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ONLINE ISSN : 1880-7577

PRINT ISSN : 0021-4795

**Mokuzai Gakkaishi**

Vol. 52 (2006) , No. 4 p.235-240

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## Inventory Analysis of Adhesives Used for Wood Based Materials

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(Received July 30, 2005)

(Accepted December 26, 2005)

**Abstract:** Five popular adhesives of urea resin (UF), melamine-urea cocondensed resin (MUF), phenol resin (PF), phenol-resorcinol resin (PRF), and aqueous polymer isocyanate (API) for wood based materials were analyzed by the inventory analysis. It was calculated that energy consumption and emissions of CO<sub>2</sub>, NO<sub>x</sub> and SO<sub>x</sub> for production of 1 kg resin using unit processes from oil drilling for material's production to resin production. It became clear that MUF and PRF consumed the largest amount of energy and exhausted maximum amount of SO<sub>x</sub> among five adhesives. On the other hand, UF consumed the least energy and exhausted minimum SO<sub>x</sub> which are equivalent to the range of 57 and 67 percents of those of MUF and PRF, respectively. PF and API were recognized to be medium ones among five adhesives analyzed. CO<sub>2</sub> and NO<sub>x</sub> emissions of API were remarkably large in such a condition that these amounts were more than six times as long as other resins. It was highly recommended that environmental loads of an adhesive should be judged by not the weight unit but the functional unit in case of life cycle assessment of wood based materials.

**Keywords:** inventory analysis, formaldehyde resin, phenol resin, resorcinol resin, aqueous polymer isocyanate

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To cite this article:

Yukinobu Sawada, Keisuke Ando, Nobuaki Hattori and Yasuo Tamura: Mokuzai Gakkaishi  
Vol. 52, No. 4, 235-240 (2006) .

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doi:10.2488/jwrs.52.235

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