Monitoring of the Diffusion Processes during Carburizing Automotive Steel Parts

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The article deals with the prediction of diffusion process of steel components, respectively diffusion of carbon during carburizing. The calculation was made on the basis of the solution diffusion in semi-infinite space. For the calculation there was used the II. Fick's law. For the reason that the transfer medium is formed at the interface environments diffusion boundary layer, for the more accurate calculations, it is necessary to consider the coefficient of transfer of β atoms of carbon. For the calculation of the diffusion coefficient D was used Arrhenius´s equation, which is based on the rate of diffusion processes (diffusion). It was calculated the time for diffusion of carbon to achieve the concentration of 0.8% C. There was also made a calculation of carbon diffusion in the gear from material EN DIN 1.7142 (DIN 14221). Diffusion was performed at 950 ° C, the initial concentration of carbon was 0.2%. Carburizing carbon concentration was 1.1% C and carburizing time was 1, 3 and 6 hours.

Keywords: Carburizing, Diffusion, Carbon, Gearwheel, Calculation

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