

ABSTRAK

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Judul Laporan Akhir : Rekondisi Blower Penyedot Asap Pada Ruang Tempa
Politeknik Negeri Sriwijaya (Pengujian)

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Ruang tempa di Jurusan Teknik Mesin Politeknik Negeri Sriwijaya merupakan fasilitas praktikum yang menggunakan tungku berbahan bakar batu bara untuk memanaskan logam. Proses pembakaran tersebut menghasilkan asap pekat dan debu yang mencemari udara dan membahayakan kesehatan mahasiswa. Blower sebagai alat utama penghisap asap mengalami kerusakan parah seperti baling-baling tidak seimbang, bearing aus, dan casing berkarat. Selain itu, cerobong asap mengalami korosi dan kebocoran, serta sistem kelistrikan blower mengalami kerusakan pada kabel distribusi. Oleh karena itu, dilakukan rekondisi menyeluruh untuk mengembalikan fungsi sistem pembuangan asap. Metode yang digunakan meliputi inspeksi awal, identifikasi kerusakan mekanik dan kelistrikan, wawancara teknisi, serta diskusi perencanaan rekondisi. Komponen utama diganti menggunakan blower axial tipe tabung berdiameter 10 inci dengan kecepatan 2850 RPM, aliran udara 1520 CFM, daya 320 Watt, dan tegangan 220 Volt. Cerobong diperbaiki dengan menambal bagian berlubang menggunakan pelat besi 2 mm melalui las SMAW. Sistem kelistrikan diperbarui dengan penggantian kabel kerosok dan pemasangan ulang jalur panel distribusi. Pengujian pascarekondisi dilakukan melalui tiga tahap: pemeriksaan visual, pengukuran aliran udara menggunakan anemometer, dan pengujian temperatur ruangan menggunakan thermometer digital. Hasil pengujian menunjukkan peningkatan signifikan: suhu ruangan saat blower aktif menurun dari 41,15°C menjadi 33,7°C dalam waktu 60 menit, dan aliran udara mencapai 0,0147 m³/s pada jarak uji 50 cm dari cerobong. Rekondisi terbukti efektif dalam memperbaiki sistem ventilasi, meningkatkan kenyamanan dan keselamatan kerja di ruang tempa. Total biaya pelaksanaan rekondisi sebesar Rp. 4.218.156 mencakup bahan, listrik, upah tenaga kerja, dan sewa alat. Dengan hasil tersebut, rekondisi blower dapat dijadikan acuan perawatan berkala sistem ventilasi bengkel tempa.

Kata Kunci: rekondisi, blower, asap, pengujian, temperatur

ABSTRACT

Reconditioning of Smoke Exhaust Blower in the Forging Room of Politeknik Negeri Sriwijaya (Testing)

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The forging room in the Mechanical Engineering Department of Sriwijaya State Polytechnic is a practical facility that uses a coal-fired furnace to heat metal. The combustion process produces thick smoke and dust that pollute the air and endanger the health of students. The blower, as the main smoke extraction device, has suffered severe damage, such as unbalanced blades, worn bearings, and rusted casings. Additionally, the chimney has corrosion and leaks, and the blower's electrical system has damage to the distribution cables. Therefore, a comprehensive overhaul was conducted to restore the smoke exhaust system's functionality. The methods used included initial inspection, identification of mechanical and electrical damage, technician interviews, and discussion of the overhaul plan. The main components were replaced with a 10-inch diameter axial blower with a speed of 2850 RPM, airflow of 1520 CFM, power of 320 Watts, and voltage of 220 Volts. The chimney was repaired by patching the damaged sections with 2 mm steel plates using SMAW welding. The electrical system was updated by replacing worn cables and reinstalling the distribution panel circuitry. Post-reconditioning testing was conducted in three stages: visual inspection, airflow measurement using an anemometer, and room temperature testing using a digital thermometer. Test results showed significant improvements: room temperature when the blower was active decreased from 41.15°C to 33.7°C within 60 minutes, and airflow reached 0.0147 m³/s at a test distance of 50 cm from the chimney. The reconditioning proved effective in improving the ventilation system, enhancing comfort, and ensuring workplace safety in the forge room. The total cost of the reconditioning process amounted to Rp. 4,218,156, covering materials, electricity, labor costs, and equipment rental. With these results, the blower reconditioning can serve as a benchmark for routine maintenance of the forge workshop's ventilation system.

Keywords: reconditioning, blower, smoke, testing, temperature