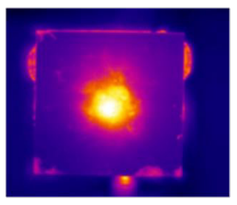
GEOCOAT

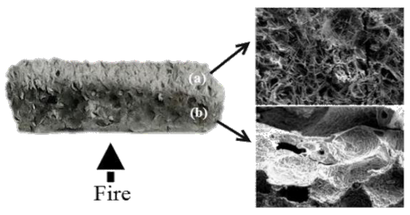
A Novel Fire Retardant Coating Based on Agricultural Waste

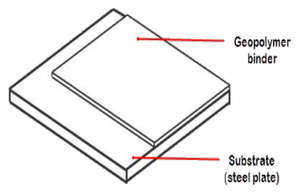
PATENT NO.: PI2016701334

BRIEF TECHNOLOGY

GeoCoat is a synergy between earth friendly waste material and great fire retardant requirements for a novel fire retardant coating material particularly on metal substrate. The main component used is rice husk which is a waste source, and the novel formulation of GeoCoat is optimized using statistical analysis tool. Currently, existing fire retardant use many additional agents including foaming, blowing and charring. With the latest novel optimized formulation, GeoCoat is able to protect the substrate by delaying the time taken. The coating also did not release any smoke and will never ignite when get in touch with fire.







PROBLEM STATEMENT & CURRENT ISSUES

Current technologies used main component which is **not from waste material**

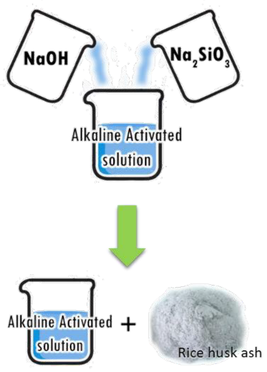
Usage of organic material as resin is **not suitable** for high temperature application

Used many additional agents which ultimately contribute to **higher production cost**

INVENTIVENESS & NOVELTY

Novel material composition

Parameters	Range
Ratio of Sodium silicate to Sodium hydroxide (AA)	4.5 to 5.5
Ratio of Rice husk ash to AA	0.40 to 0.55
Curing temperature	≤ 50°C
Curing period	1 to 7 days
NaOH concentration	8 to 10M
Rice husk ash particle size	3.4 to 59.5 µm



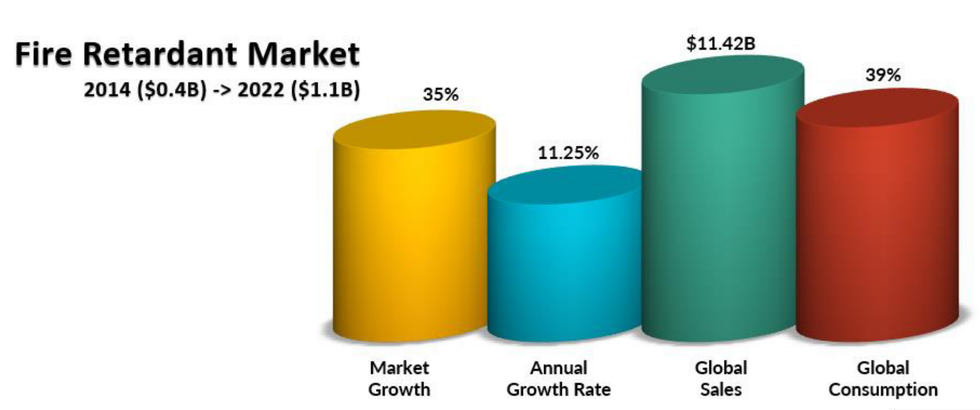
Zero smoke emission and zero fire ignition

Maintain fire temperature well below 400°C for up to 2 hours, cooler and longer than for conventional fire retardant material

Environmental friendly product

Enhance fire retardant features in many products

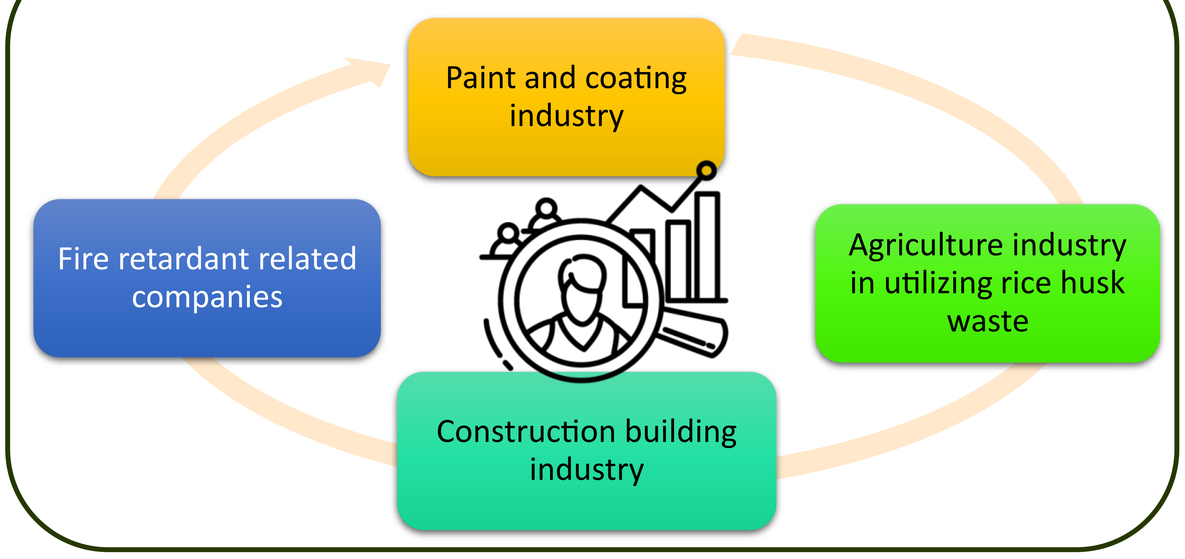
MARKET POTENTIAL



IMPACT OF THE PRODUCT

- Increase utilization of rice husk help reduce environmental pollution
- Greatly reduce number of casualties in fatal fire incidences
- Paddy millers benefit from sale of rice husk

USEFULNESS & APPLICATION



Collaborator: maerotech 864470-T

Award: **DIAMOND AWARD** International Invention & Innovation Competition 2016

International Publications

Mohd Basri, M. S., Mustapha, F., Mazlan, N., & Ishak, M. R. (2021). Rice-Husk-Ash-Based Geopolymer Coating: Fire-Retardant, Optimize Composition, Microstructural, Thermal and Element Characteristics Analysis. *Polymers*, *13*(21),

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