



High-Performance Joints for High Accuracy and High Repeatability

BYU #2017-071

DESCRIPTION

The invention consists in a membrane-enhanced lamina emergent torsion (M-LET) joint that constrains motion in undesired directions while not inhibiting the motion in the desired direction of the joint. The M-LET joints have the potential to be used as surrogate folds in origami-inspired devices.

PROBLEM SOLVED

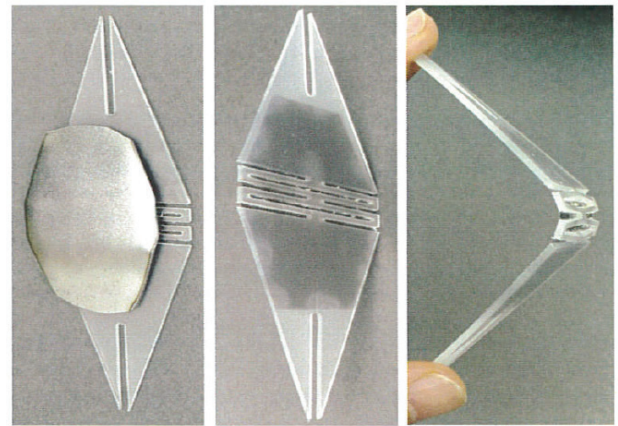
Lamina emergent compliant mechanisms (including origami-adapted compliant mechanisms) are mechanical devices that can be fabricated from a planar material (a lamina) and have motion that emerges out of the fabrication plane. Lamina emergent compliant mechanisms often exhibit undesirable parasitic motions due to the planar fabrication constraint. This invention reduces parasitic motions of lamina emergent mechanisms and makes possible a one-way joint that can ensure origami-based mechanisms emerge from their flat state into the desired configuration.

KEY ADVANTAGES

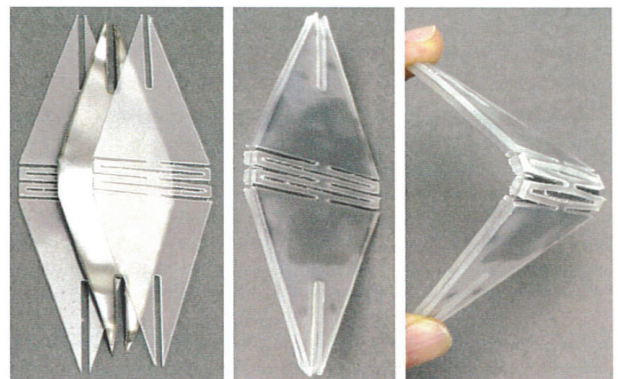
- » *Increases precision*
- » *Reduces parasitic motions*
- » *Enables one- or two-way motion*

APPLICATIONS

This technology could be used for developing high-performance origami-inspired compliant mechanisms where high accuracy and high repeatability are required.



A bilayer membrane-enhanced outside LET joint



A sandwich membrane-enhanced outside LET joint

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