

## A NOTE ON WEATHER-O-METRIC STUDIES ON CHIR WOOD-STYRENE COMPOSITES

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### Summary

Weathering characteristics of chirwood-styrene composites were studied in Twin Arc Weather-O-Meter. After 1000 hr exposure, except for slight surface roughening, there was no defect in the composite samples. However, marked surface-checking was observed in the control samples.

### Introduction

Work has been carried out by various workers[1-4] to improve the properties of various woods by preparing their composites with different liquid monomers. Investigations carried out in this Institute have shown that such composites prepared by thermocatalytic technique from chir wood (*Pinus roxburghi*), and styrene exhibit marked improvement in strength properties and dimensional stability in comparison to control wood. However, not much work has been reported on the weathering behaviour of these wood-plastic composites.

A major drawback in wood for its use in external locations is its poor weatherability. Sedziek, *et al*[5] and Autio, *et al*[6] have claimed better surface properties for the composite during outdoor weathering. Therefore, it was thought worthwhile to study the behaviour of chir wood-styrene composites during accelerated weathering and the present communication describes the results of the same.

### Experimental

Samples of chir wood of the size  $10 \times 2.5 \times 2.5$  cm were dried to a constant weight at  $50^\circ\text{C}$  and dimensions were measured. The samples were immersed in styrene having 0.2 per cent benzoyl peroxide by weight. After keeping the samples in the monomer system for 24 hr, they were wrapped in the polyethylene sheet and cured for 12 hr in an oven at  $80^\circ\text{C}$ . The samples of the treated and un-

treated wood were exposed in a Twin Arc Weather-O-Meter for 1000 hr with cycles of 18 minutes of light and water spray followed by 102 minutes of light only. The samples were examined periodically for any surface deterioration.

### Results and Discussion

On exposure to 200 hr in the Weather-O-Meter, no defect was noticed in the composite as well as in untreated samples. However after 500 hr surface roughness in untreated samples was recorded while the composite samples were in good condition. After weathering up to 750 hr surface checking in the control samples was observed and in the treated wood surface roughness appeared. In 1000 hr surface checking of untreated wood had increased. In a few samples slight end splitting was also observed. However, in the composite samples the extent of surface roughness was the same as was observed after 750 hr.

The improvement in the weathering behaviour of the composite systems might be due to the fact that they contain polymer in the lumen[7]. Therefore, the moisture diffusion in the cell walls is reduced to a great extent. This reduced rate of moisture movement increases the stability of the wood-plastic composites in comparison to untreated samples.

### Acknowledgement

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References

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