



Contents

- 1 President's Message
ACRA Council
Members for
2004 - 2006
New Technology -
Commissioning
- 2 New Technology -
Commissioning (cont'd)
- 3 New Technology -
Commissioning (cont'd)
- 4 People Interview -
Ir K. F. Lau
- 6 Project highlight -
New Police H/Q in
Wanchai
- 8 ACRA Activities
Summary of work
done by sub -
committees
- 12 Member List

Message from the President

Dear Members,

When the new Council was formed in June 2004, we faced a very difficult environment of the E&M industry at that time. However, all our Council Members are still very co-operative and enthusiastic about their contribution to the industry. Although some experienced Council Members were retired, we also recruited some energetic and committed new Council Members to serve the Association.

All of us want to build up a better platform for our Members working with Developers, Main Contractors and various Government Departments. I am very pleased to see many new faces attending the monthly Council Meeting as Sub-Committee Members, we need more resources for external liaisons with different parties. Please support and encourage your staff to participate and contribute to the industry through working with your Association. Without your support, your Association is unable to fight for your best benefits. Let's work together for our bright future! ☺



K. L. Chan
President

ACRA Council Members for 2004-2006

The new Council was re-elected in June 2004. It composed of fourteen Council Members is responsible for the management of the Association.

President K. L. Chan  Trans Hong Kong	Immediate Past President Raymond Sym  Krueger Engineering (Asia) Ltd.	Vice - President K. C. Ma  Shun Hing Electric Works & Engineering Co. Ltd.	Secretary K. Y. Ip  Young's Engineering Co. Ltd.	Director Bill Cheung  York International (Northern Asia) Ltd.	Director Gambi Chiang  Johnson Controls Hong Kong Ltd.	Director Eric Chu  Carrier Hong Kong Ltd.	Director Ringo Shee  Newland Engineering Ltd.
	Chairman Raymond Lin  The Jardine Eng. Corp. Ltd.	Vice - President Victor Law  ATAL Engineering Ltd.	Treasurer Polly Mui  Southa Co., Ltd.	Director Victor Cheung  Shinryo (Hong Kong) Ltd.	Director W. G. Chu  Meco Engineering Ltd.	Director Dennis Lau  Ryodon Engineering Co., Ltd.	

New Technology Commissioning - A Way Leading To Quality Buildings

Ir C. F. Wong



1. Background

The term "commissioning" (abbreviated as Cx) has two definitions according to British and American. In US (ASHRAE Guideline 1-1996), commissioning is the process of ensuring that systems are designed, installed, functionally tested, and capable of being operated and maintained to perform conformity with the design intent. In Britain (CIBSE Cx Code W-2003), it is the advancement of an installation from the state of static completion to the full working order to specified requirements.

HVAC commissioning is complicated but should not include other building systems

which did not directly affect the performance of the HVAC systems. With a proper commissioning process, the performance of HVAC systems could be achieved, validated and documented that meet the design needs and requirements of the owner. Because all sub-systems are integrated, a deficiency in one component will cause a less optimal operation and performance among other components. Remedy on these deficiencies can result the following benefits:

- i) Achieve environmental conditions for occupants comfort and building productivity;
- ii) Save in energy through system tuning;

Editorial Board

Chairman:
K. L. Chan

Members:
(in alphabetical order)

Cannisa Au
Gambi Chiang
Eric Chu
Polly Mui
Cyril So
B. L. Tang
Jason Wan



- iii) Ensure system and equipment function;
- iv) Facilitate building operation and maintenance.

2. Objectives and Benefits

The fundamental objectives of the HVAC commissioning process are:

- i) to formulate methodology, procedure and document to verify the performance of the HVAC facilities;
- ii) to enhance communication between various parties on building quality issue throughout all phases of the project;
- iii) to validate and report that system performance meets the design intent.

According to current ASHRAE Standard (Guideline 1-1996), HVAC commissioning process can be implemented in five phases, i.e. Pre-design phase; Design phase; Construction phase; Acceptance phase and Post-acceptance phase.

As shown, commissioning is a quality control process that facility and its systems are planned, designed, installed, tested and capable of being operated and maintained to perform according to design intent.

3. Implementation of an Effective Commissioning Process

The following two documents should be prepared in ensuring an effective commissioning process.

- i) The **commissioning plan** - a document that describes all aspects from beginning to end of the commissioning process.
- ii) The **commissioning specifications** - a document provides a clear description of the context and extent of the verification testing procedures required including documentation, reporting and

scheduling requirements.

Normally, the commissioning specifications shall also detail the operation and maintenance manual and training requirements.

To succeed in HVAC commissioning process, each party has specific responsibilities to ensure that the commissioning is completed according to the commissioning plan and specifications.

- a) Owner - shall show the dedication in procurement of quality building by defining the overall vision and establish operational goals and requirements.
- b) Commissioning Specialist - is a person or organization who is experienced in commissioning process and capable of organizing and leading the commissioning team. The commissioning team shall prepare the commissioning plan and specifications, monitors the commissioning process and prepares the final commissioning report.
- c) Design Team - consists of architects and engineers who shall prepare the design documents which explicitly transforming the owner's design intent into realistic function of the building systems.
- d) Project or Construction Manager - is responsible for managing the construction process and assuring respective commissioning process completed on time. This could include coordinating interactions between the commissioning team and other project team members.
- e) Main Contractor - is responsible for overall construction and coordination on site. The specific commissioning responsibilities could include, but not limited to site coordination, schedule performance tests and provision of facilities for commissioning.

	Program	Design	Construction	Acceptance	Post - Acceptance
Pre - Contract Stage					
Contract Stage					
Post - Contract Stage					
UK - Testing & Commissioning		Design Advice	Pre - Cx	T & C	Post - Cx
USA - Commissioning Process					

Commissioning Process



- f) M and E Subcontractors - are responsible for installing work and supplying equipment as stated in contracts. Specific commissioning responsibilities could include performing performance tests and provide / assist in training and documentation for O&M staff.
- g) Suppliers and Manufacturers - provide specified systems, equipment and components to owner, main contractor and subcontractors. These could include conducting factory and site performance tests, if specified and providing O&M information for specific equipment.
- h) Operation and Maintenance Staff - should provide continual feedback to the owner about the system performance hence the deficiency in design, installation, or commissioning phases could be upgraded or fine-tuned in the development. They should give early O&M requirements in the design intent; training requirements and attendance on performance testing.

4. Who should appoint and how to budget for Commissioning

Commissioning specialist can be appointed and paid in the following ways.

a) **Appointment** - the role of commissioning specialist and its relationship with employer and other project team members can be many and varied which depends on the contract nature. Its contractual position is very important as this defines its authority and responsibility thus its ability and effect in the project team.

In US, the Cx specialist is usually an independent party so it is usually appointed directly under the owner and has right to vet and approve the design documents. In Britain, research indicated that Cx specialist should be appointed as part of the project management team (e.g. under the main contractor). In Hong Kong, such definition has not been specified mainly due to the lack of contractual position in the adapted Conditions of Contract and the General Specifications. Therefore, commissioning is usually conducted by M and E contractors at the end of the project before handing over the building to owner. As a result, the Cx process in design and construction is always undermined.

b) **Budget cost** - this should be related to the nature of appointment. Four ways can be

defined.

- i) In-house budget - the owner set aside specific budget for commissioning each project.
- ii) Independent budget - an independent budget for commissioning that is separate from the project budget which can be part of the owner's operational expenditure.
- iii) Inclusion in design fee - the cost is being quoted or absorbed in the designer's fee.
- iv) Inclusion in contract sum - the cost is included in the construction tender bid which can be a separate item.

In US, the commissioning budget is as follows:

- Total Building - 1.5 to 3%
- HVAC - 2.5 to 5%
- Electrical - 1 to 2 %

5. Conclusion

It is no doubt that HVAC commissioning process could lead to a better building quality thus benefits the owner and occupants in long run. Unlike electrical and fire services systems that shall be properly tested to meet the statutory requirements, HVAC system is not being governed under regulations. Therefore, for the sake of safety and health, energy utilization etc., appropriate HVAC commissioning process should be executed so as to reveal the issues in a systemic documentation process. ◉

References -

- 1) Paul Tseng, *Building Commissioning: Benefits and Costs*, HPAC Engineering, April 1998
- 2) CIBSE, *Commissioning Code M*, 2003
- 3) ASHRAE, *Guideline 1-1996, The HVAC Commissioning Process*
- 4) NIBS, *Guideline 1 - The Total Building Commissioning Process*, November 1998

About the Author:

Ir C. F. Wong is a member with HKIE, CIBSE, IMechE, CIWEM, InstMC, ASHRAE and BCxA. He had attended training courses on BCx from University of Wisconsin-Madison and Building Commissioning Association; and passed in the National Environmental Balancing Bureau HVAC and Plumbing Systems Commissioning qualification examination in August 2002.



劉國藩先生 (Ir Lau Kwok Fan)

—前建築署總屋宇裝備工程師 (Former Chief Building Services Engineer of Architectural Services Department)

專訪



● 劉國藩先生
(Ir Lau Kwok Fan)

● 前建築署總屋宇裝備工程師
(Former Chief Building Services Engineer of Architectural Services Department)

People Interview

講到冷氣行業的先驅，大家都公認前建築署總屋宇裝備工程師劉國藩先生(Ir K. F. Lau)是個中的表表者。在他任內曾經推行過很多新的產品及概念，使到香港的冷氣行業可以不斷推陳出新。在訪問中，藩哥多次重申冷氣行業要一直生存下去。一定要在三方面有立足點：1) 安全——為要保命；2) 健康——保命之餘，還令人不會生病；3) 環境保護。

工作歷程

任職冷氣行業30多年的劉國藩先生，行內尊稱為「藩哥」。藩哥最初在電燈公司任職了三年，72年起加入政府工作。75年被調往軍部做保養，開始正式做冷氣保養工程。後來再由細機轉做大機，可說是紅褲子出身。他邊學邊做，還經常做執補救急(執鑊)工作，經驗豐富，自稱「救火佬」。憑著他的不斷努力及進修，後來還當上建築署的總屋宇裝備工程師之一，於今年年初才正式退休。

任職業內的難忘經歷

如香港回歸夜，「那種煎熱實無法形容」，他說做這類大型慶典時沒有第二次機會，不容有失。

當時台上雖只得200個位，卻是焦點所在，台下面7000人沒有人會留意到。故此要留意台上每個座位風咀的出風溫度，要逐個調風，不可偷懶。祇要在台上有一個嘉賓滿頭大汗，而又給攝影機拍下來，明天就大件事了。所以即場轉播是對工程人員的即場考試。

藩哥還很著重對突發事件的應變計劃，這與他一入行便做軍部有關，「冷氣行有些掩眼法，如三台車頭(compressor)燒了一台，可用拖延策略，將損害減至最低，與其被人罵，不如叫伙記今晚不要停機，一直打通宵，讓人們翌日返工感到很冷，到了下午將近放工，就算冷氣不夠，都不會被投訴。」

有時買不到特別的製冷機，惟有本地製作鈦金屬製冷機(titanium chiller)，在日本訂購控制器及晶片，選用德國壓縮機，國際大會串，在打鼓嶺砌機，自己調試。」那部機用至今已20多年，他相信「智慧是逼出來的！」

走在冷氣行業的先驅

藩哥強調香港在冷氣行業是走在最前的，因我們有著開放態度，可以接受全球不同思想學派，可以研究怎樣做好本份，在安全、健康及環境保護三方面作出承諾和貢獻。

在94年，藩哥在政府部門已開始組織空氣質素量度(Air Quality Measurement)工作，因想到恐怖主義無處不在，炭疽病(anthrax)這類細菌若於空氣中，醫生也無從著手，所以那時他已發覺，要改善空氣質素，一定要知怎去量度，才能知道自己處於什麼位置 and 需要作出多少改進。當時提倡加裝殺菌過濾網，那時很多人會

問為什麼要裝？但當有SARS發生時，大家便爭著要快些安裝。

藩哥也在即將開幕的香港濕地公園用了水源熱泵(Geothermal Source Heat Pump)的概念，去提供既環保又有效能的空調方法。

「用冷氣常被批評為消耗能源，我們應重新包裝，冷氣不是消耗能源(energy consumer)，而是擴大能源(energy amplifier)。」

「總之能源用得便不要浪費…其實隨著天氣改變發展，現在進入小冰河時期，很多動物為何會突然消失，便是因為天氣的改變，冷氣便可讓動物適合在一個環境安全地生存下去。」他笑說將來耕田也可能要用空調。

「我們必須讓公眾覺得冷氣行業在做一項偉大的工作，這是一個自然趨勢。」

藩哥在退休前還致力推動total energy heat pump，他認為是大勢所趨，確有遠見。



如何與業界結合推廣

「由於經濟低迷，現只能默默去做，然後將經驗分享。但很多時我們都忘了返回基本功（即要返回問題的根源去思考）。事實上，政府做了個很長遠投資，派了職員接受室內空氣質素(IAQ)的培訓課程。然後將技術帶返香港，自己籌組實驗室。」

94年政府開始推行IAQ，現全個行業也有醒覺，但要投錢去推行。他認為「萬事都有起頭，只要努力下去，全個社區始終會覺得值得投資。但因現處於艱難時期，整個行業只為求生存，即使美國的IAQ進展亦不太理想，若非美國911事件，也不會觸發研究如何將爆炸意外降至最低。」

藩哥又分享到現在的退休生活，除吃喝玩樂外，還在做「白老鼠」，什麼也試，惟因自己耐性不夠，不適合教書，但應允可為商會講座出任義務講者。

完美保溫系統 Perfect Insulation System

Phenotherm™ is a rigid phenolic foam thermal insulation product. It is manufactured through the thermosetting process to make the phenolic resin foam become closed-cell structures. These can create an excellent low conductivity (K value) and provide good fire property characteristics.

Phenotherm™ contains no chlorofluorocarbons or hydrochlorofluorocarbons blowing agent. As a result, the totally CFCs and HCFCs free rigid phenolic foam closed-cell thermal insulation material is environmentally friendly as it has an Ozone Depletion Potential of zero during processing. A high quality standard product in the thermal insulation market, Phenotherm™ does not give off an objectionable odour nor breed or promote mould and bacteria growth.



Rigid pipe section provides Z-Shape at longitudinal and Ends Shiplap Joints



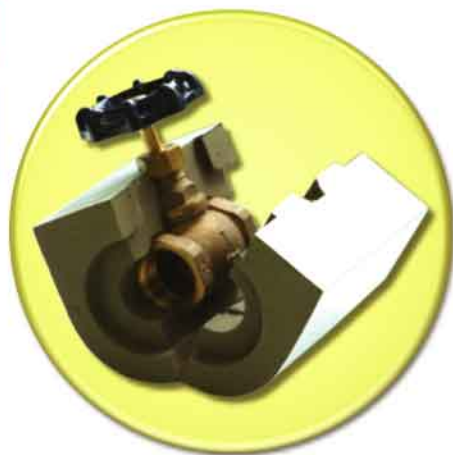
Preformed 90° Insulation Elbow

PHENOTHERM™

聚溫® 環保泡酚

CFCs & HCFCs Free Phenolic Foam Insulation (Zero ODP)

NEW



Preformed Valve Insulation Box



Advantages :

1. Manufacturer preformed
2. Easy installation
3. Top fit pipe / valve bodies
4. No cut at job site
5. Save labour cost
6. Save time cost
7. Ensure final performance
8. Reduce supervision effort



Manufacturer



**ISO 9001
FM 40753**

Phenotherm Asia Ltd.

P.O. BOX 79583, Mongkok, Kln.,
HONG KONG

website : www.phenotherm.com

Email : info@phenotherm.com

Sole Agent



**福隆(香港)有限公司
Fook Loong (HK) Ltd.**

寫字樓 : 香港九龍旺角塘尾道18號嘉禮大廈19字樓
Office : 19/F., Skyline Tower, 18 Tong Mi Road, Kln., HONG KONG.

FAX : (852) 2390-6377

Email : flhk@flhk.com.hk

☎ 2393-7773



New Police Headquarter Phase III



The new Police Headquarter consists of two composite buildings -- a 42-storey high block comprising offices, conference rooms, library, restaurant, canteen, 4-level basement car parks and various function areas; and a 14-storey low block comprising shooting range, multi-purpose hall, lecture theater and offices. Total gross area exceeds 100,000 m² while 70,000 m² are air-conditioned. Key features are illustrated in this article.

Indoor Air Quality

Inclined Laminar Flow Outlet Devices

Inclined laminar flow outlet direct the air to enter the room in evenly distributed layers through a laminarizer, air is then blown out at an angle into the shooting range above the head of the rifleman. This prevents the build up of any turbulence in front of the rifleman. The shooting area is also maintained at a negative pressure, which eliminates fugitive fumes or hazardous airborne substances.



Ultraviolet Steriliser Lamps and Bio-oxygen Air Purifier

These reduce surfaces molds, bacteria and associated thus the level of contamination on coils and drains pans. These significantly improved IAQ in the building.

CO & CO₂ Sensor Zone carbon dioxide sensors control the amount of primary air. This maintains the CO₂ level below 800PPM. Likewise the car park is equipped with variable flow ventilation that keeps the CO level below 1000PPM.

Energy Recovery and Efficiency

Heat Pump and Heat Recovery Chiller

Waste heat from heat recovery chillers together with heat generated by heat pumps provides necessary space heating and re-heating in humidity control. Waste "coolness" from the heat pump pre-cools the chilled water.

Total Energy Wheel Introduction of fresh air into the space has been a two-edged sword - while fresh air purging improves IAQ, the energy required to treat the fresh air is prohibitive. Total energy wheel, which pre-cools and dehumidifies the incoming fresh air by recovering energy from the exhaust air, is **the solution** to this dilemma.

Motion Sensor Signals from space motion sensors are incorporated into the lighting control system and central control monitoring

system to switch off lighting and air conditioning once the space is unoccupied.

Environmental Protection

Bag-in/Bag-out Filter Housing Filtration System

The exhaust air from the shooting range is first filtered through the Bag-in/ Bag-out HEPA filters before discharged to the atmosphere. The filter housings are designed so that a contaminated filter can be removed in a sealed plastic bag and clean replacement filter can be installed without breaking the seal between the housing and the surrounding environment. The filter chambers are designed to allow in situ decontamination before filters are disposed of. This eliminates occupational hazard that would be otherwise imposed on the filter replacement workers.



Off-site pre-fabricated pipework and ductwork

Most of the chilled water pipework and ductwork for the HVAC system were prefabricated and pre-insulated off-site. Mechanical couplings were used for joining chilled water pipes, which minimizes air pollution generated by traditional electric arc welding. Scrap material produced is thus kept to minimum.

Other features of the HVAC system includes variable flow rate secondary chilled water circuits, variable speed AHU's, standby air-cooled water chillers, dual-purpose ventilation/smoke extraction system for the basement car parks. ☺

Project Summary

Project Site	: Arsenal Street, Wan Chai
Client	: Hong Kong Police
Architect & Engineer	: ASD
HVAC Contractor	: Southa Technical Limited
Total Cooling Capacity	5000 T.R.
Contract Sum	: Over HK\$200M
Completion Date	: End of April 2004

Prepared by: Southa Technical Ltd.

NEW

Inverter *ECO i* Series

R410A

SANYO



The top efficiency in the EHP field

COP3.63*

* Averaged COP of cooling and heating for domestic 6HP outdoor unit

High efficiency and large capacity multi (6~48HP) Newly designed!



- Excellent energy saving
- Maximum 48HP outdoor unit capacity
- Minimum harmonics by combining "DC Inverter" and "Constant Speed" compressors
- Reduction of the piping cost and installation cost by smaller piping size
- Reduction of the refrigerant volume
- Maximum 40 indoor units can be connected
- Low operating sound design for outdoor units
- Maximum 150m actual piping
- Long-life unit with automatic operating cycling
- An emergency backup function is provided



WELCOME AIR-TECH LTD. 偉基空調有限公司

香港北角屈臣道 2-8 號海景大廈 B 座 3 樓 B300 室

UNIT B300, 3/F., BLOCK B, SEA VIEW ESTATE, NO. 2-8 WATSON ROAD, NORTH POINT, HONG KONG.

TEL 電話 : (852) 2806-8316

FAX 傳真 : (852) 2806-2426

E-MAIL 電郵 : sales@welcomegroup.com.hk

WEBSITE 網址 : www.welcomegroup.com.hk



ACRA Activities

ACRA Activities

We have successfully organized various activities, functions and trainings throughout the year. All those events are overwhelmingly participated and greatly supported by our members with highlights as follows: -

- ACRA Bowling Completion at AMF Amoy Super Bowl was finished in April.
- Demerit Point System Seminar was held on 26 June.
- Basket Ball Competition was completed in July.
- Mini Soccer Competition was taken place at Ko Shan Road Park Hard Pitch in August.



- 二零零四年十月二十八日，香港空調及冷凍商會派出一行十六人的特種部隊，前往馬來西亞的吉隆坡取經，隊員經過四日的艱苦搏鬥，終於成功而回。當中戰情激烈，隊員面對多個生死關頭，面不改容。

飽死 — 餐餐大魚大肉，嚐盡中馬特色名菜，且不用付款，還有在同一晚上吃兩次晚餐的經歷。

醉死 — 最高紀錄是一個晚上飲了四瓶白酒、三瓶紅酒及九支黑牌威士忌。好一句「飲酒從來未輸過！」

晒死 — 由早上出發，到深夜才有機會休息，行程緊密，體能少一點也支持不住。

今年沒有參加特種部隊的會員，平白損失了一個為會捐軀及鍛鍊自己的好機會，記得明年請早。

特別鳴謝 — 領隊: Victor Cheung
保姆: B. L. Tang
各位出錢出力的會員
明年將會到青島及大連取經，唔嚟就笨！



- Golf Competition was held on 17 November.

Meanwhile, ACRA Annual Dinner 2004 will be held on 29 November.



Summary of work done by sub-committees

Summary of work done by sub-committees

FEMC Liaison

- Publication and Technical Committee
- Recreation Committee
- Administration Committee

ETWB / FEHD / EPD

- ITAC (Industry Training Advisory Committee)
- Employment of skilled and semi skilled workers in Works Contracts

FSD Liaison

- De-merit Point System and its appeal for regulatory action for managing the Registered Specialist Contractors (RSC) Ventilation Staircase pressurization system (BS 5588)
- Streamlined submission for Form 314 and Form 501

ASD Liaison

- Control Standards and Operation Procedures for HVAC Installations
- Identification of Made and Origin of BS/EM materials and equipment
- Review of ASD General Specification
- Retention of T&C rates
- Handling of Blended type refrigerants

BD Liaison

- Contractors Registration Committee

Safety

- Safety Walk on 12 December 2004

EMSD

- Drafting up a COP for water cooled chiller system

McQuay

麥克維爾，跨越三個世紀的中央空調專家

In World

Your climate, We're there

1872年，麥克維爾創建於美國明尼蘇達州明尼亞波斯市(Minneapolis)。百年以來，麥克維爾公司勵精圖治，銳意進取，不斷創新，不僅擁有製冷空調領域最前沿的技術，而且品質卓越，服務優質，備受全球用戶依賴。

麥克維爾空調製冷（武漢）有限公司於1995年在武漢註冊成立，1996年正式投產，佔地達八萬平方米。主要產品有離心式機組WSC/WDC系列、單螺桿冷水機組WHS/PFS/WMD/PES/GES/BES系列以及HSP壓縮機組系列，廣泛應用於民用、商用蓄冷空調、工藝冷卻/冷凍等領域。武漢工廠生產能力與歐美各大廠家不相伯仲，成為麥克維爾在亞洲的重要生產基地，單機生產能力達3000冷噸，居國內同行業廠家之首。



McQuay Air-conditioning Ltd.
3/F., Lam Soon Bldg.,
21 Dai Fu Street,
Tai Po Industrial Estate,
Tai Po, N.T. Hong Kong.
Tel: (852) 2893 6261
Fax: (852) 2574 8599

McQuay
Air Conditioning

ATAL

Water-Cooled Air-Conditioning Solution

Water-cooled Chiller



HITACHI
Inspire the Next

pep
FILTERS

Media Filters

Cooling Tower Filtration System



Cooling Tower



Analogue Technical Agencies Ltd.

Sales Hotline: 2565 3378
Fax Hotline : 2562 6401

Webpage: www.analogue.com.hk
Email: enquiry@analogue.com.hk



Indoor Air Quality

Control Mold, Mildew, Bacteria and Fungal Growth in Indoor Environments



BBJ MicroBiocide®
For use in HVAC/R system
- Air Ducts - Floors & Walls
EPA Reg. No. 67212-1

BBJ products have all the necessary EPA and state registrations

Check our product range on our web site www.bbjenviro.com

BBJ Environmental Solutions Ltd. is subsidiary to a listed company BBJ Environmental Solutions in USA.

BBJ Environmental Solutions conducts research on the causes of, and develops solutions to, biologically related indoor air quality problems. Consequently, our products are highly effective in promoting good indoor air quality (IAQ) in buildings everywhere. BBJ has developed specific indoor air solutions for commercial buildings (schools, hospitals, offices, and manufacturing operations), mold remediation contractors, and homeowners.

BBJ has developed unique products that remove these contaminants and keep them from returning up to one year (BBJ MicroBiocide).

Distributor: Hong Kong Air-conditioning Parts Centre
Email: hkapc@jec.com Tel.: 2885 1968 Fax: 2885 6195



Company Name

Contact No.

Trade

ACRA Fellow Members

AT&T Engineering Ltd.	安興工程有限公司	2565 8339	2561 8278	E&M Contracting
Carrier Hong Kong Ltd.	那利(香港)有限公司	2694 5336	2694 5349	Air-Conditioning Equipment Supplier
Krueger Engineering (Asia) Ltd.	高維空調工程有限公司	2680 7333		Air-Conditioning, Electrical, Fire Services & Plumbing & Drainage Installation
Newland Engineering Ltd.	新隆工程有限公司	2967 8620		Supply & Installation, Operation & Maintenance of HVAC & Electrical system
Ryoden Engineering Co., Ltd.	銳源工程有限公司	2619 8811		E&M Contracting
Shun Hing Electric Works & Eng. Co., Ltd.	信興電工工程有限公司	2419 5608	2419 8282	Trading and Engineering Contracting
The Jardine Engineering Corporation, Ltd.	怡和機器有限公司	2807 4550	2807 1717	Contracting / Supplier / Building Automation / Energy Service
Trane Hong Kong	特靈香港	3128 4764		Air-Conditioning Equipment Supplier
Winetec Air Conditioning & Eng. (HK) Co., Ltd.	永達冷氣工程(香港)有限公司	2784 1200		Contracting
Young's Engineering Co., Ltd.	景福工程有限公司	2235 1803	2235 1177	Supply & Installation of Electrical & Mechanical Services, Routine Maintenance Work

ACRA Corporate Members

Alliance Contracting Co., Ltd.	聯和承造有限公司	2891 8083		Contracting
Anpoint Engineering Ltd.	恒琛工程有限公司	2851 1816		E & M Contracting
Chevalier (HK) Ltd - A/C Division	其士(香港)有限公司 - 冷氣部	2111 4811		Contracting
Estar Engineering Co., Ltd.	怡興冷氣工程有限公司	2606 6922		Trading and Contracting
Hong Kong Thermo Industries Ltd.	香港冷熱器材有限公司	2674 6876		Trading and Contracting
Hsin Cheng Aster Building Services Ltd.	新昌亞仕德星宇設備有限公司	2579 8238		E & M Contracting
Johnson Controls Hong Kong Ltd.	江森自控香港有限公司	2580 0012		Supply, install & maintain HVAC, Fire Service, E&M, Security & extra low voltage system
Kervin Engineering Co., Ltd.	康信工程有限公司	2422 3110		HVAC Contracting E & M Engineering
K-Thom Engineering Co., Ltd.	康峰工程有限公司	2481 2918		Air-Conditioning & Electrical Installation
Lee Tack Engineering Company Limited	李達工程有限公司	2306 3111		Contracting
Linkforce Ltd.	豐力有限公司	2116 5528		E & M Contracting
Lucky Engineering Co., Ltd.	耀耀冷氣機有限公司	2780 5285		E & M Contractor
Meco Engineering Ltd.	梅實工程有限公司	2891 8722		Engineering Contractor
Meco Services Limited	梅實工程維修有限公司	2892 2826		Supply, Installation, Operation & Maintenance Servicing of MVAC, Electrical & Fire Services System
Quad-Tech Engineering (HK) Co Ltd.	高得工程有限公司	2573 1832		Contracting
Shinryo (Hong Kong) Ltd.	新銳工程香港有限公司	2519 3383		Building Services, E&M Contractor
Skyforce Engineering Ltd.	天科工程有限公司	2885 1620		Building Services Installation
Southco., Ltd.	南聯有限公司	2963 7226		Supplier of A/C Equipment
Standard Refrigeration & Engineering Co., Ltd.	立達工程有限公司	2388 1213		Design, supply, installation and maintenance of MVAC System
Takasago Thermal Engineering Co., Ltd.	高砂熱學工業株式會社	2520 2403		Contracting
Technicon Engineering Ltd.	得利康工程有限公司	3193 1300		Building Services Design, Installation and Maintenance
TJ Engineering Services Ltd.	怡和技術服務	2807 4753		Air-conditioning & related services
Wang & Lee Contracting Ltd.	宏利營造有限公司	2889 1313		Air-conditioning and Electrical Installation
Westco Air Conditioning Ltd.	威美冷氣工程有限公司	2426 8123		Contracting
York International (Northern Asia) Ltd.	約克國際(北亞)有限公司	2331 9286		Manufacture of Air-conditioning equipment

ACRA Associate Members

A&R Engineering Co., Ltd.	奇樂工程有限公司	2408 2960		Contracting
ABB (Hong Kong) Ltd.	ABB(香港)有限公司	2929 3838		E&M Contracting, HVAC, Building Services, Power & Control Products
Air Master International Ltd.	雅士(國際)空調有限公司	2764 0307		Mfg of Air Conditioning Equipment & Component
Air Trade Centre Ltd.	怡興先進有限公司	2887 7000		Trading & Engineering
Alpha Appliances Ltd.	第一電器有限公司	2529 7556		Supply and Installation of Window Type and Split Type Air-Conditioners
Armaceal Asia Ltd.	阿爾斯亞洲有限公司	2574 8376		Insulation Material Supplier
Arnhold & Co., Ltd.	安利有限公司	2807 9400		To market and distribute A/C and engineering equipment for building construction industry of HK & China market
Brightwell Air-Conditioning Ltd.	冠昇空調有限公司	2331 8559		Trading of HVAC Equipment
Briskly Limited	華機科技有限公司	2511 3161		Supply & install window split & packaged VRV systems
Bun Kee (International) Ltd.	神記(國際)有限公司	2748 9319		Whole sale
California Air Limited	加州空氣有限公司	2320 7393		General Trading / Sole Agent / Supplier / IAQ Solution Service
Clean Air Services	空氣服務	2425 5033		Environmental Protection Services, such Indoor Air Quality Duct Cleaning System
Clydean Engineering Ltd.	仕電工程有限公司	2332 3591		E & M Contracting
Crownin Limited	冠殿有限公司	2416 8066		Contracting / Supplier / Building Automation
D & I Engineering Co Ltd.	思達工程有限公司	2480 3791		Engineering & Trading
Dah Chang Hong (Engineering) Ltd.	大昌實業工程有限公司	2768 3388		HVAC Installation, E&M Package Installation
Delta Pyramax Co., Ltd.	達得利有限公司	2511 2118		Trading
Dura Duct International Ltd.	達得國際有限公司	2606 6606		Supply and Installation of Ductworks and Accessories
Enviro-Tech Engineering Co., Ltd.	康達工程有限公司	2827 0688		Trading
Extensive Trading Co., Ltd.	精基貿易有限公司	2889 1681		Trading - Mechanical Equipment, Building Materials, Environmental Products
Fook Loong (HK) Ltd.	福隆(香港)有限公司	2393 7773		Insulation Material Supplier
Fungs Electrical Engineering Co., Ltd.	馮氏電機工程有限公司	2393 7773		E & M Contracting
Gata Way Airconditioning Ltd.	基達空調有限公司	2888 2666		Supplier
GEC Services (Hong Kong) Ltd.	英商通用工程(香港)有限公司	2123 0888		Contracting
GELEC (HK) Ltd.	香港通用電器有限公司	2919 8383		Supplier
Gether-Force Air-Conditioning Engineering Co., Ltd.	赫力冷氣工程有限公司	2890 2622		Contracting
Getwick Engineers Limited.	佳域工程有限公司	2893 3600		Contracting
Glen Dimplex (HK) Ltd.		2790 6600		Regional buying office for heating and cooling products & components
Goodway Electrical Engineering Ltd.	佳德電業有限公司	2405 0888		Authorized Distributors
Goodways International Limited	德維國際有限公司	2576 8770	2863 9405	Manufacturer's Representative
Grand Lusk Engineering Limited	耀昌工程有限公司	2389 1517		Building Services Contracting
Hang Shun Engineering Co.	恒信工程公司	2428 8640		Aluminum cladding for air conditioning
IES (Hong Kong) Limited	恒豐工程(香港)有限公司	2992 0830		Supply & install central hot water plant and seawater plant, supply of equipment
Jardine Engineering Management Services Ltd.		2807 1717	(86)21-62183888	Contracting / Supplier / Building Automation / Energy Service
Key Industrial and Air-Conditioning (HK) Ltd.	建寶工業空調(香港)有限公司	2775 0099		Manufacturer and Distributor of "Key" HVAC Equipment
Kinden Corporation		2368 6136		Building Services - E & M Works
Kings View Airconditioning Engineering Co. Ltd.	景豐空調工程修有限公司	2796 2417		HVAC Contracting & Maintenance
Kingspan China Ltd.	固達中國有限公司	2814 8457		Manufacture of phenolic foam insulation products, supply composite wall & roof panel & metal floor decking
Link The Best Company Ltd.	必靈(香港)有限公司	2568 4082		Trading - Building Material
McQuay Air-Conditioning Limited	麥克維爾空調有限公司	2893 6261		Split type A/C, chilled water fan coil unit, mhi chltsc, water cooled package & split type water source heat pump chillers supplier
NAP Acoustics (Far East) Ltd.	NAP聲學工程(遠東)有限公司	2866 2886		Design, Supply & Installation of acoustic treatment and vibration control products
Oxprime (International) Ltd.	鑫輝(國際)有限公司	2580 8088		Pump, Cooling Tower, VAV Box, Vibration Isolators, Dura Duct, Liquid-Solids Separation Systems, Fibreglass supplier
Peterson Engineering Ltd.	必德信工程有限公司	2365 0372		Contracting
Practical Engineering (HK) Co., Ltd.	興力高工程(香港)有限公司	2402 2772		Contracting / Supplier
Raising Engineering Limited	啟信工程有限公司	2395 6081		Air Conditioning Contracting
Rockfield Engineering Ltd.	樂錫工程有限公司	2660 9808		HVAC Installation Sales of Carrier A/C Equipment
Sanday Trading Co., Ltd.	聖德貿易有限公司	2573 4219	2572 0271	Specializing in trading construction insulation materials, such as phenolic foam, fibreglass
Shun Hing Ref. A/C Engineering Ltd.	順興豐量冷氣工程有限公司	2387 2882		Design, Supply & Installation of Air-Conditioning
Southco Engineering Limited	南聯工程有限公司	2963 7241		Air-Conditioning & Refrigeration Installation
Thermetech Building Products Ltd.	達達建築材料有限公司	2766 3837		Contracting / Supplier for Weatherproof / Fire Resistant Materials to E&M Services
Tom's Equipment Co., Ltd.	德康設備有限公司	2757 5539		Insulation Material Supplier
Union Manor Ltd.	源明有限公司	2797 2168		Contracting
Viewco Building Services & Eng. Co., Ltd.	偉保工程有限公司	2543 0610		Contracting
Vital Engineering Co., Ltd.	威達工程有限公司	2571 5382		Contracting
Wei Luen Air Conditioning Ltd.	偉聯空調設備有限公司	2890 9321		Contracting
Welcome Oncho Danki Ltd.	偉基亞洲電機有限公司	2806 8316		Trading of HVAC Equipments
Wolter Asia Ltd.	華德亞洲有限公司	2456 0198		Supply & Manufacturing of full range of Ventilation Fans
Wyermann Co., Ltd.	威士文有限公司	2814 2213		Trading & Manufacturing Air Conditioning Accessories
Yordland Engineering Ltd.	日島工程有限公司	2362 2186		Design, Supply, Installation and Maintenance of HVAC, Electrical and Fire Services System