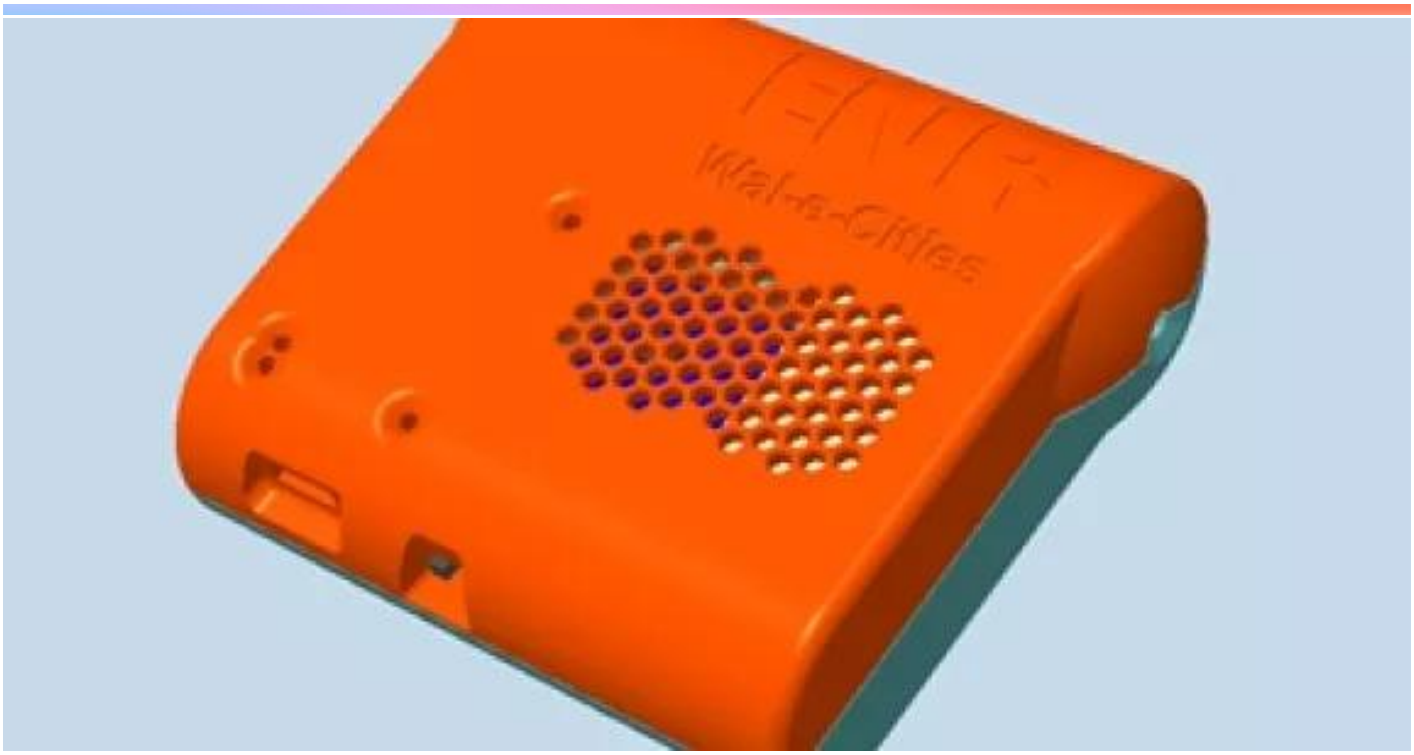


Sensor data analysis in the fight against indoor air pollution and COVID-19

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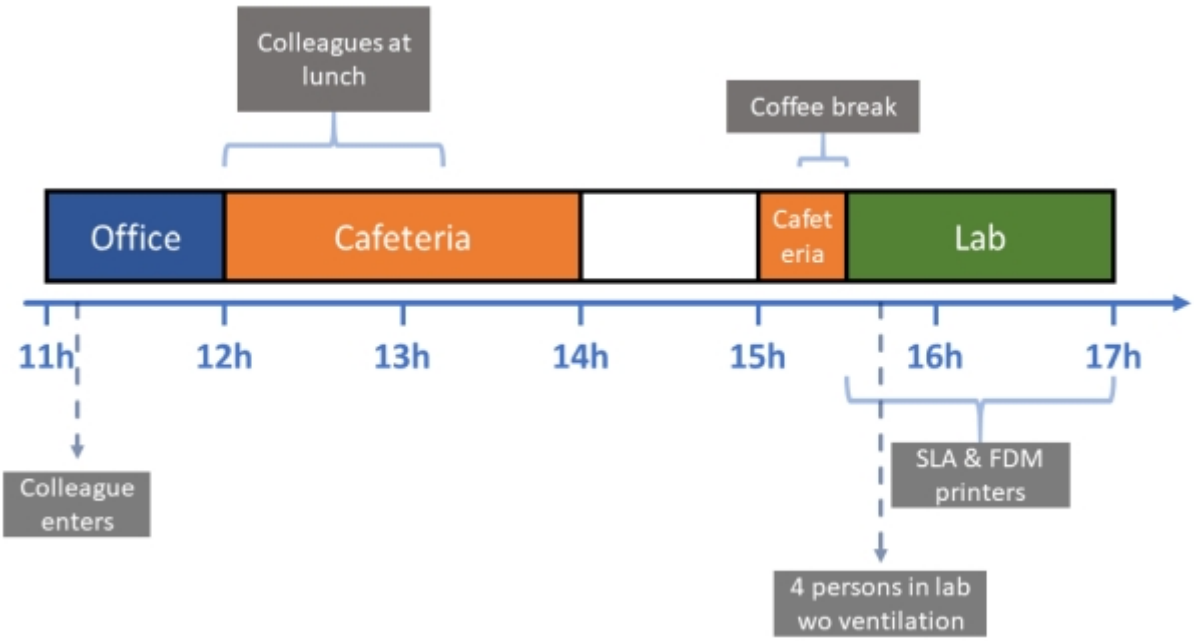
What is the influence of indoor air quality in the working environment on the performance and health of employees? Can this quality be improved in the fight against, for example, COVID-19 and for a safer and more productive working environment? We did our own research at our own premises and came up with some interesting findings.

Air quality is an important factor for the performance, concentration and even health of people during the performance of their work. The need to ventilate rooms is often underestimated and neglected, while creating a safe and productive environment for workers is a priority. Within this framework, the ERDF project Wal-e-Cities ENR focuses on monitoring indoor air quality through values such as CO2, temperature, humidity and VOC in the rooms visited by sensor users. The sensors and the network of beacons developed within the project are functional and needed to be tested in real conditions. Sirris made its premises in Seraing available for this purpose.

Triple test

The test goes as follows: the user wears the sensor during his working day. The air quality readings are correlated with the position in the building thanks to Bluetooth low energy beacons

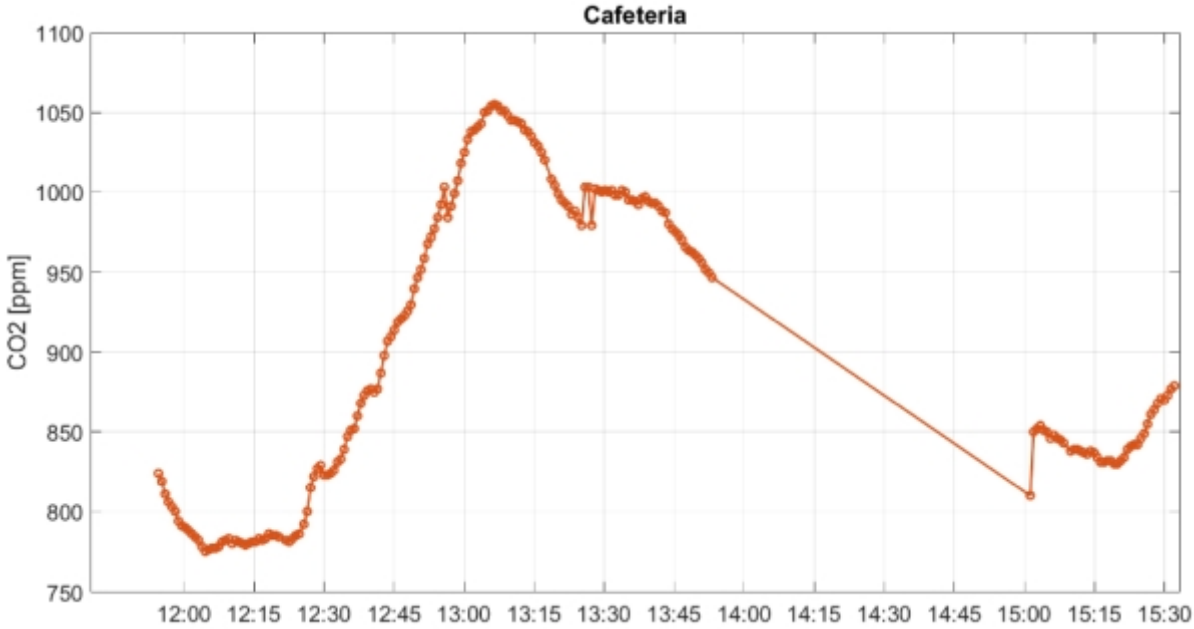
placed in relevant rooms. The test was conducted at Sirris in an office space, the cafeteria and a lab for 3D printing. The results were analysed afterwards. The user's location during the day was known and was summarised in a timeline containing the relevant events, so the data could be processed and the air quality in the three rooms analysed.



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From the analysis, variations in air quality and VOCs were detected depending on the number of people in the room and the activities: in the office environment, a CO2 peak could be detected on the curve when a second colleague was briefly present in the room. In addition, the air quality remained at a constant level of approximately 800 ppm, which is within the limits of indoor air quality according to the literature. If the CO2 concentration is too high, fatigue will set in, workers' concentration will drop and asthma sufferers may experience more symptoms. If the VOC values are too high, this can lead to eye irritation and headaches.

In the cafeteria, the CO2 concentration was evaluated at lunchtime and during the coffee break: the higher number of people in the room caused a sharp rise in the curve, but it quickly dropped again once they had left the room. This means that there is sufficient ventilation.



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The day ended with a test period in a lab equipped with 3D printers. The analysis demonstrated how the highly sensitive CO2 sensor registered a peak when four people were present. With the door open, the CO2 concentration quickly returned to normal levels. However, the VOC values were twice as high as in the office. Working with molten plastics, resins and chemicals therefore requires more ventilation.

Air quality and COVID-19

Infections with COVID-19 mainly occur indoors. Research also shows that air pollution could be a factor in the spread of the disease. Poorly ventilated rooms therefore have a real impact on the transmission of disease through the air, and so ventilation can contribute to a safer environment by reducing indoor contamination.

Tools such as those developed within the Wal-e-Cities ENR project can help detect ventilation needs and thus reduce the incidence of COVID infections in companies. Infections during the
r of infections in Belgium.

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