

IMPACT OF TEMPERATURE ON ACCURACY OF DRY RUBBER CONTENT MEASUREMENT AFFECTING THE MANUFACTURING PROCESS AND QUALITY OF CREPE RUBBER

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Sri Lanka is the largest manufacturer and exporter of natural crepe rubber in the world. Dry rubber content (DRC) measurement of natural rubber latex is critical in the crepe rubber manufacturing process. It is used as the guide for standardising the latex and determining the quantity of sodium bisulphite added for the fractionation process. Currently, the DRC is measured through a density calculation using a hydrometer on a sample of diluted field latex. The hydrometer reading is compared with a standard chart published by the Sri Lanka Standards Institute and Rubber Research Institute of Sri Lanka (RRISL). This chart is based on a standard temperature of 29 °C. However, since the temperature has an inverse relationship with density, it affects the DRC value calculated. Incorrect DRC measurement leads to incorrect chemical dosages, improper standardisation, enhancing rubber wastages, and long process times. These result in inferior quality in the final crepe rubber sheets leading to rejections and price drops in the export markets and lower output yield impeding the returns for the manufacturer. This study focuses on the significance of accompanying the temperature with the current measurement method when calculating DRC. The error in measured DRC was calculated for a series of diluted field latex samples of different temperatures based on a temperature-corrected DRC chart by Kudaligama et al. The calculations indicated a significant error component involved in the DRC measurement using the standard chart when temperature variation in the field latex was considered. Due to this error component, DRC is underestimated for temperatures below 29 °C and overestimated for temperatures above 29 °C; with maximum error percentages of approximately 14% at 24 °C and 11% at 32 °C. Hence, this study strongly recommends accompanying a temperature measurement with the hydrometer reading and referring to the temperature-adjusted DRC chart instead of the standard chart. The adverse consequences of erroneous DRC measurements are further discussed, including a quantitative analysis of rubber wastages at different temperatures.

Keywords: Crepe rubber, Dry rubber content, Field latex, Temperature