

Combined sulfur/peroxide curing systems applied for cross-linking of rubber compounds

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Abstract.

Vulcanization, often termed as curing is one of the most important processes in rubber technologies. During this process, plastics rubber compound changes into highly elastic final product – vulcanizate. The fundamental of vulcanization is formation of physical and mainly chemical cross-links between rubber chains, which leads to the formation of three-dimensional network within the rubber matrix, by reactions between the functional groups of rubber chains and suitable curing agents. Nowadays, sulfur and peroxide curing systems have been still the most widely used for cross-linking of rubber matrices. Both vulcanization systems provide to the cross-linked rubber materials certain benefits, but also some disadvantages.

The aim of the present work was to investigate the influence of curing system composition on curing process and physical-mechanical properties of rubber compounds based on natural rubber NR and acrylonitrile-butadiene rubber NBR. Application of sulfur curing systems in cross-linking of elastomers leads to the formation of sulfidic cross-links between macromolecular chains, while more stable and rigid carbon-carbon bonds are formed during peroxide curing. Both types of cross-links are formed by using of mixed sulfur/peroxide curing systems, depending on the amount of both curatives.

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