

Conformable CNG Storage Tanks



One Shape.
Maximum Conformability.



SCHWARZ P SURFACE



Platform Integration Partner



Funded Technology

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Innovation | Automation | Integration

www.relinc.net

A Paradigm Shift In CNG Tank Storage

REL, Inc. borrowed from nature to create an internally structured conformable high-pressure compressed natural gas (CNG) tank. The developed aluminum alloy 'Matrix Tank' employs a geometry mimicking the skeletal structure of the sea urchin (mathematically modeled as a Schwarz P surface), to create a structurally and volumetrically efficient vessel for high-pressure gas storage. REL developed and refined several casting technologies to produce a high-integrity tank which offers the attributes of conformability to provide greater storage capacity and more efficient packaging than conventional high-pressure vessels.

The Matrix Tank, developed by REL under ARPA-E's MOVE Program, attracted investment from Southwestern Energy Company (SWN) to integrate and test this technology into a vehicle platform. The \$2.1-million, three-year investment tasks an interdisciplinary team of REL engineers and Michigan Technological University researchers with integrating REL's ARPA funded CNG tank in a light-duty truck.

REL, Inc. is a dynamic, responsive, and vertically integrated technology development company. REL designs, develops and deploys advanced metal matrix composites (MMC) and other lightweight materials to create cost-effective, high-tech, lightweight, revolutionary products. REL has a growing portfolio of product and process technologies that deliver significant efficiency, cost savings and weight reduction.

REL is seeking financial and commercial partners to bring resources and investment for future product development, manufacturing scale-up, sales, marketing and distribution.

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CARGO EFFICIENCY

- CHASSIS MOUNT
- AERODYNAMIC INTEGRATION



STRUCTURAL EFFICIENCY

- NON-CYLINDRICAL SHAPES
- HIGH-STRENGTH ALUMINUM



COMPLEX GEOMETRY

- INTERLOCKING CELL STRUCTURE
- SEPARATE INTERNAL VOLUMES



VOLUMETRIC EFFICIENCY

- 20-35% CAPACITY INCREASE
- SCHWARZ P SURFACE CORE DESIGN



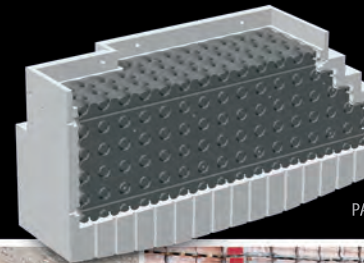
COST EFFICIENCY

- CAST ALUMINUM
- AUTOMATED MANUFACTURING PROCESS

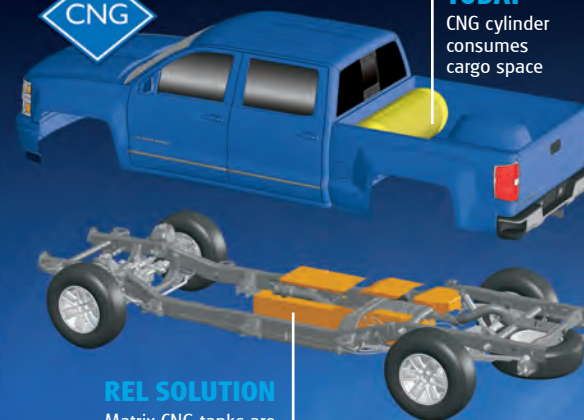
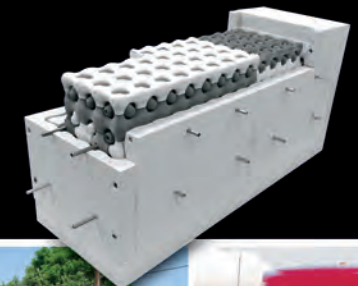


FIELD-ASSISTED CASTING

- INNOVATIVE CASTING TECHNOLOGIES
- ENABLES CASTING OF HIGH-STRENGTH ALLOYS

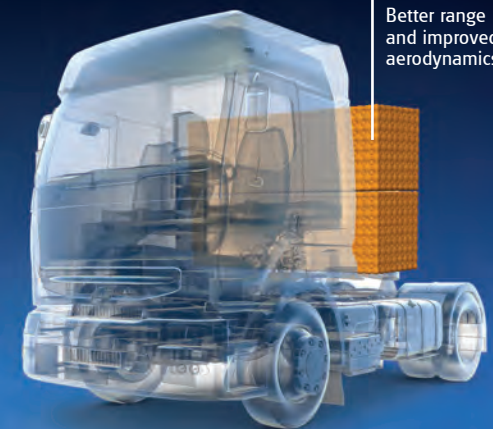


PATENTS PENDING

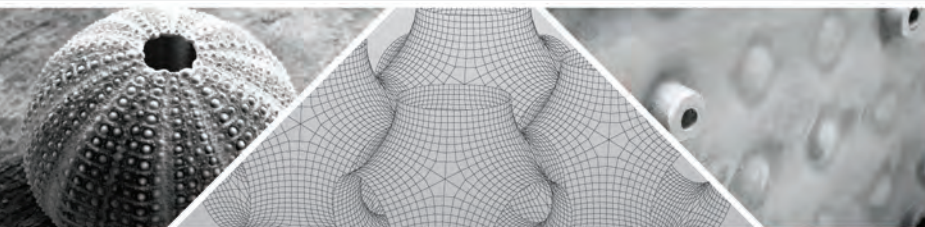


TODAY
CNG cylinder consumes cargo space

REL SOLUTION
Matrix CNG tanks are packaged efficiently under the truck



CLASS 8
Better range and improved aerodynamics



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