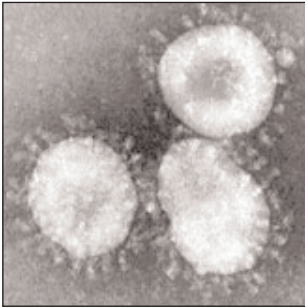


## Hong Kong Hospital Authority selects IQAir® advanced filtration systems for the fight against SARS



**In February of 2003, newspapers began reporting a rapidly spreading atypical pneumonia. Now identified as severe acute respiratory syndrome or SARS, this highly contagious condition is caused by a new coronavirus for which there is no specific antiviral treatment. While the epicentre of the outbreak was China, the disease spread quickly across Asia and to North America (especially Canada) with a total of 32 countries eventually reporting cases.**



Coronavirus

Until August 2003, an estimated 8422 cases have been reported – with a total of 916 deaths attributed to the syndrome. In terms of profession, health-care workers (HCWs) were particularly affected with a total of 1725 individuals (20% of the total) becoming infected. Adding to the immense human cost, the SARS outbreak hit many economies very hard leaving them severely damaged as tourism and other travel related industries took a nosedive. Estimates of the financial cost of SARS have varied from a conservative figure of US\$ 30 billion according to the World Health Organization (WHO) to US\$ 150 billion globally. Some experts noted that even this high figure is likely to be a gross underestimate. Thus, the effects of SARS are now regarded as the affected regions' own "September 11", and the aftershocks are still unfolding.

### Will SARS Return?

In an unprecedented effort to solve the SARS mystery and prevent its spread, the WHO, the Centers of Disease Control (CDC) and many other organisations have brought hundreds of people together. On July 5, 2003 the last two countries (China and Taiwan) were finally taken off the list of areas with recent local transmissions. At this moment in time the most pressing question is whether SARS will return. Like the Ebola virus, the SARS virus could hide in some animal or environmental reservoir, only to resurface once the conditions again mature for the spread to humans. According to the WHO, "SARS might also behave like many other respiratory diseases of viral origin, dying out as heat and humidity rise and returning when the season turns cooler."

### Preparedness is the Best Defence

Much like other respiratory illnesses, SARS is spread by close contact, when a person infected with SARS contaminates the surrounding air with tiny droplets of infectious matter. Someone in close proximity of the infected person can then become infected by breathing in the contaminated air. However, scientists are also considering other possibilities of transmission. According to the CDC, "it is possible that SARS can also spread more broadly through the air". Since there is no specific antiviral treat-

ment for SARS, the most effective strategy is control. While it is the WHO's first objective to seal off opportunities for international spread of this deadly disease, many health-care institutions are looking for additional infection control measures that will help them to contain infections in the event that the coronavirus once again flares up in an outbreak.

### The Hong Kong Case

One of the institutions that was particularly keen to implement special engineering controls as an additional precaution strategy in the fight against SARS was the Hong Kong Hospital Authority (HKHA). The authority currently manages 43 public hospitals, 47 specialist outpatient clinics and 13 general outpatient clinics. During the SARS crisis Hong Kong was one of the worst affected areas with 1755 reported SARS cases (376 of which concerned HCWs) resulting in a total of 300 deaths. In view of these huge losses, the HKHA was determined to find a way to effectively contain the SARS virus and protect their HCWs in case the disease should resurface.

### The Evaluation Process

In order to find the most efficient, reliable, flexible and cost effective solution, the Electrical and Mechanical Services Department (EMSD) of the Hong Kong Government performed rigorous tests on behalf of the HKHA. They evaluated the suitability and performance of many filtration systems, including IQAir®. With the help of a laser particle counter the EMSD tested the actual filtration efficiency of each filtration system.



A Senior Engineer of the EMSD assesses the actual filtration efficiency of two air cleaners with a laser particle counter. The majority of conventional air cleaners failed the efficiency test.

The efficiency tests revealed that most of the air cleaners failed to remove airborne particulates with the required actual efficiency in excess of 99.97% for particles of 0.3  $\mu\text{m}$  and larger. With its certified and independently type-tested filtration efficiency IQAir® passed this test. After the preliminary selection process, it was the EMSD's aim to select an infection control system that could be put into action in a matter of minutes and that would be able to effectively limit the threat of airborne disease transmission from a SARS patient to health-care workers by providing reliable and certified actual filtration performance.



Each IQAir® HEPA filter system is individually tested for filtration efficiency and air delivery. The actual test results are documented on a numbered test certificate.

### The Selection

Thanks to the professional effort of a Hong Kong based authorised IQAir® dealership and IQAir®'s previous experience in the field of hospital infection control (see IQAir® press release "Decentralised Airborne Infection Control in Health-Care Facilities"), IQAir® was able to develop a tailor-made SARS control solution for the hospitals managed by the HKHA.



Testing the IQAir® in location. Artificial smoke is generated on a hospital bed and then captured at source with the help of the IQAir® FlexVac™'s flexible suction arm.

After weeks of testing and the installation of several trial systems, the HKHA finally chose IQAir® as the only mobile filtration solution for SARS patient rooms. To equip over 20 hospitals managed by the HKHA, several hundred IQAir® systems are required for this project alone. The selected filtration system consists of an IQAir® model connected to the FlexVac™ mobile source capture system and a special flexible OutFlow™ air exhaust that enables the filtered air to be directed.

In the case of a SARS emergency, the self-contained mobile IQAir® filtration system can immediately be positioned next to the SARS patient's bed. The flexible suction arm is positioned near the patient's face to capture airborne droplets which are expelled by coughing and sneezing. The contaminated air is then filtered in a 3-stage

filtration process. At the final filtration stage IQAir®'s independently type-tested HyperHEPA® filter removes even the tiniest of airborne microorganisms, including the SARS virus, with an efficiency in excess of 99.5%. As a result the risk of infection within the patient's room can be greatly reduced, thus providing a safer working environment for health-care personnel and limiting the risk of spreading the disease.



The customised IQAir® filtration solution for the Hong Kong Hospital Authority combines an IQAir® filtration system with the FlexVac™ source capture kit and special flexible OutFlow™.

It is clear that vigilance for SARS must be maintained, because resurgence of the virus is possible. As a world leading manufacturer of mobile air cleaning systems IQAir® feel honoured and privileged to be able to play an important part in providing professional air cleaning solutions for the fight against SARS and other airborne infection control challenges.



Taiwanese IQAir® display.

**IQAir® sincerely thank all those individuals who have contributed to make this project possible. Our particular thanks go to David Mak and his team.**

## Medical Application Areas for IQAir® Systems:

Various specialised IQAir® models are available for the professional filtration of particulate contaminants, micro-organisms, chemicals and unpleasant odours. Due to their unique adaptability, reliability and certified filtration efficiency, IQAir® systems cover a broad spectrum of applications in health-care facilities:

- Bone marrow transplant units
- Organ transplant units
- Burn units
- Critical care facilities
- Intensive care units
- Isolation areas (e.g. TB-isolation)
- Dental clinics and dental laboratories
- Geriatric units
- Neonatal intensive care units
- Pulmonary Diseases
- Paediatric wards
- Oncology wards
- Haematology
- Microbiology labs
- Laser surgery fume and odour controls
- Operation theatres and anterooms
- Pathology theatres
- Pharmacies
- Computer and data storage areas
- Smoking areas
- Fresh air filtration / ventilation
- Sanitary facilities
- Waiting rooms
- Emergency rooms

## IQAir® systems are in use at many world-leading health-care and research institutions, including:

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| <p><b>Aydin University Hospital</b> (Haematology), Aydin, Turkey</p> <p><b>Beijing Friendship Hospital</b>, Beijing, P.R. China</p> <p><b>Beijing Union Medical College Hospital</b>, Beijing, P.R. China</p> <p><b>Blackrock Clinic</b>, County Dublin, Ireland</p> <p><b>Cardarelli Hospital</b>, Naples, Italy</p> <p><b>Duke University Medical Center</b>, Durham, NC, USA</p> <p><b>German Allergy &amp; Asthma Society</b>, Bonn, Germany</p> <p><b>Hollister Research Center (Univ. of California)</b> Santa Barbara, USA</p> <p><b>Harvard University</b>, Cambridge, USA</p> <p><b>Holy Cross Hospital</b>, Silver Springs, MD, USA</p> <p><b>Interfaith Medical Centre</b> (Psychiatric Ward), New York, USA</p> <p><b>Kamillianer Krankenhaus (für Allergien)</b>, M.-Gladbach, Germany</p> <p><b>King's College Hospital</b> (Histopathology Dept.), London, UK</p> <p><b>Klinikum Oldenburg (Internal Medicine)</b>, Oldenburg, Germany</p> <p><b>Kowloon Hospital</b>, Hong Kong</p> <p><b>Long Island College/University Hospital</b>, New York, USA</p> <p><b>Lungenliga (Lung Association)</b>, Zürich, Switzerland</p> <p><b>Merlin Park Regional Hospital</b> (Operation Room), Galway, Ireland</p> <p><b>Massachusetts Institute of Technology (M.I.T.)</b>, Boston, USA</p> <p><b>Municipality Hifzssihha Lab.</b> (Microbiology), Istanbul, Turkey</p> <p><b>National Cancer Institute</b>, Bethesda, Maryland, USA</p> <p><b>New York University Downtown Hospital</b> (Burn Ward), NY, USA</p> <p><b>Our Lady's Hospital for Sick Children (Univ. Coll. Dublin)</b>, Ireland</p> <p><b>Oklahoma Medical Research Foundation</b>, Oklahoma City, USA</p> <p><b>Ospedale Israelitico</b>, Rome, Italy</p> <p><b>Ospedali Vitofazzi di Lecce</b>, Lecce, Italy</p> | <p><b>Pennsylvania State Univ.</b> (Applied Research Center), PA, USA</p> <p><b>Prince of Wales Hospital</b>, Hong Kong</p> <p><b>Princess Margaret Hospital</b>, Hong Kong</p> <p><b>Queen Elizabeth Hospital</b>, Hong Kong</p> <p><b>Rockford Memorial Hospital</b>, Rockford, Illinois, USA</p> <p><b>Royal Free &amp; Univ. Coll. Med. School</b> (Oncology), London, UK</p> <p><b>St. Marien Krankenhaus</b>, Siegen, Germany</p> <p><b>St. Vincent Hosp.</b> (Oncology &amp; Liver Transplant), Dublin, Ireland</p> <p><b>Sunshine Dental Practice</b>, Diamond Bar, CA, USA</p> <p><b>The University Hospital Cincinnati</b>, Ohio, USA</p> <p><b>Universitair Ziekenhuis Antwerpen</b>, Edegem, Belgium</p> <p><b>University Clinic Bonn</b>, Germany</p> <p><b>Univ. Coll. Hosp. Galway</b> (Haematology, Neonatal, Oncology), Irel.</p> <p><b>Univ. Coll. Davis</b>, (Primate Research Center), Davis, CA, USA</p> <p><b>University Dental Clinic Halle</b>, Germany</p> <p><b>University of North Florida</b>, Jacksonville, FL, USA</p> <p><b>University Health Network</b>, Toronto, Canada</p> <p><b>Universtiy of Connecticut</b> (Fine Arts Dept.), Storrs, CT, USA</p> <p><b>University of Colorado</b>, Denver, Colorado, USA</p> <p><b>University of Texas</b>, Austin, TX, USA</p> <p><b>Wartburg Klinik</b>, Eisenach, Germany</p> <p><b>Washington Univ.</b> (HHMI, Clinical Sciences), St. Louis, MO, USA</p> <p><b>Wayne State University</b>, Detroit, MI, USA</p> <p><b>Virga Jesseziekenhuis</b>, Hasselt, Belgium</p> <p><b>Zentralkrankenhaus Bremen</b> (Internal Medicine), Bremen, Germany</p> <p><b>Zürcher Höhenklinik Wald</b>, Zürich, Switzerland</p> |
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### Disclaimer:

Airborne transmission is just one of several ways by which infectious microorganisms, such as the SARS virus, can be transmitted. The reduction of airborne contamination levels with IQAir systems depends on many factors which are specific to the indoor environment and out of the control of IQAir. These include room size, type and concentration of contaminants and source intensity. For these and other reasons, IQAir does not recommend the use of IQAir air cleaning systems as the sole control measure for infectious microorganisms and recommends that IQAir is only installed by specialists as part of a comprehensive infection control strategy.

For further information on IQAir® advanced filtration systems, please contact:

[www.iqair.com](http://www.iqair.com)