Physico-mechanical properties of particleboard made from seaweed adhesive and tapioca starch flour

ABSTRACT

Flour acted as filler was added into adhesive formulations in industry and it affects the performance of adhesive. Seaweed was chosen to act as adhesive as seaweed produces glue that can attach very strongly to the rocks despite the presence of contaminants. This study was conducted on physical and mechanical properties of particleboard by adding different percentages of tapioca starch flour (0%, 25%, 50%, and 75% based on solid basis) into seaweed adhesive formulation. 100% urea formaldehyde was used as control in the production of particleboard. The particleboards were cut and tested based on JIS A5908. The moisture content was lowered from 11.00 to 8.45% when 25% tapioca starch flour rose to 75% when added into seaweed adhesive. Thickness swelling declined from 40.18 to 26.55% and water absorption from 192.25 to 96.21% when 75% tapioca starch flour was added. Hence, it improved the physical properties of particleboard. Meanwhile, the mixing of higher percentage of tapioca starch flour into seaweed adhesive contributed a higher value of modulus of rupture, modulus of elasticity and internal bonding. In a nutshell, mixing higher percentage of tapioca starch flour in seaweed adhesive improved the physical and mechanical properties of seaweed adhesive in particleboard.