

PENGGUNAAN ABU KAYU MAHONI SEBAGAI BAHAN TAMBAH PADA KUAT TEKAN BETON

**Muhamad Restu Ferdiansyah¹⁾, Yusep Ramdani²⁾, Asep Kurnia Hidayat³⁾,
H. Herianto⁴⁾, Fitriana Sarifah⁵⁾**

Jurusan Teknik Sipil, Fakultas Teknik, Universitas Siliwangi
Jalan Siliwangi No. 24 Tasikmalaya, Jawa Barat, Indonesia
E-mail : 197011088@student.unsil.ac.id

ABSTRAK

Beton terdiri dari campuran semen, air, agregat halus, dan agregat kasar. Semen merupakan komponen aktif utama dalam campuran beton. Semen terdiri dari beberapa komposisi senyawa diantaranya kapur (CaO), Silika (SiO₂), Alumina (Al₂O₃), dan Besi (Fe). Salah satu bahan baku abu yang memiliki unsur kimia oksida berupa silika (SiO₂) adalah abu kayu mahoni. Abu kayu mahoni adalah hasil dari pembakaran kayu mahoni, banyak ditemukan limbah kayu mahoni dalam jumlah besar yang dapat dimanfaatkan untuk bahan bangunan dan campuran beton. Untuk mengoptimalkan abu kayu mahoni sehingga dapat digunakan dalam campuran pembuatan beton. Tinjauan analisis yang dilakukan pada penelitian kali ini adalah kuat tekan. Benda uji berupa silinder berukuran 15x30 cm dengan umur beton 7, 14, 21, dan 28 hari serta menggunakan metode *mix design* SNI 7656:2012. Variasi persentase penambahan abu kayu mahoni yang digunakan dalam penelitian ini 0%, 5%, 10%, dan 15% dari berat semen. Setelah dilakukan pengujian dan penelitian beton dengan penambahan abu kayu mahoni menjadi lebih padat karena nilai FAS (faktor air semen) berubah menjadi lebih kecil seiring dengan penambahan abu kayu mahoni pada campuran beton nilai FAS didapat 0% 0,582, 5% 0,554, 10% 0,529, 15% 0,506. Nilai kuat tekan rata-rata pada umur 28 hari dengan penambahan abu kayu mahoni secara berurutan 0%; 5%; 10%; dan 15% adalah 20,660 MPa; 22,231 MPa; 23,903 MPa; dan 24,962 MPa.

Kata Kunci: Beton, Abu Kayu Mahoni, Kuat Tekan

¹⁾Mahasiwa Jurusan Teknik Sipil, FT UNSIL

²⁾Dosen Pembimbing Tugas Akhir 1, Dosen Teknik Sipil, UNSIL

³⁾Dosen Pembimbing Tugas Akhir 2, Dosen Teknik Sipil, UNSIL

⁴⁾Dosen Penguji Tugas Akhir 1, Dosen Teknik Sipil, UNSIL

⁵⁾Dosen Penguji Tugas Akhir 2, Dosen Teknik Sipil, UNSIL

**THE USE OF MAHOGANY WOOD ASH AS AN ADDITIVE IN CONCRETE
COMPRESSIVE STRENGTH**

**Muhamad Restu Ferdiansyah¹⁾, Yusep Ramdani²⁾, Asep Kurnia Hidayat³⁾,
H. Herianto⁴⁾, Fitriana Sarifah⁵⁾**

*Department of Civil Engineering, Faculty of Engineering, Siliwangi University
Siliwangi Street No. 24 Tasikmalaya, West Java, Indonesia*

E-mail : 197011088@student.unsil.ac.id

ABSTRACT

Concrete consists of a mixture of cement, water, fine aggregate, and coarse aggregate. Cement is the main active component in concrete mixtures. Cement consists of several compound compositions including lime (CaO), Silica (SiO₂), Alumina (Al₂O₃), and Iron (Fe). One of the ash raw materials that has an oxide chemical element in the form of silica (SiO₂) is mahogany wood ash. Mahogany wood ash is the result of burning mahogany wood, there is a large amount of mahogany wood waste that can be utilized for building materials and concrete mixtures. To optimize mahogany wood ash so that it can be used in concrete making mixes. The review of the analysis carried out in this research is compressive strength. The test object is a 15x30 cm cylinder with a concrete age of 7, 14, 21, and 28 days and uses the SNI 7656: 2012 mix design method. Variations in the percentage of mahogany wood ash addition used in this study were 0%, 5%, 10%, and 15% by weight of cement. After testing and research, the concrete with the addition of mahogany wood ash became denser because the FAS (cement water factor) value changed to be smaller along with the addition of mahogany wood ash to the concrete mixture, the FAS value obtained for 0% 0.582, 5% 0.554, 10% 0.529, 15% 0.506. The average compressive strength at 28 days of age with the addition of mahogany wood ash at 0%; 5%; 10%; and 15% are 20.660 MPa; 22.231 MPa; 23.903 MPa; and 24.962 MPa, respectively.

Keywords: *Concrete, Mahogany Wood Ash, Compressive Strength*

¹⁾Student of Civil Engineering Department, Faculty of Engineering Siliwangi University

²⁾Supervisor of Final Project 1, Civil Engineering Lecturer, Siliwangi University

³⁾Supervisor of Final Project 2, Civil Engineering Lecturer, Siliwangi University

⁴⁾Examiner of Final Project 1, Civil Engineering Lecturer, Siliwangi University

⁵⁾Examiner of Final Project 2, Civil Engineering Lecturer, Siliwangi University