

FACTORS AFFECTING TRANSPARENCY OF NATURAL RUBBER LATEX FILMS

N. M. Claramma,, K. Mariamma George and N. M. Mathew

Claramma, N. M., Mariamma, G. K. and Mathew, N. M. (1990). Factors affecting transparency of natural rubber latex films. Indian J. Nat. Rubb. Res. 3(2) : 102-110.

The different factors affecting transparency of films made from natural rubber latex have been investigated. The effect of sulphur, zinc oxide, oil, antioxidant, fillers, viscosity modifiers, coagulants, type of latex and humidity were studied. As sulphur dosage is increased, transparency of NR latex film increases, reaches a maximum and then decreases. The presence of zinc oxide in the film decreases transparency. The particle size of zinc oxide affects transparency of the film. Paraffinic oil and styrenated phenol type antioxidant do not affect transparency of the films. Fillers decrease transparency considerably. Centrifuged latex and creamed latex give comparable transparency to the film. Clarification of prevulcanized latex and heat treatment of the film substantially improve transparency especially when clarification is done by centrifuging. Exposure of the films to a humid atmosphere decrease transparency. Films made by straight dipping are more transparent than those made by coagulant dipping.

Key words - Natural rubber, Compounding ingredients, Prevulcanized latex, Coagulants, Fillers, Viscosity modifiers, Antioxidants.

N. M. Claramma (for correspondence), K. Mariamma George and N. M. Mathew, Rubber Research Institute of India, Kottayam-686 009, India.

INTRODUCTION

Latex mixes, which yield transparent films on drying, are often preferred for products like rubber band, certain types of gloves, tubing, teats and soothers although transparency is not an important technological property for rubber products. Production of transparent rubber articles requires special attention in the choice and proportion of compounding ingredients. Fillers for transparent products should have an index of refraction very close to that of rubber as otherwise the filler particles may cause opacity to the finished product. Sulphur, accelerators, activators, etc. used in latex compounding also have marked influence on the transparency of the product.

Studies on transparency of vulcanizates from dry rubber have been reported (Johnson and Scott, 1943; Wolf, 1957; Wolf and Stueber, 1960; Mari *et al.*, 1980). The effect of formulation on the dry film transparency of prevulcanized latex has been reported by Gorton (1979). Latex films prepared using the activator/accelerator complex FIC 3/5, are reported to have higher transparency than those obtained using zinc oxide (Gorton, 1988).

In the present work various factors affecting transparency of films made from NR latex have been investigated with a view to designing formulations and developing manufacturing techniques which will render maximum transparency.