Corrosion Resistance of Plasma Nitrided and Nitrocarburized 42CrMo4 Steel

David Kusmic, Doan Van Thanh
Department of Mechanical Engineering, Faculty of Military Technology, University of Defence, Kounicova 65, 662 10 Brno, Czech Republic, E-mail: david.kusmic@unob.cz, thanhvan.doan@unob.cz

This article deals with comparison of corrosion resistance of 42CrMo4 steel used for breech mechanism in the armament production. Increasing of demands on materials used for armament production and in other industrial application leads to the innovation of technologies in the field of surface treatment especially wear resistance, surface hardness, running-in properties and corrosion resistance. For the evaluation of experimental NSS corrosion resistance tests samples of 42CrMo4 steel were compared with plasma nitrided and nitrocarburized one. Individual 42CrMo4 steel samples were subsequently metallographically evaluated and characterized by hardness and microhardness measuring. The results and comparison of corrosion resistance of not-surface treated steel samples with plasma nitrided and nitrocarburized showed significant differences of corrosion rate. Due to different plasma nitriding conditions, there are corrosion resistance differences evident between the plasma nitrided steel samples as well. The corrosion resistance evaluation is supplemented by the surface corrosion-free surfaces evaluation using the laser confocal microscopy.

Keywords: Corrosion, plasma nitriding, nitrocarburizing, surface layer

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