

PENGARUH VARIASI KETEBALAN PELAPISAN PROTEKTIF API TIGA JENIS ARANG TRADISIONAL TERHADAP SIFAT KETAHANAN API KAYU MAHONI (*Swietenia macrophylla* King)

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INTISARI

Kayu mahoni merupakan kayu yang banyak digunakan sebagai bahan konstruksi perumahan yang memiliki sifat ketahanan api yang kurang baik. Upaya yang dilakukan untuk meningkatkan sifat ketahanan api kayu mahoni dengan memberi pelapisan bahan tahan api seperti arang. Penelitian ini bertujuan untuk memanfaatkan dan mengolah arang kayu tradisional yaitu arang asam, arang sonokeling, dan arang akasia sebagai bahan baku pembuatan lembaran Lapisan Penghambat Api (LPA), serta mengetahui pengaruh jenis arang kayu dan variasi ketebalan LPA terhadap sifat ketahanan api.

Serbuk arang tradisional (asam, sonokeling, akasia) berukuran lolos 10 mesh tertahan 20 mesh dibuat LPA dengan penambahan bahan perekat sebanyak 40% dan *hardener* sebanyak 10% kemudian dicetak dengan ukuran 20cm x 20cm dan variasi ketebalan 3mm serta 5mm yang dikempa panas pada suhu 140°C selama 10 menit. Lembaran LPA arang kemudian dilapiskan pada permukaan kayu mahoni yang selanjutnya diuji pembakaran sesuai dengan ASTM E 69-02. Kayu mahoni yang telah dilapisi lembaran LPA arang diuji sifat ketahanan api kayu yang meliputi persentase kehilangan berat dan waktu mencapai suhu 260°C.

Hasil penelitian menunjukkan kayu mahoni dengan lembaran LPA arang asam dengan ketebalan 3mm dan 5mm memiliki persentase kehilangan berat berturut-turut sebesar 19,84% dan 12,16% serta waktu mencapai suhu 260°C selama 40 detik dan 35 detik. Kayu mahoni dengan lembaran LPA arang sonokeling dengan ketebalan 3mm dan 5mm memiliki persentase kehilangan berat berturut-turut sebesar 18,80% dan 8,89% serta waktu mencapai suhu 260°C selama 35 detik dan 43,33 detik. Kayu mahoni dengan lembaran LPA arang akasia dengan ketebalan 3mm dan 5mm memiliki persentase kehilangan berat berturut-turut sebesar 18,71%, dan 10,62% serta waktu mencapai suhu 260°C selama 28,33 detik dan 21,67 detik. Kombinasi jenis arang sonokeling dengan variasi ketebalan LPA 5mm menghasilkan nilai ketahanan api yang paling baik dibandingkan dengan kombinasi lainnya.

Kata kunci: arang tradisional, lapisan penghambat api, mahoni, asam, sonokeling, akasia, persentase kehilangan berat, waktu mencapai suhu 260°C

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OVERLAID EFFECT PROTECTION TRADITIONAL MADE CHARCOAL FROM THREE DIFFERENT WOOD SPECIES WITH THICKNESS VARIATION ON FIRE RESISTANCE PROPERTIES OF MAHOGANY TIMBER (*Swietenia macrophylla* King)

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ABSTRACT

Mahogany timber many used for housing construction but needs a fire resistance improvement. One of the method to improve fire resistance is overlaying the timber with fire resistance material such as charcoal. This research are aims to utilize and process traditional made charcoal from tamarind, sonokeling and acacia wood as material for Fire Retardant Sheet (FRS), and to find out the effect of three different species wood charcoal with variation of thicknees on the properties of FRS.

Traditional made charcoal (tamarind, sonokeling, acacia) turned to powder by 10 mesh filtered and hold 20 mesh. A charcoal FRS made by three different species charcoal powder with addition of 40% phenol formaldehyde and 10% hardener and then hot pressed at 140⁰C for 10 minutes. Charcoal FRS were overlaid on the surface of mahogany timber, and then were tested according to ASTM E 69-02. Mahogany timber which overlaid by charcoal FRS were tested fire resistance properties such as weight loss percentage and temperature time reach to 260⁰C.

The result shows that mahogany timber with tamarind charcoal FRS thickness 3mm and 5mm had weight loss percentage 19,84% and 12,16%, reach time to 260⁰C in 40 and 35 seconds. Mahogany timber with sonokeling charcoal FRS thickness 3mm and 5mm had weight loss percentage 18,8% and 8,89%, reach time to 260⁰C in 35 and 43,33 seconds. Mahogany timber with acacia charcoal FRS thickness 3mm and 5mm had weight loss percentage 18,71% and 10,62%, reach time to 260⁰C in 28,33 and 21,67 seconds. FRS significantly improving fire resistance properties of mahogany timber that marked by low burning temperature and low weight loss percentage compare to mahogany timber that wasn't overlaid by FRS. The excellent improvement of fire resistant on mahogany timber was by overlaying with 5mm thickness of sonokeling charcoal.

Keywords: Traditional Made Charcoal, Fire Retardant Sheet, mahogany, tamarind, sonokeling, acacia, weight loss percentage, temperature time reach to 260⁰C

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