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Production Technology for Strand-Particle Board (SPB) III. Effect of isocyanate adhesives (EMDI) on physical properties and blisters

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Abstract: A strand-particle board (SPB) was manufactured using unoriented strands for the surface layers and unoriented particles for the core layer. Todomatsu (*Abies sachalinensis*) strands, recycled waste wood particles, and emulsifiable methylene diphenyl diisocyanate (EMDI) as a resin adhesive were used. The effect of resin content (3 and 6%), surface moisture content (5, 10, 15 and 20%) and press temperature (170, 200 and 230°C) on physical properties, and the effect of resin content (10%), surface moisture content (20%) and press temperature (170, 200 and 230°C) on blisters were investigated using laboratory boards. The results are summarized as follows :

- 1) A suitable manufacturing condition for the EMDI bonded SPB was found to be a press temperature of 230°C, a resin content of 6%, and a surface moisture content of 15%. This condition produced the most superior properties, namely a board density of 0.62 g/cm³, an internal bond of 0.93 MPa, a modulus of rupture of 43.1 MPa and a thickness swelling of 1.9%.
- 2) There were blisters in surface strand layers of all manufactured boards when surface moisture content was 20%.
- 3) It was supposed that the carbon dioxide generated by the reaction of EMDI and water influences blisters and physical properties.

Keywords: MDI, structural panel, wood from thinnings, construction waste wood, blister



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