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STUDIES ON MICROCELLULAR SOLES BASED ON NR-EVA BLENDS

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Blends of natural rubber (NR) and ethylene vinyl acetate copolymer (EVA) were evaluated for technological properties relevant to microcellular sheets for hawai sandals. The effects of blend ratio and loading of precipitated calcium carbonate and china clay on the cell structure and technological properties were studied. The results indicated that with increase in the proportion of EVA in the blend, abrasion resistance, split tear strength, compression set and shrinkage were increased. The pattern of the microcells changed with EVA content of the blend and this was found to influence the properties. Between china clay and calcium carbonate the latter imparted higher split tear strength and expansion and lower compression set and abrasion resistance.

Key words: Natural rubber, Ethylene vinyl acetate, Blends, Microcellular sole, Cell structure.

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INTRODUCTION

Various types of polymers and their blends are used in footwear to achieve specified combination of properties such as light weight, wearing comfort, stiffness and durability (Duttagupta, 1975; Preyer, 1955; Varkey *et al.*, 1989; Holc, 1970). Though the wear and tear properties of microcellular solings cannot match those of a high quality solid material, they are light and therefore comfortable to wear and usually have high flexural strength. Conventionally a blend of natural rubber (NR) or styrene-butadiene rubber (SBR) with high styrene resin, SBR 1958, is used for making microcellular soles. SBR 1958 improves hardness, stiffness, abrasion resistance etc. of microcellular soling. Supply of styrene for the production of SBR is reported to be decreasing (Elliot, 1974). Attempts have been going on to develop a substitute for SBR 1958 in footwear application. Thermoplastic polyurethane and plasticised polyvinyl chloride have already made in- roads into this field. A promising alternative for SBR 1958 in microcellular soles appears to be ethylene-vinyl acetate copolymer (EVA) which possesses an overall balance of properties. EVA has excellent stress crack resistance, flex resistance and weather resistance compared to SBR 1958 and other polymers such as 1,2 polybutadiene. The present work attempts to evaluate the effect of

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