

**EFFECT OF RESORCINOL FORMALDEHYDE IN
ENHANCING THE ADHESION BETWEEN
POLYESTER SHELL AND POLYMER TO REDUCE
WASTAGE IN THE GLOVE INDUSTRY**

A dissertation submitted to the
Faculty of Animal Science and Export Agriculture
Uva Wellassa University
In partial fulfillment of the requirements for the award of
Bachelor of Science in Palm & Latex Technology and Value Addition

By
**KALUPAHANA GIRANGALAGE DUSHAN CHAMIKARA
PERIES**

Palm & Latex Technology and Value Addition Degree Programme

Faculty of Animal Science and Export Agriculture

Uva Wellassa University of Sri Lanka

2014

ABSTRACT

Waste management is a very popular topic in the every industry of the world. Industrial waste is the waste produced by industrial activity. In supported glove, accumulation of waste is a very wide brainteaser. Supported gloves are made by dipping a knitted or woven cloth liner into a liquid glove compound such as natural rubber or neoprene. Polyester shells are popular in supported glove manufacturing. Most in the cases the shell and latex is not bind together well. This poorly bind causes to delamination of the glove. Because of the delamination, these gloves are rejected. So industrial wastage have increased such as gloves, polymer, compounds and the polyester shell.

Resorcinol-Formaldehyde (RF) is a chemical system used to bond polyester to rubber. RF adhesive systems have focused on the relationship between RF compositions and the resulting adhesion of the dipped cords to rubber. The main role of the adhesive is to prevent separation at the cord-adhesive and rubber-adhesive interfaces, and within the adhesive itself.

The main objective of this research is reduce the industrial waste of the polyester glove manufacturing industry by adhesion improvement between polyester shell and the rubber compound. Resorcinol formaldehyde was used as the adhesive and to prepare resorcinol formaldehyde. Resorcinol and formaldehyde were mixed with five ratios as 1:1, 2:1, 3:2, 2:3, and 1:2. Each resin formulation was diluted as 2%, 4%, 6%, 8%, and 10%.

There is a significant adhesion improvement when using resorcinol formaldehyde as the gum between polyester shell and the rubber compound without compromising EN-388 mechanical standards (tear, punch, cut, and abrasion) typical glove. Overall results indicate that there is an improvement of adhesion between polyester shell and the rubber compound. Based on ANOVA there was a significant difference ($p < 0.05$) between resorcinol and formaldehyde when use 2:1 ratio 4% percentage.

With the improvement of adhesion properties, the wastage of rubber compound, polyester and the final product can be reduced as well.

Key words: Industrial waste, polyester shell, resorcinol, formaldehyde, adhesion, EN-388 mechanical test