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İMALATÇILARI
DERNEĞİ

Covid-19 Yurtdışı Dernek Öneriler

CAR - Çin

Recommendations on the operation of air conditioning and heating systems coping with COVID-19 after the Spring Festival

I. Basic principles of the operation of various air conditioning and heating systems

1. The five strategies - early identification, reporting, isolation, diagnosis, and treatment should be implemented to minimize the transfer of COVID-19 into buildings. To reduce the risk of cross infection caused by droplets, it is recommended to wear masks in public, including in densely populated offices.

2. Before starting the air conditioning and heating system, facility manager must get familiar with the system, and the details of the floors and rooms served by each sub-system. Strategies for normal operation, as well as response measures to COVID-19 emergency, should be formulated based on the building use. Relevant staff should be designed.

3. In spaces without supply air (also no patients with suspected or confirmed COVID-19), exhaust fans (including bathroom exhaust fans) should be operated as much as possible, to create negative pressure in the space, and thus to increase the amount of fresh air. The smoke exhaust fan can also be turned on if its noise is within an acceptable level. However, cross contamination should be prevented in buildings with shared exhaust shafts.

4. Air conditioning and heating systems that have filters with at least sub high efficiency can be operated as usual.

5. In principle, the all-air system should be operated with maximum fresh air during the COVID-19 epidemic. 100% fresh air operation should be adopted when it is allowed by the system.

6. Air-water systems with dedicated outside air and exhaust air system should be operated with maximum fresh air. Meanwhile, appropriate natural ventilation or mechanical ventilation should be provided to each room.

7. For air conditioning units with heat recovery devices that involves an "mass transfer" process, such as a rotary wheel dehumidifier, bypass mode should be enabled (without

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total heat recovery). If the system does not have a bypass pipe, one should be added before the system is operated.

8. For shopping centers, office and other buildings with large people flow, the system should be operated with maximum fresh air, as long as comfortable indoor temperature is guaranteed during working hours. The outside air system and exhaust air system should continue operating for at least 1 hour after work every day.

9. For rooms heated by various heating equipment (radiator, radiant floor heating, electric heating membrane, etc.) or air conditioning equipment appropriate natural ventilation is required.

10. In public buildings, rooms without operable windows or mechanical ventilation systems should not be used.

11. Make sure fresh air introduced by the air conditioner is from the outside. The air inlet and its surroundings should be clean so that fresh air brough to indoors is not polluted.

12. The air conditioning system should be cleaned before and during its operation.

13. To maintain the supply air temperature after increasing fresh air, measures to increase the supply and return water temperature can be taken, including increasing the number of operating boilers (heat pumps) and the temperature of primary heating sources.

14. U-shaped pipes including building sewers, water seals of air treatment devices, toilet floor

drains and air conditioning condensate drains, should be examined regularly. Water should be replenished in time to avoid air mixing between different floors.

II. General public buildings

There is large people flow in shopping centers, office buildings, hotels, schools, bus stations, airport terminals and other public buildings. These buildings should be operated with maximum fresh air on condition that comfortable indoor temperature is guaranteed during working or business hours. In addition to the basic principles aforementioned, these buildings should also follow the following requirements.

2.1 All-air system

The all air-system is the most common system in shopping centers, theatres, exhibition centers, office buildings, and hotels. Within this type of system, the return air from room is mixed with some pre-heated and/or pre-humidified outdoor air. The mixed air is then supplied to each room through air ducts. One air-system usually serves multiple rooms or one large space, both of which can lead to cross-infection between people. Therefore, when the system serves more than one room, it should be operated in 100% fresh air mode.

1. Single fan system

(1) When the air conditioning unit is a single fan unit (with only the supply fan), the return air valve should be closed to ensure 100% fresh air operation. If not applicable, low resistance filters (level F7 and above) should be added to the air conditioning unit.

(2) The fresh air can be increased as much as possible by adjusting the fan speed. By increasing the number of operating boilers (heat pumps) and the temperature of primary heating sources, the temperature of supply and return water can be increased to maintain the supply air temperature after increasing fresh air flow rate, so that the room temperature can meet the comfortable requirements.

(3) When the air conditioner is running, the windows should be opened appropriately to allow for some ventilation. If it's not possible to open the windows, exhaust fan with sufficient air volume should be installed at the appropriate position of the external wall or window. Enabling the smoke exhaust fan is also recommended.

2. Double fan system

(1) When the air conditioning unit is a double fan unit (with the supply fan and the return fan/exhaust fan), the return air valve should be closed to enable 100% fresh air operation.

(2) Both the fresh air and exhaust air valve should be fully opened to allow for maximum air exchange rate.

(3) To avoid short circulating between fresh air and exhaust air, make sure the air inlet is far away from the exhaust outlet.

3. When the return air must be used:

The return air can be used when the system operating with 100% fresh air can hardly meet the basic requirements for indoor temperature and humidity. In such a case, the following items should be noted:

(1) The maximum fresh air can be determined by reducing the indoor temperature setpoint (recommended to be at least 16 ℃).

(2) During maximum fresh-air operation, the fresh-return air ratio should be above 40%.

(3) Air conditioning units should be equipped with low resistance filters (level F7 and above). Filters (level F7 and above) can also be added to each return air inlet. More attention should be paid to the cleaning and monitoring of these filters.

2.2 Fan Coil Units with fresh air system

Fan Coil Units with fresh air systems are used in most hotel guest rooms, offices, restaurants, entertainment venues and office areas of public buildings. Attention should be paid to the following items:

1. Fresh air should be introduced from the outside of the building, and should not be taken from the mechanical room, corridor or ceiling.

2. Make sure that the exhaust ventilation system operates normally. Windows should be opened frequently to allow for air exchange.

3. For rooms with large depth, measures should be taken to ensure the ventilation for the non-perimeter areas.

4. Rooms without fresh air system or natural ventilation should not be used.

5. It is recommended to keep the fresh air system operating all day.

2.3 Room air conditioners or heating equipment

Many hotel guestrooms, restaurants, entertainment venues, and office areas of public buildings use various room air conditioners (such as PTAC, split type air conditioners and enclosure air conditioners, etc.) and heating equipment (such as radiator, radiant floor heating, electric heating membrane, etc.) to maintain the indoor air temperature. In this case, fresh air is barely introduced to the room. Hence, Attention should be paid to the following items:

1. Make sure the filter on the air conditioner is cleaned regularly.

2. Windows should be opened frequently to allow for sufficient air exchange. In case of insufficient ventilation, the exhaust ventilation system should be started or mobile HEPA filters should be added.

3. For large rooms, measures should be taken to ensure ventilation for the non-perimeter areas.

4. Rooms without fresh air system or natural ventilation should not be used.

III. Scientific research, broadcasting and industrial building

The characteristics of scientific research, broadcasting and industrial buildings include higher requirements to the air conditioning, lower occupancy density and smaller people flow. With proactive and preventive measures, occupants' health as well as the normal production and work can be ensured. In clean rooms where the air system has sub-high or high efficiency filters, the system can be operated as usual. For the operation of other air conditioning systems, please refer to the recommendations for general public buildings.

IV. Hospital building

In addition to the basic principles in Part I, the following measures should be taken for the operation of air conditioning systems in hospitals:

4.1 The outpatient, reception, emergency reception, fever clinic, isolation or observation wards, and corridors, toilets, decontamination room and dirt utility room in the public areas in COVID-19 emergency and infectious diseases hospitals, general hospitals, and hospitals that can accommodate

infected patients

1. Facility staff in charge of the operation and management of the air conditioning and ventilation system must be familiar with the polluted area, buffer area, semi-polluted area and clean area. They must know well about the flow of people and logistics of the hospital, as well as the air conditioning and ventilation system.

2. Make sure the air conditioning and ventilation system is designed to create appropriate air flow pattern, so that the air pressure reduces from the clean area to

the semi-polluted area, followed by the buffer area and the polluted area. Positive, slightly negative and negative pressure should be maintained in the clean, semi-polluted, and polluted area, respectively.

3. Contaminated air in the polluted area should be discharged from the bottom vents. The air should be filtered and disinfected (when conditions permit) before centralized or decentralized discharge. It is recommended the air should be discharged at a height above the tallest building nearby. Centralized discharge in the higher atmosphere is recommended when applicable.

4. During the reception of COVID-19 patients, the ventilation system should operate continuously to ensure appropriate airflow in the ward (fresh air is required to be no less than 6 times/hour in respiratory infectious disease areas).

5. When replacing the high-efficiency filter in the semi-polluted and polluted area, protective measures such as wearing masks and gloves should be taken. The used filter should be uninstalled by designated person. After disinfection and sterilization in a safety container, it should be disposed with the medical waste according to “Plan for management of medical waste in response to the influenza A (H1N1) epidemic situation (H.B. [2009] No. 65)”

4.2 Other areas of the general hospital

1. Cut off the air supply and exhaust to/from epidemic areas as well as the outpatient, reception, emergency reception, fever clinic, isolation or observation ward, to prevent the spread of contaminated air through air ducts.

2. Stop using the cross flow air curtain or cold air curtain at all entrances.

V. Residential building

The most common air conditioning and heating system in residential buildings is various room air conditioners (such as PTAC, split type air conditioners and enclosure air conditioners, etc.) and heating equipment (such as radiator, radiant floor heating, electric heating membrane, etc). Some households use a home air conditioning system with an outdoor unit (such as ducted units, fan coil heating and cooling system, and VRV system, etc.). The advantage is that each household is an independent user so that different users will not interfering others. Attention should be paid to the following items:

1. The air conditioning system should be cleaned before and during its use. Cleaning with direct use of high-concentration disinfectant is not recommended.

2. When using the air conditioner and heating equipment, windows should be opened appropriately to allow for ventilation.

3. For kitchens and bathrooms with windows, it is suggested to open windows for ventilation, and close the doors connecting the kitchen and bathroom with adjacent rooms. For kitchens or bathrooms without external windows, it is suggested to close the doors of adjacent rooms, and ensure sufficient disinfection measures and frequencies (disinfection is recommended after

defecation).

4. For residential buildings with fresh air system, the system should not be considered as the only source of outdoor air. Opening windows during appropriate time (when the outdoor temperature, humidity and air contaminants' concentration are appropriate) is also recommended.

5. In cases when one or more of the family members are infected, the exhaust fans in the kitchen and toilet should be turned off to prevent air from entering into the primary air ducts of the building.

VI. Transportation

Transportation in this document only refers to urban rail transit, subways, buses, taxis and private cars. As for trains and airplanes, relevant national regulations should be applied.

The air conditioning system in the above transportation can be used if increased ventilation is provided. Both drivers and passengers should wear masks to strengthen personal protection.

AFEC- İspanya

We do not have a regulation on air conditioning and COVID in Spain, but there are some Ministries that are going to publish some recommendations, but only recommendations.

AIRAH-Avustralya

Common questions about COVID-19 and air conditioning and refrigeration systems

Given the current coronavirus (COVID-19) pandemic, people are understandably concerned about how the disease is spread and whether air conditioning, refrigeration or other related HVAC&R systems could play a role.

AIRAH has compiled some of the most frequently asked questions and will continue to update these as more information becomes available.

For HVAC&R specialists looking for more detailed technical information and guides, and for those wishing to access further resources, you can also refer to our coronavirus information page coronavirus information page.

Can COVID-19 be transmitted through air conditioning systems?

At this stage, there is no evidence that COVID-19 can be spread through air conditioning systems. Please note, however, that organisations around the world are assessing ongoing research on the ways COVID-19 is spread and will continue to share updated findings.

According to the World Health Organization (WHO), studies to date suggest that the virus that causes COVID-19 is mainly transmitted through contact with respiratory droplets rather than through the air.

When someone with COVID-19 coughs, sneezes, talks or even exhales, these droplets land on nearby objects and surfaces. Other people can become infected with the virus by touching these objects or surfaces, then touching their eyes, nose or mouth.

People can also become infected with the virus if they directly inhale airborne droplets from a person with COVID-19 who has expelled the droplets from their mouth.

The WHO recommends staying more than one metre away from a person who is sick. Research shows that airborne droplets can travel much further than one metre so it's important to be mindful of this when you are near other people. How far airborne droplets carrying the virus can travel depends on air movement but can be several meters.

What actions are required for workplace heating, ventilation and air conditioning (HVAC) systems?

Although there is currently no direct research that supports that SARS-CoV-2 can be transferred through workplace HVAC systems, there is similarly no research to say that it can't. However, studies show that the virus can be carried some distance by airflows with lifetimes of 0.5 hours.

What we do know is that HVAC systems can help control the spread of the virus.

Some international studies have identified the likelihood that COVID-19 may be transmitted in very small airborne particles called aerosols and attached to dust particles. Increasing outdoor air ventilation, using initiatives such as economy cycles, can dilute these particles. Building owners and operators should seek qualified advice on increasing ventilation in existing systems.

In line with guidance from SafeWork NSW, AIRAH recommends that employers seek confirmation from their building owner that the air conditioning system is properly designed and maintained.

Also, keeping relative humidity between 40 and 60 per cent will create conditions that reduce the risk of infection through inhalation of airborne droplets carrying the virus. Research from the International Society of Indoor Air Quality and Climate (ISIAQ) shows that viruses survive better at increased humidity with 60 per cent active above 60 per cent relative humidity.

Low humidity in occupied buildings should be avoided as this can dry out the mucous membrane which is one of our primary means of defence. ISIAQ research shows that virus survival decreases with decreasing humidity.

There is no clear indication that special filters should be installed in offices and similar environments. AIRAH recommends seeking qualified advice that effective air filters have been selected and maintained appropriately.

The following interview with ASHRAE presidential member William Bahnfleth contains useful information about the effectiveness of filters, UV and other HVAC technologies in controlling COVID-19.

Please note that some ventilation systems, such as those in carparks, do not recirculate – all air is exhausted directly to the atmosphere. These systems are therefore highly unlikely to spread the virus unless they feed into nearby air intakes for other HVAC systems.

Do I need to disinfect my home air conditioner?

There is no indication at this stage that home air conditioning systems can spread the disease. Although AIRAH recommends regular maintenance and cleaning of air conditioning equipment, there is no special cleaning or disinfecting requirement because of the coronavirus.

If you suspect that the surface of an air conditioning unit has been affected – by someone coughing on it, for example – use a simple disinfectant similar to that recommended by the United States Environmental Protection Agency to clean the surface.

Can COVID-19 be spread via the water in my evaporative air conditioner?

Evaporative air conditioning systems use drinking water. According to the Water Services Association of Australia (WSAA), drinking water in Australia is high quality and is well treated. There is no evidence that drinking water will be affected by the COVID-19 virus or that it is transmitted by drinking water. Existing water treatment and disinfection processes, including use of chlorine, are effective in removing viruses from water supplies. The WSAA has developed a public fact sheet for customers around water and COVID-19.

Is food at risk of carrying COVID-19, including frozen food?

According to the Centres for Disease Control and Prevention (CDC), there is currently no evidence to support transmission of COVID-19 associated with food. It says that "there is likely very low risk of spread from food products or packaging that are shipped over a period of days or weeks at ambient, refrigerated, or frozen temperatures".

The CDC says that before preparing or eating food it is important to always wash your hands with soap and water for 20 seconds for general food safety. It also recommends washing your hands throughout the day after blowing your nose, coughing or sneezing, or going to the bathroom.

How easily can coronavirus spread inside a plane?

According to the WHO, research shows there is "very little risk" of any communicable disease being transmitted on an aircraft. However, several air cabin services staff have been infected.

The risk is like that which you would face in any other public place.

This is no different from any other situation in which people are close to each other, such as on a train or bus or in a theatre.

But transmission of coronavirus can occur between passengers who are seated in the same immediate area of an aircraft.

The WHO said this could occur when an infected person coughed, sneezed or had direct contact with another person.

Health authorities advise passengers seated within two rows of a confirmed case of coronavirus to self-isolate and seek medical attention if symptoms present.

Do I need to wear a mask?

Both the WHO and Australia's Department of Health say you do not need to wear a mask if you are healthy.

You should, however, wear one if you are taking care of a person with suspected COVID-19 or if you are coughing and sneezing.

How long can the virus last on surfaces?

According to the WHO, coronaviruses (including preliminary information on the COVID-19 virus) may persist on surfaces for a few hours or up to several days. This may vary under different conditions (e.g. type of surface, temperature or humidity of the environment).

Recent information, reported in USA Today, has found that viable virus could be detected up to three hours later in the air, up to four hours on copper, up to 24 hours on cardboard, and up to two to three days on plastic and stainless steel. The study has not yet been peer-reviewed and has not been corroborated by the WHO or CDC.

The WHO recommends cleaning surfaces that may be affected then treating with simple disinfectant to destroy the virus and protect yourself and others. Wash your hands regularly with soap and water or an alcohol-based hand rub. Avoid touching your eyes, mouth, or nose.

Got a question?

Please send your HVAC&R related questions to airah@airah.org.au and we will work with our AIRAH subject matter experts to answer.

Original document link below

https://www.airah.org.au/Web/Industry_Leadership/Update_on_coronavirus/Common_questions_about_COVID19/AIRAH/Navigation/Industry_leadership/Coronavirus_information/Common_questions_about_COVID-19.aspx

ANIMA-İtalya

I can confirm that also in Italy there's been much discussion on the use of air-conditioning units and how they should be used, mainly about equipment that recirculate indoor air. At the moment the situation is that:

" …….for air conditioning systems, it is mandatory, if technically possible, to exclude completely the air recirculation function. In any case, the measures for natural air exchange must be further strengthened and/or through the system, and the cleanliness of the recirculating air filters must be guaranteed, when the system is stopped, in order to maintain the appropriate filtering/removal levels……." (see the first document attached: Annex 9: for example, page 50…).