

## Poster Presentation

### Topic Area: Environmental Issues

#### Development of a LEED certified resin Poster # 27

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A challenge to the wood-based panels (WBP) industry has been the production of particleboards with, in addition to good overall performance, very low formaldehyde emission. This restriction is associated to the recent formaldehyde classification by IARC (International Agency for Research on Cancer) as “carcinogenic to humans (Group 1)”. However, a new important challenge has been recently imposed by the LEED (Leadership in Energy and Environmental Design®) certification, implying the absence of adhesives with urea-formaldehyde chemical bonds in “Green Building” construction. LEED certification promotes sustainable buildings that meet a set of environment preservation and human health quality goals. Minimizing indoor air contamination associated to substances that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants is one of the objectives. In this context, possible alternatives to urea-formaldehyde (UF) resins are melamine-formaldehyde (MF), melamine-phenol-formaldehyde (MPF) and phenol-formaldehyde (PF) resins. The main purpose of this study is to develop a PF resin for particleboard production that satisfies formaldehyde emission restrictions and LEED criteria.

In this work, the mechanical performance and formaldehyde emissions were optimized changing the most important synthesis variables, such as the condensation pH and the final F/P molar ratio. Several additives were also tested in order to improve the reactivity of these resins.

A main conclusion was that combination of a PF resin with an additive is essential to simultaneously achieve appropriate internal bond strength and reasonable board pressing times.