

Abstrak

Teknik pengelasan metode SMAW banyak digunakan dan ditemukan di banyak tempat. Pengelasan ini memiliki keunggulan diantaranya praktis dan hanya menggunakan listrik dan elektroda. Penelitian ini bertujuan mengetahui pengaruh pendinginan air, collant engine, dan oli SAE 20W-40 terhadap hasil las sambungan Baja ST42 dengan cara *dry penetrant test* dan microstructure test. Peneliti menganalisa data dari berbagai referensi seperti jurnal akademis yang berkaitan dengan penelitian. Peneliti melakukan proses pembuatan spesimen, pengelasan spesimen, serta pengujian dry penetrant test di Laboratorium Teknik Mesin Universitas Muhammadiyah Jember. Pada penelitian telah dilakukan beberapa tahapan, yaitu pemotongan spesimen, pengelasan, pendinginan (3 variasi media pendinginan), uji mikrostruktur. Dari pengujian *dry penetrant* terlihat secara signifikan hasil dari pendinginan menggunakan oli SAE 20W-40 lebih baik dari pendinginan menggunakan collant engine dan air. Sama dengan halnya hasil dari pengujian mikrostruktur yang menunjukkan kepadatan hasil pendinginan oli SAE 20W-40 lebih baik signifikan dibandingkan dengan hasil pendinginan *collant engine* dan air.

Kata Kunci: Baja ST-42, Media Pendingin, SMAW, Dry Penetrant, Uji Mikrostruktur

Abstract

The SMAW method of welding technique is widely used and found in many places. This welding has practical advantages and only uses electricity and electrodes. This research aims to determine the effect of water cooling, engine coolant, and #SAE 20W-40 oil on the weld results of ST42 Steel joints by means of dry penetrant test and microstructure test. Researchers analyze data from various references such as academic journals related to research. Researchers carried out the process of making specimens, welding specimens, and dry penetrant testing at the Mechanical Engineering Laboratory, Muhammadiyah University of Jember. In the research, several stages have been carried out, namely specimen cutting, welding, cooling (3 variations of cooling media), microstructure testing. From dry penetrant testing, it can be seen that significant results from cooling using SAE 20W-40 oil are better than cooling using coolant and air machines. Likewise, the results of microstructural testing show that the density of SAE 20W-40 oil cooling results is significantly better than the engine cooling results of coolant and air.

Keywords: *ST-42 Steel, Cooling Media, SMAW, Dry Penetrant, Microstructure Test*