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Phase Transforming Cellular Materials

A novel phase transforming cellular material (PXCM) is engineered with bistable configurations to improve the performance and prevent deformation of structural components, especially in the transportation industry.

The majority of cellular materials have one stable configuration; therefore, changes in cellular geometry as a result of an applied load will typically be limited either by the desire to prevent permanent deformation, or the fact that the return to the original stable configuration is impossible. There is an unmet need for a material structure that has a more stable configuration.

Researchers at Purdue University have developed a phase transforming cellular material (PXCM) that takes the idea of phase transformations and applies them to the unit cell. A structure made of these cells that is being deformed will undergo phase changes before plastic deformation occurs. To improve this, the unit cell can be designed to have bistable configurations. This method has been used to improve the performance of three typical cellular materials mostly used in the transportation industry.

Advantages:

-Improved performance of cellular materials

-Bistable configuration

-Prevents deformation

Potential Applications:

-Cellular materials

-Transportation industry

TRL: 5

Intellectual Property:

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