

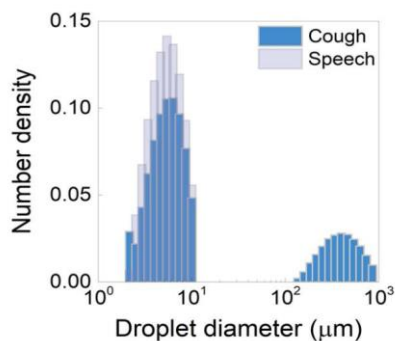
Ever since the beginning of 2020 the view on social interaction and general hygiene have changed for good, due to the global spread of COVID-19. Social distancing and hand washing routines have become the norm and appropriate measures are in place for post lock-down get-togethers in for example hotels, restaurants and air planes. Evening Breeze is a much used product in hotels and this white papers aims to inform hotel management and owners on how to handle to secure optimal safety for their guests.

Transmission

There’s still a lot to be learned about COVID-19 and its transmission, most data points towards respiratory droplets from infected individuals to be the main source of further spread¹. These droplets can either infect someone else through contaminated air inhalation or touching contaminated surfaces. None of the potential infections can be ruled out, but aerosols containing the virus in poorly ventilated rooms seem to lead to an infectious dose for its occupants over time²

Droplet size

Aerosols or droplets are typically <1000 µm in diameter; with the small droplets being prevalent and potentially more dangerous because they stay airborne much longer³



Picture 1. Droplet count

Timing

It’s crucial to have understanding about the time it take to get infected and the time it takes to get rid of the infected particles in a room. There is no bottom line for the time it takes to get infected in a contaminated space is; although it is generally understood that risks are small when occupation time is less than 15 minutes.

¹ Lai CC, Shih TP, Ko WC, Tang HJ, Hsueh PR - Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): the epidemic and the challenges. Int J Antimicrob Agents. 2020.

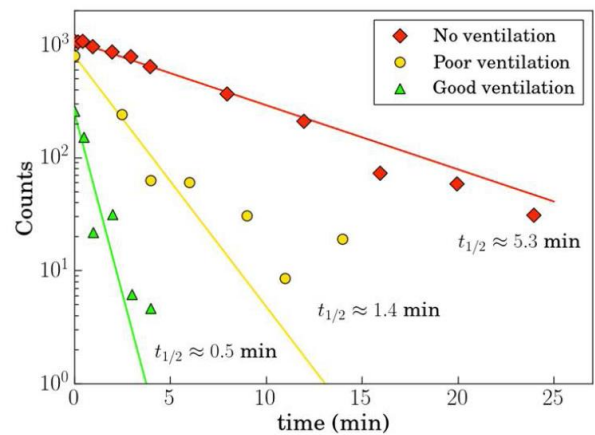
² Lowen AC, Mubareka S, Steel J, Palese P - Influenza virus transmission is dependent on relative humidity and temperature. PLoS Pathog. 2007.

³ Somsen GA, van Rijn C, Kooij S, Bem RA, Bonn D. Small droplet aerosols in poorly ventilated spaces and SARS-CoV-2 transmission. Lancet Respir Med 2020.

The time to get rid of the infected particles with in a room is crucial especially in a hotel-setting where guests and personnel visit the room on a regular basis. The below graph⁴ shows the presentation of droplets in the air for a non-ventilated, poor ventilated and good ventilated (one door, one window open) room, where it is understood that the smaller droplets (5 µm) will remain airborne for the longest period of time and are the ones measured.

This graph clearly shows that after 5 minutes a ventilated room is free from aerosols exhaled form a single infected person; where in a poor ventilated room it might take more than an hour for the aerosols to settle and die. And if we look at the 0,5 min half time for a ventilated room, meaning that after 5 minutes only 0,1% if the aerosols are still airborne, while at the poorly ventilated room after 5 minutes 50% of the aerosols are still present.

All-in-all this explains why many national and international health organisations keep stressing the importance of real ventilation, meaning real fresh air in (as opposed to ventilation is the sense of air circulation).



Picture 2. Droplet half time

Non-airborne, means they can be inhaled, but it is important to understand that these particles can remain infectious, studies vary about how long they stay infectious but 3 hours is regularly mentioned⁵. In extreme cases the virus can survive on a surface for 9 days⁶, so surface disinfection procedures maintain to play a major role in prevention!

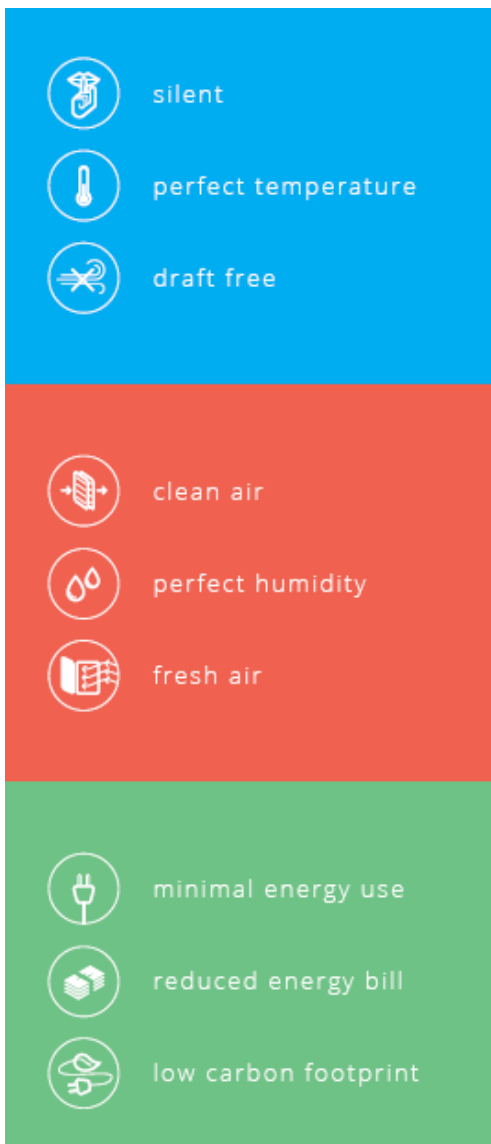
⁴ Somsen GA, van Rijn C, Kooij S, Bem RA, Bonn D. Small droplet aerosols in poorly ventilated spaces and SARS-CoV-2 transmission. Lancet Respir Med 2020)

⁵ Dr. van Doremalen, Mr. Bushmaker, and Mr. Morris. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. NEJM.org.

⁶ G. Kampf, D. Todt, S. Pfaender, E. Steinmann. Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. Journal of Hospital Infection

Please note that no scientific study has yet fully proven the infection rate through small droplets in the air, this has to do with the fact whether the small droplets carry enough virus particle to actually infect a person. This is also the reason why the 1,5m (or 6FT) distancing seems to be effective, because in that distance the larger particles will have fallen on the ground, while the smaller particles can easily travel the 1,5m, could carry to less virus to actually cause an infection, Before final proof is found, the safe suggestion is to treat these particles as potential infectious and ventilated occupied spaces.

This leads to the strong recommendation to welcome the hotel guests each and every time when they return to their room/villa in a well ventilated space. This will provide a much safer environment than a fully air conditioned room with no fresh air intake. The Evening Breeze functionality obviously provides the possibility to ventilate and let the healthy and fresh air in whenever the room is empty or occupied.

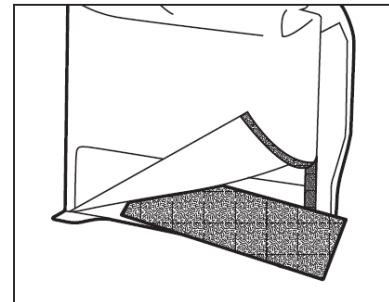


Picture 3. Evening Breeze bottom line

Filtration

Now what if we could filter out the virus. Therefore the air that contains the virus should first pass the filter station in the air handling unit. The standard Evening Breeze G4 filter is designed to filter dust and pollen; this is very good for the lungs and sleep, but does not protect against viruses. HEPA filters are for example designed for fine particle filtration, but will also have difficulties with the lower size spectrum of the viruses. This means filtration is helpful, but hard to find scientific proof for.

Evening Breeze continues to advise cleaning filters on a regular basis (2 to 6 times per year) and does suggest to clean filters between guests for the time being and until a proper vaccination program is executed. The filter that has been taken out can be washed and reused for 10 times.



Picture 4. Evening Breeze FILTER instruction

Disinfecting surfaces

Besides infection through air, there's a potential danger of infection through hand by touching contaminated surfaces and subsequently one's eyes, nose or mouth. Disinfecting hands and much used surfaces such as door handles, taps and light switches with a disinfectant should be the norm. This also holds for the Evening Breeze remote, which can be cleaned with all regular disinfectants as long as not used too wet. Other disinfecting surface treatment such as UV-light and Ozone might further add to a clean and safe room.

Washing the linen is also a form of disinfecting surfaces, but as a common routine out of the scope of this white paper.

Bottom line

Up and above the current hygiene regulations, we highly recommend to incorporate the following in your housekeeping routines, if not already incorporated:

1. Ventilate rooms as much as possible
2. Clean REMOTE and FILTERS between guests
3. Disinfect all hand touched surfaces