

## Extremely Light Foam (ELF)

A new class of lightweight, high-performance foam for demanding applications

### Value Proposition

ELF is an ultra light, ultra strong structural foam that delivers up to twice the strength of conventional foams at the same weight, while remaining easy to manufacture at scale using safe, commercially available materials.

### Technology Readiness Level 3

### IP Information

U.S. Patent pending, S-167610

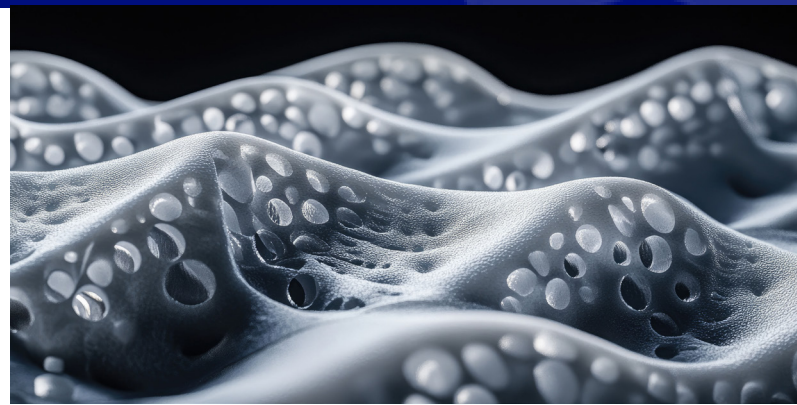
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### Overview

ELF (Extremely Light Foam) is a new way to make structural foam that is both much lighter and much stronger than today's alternatives. The process uses common epoxy materials mixed with tiny hollow particles and a temporary liquid that later evaporates. As the material cures, this liquid naturally leaves behind a well-organized network of empty space, creating a foam that is mostly air but still highly resistant to crushing and pressure. The result is a material that can be up to twice as strong at the same weight as conventional foams, while remaining easy to pour, mold, and manufacture at scale using safe, commercially available ingredients

Because it combines low weight, high strength, simple processing, and design flexibility, ELF is well suited for commercial applications in marine systems, aerospace and transportation, lightweight structural panels, insulation, and impact-absorbing components.



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### How it Works

The technology works by intentionally using a temporary liquid during the curing of a polymer foam to shape its internal structure. When the liquid-filled mixture hardens, the liquid naturally separates from the solid material and later evaporates, leaving behind a network of tiny, well-distributed voids between microscopic hollow particles embedded in the polymer. By carefully controlling the type of liquid used and the curing conditions, these voids form in a predictable and repeatable way rather than randomly. This controlled internal architecture is what gives the material its unusual combination of low weight and high resistance to crushing, while still allowing the material to be poured, molded, and manufactured using standard industrial processes and readily available materials.

### Advantages

- Ultra-low density with high structural strength
- Exceptional crush and compression resistance
- Low-cost, simple manufacturing with standard equipment
- Easily cast or molded into complex or large shapes
- Safe, non-hazardous, commercially available ingredients

### Market Applications

- Marine & Offshore
- Aerospace
- Advanced Composites & Manufacturing
- Defense & Security
- Transportation
- Energy & Industrial Systems
- Thermal & Acoustics