

ABSTRACT

Dynamic compression plate (DCP) is a plate made of biomaterials like titanium alloy or stainless steel 316L (SS-316L), which is used for joining fractured/broken bones for fast recovery. Due to its easy to be machined and cheaper than titanium alloy, SS-316L is used in this research. However, SS-316L has limitations on mechanical properties. Therefore, the surface of SS-316L needs to be treated prior use to increase mechanical properties on it. Shot peening is one of the methods to increase the surface hardness and roughness of material. This research aims to investigate the effect of shot peening on its microstructure, surface roughness, microhardness, and thickness of SS-316L DCP.

In this research, the DCP is designed for joining arm. The DCP is 105 mm $\hat{\Gamma}$ 12 mm $\hat{\Gamma}$ 4 mm and has 6 holes, 5 mm diameter each, with holes aligned to the plate. After machining, the surface is modified by shot peening using following properties: steel ball with 0.4 mm in diameter, 100 mm nozzle-to-plate distance, and shot for 10 minutes. The parameter is pressure variation, ranging from 4 – 6 kg/cm².

The results show that the shot peening of SS-316L increases its mechanical properties with significant change on its microstructure. Surface microstructure becomes denser and smaller. At pressure 6 kg/cm², surface hardness increases up to 195,6 VHN or 93% from initial condition (101,32 VHN). The surface roughness increases from 0,5 \sim m to 0,975 \sim m. The thickness decrease up to 5%, so DCP SS-316L become thinner.

Keywords : *dynamic compression plate, stainless steel 316L, shot peening, microstructure, surface roughness, microhardness, thickness.*