Abstracts

Time domain characterization of coupled electromagnetic/thermal phenomena for material processing

M. Righi, J.L. Herring and W.J.R. Hoefer. "Time domain characterization of coupled electromagnetic/thermal phenomena for material processing." 1998 MTT-S International Microwave Symposium Digest 98.3 (1998 Vol. III [MWSYM]): 1401-1404.

A time domain model based on the Transmission Line Matrix (TLM) method for the RF drying of wood in a vacuum kiln is presented. The model is capable of addressing critical issues for the material processing industry such as drying time, penetration of the electromagnetic field into the material and evaluation of critical location where arcing may occur. The control and optimization of all of these variables leads to a highly efficient drying process yielding dry wood faster and with a higher quality compared to traditional convection drying. In addition the modeling of mass transfer and heat diffusion processes allows us to monitor temperature and moisture pressure in the wood sample so that critical values are not exceeded.

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