



## **ABSTRACT**

*Batur Jaya, located in Ceper Klaten, is an industry that produces foundry goods. One of its products is a bucket tooth of excavator that is used to pick up chunks of coal at mining. Products made from high-manganese carbon steel SAE-AISI number 1541 which has high wear resistance and high impact resistance. However, the products that produced have low wear resistance and impact resistance.*

*This research is aimed to increase wear resistance and impact resistance in bucket tooth excavator specimen through temperature 1000°C normalizing process. Tests carried out include microstructure, impact, wear and hardness.*

*The results showed that the micro structure of raw materials consisted of coarse ferrite, pearlite and carbide. The highest hardness and wear resistance value was in raw material specimens with a value of 629 VHN and  $7.6 \times 10^{-5}$  mm<sup>3</sup>/kg.m. The highest impact force value was on the specimen with normal normalization with a value of 0.124 J/mm<sup>2</sup>. The heat treatment that recommended for the research so that bucket tooth products have a high durability is normalizing.*

*Keywords : bucket tooth, high-manganese carbon steel, normalizing*



## INTISARI

Batur Jaya merupakan industri yang memproduksi hasil pengecoran di Ceper Klaten. Salah satu produknya adalah *bucket tooth excavator* yang berfungsi untuk proses penggalian bongkahan batu bara di pertambangan. Produk ini dibuat dari *high-manganese carbon steel SAE-AISI number 1541* yang mempunyai ketahanan aus (*wear resistant*) dan ketahanan impak tinggi. Namun, produk yang dihasilkan Batur Jaya masih memiliki ketahanan aus dan impaknya rendah.

Penelitian ini dilakukan dengan tujuan meningkatkan ketahanan aus dan impak pada spesimen *bucket tooth excavator* melalui proses *normalizing* temperatur 1000°C. Pengujian yang dilakukan meliputi struktur mikro, kekerasan, keausan, dan impak.

Hasil penelitian menunjukkan bahwa struktur mikro *raw material* terdiri dari ferit, perlit dan karbida. Nilai kekerasan dan ketahanan aus tertinggi terdapat pada spesimen *raw material* dengan nilai 629 VHN dan  $7.6 \times 10^{-5} \text{ mm}^3/\text{kg.m}$ . Kekuatan impak tertinggi terdapat pada spesimen hasil proses *normalizing* dengan nilai  $0.124 \text{ J/mm}^2$ . Perlakuan panas yang disarankan agar produk *bucket tooth* lebih awet adalah *normalizing*.

Kata kunci : *bucket tooth, high-manganese carbon steel, normalizing*