

Indoor Environmental Quality in Sustainable Buildings at Fraunhofer IBP

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ABSTRACT

For good indoor environmental quality in sustainable buildings, we need innovative solutions that reduce energy consumption and the associated ecological footprint while promoting a healthy indoor climate.

In the field of ventilation, the Fraunhofer Institute for Building Physics (IBP) deals with various aspects of indoor air quality, energy efficiency and thermal comfort in buildings. This includes, among other things: Development and optimization of ventilation systems and components, air flow and air distribution, the investigation of air filter technologies, the analysis of thermal and acoustic comfort and the health effects of indoor air quality.

Air cleaning technologies are being developed to improve indoor air quality - as the coronavirus pandemic has shown in particular. To this end, we have developed procedures to evaluate the efficiency of devices in removing particles, allergens and pollutants from the air. At the same time, we are looking at noise generation and measuring the noise level under different operating conditions, as well as monitoring energy consumption of devices during operation.

When assessing the energy efficiency of buildings, ventilation is considered by aspects such as system efficiency, ventilation heat losses, air exchange rates, usage profiles, etc. To this end, we develop calculation algorithms such as the 'ibp18599kernel', which implements the assessment of the European requirements from the European Performance of Buildings Directive in Germany. In addition, we develop methods for life cycle analysis in order to record the environmental impact over the entire life cycle of ventilation systems and to integrate the required data basis, e.g. from environmental product declarations.

KEYWORDS

Indoor Environmental Quality, Sustainability, Indoor Air Quality, Air Cleaning, Energy Efficiency Assessment.