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Joint study by Messe Frankfurt and RWTH Aachen confirms safety of air quality in trade fair halls

Frankfurt am Main, 11 April 2022

Over the past two years, it has been virtually impossible to hold trade fairs, even though many exhibition halls in Germany have sophisticated ventilation systems in place. The health authorities operated on the assumption that, when people breathe, they emit potentially virus-infected aerosols in the same way they emit CO₂ and that this would lead to widespread infections with SARS-CoV-2.

This is why events in publicly accessible areas were not permitted to take place at first. The technical equipment and ventilation systems in our trade fair halls were not factored into the equation, even though the risk of infection can be reduced significantly through ventilation and air purification. A study conducted by Messe Frankfurt – together with a team of researchers from the Institute of Building and Indoor Climate Technology, E.ON Energy Research Centre, RWTH Aachen and Heinz Trox Wissenschaft gGmbH – examined the level of air contamination in typical trade fair halls and determined whether the air quality constituted a hygiene risk.

The study was conducted in the second half of 2021. Under the direction of Prof. Dirk Müller, contamination levels were measured at three trade fairs – Indoor-Air, Formnext and Food Ingredients (Fi) Europe – held in Halls 3 and 12 at Messe Frankfurt.



Indoor-Air, 5 to 7 October 2021, in Exhibition Hall 12 of Messe Frankfurt

As Uwe Behm, Member of the Executive Board of Messe Frankfurt, explained: “These new study results show that there was good air circulation in all of the halls under examination and at all three events, without any recognisable pockets of uncirculated air.

The concentrations of CO₂ at the individual measurement points varied only very marginally from those in the exhaust ducts, meaning that the mix of air is virtually ideal.” The measurements were taken in the supply air and exhaust ducts of the ventilation systems and with an additional 22 sensors in continuous operation during the events. These were positioned at visitor head height on columns, near aisles and stands, and in areas adjacent to the halls.

The concentration of CO₂ was taken as an indicator for the contamination of indoor air. This is because aerosols – which have been a key indicator in the pandemic and can be potentially infected with viruses – are emitted through breathing in the same way as CO₂. The aim should be not to exceed a CO₂ level of 1,000 ppm (parts per million). CO₂ concentrations above 2,000 ppm are considered hygienically unacceptable.

All CO₂ concentrations measured were consistently well under 1,000 ppm – in some cases, they were just over 400 ppm, which is almost on a par with outdoor air quality. With a maximum level of 835 ppm on the day with the highest number of visitors, it was also demonstrated that the fresh air volumes specified by Messe Frankfurt were sufficient to guarantee good and hygienically safe air quality on all days of the event. This means that, with additional safety and hygiene measures in place, it is possible to hold trade fairs safely even during a pandemic. When combined with further measures from an approved hygiene concept, there is no reason from a ventilation perspective why trade fairs should not be held. However, the air quality can and should be monitored continually by measuring the concentration of CO₂ in the air.

Link to study

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Your contact:

Markus Quint
Tel.: +49 69 75 75-59 05
press@messefrankfurt.com

Messe Frankfurt GmbH
Ludwig-Erhard-Anlage 1
60327 Frankfurt am Main

www.messefrankfurt.com

Background information on Messe Frankfurt

The Messe Frankfurt Group is the world's largest trade fair, congress and event organiser with its own exhibition grounds. The Group employs approximately 2,300* people at its headquarters in Frankfurt am Main and in 30 subsidiaries around the world. In 2021, the company had to contend with the challenges posed by the pandemic for the second consecutive year. Annual sales will be approximately €140* million after having been as high as €736 million in 2019 before the pandemic. Even in difficult times caused by the coronavirus pandemic, we are globally networked with our industry sectors. We serve our customers' business interests efficiently within the framework of our Fairs & Events, Locations and Services business fields. One of the Group's key USPs is its closely knit global sales network, which extends throughout the world. Our comprehensive range of services – both onsite and online – ensures that customers worldwide enjoy consistently high quality and flexibility when planning, organising and running their events. We are expanding our digital expertise with new business models. The wide range of services includes renting exhibition grounds, trade fair construction and marketing, personnel and food services. With its headquarters in Frankfurt am Main, the company is owned by the City of Frankfurt (60 percent) and the State of Hesse (40 percent).

For more information, please visit our website at: www.messefrankfurt.com

* Preliminary figures for 2021