

Full Length Research Paper

The effect of aging on the machinability of AA7075 aluminium alloy

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In this study, machinability tests were performed on aged AA7075 aluminium (Al) alloy through single point turning method. Before the machinability tests, AA7075 Al alloy samples were aged at 180°C for 1, 6, 12 and 24 h. The machinability tests were carried out at various cutting speeds and the resulting sample surface roughness, cutting forces and thermal changes occurring on the cutting tool were analysed depending on the cutting speed when machining the aged AA7075 alloy samples. An unaged sample was also subjected to machinability tests for comparison purposes. The hardness measurements taken from the aged samples showed that aging treatment increased the hardness between the intervals of 102 to 211 (HV), depending on the aging time. The lowest surface roughness values were measured on the samples aged for 6 h. Different types of chips were observed with thermal camera during machining of the unaged and aged samples. Temperatures of the chips were found to vary between 52 to 92°C.

Key words: AA7075, machinability, aging, heat treatment, hardness, surface roughness.