Rubber Science, **30**(1): 82-93, 2017 RESEARCH ARTICLE

NATURAL RUBBER LATEX BASED CONTACT ADHESIVES

A. A. Shybi, Siby Varghese and Sabu Thomas*

Rubber Research Institute of India, Kottayam-686 009, Kerala, India
*School of Chemical Sciences, Mahatma Gandhi University, Kottayam-686 560, Kerala, India

Received: 17 March 2017 Accepted: 19 April 2017

Shybi A. A., Varghese, S. and Thomas, S. (2017). Natural rubber latex based contact adhesives. *Rubber Science,* **30**(1): 82-93.

Renewability and environmental friendliness impart natural rubber latex-based adhesives a greener outlook. The main objective of this study was to investigate the role of dry rubber content and the size of rubber particles in the latex on the adhesive properties of ammonia preserved natural rubber field latex as contact adhesives for bonding leather specimens. Both peel strength and shear strength of field latex adhesive were tested. It was found that adhesive strength of field latex was increased with dry rubber content (drc) and maximum strength obtained was for 45 per cent drc latex. The effect of particle size and proteins on the adhesive properties of natural rubber latex was confirmed by comparing the adhesive peel strength of centrifuged latex and its combinations with skim latex, field latex *etc.* Role of various compounding ingredients and tackifier resins on the peel strength of natural rubber latex at various ageing conditions was also studied.

Key words: Adhesive, Dry rubber content, Natural rubber latex, Non-rubber constituents, Peel strength

INTRODUCTION

Natural rubber (NR) latex based adhesives have great potential due to their renewability and environment-friendliness. NR is used in adhesive industry either as its naturally occurring form as latex or as its dry solid form dissolved in a suitable solvent (Palinchak and Yurgen *et al.,* 1962; SBP, 1979; Wake, 1974). Natural rubber latex based adhesives are superior to their rubber solution adhesives mainly because of low toxicity and inflammability, higher water and solvent resistance, reduced cost, provision for varying viscosity and total solid content (Blackley, 1997 a; Simon, 1962). Natural rubber latex based adhesives are mainly used for bonding flexible and porous materials like leather, paper, textiles, and has a large contribution in pressure sensitive adhesives (Puddefoot, 1948; Shields, 1970; Adams *et al.*, 1998; Shalub *et al*., 1999). Both the adhesive and cohesive properties of NR latex help the adhesive to function as an excellent bonding agent for joining either similar or dissimilar adherends.

NR based adhesives are well known for their tackiness which involves the ability of two dried adhesive films to form a bond of measurable strength upon immediate contact with each other (Northeast, 1959; Palinchak and Yurgen 1962). This auto-

Correspondence: Siby Varghese (siby@rubberboard.org.in)