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Improved simulation tools make building design planning more reliable

Too hot in summer, too damp in winter – architects, planners and builders are facing sizable challenges when it comes to creating durable buildings that save energy while offering healthy, sustainable indoor environments. To tackle these challenges, experts need to take full account of complex hygrothermal processes and interactions. WUFI® Plus and WUFI® Passive are user-friendly software programs that use sophisticated computer modeling to depict a building and its energy and hygrothermal behavior. Researchers from Fraunhofer IBP, who developed the software, recently released new and improved versions of both products. WUFI Plus 3.0 and WUFI Passive 3.0 introduce a number of significant improvements that meet the user requests. Many of the additional features can also be accessed via the new WUFI® Plus Free 3.0 and WUFI® Passive Free 3.0 versions – which are available at no cost online. As part of the launch of the updated versions, Fraunhofer IBP has revamped the <http://www.wufi.com/> website. It now offers even more extensive information on all the WUFI® software as well as sample applications, showing how the programs can be used.

“Building simulation is the future. It provides the platform for developing hygienic and comfortable zero-energy and energy-plus buildings,” says Florian Antretter, developer of WUFI Plus and WUFI Passive at Fraunhofer IBP.

Hygrothermal building simulations realistically reproduce the interactions between building envelopes, building services, types of use and user behavior. This enables experts to simulate various ventilation strategies and evaluate how these affect comfort levels within the room. It is also possible to compare a range of passive measures designed to reduce energy consumption (insulation, windows, storage masses, etc.).

In addition to analyzing the energy efficiency of components and buildings, it is equally important to look at their hygrothermal performance under different climate conditions. “In the long term, elevated levels of moisture in building components can lead to damage, and excessive surface humidity in living areas may provoke unhealthy mold formation. WUFI simulations identify weak points in the design and help to specify appropriate execution procedures as well as facility management guidance right from the planning phase,” says Hartwig Künzle, Head of Hygrothermics department at Fraunhofer IBP.

WUFI® Plus 3.0 and WUFI® Passive 3.0 offer a number of new and improved features. Using monthly-balance-based energy assessments, the passive house module speeds up

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the design of energy-efficient buildings. The methodology for designing and certifying passive houses has been revised by Fraunhofer IBP's U.S. partner PHIUS (Passive House Institute U.S.). The new passive house certifications is now climate specific. This climate specific metric has been fully implemented in the new versions of WUFI® Plus and WUFI® Passive, and can now be used to certify passive houses in the American market. Powerful simulation features now include dynamic, three-dimensional calculation of thermal bridges and an interzonal air flow model, including a blower door test simulation.

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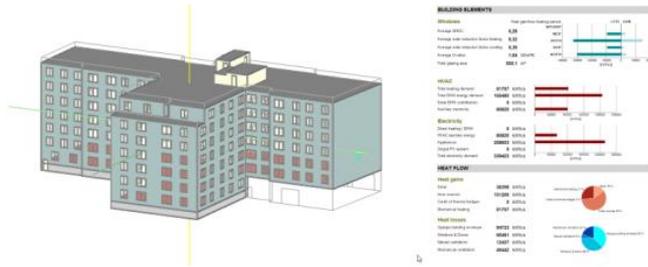
Furthermore, simulations of building systems and shading are visually displayed. Another module allows the user to assess and avoid possible overheating in summer at the design stage – avoiding problems that cannot be corrected later. With its user-friendly interface, a wide range of databases and interfaces, and an extensive choice of output formats for the results, the software helps users manage projects effectively.

The extended program functions are specifically aimed at planners, energy advisors, manufacturers of building materials and in fact anyone dealing with the wide-ranging issues surrounding new buildings and renovation projects, both residential and non-residential. Beyond these standard areas of application, the WUFI® programs are also employed in projects dealing with buildings far removed from standard usage, including historic buildings, cold storage units and swimming pools.

The new and improved WUFI® product website at <http://www.wufi.com/> provides extensive information on all the WUFI® software applications. It also offers helpful examples of how the programs can be used and includes links to manuals, demonstration videos and sample projects. Those looking for more information will find a wide array of specialist publications. The website is currently available in German and English; Chinese and other languages will follow soon. Thanks to the Institute's close collaboration with cooperation partners worldwide, users will find plenty of additional information in their own language.

The Fraunhofer IBP Hygrothermics department's many years of experience in experimental and numerical investigative techniques leaves it well positioned to comprehensively evaluate the energy properties of buildings and systems, and to advise on the climate-related protection of buildings against moisture. This wide-ranging wealth of expertise allows Fraunhofer IBP to continually meet the needs of the market when it comes to energy-efficient construction and to expand the range of solutions available. The various solutions that make up the WUFI® family are now used commercially in more than 40 different countries.

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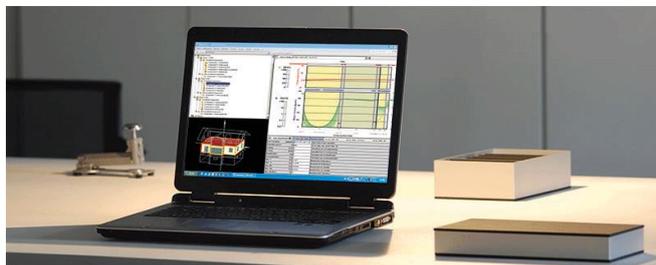


The new versions of WUFI Plus and WUFI Passive provide a comprehensive visualization of building energy balances.

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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.

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