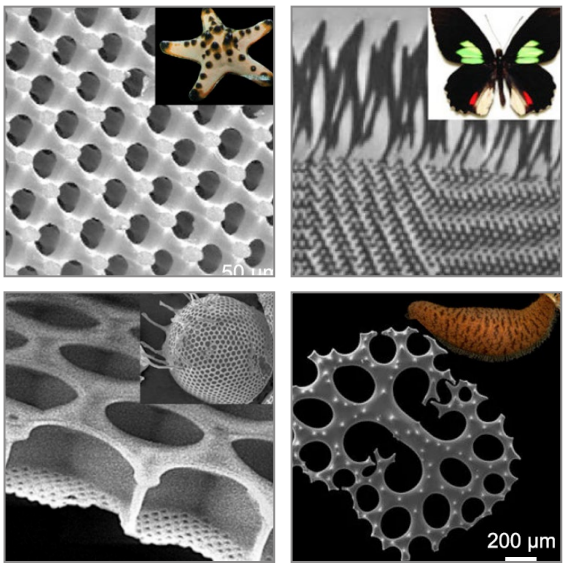
PRODUCT SHEET

SPARTAN

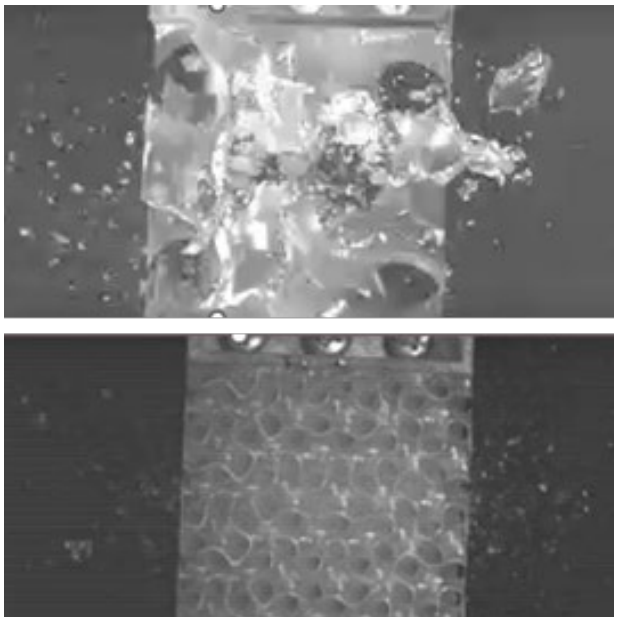
Originally developed as micro-meteorite space debris armor, SPARTAN offers an armoring technique that can be applied to modular panels for aircraft or helicopters.



Natural structures inspire SPARTAN design (Z. Jia et. al, Matter, 2023).

- SPARTAN leverages Oceanit's AI for designing bio-inspired ultra-lightweight, high-strength, and impact resistant armoring structures.
- Triply Periodic Minimal Surface (TPMS) structures, found in natural materials such as butterfly wings and bone, are used as the base design from which SPARTAN optimizes structures.

TPMS structures have a zero-mean curvature, meaning they have limited areas of stress concentration independent of the direction of loading. Since TPMS structures are mathematically expressed, optimizing for multiple requirements such as light weight and impact resistance is possible. Due to their complexity, SPARTAN structures must be additively manufactured.



Above: High velocity impact experimental results show the damage sustained when a bullet is shot at an unoptimized structure (top) versus a SPARTAN optimized structure (bottom) of the same density.

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