

## ABSTRAK

Penelitian dilatar belakangi oleh kebutuhan material komposit ramah lingkungan serta pemanfaatan bahan organik serat ijuk, serat sabut kelapa dan serbuk limbah kaca. Tujuan penelitian ini ialah untuk mengetahui pengaruh presentase kandungan serat ijuk, serat sabut kelapa dan limbah kaca dalam pembuatan kampas rem, serta untuk mendapatkan presentase kandungan penguat yang paling optimum. Disisi lain, ditemukannya beberapa sifat bahan dasar kampas rem (asbestos) yang berbahaya sehingga perlu digantikan dengan bahan lain. Oleh karena itu diperlukan inovasi komposit dengan bahan dasar alternatif pengganti asbestos yang tidak berbahaya bagi kesehatan manusia dan ramah lingkungan. Penelitian ini dilakukan dengan metode uji eksperimen di Laboratorium Teknik Mesin Universitas Mercu Buana, dengan melakukan uji densiti, uji koefisien gesek dan uji kekerasan sesesuai acuan standar kampas rem. Percobaan yang digunakan dalam penelitian ini, dilakukan dengan cara membagi menjadi 9 kombinasi komposisi pada spesimen uji kampas rem dengan penekanan kompaksi suhu ruang sebesar 5000 psi selama 45 menit dan disintering pada suhu 130°C selama 45 menit. Kemudian dilakukan uji densiti untuk mengetahui massa jenis, uji koefisien gesek dengan acuan SNI, dan ujian kekerasan dengan acuan kekerasan kampas rem. Berdasarkan penelitian yang telah dilakukan, spesimen hasil uji densiti massa jenis tertinggi yaitu kombinasi 6 dengan komposisi (SK20SJ22,5KC25RE32,5) memiliki nilai tertinggi 1,65 g/cm<sup>3</sup>. Hasil uji koefisien gesek kombinasi 1 dengan komposisi (SK20SJ20KC20RE40) memiliki nilai tertinggi 0,53. Hasil uji kekerasan kombinasi 5 dengan komposisi (SK20SJ22KC22,5RE35) memiliki nilai kekerasan 125. Maka disimpulkan bahwa kombinasi 9 merupakan, kombinasi yang paling mendekati nilai karakteristik yang dipersyaratkan untuk standar kampas rem.

**Kata kunci:** serat ijuk serat sabut kelapa dan serbuk limbah kaca kamaps rem komposit resin, uji densiti, koefisien gesek, dan Kekerasan.

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## **ANALYSIS OF RESIN COMPOSITE REINFORCED COCONUT FIBER FIBER GLASS WASTE POWDER FOR MAKING BRAKE PADS**

### **ABSTRACT**

*The research was motivated by the need for environmentally friendly composite materials and the use of organic palm fiber, coconut fiber and glass waste powder. The aim of this research is to determine the effect of palm fiber, coconut fiber and glass waste content in making brake linings, as well as to obtain the most optimal reinforcing content. On the other hand, it was found that several properties of the basic brake lining material (asbestos) were dangerous so they needed to be replaced with other materials. Therefore, composite innovation is needed with alternative base materials to replace asbestos that are not harmful to human health and are environmentally friendly. This research was carried out using experimental test methods at the Mechanical Engineering Laboratory at Mercu Buana University, by carrying out density tests, friction coefficient tests and hardness tests according to brake lining standard references. The experiment used in this research was carried out by dividing the brake lining test specimens into 9 composition combinations with compaction pressure at room temperature of 5000 psi for 45 minutes and sintering at 130oC for 45 minutes. Then a density test is carried out to determine the density, a friction coefficient test using SNI references, and a hardness test using brake lining hardness as a reference. Based on the research that has been carried out, the specimen resulting from the density test for the highest combination of 6 with the composition (SK20SJ22.5KC25RE32.5) has the highest value of 1.65 g/cm<sup>3</sup>. The results of the friction coefficient test for combination 1 with the composition (SK20SJ20KC20RE40) have the highest value of 0.53. The hardness test results for combination 5 with the composition (SK20SJ22KC22,5RE35) have a hardness value of 125. So it is concluded that combination 9 is the combination that is closest to the characteristic values required for brake lining standards.*

**Key words:** *coconut fiber palm fiber and glass waste powder, composite resin brake lining, density test, coefficient of friction, and hardness.*