

## **Investigation of Thermo-Mechanical Behavior in Polymer based Mallet Compound with Graphite**

**H.M.D Gunawardhane; I.M.S Abhysinghe; A.A.G.A Abeygunawardane\***

*Department of Material Science and Engineering, University of Moratuwa, Sri Lanka*

*\*Email: aravindag@uom.lk*

This research is based on the mixing of vein graphite powder with rubber compound; which is used to produce polymer-based mallets. Based on the records from the industry, normally these mallets have a higher curing time. So, this research aimed in reducing cure time by improving the thermal properties in the compound. The compound was mixed with vein graphite powder at different weight ratios and investigate the mechanical and thermal behavior. The graphite powder was used as a filler and was mixed with rubber compound at 2.5%, 5%, 7.5% and 10%. Under the mechanical properties in the samples, the tensile strength, resiliency, specific gravity, ML and MH were done and checked and analyzed their results. This work includes the behavior of mechanical properties of the compound with increasing graphite percentage up to 10%. Also, thermal conductivity, thermal diffusivity, specific heat capacity, TS2 and TC90 in the samples were investigated under the thermal properties of that sample compounds. Thermal conductivity of the compound was increased and TC90 was the same as the normal sample. Other properties were nearly the same as the normal sample. Hence the curing time of the mallet can be reduced using this modified compound.

**Keywords:** thermal diffusivity, specific heat capacity