Corrosion Resistance of 1.4362 Steel in Boiling 65% Nitric Acid

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Lean duplex stainless steels were developed for use in environments where high strength and corrosion resistance are required. Duplex stainless steels offer a cost-effective solution with high strength and corrosion resistance. Due to high chromium content and a balanced composition, 1.4362 ferritic-austenitic stainless steel possesses excellent corrosion resistance in acidic environments. General corrosion problems in duplex stainless steels at 475°C have been widely researched. Steels are most degraded at 475°C, but corrosion can still occur at both lower and higher temperatures. Corrosion resistance is influenced by chromium content and microstructural morphology. The percentage of each phase and its properties are determined by composition, technological processing and heat treatments. Machining and fabrication practices, such as welding, are also vital for performance. The objective of this study was to determine the effects of 30-minute isothermal heat treatments at 535°C and exposure time on relative mass loss and roughness parameters of 1.4362 lean duplex stainless steel. The influence of boiling nitric acid on the corrosion resistance of steel was investigated based on mass loss and roughness parameters. Corrosion properties and roughness of 1.4362 alloys are discussed in this paper.

Keywords: stainless steel, duplex steel, corrosion, corrosion rate, profile roughness

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