

5<sup>th</sup> International Conference and Exhibition on

# MECHANICAL & AEROSPACE ENGINEERING

October 02-04, 2017 Las Vegas, USA

## Investigation of energy consumption on thread machining of austempered ductile cast iron materials

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Ductile cast iron materials are used as fittings elements due to their high strength, ductility and toughness properties with different heat-treatment conditions. The microstructure of fittings parts consists of graphite spheres dispersed in ferrite or ferrite-perlite. But, since fitting elements have small wall thickness and cooling rates is high during casting process, this situation is caused to low strength and fracture in the wall of fittings. In this study, the fittings samples of machinability with threading process have been investigated by means of energy-power transformations. For this purpose, the austempering heat treatment was applied to the samples of fittings produced from ductile cast iron materials having to high perlite rate in ferrite-perlite matrix. Thus, the fracture is reduced and the mechanical properties are developed. The fittings samples from casting were austenitized at 900°C for 30, 60 and 90 minutes, quenched immediately in a salt bath at 280°C and subjected to austempering for 30, 60 and 90 minutes. Empirical equations such as Power Index (PI), Energy Consumption (Wh/mL), Torque (Nm), Maximum Power (kW) and percentage spindle force are calculated to determine energy-power consumption during threading process. Also, the relationship between energy-power consumption and the microstructure and hardness of heat treated samples has been examined.

### Biography

Hasan Oktem has completed his PhD from Kocaeli University. He has published more than 14 papers in SCIE index and has worked in the field of production of a new type non asbestos brake pads, plastic injection molding and metal cutting processes.

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