

## THERMOKINETIC SIMULATION OF A HOT PRESS CYCLE IN THE PRODUCTION OF PARTICLEBOARD AND MDF

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### SUMMARY

It is fact that amino adhesive systems as they are widely used in the panel board production process cure and develop strength at rates that are highly dependent on the temperature conditions in the wood furnish mat being hot pressed. In this paper an approach is introduced to assess the degree of cure of adhesive systems by using thermokinetic simulation. Using Virtual Hot Press Software (vhp) as an analytical model describing various physical processes during a hot-pressing cycle, the temperature development within different particle mats has been simulated as a function of pressing parameters. On the basis of these simulated temperature conditions as a function of pressing time, the degree of cure of a variety of adhesives could be determined using a thermokinetic model derived from Differential Scanning Calorimetry (DSC) measurements. The chemical cure (exothermic energy) of two different commercially available adhesive systems has been monitored with DSC. A reaction model (multivariate non-linear regression) was fitted to the obtained data of exothermic energy values at different heating rates. The 'partial area' as evidence of the progress of the curing reaction can be determined with the reaction model. Consequently, the degree of cure could be predicted within well defined positions of wood furnish mats during the hot-pressing cycle.