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INFLUENCE OF ADDITION OF HARD PARTICLES ON THE MECHANICAL AND CHEMICAL BEHAVIOR OF VITREOUS ENAMEL

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Abstract

The vitreous enamel coatings present very interesting properties for several industrial applications due to the glassy nature of the matter. Their chemical resistance and corrosion protection properties result very high due to the glassy nature of deposits. A good wear behavior is also requested in some applications. The use of composite layer obtained by the addition of hard particles to enamel could be a possible solution to increase the deposits hardness. In literature, there are some work about the chemical nature of the added particles, but the influence of the dimension and quantity of these particles are not well studied. The aim of this work is the study of composite enamel layers deposited on low carbon steel substrate with addition of Al₂O₃ particles characterized by macro and micro dimensions with different concentration (5, 10 and 20 %wt.). After the microstructure characterization, the abrasion resistance behavior is evaluated by Taber Test following ASTM C501 for 1500 cycles. Mass loss, gloss and roughness changes are collected. The protection properties change is evaluated by Electrochemical Impedance Spectroscopy measurements. The addition of micro dimension particles produces the best behavior. On the contrary, the presence of

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