

SUMMARY

Rizki Ernawati, Departement of Mechanical Engineering, Faculty of Engineering, University of Brawijaya, August 2016, *The Effect of Speed and Shot Angle in Shot Peening toward Residual Stress Distribution with Computer Simulation*, Academic Supervisor : Endi Sutikno and Khairul Anam

Shot peening is a process used to improve properties of the material by shoot the ball in a material with the hope the material will have a fatigue resistant properties. The process of shot peening is a cold working by treating the surface. The ball have a smaller size with a range and speed that has been determined. The material used is aluminum alloy A5052 because can not heat treated. Shoot the ball causes residual stress until at a certain depth for shot peening is a surface treatment. The residual stress that is formed is what will influence the nature of the material.

Simulation is used to examine the effect of shot peening with a single shot peening (1 time shooting the ball) using a computer. Variation rate of velocity that used is 50 m/s, 75 m/s, 100 m/s, 125 m/s and 150 m/s. Angle shooting for simulation is 0° , 10° , 20° and 30° . The modeling material used is bilinear isotropic hardening. Dimensions of ball diameter of 0.4 mm, and the specimen dimensions 30 x 20 x 10 mm.

Best residual stress distribution which has a high compressive residual stress and depth extent, and tensile residual stresses are of little value to a lower depth. The results were obtained: the greater the velocity, then the distribution of residual stress better, and the smaller the angle of the residual stress distribution the better. At the speed variation of residual stress distribution best owned by a speed of 150 m / s, while the variation of the angle obtained most excellent residual stress distribution at an angle of 10° .

Keywords : speed, shot angle, shot peening, residual stress distribution, computer simulation