

**OPTIMIZATION OF SULFER: ZINC OXIDE:
ACCELERATOR RATIO FOR NATURAL RUBBER
LATEX UNSUPPORTED GLOVES**

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By
**NANAYAKKARAWASAM CARIJJAWATHTHAGE
YASHIKA KITHMINI**

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Uva Wellassa University of Sri Lanka

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ABBSTRACT

Glove is one of most important export products which holds a significant place in rubber latex dipping industry in Sri Lanka. Different chemical ingredients are incorporated with centrifuge latex in compounding for glove production. Among them, the ratio of S, ZnO and accelerator plays an important role on vulcanization rate and the properties of the end product. The existing ratio which used in the glove industry is identified as having some wastage of above ingredients. Therefore, an investigation was carried out to optimize the S, ZnO and accelerator ratio while maintaining same physical properties in natural rubber latex unsupported gloves.

The dispersions of 50 % Zinc Oxide, 50 % Sulfur and 50 % Accelerator were prepared successfully. Nine compounds including the control were prepared by changing the ZnO, Sulfur and accelerator ratio within the selected minimum and maximum limits while all the other ingredients are constant. The existing compound was used as the control and the physical properties of finished gloves; Tensile strength, Elongation, Force at Peak were measured.

The results indicated a significant effect of different amount of dispersions on the physical properties. The experiment 04 was identified as the best treatment which resulted the best tensile strength ($>17 \text{ Nmm}^{-2}$), elongation ($>700 \%$) and force at peak ($>7 \text{ N}$) compared to the specifications of the properties of natural rubber latex disposable gloves. The cost of glove production was successfully reduced by eliminating the excess amount of ingredients in the selected compound while maintaining the properties as well.

Key words: vulcanization rate, Physical properties, Unsupported gloves, Dispersions, Tensile strength, Elongation, Force at Peak