

Full Inorganic Load Bearing

High performance light weight thermal-insulator material with robust compressive load and flame retardant properties

Invention

Scientists of the University of Duisburg-Essen developed in cooperation with the German Aerospace Center (DLR) a full inorganic insulation material with high performance qualities. The



Gone are the days when construction material was not strong enough
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material exhibits extraordinary heat-insulating and load-carrying properties. It combines the benefits of conventional inorganic building materials like compressive strength and the ability to be poured into all kind of durable moulds with the advantage of being heat insulating. The latter makes it perfect with regards to energy saving aspects. The designated properties are dependant on the ratio of matrix-material to insulation-material. It is very low weight, in relation to its compression strength, and its flame-retardant properties make it a potential construction material even for applications with high demands.

Commercial Opportunities

The superlight and superinsulating material could be used in cars, trains and any other kind of vehicles. Even aerospace applications are imaginable. By its heat resistance, the material enables the passive isolation of load bearing areas in buildings as well as passive insulation in areas where high temperatures occur like exhaust systems or furnaces. In addition, the material isolates not only thermally but also acoustically. High efficient heat pumps, new kinds of filters for clean air inside cars, trains and airplanes are just some examples of applications.

Current Status

An international PCT patent application is pending. On behalf of the University of Duisburg-Essen and the DLR, PROvendis offers access to rights for commercial use as well as the opportunity for further co-development.

Relevant Publications

Fickler, et al (2015), *Development of High Performance Aerogel Concrete*, Energy Procedia, Vol 78, 406-411.

http://elib.dlr.de/72455/1/Aerogel-Applications-2011_k.pdf

An invention of the University of Duisburg-Essen and the German Aerospace Center (DLR).

Competitive Advantages

- Moldable inorganic thermal-insulating material
- Thermal conductivities between 0.08 W/(mK) and 0.26 W/(mK)
- Compressive strength between 1.5 MP and 26 MP
- Extreme light weight densities between 490 kg/m³ and 1350 kg/m³
- Flame-retardant more than 2000 °C
- Hydrophobic porous surface
- For application with high demands like high load and great need for effective insulation

Technology Readiness Level

12345678

Technology validated in relevant environment

Ref. No.

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