



Recognise indoor air pollution as a health risk – industry associations issue urgent COVID-19 statement to EU institutions

-Joint associations' statement-

In the context of the current COVID-19 pandemic, the leading European Indoor Environmental Quality (IEQ) associations (Heating, mechanical Ventilation, Air-Conditioning (HVAC), lighting, and Building Automation and Control Systems (BACS)), strongly recommend the proper use of heating, mechanical ventilation, air-conditioning, air treatment systems and BACS to reduce indoor transmission of SARS-CoV-2 and to maintain adequate levels of indoor environmental quality (IEQ). Technical Building Systems (TBS) providing these functions are essential in facilitating the operation, energy efficiency, indoor air quality, and health and safety of many residential and non-residential buildings.

Current evidence and knowledge on the spread of COVID-19:

It is widely considered that two main aspects may cause airborne infections. Droplet transmission in which droplets ($>5\mu\text{m}$) may travel 1.5 to 2 m before falling on various surfaces; this transmission route is widely accepted including by the WHO and Johns Hopkins Medicine. The airflow in the room has a limited impact on this transmission vector which must be addressed by social distancing and rules on the wearing of masks indoors.

However, as health experts have continued to study the transmission of the virus through particles suspended in the air, known as aerosols ($<5\mu\text{m}$), it has become clear that it is an important vector for transmission as confirmed by the European Commission's Joint Research Centre (JRC)¹. Precautionary steps should therefore be taken to minimise airborne exposure. Evidence underlines that HVAC systems, which can be optimised by BACS, are helpful in this regard. They can help reduce the airborne concentration of the virus and decrease risks of transmission through renewal/dilution of the air in a building.

Precautionary measures to limit aerosolised transmission indoors:

Dilution of the aerosols via mechanical ventilation is a key element in preventing the spread of aerosolised viruses. Research reported in the Lancet states that "In the best ventilated room, after 30 [seconds] the number of droplets had halved, whereas with no mechanical ventilation this took about 5 min"². This means that proper mechanical ventilation can reduce half the virus concentration by a factor of 10 compared with no mechanical ventilation. Meaning that contamination probability is reduced by a factor of 10 thanks to mechanical ventilation. Correctly designed, installed, and maintained mechanical ventilation, air-conditioning and air treatment systems support the dilution of aerosols and can prevent the virus from spreading to other parts of the building. Mechanical supply of air from outside renews/dilutes possible pollutants whilst reducing the viral load within a building via air extraction. Therefore, properly installed and operated mechanical ventilation, air-conditioning and air treatment systems should be implemented as a strategy to protect people against potential aerosolised contamination. Whilst window airing and air cleaning technologies can be of benefit in specific

¹ <https://onlinelibrary.wiley.com/doi/10.1002/hsr2.275>

² [https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(20\)30245-9/fulltext#seccestitle20](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30245-9/fulltext#seccestitle20)



applications, a combination of mechanical ventilation, providing air renewal, and air treatment, i.e. UV-C disinfection, is the most effective strategy.

Mechanical air renewal:

Mechanical ventilation and air-conditioning units should not be switched off. Rather outdoor air supply volume flow should be elevated to increase the frequency of the replacement of polluted indoor air with outdoor air supply. The greater the number of air changes per hour (ACH) - a measure of ventilation rate - the more any aerosol can be diluted/removed. Extended operating hours before and after the regular time-of-use should be actively considered. If air humidity control is possible with the mechanical ventilation or air-conditioning system, this functionality should also be used as evidence suggests that in drier environments COVID-19 transmission increases. It is therefore recommended that relative air humidity be kept in the accepted comfort range between 40-60 %.

Window airing:

In buildings without mechanical ventilation systems, with insufficient mechanical ventilation or where installation of a mechanical ventilation system is not technically feasible, window airing is supportive but it has a limited effect on the dilution of aerosols depending on the outside conditions (1-2 ACH). Depending on the outdoor weather conditions, window airing might cause discomfort, i.e. temperature and draught for users of the building and can incur major thermal losses significantly increasing the energy consumption of buildings

Air treatment technologies:

Air treatment systems such as UV-C disinfection used in addition to mechanical ventilation, will add to the effect of the ventilation rate significantly (an impact equivalent to an additional. 6-10 ACH can be easily achieved) in reducing the concentration of infectious viral load in the air. Studies have shown the technology has been proven to inactivate, without exception, all bacteria and viruses against which it has been tested including among others those causing tuberculosis, influenza, the common cold and SARS.

UV-C disinfection can also be used inside HVAC systems to keep cooling coils free of infectious biofilm in heat exchangers, disinfects surfaces and disinfects the air flow. In applications where air recirculation is unavoidable the use of air treatment technologies is also strongly recommended.

Remote control with Building Automation and Control Systems:

Existing Building Automation and Control Systems (BACS) can monitor Indoor Air Quality (IAQ), adjust air renewal settings to the optimum levels and enable remote connectivity. This avoids physical presence at locations while having full 24/7 control of the building's HVAC systems. Most of the monitoring, supervising, and adjustment of BACS equipped HVAC systems can be achieved safely and efficiently from remote locations without physical presence. This may help to reduce the time of exposure of service and maintenance staff.

EU policies that should be used to support reduced aerosolised transmission:

Indoor air pollution must be fully recognised alongside ambient air pollution as a risk to human health. As noted in the recent European Parliament INI on the implementation of the Ambient Air Quality (AAQ)

Directives, the EU lacks a coherent legislative framework for addressing indoor air pollution³. This also has been recognised in the **Commission’s Zero Pollution Action Plan**⁴, underlining that “COVID-19 and the resulting reduced possibilities to go outside have again highlighted the importance of ensuring that at all times the indoor and outdoor air we breathe is healthy. With the insulation of buildings improving, ensuring good indoor air quality will become even more important”. **“The Commission commits to analyse knowledge and policy gaps [and thus] ... to assess pathways and policy options to improve indoor air quality, focusing on key determinants and pollution sources and exploring ways to raise greater public awareness and reduce risks”**. Such an assessment of pathways and policy options must consider opportunities to better operationalise existing policy measures to reduce indoor air pollution but must be ambitious in considering new possibilities to coherently address IEQ in all of its aspects.

A number of existing EU policies should be used to support reduced aerosolised transmission. The **revision of the Energy Performance of Buildings Directive (EPBD)** expected in Q4 2021, should be used to mandate the introduction of Minimum Indoor Environmental Quality Performance Standards (MIEQPS) for buildings, including for Indoor Air Quality (IAQ) as a component of overall IEQ. Such minimum performance standards would drive the uptake of mechanical ventilation, air-conditioning and air treatment systems, thereby improving air dilution and reducing aerosolised contamination risk in buildings. (Please see the Gathering’s detailed policy proposal).

The **EU’s forthcoming Occupational Safety and Health (OSH) Strategic Framework for 2021/2027** should fully integrate IEQ among the aspects to be considered and regulated by Member States in their OSH policies and in the Commission’s model OSH evaluation framework.

IEQ conditionality should be integrated into public procurement policy by adding/establishing **IEQ in Green Public Procurement Criteria** and in the **revision of the Energy Efficiency Directive (EED) in conditionality for purchasing by public bodies. State aid rules and guidelines** should also be addressed, with the scope expanded to include projects aimed at improving IEQ.

Ultimately, the forthcoming Conference on the Future of Europe should acknowledge that the pandemic underlines that health policy is an inherently transnational issue. The **Conference on the Future of Europe must** give serious consideration to granting the EU shared competence over health policy to facilitate the integration of health more strongly as a legal basis across all EU policy areas covering the built environment.

The informal Indoor Environmental Quality (IEQ) Gathering brings together seven European industry associations, representing companies involved in technical building systems and their maintenance. Our objective is to collectively promote healthy buildings with an adequate level of indoor environmental quality.

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³ https://www.europarl.europa.eu/doceo/document/A-9-2021-0037_EN.pdf

⁴ https://ec.europa.eu/environment/pdf/zero-pollution-action-plan/communication_en.pdf



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