HELICOID INDUSTRIES INC.

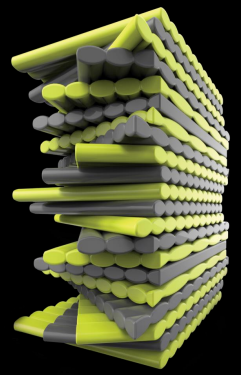
Bio-Mimetic Technology Boosting Composites Impact Strength

Dr. Lorenzo Mencattelli
Director of Research & Development

IACMI Members Meeting – February 17th, 2021

Helicoid Industries Inc.

California based company commercializing Helicoid™ technology



Targeting key manufacturers in:

SPORTING GOODS | DEFENSE | RENEWABLES ENERGY | AUTOMOTIVE | AEROSPACE

Chad Wasilenkoff
CEO

William Spathelf
CFO

Anthony Bert
EU Sales & Project Director

Pascal Joubert des Ouches
President

Dr. David Kisailus
CSA

Pascal Scaramuzzino PhD.
Defense Technology Director

Doug McCarville
CTO

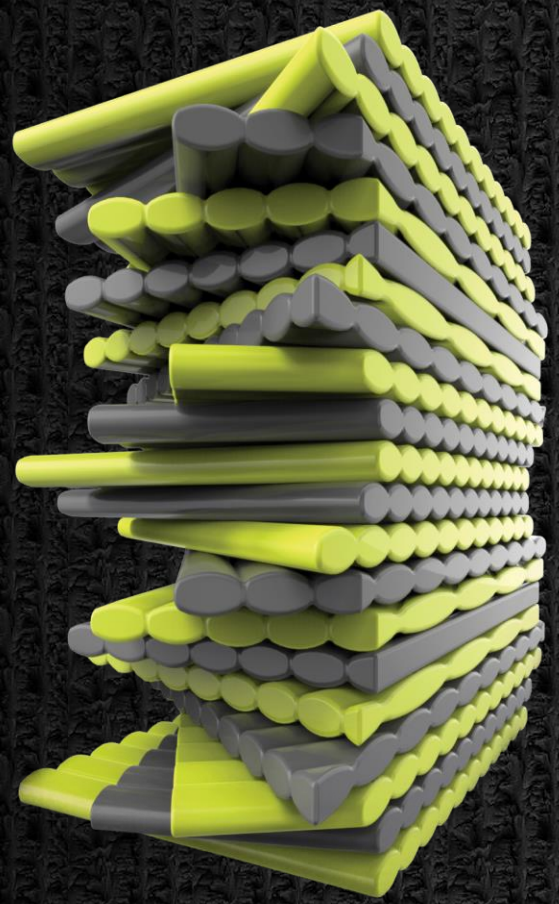
Lorenzo Mencattelli PhD.
Director of Research & Development

Anita Beishuizen
Marketing & Communications Director

HELICOID INDUSTRIES INC.

Biomimetic Composite Technology Enhancing Impact and Toughness Performance

- **Helicoid™** technology can make composites:
  - Lighter
  - Stronger
  - More Impact Resistant
  - More Durable
  - More Sustainable
  - All at a Lower Production cost



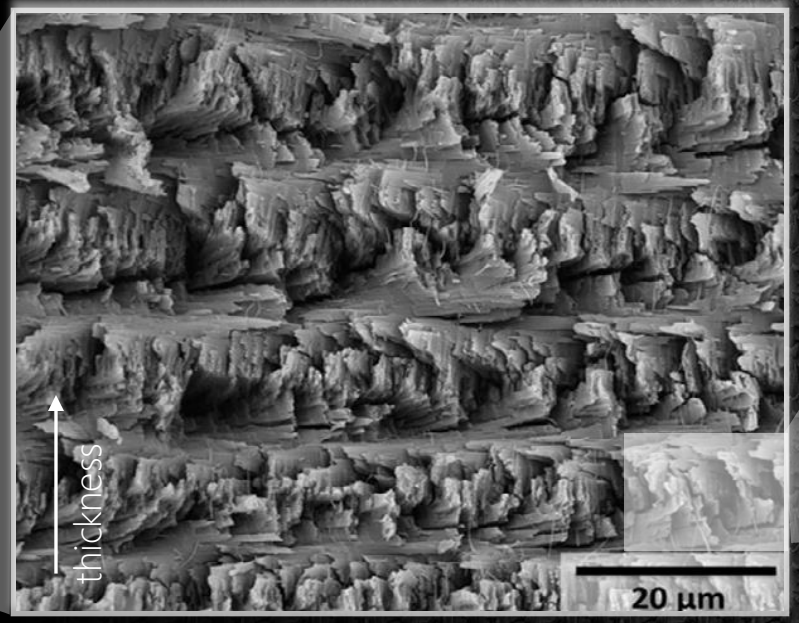
The Helicoid™ Technology inspired by Nature: The Mantis Shrimp

HELICOID
INDUSTRIES INC.

The Mantis Shrimp: Helicoidal microstructure

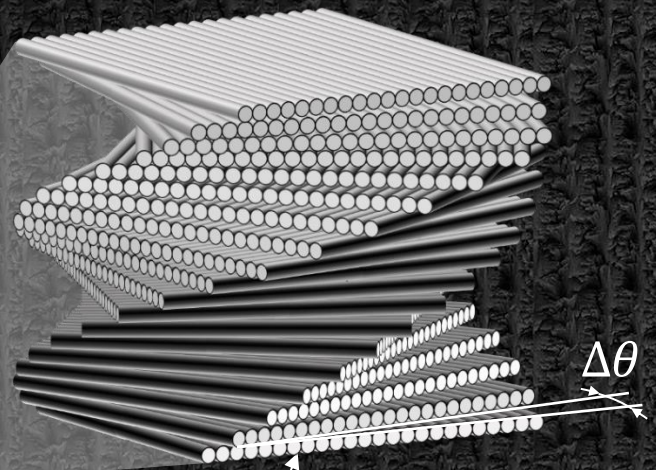
Mantis shrimp

dactyl clubs



Helicoidal microstructure

IT'S NOT THE MATERIAL
IT'S THE STRUCTURE



ply of aligned chitin fibres

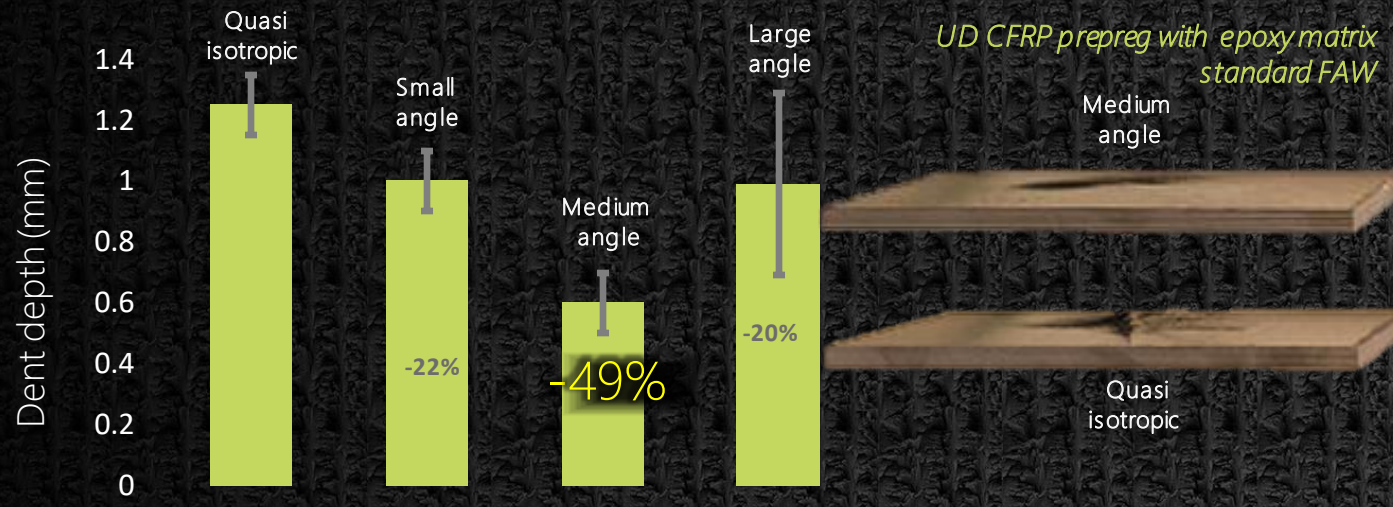
The Helicoid™ Technology - Proven Performances

Helicoid™ higher impact resistance vs conventional laminates: [0°/+45°/-45°/90°] and [0°/90°]

Weight and Cost savings

- Higher impact resistance and damage tolerance

Low velocity Impact (100J)



UD CFRP prepreg with epoxy matrix standard FAW

Grunenfelder et al., Acta Biomat, 10 (2014) 3997-4008.

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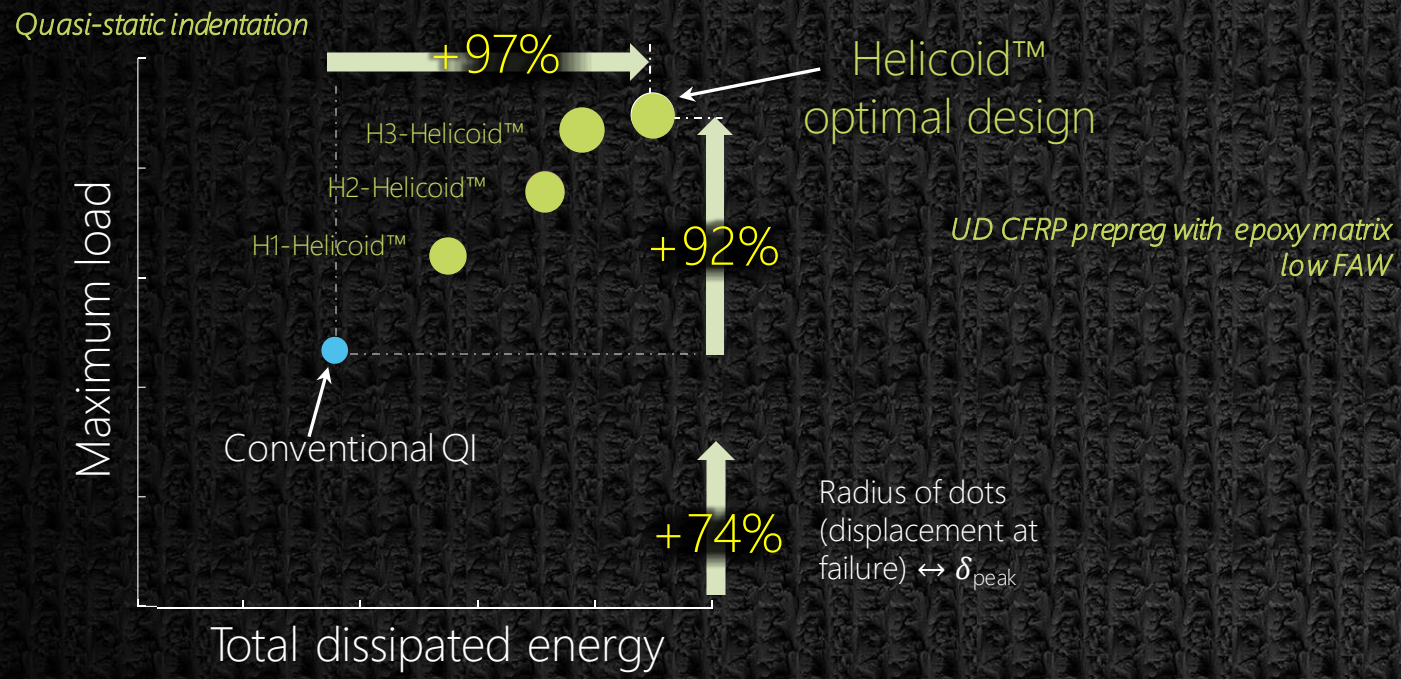

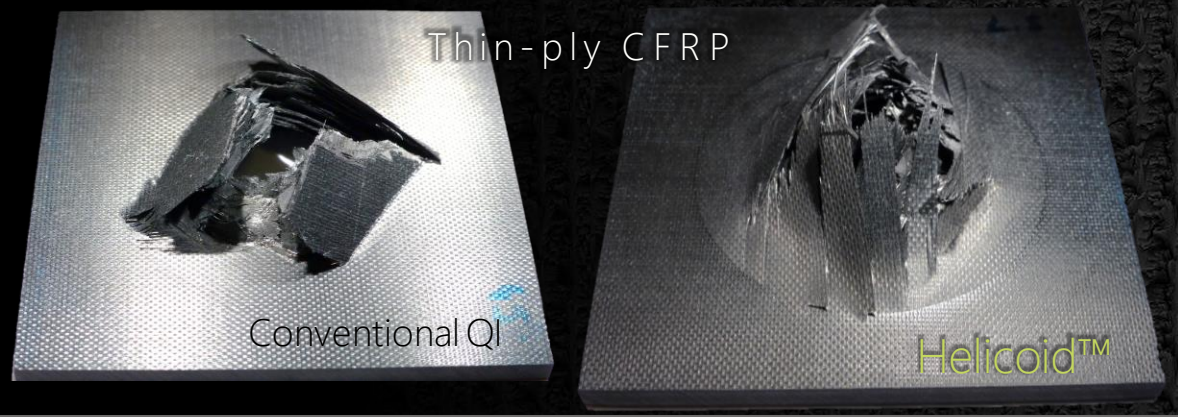

L. Mencattelli, S.T. Pinho , Composites Part A, February 2020, Vol. 129, no. 105655

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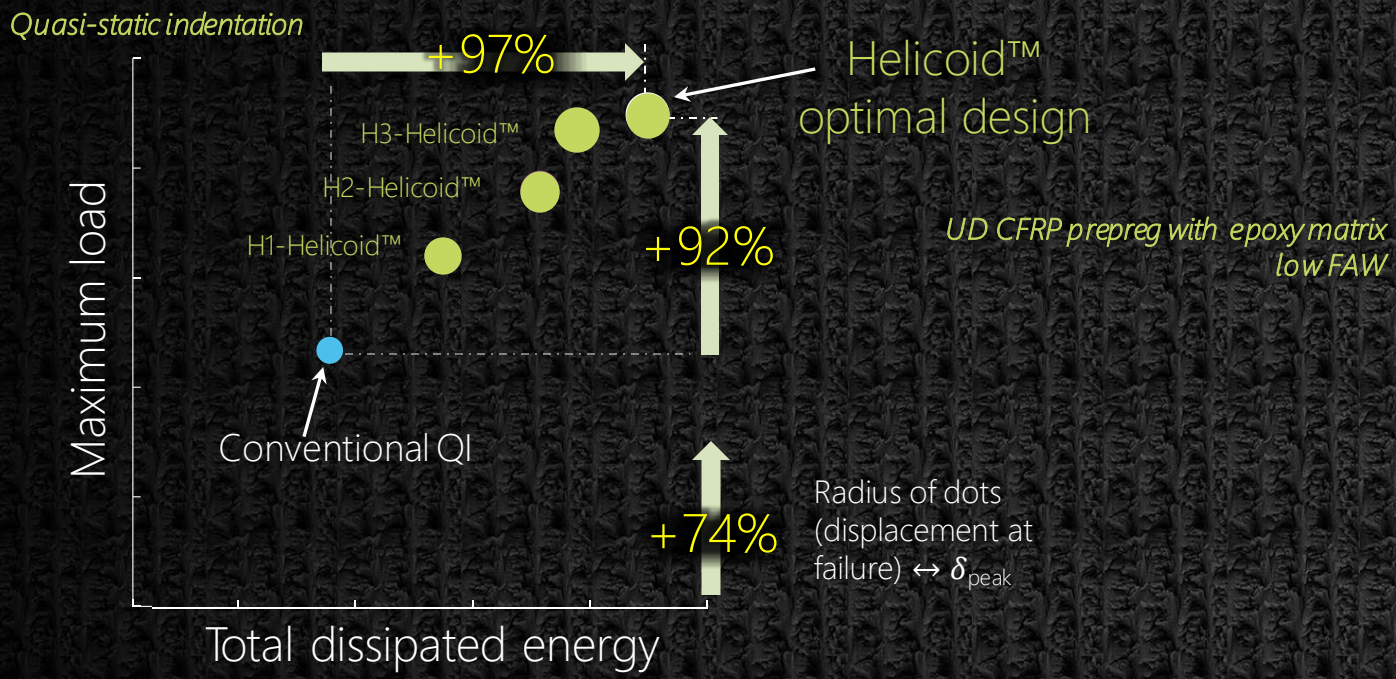
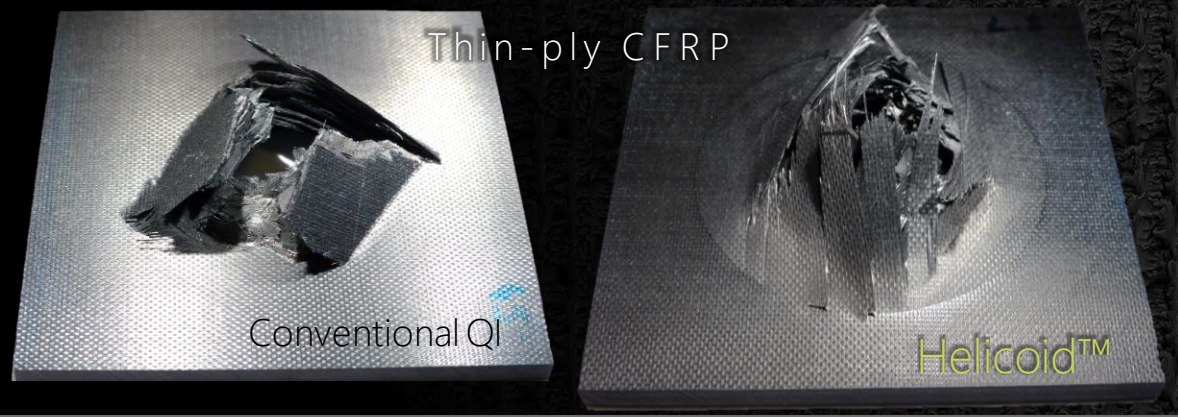
- In-plane damage tolerance improved (ILS, CAI, OHT)





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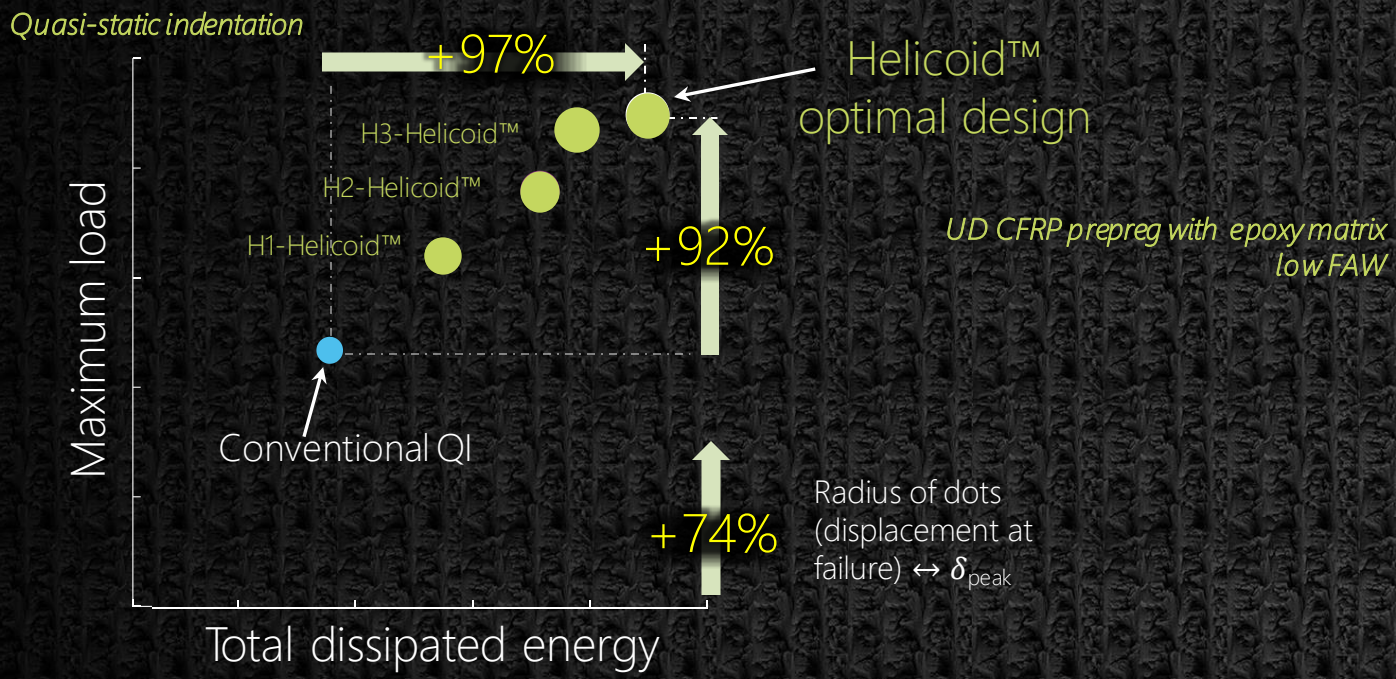

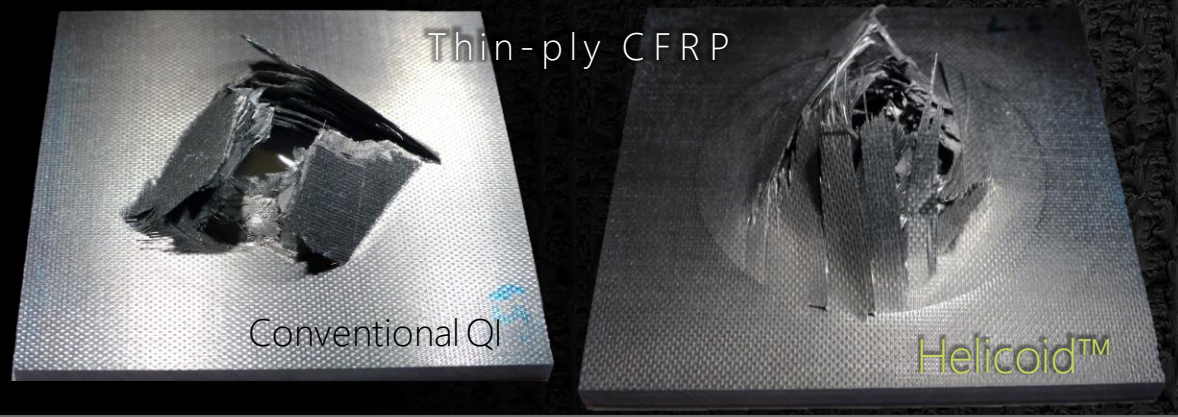

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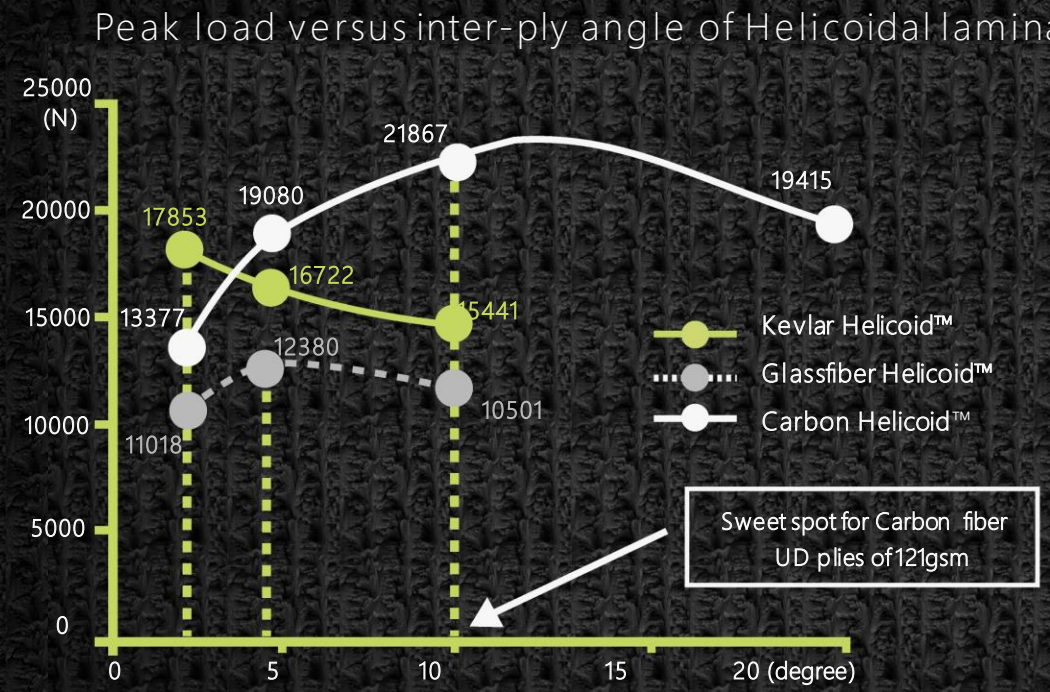

J.L. Liu, H.P. Lee, K.S. Lai, V.B.C. Tan , Journal of Applied Mechanics, March 2020, Vol.87.

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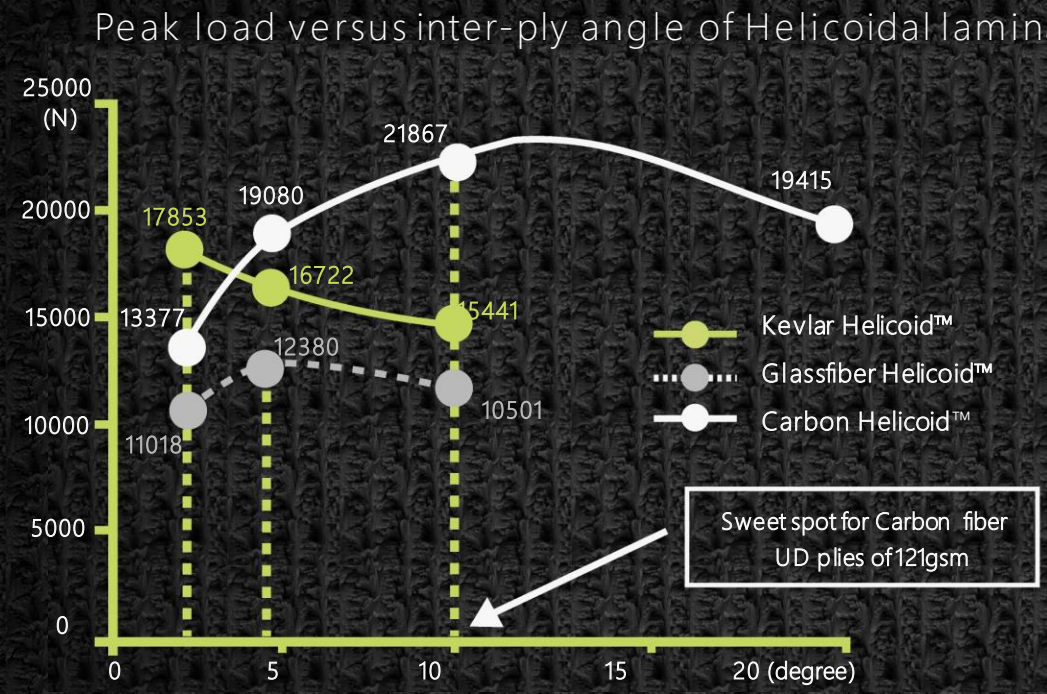
- Optimal performances achieved with tailored pitch angle, constituents, FAW, laminate thickness



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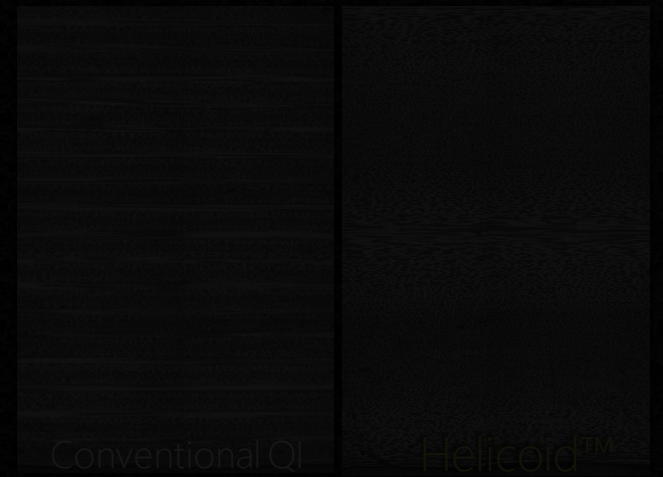
The Helicoid™ Technology

Helicoid Industries patented technologies:

- No need for complex tooling – Molding process remain unchanged
- Works with most manufacturing processes (RTM, Hand-Layup, Spry RTM, Infusion, Compression moulding, hot press)
- Same manufacturing quality
- Highly compatible with Automated Manufacturing (AFP/ATL, 3D printing) - Helicoid™ 3D preforms
- Helicoid™ Isotropic, Helicoid™ directional, Helicoid™ protective shield, Helicoid™ aligned short fibre mat

High TRL Technology – Ready for commercialisation



The Business Model

- **Licensing models**

Companies to acquire Helicoid™ technology licence and know-how

- **Material supply models**

Companies to acquire Helicoid™ preforms or NCF fabrics

- Patent in all composites (carbon fiber, Fiberglass, Kevlar, Aramid, etc…).
- Helicoid™ filed additional patents including manufacturing processes

SPORTING GOODS

DEFENSE

RENEWABLES ENERGY

AUTOMOTIVE

AEROSPACE

Soon To Launch!

Lightening strike damage

CalTestBed

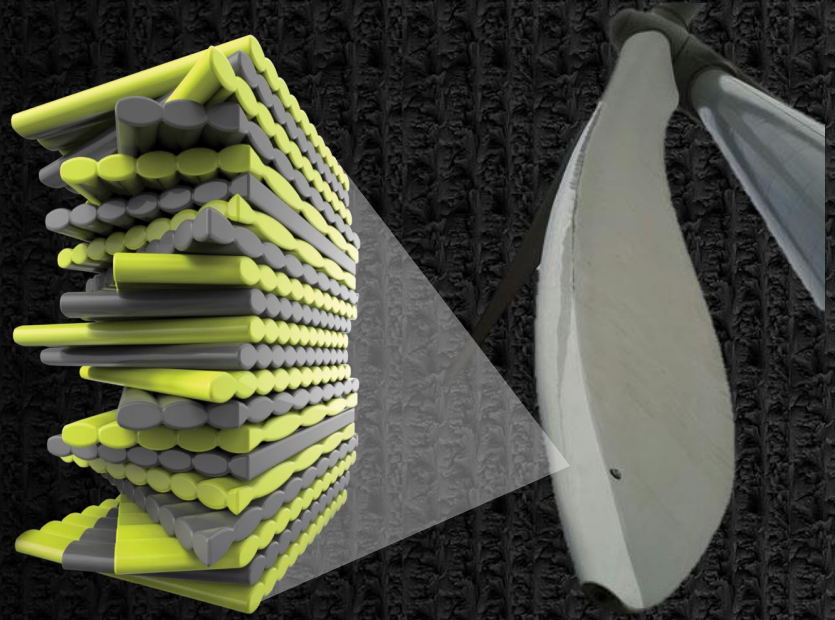
UCI University of California, Irvine

CalTest Bed Grant for ~$300k

9-months development program – Start date: April 2021

Key Issues addressed by Helicoid™ Solution

- Leading edge erosion and damage can reduce power production by 5% to 30%
- Repairs and maintenance are expensive
- Reduced operating life and ROI

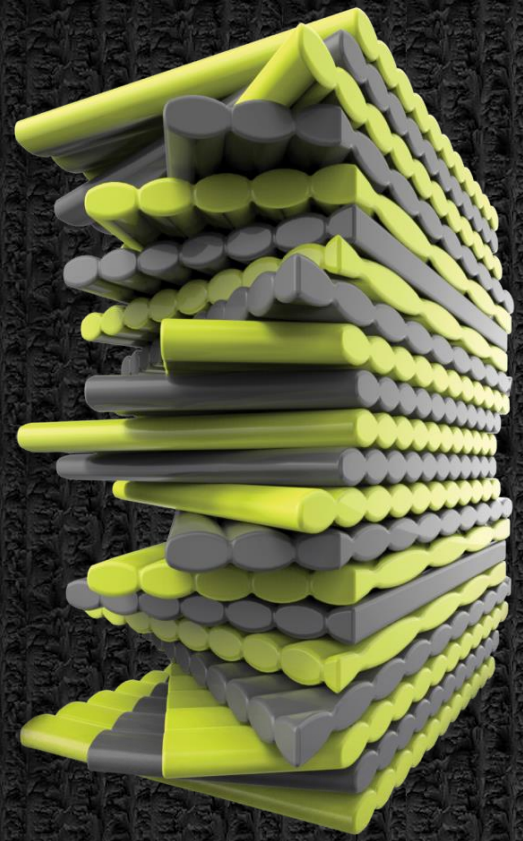


Helicoid™ LEP improves all of these

Come Talk To us!

Next steps

- Helicoid Ind. will work with your team to understand the benefits that Helicoid can provide
- Sign an MNDA
- Helicoid Ind. provides a design toolbox (FEA, Analytical, coupon testing) to tailor a solution for you
- Create a Helicoid™ prototype to confirm benefits
- Licence agreement or contract to purchase Helicoid™ materials



HELICOID INDUSTRIES INC.

THANK YOU!

Dr. Lorenzo Mencattelli - Director of Research & Development

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