

Machinability Study of A201-T7 Alloy

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Abstract : The Aluminum-Copper casting alloys are well known for their high mechanical strength, especially when compared to more commonly used Aluminum-Silicon alloys. A201 is one of the best in terms of strength vs. weight ratio among other aluminum alloys, which makes it suitable for premium quality casting applications in aerospace and automotive industries. It is reported that A201 has low castability, but it is easy to machine. However, there is a need to specifically determine the process window for feasible machining. This research investigates the machinability of A201 alloy after T7 heat treatment in terms of chip/burr formation, surface roughness, hardness, and microstructure. The samples are cast with low-pressure sand casting method and milling experiments are performed with uncoated carbide tools using different cutting speeds and feeds. Statistical analysis is used to correlate the machining parameters to surface integrity. It is found that there is a strong dependence of the cutting conditions on machinability and a process window is determined.

Keywords : A201-T7, machinability, milling, surface integrity

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