香港空調及冷凍商會有限公司
THE HONG KONG AIR CONDITIONING AND REFRIGERATION ASSOCIATION LIMITED

WINTER 2019
Newsletter 會員通訊

5 years+ 同心展關懷
caringorganisation
Awarded by The Hong Kong Council of Social Service 香港社會服務聯會頒授

Contents

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 Antonio Chan
President

The council of this term has been serving third quarter of his time and on behalf of the council, I would like to express our heartfelt thanks for the continuous support from our members to participate in all activities organized by the council. We shall be continuously representing our members' interest in all segments and upkeeping the quality of the air conditioning and refrigeration industry.

BIM Task Force : Subsequent to the Policy Address 2017 in which all capital works with project estimates more than $30 Million should adapt the use BIM technology, ACRA has always been seeking opportunities in promoting this. On 4 June 2019, ACRA has established his own BIM Task Force with the aims to (a) promote widely adaptation of BIM in the air conditioning and refrigeration industry (b) promote the idea of sharing associated family members of all equipment (c) make use of the BIM technology demonstrating the optimization of maintenance space required in major plantroom (d) serve as a platform for our members to work in line with the government and CIC in the process of adaptation of BIM technology. With the help from CIC, the kick off meeting was held in the CIC BIM Space. The venue was fully equipped with BIM Facilities and this was very meaningful to the task force to kick start the ACRA BIM Implementation process. The CIC BIM Space is open to public and members are encouraged to join the guided tour of the BIM Space by registering online in the following link : https://www.bim.cic.hk/en/about_us/page/bim_space. During the 1-hour guided tour of CIC BIM Space, visitors would be able to know BIM applications along the Building Project Lifecycle through real project showcases, acquire hands-on experience on cutting-edge BIM Technologies, receive the latest information of BIM development, such as industry leading BIM software / applications, CIC BIM standards and resources, and overview of global context in BIM development.

Greater Bay Area Committee : As reported in the last newsletter, ACRA arranged a group of members visiting to the Guangzhou Industry and Trade Technician College (GZITTC) in January this year. Subsequently, 4 member companies who have their manufacturing plants in the Greater Bay Area had joined the Career Expo offered by GZITTC recruiting young talents joining their workforces. In June, we were invited by 廣東省制冷學會 to join their delegation visit to the 2019 亞太制冷展 held in Guangzhou. In July, a delegation team led by the President of 廣東省暖通空調協會 visited us in Hong Kong and exchanged their views with us about the air conditioning and refrigeration industry development in Guangdong Province. This was followed with a delegation visit to the Holiday Inn Express SoHo – an energy efficient hotel which was awarded with 4 International Platinum, or equivalent, Green Building Awards and the delegation team was impressed on the energy saving solutions implemented there. ACRA is planning to visit them in Guangzhou very soon. In view of the frequent exchange with our counterparts in mainland, ACRA has established the Greater Bay Area Committee in September in order to enhance the communication and serves as a platform for further exchange in future. This is also in line with the government directive and EMSD initiatives to establish a closer link with GBA in particular training provisions. In October, ACRA was invited to join as part of the EMSD delegation team 廣州人社局及大灣區創科交流團 to witness the 穗港技能人才培訓基地掛牌儀式 and hopefully the GBA Committee can contribute further in the near future.

Continuous professional development is one of the important tasks of the training committee to ensure continuous development to all our members as well as the industry. This year ACRA has jointly organized the Joint Comprehensive Certificate Course on HVAC&R Systems in Buildings 2019 with HKIE BS Division, CIBSE Hong Kong Branch, BSOMES and ASHRAE HK Chapter. There are totally 12 courses and the attendance rate was mostly more than 90%. The last lecture will be held on 26 November 2019 and we would like to express our thanks to renounced speakers sharing their valuable knowledge to all participants.

Youth Committee Members play a key role in supporting the operation of the council and I would like to express our heartfelt thanks for their contribution in various committees. ACRA will continuously offer various kinds of social activities in order to have a platform for our members to share joys and have better understanding of each other. The latest 2nd Cocktail Reception "談程夜" as well as Charity Function "Happy Rice Delivery" were all well supported by members. There will be more to come and members are reminded to pay attention to our forthcoming flyers and actively take part in these functions. I am looking forward to meeting you all in the forthcoming ACRA 58th Anniversary Dinner on 25 November 2019.

Taking this opportunity, I would like to express my sincere thanks to all council members, all committee members, task force members as well as our Administrative Officer for their contribution and effort supporting the operation of the association.

RELIABLE SOLUTIONS FOR HVAC INDUSTRY

tesa® 60642 ALUMINUM FOIL TAPE

tesa® 60642 is a basic aluminum tape for thermal insulation strapping, joining and sealing application. Aluminum backing thickness achieved 40 µm with higher tensile strength and wear-resisting performance.

Parameter:

- Three color option: silver/black/white
- Size: 45M x 50mm, 45M x 63mm, 45M x 75mm

tesa® 4600 Xtreme Conditions Silicone self-fusing tape

- For high pressure leaks, up to a maximum of 12 bar
- Easily adheres to most surfaces including dirty and oily surfaces
- Instant sealing, even under water
- For temporary and permanent applications
- Clean removal from most materials without residues

Email: ray.zhang@tesa.com
Website: www.tesa.com

ATAL

Leveraging Big Data Analytics to Perform Monitoring-based RCx at All Levels

Big data analytics have become an essential tool in today's digital age for analysing energy performance of a building. Using big data technologies makes it easy to identify inefficient operation and equipment faults. Big data analytics approach coupled with our in-house expertise in energy management and data science help you realise the true potential of big data in energy saving.

1 **Data Quality**
Eliminate Data Bias

2 **Fault Detection and Diagnostics**
Identify Unnoticed System Faults

3 **Energy Performance**
Optimise Energy Efficiency

4 **Control Stability**
Ensure Proper System Operation

5 **Thermal Comfort**
Achieve Desired Room Temperature

Proven Track Records Across Multiple Market Segments

- Educational Buildings
- Government Facilities
- Commercial Buildings

ATAL Building Services Engineering Ltd
Tel: (852) 2565 3399 | Email: icbtmarketing@atal.com | www.atal.com
A member of ATAL Engineering Group

CONSTRUCTION INNOVATION AND TECHNOLOGY FUND

INTRODUCTION

At present, construction industry facing some challenges of high productivity costs, labour shortages, high quality requirement and environmental consideration, so adoption of innovation and technology to boost productivity, uplift built quality, enhance environmental and improve site safety performance which is transforming the construction sector worldwide. The Construction Innovation and Technology Fund (CITF), with an approved allocation of HK$1 billion, is established by the Development Bureau of the Government of Hong Kong Special Administrative Region (DEVB) in October 2018.

AIMS OF FUNDING

The aims to provide the impetus to transform the traditional construction industry through automation, industrialization and digitization (hereinafter referred to as "Technology Adoption"); and to enhance the capability of existing and prospective practitioners to harness construction industry (hereinafter referred to as "Manpower Development").

Steering Committee on CITF is set up by the DEVB to oversee and monitor the implementation of the CITF and comprises members from industry stakeholders and major government departments. This committee will meet regularly to monitor usage of the CITF and, where necessary, make adjustments to the key parameters and operational arrangements to cater for the latest industry development.

As the implementation partner of the CITF, the Construction Industry Council (CIC) is responsible for application processing, monitoring fund reimbursement, and CITF promotion.

CATEGORIES OF FUNDING

The CITF is dedicated to the Hong Kong construction industry for Incentivizing innovative technology adoption and nurturing practitioners & students of construction-related disciplines to embrace new technologies. The CITF is covers two aspects-Technology Adoption and Manpower Development

Technology Adoption

(i) Building Information Modelling (**BIM**)

BIM digitalises the construction process. It can minimize clashes and abortive work and reduce the risks of project delivery failure through better coordination, hence achieving clearer programme and costs at all project stages. The CITF is open for procurement of BIM software and hardware for experiential use and project adoption as well as costs for eligible companies to arrange BIM training for their staff.

Building Information Modelling (BIM)
建築信息模擬

(ii) Modular Integrated Construction (**MiC**)

MiC transfers labour-intensive processes and site-bound wet works (such as concreting, screeding, plastering and most building services installations) to off-site manufacturing yards through standardisation, thus enhancing productivity, site safety, environmental performance and cost effectiveness. The use of MiC will likely shorten construction time, in particular for interior finishes, fixtures and fittings on-site, and allow better quality control. Projects adopting MiC can apply for the CITF.

(iii) Prefabricated Steel Rebar

The use of prefabricated steel rebar can reduce laborious bar-bending work in construction sites, improve productivity and reduce material wastage. The use of prefabricated steel rebar from the approved local prefabrication yards is entitled to the CITF.

(iv) Advanced Construction Technologies

The adoption of advanced technologies such as machines and robots under the supervision of skilled and knowledgeable construction personnel can enhance construction productivity and improve safety of operations. Some examples of machines and robots include automated wall plastering machines, robotic arms for lifting heavy construction materials, automated traffic cone placement and retrieving vehicles etc.

Manpower Development

(i) Technology Enrichment Courses for Students

Support applicants (local higher education institutions) to nominate students to attend construction technology courses. It will cover training fees, accommodation for the duration of training, air passage and administration fees.

(ii) Non-local Training / Visits for Practitioners

Cover training or visits on application of automation, industrialisation and digitisation in construction to upgrade the industry. It will cover training fees and administration fees only.

(iii) International Conferences in Hong Kong

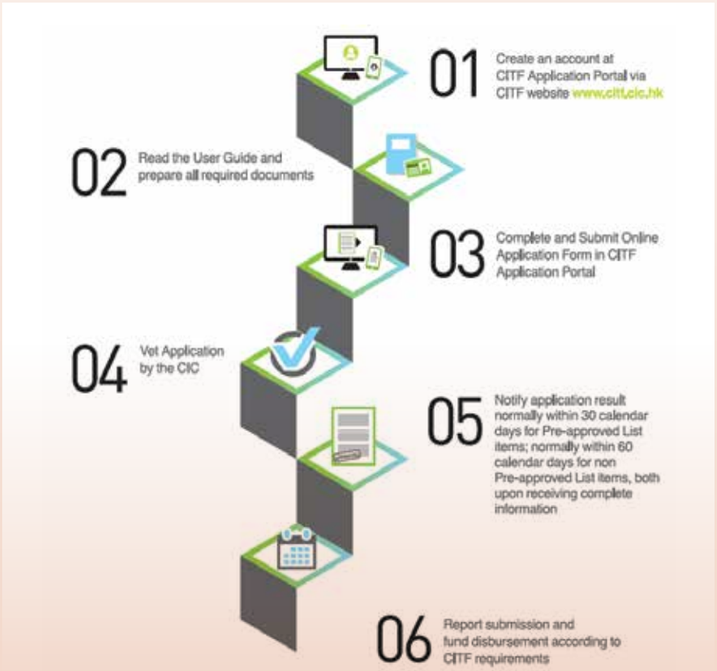
Support applicants to organize international conferences in adopting innovation and technology in construction processes. It will cover venue fees, costs of engaging speakers, and administration fees for organizing the event.

(iv) Local Collaborative Courses and Workshops

Support applicants to organize courses and workshops in construction technologies. It will cover venue fees, costs of engaging speakers, and administration fees for organizing the courses and workshops.

In fact, the aspects on Technology Adoption – Building Information Modelling (BIM), BIM software & computer and Manpower Development – Technology Enrichment Courses for Students, BIM training is much appropriate to our industry with lots of approved projects experience.

APPLICATION



For the latest news and details, please visit CITF website, Facebook and Instagram:

(852) 2100 9000
(852) 2100 9090
enquiry@cic.hk
https://www.citf.cic.hk

Follow & Like us
CITF 建造業創新及科技基金

citf.cic.hk

PROFESSIONAL COVERING SYSTEM

Arma-Chek® Silver

A multi-layer laminate of aluminum, coated with special UV protection and a polymer backing,designed to provide mechanical and weather protection for insulation.

ArmaFlex® C0

// Excellent water tightness
// UV & weather proof
// High puncture and tear resistance
// Excellent aesthetic appearance
// Excellent fire-performance:Class 0 (BS 476)
// Prefabricated elbows, tees and end caps available
// Cost savings in labour, material and time
// Accessories
ArmaFix® (pipe support)
520 BLV Adhesive (low VOC adhesive)

GREENGUARD
PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS UL.COM/GG UL 2818
GOLD




ARMACELL ASIA LTD.,

Room 1501-08,Millennium City5,418 Kwon Tong Road,Kowloon,Hong Kong

Tel:852 2574 8420 Fax:852 2574 8394
E-mail: sam.s.yeung@armacell.com

Scan and follow our Wechat

armacell® | Arma-Chek®

www.armacell.com.hk
www.armacell.com.cn

AUTO INTEGRATED LIMITED
奧力科技有限公司

AIR-TECH

AIR-TECH®

Electrostatic Precipitator

靜電除油煙淨化器

HKFSD Ventilation Division Approved

Comply with UL 710:2017 (6th Edition) and UL 867:2016 (5th Edition)

MERV15 ASHRAE Test Standard 52.2-2012

96% Oil Removal Efficiency HJ/T 62-2001

Tel. : 852 – 2612 0758
Fax : 852 – 3007 1081
rickie@autoinhk.com

People Interview

with Mr. Ng Man-Kwong and Miss Anita Ng

吳萬光先生及吳詩韻小姐

本地市場一直對機電工程服務需求殷切，政府一方面致力加強業界人才培訓，另一方面亦大力鼓勵更多年輕人加入機電工程行列，達至青黃相接。今次本會有幸邀請到在冷氣行業貢獻超過五十年的吳萬光前輩及其令嫒吳詩韻小姐接受訪問，為大家分享工程生涯的箇中點滴及對行業承傳的看法。

求學心切　立下深厚知識根基

吳先生求學時期在內地修讀電機，鑽研發電機、摩打等機械的原理及運作，同時亦擅長繪圖設計。及後在1966年移居香港，矢志要累積寶貴的實戰經驗。吳先生拒絕只做學院派，堅持從低做起，把握每一個工程項目的現場學習機會，從中鞏固了實用知識基礎，使理論與實踐得以兼備雙全。吳先生獲當時老闆賞識，負責營運三個部門，而且彼此的感情亦超越賓主關係的情誼。當時吳先生有意自立門戶，開創自己的事業，老闆竟然資助打本、予以援手，吳先生心存感激，為報答老闆的知遇之恩，亦不時在有需要的時候為老闆解決困難。

大展拳腳　用心經營

吳先生從來都以「以誠待人」的精神經營生意，猶記得當年吳先生成立運通冷氣電業有限公司（Lucky）後，為冠華鏡廠完成了一項工程，當中在後期的文件處理過程時居然發現客戶重覆付款。吳先生主動立即安排退款予客戶，因此贏得客戶信任，冠華亦從此成為其忠實客戶。時至1991年，當時的香港政府移民局面對著十七日無法啟動冷氣的困局，吳先生於是免費出手為其解困，從此深得客戶支持。除了發展本地市場，吳生先亦早於二十年前開拓中國內地業務，於上海經營有關數據中心的機電服務。創業有道的吳先生成功在於真誠待客，絕不投機取巧，與人為善及認真做事的營商態度使吳先生除了贏盡商譽，更因此廣結人緣，與客戶同業建立了深厚友誼。

慷慨施教　培育人才

除了摯誠待客，吳先生更視員工為家人，致力為同事提供培訓及發展機會，更不時舉辦多元化的課程，甚至親身上陣授課，使同事可以自我增值，增強對行業的歸屬感。只要有心學藝，吳先生都會毫不吝嗇施教及指導，因此培育出無數徒弟，可謂桃李滿門，彼此亦師亦友，感情深厚。

終身學習　孜孜不倦

年近八十的吳先生，精神矍鑠，思路敏捷，談吐風趣，在交談間可感受到吳先生的一股衝勁。吳先生每天都持之以恆，勤做運動，除了著重強健體魄，更不忘鍛鍊腦筋，家人好友的電話號碼都可以背誦如流。好學的吳先生更不時會抽空修讀各式各樣的實用課程充實自己，早前就進修了統籌學，並學以致用於工程項目，大大提升工作效率。

薪火相傳　承傳機電智慧

隨著時代變遷，各行各業需引入新秀精英以保持競爭優勢，吳小姐亦秉承家族衣缽, 加入運通，協助吳先生打理生意。吳小姐十五歲到英國求學，自小培養獨立生活管理能力，於大學主修建築，畢業後數年決定回港發展。吳小姐坦言回港生活初期，無論在生活及工作上都需作出適應。始終建築師及工程承建商工作的本質有所不同，吳小姐於是決意要由低做起，從繪圖以致巡查地盤都親力親為，涉獵範疇繁多，令自己急速成長。吳小姐做事投入，勤奮好學，為使工作時更得心應手，於是進修屋宇工程，裝備自己，紮穩根基，為打理家族事業作好準備。

時代進步　適時革新

為客戶提供專業的機電服務固然為之首要，而隨著公司的擴張及時代變遷，文件記錄及存儲的重要性亦不應被忽視。為保障公司利益及確保工程順利進行，吳小姐洞察到有必要完善公司的文書管理制度，小心釐清法律責任，強調要「重武重文」，缺一不可。另外，為配合市場需求，吳小姐亦看準住宅物業急促發展的機遇，開拓了住宅工程的業務領域，為客戶提供更全面的機電服務。認清自身優勢弱點並加以適時革新，不時審視企業定位再進行策略部署，使公司可以欣欣發展。

傳承延續　接軌邁進

將新思維帶入傳統理念,整合優勢並加以發揚，以追求卓越的決心，接軌市場潮流，正正體現了傳承延續的精神。吳先生寄語應以信任及開明態度，放手讓晚輩嘗試，在過程中從旁輔助，甚至從對方身上學習，互相指點，一起成長，成就企業的未來。

本會十分感謝吳先生及吳小姐撥冗為大家分享管理智慧及人生道理，在此謹祝願兩位生活充實美滿，事業蒸蒸日上。

YORK

YORK® YVWH PREMIUM EFFICIENCY VARIABLE SPEED DRIVE (VSD) WATER-COOLED SCREW CHILLER

In order to better meet the increasing customer need for high efficiency and energy saving chiller, Johnson Controls introduces YVWH premium-efficiency variable speed water-cooled screw chiller. YVWH, built on YORK® rich experience of chiller products and innovatively designed and manufactured, surpasses the top efficiency level of industry standard and helps the customers achieve the greatest value.

Experience
HUNDRED YEAR LEGACY OF INNOVATION

Innovation
TECHNOLOGY ADVANCEMENT

Exceeding
SETTING THE BENCHMARK FOR THE INDUSTRY

Sustainability
ONE EARTH ONE FUTURE

Cooling Capacity : 115 – 440 TR

Refrigerant : R134A & R513A

COP up to 6.68

IPLV up to 11.83

For more information, visit

Johnson Controls Hong Kong Limited
11/F & 12/F, Millennium City 6, 392 Kwun Tong Road, Kwun Tong, Kowloon, Hong Kong
Tel : (852) 2590 0012 Email : info.jchkl@jci.com

The power behind **your mission**

Johnson Controls

Merry Christmas

WINGSHING-HVAC.COM

MEP - DfMA

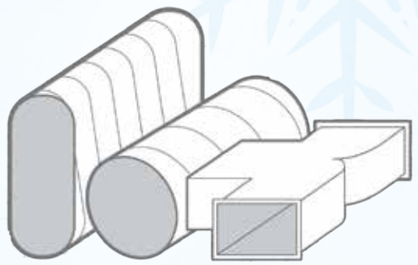
LOD 400

BIM

建築信息模型

永盛風咀製品廠有限公司
WING SHING AIR-FLOW CO., LTD.

永盛太平洋風管有限公司
PACIFIC WING SHING AIR DUCT CO., LTD.



Lucky - PIP® Pre-insulated Pipe

A New Generation of Thermal Insulation System

Advantages of using Lucky-PIP

- FSD certificate – Part 6, Part 7, Part 20
- Environmentally Friendly – CFC/HCFC/HCF Free
- Robust and Durable – Minimize Maintenance Costs
- Eliminates potential Thermal Bridges (at Pipe Support and Wall Penetration)
- Less Workmanship at Site – Less Human Error, Improve Safety and Site Management
- Perfect for Prefabrication
- Can Insulate any Pipework Route and any Shape and any Fittings
- Production Schedule Regardless of Site Condition – Improves Time Management
- High Insulation Efficiency – Energy Saving
- Less Commercial Wastage
- Ultimate Vapour Barrier and Weather Resistance

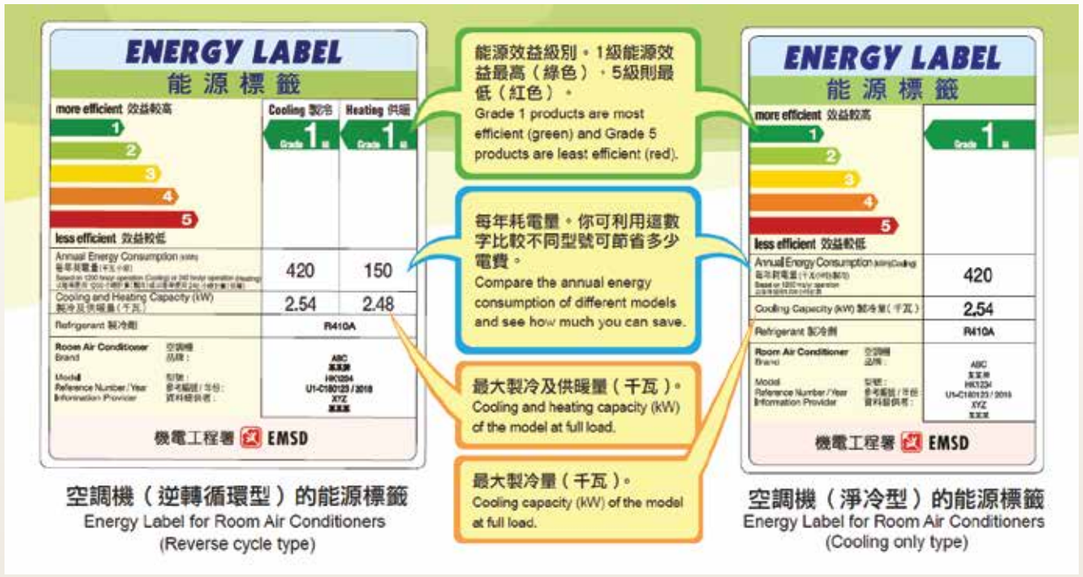
Link The Best Company Limited

Unit 8, Industrial Park, No.188 Tai Po Tin, Ping Che, Fanling, NT
Tel: (852) 2568 4092 Fax: (852) 2423 7829
E-mail: sales@linkthebest.com.hk
Website: www.linkthebest.com.hk

Link The Best

ISO 9001:2015
Certificate No:Q040

Proposal on Review of the Grading Standards under the Mandatory Energy Efficiency Labelling Scheme - 2019



The Mandatory Energy Efficiency Labelling Scheme (MEELS) was introduced through the Energy Efficiency (Labelling of Products) Ordinance (Cap. 598) (the Ordinance) which was enacted on 9 May 2008. Under the Ordinance, energy labels are required to be shown on all prescribed products for supply in Hong Kong to inform consumers of their energy efficiency performance.

Room air conditioner (RAC) is covered in the initial phase of MEELS, which has been fully implemented since 9 November 2009. The upgrading of energy efficiency standards for RAC has been fully implemented since 25 November 2015. "Cooling Seasonal Performance Factor" (CSPF) has been used to evaluate the energy performance of RAC since this upgrading. Because most of window type RACs are fixed capacity, the grading CSPF of Window Type (Category 1 in the Scheme) are lower than Split Type (Category 3) i.e. CSPF of Grade 1 RAC : Window ≥ 3.0 vs. Split ≥ 4.5. (details refer to the "Industry News" of ACRA Newsletter 2014 Winter Issue). The scope of RAC was expanded to cover "Reverse Cycle" RAC in third phase of MEEL and will be fully implemented on 1 December 2019. "Heating Seasonal Performance Factor" (HSPF) was introduced in this phase of MEEL grading of the reverse cycle RAC (Category 2 & 4 in the Scheme).

To ensure that the grading standards will not be lagged behind by technological advancement and help consumers to differentiate among energy efficient products, EMSD keep to review the grading standard under the MEELS. A proposal to review grading standard for three products including RAC and the draft revision of the CoP were uploaded for collecting views from the Public until 31, October 2019.

The energy efficiency grades for window type and split type RAC are proposed to be aligned at the same range of CSPF and HSPF i.e. Grade 1 : CSPF ≥ 4.5 & HSPF ≥ 3.6 etc. as shown on the Table 1 & 2. To meet the Grade 1 or 2 performance in the new standard, a variable speed cooling/heating technology would be required on Window Type RAC units, but there are only few models are built with this feature today. Base on the information in MEEL web-site, only 2 and 8 models of Window type RAC will be Grade 1 or 2 respectively after the review, all the remaining 643 nos. of current Grade 1 models will be downgraded to Grade 3 or 4. Moreover, there is no indication from RAC importers with immediate plan to launch variable capacity window type RAC in coming year; the choice of Grade 1 or 2 will be very limited in the new grading after the grace period expired on December 2020.

Energy Efficiency Grade for Cooling Performance	Current Cooling Seasonal Performance Factor (CSPF), F_{CSP}		Proposed Cooling Seasonal Performance Factor (CSPF), F_{CSP}
	Window Type Categories 1 - 2	Split Type Categories 3 - 4	
1	$3.00 \leq F_{CSP}$	$4.50 \leq F_{CSP}$	$4.50 \leq F_{CSP}$
2	$2.80 \leq F_{CSP} < 3.00$	$3.50 \leq F_{CSP} < 4.50$	$3.50 \leq F_{CSP} < 4.50$
3	$2.60 \leq F_{CSP} < 2.80$	$3.15 \leq F_{CSP} < 3.50$	$3.15 \leq F_{CSP} < 3.50$
4	$2.40 \leq F_{CSP} < 2.60$	$2.80 \leq F_{CSP} < 3.15$	$2.80 \leq F_{CSP} < 3.15$
5	$F_{CSP} < 2.40$	$F_{CSP} < 2.80$	$F_{CSP} < 2.80$

Table 1 : Comparison of current grading standard on CSPF vs. the proposed.

Energy Efficiency Grade for Heating Performance	Current Heating Seasonal Performance Factor (HSPF), F_{HSP}		Proposed Heating Seasonal Performance Factor (HSPF), F_{HSP}
	Window Type Categories 2	Split Type Categories 4	
1	$2.60 \leq F_{HSP}$	$3.60 \leq F_{HSP}$	$3.60 \leq F_{HSP}$
2	$2.40 \leq F_{HSP} < 2.60$	$3.10 \leq F_{HSP} < 3.60$	$3.10 \leq F_{HSP} < 3.60$
3	$2.20 \leq F_{HSP} < 2.40$	$2.80 \leq F_{HSP} < 3.10$	$2.80 \leq F_{HSP} < 3.10$
4	$2.00 \leq F_{HSP} < 2.20$	$2.50 \leq F_{HSP} < 2.80$	$2.50 \leq F_{HSP} < 2.80$
5	$F_{HSP} < 2.00$	$F_{HSP} < 2.50$	$F_{HSP} < 2.50$

Table 2 : Comparison of current grading standard on HSPF vs. the proposed.

ACRA expressed our concern to EMSD and proposed to extend the grace period to 24 months to allow for sufficient time to launch variable capacity window type RAC to the Hong Kong market.

Regin Controls Hong Kong Limited

DESIGNED,
ENGINEERED
& PRODUCED
IN SWEDEN

Browse from any platforms i.e. PC, MAC, ANDROID, IOS

NEW POWERFUL USERFRIENDLY EXOCOMPACT MODEL.
MOST RELIABLE AND FLEXIBLE IOT CONTROL DEVICE FOR ALL KINDS OF HVAC APPLICATIONS.

CHILLER-PLANTS
AHU
PAU
CRAC
CRAH
VAV
HEAT-PUMPS
FAN-COILS
EC FANS
PUMPS
LIGHTINGS
SOLAR PV

AMUSEMENT PARKS
BANKS
DATA CENTRES
ENERGY PLANTS
HOTELS
HOSPITALS
LABORATORIES
OFFICES
PHARMACEUTICALS
RESIDENTIALS
SCHOOLS
SPORTS CENTRES
TERMINALS
WATER PARKS

CONNECTIVITY
COMPABILITY
RELIABILITY

IOT
CLOUD READY
HTML5
TCP/IP
RS-485
BACnet
Modbus
EXOline
M-Bus

PROJECTS THROUGHOUT HONG KONG & MACAU

YOUR FUTURE BUILDING AUTOMATION SOLUTIONS PROVIDER

REGIN
THE CHALLENGER

+852 2407 0281
saleshk@regincontrols.com
www.regincontrols.com

Update on Retro-commissioning - Trainings, Qualifications and Registration

By: ***Ir Dr. Raymond K.L. Chan***

Retro-commissioning (RCx) is one of the key initiatives in the 4Ts (Timeline, Target, Transparency and Together) partnership programme launched by the HKSAR Government. By adoption of RCx, existing buildings can be performed better and wastage of energy will be reduced. However, even though the HKSAR Government has initiated and promoted the RCx for some time, but it is still not widely adopted by the local industry. One of the key challenges is lack of well-trained and qualified practitioners, professionals and services providers.

To overcome this challenge, a comprehensive and systematic training programme should be in place to build up the capacity of the industry. In view of this, the Hong Kong Green Building Council (HKGBC) is organising relevant training courses for operating staff, engineers and stakeholders with support from Electrical and Mechanical Services Department of HKSAR (EMSD) and other local Institutions and going to launch a "Registration Scheme" for qualified RCx practitioners, professionals and services providers which could help to facilitate the adoption of RCx in the industry.

The training courses have different levels for various stakeholders. They are:

1. Retro-commissioning Training for RCx Practitioner (Level 1)

   Target Participants: Certificate holder or above in Building Services/ Mechanical/ Electrical/ Energy Engineering or equivalent

   Course Content:
   a) What is Retro-commissioning
   b) The major energy consuming building services systems and equipment
   c) The major factors that may affect the efficiency of such systems and equipment
   d) The major roles of operational team in the process of retro-commissioning and after the process

2. Retro-commissioning Training for RCx Practitioner (Level 2)

   Target Participants: Degree holder or above in Building Services/ Mechanical/ Electrical/ Energy Engineering or equivalent

   Course Content:
   a) Retro-commissioning Overview
   b) Operation Efficiency Overview
   c) Technical Approaches of RCx
      - Air Conditioning
      - Lighting Installation
      - Power Distribution & Motor
      - Lift & Escalator
   d) Measurement & Verification

3. Retro-commissioning Training for RCx Professional (RCx Pro)

   Target Participants: Full member of registered professional bodies in Building Services/ Mechanical/ Electrical/Energy Engineering or equivalent (e.g. MASHARE, MBSOMES, MCIBSE, MHKIE, etc.)

Course Content:
Module 1 – Introduction to RCx
a) RCx mechanism an involvement of various practitioners. Their roles and responsibilities.
b) Steps and practices to carry out RCx process at various stages.

Module 2 – Investigation
a) How to conduct site evaluation and preliminary investigation.
b) Basic concept and approaches of data analytic.

Module 3 – Implementation
a) Identification of ESO from the diagnosis of analytic results.
b) Basic concept and approaches for implementation, measurement and verification of ESO.

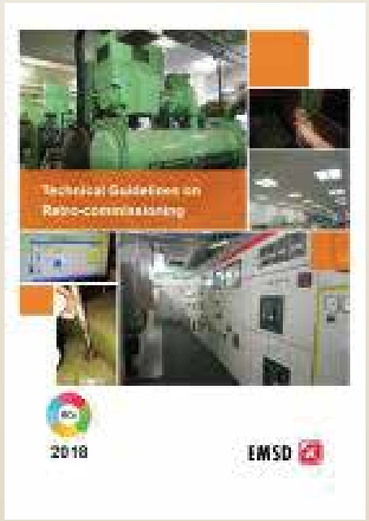
Module 4 – Measurement & Verification
a) Relevant Measurement & Verification standards for RCx and its on-site practices.
b) ESO saving estimation related to M&V and reporting of RCx project.

Module 5 – On-going Cx
a) Set up KPI, induce training and reviewing on-going commissioning plan

All participants need to attend the examination after the course and successful participants (individuals) will become qualified RCx practitioners under HKGBC Registration Scheme.

To align the standard and qualification of the service providers of RCx, the service providers (companies) will be encouraged to register under HKGBC Registration Scheme with minimum staff force (e.g. 3 nos. RCx Practitioner (Level 1), 1 no. RCx Practitioner (level 2) and 1 no. RCx Professional, etc.) and job experience. Details will be announced by HKGBC at the RCx Training and Registration Scheme Launching Ceremony on 26 November 2019.

For more information about these training courses or Retro-commissioning, please visit the HKGBC website at *http://retro.hkgbc.org.hk/preg.php?para=nil&serial=6* or EMSD website at *https://www.rcxrc.emsd.gov.hk*



SAN YIK GROUP 新益集團

新益冷氣工程有限公司

San Yik Air Conditioning Engineering Company Limited

香港九龍官塘開源道50號利寶時中心16樓01室
Room 1601, 16/F., Lemmi Centre, 50 Hoi Yuen Road,
Kwun Tong, Kowloon, Hong Kong
電話 Tel | (852) 3565-5812
傳真 Fax| (852) 3013-8621
電郵 Email | info@sanyikgroup.com

www.sanyikgroup.com

DAIKIN
Authorized Distributor

MESAN COOLGREEN™
The Green Builder's Choice

Energy Savings are in the water

Mesan provides every customer clean, efficient and cost-effective integrated solution for Green builders.

COOLGREEN™ is a smart automated energy efficient water filtration and chemical dosing solution to improve the operational excellence, reduce cost of maintenance and chemical while conserving water and minimizing waste to achieve more sustainability for the industry.

COOLGREEN™ optimization control panel

Chemical treatment control system

Self-cleaning screen filter

Cooling Tower Filtration:

- Improve energy efficiency 10% with a fast payback
- Significantly reduces buildup of habitat and food source for legionella
- Reduces chemical costs ~ 14%
- Reduces maintenance costs ~ 80%
- System life is extended due to reduction of corrosion rates

Latest Projects :

Greater Bay Boarders
Total capacity: 22,480RT

HK-Zhuhai-Macau Bridge
Total capacity: 12,470RT

Uniwalk
Total capacity: 15,000RT

Mesan Fiberglass Engineering (Int'l) Ltd.
(852) 2787 5717 (852) 2787 2983 www.mesanct.com sales@mesanct.com

Compact VRF and DX water-cooled system with high flexibility

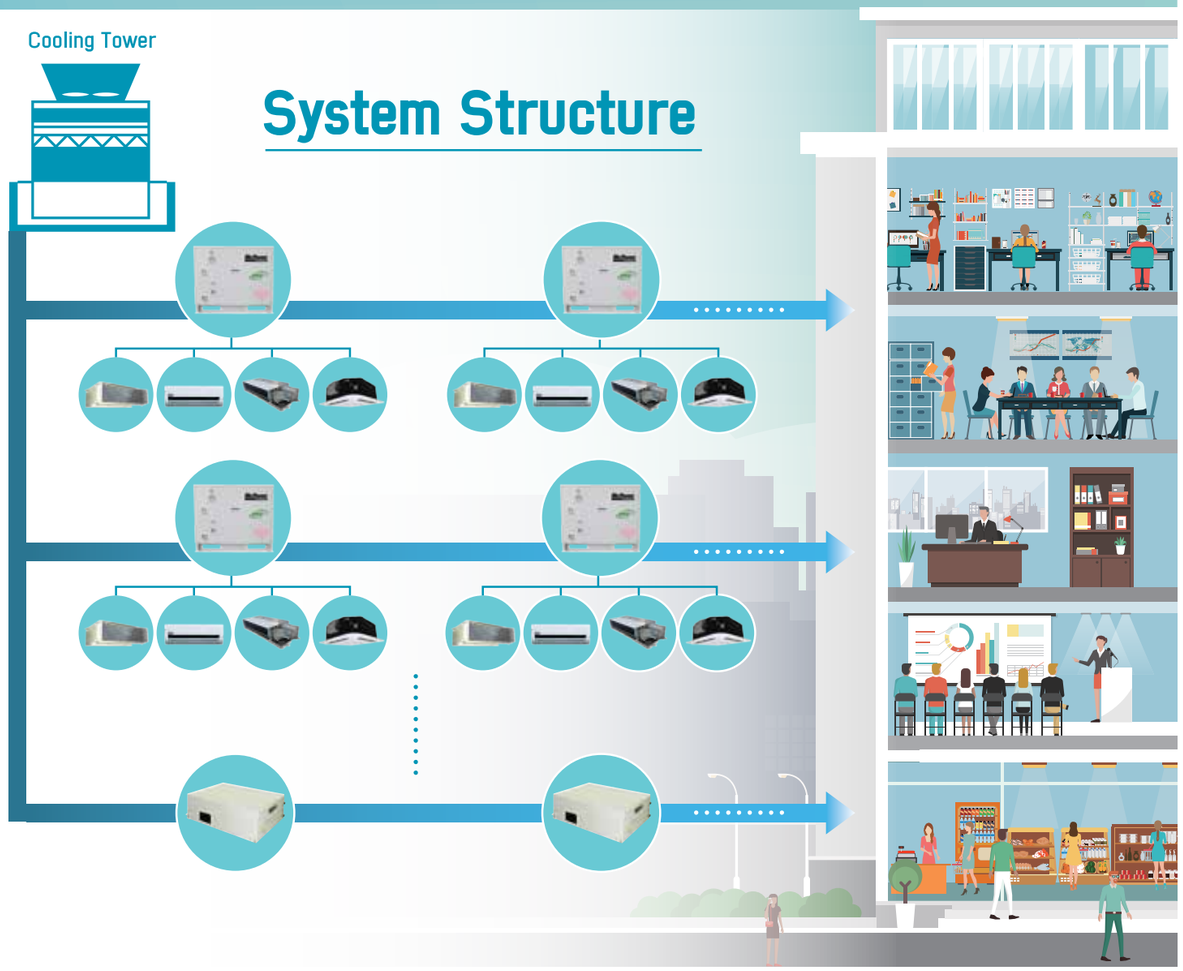
Water-cooled VRF

- Energy saving ➡ Higher COP
- Space saving ➡ Avoid big plant room
- Environmentally friendly refrigerant ➡ R410A

Water-cooled Packaged Unit

- Low installation cost
- Environmentally friendly refrigerant ➡ R410A

System Structure



McQuay Air-conditioning Limited

HONG KONG OFFICE
Tel: +852 2893 6261 Fax: +852 2574 8599

www.mcquay.com.hk

MACAU OFFICE
Tel: +853 2875 2666 Fax: +853 2848 3000

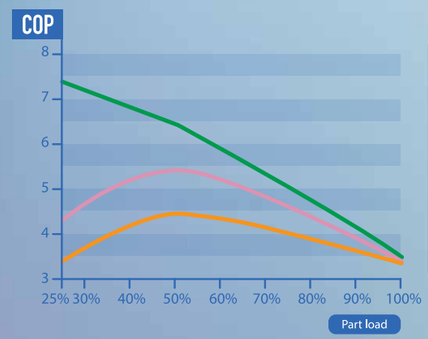
McQuay International

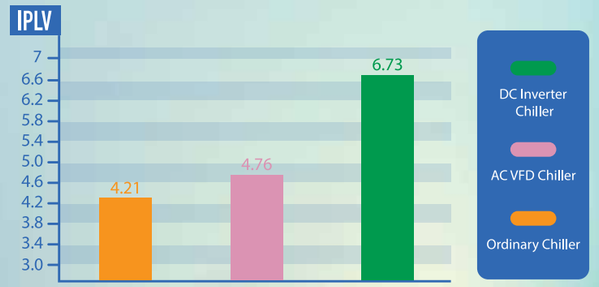
HIGH EFFICIENCY HIGH RELIABILITY HIGH COMFORT HIGH FLEXIBILITY

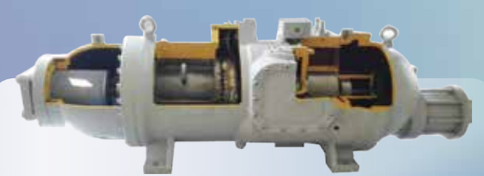
McQuay Air-cooled Screw Inverter Chiller, embedded with the DC Permanent Magnet Motor, brings a great experience to your life

- Premium energy efficiency both at full and part load conditions
- Inverter stepless single-screw compressor with DC electrical motor
- Advanced compressor technology featuring integrated inverter and variable volume ratio (VVR)
- Continuous fans speed modulation with EC fans for even higher part load efficiency
- Available with refrigerant R-134a and R-1234ze

Top class efficiency:	**R-134a**	**R-1234ze(E)**
	COP up to 3.93	COP up to 3.88
	IPLV up to 6.73	IPLV up to 6.36

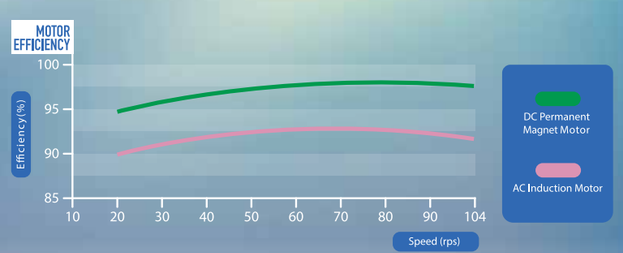






VARIABLE SPEED COMPRESSOR WITH DC PERMANENT MAGNET MOTOR

This compressor is equipped with the DC Permanent Magnet Motor(made with permanent magnet rotor). No coil is found inside so that no power consumption is induced. So, the efficiency can reach up to 98%.



McQuay Air-conditioning Limited

HONG KONG OFFICE
Tel: +852 2893 6261 Fax: +852 2574 8599

www.mcquay.com.hk

MACAU OFFICE
Tel: +853 2875 2666 Fax: +853 2848 3000

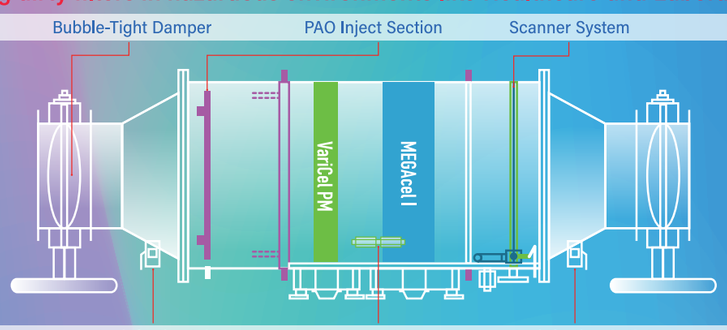
McQuay International

PROFESSIONAL ASEPTIC SOLUTIONS– DEDICATED TO HEALTHCARE AND LABORATORY

Bag In/Bag Out (BIBO)

A top quality & high efficiency containment filtration system

To minimize exposure to harmful contamination while replacing and handling dirty filters in hazardous environments like Healthcare and Laboratory



- Customized design
- Nuclear industrial grade
- On-site efficiency test with integrated scanner system

New Technology Filters

VariCel PM

- Antibacterial and deodorant
- High media elasticity
- Lower pressure drop- Up to 40%
- Energy saving → Higher filtration performance
- Small size, lightweight and space saving

New Technology Filters

MEGAcel I

- High performance ePTFE membrane media → 84 times the tensile strength of Micro-fiberglass
- Lower pressure drop - Up to 50%
- Energy saving → Reduce resistance and higher filtration performance
- No media degradation from corrosive environments (acids, alkalis and organic substances)
- Longer lifespan

McQuay Air-conditioning Limited

HONG KONG OFFICE
Tel: +852 2893 6261 Fax: +852 2574 8599

www.mcquay.com.hk

MACAU OFFICE
Tel: +853 2875 2666 Fax: +853 2848 3000

AAF INTERNATIONAL

"PACO" BRAND NAME WILL BE CHANGED/INTEGRATED INTO "GRUNDFOS" BRAND NAME FROM 1ST OF APRIL 2019

Grundfos pumps fully acquired the"PACO"pumps worldwide business operation including the sales offices, manufacturing facilities and "PACO" trade mark since year 2006. After more than 10 years for maintaining of dual brands (PACO and Grundfos) in the market, most of customers/market were already notified the benefit of Grundfos acquisition of"PACO"pumps business and recognized "PACO"were part of Grundfos products family.

With this integration of"PACO"products into the Grundfos by using"Grundfos"brand name, **all products originally from "PACO" will be changed to "Grundfos"brand only. Both technical/engineering and the whole supply chain system of this products integration will remain unchanged.** Grundfos will continue to own the"PACO"brand that will become a legacy as others acquired brands (such as Sarline and Loewe) by Grundfos in past few decades."

Grundfos Pumps (Hongkong) Limited
G/F, Sui Wai Industrial Building
68 King Lam Street
Lai Chi Kok, Kowloon
Hongkong

Tel: + (852) 27861706
Fax: + (852) 27858664

www.grundfos.com / hk.grundfos.com

be
think
innovate

GRUNDFOS

THE MURRAY
HONG KONG




Project Name	: **Murray Building Hotel Development**
Member's Role in the Project	: **Supply and Installation of Cooling Tower and Chiller Plant System, LV & HV Switchboard and Transformer Installation, Central Battery System and UPS System, Diesel Generator Set, Integrated Management System, ELV System and Swimming Pool Plant Filtration System.**
Completion Year	: **2017**
Member/ Company Name	: **Gammon E&M Limited**

Project Overview

Located along legendary Cotton Tree Drive in the heart of Hong Kong, the 46-year-old Murray Building was a former government office block built in 1969. As one of the eight projects under the "Conserving Central" initiative, Murray Building has been conserved and revitalized into the city's newest, luxury iconic landmark hotel "**The Murray**".

This contemporary urban sanctuary features 336 sophisticated spacious suites and guestrooms across 25 storeys and five elegant dining destinations including a glamorous rooftop restaurant and bar with panoramic views.

System Description

4 nos. of 500RT Chillers and 3 nos. of 250RT Heat Pumps, and 4 nos. of 495RT Cooling Towers are provided at Basement Chiller Plant Room and G/F Cooling Tower open area respectively.

25 nos. of AHU/PAU are served at Podium, 25/F & 26/F to provide centralized air-conditioning to front of house, e.g. Restaurant, Main Entrance & Lobby, Ballroom.

Chiller Plant Room

Guest Room

336 Guestrooms are served by 4-pipe Fan Coil Unit with pre-treated fresh air from PAU to provide heating and cooling AC. The Smoke Extraction System serves areas from 1/F to 23/F; and the Staircase Pressurization System serves 2 nos. of staircases and lobbies from G/F to 26/F.

BIM Application

Since Murray Building is a redevelopment project, the existing structure is retained, hence congested E&M installations become the most critical challenge, e.g. only 2.8 metres & 3.4 metres headroom at Basement Chiller Plant Room & Guest Room floors respectively. Therefore, BIM was adopted in the project. **3D scanning** was applied to scan the floor as to obtain the comprehensive analysis of existing structure, e.g. core wall, structural beam and soffit. With these data, our BIM Modelers working along with Construction Services Department could develop the accurate and "clash-free" BIM model from traditional 2D ISD drawings.

3D Scanning

In additional, BIM model was fully utilized into **4D** integration with construction planning, and **5D** integration with Digital Procurement. These features enables us to track the progress of module production by QR code.

Walk-through BIM Simulation

Moreover, BIM information can be shared with clients by **Walk-through BIM Simulation** to illustrate how the E&M installation would be, and to demonstrate the maintenance space reserved for hotel operation team, e.g. chiller tube cleaning & replacement, and routine maintenance. The full BIM model was a powerful tool to incorporate client's opinions at early/pre-construction stage for improving the coordination works.

Mobile Hoisting Gantry

Guest Room Riser Module

DfMA & Modularization

Design for Manufacturing & Assembly (DfMA) was implemented extensively to remove tedious on-site manual operations. **700 nos. of HVAC composite pipe/duct riser modules** were designed and fabricated off-site in a factory with high standard of quality control. These modules were delivered and assembled by **Mobile Hoisting Gantry**. It saves up to 30% on-site installation work compared with traditional method.

Besides, the modular plant room approach eliminated hot work, such as welding at chiller plant room. The prefabricated/welded pipe modules were assembled by coupling joint on site quickly.

To conclude, DfMA offers a number of major benefits, including significantly increased on-site productivity, shortened construction programmes, improved quality and enhanced worker safety..

SAIVER SINCE 1959 Panasonic

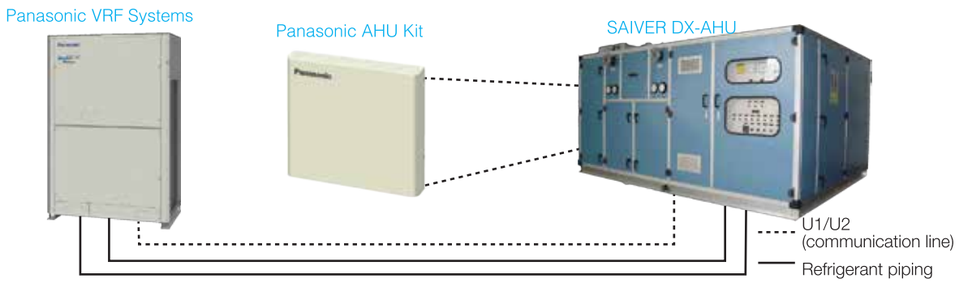
SAIVER DX-AHU WITH PANASONIC VRF SYSTEMS

Energy Saving

Smart Control

Applications:

Sport Centre | Museum | Hospital | Industrial | Church | School



- Smart AHU design with DDC control and LMCP
  - 3 modes auto-changeover (Cooling, Heating and Free Cooling)

- Energy saving
  - High C.O.P. outdoor units
  - Free cooling application
  - EC plug fan with IE4 efficiency EC motor and built-in inverter
  - Outdoor application

WELCOME AIR-TECH LTD. 偉基空調有限公司

11th Floor, Trend Centre, No. 29 Cheung Lee Street, Chai Wan, Hong Kong.
Tel: (852) 2806 8316 Website: www.saiver-welaire.com.hk
Fax: (852) 2806 2426 Email: sales@saiver-welaire.com.hk

Service is Our Business

ISO9001:2015 CertificateNo.: CC5615

5 years+ 商界展關懷 caringcompany

SAIVER Integrated AHU ITPAC, Chiller & FCU | WELAIRE Ventilating Fan & Filter | DUALSUN Solar Panel | GEOCLIMA Smart HVAC Solutions Oil Free Chiller | REGIN Controls | Panasonic FSV / FS MULIT

GEOCLIMA Smart HVAC Solutions

circlemiser™

NEW TECHNOLOGY FOR OIL-FREE CHILLERS

The new **CIRCLEMISER SERIES** is characterized by incomparable performance and high efficiency levels, with an **INCREASE IN EER UP TO 15%,** improving the already very high efficiency of Turbomiser technology.
The technological innovation of Circlemiser is in the design and development of special cylindrical condensers, and the installation of cascade flooded evaporators.

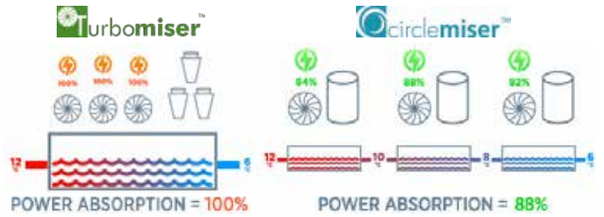
The new **CIRCLEMISER SERIER IS AVAILABLE FOR AIR COOLED TURBOMISER UNITS,** both with R134a, and with **HFO-1234ze** refrigerants.

Cylindrical Condensers

- Heat exchange surface increased by 45%

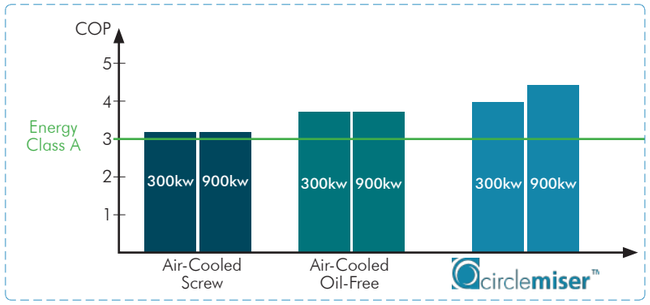
Cascade Flooded Evaporator

- Increase the evaporation temperature
- Reduces energy consumption



+15% of Cooling Efficiency

- Max. COP 4.35



WELCOME AIR-TECH LTD. 偉基空調有限公司

11th Floor, Trend Centre, No. 29 Cheung Lee Street, Chai Wan, Hong Kong.
Tel: (852) 2806 8316 Website: www.saiver-welaire.com.hk
Fax: (852) 2806 2426 Email: sales@saiver-welaire.com.hk

Service is Our Business

ISO9001:2015 CertificateNo.: CC5615

5 years+ 商界展關懷 caringcompany

SAIVER Integrated AHU ITPAC, Chiller & FCU | WELAIRE Ventilating Fan & Filter | DUALSUN Solar Panel | GEOCLIMA Smart HVAC Solutions Oil Free Chiller | REGIN Controls | Panasonic FSV / FS MULIT

無滴汗風咀

SWEATLESS DIFFUSER

沒有倒汗水的風咀。

專利設計
符合香港消防局要求
* BS476: Part 6 ; BS476: Part 7

Job Reference :
香港 - 慈山寺, 海洋公園, 柏寧酒店, 何文田地鐵站, 香港大學,福臨門 ...
澳門 - 威尼斯人, 銀河, 金沙, 永利, 新濠天地, 新葡京, 下環街市 ...

DDS STAINLESS STEEL ELECTRIC HEATING ELEMENT

FCU Heater Box

AHU / PAU
Heater Box

- **Heater**
- **Heater Box**
- **304 stainless steel tube and fin material**
- **Black heat type**
- **Country of origin - PRC**

Job Reference :
HK - HKU, Diocesan Girl's School, HKJC, HZM Bridge, Gleneagle, Hysan Place, Ocean Park Kaola project, ICC Ritz Carlton Hotel ...

DDS 佳得風管系統有限公司
Delta Duct Systems Ltd.
☎ +852 2511 2118 ✉ sales@dpx.hk 🌐 www.dds.com
3/F, Unit A, Kader Building, 22 Kai Cheung Road, Kowloon Bay, HK

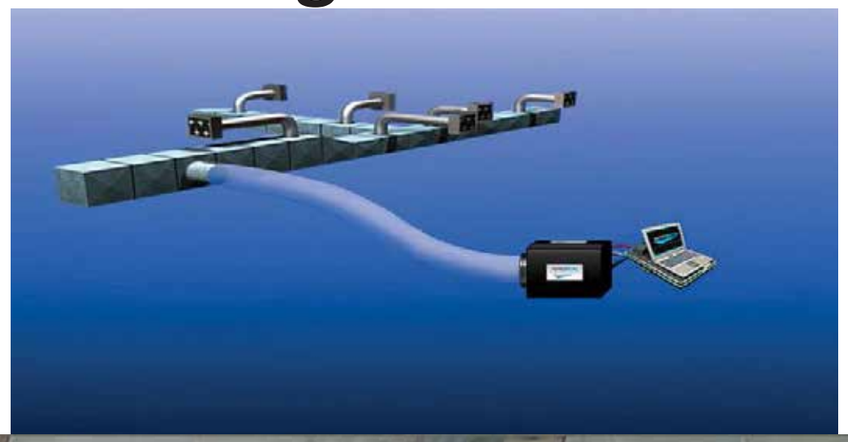
AEROSEAL®

Duct Sealing From The Inside

LEED Certificate

風喉補漏

Duct Leakage Reduction -85%



UL LISTED

HVCA

SMACNA

Enquiry: Aeroseal HK LTD.
Tel: 852-2511 2118 Fax: 852-2507 5078
Email: ivanlee@dpx.hk

聯明坪山冷氣制品廠有限公司
LUEN MING PENGSHAN AIR CONDITIONING FACTORY LIMITED

- Modernized factory founded in 1994
- Professional in manufacturing air ducts &fittings
- Certified by ISO 9001:2015
- Application for famous projects in Hong Kong & Macau
- Successfully promoted TDC duct system in Hong Kong

PRODUCTS

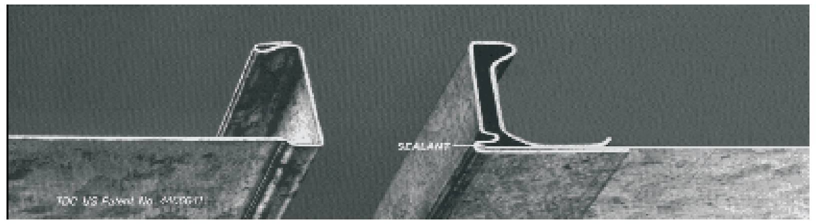
JOB REFERENCE

- MTR - West Kowloon Terminus
- MTR - Shatin to Central Link
- Central Mail Centre
- Hong Kong Children's Hospital
- Hong Kong Disneyland
- Chinese University of Hong Kong
- Hong Kong Polytechnic University
- MGM Macau
- Galaxy Macau
- City of Dreams Macau
- Wynn Palace Macau

联明LM® - TDC

FEATURE

- Roll formed directly onto the duct
- Best for minimum leakage application
- Less material usage
- Fully conform to HVAC DW/144 Specification
- Tested and certified in accordance with HVAC DW/TM1 Acceptance Scheme
- Suitable for Joints & Stiffeners Rating up to J6/S6 and pressure classes A, B and C



MANUFACTURING COSTS

COMPARE WITH SLIP ON FLANGE DUCT
(Size:1000mm×1200mm×1500mm)

联明LM® - TDC

	Number of Men	Time	Total Time
Roll Form Seam	1	1 min.	1 min.
Roll Form TDC	1	1 min.	1 min.
Form in TDC Wrap Brake	1	1 min.	1 min.
Whisper-loc Seam	1	1 min.	1 min.
Cornermatic Corner Installation	1	1 min.	1 min.
Apply Sealant to Corners	1	1 min.	1 min.
TOTAL ESTIMATED TIME REQUIRED			6 MINUTES

SLIP ON FLANGE

	Number of Men	Time	Total Time
Roll Form Seam	2	2 min.	4 min.
Get Flange from Stock	1	1 min.	1 min.
Saw Flange to Length (8 pieces)	1	3 min.	3 min.
De-burr	1	2 min.	2 min.
Assemble Frames(2)	1	5 min.	5 min.
Install Flange to Duct	1	8 min.	8 min.
Apply Sealant Flange Perimeter	1	6 min.	6 min.
Apply Sealant to Corners	1	1 min.	1 min.
TOTAL ESTIMATED TIME REQUIRED			30 MINUTES

LASER CUTTER

FEATURE

- World advance laser cutter
- High processing efficiency
- Good cutting quality
- Suitable for cutting all steel metals.
- Minimise wastage of materials

ISO 9001:2015
NO: 0406061

www.luenming.com Wechat Public Account

Building E-F, Tiantou Industrial Area, Pingshan Street, Pingshan District, Shenzhen City, P.R.China.
TEL: (86-755) 8993 7642 (852) 8302 4988
FAX: (86-755) 8993 7775 8993 7286

11/F, Gemmy Factory Building, 12 Hung To Road, Kwun Tong, Kowloon, Hong Kong.
TEL: (852) 2797 2168 FAX: (852) 2790 1254
Email: info@luenming.com

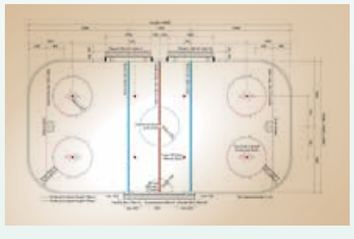
Refrigerating System of Ice Rink in Hong Kong

By: ***Mr. Eddie SIN***

Preface

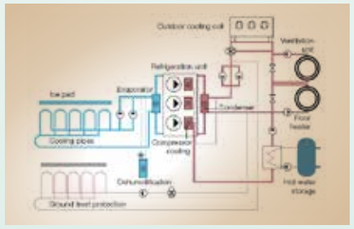
Hong Kong is a densely populated city in where seven million people are residing. In the past double decades, not only leisure skating, but ice sports like ice hockey and curling become popular and developed into professional level. Therefore, construction and ancillary facilities of an ice rink are required to dovetail with international standards like that of the International Ice Hockey Federation (IIHF). In addition to the standards, some developers and consultants will include environmental friendly features when designing the refrigeration system. In this tiny city, two ice rinks are recently built in Discovery Bay and Lohas Park which complied with IIHF standard, and the one in Lohas Park is the first ice rink adopting CO2 as refrigerant in Hong Kong.

Equipment Selection

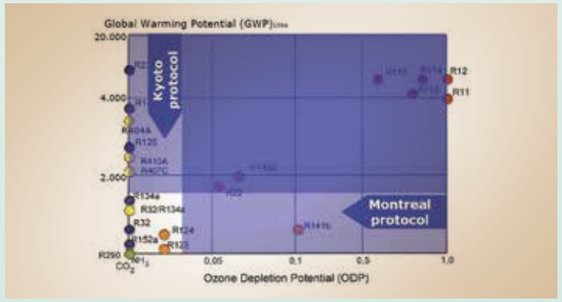


The real estate price in Hong Kong is comparable with gold per unit volume, if not more expensive, and almost all of the ice rinks here are built inside shopping malls. In order to maximize profit, developers, architects and designers will assign a smallest possible plant room. The plant room for ice rink in Hong Kong is small compared with their counterpart in Europe and Nordic countries. Typically, in Hong Kong, a plant room for a 60x30m ice rink is about 200-250m2, 3m head room. Selection of refrigerant, type of refrigeration system and major equipment will affect all aspects of capital investment, maintenance and operation.

Refrigerant



With the increasing concern on the environmental protection and phasing out of F-gas, use of low GWP refrigerants become the norm rather than the exception. Today, nearly all ice rinks in HK are using R22, R404a or R507a. However, CO2 technology is more applicable in ice rink due to its thermos-physical property which can provide both cooling and high grade heat recovery. CO2 is a natural, non-toxic and non-flammable substance and had been used in refrigeration since 1850's. It is classified as A1 ASHRAE safety classification. It has a high saturation pressure compared with other refrigerants. During ice rink operation, the evaporating pressure and gas cooling pressure are about 2.1MPa and 12MPa respectively.



Types of Refrigeration System

As mentioned previously, most of the ice rinks are installed in shopping malls, enclosed space. To design a refrigeration system suitable for the ice rink, public safety and firefighting aspects must be considered.

Direct System

Expanded liquid CO_2 will be pumped directly to the whole of the cooling piping and under the sub-floor which acts as a large evaporator to cool the ice by phase change. In case there is a leakage from the distribution pipe, about 2.1MPa liquid CO_2 is pumped out through the ice surface. Crowd of people may panic. Pumping of liquid CO_2 also requires high head room plant space for the surge drum and to prevent liquid pump cavitation. This is an unaffordable luxury in HK.

Indirect System

In the plant room, CO_2 absorbs heat from a secondary coolant, such as glycol or brine. The secondary coolant is pumped to the cooling piping of rink sub-floor. In case there is a CO_2 leakage, it is confined in the plant room and easily exhausted outdoors. By using this type of refrigeration system, CO_2 charge is lower and public safety is enhanced around the ice rink. Indirect system is more preferable in HK.

Compressor

The discharge pressure of CO_2 is as high as 12MPa, only reciprocating compressor is suitable (medium to large capacity) and available on the market. In addition to its smaller vapour volume, smaller compressor size will suffice for the same refrigeration capacity. When compared with that of R507a, only one tenth compression volume is required for CO_2 compressor.

Condensing Temperature = 40°C

Evaporating Temperature = -30°C

	R507A	R744 (CO_2)
Vapour Volume	0.08865m3/kg	0.02696m3/kg
Latent heat of vapourization	86kJ/kg	260kJ/kg
Volumetric Capacity	1.03x10-3m3/kJ	1.04x10-4m3/kJ

Multi-compressors with at least one driven by frequency inverter can provide a satisfactory capacity and temperature control for all scenario of the operation.

Gas Cooler

In a trans-critical system, the CO_2 will not condense because the discharged gas is beyond the critical point. The heat will be rejected by a gas cooler. Either water cooled or air cooled gas cooler is available. From the perspective of energy efficiency and footprint, water cooled gas cooler is always more preferable.

Ice Temperature Control

There are three methods to control the ice temperature, viz return temperature of secondary coolant (indirect system), overhead infra-red sensors over the ice surface and thermocouples/thermistors embedded underneath ice.

Method	Characteristic
Return temperature of secondary coolant	When the ice rink is closed and the ice surface is covered by thermal blanket, the heat load becomes stable at this moment. The secondary coolant is used to overcome the heat gain from ground conduction and ice sensible & latent heat. Capacity control by secondary coolant return temperature is applicable in this situation
Overhead infra-red sensor	It is not applicable when the ice rink is open to skaters. The sensing temperature will fluctuate when there is a skater passing under the sensor. The sensed temperature seems volatile leading to unstable capacity control.
Thermocouples/thermistors underneath the ice	Averaged temperature underneath the ice will directly reflect the ice temperature and its condition . Hunting will not occur even there are a lot of skaters passing by
Thermocouples/thermistors underneath the ice	Averaged temperature underneath the ice will directly reflect the ice temperature and its condition. Hunting will not occur even there are a lot of skaters passing by.

Either of the above method may be selected, it is recommended the signal controls the compressor capacity rather than pump speed especially when indirect system is adopted. High velocity of secondary coolant can prevent sediments accumulating in the cooling pipe and so ensuring the heat transfer efficiency.

Pipe Rink

The working temperature of the cooling pipe is about -18°C, seamless low temperature carbon steel is preferred. Usually DN20 or DN25 with 80-100mm centre spacing is designed. Although fabrication of carbon steel requires skillful welders and time consuming, it can provide better heat transfer due to higher thermal conductivity and thinner wall thickness when compared with plastic tubes.

In some projects, the client may request using High-Density Polyethylene (HDPE) as cooling pipe because of faster and lower cost. In such case, the pipe spacing and power consumption must be carefully studied. In general, additional 20-30% electricity is consumed for the same ice rink.

	100mm Pipe Wall Thickness	Density	Thermal Conductivity
Carbon Steel	6.02mm	7875kg/m^3	45.3W/mK
HDPE Pipe	10mm	954kg/m^3	0.4W/mK

	Advantage	Disadvantage
Carbon steel	• Higher thermal conductivity and thinner wall • Lower energy consumption • Less prone to leakage • Lower maintenance cost	• Require skillful welder • Heavier and imposes greater floor loading • Longer fabrication time • Higher labour cost
HDPE pipe	• Faster installation • Light weight and imposes less floor loading • Less skillful welder • Lower material and labour cost • Chemical resistant	• More prone to leakage • Higher energy consumption • Sometimes flammable • Larger pipe size and require more space for pipe routing

Ice Removal

In a multi-purpose arena, expeditious ice removal is necessary for the swift changeover of events. When the ice rink and the refrigeration system are closed, the secondary coolant is used to heat up and melt the ice promptly. This can be achieved by heat exchange between secondary coolant and condensing water.

For a 60x30m ice rink using glycol as secondary coolant, ice removal time of 4 hours, about 2,100kW from condensing water is required to raise ice temperature from -5°C to +2°C. If the COP of the chiller is 4, a 500TR chiller running at full load is able to deliver such heat. The operator can further speed up the ice removal rate by introducing room load. When the ice removal is carried out in the winter, the temperature of condensing water is as low as 10°C. The chiller condensing pressure can also be increased by means such as head pressure control.

Practically speaking, when the ice temperature is raised to 0°C, some ice is phase changed to liquid while remaining will be broken into pieces. The ice can be removed easily by brushing and sweeping.

Energy Saving

Hong Kong is located in the sub-tropical climate zone, warm and humid. Over half of the year the ambient temperature is over 20°C. When the saturated condensing temperature is 40°C, the CO_2 will be superheated in excess of 100°C which is a very good high grade heat source. The heat energy can be recovered and exchanged into different temperature level for different services.

60-70°C Sanitary hot Water
Reactivating desiccant dehumidifier

30-50°C Resurfacing
Air handling and space heating

10-30°C Freeze protection
Snow melting pit
Pre-heating water

The major contribution of CO_2 refrigeration is saving heat energy. About 40% of the heat energy can be recovered to water pre-heat, sub floor freeze protection, snow melting and space heating. Remaining 60% of heat can be used for sanitary hot water and dehumidification. By proper design, heating energy of an entire ice arena can be self-supplied by CO_2 refrigeration system without the need of fossil fuel/electric heating.

Dehumidifiers

Fog and condensation dripping from ceiling are unacceptable for an international ice arena. Humidity control is essential for providing the best visibility and preventing corrosion and mould growth. The most effective way to pull down the dew point of air is using desiccant dehumidifier, which can deliver dew point below freezing. Typically, ice arena air should be conditioned to 24-26°C with max. 50% RH. The major energy consumption of a desiccant dehumidifier is reactivating desiccant. The reactivation can be done by pre-heating react air from CO_2 refrigeration heat recovery system and further heated up to reactivation temperature by traditional means.

Caring Company Partnership Expo

For 9 consecutive years, ACRA is honoured to have been awarded the Caring Company certificate for the approved contribution of corporate social responsibility along with over 20 ACRA caring members joining together at the Caring Partnership Expo at HKCEC on 20 May 2019.

Next Generation Refrigerants Development Class

Two classes of the Next Generation Refrigerants Development have further been conducted by ACRA, EMSD and VTC Pro-Act on 30 May 2019 and 4 Oct 2019 to address the importance of selecting refrigerants in accordance with current environmental and safety concerns as well as sharing of recent incidents and application trends particularly suitable for industry practitioners.

BIM Kick Off Meeting

For the first time and with the support of CIC, ACRA has organized a BIM Kick Off Meeting for our taskforce members to comprehend more about the information on BIM technologies implementation at the CIC BIM Space on 4 June 2019 due to the growing demand on the adoption of BIM applications for the E&M and construction industry.

Annual General Meeting

On 14 June 2019, our President – Mr. Antonio Chan, Chairman – Mr. Pachu Leung, and Treasurer – Mr. Daniel Mok have delivered reports concluding the accomplishments, activities, and financial status for the association of Year 2018 - 2019 at the ACRA Annual General Meeting witnessed by the council members and subcommittee members.

Golf Day (Saiver-Welaire Cup)

Sponsored by Welcome Air-Tech Ltd., the prominent ACRA Golf Day – Saiver-Welaire Cup 2019 was organized at the Phoenix Hill Golf Club on 21 June 2019. It was one of the most gratifying experience for the 40 ardent members competing for this coveted golf championship while delighting in the relaxing environment with other members from the same trade outside of Hong Kong.

Darts Competition (York Choi Cup)

Thanks to York Choi Industrial Limited for sponsoring the electrifying ACRA Darts Competition on 28 June 2019. Thirty-one strong and experienced teams from 22 ACRA company members have made the game ever-challenging to win the tournament of this year. All participants including council members had an amusing and chill evening together.

Delegation Visit from HVAC Association of Guangdong Province（廣東省暖通空調協會）

It is essential for cooperating with mainland professionals for the current market nowadays. ACRA is grateful to invite the HVAC Association of Guangdong Province for a delegation visit to the High-Efficiency Generator Room at Holiday Inn Express HK SoHo in Hong Kong on 26 July 2019. Exchange between the key members of the two associations has been a rewarding experience to discuss about the technology and practical information in addition to the entire air conditioning industry development in Guangzhou and Hong Kong.

E&M GO! 2019

The 3rd year of the welcoming event for young engineers of the E&M industry namely E&M Go! organized by nineteen different E&M government departments, public entities and utilities, associations and unions etc. was held at KITEC on 16 September 2019. This youthful and energetic occasion not only provide fun atmosphere for the new comers but also reinforcing and promoting how our E&M industry can extend to be their long-term career development creating a positive impression to them as well as to their parents.

ACRA Cocktail Reception

From the success of last year, ACRA is pleased to have invited Ir Dr. P L Yuen, Senior Manager of the Hospital Authority Head Office, to be the Guest of Honour for the Cocktail Reception of this year on 4 October 2019. This event once again has received overwhelming response with over 170 participants joining to enjoy this wonderful casual networking experience of the HVAC industry

Visit Guangzhou Industry & Trade Technician College (GZITTC) 廣州市工貿技師學院

Members' Sharing

今年一月，我們商會組織拜訪及交流團拜訪廣州工貿技術學院，經學院湯偉群院長及團隊詳細介紹後，加深了對學院的認識，尤其是在廠校合作方面，對到訪的會員有極大吸引力，並於培訓人才方面作出交流。

今年六月，會員也分別參加了學院舉辦的“投身灣區，逐夢起航”的交流會。我們很高興能夠邀請‘高美怡輝（香港）有限公司’及‘恆澤節能有限公司’分享，希望廣州工貿技術學院這個培訓基地，能對於空調及冷凍商會，尤其是會員在大灣區有製造廠房及空調工程的會員，能在培訓人才方面發揮協同效應。

Cold Magic Efatar (HK) Co., Ltd. 高美怡輝（香港）有限公司

我公司有幸參與了主題為“投身灣區，逐夢起航”的交流會，使我們掌握更多行業資訊，瞭解各種政策和把握商機提供良好平臺，對製造業今後走向提供有益的參考。

特別是對廣州市工貿技師學院進行實地探訪，促進了校企交流，為校企合作創造條件。廣州市工貿技師學院具有良好的職業人才培養基礎，是一間歷史悠久、工學一體的技師學校。我們對學校機電一體化、製冷、機械等專業尤感興趣，並與學院有關負責人取得聯繫和建立溝通管道。學院招生就業處主任陳高平導師和梁超導師還專門到我公司位於江門市開平市的工廠回訪，與我公司人力資源負責人進行了一次愉快的會面，現場給予我公司人才培訓提導意見，並初步達成了雙方合作意向。我公司非常樂意與學院建立全方位的合作關係，為推動校企合作繼續努力。再次感謝本次卓有成效的交流會。

Sustainable Energy Limited 恆澤節能有限公司

''There is a need for more skilled technicians in the dynamic environment. Guangzhou Industry & Trade Technician College (GZITTC) integrates academic and vocational education to deliver high quality vocational and technical educational programmes in advanced manufacturing and other technical areas. Focusing on practical applications of skills learned with hands-on training, vocational college provides a link with education and working world.

GZITTC is capable to flexibly design courses to meet needs of the industry. There are advantages of collaboration between vocational colleges and business enterprises to develop and deliver vocational education programmes. Education-industry partnership promotes students' attainment of high-quality standards and provides them with strong experience in real-life operations to meets workforce needs.

A memorandum of understanding (MoU) was signed by GZITTC and Sustainable Energy Ltd on 21 June 2019 to express the willingness of the two parties to move forward on the co-operation in vocational training in the area of electrical and mechanical (E&M) engineering with focuses on refrigeration and air conditioning (R&AC). It allows students to focus on the technical skills of the profession to enter the industry or retain technicians in their current sector.

The MoU also include apprenticeship arrangement for students from GZITTC to combine on-the-job training with classroom instruction. An apprenticeship is a systematic training for practitioners of a profession with on-the-job trainings accompanying study with classroom work. Cooperative apprenticeship organized and managed in cooperation between educational institution and employer is effective as it is a means for students to put theory in practice and master knowledge while working for the employer who provides support to understand and learn the profession.

Apprenticeship is desirable for highly skilled manufacturing jobs. On-the-job training is particularly useful in manufacturing sector for students' future career development. Vocational training is important not only for beginning workers but also for more experienced workers to enable them to advance to more skilled jobs. With collaboration between the two parties, the training can take the form of being paired with a more experienced technician on the floor on one hand, and technical classroom instruction provided by college lectures on the other hand. ''

New Members

May to Oct 2019

1	Associate Member	Cheung Kee Metal Company Limited	Oct-19
2	Associate Member	Joneson Environmental Technologies Limited	Oct-19
3	Associate Member	A-Gas Environmental Services HongKong Limited	Aug-19
4	Associate Member	Daikin Arkema Refrigerants Asia Limited	Aug-19
5	Ordinary Member	Southa Technical Limited	Jul-19
6	Associate Member	Dictson Engineering Ltd.	Jun-19

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	2561 8278	www.atal.com	●		●	●
	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	2561 8278	www.atal.com				●
	ATAL Building Services Engineering Limited	安樂機電設備工程有限公司	2561 8278	www.atal.com	●		●	●
	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	admin@carewinhk.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	●			
	Daikin Airconditioning (Hong Kong) Limited	大金冷氣 (香港) 有限公司	3966 9528	www.daikin.com.hk				●
	Efatar Environmental Protection Equipment Limited	怡輝環保器材有限公司	2606 6922	www.coldmagicefatar.com.hk		●		
	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.aster.hk.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	qt@quadtech.com.hk	●			
	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				●
	Southa Technical Limited	南龍機電工程有限公司	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	ABB (Hong Kong) Limited		2929 3838	www.abb.com.cn				●
	A-Gas Environmental Services HongKong Limited		3188 5078	www.agas.com			●	
	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 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	●		●	●
	Castco Testing Centre Limited	佳力高試驗中心有限公司	2597 8333	www.castco.com.hk	Laboratory Testing			
	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	●			
	Cheung Kee Metal Company Limited	祥記五金有限公司	2393 1448	www.ckmetal.com				●
	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.chongkinairconbiz.com.hk	●			●
	C.J. Wishing International Limited	惠生電業有限公司	2799 9797	cjwish@cjwish.com.hk				●
	CLP Power Hong Kong Limited	中華電力有限公司	2678 7350	www.clpgroup.com	●	●	●	●
	Clydeman Engineering Limited	佳電工程有限公司	2332 3591	daniel@clydeman.com	●		●	●
	CMA Testing & Certification Laboratories Limited	廠商會檢定中心	2698 8198	www.cmatesting.org	Electricity Supply			
	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	●			●
	Daikin Arkema Refrigerants Asia Limited	大金阿科瑪冷媒亞洲有限公司	2295 6608	www.daikinarkema.com		●		
	Delta Pyramax Company Limited	佳澤科技有限公司	2511 2118	www.deltapyramax.hk				●
	Dictson Engineering Ltd.	迪迅工程有限公司	2891 8070	lui@dictson.com.hk	●		●	
	Dynalink International Technology Limited	匯能國際科技有限公司	3955 0203	www.di-technology.com	●		●	●
	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	騰達工程有限公司	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	●			
	GTECH Services (Hong Kong) Limited	英國通用工程 (香港) 有限公司	2123 0888	www.gtechservices.com.hk	●			
	GELEC (HK) Limited	香港通用電器有限公司	2919 8383	hq@gelec.com.hk				●
	Gether-Force Air-Conditioning Engineering Co., Ltd.	群力冷氣工程有限公司	2890 2622	geforce@hknet.com	●			
	Getwick Engineers Limited	佳域工程有限公司	2893 3600	getwick@getwick.com	●			
	Glory Air-Conditioning Limited	大恩空調有限公司	3487 9092	gloryacltd@gmail.com	●		●	●
	Golden Leaf International (Hong Kong) Limited	金葉國際(香港)有限公司	2648 1000	info@glint.com.hk	●		●	
	Goodway Electrical Engineering Limited	佳濤電業有限公司	2405 0888	www.goodwaygrille.com		●		●

	Company Name		Contact Number	Website / Email	Contracting	Manufacturing	Servicing	Supplier
ACRA Associate Members	Gotop Engineering (HK) Limited	高陞工程 (香港) 有限公司	2459 3038	gotopco@yahoo.com.hk	●			
	Great Top Engineering Limited	宏鋒工程有限公司	2345 2219	general@greattop.com.hk	●			
	GRUNDFOS Pumps (Hong Kong) Ltd.	高福水泵(香港)有限公司	3540 0300	www.grundfos.com		●		
	Hang Ji Industries International Co., Ltd.	恒基工貿國際有限公司	2721 6129	www.hangji.com		●		
	Hensen System Engineering Limited	豪信系統工程有限公司	2884 9001	cecil@hensen.com.hk				●
	Hilti (HK) Limited	喜利得 (香港) 有限公司	2773 4705	www.hilti.com.hk		●		
	Hi Tak Thermal & Acoustic Insulation Eng. Limited	喜德保溫隔聲工程有限公司	2770 7703	www.hitakinsul.com	●	●		●
	Hofmann Construction Material Ltd.	香港好夫曼建材有限公司	3157 1841	www.hofmannhq.com				●
	Honest Air Conditioning Limited	明發冷氣有限公司	2396 8108	aircond@netvigator.com	●			●
	H.W. International Air-Conditioning Limited	豪華國際空調有限公司	2796 8888	info@hooair.com		●		
	IES Engineering (Hong Kong) Limited	恒豐工程 (香港) 有限公司	2992 0830	www.ieshk.com.hk			●	●
	InnoTec Engineering Ltd.	科技工程有限公司	3706 6333	info@innoteceng.com	●			
	Intelligent Technologies Limited	毅智科技發展有限公司	2301 4868	info@intelligent-net.com				●
	Jade Star Engineering Limited	捷陞工程有限公司	3998 3256	jadestarhk@yahoo.com.hk	●		●	
	JC (HK) Engineering Limited	悅峰工程有限公司	2898 9885	jc.hk.eng@gmail.com	●	●	●	●
	J & J Network Engineering Company Limited	信卓網絡工程有限公司	3579 5263	www.jjnetwork.com.hk				●
	Joneson Environmental Technologies Limited	忠誠環保科技有限公司	2889 8220	jet@fsenv.com.hk	●	●	●	●
	Join Rich Engineering Limited	億聯工程有限公司	3153 2048	www.joinrich.com.hk	●			
	Jinchat Engineering (HK) Company Limited	正卓工程 (香港) 有限公司	2687 1755	jyin@jinchat.com		●	●	●
	Jun Feng Company Limited	駿峯有限公司	2707 3088	www.junfeng.com.hk			●	●
	Keio Engineering Company Limited	京工工程有限公司	2695 8872	www.keio.com.hk	●			
	Kembla (Hong Kong) Limited	金特霸 (香港) 有限公司	2528 0999	www.kembla.com.hk				●
	Kin Wo A/C Engineering Limited	健和冷氣工程有限公司	2398 0157	kw@kinwo.com.hk	●			
	Kinetics Noise Control (Asia) Limited	建力聲震控制 (亞洲) 有限公司	2191 2488	www.kineticsnoise.com		●		●
	Kings View Airconditioning Engineering Co., Ltd.	景匯空調工程維修有限公司	2796 2417	admin@kingsview.com.hk	●			
	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		●		
	KSB Limited	凱士比有限公司	2147 1226	philip.chow@ksb.com.hk		●		
	K.Y.H. Steel Company Limited	金源行鐵倉有限公司	3473 2332	www.kyh.com.hk				●
	Laser Resources (Asia) Company Limited	全美 (亞洲) 有限公司	2516 7500	laasiahh@netvigator.com		●		●
	LeBlanc Water Treatment & Chemicals Limited	利邦化工水處理有限公司	2408 2000	www.leblanc.com.hk			●	
	Lee Tack Engineering Company Limited	李德工程有限公司	2305 3111	ltec@leetack.com.hk	●			
	Legend Engineering Company Limited	卓越聲控工程有限公司	2815 0928	info@legendjt.com.hk	●	●		●
	Lifa Air Limited	麗風空氣有限公司	2511 7076	www.lifa-air.com			●	●
	Life Air IAQ Limited	活力空氣品質科技有限公司	3527 0106	winston@lifeairiaq.com		●		●
	Link The Best Company Limited	必發 (香港) 有限公司	2568 4092	sales@linkthebest.com.hk		●		●
	Luen Fat Air Condition (Holding) Trading & Engineering Co., Ltd.	聯發冷氣(集團)貿易工程有限公司	2345 0280	www.luenfat.com				●
	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				●
	Mason Industries (HK) Limited	梅森實業有限公司	2967 9639	www.mason-hk.com				●
	Maxwell Electrical Asia Ltd.	美基電器亞洲有限公司	3583 5088	www.maxwell-asia.com		●	●	
	Mesan Fiberglass Engineering (International) Limited	明新玻璃纖維工程 (國際) 有限公司	2787 5717	www.mesanct.com		●		
	Mitsubishi Electric (Hong Kong) Limited	三菱電機 (香港) 有限公司	2887 4575	www.mitsubishi-ryoden.com.hk				●
	NAP Acoustics (Far East) Limited	NAP 聲學工程 (遠東) 有限公司	2866 2886	www.napacoustics.com.hk	●	●	●	●
	New Way Engineering Company Limited	新法機械有限公司	2325 6892	www.newway.com.hk				●
	Oxprime (International) Limited	鑫輝 (國際) 有限公司	2590 8088	info@oxprime.com				●
	Pacific Sense Enterprises Limited	柏昇企業有限公司	3749 5272	www.pacificsense.com.hk	●			●
	Paul Y. (E&M) Contractors Limited	保華機電工程有限公司	2831 8338	www.pyengineering.com	●			
	Peterson Engineering Limited	必德信工程有限公司	2365 0372	stso@peterson.com.hk	●			
	PowerTech IPC Company Limited	科力發展有限公司	3105 3928	www.powertechipc.com		●		●
	Powers Technical Services Limited	寶華技術服務有限公司	2770 2110	powers.pts@gmail.com	●			
	Practical Engineering (Hong Kong) Company Limited	百利高工程 (香港) 有限公司	2402 2772	practical@practical.hk	●			●
	Pyrofoe Engineers Limited	衛安工程有限公司	2388 8038	www.pyrofoe.com.hk	●			
	Ready Electrical Metal Work Limited	全達電器金屬製品有限公司	2898 8623	kw_leung@ready-group.com	●	●		
	REC Green Technologies Company Limited	盈電環保科技有限公司	2619 8817	www.yaulee.com			●	●
	Regin Controls Hong Kong Limited	瑞晶溫控香港有限公司	2407 0281	saleshk@regin.se		●		●
	Ritech Engineering & Supply Company Limited	偉達工程材料有限公司	2410 1819	www.ritech-hk.com				●
	San Yik Air Conditioning Engineering Company Limited	新益冷氣工程有限公司	3565 5812	www.sanyikgroup.com	●		●	●
	Sanby Trading Company Limited	聖備貿易有限公司	2573 4219	www.sanby.com				●
	Samsung Electronics H.K. Company Limited	三星電子香港有限公司	2862 6300	www.samsung.com.hk		●		
	Savills Engineering Limited	第一太平戴維斯設備工程有限公司	2534 1688	pwong@savills.com.hk	●		●	
	Shenling Environmental Systems (Hong Kong) Ltd.	申菱環境系統 (香港) 有限公司	2603 0002	www.shenling.com				●
	Shun Hing E & M Engineering Limited	順興機電工程有限公司	2387 2882	project@shunhingeng.com	●			●
	Shun Hing Electric Service Centre Limited	信興電器服務中心有限公司	2406 5333	www.shunhing-service.com			●	
	Shun Hing Electronic Trading Co. Ltd.	信興電器貿易有限公司	2733 3888	www.shunhinggroup.com	●			●
	Shun Tung Engineering Company Limited	順通冷氣電機工程有限公司	2633 6866	gabriel@shun-tung.com	●			
	Sing Kin Limited	陞建有限公司	2333 1518	singkin@gmail.com	●			
	Smartech HVAC & Engineering Limited	智能空調工程有限公司	2521 9768	info@smartech-hvac.com.hk				●
	Southa Engineering Limited	南龍工程有限公司	2963 7241	www.southa.com	●			
	Stars (Hong Kong) A/C & R Company Limited	恆星 (香港) 冷熱設備有限公司	6116 7832	stanley_yuen@hstars.com.cn		●		
	Sun First International Limited	昇福國際有限公司	2807 7888	www.sunfirst.com.hk				●
	Sunny Fire Engineering Ltd.		2395 6766	sunnyfireengltd@gmail.com	●			
	Superpower Pumping Engineering Company Limited	力霸水泵機械工程有限公司	2745 3562	www.sppump.com				●
	Sustainable Energy Limited	恒澤節能有限公司	2332 3077	www.sustaine.com.hk		●	●	
	Target Energy Solutions Limited	達標能源管理有限公司	2358 9903	www.targetensol.com			●	
	Teambase Development Limited	天基發展有限公司	2554 6263	www.teambase.com				●
	Tesa Tape (Hong Kong) Limited	德莎膠帶 (香港) 有限公司	2583 9980	www.tesa.com		●		
	Thermtech Building Products Limited	泛達建築材料有限公司	2756 3837	thermbpl@netvigator.com	●			●
	Trisun Air Conditioning System Limited	三陽系統有限公司	2377 1618	enquiry@trisun.com.hk	●		●	●
	Tinwood Pacific Limited	天匯太平洋有限公司	6325 1197	www.sinro.com		●		
	Tomi Fuji EMC Limited	富勝能源管理有限公司	2432 0170	www.tomifuji.com.hk			●	
	Tom's Equipment Company Limited	義隆設備有限公司	2757 5539	tom@toms-equipment.com				●
	TROX Hong Kong Limited	妥思香港有限公司	2861 2261	www.troxapo.com				●
	Tung Shing Hardware Co., Ltd.	東成五金有限公司	2626 9983	www.tungshinghardware.com.hk				●
	Union (Luen Hop) Refrigeration Co., Ltd.	聯合冷氣工程有限公司	2627 4600	unionlh@bizentvigator.com	●			
	United Controls (Hong Kong) Limited	統一儀器 (香港) 有限公司	2556 1001	www.ucl668.com			●	●
	Victaulic Hong Kong Ltd.		6898 6823	www.victaulic.com		●	●	●
	Victory Engineering Service Company Limited	維陞工程有限公司	2979 4068	pamela@ves.hk				●
	Viewco Building Services & Engineering Co., Ltd.	偉保工程有限公司	2543 0610	engineering@viewco.com.hk	●			
	Wai Luen Air Conditioning Limited	偉聯空調設備有限公司	2890 9321	garychan@wailuenhk.com	●			
	Wardson Engineering Limited	華順工程有限公司	2329 8268	wsengltd@yahoo.com.hk	●			
	White Hippo Limited	白河馬企業有限公司	2303 1318	www.kshop310.hk				●
	Wing Shing Air-Flow Company Limited	永盛風咀製品廠有限公司	2792 6331	accounting@wingshing-hvac.com		●		●
	Wo Lee Steel Company	和利鋼鐵有限公司	2393 0131	www.wolee.com				●
	Wolter Asia Limited	華德亞洲有限公司	2456 0198	info@wolter.com.hk		●		●
	Wysermann Company Limited	威士文有限公司	2614 2213	wysermann@wysermann.com.hk		●		●
	Yin On Trading Limited	賢安建材貿易有限公司	2572 7110	office@yinon.com.hk				●
	Yordland Engineering Limited	日島工程有限公司	2362 2186	www.yordland.com	●		●	●
	York Choi Industrial Limited	旭彩實業有限公司	2795 8286	www.yorkchoi.com		●		
	Yuen Fong Air-Condition Products (HK) Limited	圓方空調設備製品(香港)有限公司	2880 5880	yuenfongaircondition@hotmail.com				●
	Zenith International Enterprise Ltd.	盛豐國際企業有限公司	2815 5852	www.ebara.com.hk				●