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The effect of hydrogenated butadiene-nitrile caoutchoucs on the properties of rubber for sealing elements

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Abstract

The influence of various grades of hydrogenated butadiene-nitrile caoutchoucs Therban 3406, Zetpol 2000L, ZN 35056, ZN 35156 and ZN 35256 on technological (plasticity, ring modulus, density), rheometric, physical and mechanical properties of the model rubber mixture has been studied. The study has been carried out with the purpose of selecting the basis of a rubber compound for the manufacture of thermo-aggressive resistant sealing elements of packer-anchoring equipment used in the oil and gas production industry. It has been shown that the variants of the rubber mixture based on the caoutchoucs Therban 3406, Zetpol 2000L and ZN 35056, containing not more than 1% residual unsaturated bonds, possess practically the same technological and technical properties. The studies of the influence of the rubber's unsaturation on the relative residual strain compression (RSC) of rubber have been carried out. The influence of the standard liquid SZHR-1 on the elastic-strength properties of rubber, as well as the degree of swelling by the mass of vulcanizates after their soaking for one day in SZHR-1 and a mixture of isooctane + toluene was studied. It has been shown that the rubber mixture based on caoutchoucs Therban 3406, Zetpol 2000L and ZN 35056 is the most thermo-aggressive resistant. For the manufacture of sealing elements capable of operating under harsh operating conditions, the most available hydrogenated butadiene-nitrile rubber of the brand ZN 35056 is proposed for usage.

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