



## The effects of heat damage of aluminum 6061-T6 AM-2 Mats and High Power Run-Up Anchor

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### ABSTRACT

Mechanical property measurements were made on used sections of mobile landing surfaces for the vertical take off and landing military aircraft. Additionally, property measurements were made on used sections of anchors used to restrain aircrafts movement during full power engine operations following maintenance. In both cases, the material used was aluminum alloy 6061 in the T6 temper. Tensile, hardness and electrical conductivity tests were performed. The landing surfaces were hollow core; the top portion showed more degradation than the bottom due to the former being in closer proximity to aircraft exhaust gases. The used anchor panels showed significant levels of mechanical degradation, falling well below SAE minimum standards.

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### 1. Introduction

Temporary airfields in remote locations have been used by American forces since the Vietnam conflict. The landing surfaces are hollow plates of aluminum alloy 6061 in the T6 temper. They are known as AM-2 Mats, [1]. Additionally, heavy anchor plates are used in remote locations to restrain motion of an aircraft during high power testing following maintenance. Typically these anchors experience little usage, but with the increased tempo of operations overseas, the mats and anchors may be used more than they were designed to handle. This project involves the study of the effect of heat damage on the mechanical properties of Al 6061-T6 AM-2 Mats.

High temperature exhausts reaching nearly 1300 F (700 °C) may impinge on the AM-2 Mats. It is a concern that the high volume of high temperature exhaust on the AM-2 Mats surface and anchor plates would make them more susceptible to softening failure. It was reported that bars used to secure the mats together near the anchor section have actually melted. Some sections experienced noticeable discolorations, cracks, and separations in areas of high temperature exhaust and high stress concentrations, [2]. The objective of this study is to evaluate the mechanical tensile and electrical conductivity properties of the AM-2 Mats and the High Power Run-Up Anchors after their being used in the field. A correlation between discoloration and softening in mechanical properties is also investigated.

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