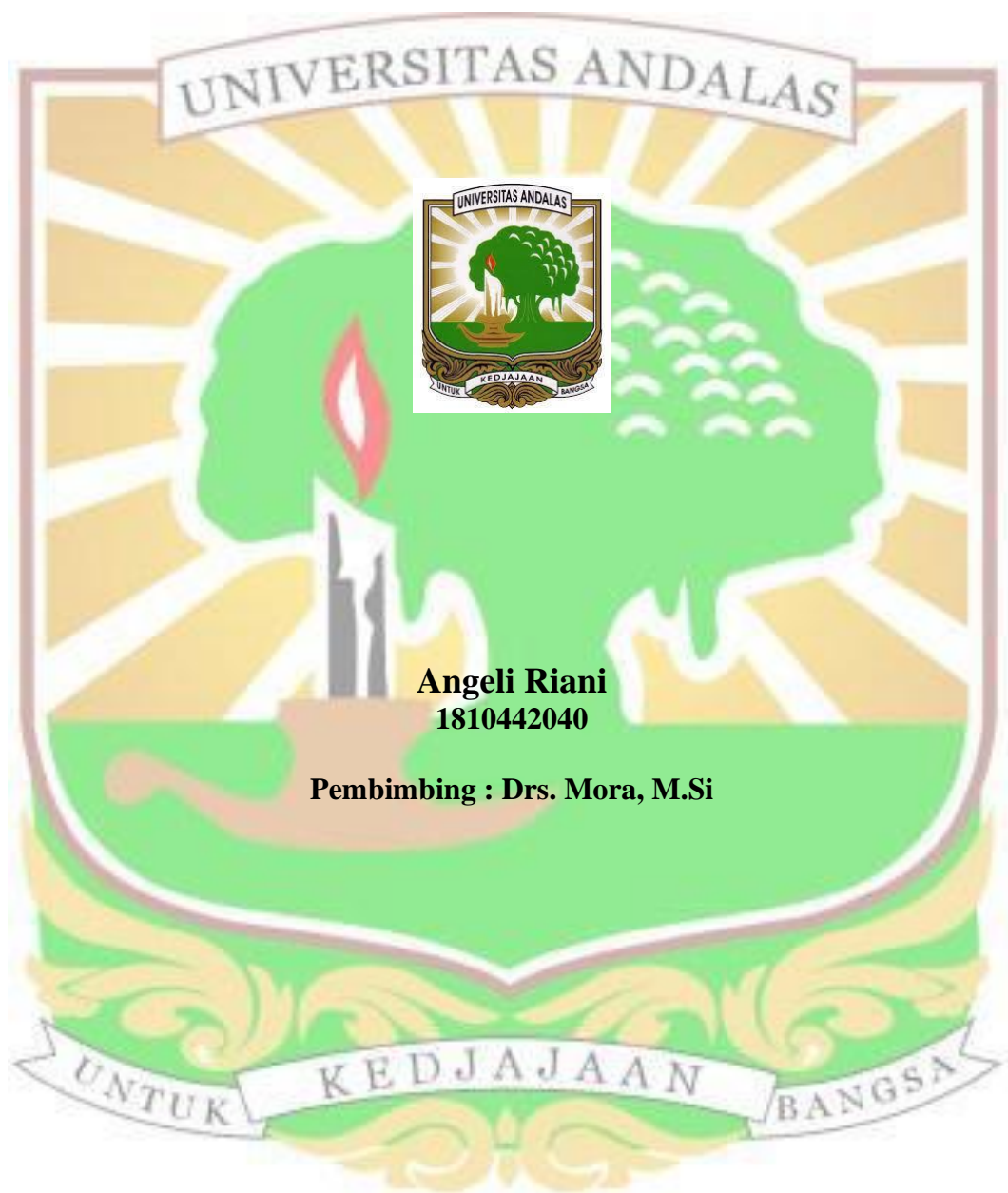


**PENGARUH VARIASI WAKTU *MILLING* DAN SUHU SINTERING  
TERHADAP SIFAT FISIS DAN KUAT TEKAN KERAMIK *CLAY***

**SKRIPSI**



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## PENGARUH VARIASI WAKTU *MILLING* DAN SUHU SINTERING TERHADAP SIFAT FISIS DAN KUAT TEKAN KERAMIK *CLAY*

### ABSTRAK

Telah dilakukan penelitian untuk mengetahui pengaruh variasi waktu *milling* dan suhu sintering terhadap sifat fisis dan kuat tekan keramik *clay*. *Clay* dimilling dengan variasi waktu 0 jam (tanpa *milling*), 5 jam dan 10 jam. Persentase campuran *clay* tanpa *milling* (*milling* 0 jam) dengan *milling* variasi waktu 100%:0%, 90%:10%, 80%:20%, 70%:30%. Pengujian yang dilakukan pada sampel meliputi uji sifat fisis (susut bakar, densitas, porositas) dan kuat tekan, serta karakterisasi menggunakan *X-ray Fluorescence* (XRF). Berdasarkan hasil pengujian yang dilakukan, nilai susut bakar berbanding terbalik dengan nilai densitas. Semakin besar nilai susut bakar, semakin kecil nilai densitas yang dihasilkan. Nilai susut bakar keramik tertinggi diperoleh pada komposisi massa 100% tanpa *milling*, yaitu 21,26%, 20,47%, dan 20,04%. Nilai densitas tertinggi yaitu pada campuran *clay* 80% tanpa *milling* dengan 20% *milling* 5 jam untuk semua variasi suhu sintering (700°C, 800°C, dan 900°C) dengan yaitu 1,80 g/cm<sup>3</sup>, 1,63 g/cm<sup>3</sup>, dan 1,81 g/cm<sup>3</sup>. Nilai porositas terendah diperoleh pada keramik *clay* campuran 70% tanpa *milling* dengan 30% *clay* *milling* 5 jam untuk suhu sintering 700°C, yaitu 20,00%. Nilai kuat tekan tertinggi untuk suhu 900°C, yaitu pada *clay* 70% tanpa *milling* dengan 30% *milling* 5 jam, yaitu 383,13 kg/cm<sup>2</sup>. Hasil XRF menunjukkan *clay* Nagari Aripin Kec X Koto Singkarak, Kab Solok, Sumatera Barat mengandung silika (SiO<sub>2</sub>), alumina (Al<sub>2</sub>O<sub>3</sub>), dan besi oksida (Fe<sub>2</sub>O<sub>3</sub>).

Kata kunci: *clay* , keramik *clay*, *milling*, suhu sintering





# **EFFECT OF MILLING TIME VARIATION AND SINTERING TEMPERATURE ON PHYSICAL PROPERTIES AND COMPRESSIVE STRENGTH OF CLAY CERAMICS**

## **ABSTRACT**

Research has been conducted to determine the effect of milling time variation and sintering temperature on the physical properties and compressive strength of ceramic clay. Clay is milled with time variations of 0 hours (without milling), 5 hours and 10 hours. The percentage of clay mixture without milling (milling 0 hours) with milling time variations 100%: 0%, 90%: 10%, 80%: 20%, 70%: 30%. The tests performed on the samples include physical properties tests (shrinkage, density, porosity) and compressive strength, as well as characterization using X-ray Fluorescence (XRF). Based on the test results, the value of fuel shrinkage is inversely proportional to the density value. The greater the value of fuel shrinkage, the smaller the resulting density value. The highest ceramic shrinkage value is obtained at 100% mass composition without milling are 21.26%, 20.47%, and 20.04%. The highest density value is in a mixture of 80% clay without milling with 20% milling 5 hours for all sintering temperature variations (700 ° C, 800 ° C, and 900 ° C) with 1.80 g/cm<sup>3</sup>, 1.63 g/cm<sup>3</sup>, and 1.81 g/cm<sup>3</sup>. The lowest porosity value is obtained in ceramic clay mixture of 70% without milling with 30% clay milling 5 hours for sintering temperature 700°C, which is 20.00%. The highest compressive strength value for 900 ° C, which is on clay 70% without milling with 30% milling 5 hours, which is 383.13 kg / cm<sup>2</sup>. XRF results show that the clay of Nagari Aripin, X Koto Singkarak Kec, Solok Kab, West Sumatera contains silica (SiO<sub>2</sub>), alumina (Al<sub>2</sub>O<sub>3</sub>), and iron oxide (Fe<sub>2</sub>O<sub>3</sub>).

Keywords: clay, clay ceramics, milling, sintering temperature