Healthy air at peak times? Feasible.

THE TOP ISSUE IN OFFICES AND SCHOOLS

BLAUBERG Ventilatoren

We are currently faced with a new task, namely to find out what is dangerous and what is not, and how we should act on the basis of the current data on corona and the risk of infection. Some are looking for the answers only for themselves, others have to take responsibility for an entire staff or school.

Catchwords like “aerosol“ (any mixture of suspended particles in gas), which were rarely heard before, become important. When you start researching, you encounter different, rapidly changing and often mutually contradicting information and opinions and you are almost more confused than before.

However, one can look at one certain point. **Which information is universally valid and will actually bring positive results when implemented?**
We are focusing on the topic of air quality here. How can I reduce the risk of infection and illness and increase health by improving indoor air quality?

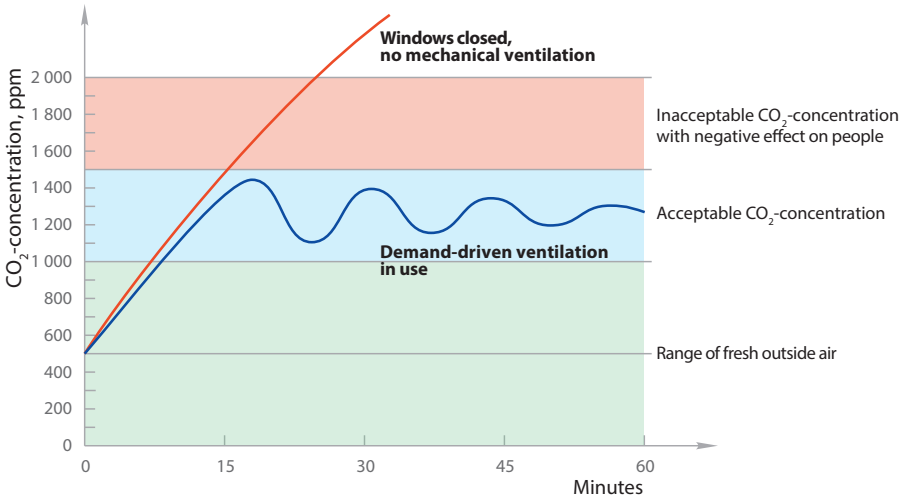
There is a multitude of studies, starting in the middle of the 19th century with Max von Pettenkofer‘s findings on the relationship between the CO_2 content of indoor air and the well-being of people. However, two fundamental factors emerge from the combined results of these studies:

1. THE PURE PROBABILITY CALCULATION
The more people and activity are present in a room, the more particles from respiration, evaporation and turbulence are present in the room air, among them of course also pathogens. These accumulate in the absence of exchange with fresh air. In addition, there are particularly polluted areas which the air flow cannot reach or in which more people are present than in other areas. In short: the thicker the air/aerosol, the higher the risk of infection.

2. THE PHYSICAL CONDITION DUE TO THE AIR QUALITY
Depending on the condition of the air you feel better or worse, this can be experienced subjectively. The CO_2 content is decisive, so that increased CO_2 concentrations show themselves as dizziness, headaches and concentration disorders up to respiratory irritation and diseases etc. Air humidity is also an important factor: too low a humidity dries out the mucous membranes, which is unpleasant and makes the respiratory tract more vulnerable. Air that is too

humid affects the body's temperature regulation and provides a welcome environment for some pathogens and mould spores. Thus, if the air quality is inappropriate, the body is to the detriment of the immune system very busy maintaining normal body functions and thus provides a better target for infectious pathogens.

The effects of air quality on health are so clear that some professional associations have already set themselves the task to observe this issue in schools and companies.



SOLUTION

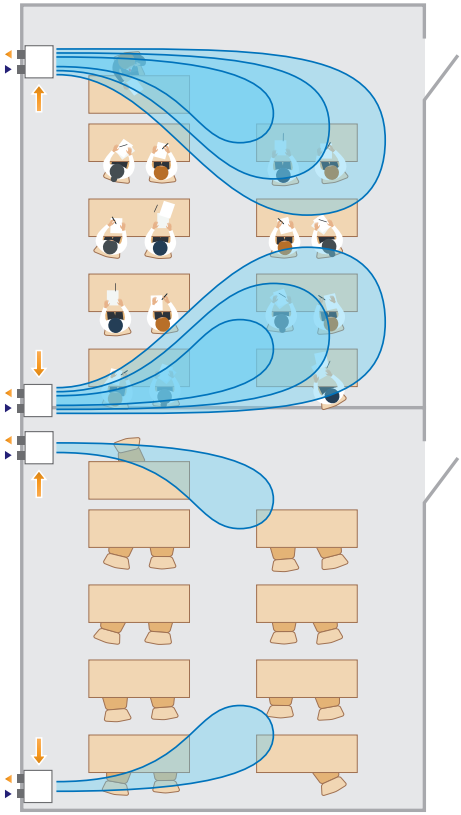
The solution to this challenge is of course proper ventilation. One approach to this is traditional window ventilation, which is recommended, among other things, as intermittent ventilation at regular intervals and cross ventilation via opposite windows. The feel-good effect of fresh air is immediately noticeable. However, it is somewhat more difficult to ensure a sufficient air exchange rate, to supply even the more remote corners and to keep the air humidity and temperature (and thus heating costs) balanced.

In order to manage these factors in addition to the supply of fresh air, controlled ventilation systems have been developed. Here, ventilation systems which are built into the walls and ensure a regular exchange of air. Used air and its particles are removed from the room, while fresh outside air is supplied, often freed from unwanted substances via filters. The exchange with fresh outside air is especially important, since the O_2/CO_2 content as a decisive factor cannot be improved by simply circulating and filtering the room air. Only fresh air brings healthy air. A well thought out arrangement of the ventilation elements guarantees the exchange of air in the entire room. Models with humidity and heat recovery are particularly energy-efficient and ensure that a healthy and pleasant indoor climate is maintained, including the right humidity.

The disadvantage of this ventilation method is that it actually has to be taken into account at the planning stage of the building. Unless you use ventilation systems that can be retrofitted. These can be inserted through a core hole drilled into the existing wall and can be put into operation directly after power is connected. Since they can be inserted individually into the different rooms without central piping, they are called "decentralized

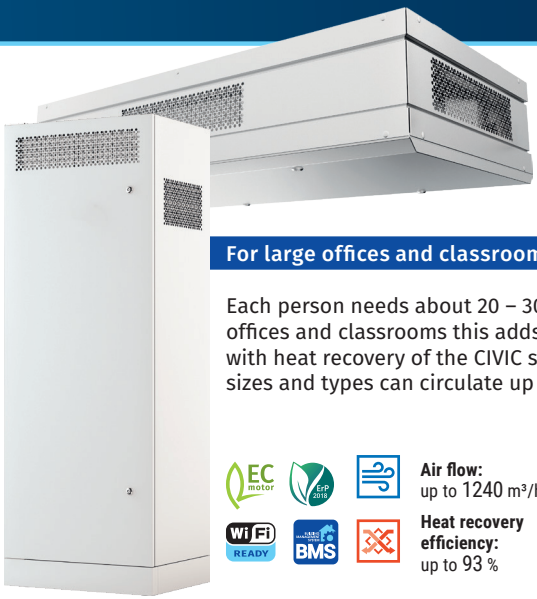
ventilation systems“. Installation and operation of such systems are designed to be simple and user-friendly. Thanks to a wide range of setting options, for example the ventilation intensity can be set individually for different times of the day, allowing the ventilation of the rooms to be adapted to individual needs. With the help of these ventilation systems, sufficient and health-promoting ventilation can be ensured and controlled according to current guidelines, thus protecting one‘s own health and that of employees and fellow occupants.

ADVANTAGES OF SINGLE-ROOM VENTILATION



- Little space requirement and simple installation, as no complex pipe systems have to be laid. Therefore single-room ventilation systems are very suitable for existing buildings.
- Air flow rate and type of the ventilation unit can be calculated and regulated individually for each room.
- Each room is ventilated individually with the needed intensity and duration. The units can be programmed with detailed weekly schedules.
- Fresh air is supplied through short air pipes, which are built into the wall. Short flow paths and thus a low air resistance enable an energy-efficient operation.
- Single-room air handling units have a high fire safety, as there are no pipe connections between the individual rooms.

The ventilation is regulated according to actual demand. When the room is fully utilized the unit automatically operates at a higher flow rate. If a room is not used, the ventilation intensity can be reduced.



Scan to get to the CIVIC LB data sheet

Scan to get to the CIVIC DB data sheet

For large offices and classrooms: CIVIC LB // DB

Each person needs about 20 – 30 m³ of fresh air per hour. In large offices and classrooms this adds up to a lot. The decentralized units with heat recovery of the CIVIC series can help here. Different unit sizes and types can circulate up to 1200 m³.

Air flow: up to 1240 m³/h

Heat recovery efficiency: up to 93 %

Offices for 2 to 3 persons and single-room apartments

Freshbox 100 WiFi

Wether in a private apartment or as a solution for small offices with an air volume up to 100 m³ – the Freshbox WiFi is equipped with an energy-efficient counter-flow heat exchanger and convinces with a modern design and easiest operability. With one unit a second room can be ventilated optionally.

Scan to get to the Freshbox 100 WiFi data sheet

Air flow: up to 100 m³/h

Heat recovery efficiency: up to 98 %

System for several rooms, synchronizable

VENTO Expert A 50-1 S10 W V.2

The VENTO Expert can operate in synchronization with other units and can thus ventilate several rooms. Due to the simple operation via the VENTO app a detailed and individual weekly schedule can be set.

Scan to get to the VENTO Expert data sheet

Air flow: up to 50 m³/h

Heat recovery efficiency: up to 93 %

INFOBOX

Air exchange rate

The air exchange rate indicates how often the room volume has to be exchanged with fresh outside air within one hour. The unit is h^{-1}. A sufficient air exchange is important to remove carbon dioxide, pollutants and moisture for constructional and hygienic requirements, and to supply oxygen.

Depending on the ventilation habits and the ventilation method the following air exchange rates can be attained:

- Windows and doors closed — 0 to 0,3 h^{-1}
- Window tilted — 0,3 to 1,5 h^{-1}
- Window completely open for a short time (intermittent ventilation) — 0,3 to 4 h^{-1}
- Window completely open permanently — 9 to 15 h^{-1}
- Opposite windows and doors open permanently (cross ventilation) — up to 40 h^{-1}

A minimum air exchange rate should generally be ensured by a correct ventilation. If it is not possible to attain that rate, a mechanical ventilation with heat recovery should be used.

AIR EXCHANGE RATES IN COMMERCIAL AND PRIVATE ROOMS

The air exchange rate, which is needed for the exhaust and supply ventilation of a room depends on different factors. To determine the air exchange rate, the designation or use of the room has to be known.

Type of the room	ACPH
Offices	4 – 8
Meeting rooms	5 – 8
Seminar rooms	6 – 8
Libraries	4 – 5
Classrooms	5 – 8
Waiting rooms	4 – 6
Changing rooms	6 – 8
Commercial kitchens	15 – 30
Public toilets	5 – 15
Salesrooms	4 – 8
Gyms	4 – 6
Fitness centers	4 – 8
Cinemas, Theaters	5 – 8
Workshops	4 – 20
Assembly halls	4 – 8
Living spaces	3 – 6
Private bathrooms	5 – 7
Private kitchens	15 – 25
Private toilets	5 – 8

Source: https://www.haustechnikdialog.de/SHKwissen/1307/Luftwechsel
Non-binding information, no guaranty, values can vary.