



**India** Chapter

# ASHRAE INDIA CHAPTER



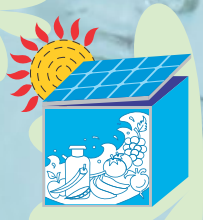
For the  
HVAC&R  
Industry

October-December 2013 | Volume 15 Issue 2 | Editor : K.K. Mitra, Associate Editor : Dinesh Rawat

## BULLETIN



### Solar Powered Cold Store



## Technical Workshops

- A Full day workshop on '**Large Chilled Water System Designs**' was held by Mr. Larry Konopacz, Manager of Training and Education for (Xylem) Bell & Gossett's Little Red Schoolhouse®, on 21st Sept., 2013 at K-43, Kailash Colony, New Delhi.
- ASHRAE India Chapter in association with ISHRAE Institute of Excellence organised a full day Technical workshop by Mr. G C Modgil, Director, Sterling India Consulting Engineers on '**Under Floor Air Conditioning**' on 5th Oct., 2013 at Deck Suit, India Habitat Centre, Lodhi Road, New Delhi.
- Workshop on '**Controlling Temperature rise in chilled water pipe & ducts using insulation**' was held by Mr. Ashu Sharma, Sr. Manager (Marketing & Technical), Lloyd Insulations (India) Ltd. on 19th Oct., 2013. at K-43, Kailash Colony, New Delhi.
- Workshop on '**Fire Smoke Mitigation and Management**' was held by Mr. Sandeep Goel, Founder Director, Proion Consultants on 19th Nov., 2013. at K-43, Kailash Colony, New Delhi.
- Workshop on '**Importance of commissioning of HVAC systems**' was held by Mr. K.D. Singh, Managing Director, Aircon Engineers Pvt. Ltd. on 7th Dec., 2013. at K-43, Kailash Colony, New Delhi.
- Workshop on '**Manual Balancing, Automatic Balancing, Pressure Independent Balancing & Control Valves – what are these? What do I need for my chilled water plant?**' was held by Mr. Priyank S. Garg on 7th Dec., 2013. at K-43, Kailash Colony, New Delhi.
- Workshop on '**Guide on Selection & Performance of Cooling Towers**' was held by Mr Ong Ik Jin, General Manager, Nihon Spindle Cooling Towers, Japan on 17th Dec., 2013. at K-43, Kailash Colony, New Delhi.



### ASHRAE Treasurer visits Chapter

Mr. David Underwood, ASHRAE Treasurer visited ASHRAE India Chapter. ASHRAE India Chapter organised welcome dinner for Mr. David Underwood on Friday, 18th Oct., 2013 at Willow, India Habitat World, Lodhi Road, New Delhi so that members get an opportunity to interact with the visiting dignitary. Mr. Underwood gave a presentation on 'ASHRAE Standard 189.1' during the function.



### Solar Cold Storage For Mali Gabini Village Chamoli Under ASHRAE India Chapter Sustainability Programme

Mr. Rajinder Singh, Senior Faculty, Refrigeration & Air-Conditioning Department, G.B. Pant Polytechnic, Okhla, and Secretary & Chair - Student Activities, ASHRAE India Chapter, has designed a SOLAR COLD STORAGE of size 2 cubic meter for storage of 1000 Kg of Oranges and having Refrigeration capacity of 0.75 TR for MALI GABINI Village Chamoli under ASHRAE India Chapter Sustainability Programme. The assembly and testing of the SOLAR COLD STORAGE most probably be done by the end of Feb. 2014.

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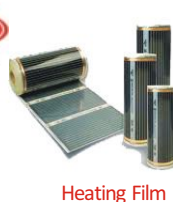
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# AIC TECH

AIC TECH - a full day technical conference was held on 14th Sept., 2013 at The Theatre, Habitat World, New Delhi by ASHRAE India Chapter. The theme of the conference was 'Energy Efficiency : The Road Map to a Sustainable Future'. The inaugural lamp was lighted by Mr. K D Singh, President AIC, Dr. R K Sharma, Director of National Horticulture Board of Government of India, Mr. Kamal Singh, Director – Danfoss Power Electronics India, Mr. Pramod Dhir and Dr. R K Malhotra. Over 200 participants comprising all stakeholders attended the conference. AIC Publication of 'Applied Psychrometry For Air-conditioning Engineers' was also launched during the programme by Mr. Pramod Dhir, Mr. Kamal Singh and Mr. K D Singh.



Daspass Sales Corporation

# Thermal Insulation System at on-going Chandigarh Airport Expansion

For the on-going Chandigarh Airport Expansion project, the chilled water system insulation was very exclusively designed and being implemented presently. The main header pipe supplying chilled water from the plant to the terminal building was of pipe diameter 400mm and length 591 meter. The operating temperature of the liquid was 7°C. The thermal insulation design was based on maintaining the minimum possible temperature gain across the length of



pipeline coupled with minimum heat gain possible. The insulation material considered was Polyurethane Foam in the form of especially tailor-made manufactured Pipesection of density  $36+2 \text{ kg/m}^3$ . The thermal conductivity of Polyurethane Foam Pipesection was  $0.021 \text{ W/mK}$  at  $10^\circ\text{C}$  mean temperature. The total insulation thickness was calculated as 150mm. The insulation was to be applied in 2 layers of 75mm each. The 1st layer pipe section was of inner dia 400mm. The 2nd layer insulation was again in the form of Pipesection with inner dia 550mm and thickness 75mm. The 2nd layer insulation was factory laminated with aluminium foil on the outer side to act as vapour barrier. The Pipesection were fixed with cold applied adhesive and finally tied with bands. The total designed heat gain is approx.  $12.4 \text{ Kcal/hr. m}^2$  and the temperature gain would be approx.  $0.3^\circ\text{C}$  that is almost negligible.



It was a very unique insulation system design allowing for minimum temperature gain and heat gain across the length of the pipeline. Also most probably for the 1st time such large dia Polyurethane Foam Pipesection were manufactured (usually max. upto 350mm nb), transported and then applied at site for chilled water piping. Polyurethane Foam insulation used was of Close Cell content, Fire Resistive, Not easily Ignitable and low Thermal Conductivity value. The product conforms to IS : 12436.



**K.K. Mitra**  
Vice President  
Marketing & Technical  
Lloyd Insulations (India) Limited

Sh. K.K. Mitra – Vice President (Marketing & Technical), Lloyd Insulations (India) Limited, New Delhi – A 55 plus year old company, holds Post Graduate Diploma in Planning & Management with a specialization in Marketing and Finance and also, Masters in Business Administration with specialization in operation management. He has at his back 25 plus years experience at Lloyd Insulations in the areas of Thermal Insulation, Refractory lining, Cold Store, Pre-engineered & prefabricated buildings.

# THERMAL INSULATION THICKNESS – A KEY TO SUCCESS

*Continued from last edition...*

Thermal Insulation thickness is done as per the procedure laid down in ASTM C-680:2010 (Determination of Heat Gain or Loss and the Surface Temperatures of insulated pipe and Equipment system). This is the latest standard for thickness calculation as well as heat loss calculation. This method takes into consideration Thermal Conductivity, Wind Velocity, Relative Humidity & Emissivity factors. It also considers each situation of the pipe diameter as well as the vertical & horizontal orientation of the pipeline.

**Some illustrations are given below with respect to the emissivity and wind factor :-**

Operating Temperature	5	°C
Ambient Temp	40	°C
Windage	0	M/sec.
Pipe Diameter	150	mm

Typical Insulation with Thermal Conductivity value 0.021W/mK at 20 Deg C Mean Temperature and emissivity factors as :

Aluminium	:	0.2
Plaster	:	0.65
Dark/Dull/Black finish	:	0.85

## Thickness Table

RH (%)	70			80			85			90		
	Al.	Plaster	Dark/Dull/Black	Al.	Plaster	Dark/Dull/Black	Al.	Plaster	Dark/Dull/Black	Al.	Plaster	Dark/Dull/Black
Thickness (mm)	30	25	25	50	30	25	70	40	35	115	65	55
Heat Gain (Kcal/Hr.m <sup>2</sup> )	17.19	22.35	22.82	10.2	18.6	22.8	6.97	13.75	15.95	3.92	7.95	9.72
Surface Temp. (°C)	33.9	33.9	33.9	36.1	36.1	36.1	37.2	37.2	37.2	38.33	38.33	38.33

## From the Desk of the Editor

The New Year 2014 has commenced. AIC would like to wish every reader a very Happy and Great Year ahead. The New Year possesses lots of challenges and hard work ahead. With the ongoing climatic changes coupled with severe winter conditions all over the globe, a great challenge holds ahead for the Energy Manager. With increasing demand of Energy to run the heating units, energy demand will be rising tremendously. A challenge to the equipment manufacturers to generate heat continuously and efficiently. A global challenge to manufacture efficient Heating Systems. An equal challenge to the Thermal Insulation material manufacturers and applicators to properly barricade the civil construction components from the incidence of cold from the environment. Insulation material system to effectively with hold the severe cold from getting inside the buildings. An efficient insulation system saves, energy reduces load and enhances the performance and life of the capital equipments. Building insulation has become a bare necessity in the construction industry.

Solar Energy will be a key element of Energy availability in the country in near future. AIC is going ahead with its community sustainability programme on installation of a solar plant at village Chamoli in Utranchal. Also planned is a small solar operated cold room at Chamoli to store Apples. There is again a challenge to equipment manufacturers to design, manufacture and provide the suitable models for efficient cooling. In future cold rooms – precooling units in the field will be run on solar Thermal or solar photo voltaic panels for energy inputs.

AIC Tech was held in September 2013 at India Habitat Centre consisting of a full day Technical events. The event was a grand success. Technical presentations and lectures were made by academics, consultants and manufacturers. The next mega technical event planned is 'AIC Prakruti Tech' on 27th February, 2014 alongside ACREX 2014 at Pragati Maidan. This programme will feature number of panel discussions on air conditioning system machinery and Green Buildings from eminent persons from the industry.

There was a number of lectures and workshops organized on different technical issues concerning the air-conditioning Industry and to the benefit of practicing engineers.

ASHRAE India Chapter has received the following awards at CRC 2013 held at Doha :

- PAOE Community Sustainability Projects
- President Award of Excellence
- Honor Roll

The New ASHRAE India Chapter website [www.ashraeindia.org](http://www.ashraeindia.org) is online now

Energy efficiency is the slogan of the Technology Manager and every system and mechanism needs to be developed energy efficient to consume lesser energy and increase the availability of the fast depleting fossil fuels and make the environment more Green for the future generation to come.

# Announcements

## ASHRAE LEARNING INSTITUTE

### 1) HVAC Design Training

March 17 – 19, 2014 --- Level I - Essentials --- Atlanta, GA and Toronto, Canada

March 20 – 21, 2014 --- Level II - Applications --- Atlanta, GA

**HVAC Design: Level I – Essentials - Registration is \$1,239, \$989 (ASHRAE Member)**

Gain practical skills and knowledge in designing, installing and maintaining HVAC systems that can be put to immediate use. The training provides real-world examples of HVAC systems, including calculations of heating and cooling loads, ventilation and diffuser selection using the newly renovated ASHRAE Headquarters building as a living lab.

**HVAC Design: Level II – Applications - Registration is \$829, \$679 (ASHRAE Member)**

In two days, gain an in-depth look into Standards 55, 62.1, 90.1, and 189.1 and the Advanced Energy Design Guides. Training will focus on a range of topics including: HVAC equipment and systems; energy modeling; designing mechanical spaces; designing a chiller plant; and BAS controls.

### 2) Hot products from ASHRAE

**Latest Edition of Standard 90.1 Now Available as a Redline**

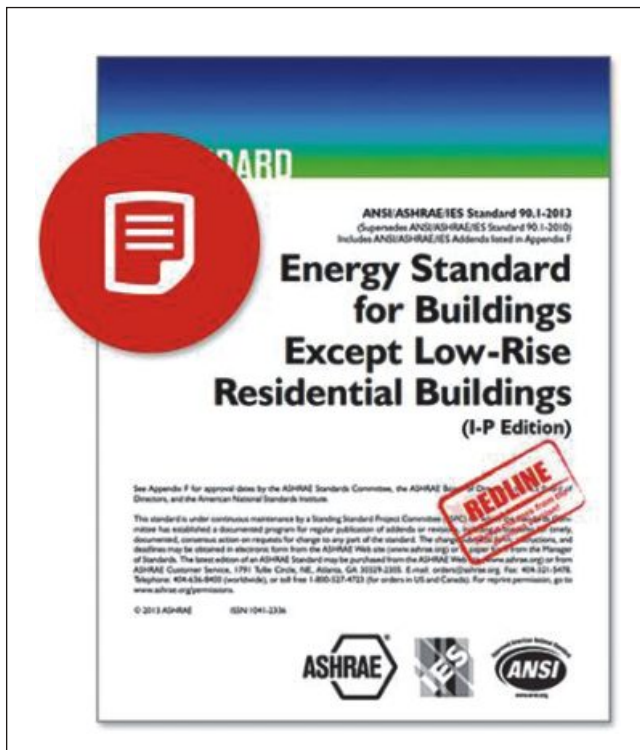
architects as per wishes of building owners,” seminar chair Kent Peterson, P.E., said. “However, based on experience of design of several green buildings, it has been found that façade optimization can help reduce as much as 40 percent of building energy. This becomes an important aspect in developing economies wherein decisions are generally based on first cost with little importance to life cycle cost. Emerging markets, such as Brazil, Russia, India and China, will add over 100 billion square feet in next two decades. So better understanding of facade design will go a long way in preserving ecological balance in the world.”

Peterson is chairing a seminar on façades as part of the Technical Program at ASHRAE’s 2014 Winter Conference, Jan. 18-22, at the New York Hilton, New York, N.Y. The International Air-Conditioning, Heating, Refrigerating Expo®, held in conjunction with the Winter Conference, Jan. 21-23.

The Façade Odyssey: Solutions for Design of High Performance Buildings is part of a track focused on Systems and Equipment.

Speakers from different parts of world present experience on the effect of various basic elements in design of envelope and its consequent effect on building operating energy, carbon emissions and air-conditioning load. The final part of presentation focuses on future façade solutions.

Speaker John Swift Jr., P.E., Cannon Design, Boston, Mass., will focus



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Use the redline to instantly identify updates in the 2013 revision of Standard 90.1.

This expanded document compares the 2013 edition to 2010, ensuring you know exactly what changes have been made from one edition to the next.

It's an indispensable reference for engineers and other professionals involved in the design of buildings and building systems. Select the redline upgrade in print or digital format to receive two documents; the clean, active version of the standard and the redline version.

**About Standard 90.1-2013:** Energy Standard for Buildings Except Low-Rise Residential Buildings (ANSI approved; IES co-sponsored) provides the minimum requirements for energy-efficient design of most buildings. Learn more

**About Redlines:** A redline document is a quick, easy way to compare all the changes between the active standard and the previous version. Redlines allow users to instantly identify additions, deletions, and other formatting and content changes. Learn more.

## ASHRAE 2014 WINTER CONFERENCE

### Role of Façade in Energy Savings to be Discussed at ASHRAE Winter Conference

ATLANTA – A building façade isn't just about putting your best face forward. It also plays an important role in energy savings.

“Façade design is a vital aspect of building, largely controlled by

on the latest developments in high performance facades in North America, including use of simulation tools by integrated design teams to perform extensive and detailed analysis. He will share case studies on two large research laboratory projects: the New Cambridge Campus for Novartis currently under construction, and a new research building for the CJ Corp. in Seoul, South Korea designed by the Yazdani Studio of Cannon Design.

Ashish Rakheja, P.E., chief operating officer of Spectral, New Delhi, India, focuses on double façade, phase change materials and green walls.

“High performance buildings are synonymous with efficient air-conditioning systems and innovative lighting solutions and target minimized operation cost (EUI) but often engineers and architects individually,” Rakheja said. “One of the areas that presents an opportunity is integrated design, where the project team members work in tandem to collectively evaluate the effect of various external parameters rather than approaching it in silos. This requires better understanding of the effect that a simple decision on façade design can play on building energy efficiency and equipment selection.”

Also presenting is Frank A. Mills, P.E., Low Carbon Design Consultants, Leyland, United Kingdom, who will discuss the role of façade design in natural ventilation.

Other sessions in the Systems and Equipment track include:

- Two-phase Flow Analysis on Refrigeration Systems, Sunday, Jan. 19
- Technical Paper Session 3, Sunday, Jan. 19
- College of Fellows Debate: Manufacturers are the Real Designers, Monday, Jan. 20
- Advanced Residential HVAC System Studies: Humidity Control Options, Solar PV Integration, and Multi-function Integration, Monday, Jan. 20
- Conference Paper Session 8, Monday, Jan. 20
- Energy Master Planning for Low Energy Communities, Part 2, Monday, Jan. 20
- Three Studies of Cooling System Enhancements, Monday, Jan. 20
- The Challenge of Upgrading Tunnel Ventilation Systems: 3 Case Studies, Monday, Jan. 20
- Advanced Rooftop Units Campaign: Accelerating Efficiency, Tuesday, Jan. 21
- Optimized Control Strategies for Chilled Beams and Radiant Panels, Tuesday, Jan. 21
- Technical Paper Sessions 7 and 8, Tuesday, Jan. 21
- Conference Paper Sessions 16 and 18, Tuesday, Jan. 21
- Optimum Design of Heat Exchangers, Wednesday, Jan. 22
- How Much Energy Saving can we Expect from Natural Ventilation? Wednesday, Jan. 22
- Conference Paper Session 23, Wednesday, Jan. 22
- Data Center Control and Fire Safety in Tall Buildings, Wednesday, Jan. 22
- HVAC&R Paper Seminar: RP-1353 Stability and Accuracy of VAV Box Control at Low Flows, Wednesday, Jan. 22
- Using System EER/COP to Reasonably Model GSHP System Performance, Wednesday, Jan. 22

**New Publications**

Applied Psychrometry for Air-conditioned Engineers

## Humidity Control • Energy Recovery • IAQ



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## PracruTech 2014

**27th Feb 2014**

**11AM - 11.45 AM**

District Cooling: Myth or reality for Indian Industry?  
Moderated by **Mr. G.C. Modgil**

**12.15 - 1 PM**

Water Balancing: Contribution to Energy Saving & System performance..  
Moderated by **Mr. Kavy Pradeep**

**2 PM - 2.45 PM**

Green Buildings - Are we harnessing its true potential?  
Moderated by **Dr. P.C. Jain**

**3 PM - 3.45 PM**

Primary variable pumping: Solution for the future?  
Moderated by **Mr. Nirmal Ram**

**4.15 PM - 5 PM**

Energy Regulatory Body: Boon or Bane?  
Moderated by **Mr. Angad Singh**

**Venue: Conference Room 3, Phoolwari, Pragati Maidan, New Delhi**

**Time: 10:30 – 17:00 hrs**

For more details, contact –

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**Register Now: [www.acrex.in](http://www.acrex.in)**