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Title: A new methodology to evaluate the cure of resin-impregnated papers for HPL

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Abstract:

High-pressure laminates (HPL) are a multipurpose, high strength and value-added surface material for use on construction (facades, walls and flooring) and furniture sector. Standard HPL is obtained by the hot-pressing of an assembly of paper sheets impregnated with thermosetting resins (usually melamine-formaldehyde and phenol-formaldehyde) and normally is used for surfacing wood based panels (WBP). In the last years the production of HPL has increased and new products are being launch, such as: HPL produced with new resins, HPL with new functionalities (chemical resistance, wear resistance, UV resistance, etc.), compact HPL (high thickness).

The introduction of new resins and the incorporation of additives increase the interest on the development of a novel methodology to evaluate the cure of the resin-impregnated paper making possible to optimise both the impregnation (resin content, speed, temperature) and the hot-pressing (time, temperature, pressure schedule) stages.

Using ABES (Automated Bonding Evaluation System) equipment, a study on the curing conditions of several resin-impregnated papers and its impact on the performance of HPL, has been carried out. A new methodology is presented and applied to several different combinations of kraft, decorative and overlay papers and wood, selected to ensure higher fidelity to a real HPL under hot-pressing conditions. A kinetic model for the cure of impregnated papers was developed and its relation with current accepted curing mechanism is presented.