



SULFUR CONCRETE

ABSTRACT

The present invention relates to utilizing sulfur in building materials.

MARKET NEED AND OPPORTUNITIES

About 6,000 tons/day of solid sulfur is produced in Saudi Aramco's oil and gas production units. A large proportion of the sulfur is exported at a low price. It is expected that the quantity of sulfur will increase with increase in the oil production. There is a strong desire to utilize the by-product locally.

The utilization of sulphur, as a binder, in concrete would lead to conservation of water and also reduce the cement consumption. The developed sulfur concrete can be used in pre-cast element, pavements, slabs, tiles, repair of cracked concrete, and as fair coat on walls, slabs, and beams.

The use of sulfur eliminates the use of Portland cement and water, leading to technical and economic benefits (production of Portland cement is energy intensive).

COMPETITIVE ADVANTAGE

Laboratory tests of developed sulfur concrete have indicated that it possess better mechanical properties and is more durable than the conventional sulfur concrete (see picture beside). Further, it utilizes indigenous and abundantly available industrial waste materials, as against the synthetic additives used, leading to an overall low price concrete. Since synthetic polymers are not utilized in the developed sulfur concrete it will be cheaper than the conventional sulfur concrete.

READINESS FOR MARKET

The technology has been developed in collaboration with Saudi Aramco. The patented method can be implemented on an industrial scale with suitable investment.

The developed sulfur concrete was tested to evaluate the following properties: lab test conducted are as follows:

1. Compressive strength-ASTM C39
2. Flexure strength – ASTM C78
3. Water absorption – ASTM C642
4. Thermal Conductivity –ASTM C201
5. Corrosion Current Density – Electrochemical polarization technique.

KFUPM would like to talk to companies that are interested in setting up facilities to market the developed sulphur concrete. Prospective investors are required to provide financial support to setup the industrial facilities for production of building components utilizing the developed sulfur concrete. KFUPM inventors will provide technical support for such a venture.



Conventional sulphur concrete exposed to water (Damaged)



Developed sulphur concrete exposed to water (Undamaged)

PATENT PROTECTION

Two U.S. patents and two GCC patents pending cover the composition and method.

ABOUT KFUPM

King Fahd University of Petroleum & Minerals is a leading educational organization for science and technology. KFUPM Innovation Center is the IP management and technology licensing office tasked with taking innovation from lab to market place.

For further information please contact
Innovation Center
Email: ip-license@kfupm.edu.sa
Telephone: +966-13-8607297