OPTIMIZATION OF EPDM RECLAIM IN EPDM COMPOUNDS

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Ethylene-propylene rubbers (EPDM) continue to be one of the most widely used and fastest growing synthetic rubbers being used in specialty and general-purpose applications. In this study, EPDM-reclaim has been used as partial replacement for virgin EPDM, which eventually reduce the production cost, provided the material properties do not deteriorate significantly. Characterisation of vulcanisates illustrate that addition of up to ten parts of EPDM reclaim to virgin rubber do not significantly deteriorate vulcanisate properties. Tensile, tear, and hardness properties were maintained almost as that of the virgin EPDM vulcanisate. Also, there is no drastic increase in heat build-up after reclaim addition. There is only a marginal reduction in thermal stability with the incorporation of EPDM reclaim. The above results were well supported by swelling analysis and dispersion study which show that as the reclaimed rubber content increases, the level of dispersion gradually deteriorates. From the findings it may be concluded that incorporation of up to 10 parts reclaimed EPDM is justifiable in EPDM vulcanisates.

Keywords: EPDM, Mechanical properties, Reclaimed EPDM rubber

INTRODUCTION

Extensive utilization of rubber in various applications causes a problem in the disposal of the resulting rubber products after service. Among various possibilities of handling used and worn-out products, one of the most commonly applied methods is to dump them in a landfill, creating potential breeding places for disease-carrying insects. Furthermore, these piles can catch fire, which are practically impossible to extinguish and cause air, soil and surface-water pollution. Therefore, recycling of used rubber products is considered a way to save the environment and to reduce the material cost by reshaping the used rubber into a new product or otherwise replacing some fraction of the virgin material. Reclaimed rubber is an interesting raw material as it reduces the production costs of new rubber articles, and saves energy through shorter mixing times and lower power consumption.

Unlike thermoplastics, elastomers are thermoset which makes them more difficult to recycle. In order to make them re-processable, the three-dimensional network has to be broken down, the so-called reclaiming process. In this process, either sulphur crosslinks connecting the polymer chains or carbon-carbon bonds within the polymer backbone are to be broken. The first

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