香港空調及冷凍商會有限公司
THE HONG KONG AIR CONDITIONING AND REFRIGERATION ASSOCIATION LIMITED
WINTER 2017
Newsletter 會員通訊

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ACRA Office
Room 1801,
Tung Wai Commercial Bldg.,
109-111 Gloucester Road,
Wanchai, Hong Kong.
Tel: (852) 2598 0101
Fax: (852) 2598 0102
E-mail: info@acra.org.hk
Web Site: www.acra.org.hk

Message from the President

Ir C. F. Wu
President

In this summer, new Principal Officials were appointed to serve the fifth term of the Hong Kong Special Administrative Region Government. No doubt, issues that have accumulated for a decade could not be solved overnight under the new-term government in which filibustering is still ongoing inside the Legislative Council. Some of the Legislative Council members are focusing on other matters rather than discussion on public works funding proposals. As a result, a large volume of public works projects has been put on hold, this is a crisis to the construction industry as well as long-term development of Hong Kong. Tender price indices conducted by the Government and private cost consultant both experienced a decline since Q4 2016 while material price and labour wages are increasing, so what does it indicate? A healthy economy shall be in the best interests of the society as a whole and that new prevention measures should be installed to restrict filibustering in the chamber. Stop Filibustering!

Government's new policies related to construction industry has been rolling out. As told, starting from year 2018, large share of Government contracts under Development Bureau to be undertaken by Group C Contractors shall employ the NEC Contract arrangement; and the Building Information Modelling (BIM) shall be adopted as part of Cost Management. Besides, following the increasing number of proven commercial applications of Radiant Cooling system in Hong Kong, the Government will promote this system inside Government Buildings for the benefit of energy efficiency. Buildability is also one of the Government's concerns, ACRA will bring forward the air-conditioning product life cycle management into agenda of the forthcoming meeting with Government.

ACRA joined meetings organized by the Government and Trade Liaison Group on Monitoring the Development and Coordinating Actions in Handling Eco-Friendly Flammable Refrigerants. As a major stakeholder, ACRA shared the market information on the latest development of new refrigerant with the Government. In addition, ACRA was invited by the Government to join the working group on training for air-conditioning practitioners in handling flammable refrigerants, where EMSD, FSD, LD, VTC, HKIE and ACRA have been working together to formulate the best practice in industry, and target to offer training to practitioners in mid-2018.

Exceptional succession can keep the industry to sustainability and growth, ACRA has been taking an active role to support the Government, CIC and VTC in promoting the industry. In October this year, Hong Kong sent a delegation composed of 23 contestants to the 44th WorldSkills Competition held in Abu Dhabi. It was glad to see that Refrigeration & Air Conditioning Trade being one of the contestants. The Hong Kong Team has won 1 Bronze Prize and 7 Medallions for Excellence; although there was no prize awarded to the Refrigeration & Air Conditioning the experience gained was irreplaceable. The HK E&M Trade Promotion Working Group comprising of government departments, public organisations, trade unions and associations, is significant platform to attract talents and new blood to the industry. ACRA has been supporting the group particularly by the ACRA Youth Committee delivering positive messages to the community and talents at similar age group through the platform.

In this month, the number of ACRA members has reached a new height of 178, this further reinforces the foundation of ACRA, and demonstrates the cohesiveness of our industry. "Caring Organisation" has being awarded to ACRA for 7 consecutive years, much enjoyment has been rewarded when serving the community. ACRA joined the charity run and concert for Construction Charity Fund, also ACRA has been providing both financial and volunteering support to NGOs for caring events such as Happy Rice Delivery with over 110 volunteers joined, Joyful Dinner with 20 tables of elderlies, and Happy Farm day camp with the children, etc.

With infinite support from all of our valued members and stakeholders, we find ourselves becoming stronger having the capability to better serve the industry. Let's work together for a brighter future. GO E&M! GO ACRA!

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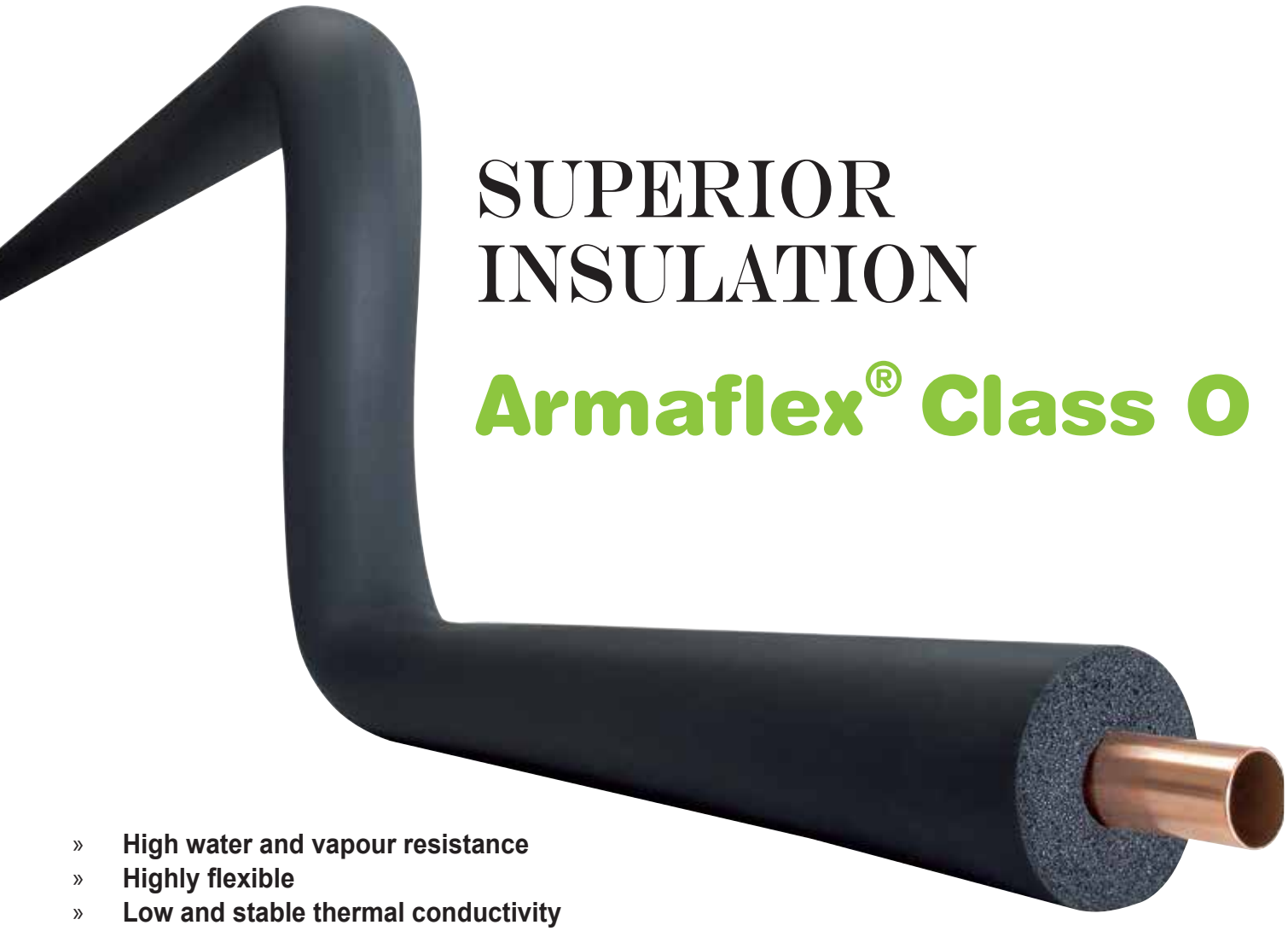

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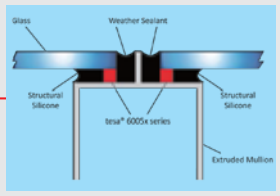

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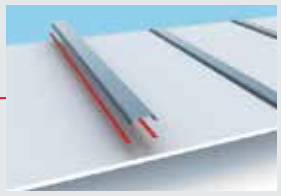

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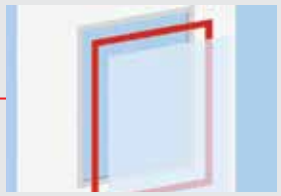

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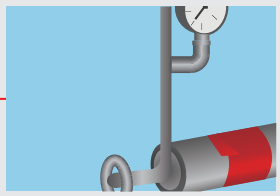

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Smart Hong Kong: Explore the Business Landscape of the HVAC Industry

By: **Dr. Pan LEE**

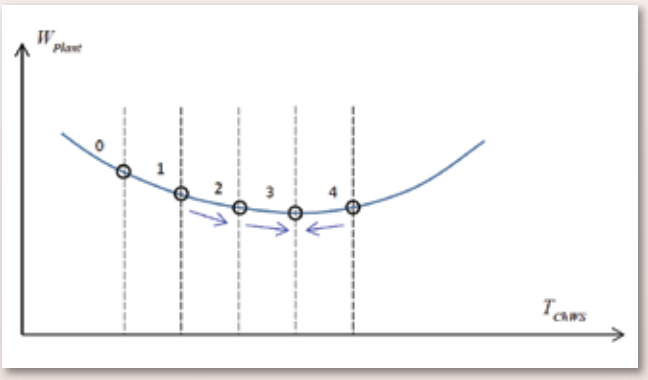
Hong Kong's Smart City Blueprint

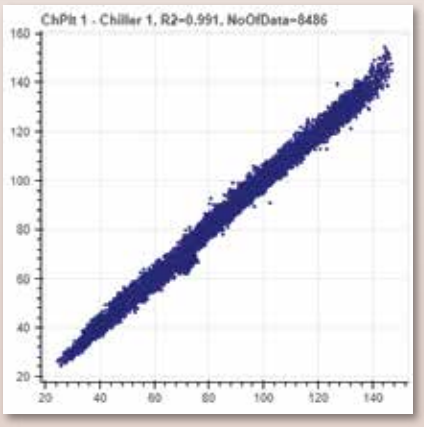
The smart city market continues to grow supported by the initiatives of the Government highlighted in the recently released "Smart Hong Kong Consultancy Study Report". The HKSAR Government carries on its efforts to create our unique version of smart city with the vision of embracing innovation and technology to build a strong economy and bring quality living. The Report focuses on six areas – "Smart Mobility", "Smart Living", "Smart Environment", "Smart People", "Smart Government" and "Smart Economy", detailing a clear framework of medium-term and long-term strategic plans. Considering the built environment as a foundation of the smart city infrastructure, the Government seeks to promote the green designs of urban environments and building services through the use of integrated information and automation technologies.

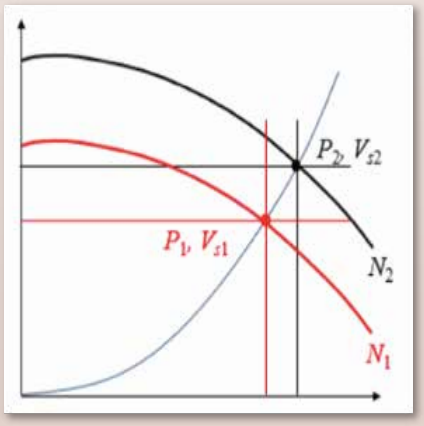
Complement HVAC Equipment with Energy Optimisation System

Given the dominance of air-conditioning systems in building energy consumption, and of buildings in Hong Kong's overall energy use and greenhouse gas (GHG) emissions, ensuring air-conditioning systems are run at the highest possible energy efficiency is important to realisation of Hong Kong's GHG emission reduction target. Choosing the energy efficient air-conditioning equipment is the first crucial step of achieving energy saving, and the adoption of energy optimisation system is the next step towards advancing sustainability. Since most of the buildings are equipped with building management systems (BMS), greater utilisation of BMS data is important to develop a set of specific equipment models for chiller plant optimisation. These models not only truly reflect the actual performance of HVAC equipment, but also quantify the performance deterioration from design conditions. By deploying a reliable system for data analysis and equipment monitoring, obstacles such as inefficient operation of HVAC equipment, unnoticed equipment faults and unnecessary energy waste can be avoided. The utilisation of IoT (Internet of Things) technology in automatic fault detection & diagnostics (FDD) and optimisation control systems makes insightful data accessible for operation and maintenance (O&M) personnel. A suite of modular optimisation control and FDD software can be run in

a cloud-based server or a personal computer, in parallel with a BMS, consistently obtaining the necessary system operation data from the BMS and feeding the BMS with optimised control commands and settings, and any arising system or equipment faults. With data visualisation, the O&M personnel is allowed to conveniently review the performance of the systems under optimised control, and any discrepancy or deterioration in system performance pointing to emergence of system or equipment fault, maximising the benefits of optimisation control. Apart from the benefits described above regarding the performance review features, data visualisation system enables top management to determine energy saving goals and chart a path forward to sustainable development.







Work Together Towards a Sustainable Future

High energy performance of central air-conditioning systems can only be achieved when efficient equipment and optimised control system are both in place and coordinated together. Beyond the efforts of the Government, we can all do our part to promote intelligent and green buildings as being one of the market players. The involvement and support from everyone in the industry is essential to the success of achieving "Smart Hong Kong".

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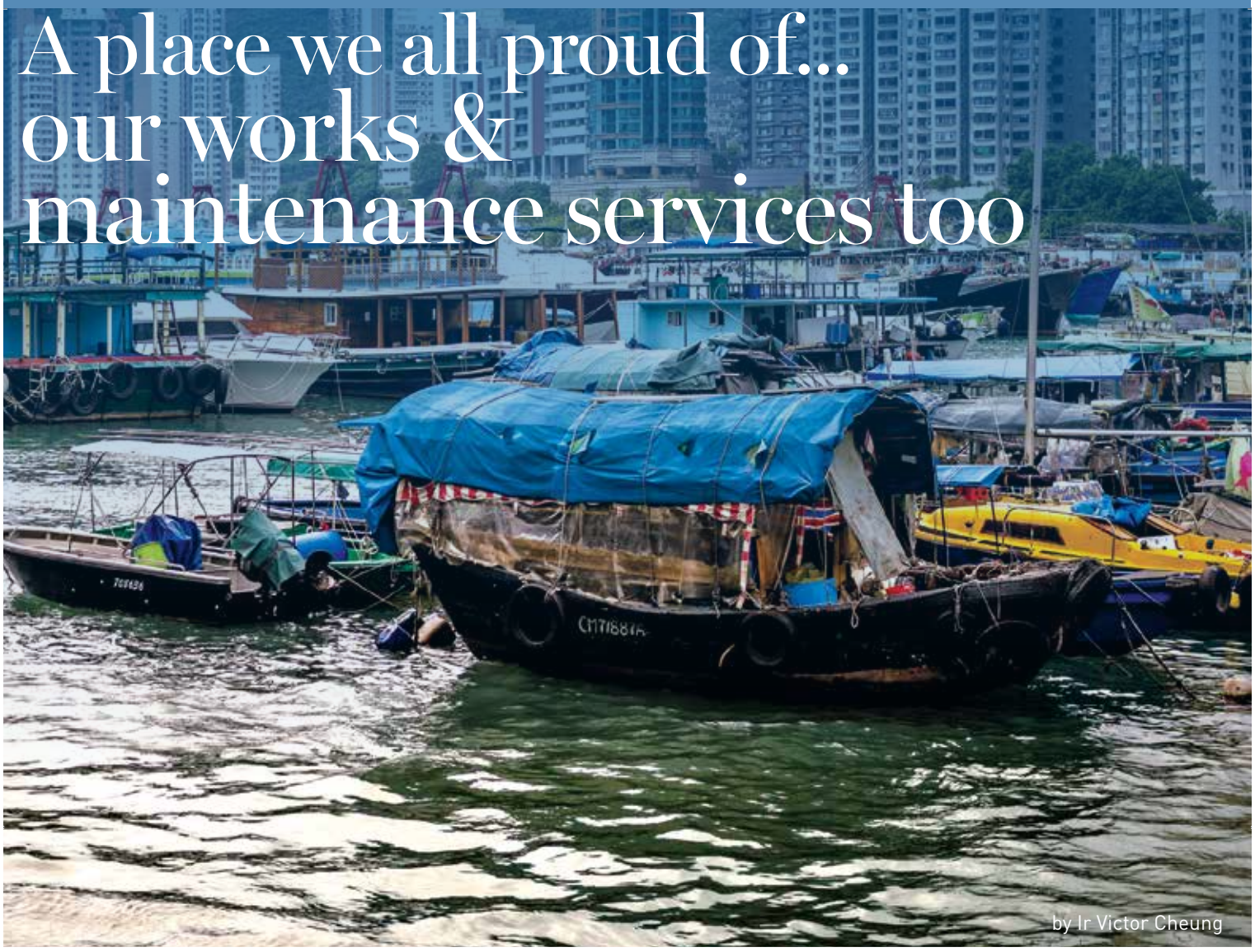

by Ir Victor Cheung

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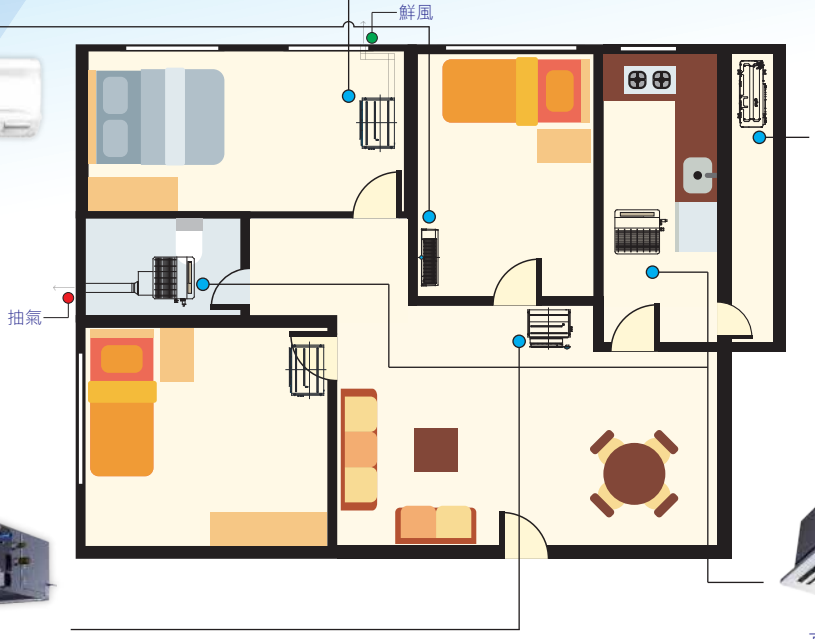

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People Interview with Mr. K K Leung

梁基強先生

今年香港空調及冷凍商會五十六周年，我們邀請到在冷氣行業貢獻超過35年的前輩梁基強先生(KK Leung) 接受本會訪問。KK自1981年加入怡和機器，曾於香港、澳門、中國及台灣等地工作，至今年4月1日榮休的前，任特靈董事兼總經理。KK的敬業精神與工作魄力在業界備受尊敬，多次臨危受命，為怡和及特靈解決危機及奠下發展的基石。

生於澳門 成於香港

KK生於澳門，父親從事裝修工程工作。自少年時已經幫父親工作，因此經常與裝修工人相處，累積了寶貴的經驗，有助日後他在自己的工作中與技術人員及同事融洽溝通。因澳門當年未有大學，KK中學畢業後便轉往香港理工學院進修，及後在香港成為註冊專業工程師。1979年於機械工程系畢業後，他被著名汽車代理及維修商夏巴汽車有限公司取錄為管理培訓生，是他的第一份工作。作為培訓生，最初工作是負責前線接待客人，從而建立了不少人脈關係及待客的經驗。

KK求學時主修控制自動化，對控制自動化技術的工作十分感興趣，所以其後便轉往一家屋宇控制自動化公司工作。其間，他曾經參與興建海港城初期地盤工程近一年半時間，學習了不少屋宇自動化管理系統的知識，吸收項目管理經驗，獲益良多。

怡和培訓 才能出眾

累積多方面經驗後，梁基強先生於1981年7月15日加入怡和機器。最初他負責澳門國際銀行(LUSO BANK) 的項目。三個月後，受上司賞識調回香港在技術服務部門工作。KK在該部門的上司身上學習了很多，他說:「不單是知識，怡和機器對工程師的培訓更著重的是分析和思考，解決問題的方法。這才是對人才培訓最重要的。」藉著出眾的才能，及家人的支持，梁先生表現更上一層樓，步步高昇。

管理特靈 重視人才

1987年，KK被委任為怡和機器旗下景福維修有限公司(T-Young’s Services Limited)的主管，公司及後演變成今天的特靈香港。新的公司帶來新的挑戰，面對人心不穩，人才流失嚴重等問題。最壞的時候，維修職員人數由260人減少至只有130人。KK重整旗鼓，由怡和借調人手，建立有效團隊，將難題逐一解決。他著力改善員工福利和待遇，改善工作環境。由於他的努力，公司產生了意想不到的改變，第一年由預算赤字變為盈餘。相信最主要的改變源自人心，在KK的帶領下，員工心態變得更積極，做到想客人所想，以客為先。

捕捉機遇 開拓亞洲

1990年景福業務開始穩步向上，適逢當時台灣特靈在維修服務上想自立門戶，怡和機器又委以重任，派KK往台灣，進行業務重整。在台灣人生路不熟，KK遇到的困難比以前更多，事無大小都親力親為，業務亦開始漸入佳境。至1993年，因他兒子的誕生，為方便照顧家人，他便申請調回香港。KK認為他工作最大的推動力就是家庭，有家人的支持，便是他每遇困難壓力時仍能樂觀積極解決的力量。

之後特靈開拓國內業務，需要在北京、上海、中山等地開設辦事處及收購廠房。因有良好的往績，此艱難任務，又落在KK身上。他再次由零開始，到地方政府外經貿辦辦手續，員工招聘，公司註冊等他都不假手於人，為特靈在中國的業務發展奠下良好根基。1995年，特靈香港將設備、維修及零件銷售業務整合，KK返回香港執掌管理，成為今天的TYS Ltd。往後的22年梁先生盡心盡力，令特靈業務更上一層樓。

感謝前人　力求進步

被問到工作中最難忘的事，KK憶述一次工作意外，一位年輕技術員身故，當家訪面對技術員的父親低泣無言的一刻，最是難忘的。所以KK十分重視安全，每一個公司的安全會議必定參與，更會投放大量資源於安全方面。公司有連續3年成功做到零意外，近一年都只有一、兩宗輕微意外。在有超過兩百個服務技術人員的公司，能達到這樣的安全水平並不容易。

寄語年輕一代，他認為首先要裝備好自己。不要只專注技術方面，在職場上語文及溝通能力更為重要。凡事做好充足準備，才能將挑戰變成機遇。無論醫生，律師或工程師，只要把工作做得出色，自然會得到相等的回報。其次，正面思維亦十分重要。一項難題，視為負擔將負面情緒帶入工作，又或視為有趣的謎題以破解為樂，都取決於自己的思想態度。

對於行業的未來發展，KK認為業界一直做得十分成功，特別在環境保護及能源效益方面。冷媒由初期的R11到R123，以至新一代環保雪種R1233zd，都一直在進步。香港在研發方面比較薄弱，所以產品上被美國、中國等主導。香港其實可專注發展自動化系統及舊系統更新升級。

KK認為公司或行業的成功，要感謝前人的努力和智慧。無論是業界那一部份，服務、設備銷售、零件、系統設計、安全、環保等缺一不可。只要商會團結各會員公司，保持良性競爭，便能提升整個行業水平。

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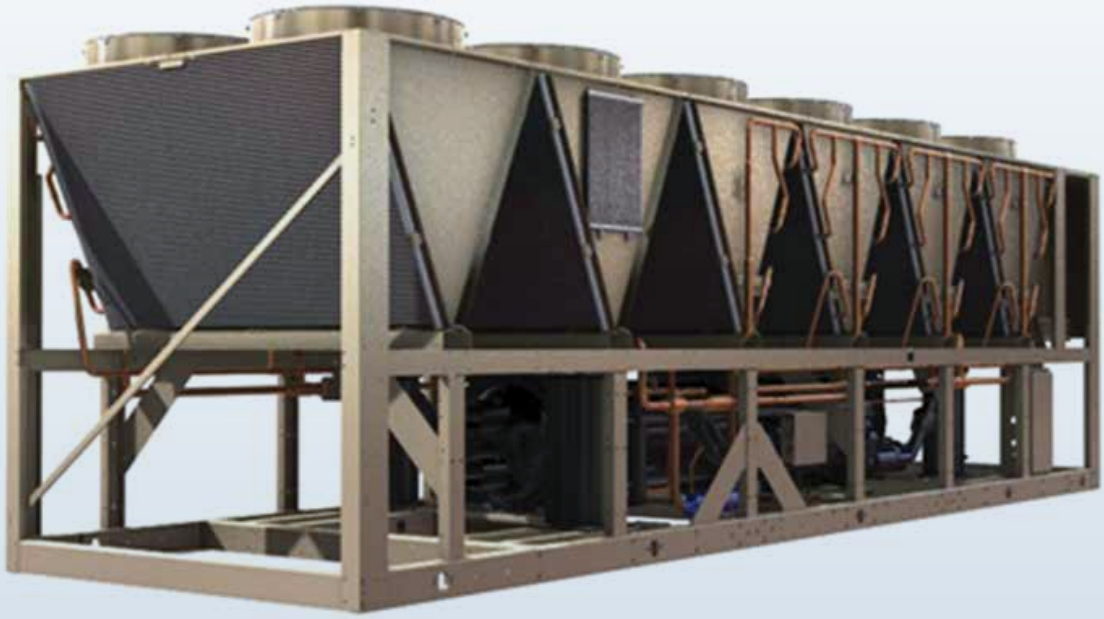
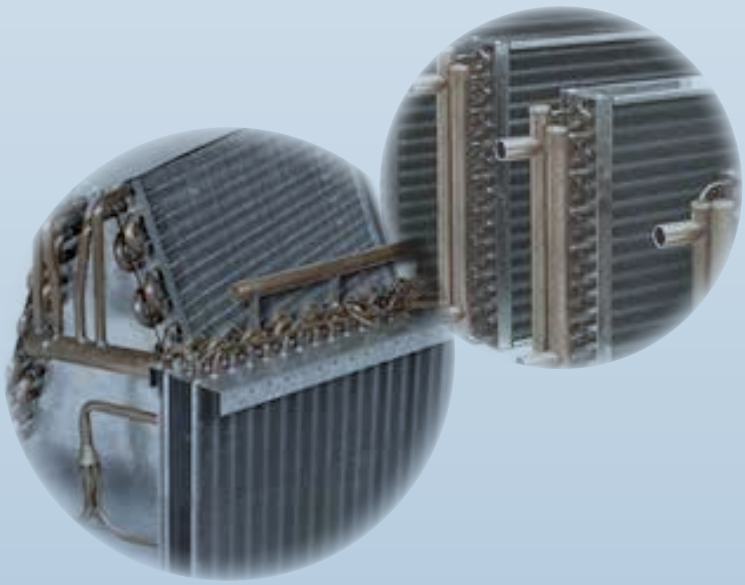
Microchannel Heat Exchanger Technology Creates More Sustainable, Reliable, Environmental Friendly HVAC Products

By: **Tobey Or**



Background

Microchannel Heat Exchanger (MCHX) was first applied in the automotive industry in the late 1980's, driven primarily by the need to switch from CFC to HFC. Other features such as weight, dimensions, and refrigerant charge contributed to the design of Microchannel. The Microchannel technology has proved to be successful in automobiles which is experienced in extreme vibrations from the engine and road condition.



Design and Construction

MCHXs are constructed of parallel flow aluminum alloy tubes metallurgically brazed to enhanced aluminum alloys fins. The proprietary aluminum alloys used in the heat exchangers have been carefully selected and are the outcome of years in laboratory testing, field trials, and thousands of installations in the most severe climate conditions around the globe. Thus, the Microchannel is a superior heat exchanger that has been field-proven to meet HVAC industry requirements. There are three basic components used in the construction of MCHXs (see FIGURE 1):

- Parallel Flow Aluminum Alloy Tubes
- Enhanced Aluminum Alloy Fins
- Aluminum Alloy Manifolds

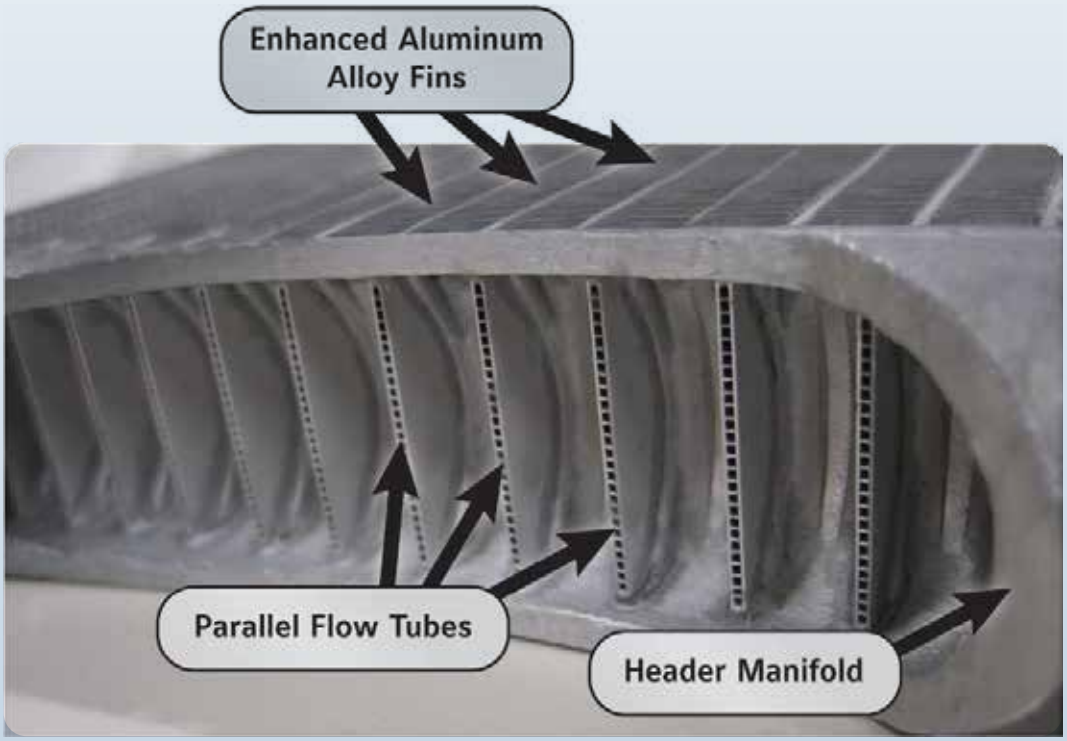


FIGURE 1 – Cut Away View of Basic Microchannel Heat Exchanger Construction

Less Refrigerant Charge

Reduction in the overall cross-sectional area of the tube carrying the refrigerant, not only reduces the size of the heat exchanger, but also reduces the refrigerant charge up to 50%. This allows lower installation and service costs associated with expensive refrigerant cost.

Lower Airside Pressure Drop

The parallel channels in MCHXs allow for reduced airflow restriction across the tubes when compared to the staggered tube layout in Round Tube Plate Fin heat exchangers are illustrated in FIGURE 2.

In addition, MCHXs are approximately one-fourth the depth of RTPF heat exchangers. The parallel tube layout and reduced heat exchanger depth help in minimizing the restriction of air through the heat exchanger and thus reducing air pressure drop, lower fan power and overall noise levels.

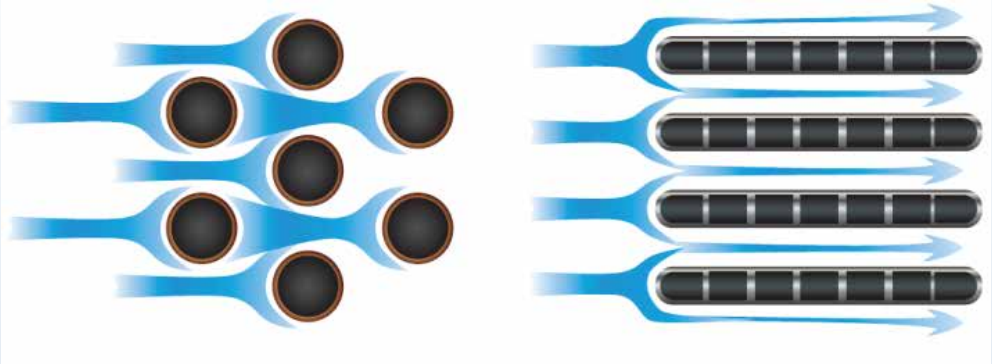


FIGURE 2 – Round Tube Plate Fin vs. Microchannel Coil Air Flow

Easy to Clean

Regular cleaning is an essential part of maintaining the integrity and heat transfer properties of heat exchangers. The reduced depth and parallel tube layout of MCHX minimize the restriction of cleaning water through the heat exchanger. This can provide a shorter and more direct path for cleaning water to carry away dirt and debris in MCHXs during regular maintenance.

Corrosion Resistant Consideration

Aluminum resistance to general corrosion is high, hence it is widely used in outdoor HVAC applications. The factor that contributes the most to good corrosion resistance of aluminum is its self-forming microscopically-this surface layer of aluminum oxide. The file can vary in thickness depending on the type of aluminum alloy and the age of the heat exchanger.

No Galvanic Corrosion

Galvanic Corrosion occurs when two different metals are in electric contact with each other and bridged with an electrically conducting media (see FIGURE 3). Aluminum, being the less noble of two metals becomes the sacrificial metal and corrodes in round tube plate fin, whereas aluminum alone, it might not have corrosion in Microchannel.

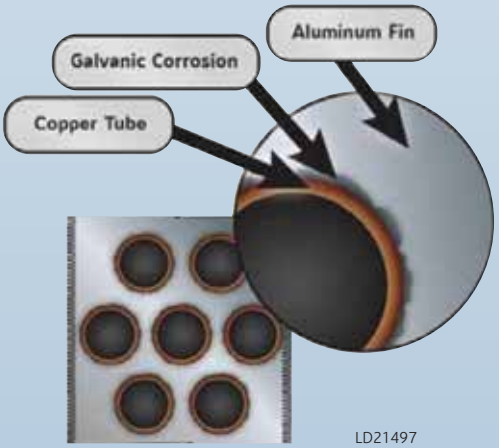


FIGURE 3 – Galvanic Corrosion between Copper Tube and Aluminum Fin

Corrosion Protection

For corrosive environment, Environment Guard Premium, which is an E-coat process that will prevent corrosion twice as long as uncoated heat exchanger in the Sea Water Acetic Acid Test (SWAAT) can be applied to a Microchannel Coil. This heat exchanger e-coating can stand up to 3,000 hours under the SWAAT test and is advised especially for the industrial and coastal area. The comparison of Microchannel Coil with E-coat before and after 500 hours in SWAAT test are shown in FIGURE 4&5.

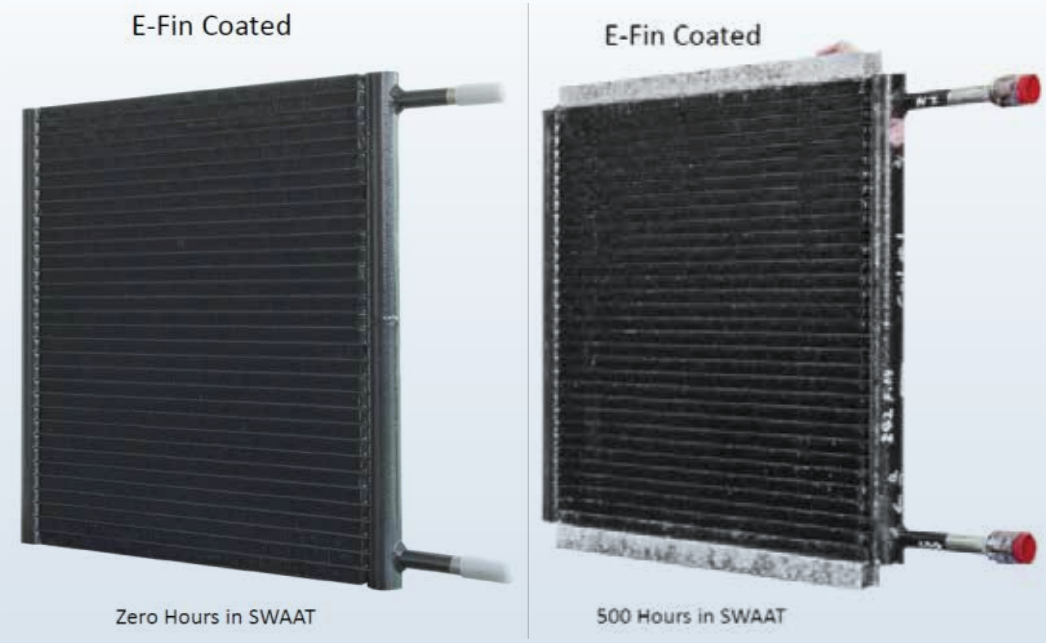


FIGURE 4 – Microchannel E-coat Process FIGURE 5 – Microchannel with E-coat under SWAAT test

Advantages

Microchannel Heat Exchangers have immense advantages that make the technology an excellent fit for stationary HVAC equipment. The high efficiency, reliability, reduced refrigerant charge, and reduced size, weight and carbon footprint are all reasons making Microchannel a good choice for air-cooled chiller condensers.

Reference:
(1) Davis, Joseph R. (1999) corrosion of Aluminum and Aluminum Alloys. ASM International, pp.27,135-149
(2) Hack, H.P. (2005) Evaluation of Galvanic Corrosion. ASM Handbook, Vol. 13, pp.233-235.

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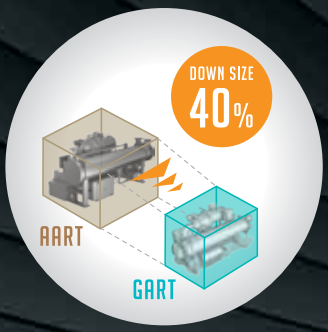

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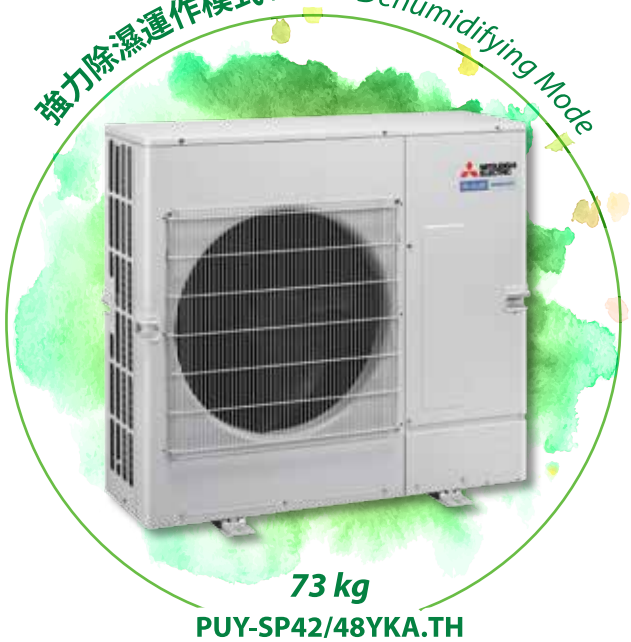

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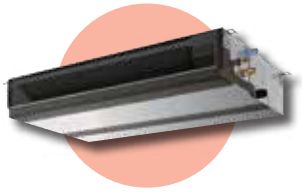

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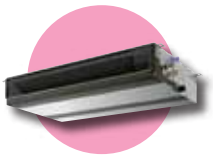

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Safety of Flammable Refrigerants

Refrigerant has never been a safety issue for air-conditioning in the past decade or so until the explosion and fire incidents were reported in news to be associated with the use of so-call eco-friendly refrigerants for air-conditioning. These refrigerants were found to contain high contents of highly flammable hydrocarbons[1]. To certain extent, they are not true eco-friendly refrigerants but some "quick-fix" options in response to the hot environmental issue, Global Warming or Climate Change. They are being promoted to the end-users for commercial purpose more than environmental reasons. Recently, a joint circular issued by the government (EMSD, FSD and Labour Department) advised the trade not to adopt flammable refrigerants[2].

In fact, various country and regional regulatory requirements are putting pressure on the industry to reduce the use of high Global Warming Potential (GWP) refrigerants in Heating, Ventilation and Air Conditioning (HVAC) equipment/systems. Some leading manufacturers of the industry proactively declared at the Climate Summit on 23 September 2014 to reduce 50% greenhouse gas refrigerant footprint of products by 2020 and lower GWP alternatives across the portfolio by 2030[3].

To walk the talk, we must deal with some primary issues:

- ***Safety*** – flammable refrigerants likely to be used, the total refrigerant lifecycle needs to be evaluated by product and by application to understand the potential impacts.
- ***Efficiency*** – to meet or exceed the product performance today and yet be able to perform at high ambient conditions.
- ***Cost*** – not only the cost of equipment and refrigerant, but also the cost of safety; Intellectual Property (IP) barriers need to be addressed as well.
- ***Technology*** – cost/time required in changing technology and the changes be as "future-proof" as possible.

Flammability is the greatest technical/safety challenge at the moment. It seems we are facing a dilemma of safety and sustainability. Shall we sacrifice safety for low GWP?

Recently, an international symposium on new refrigerant and environmental technology, held in Kobe Japan, gathered together a lot of experts to share the latest results of their research and development. Among the next generation low-GWP refrigerants, some are defined as 2L class of flammability according to ASHRAE Standard 34. The new class of flammability, 2L, is set between class 1 and 2 with lower burning velocity (≤10 cm/s). This has been added so as to allow broader use of chemicals including the "mildly" flammable ones. However, not all 2L chemicals are equally safe in building HVAC applications. For instance, Table 1 shows five 2L chemicals, of which some were classified as Class 2 previously. The auto-ignition temperature varies from 368 to 750 °C. The quenching distance[4] is another important parameter to the safety design of electric parts being selected for an air-conditioner or heat pump using flammable refrigerant. Illustrated by Fig.1, it is the critical size(the red area) that an inflamed volume must exceed to propagate unaided fire. Humidity is a new parameter that has been identified as affecting the burning velocity after 2L class was defined. As shown in Table 2, R1234ze is not flammable in dry air but flammable in wet air[5].

The HVAC industry standardized on non-flammable refrigerants for all applications during the transition away from those refrigerants with ozone depletion potential (ODP). As a result, many equipment manufacturers use all non-flammable refrigerants in its applications and products. The safety of employees, customers, technicians and any other individuals who interact with refrigerants is a top priority. It is of concern that some refrigerant manufacturers and HVAC companies are promoting flammable chemicals (i.e. class 2L, 2 and 3) for applications. The impact would be an increased risk of flammability or combustion in high use applications like supermarkets and high occupancy

applications such as apartment or office buildings. Having said that, we should support research/studies to fully understand and mitigate the safety risks among the class 2L refrigerants so that a broader array of low-GWP refrigerants can be made available for safe use in HVAC applications. In fact, we may further protect the end users by taking a proactive role in developing requirements and standards for the safe use of flammable refrigerants while ensuring that the next gen refrigerants are low-GWP. For the time being, the good news is that we do have non-flammable next-gen low-GWP options for large tonnage water-cooled centrifugal machines (e.g. R1233zd and R514A); and with GWP below 600, we have some promising non-flammable alternatives available for air-cooled or water-cooled screw machines (e.g. R513A and R515A). Some may be slightly less efficient the existing options but can still maintain and even improve on today's efficiency standards. Unfortunately, no non-flammable alternative is available for variable-refrigerant-flow (VRF) or split systems. The cost of new refrigerants could be another challenge which may slow down the adoption, but it will come down over time with increased use. Many testing and evaluation reports can be obtained from the website of AHRI low-GWP alternative refrigerants evaluation program. In the next few years, more new refrigerant options are expected to be commercialized.

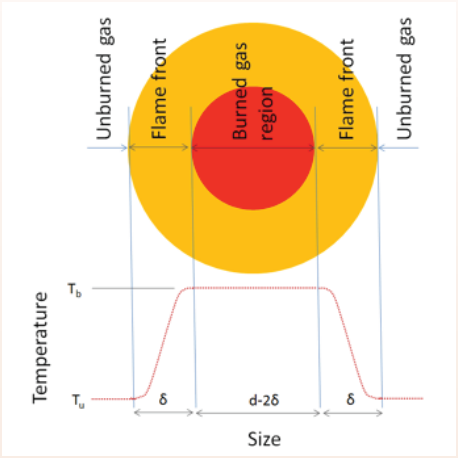

Fig. 1: Conceptual diagram of fireball structure[4] (spherically propagating flame)

Table 1: Safety difference across various 2L refrigerants[4]

Refrigerant Number	Chemical Formula	Auto-ignition temp., °C	Max. burning velocity, cm/s	Quenching distance, mm
R32	CH2F2	648	6.7	7.55
R143a	CH3CF3	750	7.1	7.03
R1234yf	CH2=CFCF3	405	1.5	24.75
R1234ze	CF3CH=CFH	368	-	-
R717	NH3	630	7.2	8.95

Table 2: Flammability of refrigerants relative to humidity[5]

Refrigerant Number	Air humidity	Stoichiometric concentration	Limit of flammability (lower/upper)		Max. burning velocity,	Combustion heat, 106J/kg
		Vol%	LFL vol%	UFL vol%	cm/s	
R32	-	17.36	13.5	27.5	6.5[d]	9.3
R1234yf	Dry	7.75	6.7	11.7	1.6	10.3
	Wet	7.41	5.15a	13.6a	5.9b	10.8[c]
R1234ze	Dry	-	not flammable			10.2
	Wet	-	5.9[a]	12.6[a]	5.2[b]	10.7[c]

a) absolute humidity: 0.016 kg/kg(DA); b) absolute humidity: 0.03 kg/kg(DA);
c) absolute humidity: 0.052 kg/kg(DA); d) microgravity

Reference

[1] OFOMB. 2015. Executive Summary: Direct Investigation into the Safety Regulation of Eco-friendly Refrigerants, The Office of the Ombudsman (OFOMB), Hong Kong.

[2] EMSD, FSD and LD. 2017. Circular: Safety of Flammable Refrigerants, Electrical and Mechanical Services Department (EMSD), Fire Services Department (FSD) and Labour Department (LD) of the HKSAR Government.

[3] IR. 2014. "Ingersoll Rand to Cut Greenhouse Gas Emissions in Half by 2020; Invests $500 Million in Energy Efficiency to Address Climate Change", News Release, Ingersoll Rand, 22 September 2014. (http://company.ingersollrand.com/ircorp/en/discover-us/sustainability/our-climate-commitment.html)

[4] Takizawa, K., Tokuhashi, K. and Kondo, S. 2014. "Fundamental and Practical Flammability of Mildly Flammable (2L) Refrigerants", Proceedings of JRAIA International Symposium on New Refrigerants and Environmental Technology 2014, 20-21 November 2014, Kobe Japan. Pp.79-84.

[5] Ueda, K. 2014. "Chiller Risk Assessment and Guideline by Mildly Flammable Refrigerants", Proceedings of JRAIA International Symposium on New Refrigerants and Environmental Technology 2014, 20-21 November 2014, Kobe Japan. Pp. 241-249.

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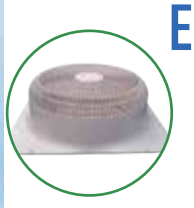
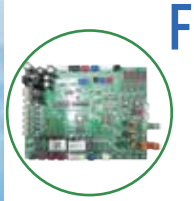


E

Low noise air grille

Silent air guide ring

Simulation of CFD Airflow Analysis



F

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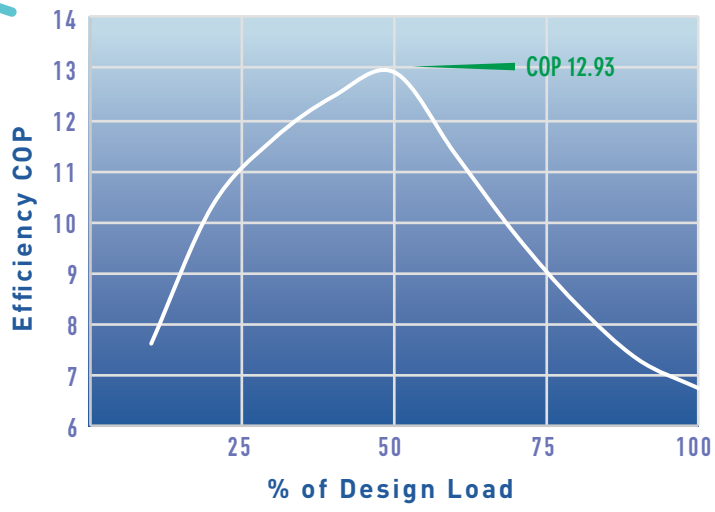

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Cathay Pacific Catering Service Phase II Expansion

By: **Angus Wong**

Project Name	: **Cathay Pacific Catering Service Phase II Expansion**
Architect	: **Leigh & Orange Ltd.**
Consultant	: **Mott MacDonald Hong Kong Limited**
Completion Year	: **2017**
ACRA Member	: **Young's Engineering Co., Ltd.**

Project Overview

The Cathay Pacific Catering Service (CPCS) Phase II Expansion is located adjacent to the existing CPCS facility and connected via two bridges. The building consists of 4 levels to house various catering facilities and administrative offices with total construction area of about 21,000 square meters. The new facilities are designed to produce additional 40,000 meals and handle extra 120 flights daily, and the combined capacity of CPCS is then boosted by 40%, with the capability of producing 140,000 meals and handling 310 flights on a daily basis[1].

Technical Highlight

MVAC installation is comprised of a water cooled chiller plant configured with a combination of four 1,400 kW (400 TR) screw chillers and two 300 kW water-to-water heat pumps to give a total cooling capacity of 6,200 kW (1,760 TR). Low chilled water supply and return temperatures were designed to cater for low room temperature requirement of some designated processing areas. Ethylene glycol solution was added to the chilled water to lower down the freezing point of chilled water against the freezing risk. The fresh water for processing is pre-heated by water-to-water heat pumps and its cooling output is used for supplementing the chilled water system of the AHUs serving the administration offices, such that the benefits of heating and cooling productions of the heat pumps are fully captured.

The waste heat from the chillers are rejected to atmosphere through four 1,900 kW closed type cooling towers located at R/F. The heat exchange coils in closed type cooling towers serve to isolate the condensing water from the ambient air thus preventing the risk of contaminating the condensing water circulating in the closed loop. It also helps to prevent Legionnaires' Disease generally a concern of the open type cooling towers.

Variable primary flow system was adopted to deliver chilled water at the demand flow rate and required temperature from the chiller plant to the terminal units, namely AHU, PAU, FCU and CRAC, under full load and partial load conditions. It eliminates the constant flow primary pumps and improves the Low-Delta-T syndrome resulting better chiller plant efficiency and energy saving. The chiller plant is controlled and monitored by a proprietary chiller plant control system to provide optimum control and operations of the chiller, cooling tower and pump combinations to achieve the maximum efficiency and cater for the varying cooling load demand.

To achieve energy saving on the air conditioning system, CO2 sensors were installed in AHUs strategically to reduce the excessive fresh air rate and its respective ventilation load. AHUs equipped with VSD were allowed to reduce the energy consumption during part load operations. Dual AHUs connected in single air distribution system were designed for processing areas to enhance the system reliability and enable a partial backup during overhaul.

The air-conditioning system in server room is supplied by two dedicated CRAC units, one with chilled water cooling coil and one with DX cooling coil for reliability under two separate cooling supplies. The DX CRAC unit is backed up by essential power to ensure no disruption when normal power is suspended.

Building Management System adopted BACnet open protocol to provide customized monitoring and controlling of the MVAC system and to maintain interfaces with other building services systems. Operation parameters and alarms are logged and stored in the server for reporting, analysis and control function, such that the most efficient system operations and control will be maintained.

Way Forward

To meet future air traffic growth and maintain Hong Kong's competitiveness as an international aviation hub, the existing Hong Kong International Airport will expand into a three-runway system. The needs of ancillary supporting facilities such as aviation catering are driven by the expanding demand. To cope with the growth of air traffic and demand for in-flight meals, Cathay Pacific Catering Service Phase II Expansion has been completed and put into full operations to receive this challenge and opportunity. This expansion building being the first non-Airport Authority premises achieving BEAM Plus Gold Standard in Hong Kong International Airport has truly reflected CPCS's vision in environmental friendly, hygiene, safety and efficiency and commitment in green initiatives[2].

Reference

1 "New Facility Ground Breaking Ceremony", Food for Thought, Issue 036, 2015

2 "New Features of Extension Facility", Food for Thought, Issue 040, 2017

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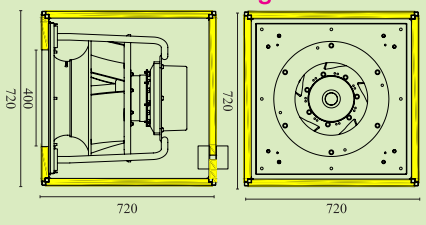

Latest job references:

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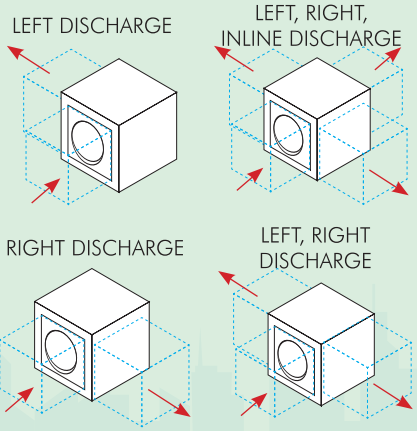
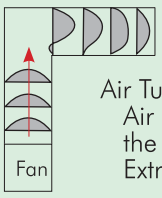
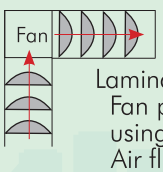


Air Pattern



Air Turbulence
Air being discharged into the corner
Extra pressure drop



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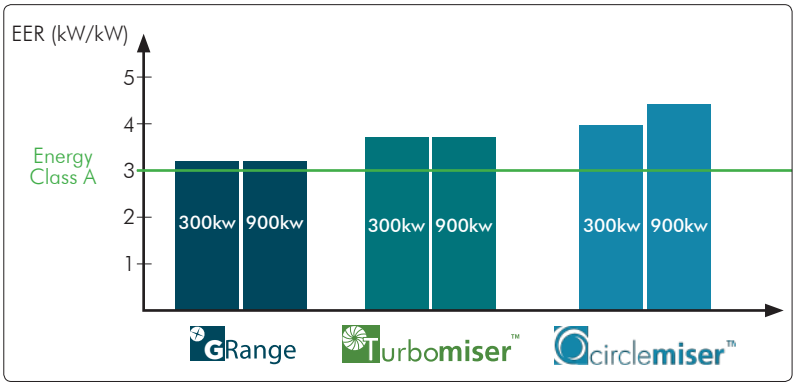

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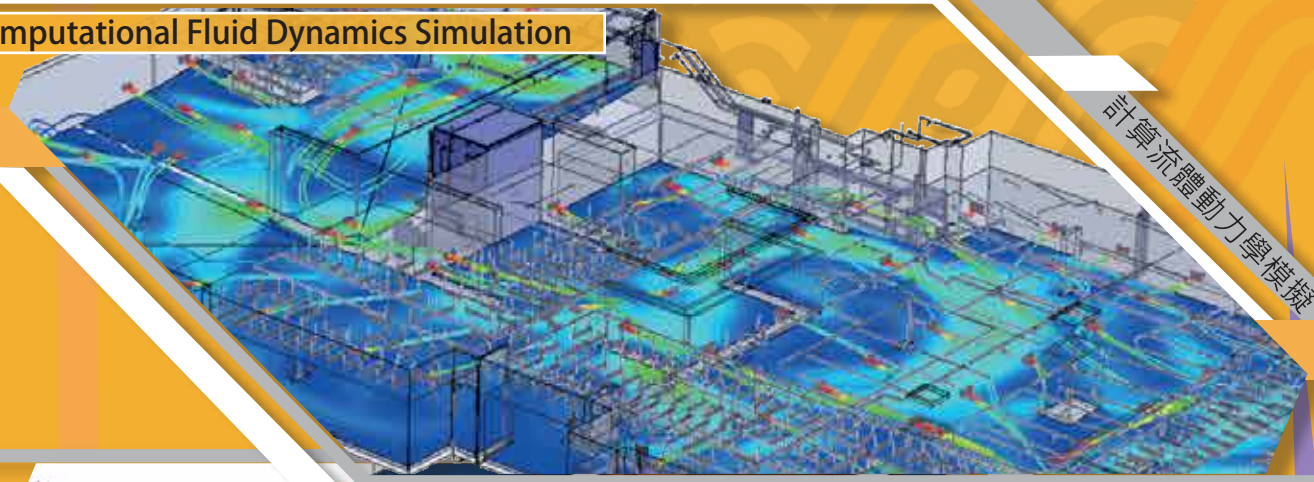

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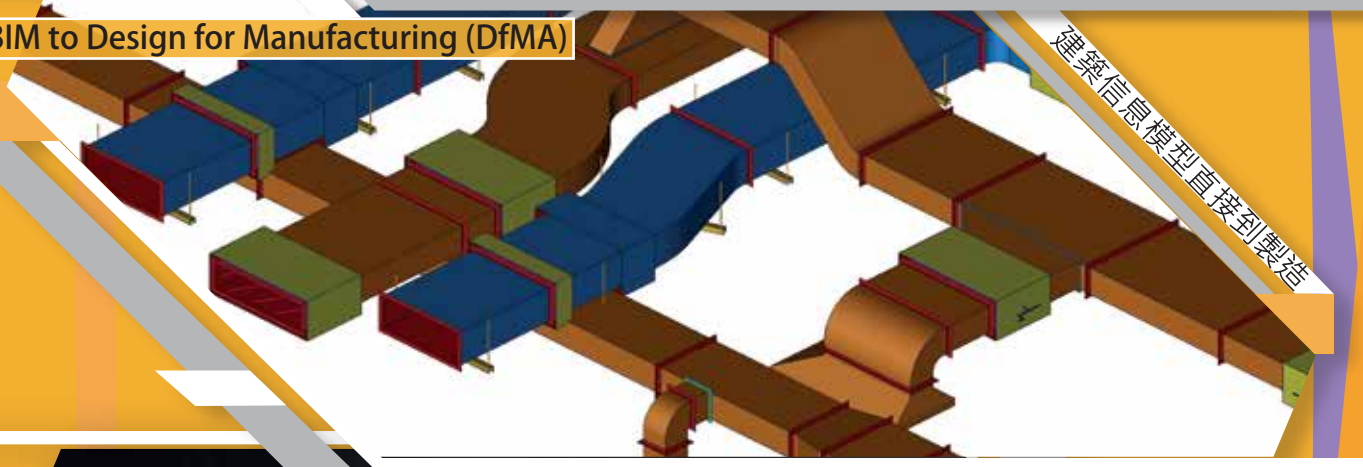

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2	Aug-17	Associate Member	Jade Star Engineering Limited
3	Oct-17	Associate Member	JC (HK) Engineering Limited

Technical Visit of Chilled Ceiling System

On 20 September 2017, ACRA organized a Technical Visit of Chilled Ceiling System to AirStar Air Conditioning Technology Group (Hong Kong) Limited at the Hong Kong Science and Technology Parks. The delegation had an on-site visit to see the Chilled Ceiling System led by the director of the company who is also the patent holder of this advanced air conditioning technology. Besides, technical sharing on the Mongkok Hang Seng Bank project regarding its project design and effect of its operation from the above-mentioned application was also discussed. Our delegates had a rewarding day at the Science Park having the opportunity to better understand this new technology and to exchange relevant technical information/experience with the companions in this field.

主講：嚴繼光先生，燕通科技（香港）有限公司董事長
發明專利權人

Annual General Meeting

ACRA's President, Mr C F Wu, and Chairman, Mr Franklin Lau, gave their reports of significant achievements in 2016-17 and activities, and direction the association will take in the coming year at the Annual General Meeting on 16th June 2017. Thanks C F and Council members for their tremendous efforts in leading the association and connect the association with members, government and related parties.

Horse Racing Night

A fun night out on 21st June 2017 at Happy Valley Racecourse! In addition to the on-track thrills, the evening's excitement also included delicious cuisines, good wine and 賽馬大亨計獎金比賽！

Champion : Mr. Kevin Lau, York Choi Industrial Limited
1st Runner-up : Mr. YK Ng, Fook Loong (HK) Limited
2nd Runner-up : Mr. Franklin Lau, The Jardine Engineering Corporation Limited
3rd Runner-up : Mr. Billy Cheung, ATAL Engineering Limited

Mr Daniel Chong, Past President of ACRA, presented the 2nd Runner-up award to Mr Franklin Lau, Chairman of ACRA

Mr Daniel Mok, Secretary of ACRA, presented the 3rd Runner-up award to Mr Billy Cheung.

Mr C F Wu, President of ACRA, presented the Champion award to Mr Kevin Lau.

Mr Daniel Chong, Past President of ACRA, presented the 1st Runner-up award to Mr YK Ng.

Caring Events

Happy Farm with Children 有機農場孩子同樂日

Jointly organized by ACRA Caring Committee and Open Door Ministries（開心社區服務）, 'Happy Farm with Children' was held successfully on 5th August 2017 to render warm and care to children from low-income households.

20 volunteers from the 2 organizations brought 20 kids and their parents to ecotour 330（生態旅遊330）in Tuen Mun. Through experiencing farming and visiting organic farm, food waste landfill and butterfly garden, kids were able to learn about food waste management problems and behavioural changes that would help reduce food waste generation.

Together with our volunteers, the kids experienced farming.

More than 20 volunteers from our member companies supported the event

We would like to thank the following members for the sponsorship and great support to the event:-

ATAL Building Services Engineering Ltd.
Bun Kee (International) Limited
Fook Loong (HK) Limited
Krueger Engineering (Asia) Limited
Southa Company Limited
Auto Integrated Limited
Eaxon International Company Limited
GELEC (HK) Limited
REC Engineering Company Limited
Welcome Air-Tech Ltd

Happy Rice Delivery 關懷社區行動 2017 — 粒粒開心贈長者

For continuous years, ACRA jointly organizes one of the largest annual caring events - Happy Rice Delivery「關懷社區行動 2017 — 粒粒開心贈長者」with Open Door Ministries（開心社區服務）to show affectionate care for the solitary elders / elderlies in need at Lam Tin Estate which was held on 7 October 2017 this year.

With tremendous support from our ACRA members, over 110 volunteers have joined this event to distribute a total of 100 bags of rice to approx. 120 elders in the estate. The Chairman of ACRA Caring Committee, Mr. Raymond Synn, sent his special regards to the Open Door Ministries and the participated companies and volunteers to show their wholehearted care for the senior citizens in our society. Also, thanks to our Youth Committee members joining this meaningful occasion for their first time. We hope this would bring awareness to the public that both necessities and mentalism of the seniors shall be addressed provided the aging population issue of the city. We will continue to try our best to serve the community for a better quality of life.

Sincere thanks to the following 16 members for the great support to this event:

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Shinryo (Hong Kong) Limited
Smartech HVAC & Engineering Ltd.
Southa Company Limited
The Jardine Engineering Corporation Limited
Viewco Building Services & Engineering Company Limited
Welcome Air-Tech Ltd
White Hippo Limited
Wo Lee Steel Company
Zenith International Enterprise Ltd.

ACRA Training Course on HVAC System & Product Updates

ACRA organized 4 days of training on HVAC System and Product Updates every Monday from 9th to 30th October 2017 which received overwhelming response from the industry. This course is designed for both practitioners and young engineers to acquire the latest technology and product information on HVAC System in order to develop a more effective engineering by enhancing energy efficiency. Training topics including Chilled Beam, Fan & AHU Selection, Pump & Valve Selection, and Retro-Commissioning were presented by the respected guest speakers from our supportive members.

9 October 2017 - Chilled Beam
Guest Speakers: Dr Pan LEE and Mr. Edmond YEUNG from ATAL Engineering Ltd.

16 October 2017 - Fan & AHU Selection
Guest Speaker: Mr. Tony NG from Welcome Oncho Denki Ltd.

23 October 2017 – Pump & Valve Selection
Guest Speakers: Mr. John MA and Mr. David KWONG from The Jardine Engineering Corporation Ltd.

30 October 2017 – Retro-commissioning
Guest Speaker: Ir Daniel CHONG from Winston A/C Eng. (HK) Co., Ltd.

Midea Cup Darts Competition

Sponsored by Midea Electric (Hong Kong) Limited, 20 member companies had an awesome darts competition on 19th September 2017. Believe it or not, the darts fans in ACRA were so eager to take champion title!

Under the sponsorship of Midea Electric (Hong Kong) Limited, the darts competition received overwhelmed respons!

五匹賽事	
Champion	Delta Pyramax Company Limited
1st Runner Up	Southa Company Limited (Team 2)
2nd Runner Up	C.J. Wishing International Limited
3rd Runner Up	Shinryo (Hong Kong) Limited
四匹賽事	
Champion	Welcome Air-Tech Ltd.
1st Runner Up	ATAL Building Services Engineering Ltd. (Team 2)
2nd Runner Up	Southa Company Limited (Team 1)
3rd Runner Up	The Jardine Engineering Corporation Limited (Team 1)
三匹賽事	
Champion	REC Engineering Company Limited
1st Runner Up	Hilti (HK) Limited (Team 2)
2nd Runner Up	The Jardine Engineering Corporation Limited (Team 2)
3rd Runner Up	Trane Hong Kong
二匹賽事	
Champion	Daikin Airconditioning (Hong Kong) Limited
1st Runner Up	Young's Engineering Company Limited
2nd Runner Up	Chin Tat Trading Company
3rd Runner Up	Midea Electric (Hong Kong) Limited (Team 1)
一匹賽事	
Champion	Bun Kee (International) Limited
1st Runner Up	Midea Electric (Hong Kong) Limited (Team 2)
2nd Runner Up	Hilti (HK) Limited (Team 1)
3rd Runner Up	ATAL Building Services Engineering Ltd. (Team 1)

五匹賽事 *Champion - Delta Pyramax Company Limited*

四匹賽事 Champion - Welcome Air-Tech Ltd.

三匹賽事 Champion - REC Engineering Company Limited

二匹賽事 Champion - Daikin Airconditioning (Hong Kong) Limited

一匹賽事 Champion - Bun Kee (International) Limited

Upcoming Event: *Caring Event – Joyful Lunch (9 Dec 2017)*

Member List

	Company Name		Contact Number	Website / Email	Contracting	Manufacturing	Servicing	Supplier
ACRA Fellow Members	ATAL Engineering Limited	安樂工程有限公司	2565 3399	www.atal.com.hk	●		●	●
	Carrier Hong Kong Limited	開利 (香港) 有限公司	2694 5618	www.carrier.com.hk				●
	Krueger Engineering (Asia) Limited	高雅機電工程有限公司	2860 7333	www.krueger.com.hk	●			
	Newland Engineering Limited	新陸工程有限公司	2967 8620	moshiu@newland.com.hk	●			
	REC Engineering Company Limited	盈電工程有限公司	2619 8888	www.rec-eng.com	●		●	
	Shinryo (Hong Kong) Limited	新菱工程香港有限公司	2237 8624	www.shinryo.com	●			
	Shun Hing Engineering Contracting Company Limited	信興機電工程有限公司	2419 8282	www.shecon.com	●			
	The Jardine Engineering Corporation Limited	怡和機器有限公司	2807 4511	www.jec.com	●		●	●
	Trane Hong Kong	特靈香港	3128 4756	www.tranehk.com		●	●	●
	Winston Air Conditioning & Engineering (Hong Kong) Company Limited	永通冷氣工程 (香港) 有限公司	2764 1200	www.winston-hk.com	●		●	
	York International (Northern Asia) Limited	約克國際 (北亞) 有限公司	2590 0012	www.johnsoncontrols.com	●	●	●	●
	Young's Engineering Company Limited	景福工程有限公司	2235 0900	www.youngs.com.hk	●		●	
ACRA Ordinary Members	Alliance Contracting Company Limited	聯和承造有限公司	2891 9083	www.alcc.com.hk	●			
	Analogue Technical Agencies Limited	安樂科技有限公司	2565 3399	www.atalbs.com.hk				●
	ATAL Building Services Engineering Limited	安樂機電設備工程有限公司	2561 8278	www.atalbs.com.hk	●		●	●
	Bun Kee (International) Limited	彬記 (國際) 有限公司	2748 9319	www.bunkee.com				●
	BYME Engineering (Hong Kong) Limited	嘉福機電工程有限公司	2881 6690	www.bymehk.com	●		●	
	Carewin Engineering Limited	嘉榮行工程有限公司	2898 2183	carewin@on-nets.com	●		●	
	Chevalier (E & M Contracting) Limited	其士 (機電工程) 有限公司	2111 4811	www.chevalier.com	●			
	China State Mechanical & Electrical Engineering Limited	中國建築機電工程有限公司	2823 7888	www.cohl.com	●			
	Chun Wo E & M Engineering Limited	俊和機電工程有限公司	3758 8007	www.chunwo.com	●			
	Cold Magic Efatar (Hong Kong) Company Limited	高美怡輝 (香港) 有限公司	2606 6922	www.coldmagicefatar.com.hk		●		
	Daikin Airconditioning (Hong Kong) Limited	大金冷氣 (香港) 有限公司	3966 9320	www.daikin.com.hk				●
	EMR (Asia) Limited		2866 3108	www.EmersonClimateAsia.com		●		●
	Fook Loong (HK) Limited	福隆 (香港) 有限公司	2393 7773	www.flhk.com.hk				●
	Gammon E&M Limited	金門機電工程有限公司	2516 8823	www.gammonconstruction.com	●			
	Gate Way Valve & Fitting Limited	基法水管配件有限公司	2688 2666	www.gatewayv.com.hk				●
	Honeywell Limited	霍尼韋爾 (香港) 有限公司	2331 9133	www.honeywell.com			●	●
	Hsin Chong Aster Building Services Limited	新昌亞仕達屋宇設備有限公司	2579 8238	www.hcaster.com	●			
	Johnson Controls Hong Kong Limited	江森自控香港有限公司	2590 0012	www.johnsoncontrols.com	●	●	●	●
	K-Thorn Engineering Company Limited	旗鋒工程有限公司	2481 2918	main@k-thorn.com.hk	●			
	Lik Kai Engineering Company Limited	力佳工程有限公司	2611 4501	ericyung@likkai.com.hk	●			
	Lucky Engineering Company Limited	運通冷氣電業有限公司	2780 5285	general@luckyeng.com.hk	●			
	McQuay Air-Conditioning Limited	麥克維爾空調有限公司	2893 6261	www.mcquay.com.hk	●	●	●	●
	MECO Engineering Limited	德寶工程有限公司	2774 8200	meco-engltd@yahoo.com.hk	●			
	Midea Electric (Hong Kong) Limited	美的電器(香港)有限公司	3669 4888	www.mideahk.com	●	●		●
	Quad-Tech Engineering (Hong Kong) Company Limited	高得工程有限公司	2573 1832	quadtech@hkstar.com	●			
	Raising Engineering Limited	威信工程有限公司	2395 6081	simonsiu@raising.com.hk	●			
	Ryowo (Holding) Limited	菱和 (集團) 有限公司	2391 8381	www.ryowo.com		●		
	Siemens Limited	西門子有限公司	2107 6506	andy.wong@siemens.com				●
	Skyforce Engineering Limited	天科工程有限公司	2885 1620	info@skyforce.com.hk	●			
	Southa Company Limited	南龍有限公司	2963 7175	www.southa.com				●
	Standard Refrigeration & Engineering Company Limited	立德工程有限公司	2781 0871	SRE@hklpg.com.hk	●		●	●
	Takasago Thermal Engineering (Hong Kong) Co., Ltd.	高砂熱學工業 (香港) 有限公司	2520 2403	sales@takasago.com.hk	●		●	
	Technicon Engineering Limited	得力確工程有限公司	3193 1300	technic@technicon.com.hk	●			
	Welcome Air-Tech Limited	偉基空調有限公司	2806 8316	www.saiver-welaire.com.hk		●	●	●
	Westco Air Conditioning Limited	威高冷氣工程有限公司	2426 3123	mandylo@scee.com.hk	●			
ACRA Associate Members	A & R Engineering Company Limited	奇樂工程有限公司	2408 2960	general@arengco.com.hk	●			
	Aires Engineering Company Limited	毅力機電工程有限公司	2658 8856	adrianwong@aires.com.hk	●			
	Air Master International Limited	雅士 (國際) 空調有限公司	2764 0307	winston@airmaster.com.hk		●		
	Air Star Air Conditioning Technology Group (Hong Kong) Limited	燕通科技(香港)有限公司	2607 4131	www.yantong.cn		●		●
	Alpha Appliances Limited	第一電業有限公司	2529 7555	www.alpha-general.com				●
	Anway Engineering Company Limited	正佳工程有限公司	2598 4228	www.anway.com.hk				●
	Armacell Asia Limited	阿樂斯亞洲有限公司	2574 8376	www.armacell.com		●		
	Arnhold & Co., Ltd.	安利有限公司	2807 9400	patricklai@arnhold.com.hk				●
	A Shing Engineering Company Limited	亞成冷氣工程有限公司	2537 1818	wilkiengan@ashing.com.hk	●			●
	Auto Integrated Limited	奧力科技有限公司	2612 0758	rickiewong88@gmail.com		●		●
	BELIMO Actuators Limited	搏力謀執行器有限公司	2687 1716	www.belimo.com		●		
	Biocline Healthcare Services Limited	新康醫療器材工程有限公司	2672 1111	bio@biocline.com	●			●
	Bitzer Refrigeration Asia Limited	比澤爾制冷亞洲區有限公司	2868 0206	www.bitzer.de				●
	Brisky Limited	穿梭科技有限公司	2511 3161	tkwan@briskyltd.com	●		●	●
	Centalink International Limited	信嘉國際有限公司	2626 1897	andy@centalink.com.hk		●		
	CDBM Engineering Consultant Company Limited	新雄力工程顧問有限公司	2598 1088	mail@cdbm.asia	●			
	Chi Yip Engineering Company	志業工程公司	3078 9984	canny@acmv-cy.com	●			●
	Chin Tat Trading Company	展達貿易公司	3521 1589	www.chintat.com.hk				●
	Chit Tat Electrical Engineering Limited	捷達機電工程有限公司	2529 8888	chittat@yahoo.com.hk	●	●	●	
	Chong Kin Air-Condition Trading Engineering Co., Ltd.	創建冷氣貿易工程有限公司	2307 5159	www.chongkinaircon.biz.com.hk	●			●
	C.J. Wishing International Limited	惠生電業有限公司	2799 9797	cjwish@cjwish.com.hk				●
	Clydeman Engineering Limited	佳電工程有限公司	2332 3591	daniel@clydeman.com	●		●	●
	Compass Engineering Limited	康栢工程有限公司	2688 7778	compassengltd@yahoo.com.hk	●		●	
	Crowntin Limited	冠殿有限公司	8202 0830	clchoy@crowntingrp.com.hk	●			●
	Dah Chong Hong (Engineering) Limited	大昌貿易行工程有限公司	2768 3595	www.dch.com.hk	●			
	Delta Pyramax Company Limited	佳澤科技有限公司	2511 2118	www.deltapyramax.hk				●
	Dynalink International Technology Limited	匯能國際科技有限公司	3955 0203	www.di-technology.com	●		●	●
	Dynamic Success Company Limited	勁技有限公司	2116 9021	www.dsuccess.net				●
	Eaxon International Company Limited	恩索有限公司	3590 4656	gamescheung@eaxon.hk		●	●	●
	ebm-papst Hong Kong Limited	依必安派特香港有限公司	2145 8678	info@hk.ebmpapst.com		●		●
	Electrodrive Engineering Limited	高宜工程設備有限公司	2573 7211	info@electrodrive-eng.com				●
	Enviro-Tech Engineering Company Limited	鷹達工程有限公司	2827 0688	steveli@envirotech.com.hk				●
	Ever Cool Refrigerating & Air-Conditioning Co., Ltd.	嘉毅冷凍空調設備有限公司	2356 8598	info@evercoolhk.com		●		●
	Evergreen Environmental Technology Company Limited	冬青環保科技有限公司	2562 3331	www.evergreen-environmental.com				●
	Extensive Trading Company Limited	精基貿易有限公司	2889 1681	www.extensive.com.hk				●
	Far East tEngineering Services Limited	遠東工程服務有限公司	2898 7331	www.fareast.com.hk	●		●	
	Fortune Links Hong Kong Limited	鑫力香港有限公司	2562 9399	info@fortunelinks.com.hk		●	●	●
	Fungs E & M Engineering Company Limited	馮氏機電工程有限公司	2682 7200	fungscww@netvigator.com	●			

Contracting Manufacturing Servicing Supplier

ACRA Associate Members

Company Name		Contact Number	Website / Email	Trade
GTECH Services (Hong Kong) Limited	英國通用工程 (香港) 有限公司	2123 0888	www.gtechservices.com.hk	C
GELEC (HK) Limited	香港通用電器有限公司	2919 8383	hq@gelec.com.hk	S
Gether-Force Air-Conditioning Engineering Co., Ltd.	群力冷氣工程有限公司	2890 2622	geforce@hknet.com	C
Getwick Engineers Limited	佳域工程有限公司	2893 3600	getwick@getwick.com	C
Goodway Electrical Engineering Limited	佳濤電業有限公司	2405 0888	www.goodwaygrille.com	M S
Gotop Engineering (HK) Limited	高陞工程 (香港) 有限公司	2459 3038	gotopco@yahoo.com.hk	C
Great Top Engineering Limited	宏鋒工程有限公司	2345 2219	general@greattop.com.hk	C
GRUNDFOS Pumps (Hong Kong) Ltd.	高福水泵(香港)有限公司	3540 0300	www.grundfos.com	M
Hang Ji Industries International Co., Ltd.	恒基工貿國際有限公司	2721 6129	www.hangji.com	M
Hensen System Engineering Limited	豪信系統工程有限公司	2884 9001	cecil@hensen.com.hk	S
Hilti (HK) Limited	喜利得 (香港) 有限公司	2773 4705	www.hilti.com.hk	M
Hofmann Construction Material Ltd.	香港好夫曼建材有限公司	3157 1841	www.hofmannhq.com	S
Honest Air Conditioning Limited	明發冷氣有限公司	2396 8108	aircond@netvigator.com	C S
Hi Tak Thermal & Acoustic Insulation Eng. Limited	喜德保溫隔聲工程有限公司	2770 7703	www.hitakinsul.com	C M S
H.W. International Air-Conditioning Limited	豪華國際空調有限公司	2796 8888	info@hooair.com	M
IES Engineering (Hong Kong) Limited	恒豐工程 (香港) 有限公司	2992 0830	www.ieshk.com.hk	Sv S
Intelligent Technologies Limited	毅智科技發展有限公司	2301 4868	info@intelligent-net.com	S
Jade Star Engineering Limited	捷陞工程有限公司	3998 3256	jadestarhk@yahoo.com.hk	C Sv
JC (HK) Engineering Limited	悅峰工程有限公司	2898 9885	jc.hk.eng@gmail.com	C M Sv S
J & J Network Engineering Company Limited	信卓網絡工程有限公司	3579 5263	www.jjnetwork.com.hk	S
Jinchat Engineering (HK) Company Limited	正卓工程 (香港) 有限公司	2687 1755	jyin@jinchat.com	M Sv S
Jun Feng Company Limited	駿峯有限公司	2782 2620	www.junfeng.com.hk	Sv S
Keio Engineering Company Limited	京王工程有限公司	2695 8872	www.keio.com.hk	C
Kembla (Hong Kong) Limited	金特霸 (香港) 有限公司	2528 0999	www.kembla.com.hk	S
Kin Wo A/C Engineering Limited	健和冷氣工程有限公司	2398 0157	kw@kinwo.com.hk	C
Kinetics Noise Control (Asia) Limited	建力聲震控制 (亞洲) 有限公司	2191 2488	www.kineticsnoise.com	M S
Kings View Airconditioning Engineering Co., Ltd.	景匯空調工程維修有限公司	2796 2417	admin@kingsview.com.hk	C
K-Flex (Hong Kong) Insulation Company Limited	凱門 (香港) 保溫材料有限公司	2668 5202	www.k-flex.com	M
KSB Limited	凱士比有限公司	2147 1226	philip.chow@ksb.com.hk	M
K.Y.H. Steel Company Limited	金源行鐵倉有限公司	3473 2332	www.kyh.com.hk	S
Laser Resources (Asia) Company Limited	全美 (亞洲) 有限公司	2516 7500	laasiahh@netvigator.com	M S
LeBlanc Water Treatment & Chemicals Limited	利邦化工水處理有限公司	2408 2000	www.leblanc.com.hk	Sv
Lee Tack Engineering Company Limited	李德工程有限公司	2305 3111	ltec@leetack.com.hk	C
Legend Engineering Company Limited	卓越聲控工程有限公司	2815 0928	info@legendjt.com.hk	C M S
Lifa Air Limited	麗風空氣有限公司	2511 7076	www.lifa-air.com	Sv S
Life Air IAQ Limited	活力空氣品質科技有限公司	3527 0106	winston@lifeairiaq.com	M S
Link The Best Company Limited	必發 (香港) 有限公司	2568 4092	sales@linkthebest.com.hk	M S
Luen Ming Pengshan Air Conditioning Factory Ltd.	聯明坪山冷氣製品廠有限公司	2797 2168	www.luenming.com	S
Mason Industries (HK) Limited	梅森實業有限公司	2967 9639	www.mason-hk.com	S
Maxwell Electrical Asia Ltd.	美基電器亞洲有限公司	3583 5088	www.maxwell-asia.com	M Sv
Mesan Fiberglass Engineering (International) Limited	明新玻璃纖維工程 (國際) 有限公司	2787 5717	www.mesanct.com	M
Mitsubishi Electric (Hong Kong) Limited	三菱電機 (香港) 有限公司	2887 4575	www.mitsubishi-ryoden.com.hk	S
NAP Acoustics (Far East) Limited	NAP 聲學工程 (遠東) 有限公司	2866 2886	www.napacoustics.com.hk	C M Sv S
New Way Engineering Company Limited	新法機械有限公司	2325 6892	www.newway.com.hk	S
Oxprime (International) Limited	鑫輝 (國際) 有限公司	2590 8088	info@oxprime.com	S
Pacific Sense Enterprises Limited	栢昇企業有限公司	3549 5372	www.pacificsense.com.hk	C S
Peterson Engineering Limited	必德信工程有限公司	2365 0372	stso@peterson.com.hk	C
Powers Tech IPC Company Limited	科力發展有限公司	3105 3928	www.powertechipc.com	M S
Powers Technical Services Limited	寶華技術服務有限公司	2770 2110	powers.pts@gmail.com	C
Practical Engineering (Hong Kong) Company Limited	百利高工程 (香港) 有限公司	2402 2772	practical@practical.hk	C S
Program Contractors Ltd.	葆岡工程有限公司	2326 8020	program@program.com.hk	C M S
Pyrofoe Engineers Limited	衛安工程有限公司	2388 8038	www.pyrofoe.com.hk	C
Ready Electrical Metal Work Limited	全達電器金屬製品有限公司	2898 8623	kw_leung@ready-group.com	C M
REC Green Technologies Company Limited	盈電環保科技有限公司	2619 8817	www.yaulee.com	Sv S
Regin Controls Hong Kong Limited	瑞晶溫控香港有限公司	2407 0281	saleshk@regin.se	M S
Ritech Engineering & Supply Company Limited	偉達工程材料有限公司	2410 1819	www.ritech-hk.com	S
San Yik Air Conditioning Engineering Company Limited	新益冷氣工程有限公司	3565 5812	www.sanyikgroup.com	C Sv S
Sanby Trading Company Limited	聖備貿易有限公司	2573 4219	www.sanby.com	S
Savills Engineering Limited	第一太平戴維斯設備工程有限公司	2534 1688	pwong@savills.com.hk	C Sv
Shenling Environmental Systems (Hong Kong) Ltd.	申菱環境系統 (香港) 有限公司	2603 0002	www.shenling.com	S
Shun Hing E & M Engineering Limited	順興機電工程有限公司	2387 2882	project@shunhingeng.com	C S
Shun Tung Engineering Company Limited	順通冷氣電機工程有限公司	2633 6866	gabriel@shun-tung.com	C
Sing Kin Limited	陞建有限公司	2333 1518	singkin@gmail.com	C
Smartech HVAC & Engineering Limited	智能空調工程有限公司	2521 9768	info@smartech-hvac.com.hk	S
Southa Engineering Limited	南龍工程有限公司	2963 7241	www.southa.com	C
Stars (Hong Kong) A/C & R Company Limited	恒星 (香港) 冷熱設備有限公司	6116 7832	stanley_yuen@hstars.com.cn	M
Super Mark (H.K.) Engineering Company Limited	高達 (香港) 工程有限公司	2595 1122	www.supermark.com.hk	C Sv S
Superpower Pumping Engineering Company Limited	力霸水泵機械工程有限公司	2745 3562	www.sppump.com	S
Sustainable Energy Limited	恒澤節能有限公司	2332 3077	www.sustaine.com.hk	M Sv
Target Energy Solutions Limited	達標能源管理有限公司	2155 9882	www.targetensol.com	Sv
Teembase Development Limited	天基發展有限公司	2554 6263	www.teembase.com	S
Thermtech Building Products Limited	泛達建築材料有限公司	2756 3837	thermbpl@netvigator.com	C S
Trisun Air Conditioning System Limited	三陽系統有限公司	2377 1618	enquiry@trisun.com.hk	C Sv S
Tinwood Pacific Limited	天匯太平洋有限公司	6325 1197	www.sinro.com	M
Tomi Fuji EMC Limited	富滕能源管理有限公司	2432 0170	www.tomifuji.com.hk	Sv
Tom's Equipment Company Limited	義隆設備有限公司	2757 5539	tom@toms-equipment.com	S
TROX Hong Kong Limited	妥思香港有限公司	2861 2261	www.troxapo.com	S
United Controls Limited	統一儀器有限公司	2556 1001	www.ucl668.com	Sv S
Union (Luen Hop) Refrigeration Co., Ltd.	聯合冷氣工程有限公司	2627 4600	unionlh@bizentvigator.com	C
Victory Engineering Service Company Limited	維陞工程有限公司	2979 4068	pamela@ves.hk	S
Viewco Building Services & Engineering Co., Ltd.	偉保工程有限公司	2543 0610	engineering@viewco.com.hk	C
Wai Luen Air Conditioning Limited	偉聯空調設備有限公司	2890 9321	garychan@wailuenhk.com	C
Wardson Engineering Limited	華順工程有限公司	2329 8268	wsengltd@yahoo.com.hk	C
White Hippo Limited	白河馬企業有限公司	2303 1318	www.kshop310.hk	S
Wing Shing Air-Flow Company Limited	永盛風咀製品廠有限公司	2792 6331	accounting@wingshing-hvac.com	M S
Wo Lee Steel Company	和利鋼鐵有限公司	2393 0131	www.wolee.com	S
Wolter Asia Limited	華德亞洲有限公司	2456 0198	info@wolter.com.hk	M S
Wysermann Company Limited	威士文有限公司	2614 2213	wysermann@wysermann.com.hk	M S
Yin On Trading Limited	賢安建材貿易有限公司	2572 7110	office@yinon.com.hk	S
Yordland Engineering Limited	日島工程有限公司	2362 2186	www.yordland.com	C Sv S
York Choi Industrial Limited	旭彩實業有限公司	2795 8286	www.yorkchoi.com	M
Zenith International Enterprise Ltd.	盛豐國際企業有限公司	2815 5852	www.ebara.com.hk	S

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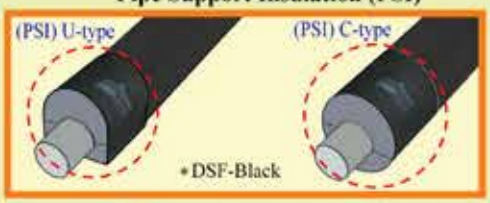

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- ★Rigid insulation ensure the final performance, **NO COMPROMISE ON WALL THICKNESS** as other flexible insulation materials.
- ★Pipe insulation **WALL THICKNESS IN SINGLE LAYER** from 15~150mm.
- ★**NO AIR-GAP** after proper installation, insulation ID cut to top-fit pipe OD.
- ★**PERFECT HARMONY** with pipe support in same materials.
- ★**OPTIONAL SURFACE COLOUR** such as Aluminium, White or Black, can match colour with most of the insulation materials in market.
- ★**EASY & FAST INSTALLATION** (As Easy As ABC)
  - A. Apply adhesive.
  - B. Snap-on Pipe Support/Pipe Insulation.
  - C. Seal with Aluminium Tape.

ADVANTAGE
Labour saving + Time saving = Money saving !

EASY JOB

1994

2018 onward...

General Cancer Centre,
Prince of Wales Hospital
Shatin, N.T.
Year of Completion : 1994

International Financial Centre
Phase I (IFC-1)
South West Tower at
Hong Kong Station, H.K.
Year of Completion : 1998

Nina Tower
Tsuen Wan, N.T.
Year of Completion : 2007

Central Mail Centre
Kowloon Bay, KLN.
Year of Completion : 2013

Yuen Long Leisure and
Cultural Building
52 Ma Tin Road,
Yuen Long, N.T.
Year of Completion : 2017

SOLE AGENT :

福隆(香港)有限公司
Fook Loong (HK) Ltd.
香港九龍旺角塘尾道18號嘉禮大廈19字樓
19/Fl., Skyline Tower, 18 Tong Mi Road, Kln., HONG KONG.
Email : flhk@flhk.com.hk ✆ 2393-7773
www.flhk.com.hk FAX : (852) 2390-6377