E2-04: Use of oil extended natural rubber in tyre retreading industry

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The addition of small amounts of oils, softens and improves the processability of natural rubber. The extension of natural rubber by cheap processing oils (PO) has allowed the rubber manufacturer to produce low cost compounds which have good performance as tyre treads, which may even under certain circumstances wear better than unextended compounds.

This paper describes the use of rubber seed oil (RSO) in place of PO for the manufacture of oil-extended natural rubber (OENR) which can successfully be used in tyre retreads. Incorporation of oil into rubber has been carried out in both dry rubber and latex stages. A new technique, developed for the incorporation of RSO into latex was found to be simpler and faster than the standard method, and also economical. Rheological and technological characteristics of tyre tread compounds prepared using different levels of RSO and PO were compared. Technological properties of RSO based vulcanizates were found to be superior to those of PO based vulcanizates.

Breakdown behaviour of the rubber prepared with different amounts of RSO was also studied and the results indicated a significant decrease in the Mooney Viscosity and therefore the energy needed for mastication as the amount of RSO was increased.