Bioinspired Coatings, Materials, and Structures for Thermal Management

Tech ID: 33570 / UC Case 2022-934-0

BRIEF DESCRIPTION

The plant species Banksia speciosa relies on wildfires to propagate its seeds. The specialized coating on the seeds, along with the follicle structure, can protect seeds from temperatures over 1,000°C. Inspired by this coating on the seeds of the Banksia plants, researchers at UC Irvine have developed novel, bioinspired coatings, materials, and structures for thermal management, enabling development of cost-effective and ecological thermal management systems.

SUGGESTED USES

·Protective coating material for heat management: protects substrates from thermal damage

·Materials to manage thermal propagation: controls directionality and speed of propagation

·Fire protective materials for aerospace or automotive composites

·Heat resistant wearable fabric for use in sports & personal protective gear

·Construction panels that absorb heat

FEATURES/BENEFITS

» Relies on cheap and green materials, enabling future developments of more ecological materials for thermal management

» Lightweight and flexible

» Easily translated to make structural materials for heat protection

TECHNOLOGY DESCRIPTION

Banksia speciosa is a plant that relies on wildfires to propagate its seeds. When the flower is pollinated, the plant develops a wooden structure called a follicle which encases two seeds. This follicle system and the seeds themselves comprise of specific compositional and structural features that protect the seeds from temperatures over 1,000°C. Systems from other species in the Banksia genus that do not rely on wildfire for propagation completely decompose if exposed to similar thermal conditions, fully compromising the seeds. Therefore, these plants represent an intriguing source of knowledge for thermal management systems.

Bioinspired by the thermal resistant seed coating of the plants from the Banksia genus, researchers at University of California, Irvine have developed novel coatings, materials, and structures for thermal management and protection.

STATE OF DEVELOPMENT

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OTHER INFORMATION

CATEGORIZED AS

» **Materials & Chemicals**
» Composites
» Other
» Textiles
» Thin Films

RELATED CASES

2022-934-0

In experimental stage

PATENT STATUS

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Published Application	WO 2023/168114	09/07/2023	2022-934

Additional Patent Pending

UCI Beall
Applied Innovation

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