

EFFECT OF SUN DRYING ON THE PROPERTIES OF SHEET RUBBER

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George, K.M., Thomas, K.T., Joseph, S. and Nair, B.R. (2002). Effect of sun drying on the properties of sheet rubber. *Indian Journal of Natural Rubber Research*, 15(2) : 129-136.

Drying is one of the most critical steps in the processing of latex into dry forms of natural rubber. Sheet rubber, which predominates the Indian rubber market, is conventionally dried in smoke. However, owing to various constraints, many small growers resort to at least partial drying in the open sun. In the present study different modes of sun drying are compared with smoke drying. The effect of ultra-violet light on the raw rubber properties has also been studied. It is observed that Fo, Mooney viscosity and gel content increase while PRI decreases as a result of sun drying. The results indicated that unless exposed to sun for prolonged periods, the raw rubber and the breakdown properties are not affected significantly. A slight over-exposure of sheet to direct sunlight will not adversely affect the initial vulcanizate properties of the rubber but its ageing properties are found to be inferior.

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Key words: Breakdown behaviour, Sheet rubber, Sun drying, Technological properties

INTRODUCTION

More than 70 per cent of the natural rubber latex produced in India is processed as sheet rubber. A major share of the production is by the small growers. The methods of processing adopted by the individual growers may differ and this could be reflected in the properties of the sheet rubber.

Drying is one of the most critical operations in the production of sheet rubber. Smoke drying is practised conventionally and the creosotic materials present in smoke impart a limited short-term protection against fungal attack. Further, smoke drying is quicker than open sun drying (Thomas, 1971). The consumption of firewood for drying of sheet rubber is reported to be 1 kg per kilogram of rubber (Edgar, 1958). However, the low availability of firewood has recently become a constraint. In order to reduce the cost of drying and also to improve the quality of crepe rubber, solar heating was proposed as an alternative method (Walpita *et al.*, 1984). Experiments with smoke house fitted with solar panels showed that there could be a saving in fire-

wood to the extent of 60 to 70 per cent by using solar-cum-smoke dryer (Nair *et al.*, 1988). But the capital expenditure on installation of solar panels is comparatively high.

It is a usual practice in smallholdings to resort to varying extents of direct sun drying of sheet rubber. Mostly sun drying is limited to the initial one or two days while in some cases it may be extended even to the complete drying period. There have been contradictory reports on the effect of direct exposure of natural rubber to sun. O'Connell (1966) reported that sunlight has a deleterious effect on all grades of natural rubber and even a few hours' exposure can seriously affect the properties of the rubber. It has also been reported that direct exposure of wet sheets to sunlight does not affect the dynamic properties of the rubber (Tan *et al.*, 1977). Tillekeratne *et al.* (1995) reported that complete sun drying of sheet rubber does not adversely affect its physical or vulcanizate properties. The present study is carried out to assess the effect of sun drying on the raw rubber properties, mastication characteristics and processing properties of sheet rubber.