

Variability of Local Corrosion Attack Morphology of AISI 316Ti Stainless Steel in Aggressive Chloride Environment

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AISI 316Ti is Cr-Ni-Mo austenitic stainless steel stabilized by Ti, recommended for construction of various industrial and medicine devices. In spite of its high Pitting Equivalent Resistance Number (PREN=23.688) it underlies local corrosion namely pitting in aggressive chloride environment. Appearance and extent of AISI 316Ti corrosion damage in a particular chloride solution depends strongly on temperature and surface treatment. One part of tested specimens is surface untreated the second part is treated by nitric acid passivation. Specimens are immersed for 24 hours at the temperatures of 30, 50 and 80 °C in 0.3M FeCl₃ solution to induce pitting. Pitting corrosion morphology (shape and size of corrosion pits) is observed viewed from above and in profile as well, by optical metallographic microscope and scanning electron microscopy SEM. Shape and size of corrosion pits is compared in dependence on temperature and surface finish of specimens.

Keywords: Pitting corrosion morphology, AISI 316Ti stainless steel, Immersion test, Aggressive chloride solution, Nitric acid passivation

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