

**PENGARUH VARIASI TEMPERATUR *ARTIFICIAL AGING* PADA
PROSES *HEAT TREATMENT* MATERIAL AA 2024 T351 TERHADAP
NILAI KEKERASAN DAN STRUKTUR MIKRO**

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ABSTRAK

Paduan aluminium 2024 banyak digunakan untuk elemen pada pesawat terbang seperti pada *skin wing* pesawat. Aluminium digunakan untuk bahan pembuatan *skin wing* pesawat karena *ratio strength* dan *weight* yang tinggi. Untuk meningkatkan kualitas paduan aluminium 2024 tersebut dilakukan proses *heat treatment*. Terdapat proses perlakuan panas untuk mendapat produk yang diinginkan untuk aplikasi *skin wing* pesawat. Proses terdiri dari *solution treatment*, *quenching* dan *natural aging*.

Penelitian ini bertujuan untuk mengidentifikasi pengaruh variasi temperatur *artificial aging* terhadap kekerasan dan struktur mikro pada material AA 2024 yang akan diberikan proses *solution treatment* pada temperatur 500 °C selama 1 jam lalu *diquenching* dengan media air selama 5 menit. Lalu dilakukan proses *artificial aging* selama 1 jam pada variasi temperatur 0 °C, 100 °C, 150 °C, 200 °C, dan 250 °C. Hasil pengujian dari material AA 2024 menunjukkan bahwa tingkat kekerasan pada variasi temperatur (1) 0 °C sebesar 43.36 R_A, (2) 100 °C sebesar 45.90 R_A, (3) 150 °C sebesar 47.23 R_A, (4) 200 °C sebesar 50.80 R_A, dan (5) 250 °C sebesar 36.63 R_A. Dengan demikian nilai rata-rata kekuatan tertinggi didapatkan pada variasi temperatur 200 °C sebesar 50.80 R_A.

Kata kunci: *artificial aging*, AA 2024 T351, Al-Cu, *skin wing*, pengaruh variasi temperatur

THE EFFECTS OF ARTIFICIAL AGING TEMPERATURE ON THE HEAT TREATMENT PROCESS ON THE HARDNESS AND MICROSTRUCTURE OF MATERIAL AA 2024 T351

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ABSTRACT

Aluminum alloy 2024 is widely used for aircraft component such as aircraft skin wings. Aluminum is used as a material for making airplane skin wings because of its strength and weight ratio. To improve the quality of the 2024 aluminum alloy, a heat treatment process is carried out. There is a heat treatment process to obtain the desired product for aircraft skin wing applications. The process consists of solution treatment, quenching, and natural aging.

This research was aimed to investigate the effects of variations in artificial aging temperature variations on the hardness and microstructure of the AA 2024 material which was given a solution treatment process at the temperature of 500°C for 1 hour and then quenched with water for 5 minutes. Then, the artificial aging process was carried out for 1 hour at temperature variations of 0 °C, 100 °C, 150 °C, 200 °C, and 250 °C. The test results of the 2024 AA material showed that the level of hardness at temperature variations (1) 0 °C is 43.36 RA, (2) 100 °C is 45.90 RA, (3) 150 °C is 47.23 RA, (4) 200 °C is 50.80 RA, and (5) 250 °C is 36.63 RA. Thus, the highest average strength value was obtained at the temperature variation of 200 °C of 50.80 RA.

Keywords: *artificial aging, AA 2024 T351, Al-Cu, skin wing, temperature variations*

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