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Bonding performance of sucrose fortified amino polymers for wood-based panels

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Urea-formaldehyde (UF) resins are the most used binders in wood-based panels industry. Their high reactivity, excellent adhesion to wood and low price are the reasons for the widespread acceptance of these adhesives [1]. Nevertheless, these adhesives present a disadvantage of formaldehyde emission. However, neither the new bio nor no-added formaldehyde (NAF) adhesives developed have similar performance when compared with amino-formaldehyde polymers. In addition, recent developments in synthesis protocols and reinforcement of polymeric matrix with additives such as melamine [2] or sucrose [3] have shown that it is possible to produce wood-based panels with very low emission formaldehyde. Costa *et al.* [3] have studied the effect of sucrose on polymeric structure of amino-formaldehyde adhesives. ABES equipment [4] has shown an excellent ability for evaluating the bonding performance of UF adhesives [5]. In this work, it is present the strength development characteristics of UF adhesives fortified with sucrose using ABES and the physico-mechanical characterization of particleboards produced using these adhesives, as well as their formaldehyde emission. These results seem to indicate that UF resins are still an interesting solution for low formaldehyde emission wood-based panels.

[1] M. Dunky, *Int J Adhes Adhes.*, 18, 95 (1998)

[2] N. Paiva *et al.*, *J Appl Polym Sci*, 124, 2311 (2012)

[3] N.A. Costa *et al.*, The role of sucrose in amino polymers synthesized by the strongly acid process (submitted)

[4] P. Humphrey, US Patent 5176028 (1993)

[5] N.A. Costa *et al.*, Simp46 (Ref: 324611R), CLME'2011 Maputo, Mozambique (2011)