



H'ng Paik San

IUFRO Division 5 Conference

IUFRO D5.05 Session D

(Composites Science)

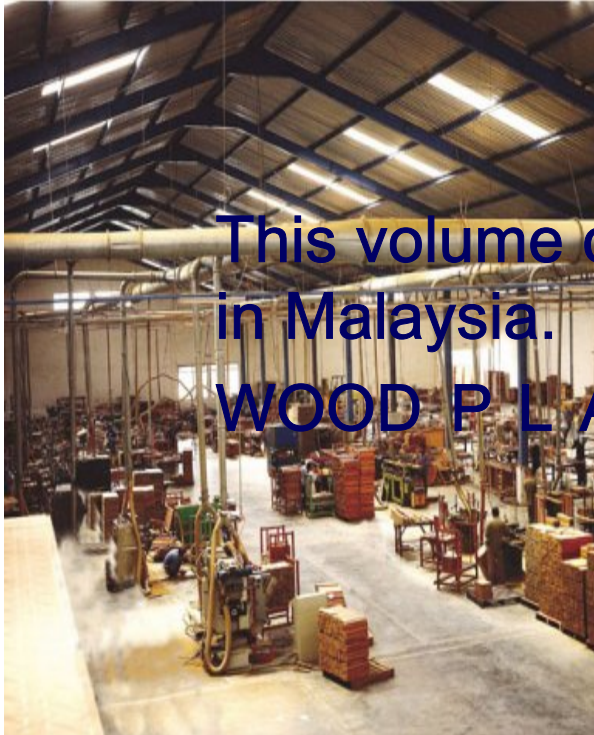


H'ng Paik San*, Yeoh Beng Hoong, Teo Seow Chian and Yeoh Poh Hun

PROPERTIES OF WOOD SAWDUST/POLYPROPYLENE COMPOSITES

*Department of Forest Production, Faculty of Forestry
Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia
*Corresponding author: Tel: +603-89467189 Fax: +603-89432514
email: ngpaiksan@putra.upm.edu.my*

Background



This volume can supply to a new wood based industry in Malaysia.

WOOD P L A S T I C COMPOSITE



- Estimated 1 million
- The saw account



timber used in these factory =
300 fu
ing an
plants
sawtim





AIM OF WORK AND METHODS

- This study is carried out to determine the application of wood waste (sawdust) as a substitute for wood flour in the production of WPC.
- The sawdust was obtained directly from furniture processing mill without any refining process.
- The sawdust was sieved into 40 mesh size wood flour and dried to 4% moisture content.
- The flours, polypropylene (PP) and maleic anhydride (MAH) are mixed and then molded into desired shape.
- Variables in this study; wood to plastic ratio and MAH percentage.



RESULTS

Table 1: Dimensional stability of wood plastic composites

Wood loading, % w/w	MAH %w/w	24-hours water soak		2-hours water boil		Physical Variation From 50% to 90% relative humidity		
		Water Absorption (%)	Thickness swelling (%)	Water Absorption (%)	Thickness swelling (%)	Water Absorption (%)	Thickness swelling (%)	Linear Expansion (%)
		Unfilled PP	0	0.05	0.09	0.04	0.18	0
20	0	0.13	0.41	0.59	0.62	0.14	0.48	0.01
40	0	0.48	0.7	1.99	1.18	0.38	0.56	0.01
20	3	0.12	0.45	0.61	0.55	0.12	0.34	0.01
40	3	0.31	0.8	1.82	1.12	0.39	0.35	0.01
20	6	0.1	0.19	0.66	0.61	0.13	0.34	0.01
40	6	0.3	1.05	2.4	1.26	0.36	0.35	0.01

Table 2: Bending Properties of wood plastic composites

Wood Loading (%)	Modulus of Rupture		Modulus of elasticity	
	Dry (MPa)	wet (MPa)	dry (MPa)	wet (MPa)
20	46.8 ^a	45.4 ^a	2015 ^b	1922 ^b
40	35.6 ^b	37.2 ^b	2324 ^a	2310 ^a



Conclusion

- Wood plastic composite can be produced directly from furniture processing sawdust.
- The WPC using sawdust as filler in this study produced similar result with other research using commercial filler.
 - Different wood flour loading will affect the bending properties and dimensional stability.