

**EFFECT OF STANDARD TECHNICALLY SPECIFIED RUBBER
VARIATIONS ON RHEOLOGICAL PROPERTIES OF SOFT
COMPOUND OF SOLID TIRES**

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DIYAGU ARACHCHIGE WARUNA YASADAREE DE SILVA

**Department of Export Agriculture
Faculty of Animal Science and Export Agriculture
Uva Wellassa University of Sri Lanka**

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ABSTRACT

Soft compound of solid tires is used to produce the middle section (cushion) of the solid tires which enhanced to provide the cushioning effect. Medium hardness, low heat build-up, high elasticity and high resilient are the most desirable characteristics expected from the soft compound. Unexpected deviations in the rheological properties of produced soft compound significantly affect its performance when building solid tires. Technically Specified Rubber (TSR) is used as the main raw material to produce the soft compound. TSR from different suppliers may lead to these unexpected deviations in the rheological properties of the soft compound produced. The objectives of this study were to investigate the effect of TSR variations of suppliers on rheological properties of soft compound and identify the raw rubber property or properties which cause such variations. Rheological properties such as t_{s2} (scorch time) and t_{c90} (optimum cure time) of soft compound produced from TSR supplied by three different suppliers (30 samples each) were measured to check the effect of TSR variation of the suppliers on rheological properties of soft compound. Raw rubber properties such as dirt content, ash content, volatile matter content, Nitrogen content, Wallace plasticity (P_0) and Plasticity Retention Index (PRI) of 3 samples of TSR from each supplier were measured to identify the cause of the TSR variations. The results revealed that the rheological properties of the soft compound are significantly affected by the TSR variation of the supplier ($p < 0.05$). Dirt content, ash content, volatile matter content, Nitrogen content were having a significant effect for the resulted variation of TSR ($p < 0.05$). Findings of this study will be useful in selecting the best TSR supplier to produce best soft compound in solid tire manufacturing.

Keywords: Rheological properties, Soft compound, Solid tires, Technically Specified Rubber, Raw rubber properties