

The influence of technological additives and peroxides on the properties of rubber mixtures based on ethylene propylene caoutchouc

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Keywords: technological additives, peroxides, ethylene propylene rubber, rubber mixtures, physical, mechanical and operational properties, heat resistance.

Abstract

The article investigates the influence of technological additives and peroxides on the properties of two rubber mixtures based on ethylene-propylene caoutchouc of marking SKEPT-40. The main properties were: rheometric (maximum and minimum torques; start, optimum and maximum vulcanization rates; maximum vulcanization rates), physical and mechanical (conditional tensile strength, elongation at break, hardness) and operational (changes in conditional strength at tensile, elongation at break and hardness after aging in air). The resistance of rubbers to the action of high temperatures by methods of differential thermal and thermogravimetric analysis was studied. As technological additives, MA-L22, Struktol WS180, Zincolet BB 222 and Struktol A89 were used. Vulcanizing agents were peroxides: Novoperox BP-40, Percodox BC-FF, Dicumyl Peroxide (DK), Chemanox PX1 and Dicumyl Peroxide DCP 99. The studies were carried out for two rubbers, one of which is intended for the manufacture of molded products, and the second rubber – for sealing profiles. It was shown that the technological additive Zincolet BB 222 increases the vulcanization rate of rubber mixture for molded products. All technological additives used have practically no effect on the conditional tensile strength and hardness vulcanizates of molded products, increasing their elongation at break. The smallest changes in the physical and mechanical properties are characterized by the vulcanizate, which contains the technological additive Zincolet BB 222. Technological additives practically do not affect the process of vulcanization of the rubber mixture and slightly affect the process of destruction of rubber during aging. Of the investigated technological additives Zincolet BB 222 is more conducive to improving the thermal properties of rubber. It has been established that Novoperox BP-40 and Chemanox PX1 peroxides increase the rate of vulcanization of the rubber mixture for sealing profiles. For vulcanizates of this rubber mixture, when Novoperox BP-40 and Chemanox PX1 is replaced with other peroxides, a decrease in the conditional tensile strength, hardness and an increase in the elongation at break are observed. With aging in air, changes in the physicochemical properties of the vulcanizates of the rubber mixture variants containing Novoperox BP-40 and Chemanox PX1 are insignificant and close to each other.

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