

INTISARI

Aluminium paduan AA 7075 merupakan material yang banyak digunakan pada industri pesawat terbang karena memiliki beberapa keunggulan yaitu aluminium merupakan logam ringan, sifat mampu mesin (machinability) baik, ketahanan terhadap korosi baik dan sifat mampu cor (castability) baik serta logam non magnetik. Aluminium juga memiliki keuletan tinggi, mudah dibentuk dan mudah disambung. Aluminium memiliki ketahanan yang baik terhadap korosi, kendati demikian aluminium tetap akan mengalami korosi jika berada di lingkungan korosif termasuk aluminium paduan AA 7075 yang digunakan pada industri pesawat terbang. Upaya mengendalikan korosi dengan penggunaan inhibitor. Tujuan penelitian ini adalah untuk mempelajari pengaruh inhibitor terhadap laju korosi dan laju perambatan retak fatik korosi pada aluminium paduan AA 7075.

Penelitian ini menggunakan inhibitor Na_2CrO_4 dengan variasi konsentrasi 0,1%, 0,3%, 0,5% dan 0,7% yang ditambahkan ke dalam larutan 3,5% NaCl. Pengujian laju korosi menggunakan metode polarisasi potensiodinamik. Pengujian fatik korosi dilakukan dengan amplitudo konstan pada frekuensi 10 Hz dan rasio tegangan (R) 0,1. Spesimen yang digunakan adalah center specimen retak (CCT) dengan orientasi searah dengan pengerolan. Pengamatan SEM dilakukan setelah pengujian fatik korosi. Data pendukung penelitian yaitu sifat mekanis material yang meliputi pengamatan strukturmikro optik, pengujian tarik dan pengujian kekerasan.

Hasil penelitian menunjukkan bahwa konsentrasi efektif inhibitor Na_2CrO_4 dicapai pada 0,3% yang ditandai dengan menurunnya laju korosi dan laju perambatan retak fatik korosi yang lebih lambat.

Kata kunci : Aluminium 7075, korosi, inhibitor, cromat, pesawat.

ABSTRACT

AA7075-T6 is aluminum alloy material that is widely used in the aircraft industry. AA7075-T6 has several advantages of aluminium such as light metal, good machinability, good corrosion resistance and good castability and non-magnetic metals. Aluminum also has high ductility, easy to form and easy to connect. Aluminum has good corrosion resistance, though aluminum will still be corrosive if present in corrosive environments including aluminium alloy AA7075-T6 used in aircraft industry. Efforts to control corrosion with the use of inhibitors. The purpose of this study was to study the effect of inhibitors on corrosion rate and the rate of propagation of corrosive fatigue cracking on aluminum alloy AA7075-T6.

Na_2CrO_4 inhibitor was used in this study with a concentration variation of 0,1%, 0,3%, 0,5% and 0,7% added to a 3,5% NaCl solution. Corrosion rate of material test was measured by using potentiodynamic polarization method. The corrosion fatigue test was performed with a constant amplitude at a frequency of 10 Hz and a stress ratio (R) of 0.1. The specimen used was the center specimen crack (CCT) with direct orientation with rolling. SEM observations were done after corrosion fatigue test. The microstructure observation, tensile and hardness tests were also investigated in this study.

The results showed that the most effective concentration of Na_2CrO_4 inhibitor was achieved at 0.3%, indicated by decreases both the corrosion rate and fatigue corrosion crack propagation. Addition 0,3% of inhibitor can increase the lifecycle by 88%.

Keywords: AA7075-T6, corrosion, inhibitor, chromate, plane.