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INFLUENCE OF BUFFER LAYER ON MICROSTRUCTURE AND CORROSION PROPERTIES OF LASER CLADDED Co-BASED COATINGS

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Abstract: In order to improve the corrosion resistance of low carbon steel, composite coatings are usually deposited on its surface by different deposition processes [1]. Laser cladding has many advantages to produce such protective coatings with fine microstructure and enhanced properties [2]. In the present study, Co-based (MetcoClad 6F) coatings were deposited on low carbon substrate by blending a Ni-Cr based (Metco 12C) buffer layer and varying the laser power during cladding. In previous studies was demonstrated that the presence of a buffer layer reduces the overall cracking susceptibility of top coating by reducing the internal stresses, thus ensuring a more uniform heat distribution [2]. Thereby, the aim of our study was to obtain dense and defect-free Co-based coatings with enhanced corrosion resistance by using a buffer layer and by optimizing the laser power.

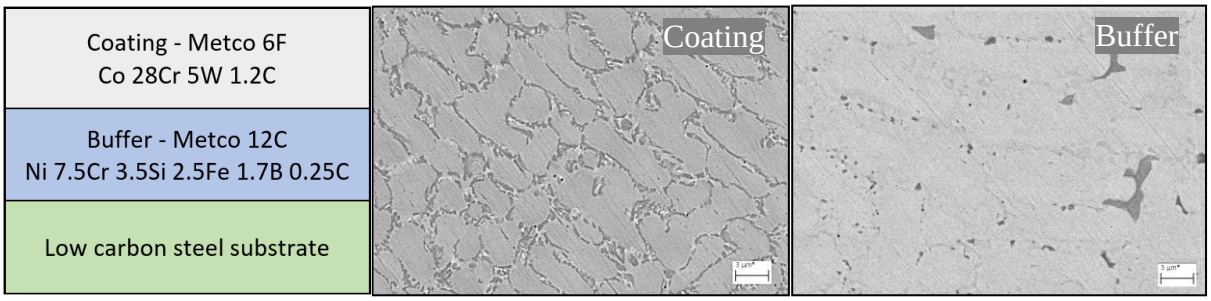

Fig. 1. Schematic representation of the laser cladded coatings, microstructure of MetcoClad 6F coating and microstructure of the Metco 12C buffer layer

The microstructure was investigated by optical and scanning electron microscopy and the corrosion behavior was evaluated by means of electrochemical methods in NaCl and HCl solutions. The results show that the buffer layer and the laser power have a significant effect on the properties and corrosion resistance of the laser cladded coatings.

Selective references:

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