



INVENTORS

AIMI NOORLIYANA HASHIM
 NOOR MATIYAMAZLIZA MOHD NAR
 NOOR AZIRA MOHD NOOR
 KAMROSI ABDUL RAZAK
 PROF. DATUK DR. KAMARUDIN RUSSIM

CONTACT DETAILS

CENTER OF EXCELLENCE GEOPOLYMER AND GREEN TECHNOLOGY (CEG@GTECH),
 SCHOOL OF MATERIALS ENGINEERING,
 UNIVERSITI MALAYSIA PERLIS,
 TAMAN BUHIBBAH, 02600 JEJAWI, PERLIS,
 MALAYSIA.
 e-mail: aimiliyana@unimap.edu.my

ALKALI ACTIVATED SLAG CEMENT FOR SUSTAINABLE DEVELOPMENT

Patent Novelty Search: PT/4569/UNIMAP/13
 Patent No.: PI 2010006250

PRODUCT DESCRIPTION

The synthesis of alkali activated slag cement using iron blast furnace slag becomes an important measurement for energy conservation and environment protection. Alkali activated slag cements differ from ordinary Portland cement through the use of an alkali-activated iron blast furnace slag with limestone and kaolin blends to give high compressive strength, long-term performance, improved durability characteristics and lower maintenance costs.

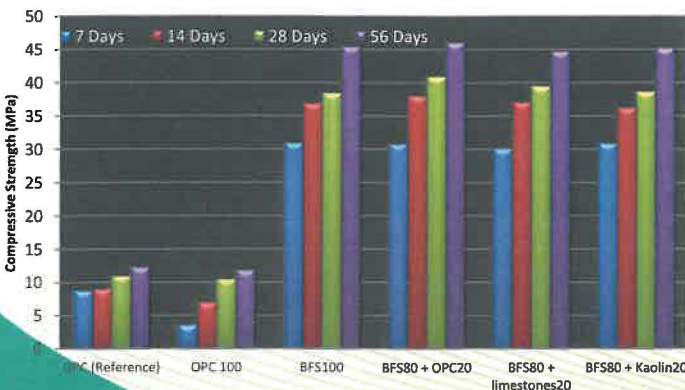
PROBLEM STATEMENT

One of the main challenges for the cement industry is to reduce CO₂ emissions into the atmosphere during the manufacture of Portland cement. In this context, the use iron blast furnace slag in cement serves to make concrete "greener." Not only it can be considered a recycled material, but it can also significantly reduce energy consumption, reduces virgin material use and reduces greenhouse gasses emitted in the production of concrete raw materials.

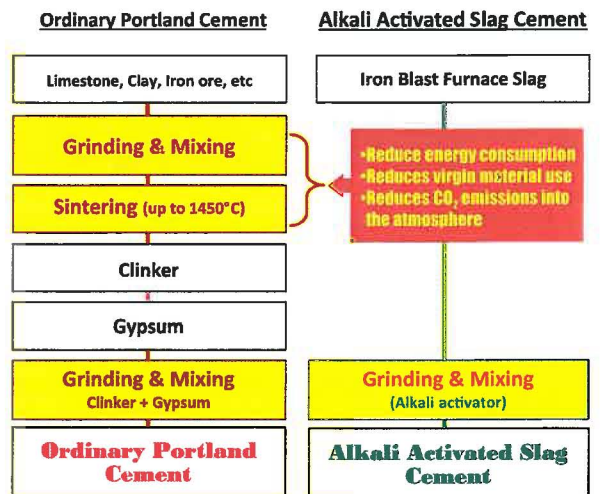
PRODUCT ADVANTAGES

Compound (%)	CaO	SiO ₂	Fe ₂ O ₃	MgO	Al ₂ O ₃
Portland Cement	65	22	3	2	6
BF Slag	39.3	33.8	0.5	8.1	14.2
Kaolin	0.02	52.3	1.0	0.1	42.8

Compressive Strength Development of Alkali Activated Slag Mortar



PROCESS DESCRIPTION



NOVELTIES

- Alternative, low cost and green in making cement.
- Using waste in the making of cement
- Turns waste into wealth.

COMMERCIAL POTENTIAL

The production of alkali activated slag cements associated with low energy consumption and low CO₂ emission, along with the potential to reach high mechanical strength at early ages of curing, high stability in aggressive environments and resistance to elevated temperatures. These properties have made alkali activated slag cements is a very interesting alternative from both scientific and commercial points of view.

PUBLICATION

• H. Aimi Noorliyana, Al Bakri, A.M.M., Azira, M.N., Mariamadzliza, M.N., Kamrosni, A.R. and Kamarudin, H. Alkali Activated Blast-Furnace Slag Cement: The opportunity to solve sustainable issues; *Advances in Environmental Biology*, 7(12) October Special Issue 2013, Pages: 3713-3715.

