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DYNAMIC PROPERTIES OF NEW PROCESS NATURAL RUBBER BY DYNAMIC MECHANICAL THERMAL ANALYSIS AND GABO FLEXOMETER

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ABSTRACT
Malaysian Rubber Board has developed a new grade of rubber using a new process and technique for production of field coagulum grades. Research showed that the new process natural rubber (NPR) has low gel content, better processability, low modulus and similar recovery behaviour and physical properties compared to commercial Standard Malaysian Rubber (SMR). Further research is carried out to determine the dynamic properties of NPR by Dynamic Mechanical Thermal Analysis (DMTA) and Gabo flexometer. The DMTA measures the tan delta values of material when exposed to temperatures from -70°C to 80°C at constant deformation. The Gabo flexometer machine can be used to determine heat build-up and viscoelastic properties of rubber undergoing rapid cyclic deformations at certain frequency or over a range of frequencies. The cyclic deformation behavior of rubber is important in products such as an indication of tyre performance, bearing, v-belts, and cable pulley insert rings etc. which are subjected to dynamic flexing in service. The dynamic properties of NPR are compared with commercial grades SMR 10 and SMR CV 60. DMTA results show that the vulcanizates give almost similar curves and values at both 0°C and 60°C indicating little differences in the compound's wet grip and rolling resistance properties for the three grades of rubber. The Gabo flexometer machine determined heat build-up and viscoelastic properties of rubber. The results indicate that the NPR generates the lowest heat build-up value and low tan delta as compared to SMR 10 and SMR CV60. As a general conclusion, NPR could be advantages as an alternative material for tyre applications.

Keywords: DMTA; Gabo flexometer; heat build-up; viscoelastic properties; tan delta
En Shahril Idzulsyahril (DMTA and heat build-up test).

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