

7.2.2: Laminates and Coatings - Cold Temperature, High Pressure, and Modifications for Product Improvement

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Abstract:

High-pressure laminates (HPL), manufactured with paper and thermosetting resins, are a value-added product that has been increasingly used for home and commercial surfaces. Given the great interest in this type of product, the focus on the development of new products, with improved characteristics, is very important. Thus, it is intended to modify the surface of HPL, using polyurethane resins, to improve its chemical resistance.

The aim of this work was to develop a HPL with higher chemical resistance. The decorative laminate should have resistance to chemicals according to EN 438-2. In order to improve this property, melamine-formaldehyde resins with polyurethane based resin were combined. Combinations of the resins were used to impregnate unicolor paper and then dried in a forced air oven at about 140 °C. The impregnated paper was pressed, into a homogeneous board at 140 °C under a pressure of 40 bar.

The operating conditions used in production are very important and may influence properties of the laminates. This feature may be responsible for the superficial aspect of the HPL that presents in this case a less intense colour and small white spots.

The HPL that used the combination of polyurethane based resin and melamine resin showed the best chemical resistance. According to these results, it is possible to infer that the use of polyurethane based resin in the formulation of the impregnated resin increases laminate chemical resistance.

It is important to improve the superficial aspect of the laminate and future studies will be focused on other resin combinations and different operating conditions.

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