Workshop and Training Program
on
Natural / CO_2 Refrigeration Systems for Supermarket and Other Applications

Venue & date

Workshop: ***HM Hall, DME, Anna University, Chennai, 5th OCT 2018***
Training Program: ***R&AC Lab, IIT Madras Chennai, 6th OCT 2018***

Organized by

Supported by

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SINTEF

NTNU
Norwegian University of Science and Technology

ASHRAE Chennai Chapter

ENGINEERING TOMORROW

Danfoss

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Motivation

India is committed to phase out HCFC class refrigerants and phase down HFC class refrigerants which have high global warming potential (GWP) in the years to come as per the recent Kigali agreement. Therefore Indian industries like Air-Conditioning, Automobiles and Refrigeration have serious implications on both technical and financial fronts in the coming years. Industries have to either invest in R & D to find the substitutes for HFCs or have to buy patented refrigerants and technologies from other MNCs. Without technology transfer or research, it would be difficult for domestic industries to compete in global as well as domestic markets.

The technology developments in the recent years, together with safety standardization have eventually made it possible to move towards natural refrigerants globally from the harmful synthetic refrigerants for real long-term solutions. It is perceived that the possible candidates for replacement are natural working fluids such as ammonia and carbon dioxide (CO_2) which have zero Ozone Depletion Potential (ODP) and very low Global Warming Potential (GWP).

Objectives

The intended workshop and hands on training program on are meant to disseminate the knowledge by means of lectures, lab visit, and demonstrations on both GAX based ammonia absorption refrigeration and multi-ejector CO_2refrigeration / heat pump system. The systems have heat recovery facility for waste heat utilization for applications such as milk dairy, hospitals, hotels and so on. All the attendees of the workshop and training program such as practicing engineers, consultants, industry personnel and also students are bound to get benefited with this emerging technology in the fields of Heating, Ventilating ,Air Conditioning and Refrigeration (HVAC&R).

Target Audience

All the technical persons / professionals / academic and PG / Ph.D. students involved in HVAC&R aspects of the following:

1. Dairy Industries
2. Food Refrigeration
3. Hospitals
4. Hotels
5. Data Centres
6. Supermarkets
7. Cold Chain and Storages
8. Fisheries
9. Marine Refrigeration
10. LowTemperature Refrigeration
11. ControlsinRefrigeration
12. ProcessCoolingandHeating
13. PharmaceuticalIndustries
14. CommercialRefrigeration

Workshop Schedule

Date and Venue: 5th OCT 2018; HM Hall, Dept. of Mech. Engineering, Anna University, Chennai – 600 025

Slot (h)	Event	Speaker
08:30-09:00	Registration / Tea / Networking	
09:00-10:30	Inauguration Chief Guest address - Current status of Low GWP refrigerants	Chief Guest - Prof. S Srinivasa Murthy, IISc Bangalore
10:30-11:00	Tea Break	
11:00-11:45	Low Charge Ammonia Systems	Mr. Ramesh Paranjpey, Fellow ASHRAE
11:45-12:15	Fundamentals and applications of CO_2 refrigeration and heat pump technology	M.P.Maiya, IIT Madras
12:15-12:45	Controls in CO_2 systems	Mr. R. P. Kamath, Danfoss, Mumbai
12:45-13:45	Lunch Break	
13:45-14:15	Research and Developments on CO_2 systems	Dr. Pramod Kumar, IISc Bangalore
14:15-14:45	CO_2 systems for supermarket applications	Dr. Angel Pardinas, NTNU, Norway
14:45-15:15	CO_2 refrigeration pack at IIT Madras	Dr. Krzysztof Banasiak, SINTEF, Norway
15:15-15:30	Tea Break	
15:30-16:30	Natural working fluids for combined heating and cooling applications	Prof. A. Hafner, NTNU and Prof. P.Neksa, SINTEF, by Video Conference.
16:30-17:00	Closing Remarks and Wrap up	
17:00 -	Visit to Facilities @ IITM / Anna University	

Training Program Schedule

(Hands on training on versatile 3 temperature (LT, MT, AC) 10 TR CO2 system with HT heating options)

Date and Venue: 6th OCT 2018, R&AC Lab, IIT Madras, Chennai – 600 036

(*Please indicate your interest for this training program. Participation is by selection / invitation only)*

Slot (h)	Event	Speaker
09:30-10:00	Salient features & specs of CO_2 refrigeration pack	Dr. Krzysztof Banasiak
10:00-11:00	Management and control of the head pressure at various modes of operation	Mr. R. P. Kamath
11:00-11:30	Tea Break	
11:30-12:30	Development of CO_2 refrigeration pack	Dr. Krzysztof Banasiak / Dr. Angel Pardinas
12:30-14:00	Lunch Break	
14:00-17:00	Demonstration and training on multi-evaporator, multi-ejector CO_2 refrigeration / heating system	Dr. Krzysztof Banasiak / Dr. Angel Pardinas / Mr. R. P. Kamath / Dr. S. Singh / M.P.Maiya

Registration

Participants can register by sending the following details to coordinators (NWFWR2018@gmail.com)

Name:

Organization / Industry:

Interested in hands on training on CO_2 refrigeration test facility on 06-10-2018 at IIT Madras: YES / NO

Email: Mobile No.:

Note: There is **NO** registration fee. Students should bring identity card and endorsement letter from their institute. Accommodation may be arranged on prior information in the Student Hostels on payment basis. **Please wait for confirmation of your registration to workshop and training program by return email.**