ULB KTO
KNOWLEDGE TRANSFER OFFICE

TECHNOLOGY OFFER | ENGINEERING & MATERIALS

SELF-HEALING SULFUR CONCRETE

KEYWORDS

- Self-healing sulfur mortar/concrete
- Electro-conductive and microwave-absorbing admixtures
- Microwave-absorbent and/or ferromagnetic filler
- Maintenance and repair

Collaboration type
License agreement
R&D collaboration

IP status
Patent pending
Priority application
EP25207767.2
Date of priority:
9 October 2025

Inventors
Didier SNOECK

CONTACT

ULB KTO
KNOWLEDGE TRANSFER OFFICE

Knowledge Transfer Office
ULB Research Department

Arnaud Quintens
Business Developer

arnaud.quintens@ulb.be

www.ulbkto.be

THE TECHNOLOGY IN A NUTSHELL

The technology offers an alternative solution to current sulfur concrete thanks to its crack detection and self-healing abilities provided by the addition of microwave-absorbent and/or ferromagnetic fillers.

STATE OF THE ART

Compared to Portland concrete, sulfur concrete currently used in the industry has many advantages: good chemical resistance, impermeability, fast curing, recyclability and construction without the addition of water. Nevertheless, it suffers from a certain weakness due to its low temperature resistance properties. The development of reliable and self-healing sulfur concrete is then a good alternative to existing less environmentally friendly solutions.

THE INVENTION

A new intelligent and self-healing sulfur concrete has been invented thanks to the addition of microwave-absorbent and/or ferromagnetic fillers allowing:

1. Early microcracking detection
2. Self-healing capabilities that can be activated by heating (microwave or induction).

It is designed to maintain its strength and can carry out localized repairs at high temperatures.

KEY ADVANTAGES OF THE TECHNOLOGY

- Circular material for recasting potential
- High temperature resistance and local heating
- High acid and mechanical resistance
- Easy monitoring of potential crack formation
- Auto-repairing and self-healing of formed cracks

LIEU LIAISON ENTREPRISES-UNIVERSITÉS
www.enmieux.be
Cofinancé par l'Union européenne
Wallonie

TECHNOLOGY READINESS LEVEL

TRL 3-4: Laboratory-scale components were manufactured and showed regained mechanical properties after five repaired cycles. The novel construction material is chemically characterized and studied. The material is currently being modeled.

1 2 **3** **4** 5 6 7 8 9

POTENTIAL APPLICATIONS

- **Civil infrastructure**
- **Paving blocks, sleepers, sewer systems, channels, etc.**
- **Connection joints**
- **Spatial infrastructure**
- **Extra-terrestrial habitats**

THE TEAM

The group on Sustainable Structural Design is part of the Civil Engineering Laboratory (LGC) of ULB-BATir and has large testing facilities (1,700 square meters) with up-to-date load and test equipment and data acquisition systems.

THE INVENTOR

Didier Snoeck is Associate Professor at *Université libre de Bruxelles (ULB)*, the Brussels School of Engineering (EPB), and the Building, Architecture and Town Planning (BATir) Department. He holds the chair of Sustainable Structural Design. The main topics of his research are sustainable structural design, superabsorbent polymers, concrete technology, circularity, durability and sustainability, the water interactions down to the nanoscale, nano- and microstructural properties, self-sealing and self-healing of cementitious materials and sulfur concrete.

RELEVANT PUBLICATIONS

> *Effect of carbon-based materials on the microwave-induced healing ability of sulfur mortar* (not yet published). Wang, Q. and Snoeck, D.

ULB KTO
KNOWLEDGE TRANSFER OFFICE

www.ULBKTO.be