ABSTRACT

In the manufacturing process, information about material characteristic is very important. One of them is strain rate of material. To get strain rate data of material, an observation has to be carried out. On this final project, such observation method to get strain rate of a material had been discussed. The method had been used is Bar Hopkinson Method. It was used because of its low cost and easy-to-analyze. In this method, material that would be observed was impacted using special bar and on certain rate until deformation. Using strain gage, strain rate of observed material could be measured. Varying the rate of projectile, the strain rate resulted would be in varied. From the result, strain and stress would be calculated for specific rate as time function. The final result of this observation had been figured in the form of strain and stress curve with specific strain rate and projectile rate.

This research was conducted using Al-2024 material, with conclusion for higher velocity of projectile (v) produced higher strain rate value. For v = 6.25 m/s; \( \dot{\varepsilon} = 313/s \), v = 10 m/s; \( \dot{\varepsilon} = 668/s \), v = 16.67 m/s; \( \dot{\varepsilon} = 1132/s \). Based on experiment using Al-2024 material obtained strain rate hardening value is 0.13 and strain rate sensitivity value is 0.21.

Keywords: strain rate, strain, stress, strain hardening, strain rate sensitivity.