

## PRESS RELEASE

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### Representing 20 years of building quality: the WUFI® family

**The WUFI® family of software products has something to celebrate: the release of the latest version, WUFI® Pro 6.0, nearly coincides with the software's twentieth anniversary, continuing the success story of this established and internationally recognized software. "The fact that we have been successful in this market for 20 years says a lot about our product. But the long-standing relationships with our international customers are also an important part of our success," says Dr. Hartwig Künzle, head of the Hygrothermics department at the Fraunhofer Institute for Building Physics IBP. In collaboration with his colleague Prof. Martin Krus, he developed the first version of the program in 1995. Focusing on different aspects, the two building physicists addressed the closely correlated issues of heat and moisture transport in building components. High moisture content causes increased heat loss and, conversely, temperature conditions affect moisture transport in building components. Investigating this mutual dependence and defining standards based on their findings laid the foundation for developing WUFI®.**

"Building damage has reached proportions that not only experts, but also the public consider alarming" – this quote by Germany's then Federal Minister of Transport, Building and Urban Development was cited in German weekly news magazine Focus in 1993. His estimates had put economic losses resulting from avoidable structural damage to private and public buildings in the billions of euros. According to the 1987 annual building damage report, the main causes were botched jobs in new construction, damage following faulty renovation of old buildings, and environmental influences. "Fraunhofer IBP responded to these problems more than 20 years ago when it began developing the WUFI® software products. This software tool was aimed at supporting designers, architects and construction companies in their day-to-day work," explains Prof. Klaus Peter Sedlbauer, director of Fraunhofer IBP. "Our outdoor testing site in Holzkirchen – the biggest one of its kind in the world – offered ideal conditions to scientifically underpin the calculations with data from this outdoor facility and from the lab. By continuously comparing measured and calculated data, a reliable method emerged for verifying the usability of a building, building product or design," he adds.

What makes WUFI® so unique? It's not just the user-friendliness it offers despite its complex mathematical models. The name WUFI® is an acronym for **W**ärme **U**nd **F**euchte **I**nstationär – which, translated, means transient heat and moisture transport. The software makes the basic principles and interactions involved in the heat and moisture transport in building components under natural climate conditions

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transparent. It conveys fundamental insights into processes taking place in building components, giving designers, architects and engineers crucial decision-making tools to ensure damage-free construction and renovation.

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Today, WUFI® has become an indispensable part of everyday design and construction processes for many offices and manufacturers of building materials. "In the first year, we sold WUFI® 1D to five customers. In the last few years, we've sold more than 3,000 licenses," says Dr. Hartwig Künzle, highlighting the product's success. The WUFI® family covers all aspects of hygrothermal simulation of building components and buildings. The program versions WUFI® Pro and WUFI® 2D assess whether a design guarantees damage-free condition in typical cross-sections and in such critical locations as the connecting sections of individual structural elements. WUFI® Plus and WUFI® Passive, in contrast, cover building simulation and place an additional focus on hygiene and comfort in the building interior.

Until just a few years ago, so-called dew point methods were the standard tools for evaluating the moisture balance of building components. However, it permits only a non-transient, i.e. highly simplified, assessment of the risk of condensation in winter. It doesn't account for such factors as building moisture, driving rain, rising damp, hygroscopic moisture or summer condensation. Hygrothermal simulation, in contrast, permits a realistic simulation of the transient heat and moisture conditions subject to the measured outdoor climate and actual use, and includes all of the above-mentioned effects. WUFI® thus allows a building component assessment from a moisture standpoint for any desired uses and climate boundary conditions – not just throughout the course of a year, but also long term over the lifetime of the building. It permits assertions regarding damage mechanisms such as frost, mold, dry rot, material fatigue, condensation formation inside and on the surfaces of building components, corrosion of metal parts, etc. WUFI® also allows building components and systems to be optimized for various applications and climate locations, and answers questions regarding the drying-out period of new building components or those that have been soaked through as a result of water damage.

WUFI® Plus examines the hygrothermal interactions between building components and indoor climate. Combining hygrothermal building component simulation with energy building simulation facilitates a holistic view of the interaction between the building envelope and the interior and how this affects indoor climate, comfort levels and energy demands. This software is used, for instance, in developing optimized ventilation concepts for homes and offices, or in designing combined passive and active indoor climate stabilization measures for museums or historic buildings in order to avoid damage to the building structure and the items on display.

Passive houses have very low energy demands. If the outdoor climate is subject to high dynamic fluctuation, or if the cooling and dehumidification of ambient air play a major role, then dynamic models are needed to adequately describe a building's hygrothermal behavior. Thermal and moisture storage masses can be measured more

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accurately to further optimize energy demand and prevent any limitations to comfort, such as overheating. Further, transferring highly insulated building components to other climate zones requires a dynamic hygrothermal assessment to ensure their condition remains damage-free. That's why, in 2012, Fraunhofer IBP and the Passive House Institute US (PHIUS) jointly developed WUFI® Passive, which, in addition to verifying that a building meets standard passive house criteria, also allows a hygrothermal simulation of that building.

The various products in the WUFI® family are now used by designers, manufacturers of building materials, construction companies and consultants, as well as in research and teaching at numerous educational institutions and universities, in more than 40 countries around the world.

To celebrate the software's twentieth anniversary, we are offering a 20 percent discount on all WUFI® products from October 15 to December 15, 2015.

For an overview of WUFI® products, please visit:

<https://wufi.de/en/software/product-overview/>

For more information on WUFI®, please visit:

<https://wufi.com/>

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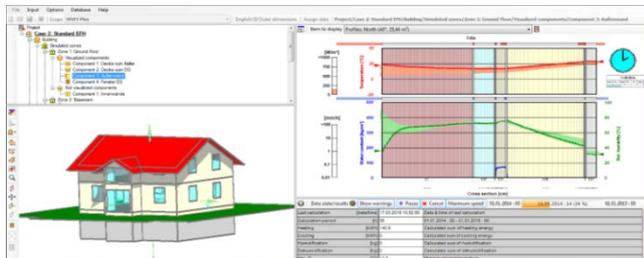


Since 20 years, WUFI is an established and internationally recognized software. Today, the WUFI® family has become an indispensable part of everyday design and construction processes for many offices and manufacturers of building materials.

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Screenshot of the building simulation software WUFI® Plus

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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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