

**THE MODELLING OF THERMAL BEHAVIOUR OF
KAOLIN CLAY AT DIFFERENT TEMPERATURES**

**A Project Report Presented In Partial Fulfilment Of The
Requirement For The Award Of Advance Diploma In Mechanical
Engineering Of Mara Institute Of Technology**

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MAY 1996

ACKNOWLEDGEMENT

In the name of ALLAH and most beneficial and merciful.

We were indebted to many professionals especially to our project adviser Ir. Dr. Mohamad Nor Berhan for this supervision and suggestion in this project. we also like to thanks to ;

- 1. Pn. Afidah, Adviser Of An ANSYS Software.**
- 2. En. Baharum, Adviser Of Graphic Modelling.**
- 3. Tn . Haji Mohamad Jamil, Cadem Coordinator.**
- 4. Cik Norhasliza (PRIMETIME) , LCD Graphic Monitoring.**

with their guidance and helpful works and information for this project.

Their continuously patient guidance, valuable advise, constructive criticism and repeated encouragement throughout this project have made it possible to complete our project.

Finally, we would like to thanks to our classmate and lecturers, who give us full support on the completion of our course.

PREFACE

The lay public thinks of **KAOLIN CLAY** as artware and knows that the products of the earliest artisans were ceramics. The engineer also knows that ceramic materials are used in a wide usage of **Hi-Tech** products extending from mechanical properties, i.e. *high-speed cutting tools*, to electrical properties, i.e. *piezoelectric transducers* to high frequency magnets and optic fibers.

Instead of using kaolin in the manufacturing of porcelain, firebrick, and China ware, Kaolin has also been exported on a small scale, for use as rubber filler in Malaysia since 1932. At present there are no proper investigation has been carried out to find the new breakthrough of Kaolin especially on engineering purposes.

This project gives to us a new approach with the structure in Kaolin. After we get what's their behaviour, we can analyse the advantages of that clay and the new '*best product*' will be produces respect to these. We hope that this project can be fruitful as a starting point of intensive research on Kaolin clay.

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1.0 INTRODUCTION.

Ceramic In Malaysia

Malaysians, use ceramic as one of the material to produce equipment for their daily application. They choose traditional ceramic because these materials are very cheaps and easily available everywhere. They have traditional process for ceramics material that traditional products such as becoming very popular 'Tembikar' in Serawak.

Ceramic Properties

The properties of this material are good in heat resistance, wear resistance, hardness, oxidation and corrosion, and stable with chemical and thermal reaction.

Ceramics such as Alumina, zirconia, silicon nitride and silicon carbide are characterised by good resistance wear, oxidation and corrosion, when compare with metals and thermoplastics.

Ceramic Applications

Now, products of modern ceramic become very popular, because of advantages in properties and their behaviour. With their good oxidation and corrosion properties, they are special products for wet condition. For example ceramic tile, sinking, toilet bowl kitchen and bath room tiles. Good heat resistance of ceramics as for fire clay wall give better condition inside room.

The high strength and wear resistance make ceramic tile able to support load and longer life.

Engineering Ceramics

Engineering ceramics have been developed for various applications in metallurgy such as in heat engine systems and aerospace industries. Many parts of engine where heavy wear and superheated operation are desired ceramic have replaced metals.

In production industries, advance cutting tool made of ceramic material have been used. SUNCHIRIN (M) Co. use *Super Ceramic 'Insert'* tool in high operation cutting speed to machine Aluminium. SUMITOMO (M) Co. produces Automotive disk brake, they use *special ceramic 'insert'* tool to machine carbon steel at high temperature.