

An Investigation of the Strength Deterioration of Forged Aluminum 6082 (T6) Alloy

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Abstract : The study is focused on the strength of forged aluminum alloy (AA) 6082 (T6). Aluminum alloy 6082 belongs to Al-Mg-Si family which has a wide range of automotive applications. A decrease in the strength of AA 6082 alloy was observed after T6 treatment. The as-received (extruded), forged, and forged + heat treated samples were examined to understand the reason. These examinations were accomplished by optical (OM) and scanning electron microscope (SEM) and X-ray diffraction (XRD) studies. It was observed that the defects had an insignificant effect on the alloy strength. The alloy samples were subjected to age hardening treatment and the time to achieve peak hardening was acquired. Standard tensile specimens were prepared from as-received (extruded), forged, forged + solutionized and forged + solutionized + age hardened. Tensile tests were conducted by Instron universal testing machine. It was observed that there was a significant drop in tensile strength in the case of solutionized sample. The detailed study of the fracture samples showed that the solutionizing after forging was not the best way to increase the strength of Al 6082 alloy.

Keywords : aluminum alloy 6082, strength, forging, age hardening

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