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ASHRAE SINGAPORE CHAPTER NEWSLETTER – AUGUST 2005 ISSUE

PRESIDENT'S MESSAGE

This second issue newsletter highlights several of our past Chapter activities; 23rd Annual Dinner & Dance held on 14 May 05, and Technical Talk by ASHRAE Distinguished Lecturer, Mr Forrest Fencl on 'UVC Technology for AHU capacity, maintenance, and IAQ control.'.

I am pleased to announce that Mr Raymond Wong, past DRC in Region XIII, was the recipient of ASHRAE Society award of "Distinguished Service Award" at the 2005 ASHRAE Meeting in Denver. Congratulations…

This year, Mr Sunny Tan, who has served as Regional Vice Chair (RVC) for Student Activities in Region XIII (2002-2005), has just handed the 'baton' to Thailand Regional officer. On behalf of the Chapter, I would like to give our vote of 'Thanks' to Sunny.

Another good news for the Chapter is that our member, Dr Chou Siaw Kiang, has recently been elected by Society to the grade of Fellow. He will be invited to attend coming ASHRAE Winter Meeting in January 2006 to receive the Fellow award plaque with a mounted medallion. Congratulations again…

The Chapter will continue to organise more informative Technical Talks and seminars in coming months to reach out to more members and industry friends. We would also like to collaborate with other associations or institutions to organise joint events; such as co-sponsoring with Department of Building, NUS on coming ASHRAE Distinguished Lecturer Talk by Professor Jan Sundell on 23 August 2005, and joint organised with Singapore Polytechnic on the cleanroom seminar on 17 September 2005. (See details in coming events column)

I hope to see our members will benefit in participating our Chapter organising ASHRAE activities.

Have fruitful months ahead.

Albert Sin Yew Tek
President, 2005-2006
ASHRAE Singapore Chapter

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COMING EVENTS

Visit web site for details at: www.ashrae.org.sg

ASHRAE Distinguished Lecturer Talk
23 August 2005, 7 to 10 pm, School of Design and Environment, NUS
Presented by Professor Jan Sundell
"Indoor Environments And Health"

SP 9th Cleanroom Seminar 2005: Definition of Cleanroom Technology Scope of Works, Maintenance, Performance Testing and Monitoring of Cleanrooms
17 September 2005, 9.00 am to 12.30 pm, Furama Riverfront Singapore
Jointly organized with Singapore Polytechnic and School of Mechanical & Manufacturing Engineering

ASHRAE Region XIII Chapter Regional Conference (CRC) 2005
26-27 August 2005, Hong Kong
In conjunction with Technical Seminar on 26 August 2005, Hong Kong on "Green Design & Technology for Sustainable Buildings"

ASIA PACIFIC CONFERENCE 2005 ON BUILT ENVIRONMENT 2005
25-26 November 2005, Manila, Philippines

SUSTAINABLE ENERGY ASIA 2005
www.environmexasia.com
29 Nov – 2 Dec 2005, Suntec City Singapore
ASHRAE Singapore Chapter is the supporting organisation.

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23rd Annual Dinner & Dance

ASHRAE Singapore Chapter's 23rd Annual Dinner and Dance was a grand success.

The event was held at the Pan Pacific Hotel on Saturday, 14 May 2005. More than 300 members and guests celebrated the gala event. The Guest of Honour was Mr. Heng Chiang Meng, Chairman of Singapore Environment Council, and Board member of National Environment Agency.

The event commenced with the welcome address by Mr. Wang Yih Chyuan, chairman of the D&D organizing committee. The occasion also marked the change of leadership for ASHRAE Singapore Chapter as the outgoing president, Mr. Chua Kim Lian handed over the 'gravel', symbol of leadership to Mr. Albert Sin as incoming new president for the year 2005-2006. Mr. Albert Sin took the opportunity to introduce the new members of the Board of Governors.

The audiences were delighted with screening of photos slideshow on the Chapter's past year's activities and accomplishments. Many recognised themselves and friends in the photos which have brought fond memory of the past year.

Master of Ceremony Mr. Water Tay, added life and fun with games, singing, and lucky draw event. In addition, several artistes' performances kept the audiences entertained throughout the evening.

Overall, everyone had a wonderful time.

ASHRAE SINGAPORE CHAPTER 2005-2006 Board of Governors:
(From Left: Tan Yong Hoa, Norman Ng, David Lau, Dr. Sitaraman Chandrasekhar, Albert Sin, Francis Lee, Raymond Chang, Gadam Sivakumar and Steven Leong)

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Distinguished Service Award by ASHRAE Society

Congratulations Raymond! Being the recipient of the Distinguished Service Award at the 2005 ASHRAE Meeting in Denver.

Raymond YW Wong received the Distinguished Service Award from ASHRAE President Ron Vallort at the 2005 Annual Meeting in Denver, Co. Raymond was DRC of Region XIII from 2001- 2005 and now serves on the Honours and Awards Committee and the Professional Development Committee at Society level.

Change of Region XIII RVC (Student Activities)

Sunny C L Tan

After serving six years (1999 – 2005) in the ASHRAE Student Activities Committee, Sunny C L Tan of Singapore Chapter has retired from the post of Region XIII RVC for Student Activities. Although Sunny may had retired from the post of RVC, but he has not retired from his work in the Student Activities Committee, as Sunny has been reappointed by ASHRAE President-elect Lee W. Burgnett as the Consultant in the Student Activities Committee at the Society level.

Wichai Laksanakorn of Thailand Chapter has been elected by Region XIII and appointed by ASHRAE President-elect Lee W. Burgnett as the new Region XIII RVC for Student Activities as from 1st July 2005 for a period of three years. Chapters in Region XIII may refer to Wichai for any matters regarding ASHRAE Student Activities, alternately you may refer to Sunny Tan whom we are sure is more than willing to give a helping hand.

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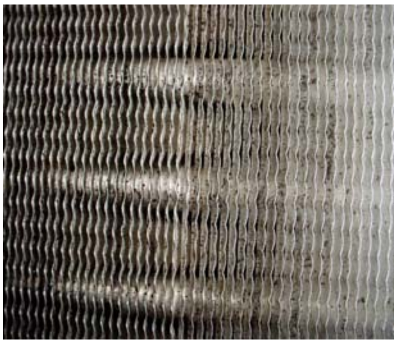
Technical Talk : UVC Technology for AHU capacity, maintenance & IAQ control

Speaker: Mr. Forrest Fencl, UV Resources,
ASHRAE Distinguished Lecturer
Date : 16th May 2005
Location : Jupiter Room III, Furama Riverfront.

Poor Indoor Air Quality
Poor IAQ is defined as unacceptable levels of air contaminants that serves & surrounds the occupants. When chararcterised, they are defined as suspended particulates, gas compounds and bioaerosals. Bioaerosals include bacteria, viruses and fungi (mold). Amongst their products are endotoxins and mycotoxin which can cause odors, VOC and allergies.

Mold & its source
Mold is very common in HVAC systems, especially in damp areas like cooling coils and drain pans and can multiply with a RH of as little as 30%. One colony can become millions in days. It is estimated that a 4 ft x 6 ft coil with 10fins/inch and 9 inch deep has a surface area of 5000 sq ft can have approximately 30 trillion mold particles within 15 days! (pix of dirty coil, close up)



(Before UVC)

(After UVC)

Dirty cooling coil increases the pressure drop and affect the efficiency of heat transfer of the coil. As such there is lesser off load of heat and the system is unable to meet temperature. Chill water plant works overtime with little or no effect on the deteriorating situation. Temptation to reduce make-up air intake (temperature of make up air is much warmer in tropical countries like Singapore) to achieve desired cool temperature is not uncommon. This may lead to higher level of CO_2 and VOCs.

Most if not every new building, modes of transport like our buses, mrt trains, cars buses are air conditioned. This means that there are mold every where. Effective filters may reduce the amount of microbial intrusion in our HVAC system and once they attached themselves on the coil, the multiplication starts.

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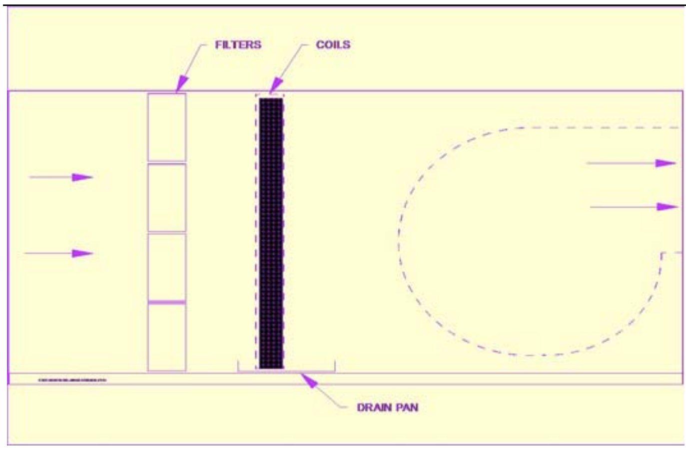
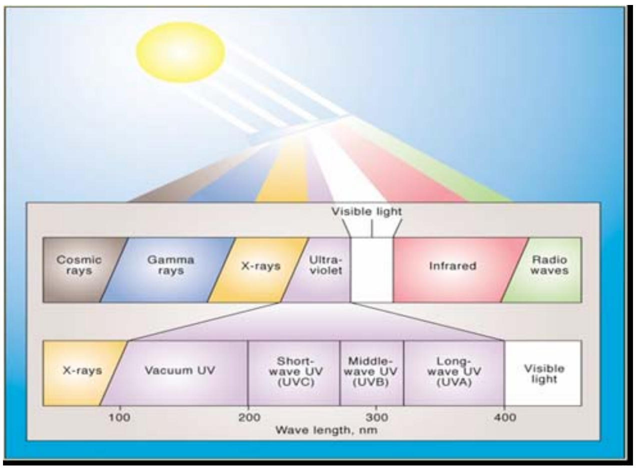


Coil Cleaning?
Cleaning of cooling coils may not dislodge the mold particles that grow deep between the fins and even if chemical treatment can reduce the amount of mold, it multiplies at an astonishing rate that within weeks, they are back again.

Seeing the Light
Mold and other micro organism is thus a persistent problem and the moisture producing areas like cooling coils and drain pans and the ultimate solution is source control with Ultra Violet Germicidal Irradiation (with UV C band). The sun irradiates all 3 types of UV "A", UV "B" and UV "C" light but UVC is filtered and is artificially created. Operating at a wave length of 253.7 namometers, it does not produce any ozone.



Total coverage of UVC on coils & drain pans
For total control of mold multiplication on coils and drain pans, it is essential that sufficient number of UVC lights is employed to ensure 100% coverage. Professor Waly Kowalski of Penn State University has designed software that determines the required number of rows of UVC lights as well as the number of UVC lights per row by just entering the width and

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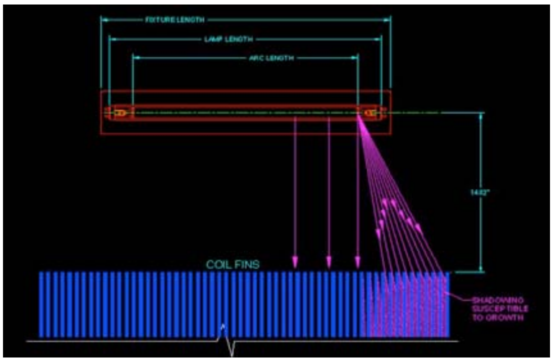
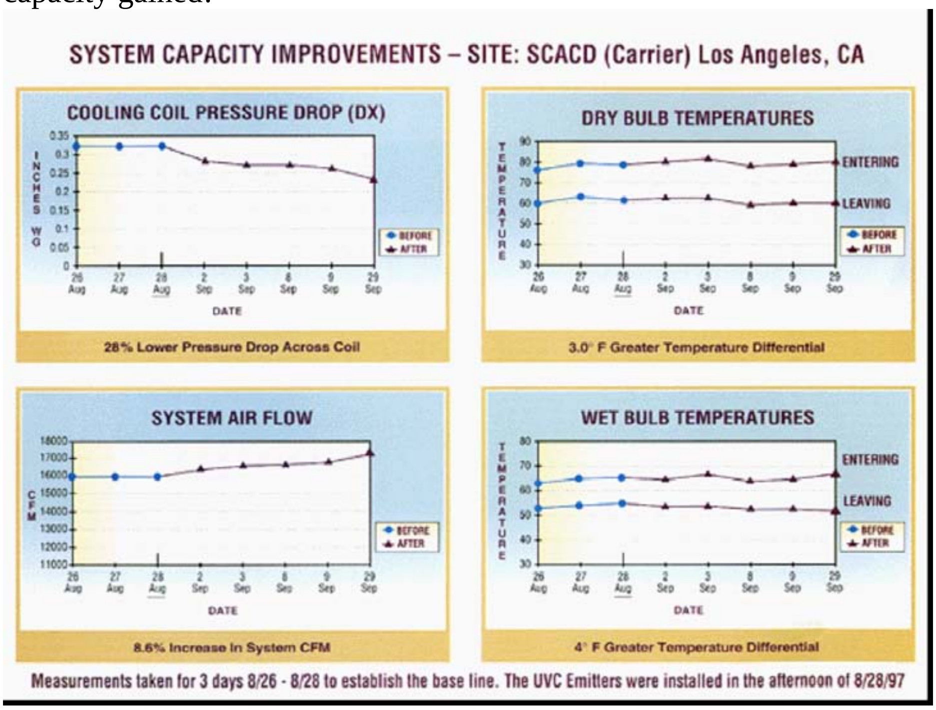
height of the cooling coil. The software also predicts the kill rate of 4 most common types of microbes (aspergillus niger, rhizopus nigricans, penicillium, cladosporium)



UVC Lights must irradiate entire cooling coil face area

Energy Savings

Below is an excerpt from a site, SCACD (LA), showing the improvement of the HVAC system. Two sets of data were taken, one prior to the installation of the UVC lights and another 30 days thereafter and the results were astounding in terms of Energy reduction and capacity gained!



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- Energy Calculations — Fouled — Clean
- Airflow, cfm — 16000 — 17400
- Inlet Air DBT, F — 80 — 80
- Inlet Air WBT, F — 65 — 66
- Outlet Air DBT, F — 61 — 59
- Outlet Air WBT, F — 54 — 53
- Capacity, Btuh — 535,680 — 824,499
- Capacity Loss/Gain: 288,819 Btuh
- Energy Reduction: 20.39 kW or a 30% + Gain
- 4.5 Lbs. of air per hour = 1 CFM
  - So Btu's per hour then is CFM x 4.5 x (h1 - h2)
  - h1 = air entering & h2 = air leaving Wet-bulb

So our SCACD example becomes:
Btu/hr = 16,000 x 4.5 x 9 or 648,000 Btu's / hour
Btu/hr = 17,400 x 4.5 x 13 or 1,017,900 Btu's / hour
1,017,900 ÷ 12,000 = 84.83 tons of A/C - clean coil
648,000 ÷ 12,000 = 54.00 tons of A/C - dirty coil
A 30.83 ton or 36% gain!

Conclusion

UVC is the only remedy to continuously kill and degrade surface microbes and organic material and
to kill airborne microbes in "HVAC equipment!"

It poses no risk to equipment, occupants or furnishings and it produces No Secondary Contamination!

As a result, there is better IAQ and better system efficiency and lesser maintenance.

ASHRAE Distinguished Lecturer, Mr Forrest Fencl sharing his expertise on UVC technology in HVAC application

President, Mr Albert Sin presents certificate of appreciation to Mr Forrect Fencl

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Leadership Interview

Dr. Leong Kai Choong

Leong Kai Choong was born in Singapore. He received his early education at Raffles Institution and obtained his B.Eng.(Mech.) at the National University of Singapore (NUS), M.S. in Mechanical Engineering at University of California, Los Angeles (UCLA) and his Ph.D. at the University of Queensland (UQ).

His professional affiliations include P.Eng.(Mech), Singapore, Senior Member of the Institution of Engineers, Singapore and Member of ASHRAE.

He is currently Associate Professor and Vice-Dean at the School of Mechanical and Aerospace Engineering at Nanyang Technological University. Prior to joining academia, he worked as an engineer in a manufacturing company and then as an M & E engineer in a local construction company.

Q1. What attracted you to engineering and/or the HVAC industry?

The opportunity and privilege to play an active part for the betterment of human society through technological and engineering advances. I was interested in the HVAC industry because of its direct applications of engineering concepts to create positive impacts on human comfort, health and engineering processes.

Q2. What was your first job in the HVAC industry and where did it lead?

As an M & E engineer in a local construction company.

Q3. Describe the industry at that time. What were the challenges that you and your colleagues were facing?

The HVAC industry was rather active with many public and private sector projects.

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Q4. How and when did you get started in ASHRAE?

I met a past president of the then Singapore Association of ASHRAE Members (SAAM), the predecessor organization of ASHRAE Singapore Chapter in the course of my work. He encouraged me to be a member of ASHRAE and SAAM.

Q5. What was your ASHRAE chapter experience?

I had an enjoyable time serving the ASHRAE Singapore Chapter in various capacities as Committee Chairman, Hon. Treasurer, Hon. Secretary, President-Elect, President and Immediate Past President. The highlight of my experience was my stint as Chapter President during ASHRAE's Centennial Year of 1994-95.

Q6. How was SAAM (ASC) interacting with the public?

SAAM was involved in dialogue with government bodies and regularly held seminars and conferences on pertinent issues of the day such as Montreal Protocol, depletion of stratospheric ozone layer and phasing out of CFC's.

Q7. On what SAAM (ASC) committees did you serve?

Served in various conference and seminar committees and in the Presidential Advisory Committee of ASHRAE Singapore Chapter.

Q8. What people stand out as influences on you?

I am particularly impressed by all members of the Board of Council and past presidents during my time who dedicated their time and energy to serve the chapter and society on a voluntary basis.

Q9. What has ASHRAE meant to the industry's growth?

ASHRAE will always serve as the resource society for the continual growth of the HVAC industry.

Q10. What advise would you give to a young person entering the HVAC field?

Have a good foundation in engineering by studying at recognised universities such as NTU and NUS. Find an experienced engineer as a mentor and learn the engineering aspects of the profession for the first few years of your career before moving on to sales, marketing or management.

Q11. What other interests and/or hobbies do you have?

I enjoy a good game of tennis and reading a good book.

*SAAM: Singapore Association of ASHRAE Members now known as ASHRAE Singapore Chapter.