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EXPERIMENTAL INVESTIGATION OF WEAR RESISTANCE OF MODELS HARD FACED WITH VARIOUS FILLER METALS

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Abstract: *Hardness, microstructure and wear resistance of hard faced models, executed by application of four different kinds of filler metals, are analyzed in this paper. The objective of this work is to show which filler metal is the best for hard facing, from the aspect of laboratory checking of the wear resistance. Models that were hard faced, were made of low carbon steel, primarily from the reason to save the expensive base metal, but also to analyze the possibilities for extending the service life of structural parts. Hard facing was done in three passes/layers, by the MMAW procedure, with use of various filler metals. Those were filler metals aimed for hard facings of parts exposed to intensive wear. Three samples were hard faced without the interpass, while on one sample the interpass was deposited by the austenite electrode. After the hard facing, the metallographic slits and blocks were prepared, aimed for the hardness measurements, investigating the microstructure and tribological investigations. Hardness was measured in three directions, while the microstructure was red-off in all the zones of the hard faced layers: base metal, heat affected zone and in the weld metal. Tribological investigations were performed on blocks made of pure weld metal, in order to determine the friction coefficient and the wear scare. The wear scare width was used as a parameter for estimates of the wear resistance of models, with previous metallographic investigations and hardness measurements.*

Keywords: *hard facing, filler metals, hardness, microstructure, friction coefficient, wear scare width.*

1. INTRODUCTION

Numerous working parts are during the exploitation exposed to various types of complex tribological processes and wear. It is hard to determine which of the wear mechanisms is the dominant one and which one leads to biggest damages. Usually, damages are consequences of coupled action of several wear mechanisms. That is why it is necessary to apply higher quality materials, which are resistant to wear and which can produce more working hours for the concrete machine part. Since manufacturing of large parts or the whole structures of high-quality materials would be too expensive, the problem could be solved by application of hard facing. It enables reparation of damaged parts or manufacturing of the new parts by depositing the high quality material of high hardness on the surface of the part made of the softer and cheaper material. In that way, one saves not only material and money, but also the time needed for revitalizing damaged