

Hygic Material Properties of Porous Building Materials

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The erection of new buildings and the renovation and preservation of building structures and monuments require the quantification of the temperature, moisture, salt and pollution distribution in porous materials under actual climatic boundary conditions. The thermophysical modeling leads to a coupled non-linear differential equation system. The temperature T and the capillary pressure p_c will be used as driving potentials in this transport system. In order to solve the transport equation system with numerical methods the material function thermal conductivity $\lambda(w(p_c), T)$, capillary conductivity $K(w(p_c), T)$ and vapor conductivity $\delta(w(p_c), T)$ and the moisture retention function $w(p_c, T)$ are necessary. This paper will be focused on the determination of $w(p_c)$ and $K(w(p_c))$ in the isothermic case. The pore size distribution has been formulated by simple analytical functions with w_j (partial volume of the pore segment), R_j (mean radius of the pore segment) and n_j (shape parameter). Hence, it follows by integration the retention function and the moisture conductivity with the same parameters. The results will be compared with measurement results of different materials.