol has thus saved many lives that would otherwise have been lost to skin cancer. According to current estimates, the ozone concentration in the ozone layer is expected to recover to pre-1980 levels by the year 2049 and the Antarctic ozone hole is expected to disappear by 2065.

So far little attention has been paid to the fact that the Montreal Protocol has contributed substantially to the protection of the global climate. Most ODSs are also powerful greenhouse gases and contribute to the radiative forcing of climate change. The Global Warming Potential (GWP) of CFC-12 for example is 8,500 times higher than the GWP of Carbon dioxide (CO_2).

In a recent study by the National Academy of Sciences of the United States of America[1] the CO_2 emission reductions by the Montreal Protocol through the phase out of ODSs have been compared to the emission reduction target of the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC). This amendment to the International Treaty on Climate Change aims to reduce CO_2 equivalent emissions in the signatory countries between 2008 and 2012 (the first commitment period) by 5.2% compared to a 1990 baseline of a basket of the six major greenhouse gases[2]. In the a.m. study, the estimated emission reduction in GWP-weighted ODS emissions due to the implementation of the Montreal Protocol until 2010 exceeds significantly the target of the first commitment period of the Kyoto Protocol.

At present, it is discussed whether and how the Montreal Protocol can further contribute to ozone and climate protection by accelerating the phase-out of the remaining substances, in particular hydrochlorofluorocarbons (HCFCs), which under the current scenario will be frozen at 2015 levels and phased out by 2040 only. The ODP values of HCFCs (mainly used as refrigerant in air conditioning and for foam expansion) are rather low but these substances have considerable GWP values. The commonly used ODS-free alternatives to HCFCs are hydrofluorocarbons (HFCs), which have a similar or even higher GWP than the HCFCs.

Therefore an accelerated phase-out of HCFCs under the Montreal Protocol, which will benefit both the ozone layer as well as the global climate, needs to provide sufficient incentives to switch over to low GWP alternatives, e.g. hydrocarbons. However, an appropriate technology to replace HCFCs with cost effective low GWP alternatives is not yet available for all existing applications. New low GWP products are presently being introduced into the market as alternatives to HFC 134a in mobile air conditioning and will hopefully also become available for other applications in future. We will keep you updated on this topic as soon as new information comes up.

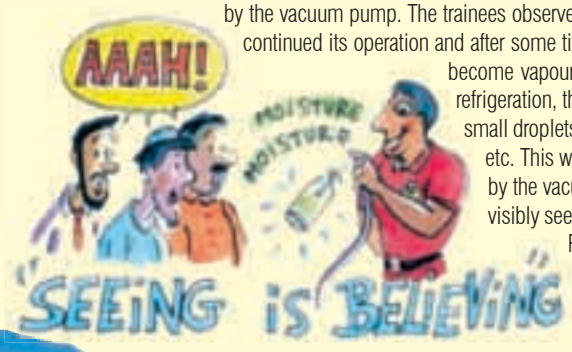
Contact: Markus Wypior
Email: markus.wypior@proklima.org

1 Guus J. M. Velders, Stephen O. Andersen, John S. Daniel, David W. Fahey, and Mack McFarland: The importance of the Montreal Protocol in protecting climate, Proceedings of the National Academy of Sciences of the United States of America, (2007), www.pnas.org

2 CO_2, CH4, N_2O, HFCs, PFCs, and SF6

Technicians Corner
Importance of proper vacuum pump

The importance of using a proper vacuum pump was well demonstrated at a NCCoPP training programme. In the picture you will notice a demo by the trainer on how a proper vacuum pump helps remove moisture.The trainer connected a bottle containing some water to the vacuum pump. The objective was to demonstrate how this water would get converted to vapour and get pulled out of the bottle when a deep vacuum was pulled over the surface of the water by the vacuum pump. The trainees observed that water level in the bottle kept coming down as the vacuum pump continued its operation and after some time all the water had disappeared. This proved that the liquid water had become vapour due to the low pressure or vacuum created by the vacuum pump. In refrigeration, the bottle is replaced by the refrigeration system which also has water (in small droplets) inside its various components like compressor, evaporator, condenser etc. This water can be detrimental to the system and has to be removed effectively by the vacuum pump by pulling a deep vacuum, as demonstrated. As the trainees visibly see the water disappearing they get convinced of the key role of the Vacuum Pump in refrigeration practice. After all, Seeing is Believing.



This is a good and interesting innovation made by the Rajasthan Training cell which we would like to applaud.

ROLE OF CUSTOMS IN THE PROTECTION OF THE OZONE LAYER

India is both a producer and consumer of Ozone Depleting Substances especially CFCs. Smuggling of illicit ODS from India to US was detected for the first time in mid 1990s. Today India is also experiencing illicit ODS imports. Routes through Bangladesh and Nepal play a key role in facilitating these illegal imports. India's Simplified Customs Procedures with Nepal is being misused by smugglers for illegal traffic of ODS. Smuggling routes exist through the border town of Birganj and Birat Nagar. Much of the illegal material seized in India has transited through Dubai and Singapore. More than 60% of the CFC imported into Dubai is re-exported both legally and illegally to Africa, South Asia and other markets, bypassing Montreal Protocol Licensing System. The Dubai Export Free Zone often serves as a conduit for illegal ODS passing through Pakistan and India. The challenge to curb smuggling in Article 5 countries is indeed a difficult one because it is in these countries that the bulk of production and consumption now occurs since the scheduled phase out of ODS in these countries is still to be completed.

As a party to the Montreal Protocol and its London Amendment since 17th September 1992, India has agreed to control the export and import of ODS substances and their production. At present, these can be imported/exported only under license and as per quota allotted by the Ozone Cell under the Ministry of Environment and Forests. Of late, a number of seizures of illegal consignments of these products have been reported through the Indo–Nepal border and Indo–Bangladesh border and also from major Custom Houses and ICDs. It is not easy to identify these products if they are transported by mis-declaration and mislabeling. The only scientific method for identification is by special kits which are being distributed to various stake holders.

The Ozone Cell under the Ministry of Environment and Forestsis entrusted with the implementation of the Montreal Protocol. India has also taken a number of fiscal and regulatory measures to facilitate ODS phase out in the country. Customs and excise duty exemptions have been allowed on goods required for ODS phase out projects and for new investment in substitute industries as per non-ODS technology. The Reserve Bank of India has issued directions to all commercial banks and financial institutions not to finance new establishments with ODS Technology. Trade in ODS with non-parties to the protocol has been banned.

The Central Board of Excise & Customs (CBEC) has been playing a crucial role in the implementation of these fiscal and regulatory measures. NACEN, the training arm of the CBEC is committed to upgrading the skills of approximately 50,000 officers. Since India is one of the article 5 countries, NACEN has been identified by UNEP to be its resource center for Regional Delivery of Customs Training on Control and Monitoring of Ozone Depleting Substances for successful implementation of Montreal Protocol. The co-operation between UNEP and NACEN is part of UNEP's South–South Co-operation initiative. UNEP which has over arching agreement with World Customs Organization in Brussels strongly believes that environmental crime control can be carried out by engaging and strengthening institutes like NACEN in order to build the capacity of not only Customs officers and other stake holders in India but also, that of the Asia Pacific region. Accordingly NACEN focuses on providing training to Customs and Enforcement officers in identifying and tracking ODS and detecting illegal movement.

There is a dire need for providing adequate knowledge of ODS and its smuggling and NACEN has spearheaded the training cum awareness drive. Numerous projects have been launched and several training programmes have been organized. A cadre of trained trainers has been created who have conducted numerous training courses across the length and breadth of the country. A course on Green Customs in which the coverage is wider is also being conducted by NACEN.

In 2005-06 NACEN conducted 28 workshops in which 333 officers (144 in Group A, 121 in Group B and 68 in Group C) have been trained across the country. Officers were drawn from various agencies such as Police, Customs, Border Security Force, Indian Coast Guard, and Directorate General of Foreign Trade etc.

NACEN Faculty trained by UNEP were also associated with the Train the Trainers Programme for DPR Korea, Maldives, Bhutan and Afghanistan. For the coming year, the emphasis will be on e-learning in addition to face-to-face training of enforcement officers of Target Group A, so as to reach out to a maximum number of officers. The concept of this training activity is "training whenever and wherever".One face-to-face training programme at Cochin was held from 22nd to 23rd November 2006 under Tranche II Programme for cutting edge level officers. More such training programmes are being organized in the coming months.

UNEP has also proposed for NACEN to become a collaboration centre on 'green customs' in the Asia Pacific Region, the first centre of its kind in a developing country. The Collaboration Centre will be primarily for research, analysis and capacity building on various environmental conventions including ODS. The agreement is expected to promote the enforcement of environmental regulations at the border by way of imparting training and enhancing awareness more specifically on the role of Customs authorities in the implementation of Multilateral Environmental Agreements. Its core activities are thus linked to environment and security and combating environmental crime. It is expected that the agreement will provide a framework of co-operation and understanding and facilitate collaboration between UNEP and NACEN to further the shared goals and objectives in regard to the conservation, protection, enhancement and support of nature and natural resources including biological diversity worldwide. The Centre will work on analytical tools and on the exchange of experiences with collaborators in developing and developed countries with support for capacity building and training approaches as an integral part of the programme. This Centre will also provide scientific and practical support to UNEP'S activities, including developing, testing, implementing and monitoring concrete projects especially in developing countries.

In short, NACEN is looking forward to more exciting times ahead and greater responsibilities.

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or Director General, NACEN
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20TH ANNIVERSARY OF THE MONTREAL PROTOCOL

The year 2007 marks the 20th Anniversary of the signature of the Montreal Protocol, which is recognized as one of the most successful multilateral environmental agreements. The Montreal Protocol was the first treaty to protect the atmosphere from human impacts. There is much that is unique about the agreement and the way it was developed. For instance, research findings were a vital part of the decision-making process, and scientific assessments are stipulated in the Protocol every four years as a basis for further decisions on ozone-depleting substances.

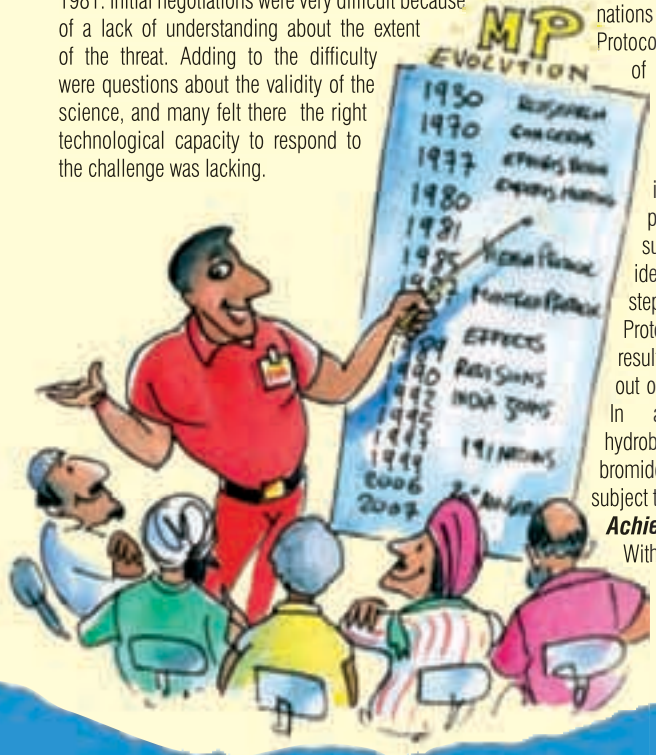
History – Early Research on Stratospheric Ozone

Research on the ozone layer started as early as the 1930s. In the 1970s, concerns arose that stratospheric transport aircrafts might damage the ozone layer. It was at this time that the theory was proposed on the role of chlorofluorocarbons (CFCs) in the depletion of the ozone layer. At the time, CFCs were used in refrigeration, aerosol cans, and certain industrial processes. Initially, the idea was greeted with a great deal of skepticism. However, further research and monitoring began to convince the scientific community that the CFC hypothesis might be valid.

Global Efforts Begin

In 1977, the Coordinating Committee on the Ozone Layer was established by the United Nations Environment Programme (UNEP), and UNEP's Governing Council adopted the World Plan of Action on the Ozone Layer. In the late 1970s and early 1980s, some national governments, including the United States, Canada and Scandinavian countries, imposed bans on CFCs as aerosol propellants in non-essential uses: antiperspirants, hairsprays and deodorants.

In 1981, UNEP acted on a proposal submitted by a meeting of legal experts, chaired by Canada, and decided to develop a global convention. Sweden spearheaded the effort, and with assistance from Norway, Finland and Denmark, developed a convention that was first presented to the international community in 1981. Initial negotiations were very difficult because of a lack of understanding about the extent of the threat. Adding to the difficulty were questions about the validity of the science, and many felt there the right technological capacity to respond to the challenge was lacking.



The Framework

In 1985, the Vienna Convention on the Protection of the Ozone Layer was signed. The Vienna Convention, which outlines states' responsibilities for protecting human health and the environment against the adverse effects of ozone depletion, established the framework under which the Montreal Protocol was negotiated. Canada was the first to ratify the framework treaty. At the time, the parties were unable to agree to specific control measures. However, a resolution initiated by Sweden was adopted, whereby the parties agreed to two meetings over the following two years to start work on a control protocol.

The period between the Vienna Convention (March 1985), and the Montreal Protocol (September 1987), was characterized by incredible progress. The global scientific community reached consensus on outstanding matters, while meetings were held in Rome to clarify and quantify the current global emissions of ozone-depleting substances and future trends, and new mechanisms for control were discussed.

By September 1987, the disagreements and lack of understanding had given way to trust. In turn, the trust offered the prospect of consensus on control measures. Thus, it was on September 16, 1987 that the Montreal Protocol on Substances that Deplete the Ozone Layer was signed by 24 countries. On January 1, 1989, the Protocol came into effect. All Parties agreed to meet near-term targets of freezing consumption of key CFCs and halons at 1986 levels, and reducing consumption by 50% within 10 years. Since then, it has undergone five revisions, in 1990 (London), 1992 (Copenhagen), 1995 (Vienna), 1997 (Montreal), and 1999 (Beijing). Due to its widespread adoption and successful implementation, the Montreal Protocol has been hailed as an example of exceptional international cooperation, with Kofi Annan quoted as saying "Perhaps the single most successful international agreement to date has been the Montreal Protocol" At present, 191 nations have become party to the Montreal Protocol. The 5 nations that are not party as of November 2006 are Andorra, Iraq, San Marino, Timor-Leste and Vatican City.

While the Protocol is complex, its most important feature was the dynamic process for controlling ozone-depleting substances in addition to those initially identified in the Protocol. One of the major steps was the amendment to the Montreal Protocol in Copenhagen, in 1992, which resulted in a further acceleration of the phase-out of several ozone-depleting substances. In addition, hydrochlorofluorocarbons, hydrobromofluorocarbons and methyl bromide were added to the list of substances subject to control.

Achievements

With a strong multilateral mechanism for discussing various ODS phase-out issues, financial and technical support to developing countries by the developed countries on ODS phase-out and time bound ODS phase-out targets to be achieved by the developed and developing countries, this protocol has helped in reducing ODS production and consumption by more than 90% compared to the production and consumption levels a couple of decades ago. For achieving the phase-out targets, several project support measures have been implemented, particularly designed to address small and medium sized enterprises on cost effectively managing ODS phase-out and transitioning to a ODS free era. This protocol has also been able to promote south-south cooperation on technical and policy matters relating to ODS phase-out and regional initiatives of cooperation in monitoring ODS trade – two very important aspects which can be adapted for implementation of other international environmental agreements. In addition to the above, technical assessments have demonstrated that activities under Montreal Protocol have significantly contributed to reduction in CO_2 emission levels.

To celebrate the 20th anniversary of this landmark agreement, governments of countries across the globe are implementing several awareness activities to publicize the achievements under Montreal Protocol. These include public advertisements, poster competitions, public events with high-level participation, quiz competitions, painting competitions etc. in their countries. In addition to these, in cooperation with the industry, publicity events are also proposed to be undertaken to enhance general visibility of ODS free technologies and encourage faster adoption of ODS free products. To commemorate the date of signature of Montreal Protocol, the Ozone Secretariat is organising special events in association with Government of Canada in Montreal, Canada. Additional details on the events in Montreal can be obtained from the Ozone Secretariat website.

India and the Montreal Protocol

India has been a party to the Protocol as early as 1992. Over the last 15 years, the country has been actively involved in shaping policies adopted internationally for achieving ODS phase-out – particularly taking into account the special situation of developing countries. During this period, India has implemented several projects with a total funding of about USD 220 million to phase-out more than 11,000 ODP tons. As a part of 20th Anniversary celebrations, several events including publication of India's success story, awareness materials including stickers, posters, folders etc., exhibition on CFC free products, jingle broadcast on FM radio, children's painting & poster design competition, model making competition, ozone quiz, skit and slogan writing competition are proposed to be organized. In this landmark year, the Ozone Secretariat has given a special recognition award to India for its successful efforts to phase out CFCs. This award has been presented to the Government as a part of the 20th Anniversary celebrations in Montreal, Canada in September 2007.

Let us all join hands in these celebrations and reiterate our commitments to protect the Ozone Layer and adopt practices that are environment friendly.

Contact: UNEP, ROAP, Bangkok

Newsflashes from Ozone Layer

Defence Scientists Develop New Fire-Fighting Compound

The Defence Research and Development Organisation (DRDO) has developed a new fire-fighting compound, Hepta-flouro Propane. This compound is a viable alternative to existing Halon as it has less harmful effects on the environment. The new compound, which is in the form of an odour-less Liquefied Compressed Gas, has been developed by the Delhi-based Centre for Fire, Explosives and Environment Safety (CFEES), in collaboration with the Hyderabad-based IICT, using six technologies, which have been transferred by the laboratory to industries in the private sector.

The high fluid, humidity resistant and non-toxic Hepta-flouro Propane will help in the protection of the ozone layer of the environment. Cutting down import of Halon alternative fire suppressant materials will lead to greater self-reliance in fire protection.

The six technologies which have been transferred are MAP based extinguishant powder for ABC class of fires, advanced oxidation process for hazardous effluents, cement-based solid matrix for disposal of toxic heavy-metal wastes, laser-based intelligent fire sensor, activated carbon spheroids for NBC applications and Hepta-flouro Propane for replacement of Halons in fire suppression. Various parameters like purity, acidity, boiling point, suspended particles and halogen ions have been determined in the new compound and have been found meeting the requirements.

The transfer of the six technologies to the private sector will help to promote the use of the eco-friendly fire fighting compound in the civilian world along with the armed forces.

The technology recipient partners from the private sector are Southern Electronics (Bangalore), Water Quality Management Systems (Chennai), Mechvac Fabricators and KV Fire Chemicals (New Bombay) and Hindustan Electro Graphite Limited (Bhopal).

Currently DRDO is developing two additional state-of-the-art fire suppression technologies based on water-mist and on zero-ODP and zero-GWP chemicals. (ANI)

Source: Daily India.com, 16 February 2007

FAQs

This section will focus on a variety of FAQs and will look at it topic-wise. In this issue we focus on technical issues under RAC specific to "Servicing Practices".

Q1 Using Nitrogen at 10bar makes the oil in the condenser and evaporator to come out?
Flushing needs to be done at 5 bar only.

Q2 Trichloroethylene also contains Chlorine and is recommended for cleaning. Will it not also contribute to the Ozone layer damage?
The chlorine in Trichloroethylene does not rise to the stratosphere and therefore, does not contribute to ozone damage. It is not as stable as CFCs and the chlorine in it gets separated and lost in the lower atmosphere. It is therefore not listed amongst the ODS in the Montreal Protocol that needs to be phased out.

Q3 What is the correct measure of vacuum? Is it the level of vacuum or the time the vacuum pump is kept running?
The level of vacuum, as measured in microns of Hg in a vacuum gauge (that is of the Pirani or Thermocouple type) is the right measure of vacuum. The recommended is at least 200 microns (100 microns desirable) Hg for 134a and 500 microns Hg at least for R12. After achieving this level of vacuum, the vacuum pump should be isolated with the valve and stopped and the vacuum holding capacity of the system should be checked. If the pressure rises slowly and then stabilises at a higher level of microns, it means that there is some moisture still remaining. The vacuum pump should be restarted and reconnected and run again for about 10 minutes and the rise in pressure checked again. This process should be repeated till the rise in pressure is as low as possible, suggesting that almost all the water vapour has been removed. After this has been achieved, the vacuum pump should be run for another 5 to 10 minutes before proceeding to the next step of charging refrigerant. In servicing, it is adequate to evacuate down to atleast 500 microns and then allow a rise in vacuum up to 1000- 1500 microns.

Q4 Evacuation needed for HFC is to be as low as 100 Microns. Is such a low level needed for HCs also?
HCs can be evacuated to the same levels as CFCs i.e. at least 500 Microns. Moisture can be as detrimental in an HC system as in a R12 system. Further the solubility of HCs in oil as well as the solubility of moisture in HCs is higher than in the case of CFCs. Therefore it is better to evacuate HC systems to at least 500 microns and for HFC system is at least 200 microns. In servicing, both HC and HFC appliances can be evacuated down to 500 microns atleast.

Q5 What is the purpose of using flux? What is it made of?

Oxidised metal surfaces cannot be brazed and thus, need cleaning beforehand. This cleaning action is performed by the Flux. Flux reacts chemically with the metal oxides and dissolves them and prevents oxides from reforming. Flux becomes fluid at brazing temperatures and adheres to the base metal. The molten filler in the brazing process then displaces flux. Flux is required when brazing ferrous metals with filler rods not containing Phosphorous.

Fluxes are formulated from many chemicals e.g. acid, Borates, Fluorides, Fluoborates, Deoxidizes, water & wetting agents and are available in the form of powder, paste and liquid.

Q6 What is the minimum required level of Ag content in Brazing rods?
Cu to Cu brazing does not need Ag though the presence of 2% Ag helps a lot. However 15% Ag rods is recommended even for Cu to Cu brazing when clearances between the tubes is high to ensure proper filling of the clearance space. For Cu to steel or brass, at least 35% Ag is needed Infact, 45% Ag would be the best.

Newsflashes from NCCoPP

Coming up: Call for NCCoPP Excellence Award for the Trainer of the Year

INFRAS is announcing the launch of an Excellence Award Scheme for Trainer of the Year to honour outstanding performance of trainers under NCCoPP. Training Cell organisers and industry partners soon will be requested to submit their voluntary nominations which will be scrutinized by a jury. Under this scheme, one excellence and three outstanding awards will be announced. Award winners will receive a Certificate of Excellence & cash contribution of INR 10,000 and 5,000 respectively. Details of the award winners along with a summary of their contributions will be published on the NCCoPP website and in the Eco Cool magazine.

NCCoPP Training Programmes Schedule (2007 – 08)

NCCoPP RSE TRAINING (2-days programme)

Region	State	City	Date	Training Partner
North	Jammu & Kashmir	Jammu	27-Oct-07	Ananth Enterprises
North	Himachal Pradesh	Solan	15-Sep-07	Ananth Enterprises
North	Punjab	Pathankot	06-Oct-07	Ananth Enterprises
North	Punjab	Ludhiana	17-Nov-07	Ananth Enterprises
North	Punjab	Faridkot	01-Dec-07	Ananth Enterprises
North	Punjab	Mohali	08-Dec-07	Ananth Enterprises
North	Haryana	Kurukshetra	03-Nov-07	Ananth Enterprises
North	Haryana	Rewari	24-Nov-07	Ananth Enterprises
North	Haryana	Bahadurgarh	15-Dec-07	Ananth Enterprises
North	Uttaranchal	Haridwar	27-Oct-07	Ananth Enterprises
North	Uttar Pradesh	Kanpur	08-Sep-07	Isha Enterprises
North	Uttar Pradesh	Azamgarh	15-Sep-07	Isha Enterprises
North	Uttar Pradesh	Lucknow	Oct -07	Isha Enterprises
North	Uttar Pradesh	Varanasi	Nov -07	Isha Enterprises
North	Uttar Pradesh	Gorakhpur	Nov -07	Isha Enterprises
North	Uttar Pradesh	Lakhimpur	Dec -07	Isha Enterprises
North	Uttar Pradesh	Faizabad	Jan -07	Isha Enterprises
North	Rajsthan	Jaipur	13-Oct-07	Bohra Sevices
North	Rajsthan	Nagour	24-Nov-07	Bohra Sevices
North	Rajsthan	Jhalawar	15-Dec-07	Bohra Sevices
North	Rajsthan	Bharatpur	02-Feb-08	Bohra Sevices
North	Rajsthan	Pali	23-Feb-08	Bohra Sevices
North	Delhi	Delhi	Nov -07	Hindustan Refrigeration
North	Delhi	Delhi	Nov -07	Hindustan Refrigeration
North	Delhi	Noida	Dec -07	Hindustan Refrigeration
North	Madhya Pradesh	Indore	06-Oct-07	Divyansh Services
North	Madhya Pradesh	Bhopal	08-Dec-07	Divyansh Services
North	Madhya Pradesh	Jabalpur	17-Nov -07	Divyansh Services
North	Madhya Pradesh	Gwalior	27-Oct -07	Divyansh Services
North	Haryana	Hissar	29-Sep-07	Godrej & Boyce Mfg Co. Ltd.
North	Rajasthan	Kota	03-Oct-07	Godrej & Boyce Mfg Co. Ltd.
North	Rajasthan	Bhilwada	06-Oct-07	Godrej & Boyce Mfg Co. Ltd.
North	Uttar Pradesh	Moradabad	17-Nov-07	Godrej & Boyce Mfg Co. Ltd.
North	Uttar Pradesh	Agra	20-Nov-07	Godrej & Boyce Mfg Co. Ltd.
North	Chattisgarh	Bhilai	20-Nov-07	Godrej & Boyce Mfg Co. Ltd.
North	Madhya Pradesh	Harda	23-Nov-07	Godrej & Boyce Mfg Co. Ltd.
East	Bihar	Patna	Nov-07	Loyola Industrial School
East	Bihar	Ranchi	Jan -08	Loyola Industrial School
East	Assam	Guwahati	09-Feb-08	Kuwality Coolers
East	Assam	Silchar	17-Nov-07	Kuwality Coolers
East	West Bengal	Kolkata	Nov-07	Crystal Refrigeration Co
East	West Bengal	Asansol	Dec-07	Crystal Refrigeration Co
East	West Bengal	Durgapur	Jan -08	Crystal Refrigeration Co
East	Orissa	Cuttack	17-Nov-07	L.N.Dash
East	Orissa	Balasore	20-Nov-07	L.N.Dash
East	Orissa	Sambalpur	01-Dec-07	L.N.Dash
East	West Bengal	Siliguri	06-Oct-07	Godrej & Boyce Mfg Co. Ltd.
East	West Bengal	Kolkata	27-Oct-07	Godrej & Boyce Mfg Co. Ltd.
East	Jharkhand	Gaya	03-Nov-07	Godrej & Boyce Mfg Co. Ltd.
East	Bihar	Jamshedpur	17-Nov-07	Godrej & Boyce Mfg Co. Ltd.
West	Gujarat	Ahmedabad	01-Dec-07	Kirti Freeze
West	Gujarat	Baroda	27-Nov-07	Kirti Freeze
West	Gujarat	Surat	15-Dec -08	Kirti Freeze
West	Maharashtra	Pune	27-Oct-07	Max Cooling Systems
West	Maharashtra	Thane	08-Dec -07	Max Cooling Systems
West	Maharashtra	Nasik	24-Nov-07	Max Cooling Systems
West	Maharashtra	Mumbai	01-Dec-07	Godrej & Boyce Mfg Co. Ltd.
South	Andhra Pradesh	Hyderabad	Nov-07	Maega Services
South	Andhra Pradesh	Visak	Dec-07	Maega Services
South	Karnataka	Bangalore	01-Dec-07	Dewpoint Appliances (p) Ltd
South	Karnataka	Belgaum	17-Dec-07	Dewpoint Appliances (p) Ltd
South	Tamilnadu	Chennai	17-Nov-07	Sakthi Refrig & Aircon
South	Tamilnadu	Chennai	01-Dec-07	Sakthi Refrig & Aircon
South	Tamilnadu	Coimbatore	15-Dec-07	Sakthi Refrig & Aircon
South	Kerala	Trivandrum	24-Nov-07	V.R.Enterprises
South	Kerala	Trichur	22-Dec-07	V.R.Enterprises
South	Kerala	Kochi	12-Jan-08	V.R.Enterprises
NCCoPP MAC Training [1-day programme]				
North	Punjab	Amritsar	23-Dec-07	Ananth Enterprises
North	Haryana	Hissar	05-Nov-07	Ananth Enterprises
North	Uttar Pradesh	Kanpur	Jan-08	Isha Enterprises
North	Rajasthan	Jodhpur	17-Nov-07	Bohra Services
North	Madhya Pradesh	Indore	27-Jan -08	Divyansh Services
East	West Bengal	Kolkata	23-Sep-07	Don Bosco Technical School
East	Orissa	Bhubaneshwar	27-Sep-07	L.N.Dash
West	Gujarat	Baroda	21-Oct-07	Kirti Freeze
South	Karnataka	Belgaum	19-Nov-07	Dewpoint Appliances (p) Ltd
South	Andhra Pradesh	Vijayawada	Dec-07	Maega Services
South	TamilNadu	Chennai	Jan -08	Sakthi Refrig & Aircon
South	TamilNadu	Coimbatore	14-Dec-07	Sakthi Refrig & Aircon
NCCoPP OTC Training [1-day programme]				
South	Andhra	Vijaywada	01-Oct-07	Godrej & Boyce Mfg Co. Ltd.
South	Tamilnadu	Chennai	03-Oct-07	Godrej & Boyce Mfg Co. Ltd.
North	Rajasthan	Jaipur	09-Oct-07	Godrej & Boyce Mfg Co. Ltd.
East	West Bengal	Kolkata	06-Nov-07	Godrej & Boyce Mfg Co. Ltd.
North	Jammu & Kashmir	Jammu	Dec-07	Ananth Enterprises
North	Uttar Pradesh	Meerut	Jan-08	Isha Enterprises
North	Rajasthan	SriGanganagar	19-Jan-08	Bohra Services
North	Madhya Pradesh	Indore	20-Jan-08	Divyansh Services
West	Gujarat	Rajkot	28-Jan-08	Kirti Freeze
NCCoPP Domestic Refrigerator Retrofit Training [1-day programme]				
North	Punjab	Ludhiana	(to be confirmed)	Whirlpool of India Ltd.
North	Madhya Pradesh	Indore	(to be confirmed)	Whirlpool of India Ltd.

Equipment Support Scheme (ESS) Update

A brief on the current status of the ESS distribution (how many units have been delivered and geographical coverage till date) for both regular units & mini-reclamation centres.

ESS Phase 1

Region	State	Distributed
South	Andhra Pradesh	51
South	Karnataka	38
South	Tamil Nadu & Puducherry	49
North	Chandigarh	5
	Total	143

ESS Phase 2

Region	State	Distributed
West	Gujarat	53
West	Maharashtra	31
South	Kerala	22
	Total	106

ESS Phase 3

Region	State	Distributed
North	Chandigarh (Punjab, J&K, Uttaranchal, Haryana, Himachal Pradesh)	94
North	Rajasthan	24
North	Uttar Pradesh	29
North	Delhi	11
	Total	158

ESS for Mini-Reclamation Units

Region	State	Distributed
North	Chandigarh (Punjab, J&K, Uttaranchal, Haryana, Himachal Pradesh)	1
South	Karnataka	1
	Total	2

Technicians Trained

Training Program	RSE	OTC	OTC Pilot	ITI Instructor	MAC	MAC Pilot	NCCoPP TOT	TOT	Independent	Mini-MAC TOT	ITP/ SGTB	Railway Technician
Total	5108	100	17	66	437	29	9	26	26	29	67	15

Grand Total 5929

Book Post

Training Partners And Contacts

The following organisations manage all training in India through the appointed training partners:

Regional Management Organization: **Quest Consulting and Training,** V. Subramaniam, Plot No 86, Road No 3, Threemurthy Colony, Mahendra Hills, East Marredpally, Secunderabad - 500026 Tel: 040-27732851 & 27732891 Mobile: 99497 36363 Email:questvs@gmail.com

Godrej & Boyce Mfg Co. Ltd. (Appliance Division) S A Juvekar, L.B.S. Marg, HO Service, Plant 11, Pirojsha Nagar, Mumbai - 400 079 Tel: 022-6796 6603 / 6623 Fax: 022-6796 6066 Email: saj@godrej.com www.godrejsmartcare.com

Training Partners:

Andhra Pradesh: Veerender Nath, Maega Services, 3-3-780/B, Kuthbiguda, Esamia Bazaar, Hyderabad - 500 027 Tel: 040-246 53 602 Mobile: 98492 03750 Email: tvnath@rediffmail.com

Assam: D.Talukdar, Kuwality Coolers, Das Complex, R.G.Barua Road, Guwahati - 781 024 Tel: 0361-220 22 29 Mobile: 98640 17889 Email: kuwalitycoolers@rediffmail.com

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Rajasthan: Surendra Bohra, Bohra Services, 60 Gem Enclave, Pradhan Marg, Malviya Nagar, Jaipur - 302 017. Tel: 0141-252 24 00 Mobile: 94140 66848 Email: bohra@bohraappliances.com

Tamil Nadu: R.Kamala Kannan M/s.Sakthi Refrigeration & Air-conditioning Enterprises, 0/1-Kanakkar Street, Near Venkateswara Theatre, Thiruvottiyur, Chennai-600 019 Tel: 044-2573 3833 Mobile: 94443 88495 Email: skssaba@yahoo.co.in

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West Bengal: Navin Lamba, Crystal Refrigeration Company, 7, A.J.C Bose Road, Kolkata - 700 017 Tel: 033-224 76 48 8 Mobile: 98308 20848 Email: nl@vsnl.net

For MAC Training Bro.Theophill, DonBosco Technical Institute, 23,Darga Road, Park Circus, Kolkata- 700 017 Ph: 033-228 72 98 9. 033-228 79 20 2 E mail: dbti@cal.vsnl.net.in

Industry Training Partners:

Emerson Climate Technologies (India) Ltd., V.G. Sardesai, 1202/1, Ghole Road, Pune-411028 Tel:+91-20-255 34 99 88/98, Fax: 255 36 350 Email: vijay.sardesai@emersonclimatetechindia.com

Whirlpool of India Limited, Mr. S. Venkatesh / Kapil Chawla, 28, N.I.T., Faridabad - 121 001 Tel: 0129 2232381 / 5512535 Email: s_venkatesh@whirlpool.com; kapil_chawla@whirlpool.com

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INFRAS Zurich representing Government of Switzerland

United Nations Development Programme (UNDP)

United Nations Industrial Development Organization (UNIDO)

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