



INVENTORS

ALIDA ABDULLAH
MOHD MUSTAFA AL BAKRI ABDULLAH
MOHD IZZAT AHMAD
CHE MOHD RUZAIHI GHAZALI
NUR AIN JAYA
ROMISUHAN AHMAD

CONTACT DETAILS

Centre of Excellence Geopolymer & Green Technology (CEGeoTech)
School of Material Engineering
Universiti Malaysia Perlis (UniMAP)
P.O. Box 77, d/a Pejabat Pos Besar
01000 Kangar, Perlis, Malaysia

A NOVEL GEOPOLYMER CERAMIC MATRIX COMPOSITES

PRODUCT DESCRIPTION

Geopolymer is a new technology which using aluminosilicate sources to produce a compacted network structure binder which is an alternative to the Ordinary Portland Cement (OPC). However the development of this technology is not limited only on the binder processing but it can be used on the other application such as ceramic technology. Geopolymer ceramic which using waste materials such as fly ash and others is very strong, hard, and chemically inert ceramic which can be used in several applications, including those in extreme environments. High performance and lightweight are the desired properties for geopolymer ceramic matrix composites.

PROBLEM STATEMENTS

- Due to the complex fabrication method of advanced ceramic technology nowadays, we offer simplest and user-friendly method for high performance ceramic properties.
- To produce equal qualities to other advanced ceramic by using waste materials.
- Widen technology of geopolymer ceramic.

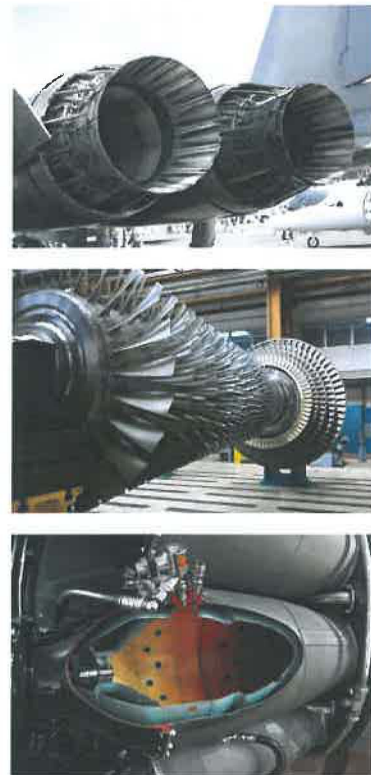
NOVELTIES

- High performance and lightweight criteria.
- Chemical resistance.
- Good oxidation resistance
- Excellent creep resistance

PRODUCT PROPERTIES

Properties	Geopolymer Ceramic	Geopolymer Ceramic Matrix Composites
Source material	Environmental friendly	Waste
Strength (MPa)	~120	~140
Density (g/cm ³)	2.4 - 2.6	1.9 - 2.1
Hardness (GPa)	~7.00	~7.5
Withstand temperature (°C)	>1300	>1300

POTENTIAL APPLICATIONS



COLLABORATION

This product is in research cooperation agreement between King Abdul Aziz City Science & Technology (KACST) and granted with Saudi Aramco Oil with 2.2 million.



PUBLICATIONS

- A.M. Mustafa Al Bakri, H. Kamarudin, M. BnHussain, J. Liyana, C.M. Ruzaidi and A.M. Izzat, "Study on Refractory Materials Application Using Geopolymer Processing" Australian Journal of Basic and Applied Science, 2012
- C.Y. Heah, H. Kamarudin, A.M. Mustafa Al Bakri, M. Bnhussain, M. Luqman, I. K. Nizar, C.M. Ruzaidi, and Y.M. Liew, "Study on solids-to-liquid and alkaline activator ratios on kaolin-based geopolymers", International Journal of Mineral, Metallurgy and Material, 2013
- C.Y. Heah, H. Kamarudin, A.M. Mustafa Al Bakri, M. Bnhussain, M. Luqman, I. Khairul Nizar, C.M. Ruzaidi, and Y.M. Liew, "Kaolin-based geopolymers with various NaOH concentrations", International Journal of Minerals, Metallurgy and Materials, 2013