

## Development of Portable Water Jet Cutter Mobile Hand Tool: Analysis of Nozzle Geometries and Materials

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**Abstract :** This paper presents the development of a portable water jet cutter for soft materials such as meat. Twelve geometries of nozzles were simulated using finite element method. Water pressure was set to 1500 lb/in<sup>2</sup>. Through the simulation, highest average water output speed was 133.04 m/s. The nozzle was fabricated from Al - alloy 5052 with the Factor of Safety~ 3. This indicates that the nozzle made of Al-alloy 5052 is capable of performing the cutting process without any fracture. Preliminary design of mobile water jet hand tool is presented at the end of this paper.

**Keywords :** water jet, finite element, Al-alloy 5052, nozzle geometry

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