

**EFFECT OF STORAGE CONDITIONS ON
VISCOELASTIC PROPERTIES OF
CREPE RUBBER**

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Addition

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ABSTRACT

Latex crepe rubber is one of main raw natural rubber types produced in Sri Lanka. Rubber as a viscoelastic material, it consists with both viscous and elastic properties. Viscoelastic properties of raw rubber influence the processability of a rubber compound. Even though Sri Lanka is the leading manufacturer of latex crepe rubber, converting crepe rubber into products is carried out in other countries and as a result, manufactured crepe rubber should be kept under storage conditions prior to processing. The objectives of this study were to study the effect of storage conditions on the viscoelastic properties of raw crepe rubber, viscoelastic properties of compounded crepe rubber and the effect of the non-rubber content on viscoelastic properties of crepe rubber. Two factor factorial design was employed as the statistical design of the study. Fractionated Bleached (FB), Un-Fractionated Un-Bleached (UFUB), Yellow Fraction (YF) were considered as three different grades of crepe rubbers. These crepe rubber were stored at different temperatures such as 2 °C, 22 °C, 30 °C and 40 °C. Samples were drawn in every two weeks interval up to six weeks and analysed for viscoelastic behaviour by analysing Mooney viscosity and stress relaxation. Plasticity Retention Index (PRI) and un-aged plasticity (P_0) of crepe rubber were also measured to study the thermo-oxidative respect to different storage temperature and time. Data was analyzed by using Duncan's Multiple Range Test. Mooney viscosity and un-aged plasticity were gradually increased with the increasing storage time and increment storage temperature. YF was exhibited the highest Mooney viscosity and un-aged plasticity because of the availability of high content of non-rubber. PRI values were gradually decreased with the increasing storage time and increasing storage temperature. High stress relaxation rates were exhibited by both FB and UFUB crepes. Low stress relaxation rate was exhibited by YF crepe because of the availability of low rubber content. Compounded crepe rubbers were exhibited comparatively low Mooney viscosity values and rapid relaxation rate than raw rubbers. Low Temperature storage conditions are most preferable to maintain satisfactory viscoelasticity and resistance to oxidation of crepe rubber which could finally affect to the better processability of rubber compound.

Key words: crepe rubber, viscoelasticity, Mooney viscosity, stress relaxation, non-rubber substances