

Origami-Inspired Folding Patterns for Soft-Sheet Materials

ID: 2015-067

Executive Statement:

An innovative folding technology designed for efficient packing and deployment of soft-sheet materials into cylindrical shapes without an underlying frame.

Technology Overview:

This technology, developed by Brigham Young University, introduces novel folding patterns inspired by origami to compactly fold textiles and fabrics. The invention, detailed in the document "2015-067d_Redacted.pdf," focuses on creating cylindrical shapes that can be easily stored and deployed, targeting applications in airbags, inflatables, and parachutes. The folding patterns, including the "Inverted Cone Fold," "Flasher Fold," and "Modified Miura Map Fold," leverage internal pressure differences for deployment, eliminating the need for rigid structures.

Key Advantages:

- Enables compact storage and efficient deployment of materials
- Removes the necessity for a rigid frame, reducing weight and complexity
- Offers flexibility in shapes and dimensions, enhancing applicability across industries
- Supported by National Science Foundation (NSF) grants, indicating strong research backing and potential for innovation

Problems Addressed:

- Overcomes limitations of traditional folding methods restricted to rectangular configurations
- Addresses the challenge of efficiently packing and deploying soft-sheet materials
- Solves the issue of requiring a rigid frame for deployment, offering a more versatile solution

Market Applications:

- Automotive industry for airbags
- Recreational industry for inflatables and parachutes
- Space industry for compact packing of materials in spacecraft
- Emergency services for rapidly deployable shelters and medical devices