

SOIL STABILIZATION



The present invention is an environment friendly soil stabilization composition and method to stabilize soils that are utilized in construction of roadways and pavements.

Invention

Soil Stabilization is alteration of soils to enhance their physical properties. The present invention proposes utilizing Electric Arc Furnace Dust (EAFD), a solid waste generated during production of steel, to stabilize soils that are utilized in roads and pavements construction.

Market Size and Growth

In United States, as per the American Road & Transportation Builders Association (ARTBA), the highway, bridge, parking lot and driveway markets will increase from \$58.9 billion in 2016 to \$62.5 billion in 2017, and will continue to grow over the next five years.

In other countries as well, the roads construction market shows upward trend. In the UK, the annual growth during the period 2013-2018 is expected to be 3.3%^[1]. The Indian road construction market is expected to grow at 3.4%^[2] and in Australia the growth is expected to be around 0.7%^[3].

Furthermore, a review of patents filed in the field of 'road construction' technologies reveals that there has been steady growth in number of patent applications filed from 2010 to 2015. This suggests steady R&D in the industry, especially related to materials.

1. "Road & Motorway Construction in the UK", IBIS World, September 2017.
2. "Construction Equipment: Driving Growth in a Challenging Market", Redseer Consulting, 2014
3. "Road and Bridge Construction in Australia", IBIS World, March 2017.

Applications

The proposed invention could be utilized for stabilization of soils utilized in construction of:

- Roads
- Pavements
- Highways
- Buildings

Advantage

EAF dust is categorized as a hazardous solid waste and its disposal creates environmental problems. The present invention is expected to reduce EAFD disposal by utilizing it for roadways construction.

Project Status

Four properties were tested in labs at KFUPM:

- Unified Compressive Strength increased with increase in percentage of EAFD
- Soaked California Bearing Ratio (CBR) of more than 50 achieved
- Durability: fulfilled the requirements of both Portland Cement Association and US Corps of Engineers (USCE)
- Leaching: No leaching of heavy metals observed into the groundwater

Looking for Industrial Partner for Technology Development

KFUPM is interested in seeking market feedback from industry, partner with a company for further development of this technology, and/or licensing the technology to a company to commercialize it.

Patent Protection

The invention is protected in US through patent US9499742 and in Saudi Arabia through patent application 115370142. The protection covers the composition of proposed materials and the method to use such materials for soil stabilization. Patents are owned by King Fahd University of Petroleum & Minerals.

About KFUPM

King Fahd University of Petroleum & Minerals is a leading educational institution for science and technology. The Innovation & Industrial Relations (IIR) office at KFUPM is tasked with taking innovation from lab to market place. For any inquiries regarding this technology, please get in touch with IIR executive below.

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