

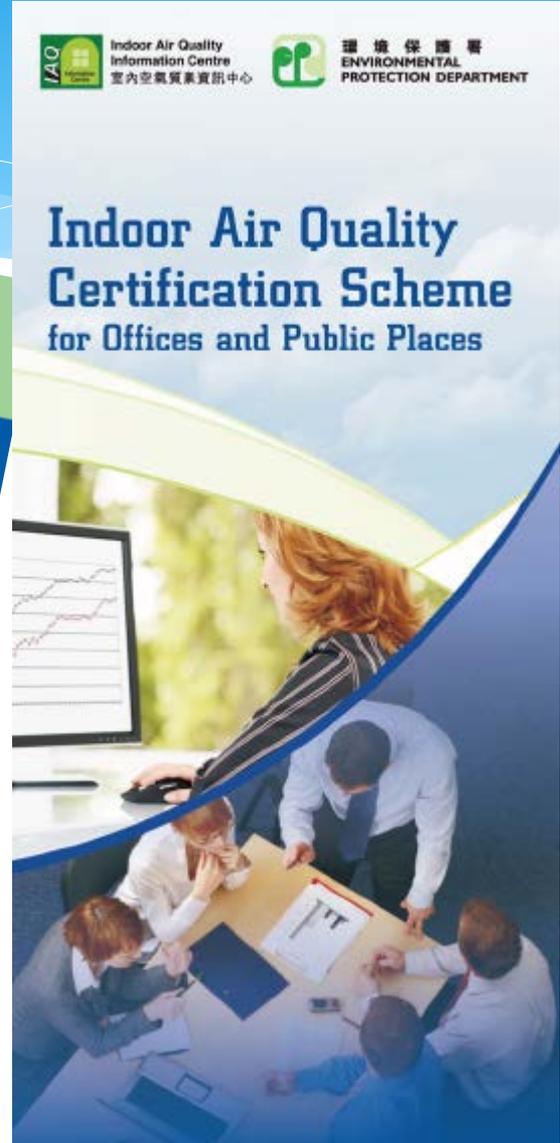
Indoor Air Quality Control for Offices and Facilities

Mr. Dominic Lam
Chairman,
Hong Kong Indoor Air Quality Association



香港室內空氣協會
HONG KONG
INDOOR AIR QUALITY
ASSOCIATION

Indoor Air Quality Certification Scheme for Offices and Public Places



IAQ Parameters

- **Physical**

- Air Temperature
- Relative Humidity
- Air Movement

- **Biological**

- Airborne Bacteria

- **Chemical**

- CO₂ (Carbon dioxide)
- CO (Carbon monoxide)
- RPS (respirable suspended particulates)
- TVOC (total volatile organic compounds)
- NO₂ (nitrogen dioxide)
- O₃ (ozone)
- HCHO (formaldehyde)
- Rn (radon)



System Control for Excellent IAQ

- * Air temperature, Relative humidity, Air movement
 - * Thermal comfort parameters
- * Poor thermal comfort is caused by
 - * Improper air-conditioning set-points
 - * Ineffective supply air distribution
 - ↘ may cause thermally discomfort



OFFICE TEMPERATURE WARS

The argument happens in every office:
some feel the heat, while others shiver.
Find out the real impact when offices run hot and cold.

80%
of office workers complain about
their office temperature

An illustration of a man and a woman with angry expressions, representing the 'office temperature wars'.

System Control for Excellent IAQ

- * Carbon Dioxide (CO₂)
 - * High CO₂ is caused by
 - * Inadequate fresh air supply
 - * Overcrowding
 - * Improper ventilation



System Control for Excellent IAQ

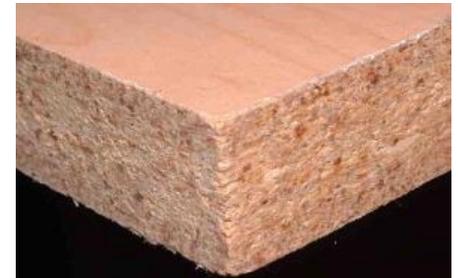
- * Volatile Organic Compounds (VOCs)

- * from building materials, adhesives (such as paint, air fresheners, deodorants, sprays)



- * Formaldehyde (HCHO)

- * from adhesive (used in pressed wood products), coating materials, incense burning



NEWS • HONG KONG • ENVIRONMENT

South China Morning Post 南華早報
HONGKONG

Professor accuses HKU of secrecy over formaldehyde threat on new campus

University withholding facts about formaldehyde hazard from furniture on new campus, professor says

Olga Wong
olga.wong@scmp.com

Friday, 17 August, 2012, 4:00am

System Control for Excellent IAQ

- * Respirable Suspended Particulates (RSP)
 - * from dusty outdoor, tobacco smoking, clothes fibres



System Control for Excellent IAQ

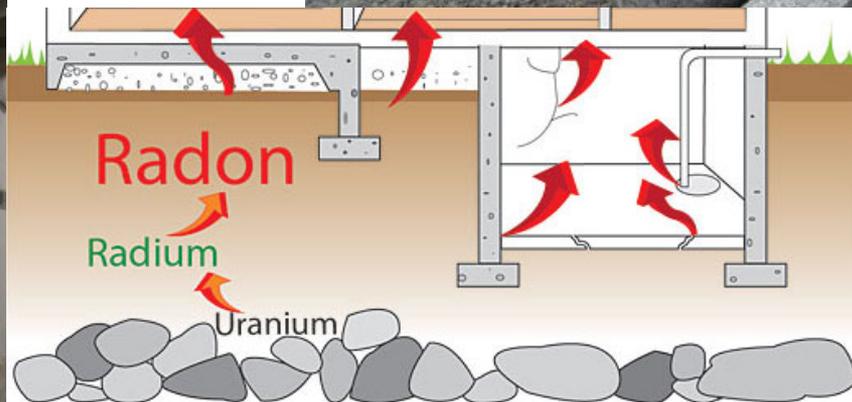
- * Radon (Rn)

- * from mineral materials (such as marble)

- * High Rn is caused by

- * Improper ventilation

- ↘ risk of suffering from lung cancer



System Control for Excellent IAQ

- * Carbon Monoxide (CO)

- * from diesel engine exhaust, burning stove



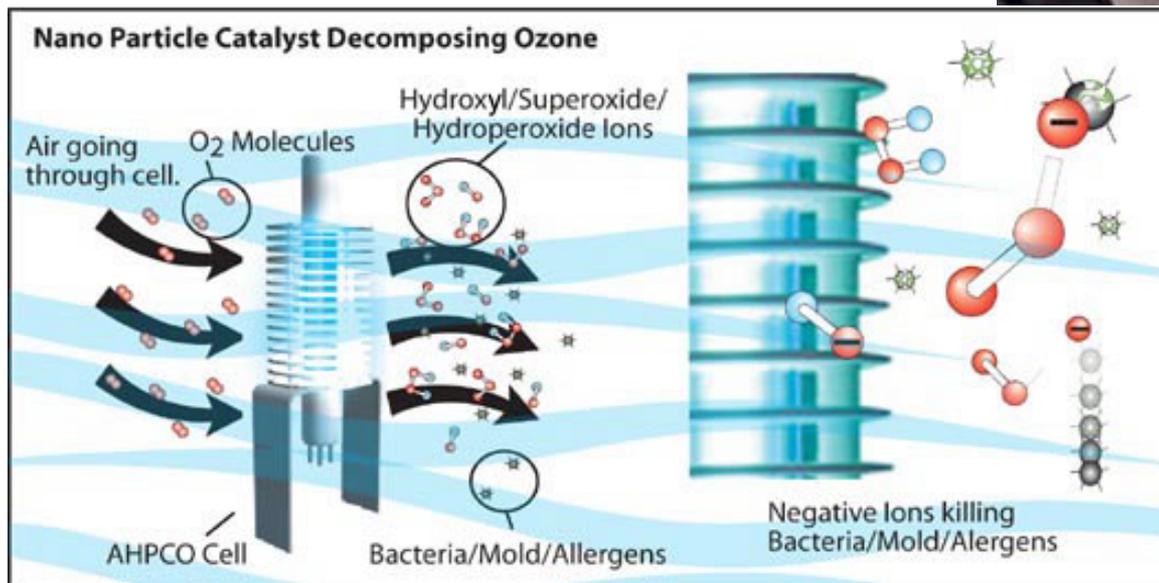
- * Nitrogen Dioxide (NO₂)

- * from diesel engine exhaust, burning stove



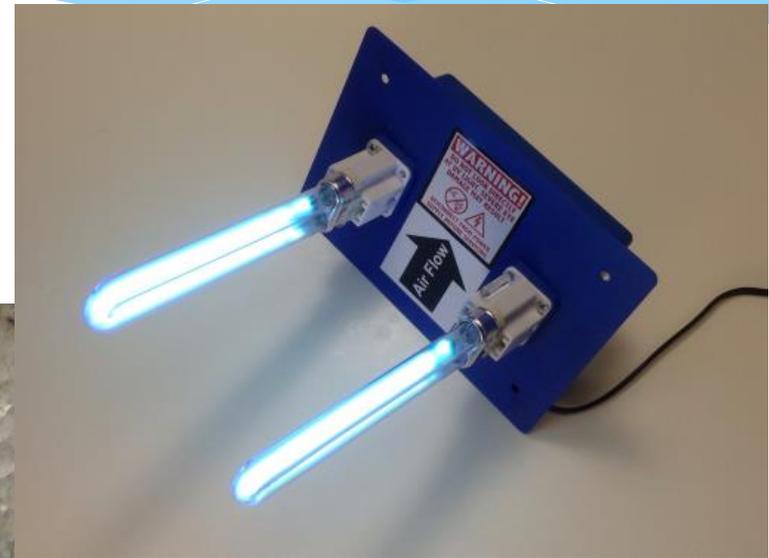
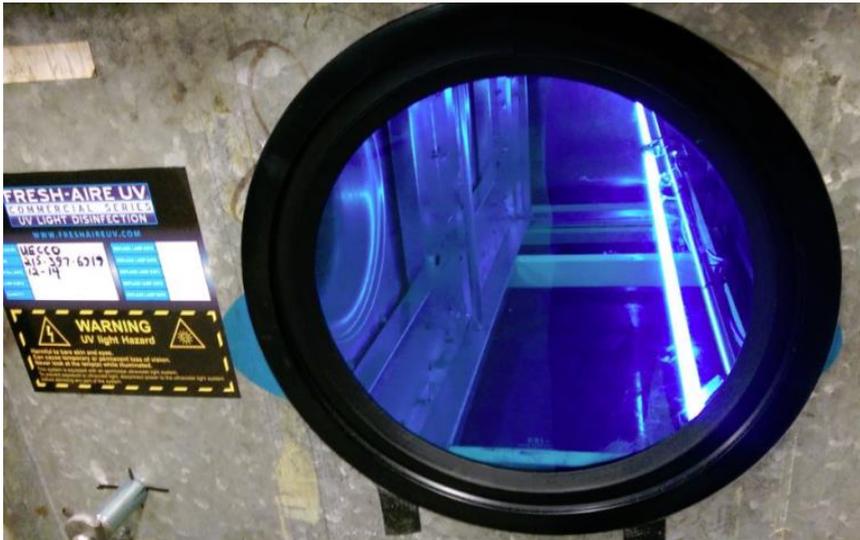
System Control for Excellent IAQ

- * Ozone (O_3)
 - * from equipment utilizing UV light or ionization of air (such as photocopiers, laser printers)



System Control for Excellent IAQ

- * Airborne Bacteria
 - * High airborne bacteria is caused by
 - * Inadequate ventilation
 - * Poor particulates filtering



New IAQ Parameters

**** to be included in 2019 ****

- **Mould Inspection**

- **VOCs**

- Benzene 苯
- Trichloroethylene 三氯乙炔
- Tetrachloroethylene 四氯乙炔
- Naphthalene 萘
- Polycyclic aromatic hydrocarbons (PAHs) 硝基多环芳香烃



System Control for Excellent IAQ

* Mould

- * Mould grows in humid condition
 - * Control indoor RH
 - * Minimize condensation
 - * Specific cleaning/removal process



System Control for Excellent IAQ

* Benzene

- * A genotoxic carcinogen in humans which lead to myeloid leukaemia
- * Indoor sources: building materials, furniture, cooking systems and stored solvents
- * Outdoor sources: heavy traffic, petrol stations



System Control for Excellent IAQ

* Trichloroethylene

- * A volatile, colourless liquid with a sweet ethereal (chloroform-like) smell
- * A widely used industrial solvent
- * Inhalation is the main route of exposure



System Control for Excellent IAQ

- * Tetrachloroethylene
 - * Sources: dry cleaning facilities elevate concentrations of PCE
 - * Dry-cleaned clothes are also possible indoor sources of PCE



System Control for Excellent IAQ

- * Naphthalene
 - * Sources: off-gases from deodorizer, repellent and fumigant



System Control for Excellent IAQ

- * Polycyclic aromatic hydrocarbons (PAHs)
 - * Potent carcinogens
 - * Sources: traffic emissions, smoking, cooking, domestic heating with fuel stoves and open fireplaces, as well as from incense and candle emissions



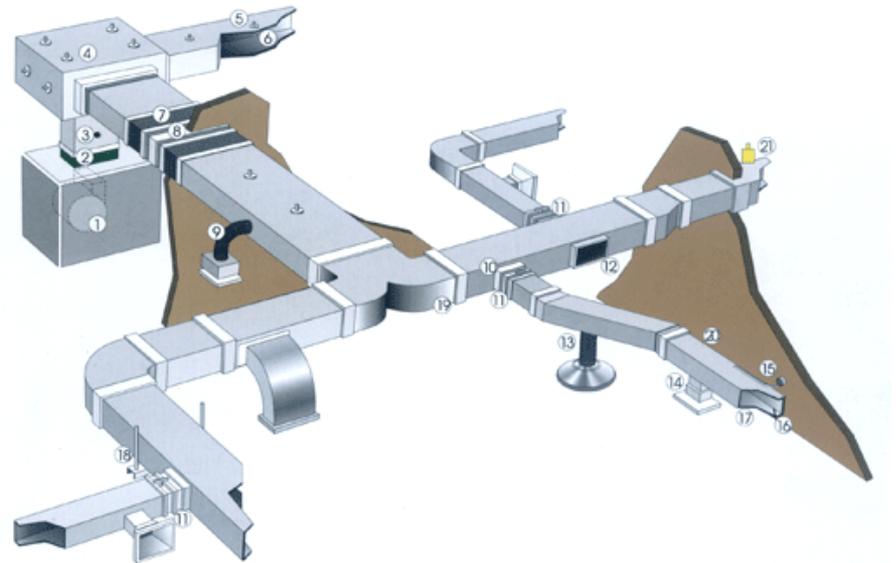
System Control for Excellent IAQ

- * Improvement of IAQ
 - * Air-conditioning system design
 - * Operation & Maintenance
 - * Remedy measures



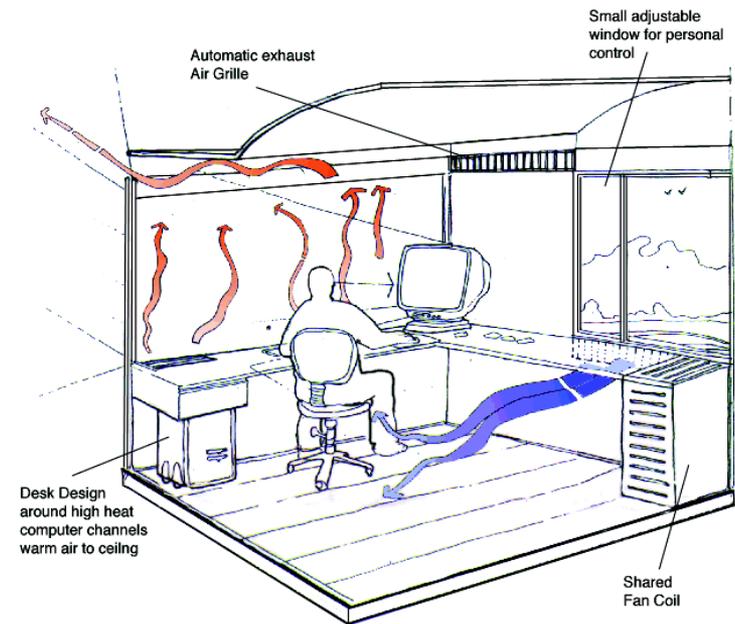
System Control for Excellent IAQ

- * Air-conditioning system design
 - * for sufficient cooling capacity
 - * for adjustable and controllable set-points
 - * for evenly supply air distribution in zone



System Control for Excellent IAQ

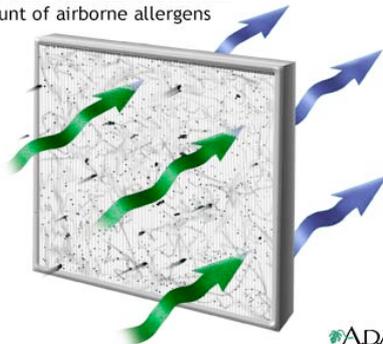
- * Operation & Maintenance
 - * system normal operation
 - * operation under design condition
 - * Thermal comfort set-points
 - * Fresh air intake rate
 - * Exhaust rate



System Control for Excellent IAQ

- * Remedy measures
 - * Removal of known indoor pollutant sources
 - * Additional ventilation for indoor sources which cannot be moved
 - * Installation of air cleaners / purifiers / filters
 - * Cleaning of ductwork system

A HEPA air filter can reduce the amount of airborne allergens





HONGKONG







China

Taiwan

Hong Kong

兩岸三地室內空氣質素協會



China

TIEQM Taiwan Indoor Environment Quality Management Association

台灣室內環境品質管理協會

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Shanghai Indoor Contamination Control Industry Association

Shanghai Indoor Contamination Control Industry Association 上海市室內環境淨化行業協會



上海市室内环境净化行业协会
Shanghai Indoor Contamination Control Industry Association

- 實施行業監督
- 提升服務資質 (上海室內環境淨化治理從業人員資格)
- 舉辦定期聽證會
- 推動標準化工作
- 舉辦展覽會及技術論壇
- 提供教育培訓 (室內環境治理員訓練課程 - 中級及高級課程)



Taiwan Indoor Environment Quality Management Association

台灣室內環境品質管理協會

- 推動政策實行
- 提升室內環境品質的意識
- 訓練專業人才
- 提供研究及實務解決方案
- 建立自主管理及認證制度
- 推動技術交流與研討合作



兩岸三地室內空氣質素協會 合作協議



上海市室内环境净化行业协会
Shanghai Indoor Contamination Control Industry Association

TIEQM Taiwan Indoor Environment Quality
Management Association
台灣室內環境品質管理協會

- * 三地輪流舉辦技術研討會 (2018 :上海; 2019: 香港)
- * 共同制定技術規範和標準, 推動質量提升
- * 定期交流信息, 共同制作編輯出版刊物
- * 交流培訓教材和師資, 探討技術證書互認事宜





Thank you!

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