

ABSTRAK

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(2025: xiii + 55 Halaman + 18 Gambar + 16 Tabel + 5 Lampiran)

Laporan akhir ini membahas proses rancang bangun alat penghisap udara yang dibuat di Bengkel Las Jurusan Teknik Mesin Politeknik Negeri Sriwijaya. Perancangan ini bertujuan untuk menjaga kualitas udara di area kerja agar tetap aman dan sehat, serta meminimalisir risiko kecelakaan kerja akibat paparan asap dan gas berbahaya yang timbul dari proses pengelasan. Metode yang digunakan dalam kegiatan ini meliputi observasi langsung di lapangan, wawancara dengan pihak terkait, diskusi, serta studi pustaka guna memperkuat dasar teori perancangan. selain itu, dilakukan pengujian secara visual dan fungsional untuk mengetahui sejauh mana kemampuan alat dalam menghisap asap pada ruang las. Pengujian dilakukan dengan cara mengukur jumlah asap yang dapat dikeluarkan dalam waktu tertentu sehingga dapat diketahui efektivitas kerjanya. Hasil pengujian menunjukkan bahwa alat penghisap udara yang dirancang mampu mengurangi asap dan racun dengan tingkat efisiensi yang cukup baik. perhitungan teknis juga dilakukan untuk menentukan ukuran blower yang sesuai dengan kapasitas bilik las. dari hasil analisis diperoleh bahwa bilik pengelasan dengan volume 65 m³ dan kadar asap 1691 PPM dapat dihisap menggunakan blower berdiameter 12 inch. Rancang bangun ini juga menunjukkan adanya hubungan antara kapasitas blower dengan kualitas udara di ruang las, di mana pemilihan ukuran blower yang tepat sangat memengaruhi kinerja alat. dengan pendekatan ini, rancang bangun alat penghisap udara memberikan gambaran mengenai pentingnya perencanaan teknis, proses uji, serta analisis data dalam mendukung keselamatan dan kesehatan kerja pada proses pengelasan.

Kata kunci: *exhaust fan*, rancang bangun, perancangan, pengujian, pengelasan

ABSTRACT

Air Extraction Design in Welding Rooms Sriwijaya State Polytechnic (Testing Process)

(2025: xiii + 55 Pages + 18 Figures + 16 Tables +5 Attachment)

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***DIPLOMA–III MECHANICAL ENGINEERING STUDY PROGRAM
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This final report discusses the design and development of an air suction device constructed at the Welding Workshop of the Mechanical Engineering Department, Politeknik Negeri Sriwijaya. The main purpose of this project is to maintain air quality in the workplace so that it remains safe and healthy, as well as to minimize the risk of work accidents caused by exposure to hazardous fumes and gases produced during welding activities. The methods used in this project include direct field observation, interviews with relevant parties, discussions, and literature studies to strengthen the theoretical foundation of the design. In addition, visual and functional testing was carried out to determine the effectiveness of the device in extracting fumes in the welding room. The tests were conducted by measuring the amount of fumes that could be removed within a certain period of time in order to evaluate the device's performance. The results indicated that the designed air suction device was able to reduce fumes and toxic gases with a fairly good level of efficiency. Technical calculations were also conducted to determine the appropriate blower size in accordance with the welding booth capacity. Based on the analysis, a welding booth with a volume of 65 m³ and a fume concentration of 1691 PPM can be ventilated effectively using a 12-inch blower. This design also highlights the relationship between blower capacity and indoor air quality, where the proper selection of blower size significantly affects the overall performance of the device. Through this approach, the design provides insight into the importance of technical planning, testing processes, and data analysis in supporting occupational safety and health during welding activities.

Keywords: exhaust fan, design and construction, planning, testing, welding