ABSTRAK

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Judul Laporan Akhir	:	Rancang Bangun Alat Pencetak Arang Briket dengan Menggunakan Sistem *Screw* (Proses Pengujian)

(2025: xiv + 71 Halaman, 40 Gambar, 6 Tabel + 6 Lampiran)

Laporan akhir ini membahas proses rancang bangun serta pengujian fungsional alat pencetak briket arang berbasis sistem screw yang menggunakan limbah arang kayu bahan baku utama. Pembuatan alat ini dilatarbelakangi oleh kebutuhan akan energi alternatif yang ramah lingkungan serta perlunya efisiensi dalam proses produksi briket, terutama bagi pelaku usaha kecil dan menengah (UMKM) yang masih mengandalkan metode pencetakan manual. Alat ini dirancang dengan motor listrik berdaya 1 HP sebagai penggerak utama screw, sistem transmisi daya menggunakan pulley dan sabuk-V, serta cetakan berbentuk persegi dengan ukuran 40 × 40 mm. Material rangka utama menggunakan besi siku ASTM A36 yang dikenal memiliki kekuatan dan ketahanan yang baik serta mudah diperoleh di pasaran. Proses perancangan juga memperhitungkan perencanaan torsi, daya motor, diameter poros, panjang sabuk, dan kekuatan sambungan las, sehingga alat dapat bekerja optimal dan aman digunakan. Pengujian fungsional dilakukan untuk memastikan kinerja alat, meliputi pengamatan terhadap kelancaran putaran screw, aliran bahan dari hopper ke cetakan, stabilitas motor saat beroperasi, serta hasil cetakan briket dari segi bentuk, kepadatan, dan keseragaman. Hasil pengujian menunjukkan bahwa alat mampu beroperasi sesuai dengan desain, menghasilkan briket padat secara kontinu, dan mempercepat waktu produksi dibandingkan metode manual. Massa adonan yang dicetak dalam satu siklus putaran screw mencapai ±421 gram. Diharapkan alat ini dapat menjadi solusi aplikatif dalam pemanfaatan limbah biomassa, khususnya arang kayu, menjadi bahan bakar alternatif yang ekonomis, efisien, dan berkelanjutan. Selain itu, laporan ini juga dapat dijadikan referensi teknis untuk pengembangan alat sejenis di masa mendatang.

Kata Kunci: Briket Arang, Sistem *Screw*, Pencetak, Pengujian Alat.

ABSTRACT

Designing a Charcoal Briquette Molding Machine Using a Screw System (Testing Process)

(2025: xiv + 71 pp. + 40 Figures + 6 Tables + 6 Attachments)

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This final report presents the design and functional testing of a charcoal briquette molding machine using a screw system, with coconut shell waste as the primary raw material. The background of this project is driven by the increasing demand for environmentally friendly alternative energy sources and the need to improve production efficiency, especially for small-scale businesses that still rely on manual briquette molding methods. The machine is equipped with a 1 HP electric motor as the main screw drive, a power transmission system using pulleys and V-belts, and a square mold with dimensions of 40 × 40 mm. The main frame is constructed from ASTM A36 angle iron due to its strength, durability, and ease of procurement. The design process also includes detailed calculations of torque, motor power, shaft diameter, belt length, and weld strength to ensure safe and optimal machine performance. Functional testing was conducted to evaluate the machine's performance, including observing the smooth rotation of the screw, the flow of material from the hopper into the mold, the operational stability of the electric motor, and the consistency, shape, and density of the molded briquettes. The results demonstrated that the machine operates as designed, is capable of producing compact briquettes continuously, and significantly reduces production time compared to manual methods. Each screw cycle was able to mold approximately 421 grams of briquette material. This machine is expected to serve as a practical solution for converting coconut shell biomass waste into renewable fuel in a simple, efficient, and economical way. Furthermore, this report provides a technical reference for future development of similar molding machines and promotes sustainable energy practices in small industries.

Keywords : Charcoal Briquettes, Screw System, Molding Machine, Equipment Testing.