World Academy of Science, Engineering and Technology
International Journal of Mechanical and Mechatronics Engineering
Vol:15, No:07, 2021

Experimental Investigation and Numerical Simulations of the Cylindrical Machining of a Ti-6Al-4V Tree

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Abstract : Predicting the behaviour of the Ti-6Al-4V alloy during the turning operation was very important in the choice of suitable cutting tools and also in the machining strategies. In this study, a 3D model with thermo-mechanical coupling has been proposed to study the influence of cutting parameters and also lubrication on the performance of cutting tools. The constants of the constitutive Johnson-Cook model of Ti-6Al-4V alloy were identified using inverse analysis based on the parameters of the orthogonal cutting process. Then, numerical simulations of the finishing machining operation were developed and experimentally validated for the cylindrical stock removal stage with the finishing cutting tool.

Keywords : titanium turning, cutting tools, FE simulation, chip
Conference Title : ICMME 2021 : International Conference on Mechatronics and Mechanical Engineering
Conference Location : London, United Kingdom
Conference Dates : July 26-27, 2021