

## INTISARI

Aluminium dan paduannya adalah logam non besi (non-ferrou) yang banyak digunakan di industri perkapalan. Salah satu di antaranya adalah aluminium paduan AA5083. Aluminium dapat mengalami korosi akibat kondisi lingkungan yang korosif seperti lingkungan air laut kombinasi antara tegangan dinamis dan lingkungan korosif dapat mengakibatkan lelah korosi (*corrosion fatigue*) sehingga diperlukan cara untuk menghambat laju korosi. Tujuan penelitian adalah untuk mengkaji pengaruh antara penambahan inhibitor 0,3 % Molybdate pada AA 5083 dalam larutan 3,5 % NaCl pada pengelasan tanpa perlakuan dan perlakuan STT dengan temperatur pemanasan 200 °C. Mengetahui laju perambatan retak fatik-korosi AA 5083 pada pengelasan tanpa perlakuan dan perlakuan STT dengan temperature 200 °C. Mengetahui efesiensi inhibitor pada pengelasan tanpa perlakuan dan perlakuan STT dengan temperature 200 °C.

Penelitian ini menggunakan inhibitor 0.3% molybdate ( $\text{MoO}_4$ ) dengan tanpa inhibitor udara dan 3,5 % NaCl pada pengelasan tanpa perlakuan dan perlakuan STT dengan temperature 200 °C. Pengujian yang dilakukan meliputi pengamatan mikrostruktur, SEM (*scanning electron microscope*), pengujian kekerasan *Vickers*, uji tarik, laju perambatan retak fatik-korosi dan uji korosi dengan metode polarisasi potensiodinamik (*Tafel Plot*).

Hasil penelitian menunjukkan bahwa penambahan inhibitor 0.3% molybdate pada AA 5083 dalam larutan 3,5 % NaCl pada pengelasan dengan perlakuan pemanas STT 200 °C mampu mengurangi laju korosi sebesar 0.3974 *mpy* dengan efesiensi 15,5 % dan pengelasan STT 200 °C dapat menambah umur fatik 133,90 % dengan jumlah sebesar 378220 siklus.

**Kata Kunci:** Aluminium paduan 5083, *Static Thermal Tensioning*, 3,5 % NaCl, udara, 0,3 % Molybdate, Inhibitor korosi, krosi, laju perambatan retak fatik-korosi.

## ABSTRACT

*Aluminium and its alloys are metals nonferrous (non-ferrou) that is widely used in the shipping industries. One of them is the aluminum alloy AA5083. Aluminium can undergo corrosion due to corrosive environmental conditions, such as salt water environment combination between dynamic voltage. Furthermore, corrosive environment can cause corrosion fatigue. As a result, it needs a way to inhibit the rate of corrosion. The purpose of this research is firstly to study the influence between the addition of inhibitors of 0.3% on AA 5083 Molybdate in aqueous solution 3.5% NaCl on welding without treatment and STT's treatment with temperature warming 200 °C. Secondly, to obtain the rate of crack propagation of corrosion- fatigue on AA 5083 from welding without treatment and STT's treatment with temperature 200 °C. Thirdly, to figure out the efficient use of inhibitors on welding without treatment and STT's treatment with temperature 200 °C.*

*0.3% molybdate (MoO<sub>4</sub>) solution was used as an inhibitor in this study. The MIG welded AA5083 with and without STT treatment were subjected to 0.3% molybdate (MoO<sub>4</sub>) inhibitor. The experiment that was conducted in this research include the observation of the microstructures, SEM (scanning electron microscope), hardness, tensile, the rate of crack propagation of fatigue-corrosion and corrosion tests were investigated.*

*The result shows that the addition of inhibitors 0.3% molybdate on AA 5083 in 3.5% NaCl solution on welding with heating treatment STT 200 °C reduces the rate of corrosion of 0.3974 mpy with efficient use of 15.5% and the fatigue cycle is improved by 133.90 %.*

**Keywords :** *Aluminum alloy 5083, Static Thermal Tensioning, 3.5% NaCl, 0.3% air, Molybdate, Corrosion Inhibitor , krosi, crack propagation rate fatigue-corrosion.*