



energies

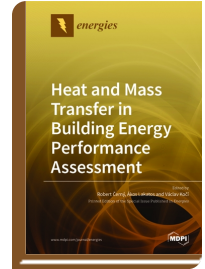


Special Issue Reprint

Heat and Mass Transfer in Building Energy Performance Assessment

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ISBN 978-3-03921-926-1 (Softback)
ISBN 978-3-03921-927-8 (PDF)

The building industry is influenced by many factors and trends reflecting the current situation and developments in social, economic, technical, and scientific fields. One of the most important trends seeks to minimize the energy demand. This can be achieved by promoting the construction of buildings with better thermal insulating capabilities of their envelopes and better efficiency in heating, ventilation, and air conditioning systems.

Any credible assessment of building energy performance includes the identification and simulation of heat and mass transfer phenomena in both the building envelope and the interior of the building. As the interaction between design elements, climate change, user behavior, heating effectiveness, ventilation, air conditioning systems, and lighting is not straightforward, the assessment procedure can present a complex and challenging task. The simulations should then involve all factors affecting the energy performance of the building in questions.

However, the appropriate choice of physical model of heat and mass transfer for different building elements is not the only factor affecting the output of building energy simulations. The accuracy of the material parameters applied in the models as input data is another potential source of uncertainty. For instance, neglecting the dependence of hygric and thermal parameters on moisture content may affect the energy assessment in a significant

conditions in the form of weather data sets representing the uncertainty of the outputs. In light of recent trends in climate change, it is increasingly important.



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This Special Issue aims at providing recent developments in laboratory analyses, computational modeling, and *in situ* measurements related to the assessment of building

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