The Assessment of Selected Mechanical Properties of Steel after Application of Plasma Nitriding

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The article deals with mechanical properties of plasma nitrided steel. Experimental work was focused on evaluation of influence of plasma nitriding process to notch toughness of steel, the experimental were realised on V-notch samples of size 10x10x55 mm (according to CSN ISO 148-1 standard). Nitrided layers were applied to steel 30CrMoV9 which were subsequently evaluated by metallographic, GDOES and microhardness method. The notch toughness tests of steel were carried out using the instrumental Charpy hammer at temperatures -40 °C, +21 °C and + 70 °C. The results of experiments showed that plasma nitriding process has a direct impact on change of notch toughness parameters. The notch toughness of plasma nitrided steel was significantly decreased. The measurements thereinafter showed that values of notch toughness at low temperature (-40 °C) decreased but also at higher temperature (+70 °C). It was found a dependence of notch toughness values of plasma nitrided steel between the testing temperature and plasma nitriding process parameters.

Keywords: Plasma Nitriding, Notch Toughness, V-notch

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