PRESS RELEASE

Moisture in Buildings – Highly Relevant All Over the World

Moisture management in buildings is a trending topic, as moisture related problems not only affect old buildings, but energy efficient new ones as well. In the United States, roughly 50 percent of all households reported the prevalence of dampness and mold. European households discovered these same issues, reporting them in about 20 percent of households. The Fraunhofer Institute for Building Physics IBP has conducted research in this field for many years, and is dedicated to solving to these problems by providing software, experience, and solutions to organizations such as ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers). With contributions of Fraunhofer experts, a new chapter on moisture management in buildings was developed for ASHRAE's *Handbook of Fundamentals*.

Energy efficient enclosures built in hot-and-humid climate zones often result in reduced dehumidification provided to interior spaces by air conditioning systems. Unfortunately, this can lead to serious hygienic consequences. In temperate climate zones on the other hand, increased airtightness, diffusion resistant insulation systems, and built-in moisture are causing moisture problems and mold growth.

Based on problems with excessively high or low humidity levels in buildings, the ASHRAE board of directors decided over ten years ago to establish a technical committee with the title of "Moisture Management in Buildings." Earlier in 2017, this same committee, under the lead of Prof. Hugo Hens (Emeritus KUL, Belgium) and with participation of the Fraunhofer IBP researchers Florian Antretter and Prof. Dr. Hartwig Künzel, authored a new chapter of the *ASHRAE Handbook of Fundamentals* devoted to moisture management in buildings. Given that the *Handbook* is the most popular book worldwide for the planning and sizing of HVAC equipment with reference to the building envelope, this collaboration with Fraunhofer IBP is a logical step towards furthering the practice of moisture management in buildings.

The many different causes for moisture-related problems in buildings are discussed in the new chapter, as well as the quantification of moisture sources and sinks. Prof. Dr. Künzel explains: "The new chapter highlights the crucial role of moisture storage in the interior surfaces of the building envelope and building interior – also called moisture buffering – for a healthy and comfortable indoor environment." The newly-included information will help architects and mechanical engineers, throughout the design process, to develop appropriate decisions based on hygrothermal building simulation. Fraunhofer IBP provides suitable tools with the simulation software WUFI® Plus and WUFI® Passive and supports users with accompanying trainings.

Head of Press and Public Relations
Silke Kern | Fraunhofer Institute for Building Physics IBP | Phone +49 711 970-3302 |
Nobelstr. 12 | 70569 Stuttgart | www.ibp.fraunhofer.de | silke.kern@ibp.fraunhofer.de

Background Information

The WUFI® Plus software computes the hygrothermal interaction between building components and indoor environment. Coupling hygrothermal component simulation with a dynamic building energy simulation allows for an integrated assessment of all interactions between the building envelope and its enclosed spaces while defining their implications on indoor environment, comfort and energy demand. For example, the software could be applied to the optimization of ventilation concepts for residential and office buildings, or for dimensioning of combined measures for passive and active indoor climate control (e.g. for new or historic buildings), and to prevent damage on building fabric and interior.

WUFI® Plus computes the hygrothermal conditions in building components and the indoor environment to avoid moisture related problems.
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Building physics is one of the keys to a successful building project. The **Fraunhofer Institute for Building Physics IBP** focuses its work on research, development, testing, demonstration and consulting in the various fields of building physics. These include noise control and sound insulation in buildings, the optimization of auditoria acoustics and solutions for improving energy efficiency and optimizing lighting technology. Fraunhofer IBP's work also covers issues of climate control and the indoor environment, hygiene and health protection, building material emissions, weatherproofing and protection against heat and moisture, preservation of building structures and the conservation of historic monuments.

For more information please contact:
Florian Antretter | Phone +49 8024 643-242 | florian.antretter@ibp.fraunhofer.de | Fraunhofer Institute for Building Physics , Holzkirchen branch | www.ibp.fraunhofer.de