

## **The Use of Buffing Dust in Enhancing the Mechanical Properties of Vulcanized Natural Rubber in Tyre Industry**

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Before the used tyres are completely worn out, at a certain stage, some can be made to be reused by rebuilding. At the starting point of rebuilding process, the surface of the used tyres are scratched off by tyre polishing which generates a waste called buffing dust. Buffing dust contains different sizes of vulcanized rubber particles and it can be used as a filler material in various rubber products reducing the cost of raw materials. In the current research, it was expected to do value addition for buffing dust using as a filler and cost reduction in pneumatic tyre manufacturing. Buffing dust with the particle size ranges from 150  $\mu\text{m}$  to 180  $\mu\text{m}$  was used for the study. The pneumatic tyre compound formulation is used in rubber compounding. A series of compounds containing 5, 10, 15, 20, 25 and 30 parts per hundred rubber (phr) by weight of buffing dust was prepared. A nibber compound in the absence of buffing dust was also prepared to be used as the reference for the comparison of results. Required samples for the investigation of mechanical properties were prepared by vulcanizing the rubber compounds at 160 °C for 20 minutes. Mechanical properties such as tensile strength, tear strength, hardness and abrasive resistance of the resulting vulcanizates were investigated. The use of the buffing dust as a filler with 10 phr or lower in vulcanized natural rubber compounds enhanced the mechanical properties such as modulus at 100% elongation and hardness of the rubber compound. The samples having 15 phr or more of buffing dust showed significantly low hardness. Tear strength of the samples gradually decreased with increasing the amount of buffing dust incorporated. However, there was no drastic reduction in the tear strength of buffing dust filled samples compared with the tear strength of the reference sample. The incorporation of buffing dust into vulcanized natural rubber compounds has significantly lowered their tensile strength.

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