

**INFLUENCE OF ACIDIFIED CLAY ON QUALITY OF
NATURAL RUBBER LATEX CREPE**

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By
**BAMUNU ARACHCHI PATHIRANNAHALAGE PIYUMALI
MADUBHASHINI JAYASEKARA**

**Palm & Latex Technology and Value Addition Degree Programme
Faculty of Animal Science and Export Agriculture
Uva Wellassa University of Sri Lanka**

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ABSTRACT

Latex of *Hevea brasiliensis* is used to manufacture crepe rubber. Mainly there are two crepe rubber types, fractioned bleached (FB) and unfractioned unbleached (UFUB). Crepe rubber has different applications like food and pharmaceutical articles. Conventionally, Carbon Black, CaCO_3 and china clay are used as fillers in rubber industry to enhance physical properties and improve the cost performance ratio, but it consumes greater amount of fillers compared to nano fillers. In this study Acidified clay/AMMT was used as the nano filler. The acidified clay was incorporated in to rubber at latex stage. Therefore, in the 1st phase of this study, the best H_2SO_4 concentration and acid: clay ratio was determined in order to acidify MMT clay. 5M concentration and the 0.4 acid: clay ratio was selected as the best. Then the MMT clay was acidified and incorporated in to rubber latex by 4% wet dispersion in to UFUB latex as 0, 1, 2, 3, 4 and 5 phr levels. Then the raw rubber properties were evaluated according to the ISO procedures. In the 2nd phase, the crepe rubber compounds were prepared for each sample and curing and physical properties were evaluated following ISO procedures. The raw rubber properties of nano crepe rubber (NCR) have been indicated reduction of PRI and a reducing trend for Mooney viscosity when increasing the clay loading level and maximum processability at 4 phr level of clay loading. Rheological behaviours of NCRs have been indicated longer scorch times with the filler loading. Maximum hardness has achieved at the 0 phr loading level (41.6 IRHD). The 3 and 4 phr levels are also at the optimum range 40.17 and 40.1. The Tensile strengths of 0, 4 and 5 phr are 20.99, 21.02 and 22.09 (MPa) respectively and are the maximum tensile strengths. Moduli at 100 % and 300 % decreased dramatically compared to the gum vulcanizate as a function of clay loading level. Compression set has been minimized with increasing the clay loading level. Tear strength has increased in 1 and 2 phr levels (36.4, 34.45). However some mechanical and raw rubber properties can be improved but a good dispersion and reinforcement cannot be achieved due to some limitations.

Key words: Natural Rubber Latex, Crepe Rubber, Montmorillonite, acidified clay, nano fillers, raw rubber properties, physical properties