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ADVANCED MATERIAL EDITION

IMPROVING COMPOSITES WITH HELICOID TECHNOLOGY

HELICOID INDUSTRIES

CHAD WASILENKOFF, FOUNDER-CEO

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MANUFACTURING TECHNOLOGY INSIGHTS
TOP 10
ADVANCED MATERIAL
SOLUTION PROVIDERS - 2020

HELICOID INDUSTRIES

IMPROVING COMPOSITES WITH HELICOID TECHNOLOGY

Advancements in material sciences have encouraged numerous industries to aggressively adopt composite materials, such as fiberglass, carbon fiber, and fiber-reinforced matrix systems, to build boats, automobiles, and even aircraft. Even though composite materials are lighter and eliminate design obstacles to a great extent, their traditional architecture is not as efficient or as cost-effective as it could be.

The marketplace is constantly demanding lighter, stronger, and more impact-resistant materials with better energy efficiency. Helicoid Industries, a leading global expert in the architecture for composite materials, entered into a licensing agreement with the University of California Riverside (UCR) to commercialize their bio-inspired, patented Helicoid® architecture technology for composite materials. This technology was the result of UCR spending over 14 years researching one of nature's feistiest predators, the "smasher" mantis shrimp. This research focused on studying the creature's internal structure that it developed naturally to protect its hammer-like club. On digging deeper and reverse-engineering the club, UCR concluded that it is not the material, but the structure that provides the strength and toughness. The material is essentially organized in layers of locally parallel fibers and stacked so that each sheet is skewed by an angle from the one below. This unique architecture is called a "helicoid."

When practically applied, the Helicoid® architecture enables the same impact resistance and strength with half the material. "Our disruptive technology can have a profound impact on the $100 billion dollar composite industry while improving performance and reducing weight of parts which will increase their overall energy efficiency," states Chad Wasilenkoff, Founder-CEO, Helicoid Industries.

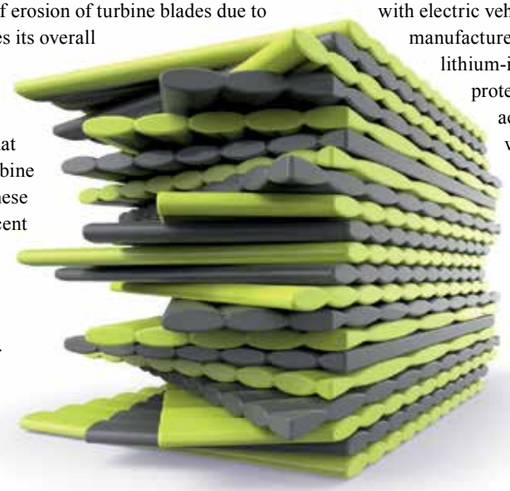
The company adopts a sub-licensing strategy and caters to manufacturers in the wind turbine, aerospace, sporting goods, auto parts, defense, and industrial components sectors. One of the core areas of focus for Helicoid Industries is the sporting goods arena where golf clubs, hockey sticks, rackets for badminton and tennis, and surfboards can be manufactured using the Helicoid® technology. This helps make the equipment lighter, more durable, and easy-to-use.

The protective gear industry is another major market. Helicoid Industries has collaborated with one of the world-

CHAD WASILENKOFF,
FOUNDER-CEO

leading motorcycle helmet companies to develop prototypes using the Helicoid® architecture. The result will make them lighter and more impact-resistant. Using this architecture, manufacturers of protective gear such as bulletproof vests can also improve Kevlar's performance, attributing them with higher resiliency and comfort, even in harsh environments.

Not stopping there, the company is paving the way for leading-edge protection of wind turbine blades. One of the biggest challenges that wind farm owners face is the swift pace of erosion of turbine blades due to nature's forces. That, in turn, reduces its overall efficiency and aerodynamics. Protected by the Helicoid® technology, Helicoid Industries' will offer leading-edge protection that improves the performance of the turbine blades. With enhanced efficiency, these wind turbines can achieve a ten percent increase in the overall electricity production over the lifetime of a turbine.



The company is also working with one of the leading producers of composite aerospace parts to design and develop new parts for next-generation commercial aircraft. These airplanes will be more impact-resistant while having the advantage of being lighter weight. Apart from these industries, the Helicoid® structure is a platform technology that can easily be applied to other verticals, including construction and manufacturing of consumer products such as mobile phone cases, significantly reducing production cost. Overall, this technology can improve composites from catastrophic failure by up to 75 percent, improve their impact strength by up to 50 percent, and increase maximum load-bearing capacity by 92 percent.

> **"Our disruptive technology can have a profound impact on the $100 billion dollar composite industry while improving performance and reducing weight of parts which will increase their overall energy efficiency"**

With the launch of its Helicoid® architecture technology at the beginning of the year 2020, Helicoid Industries has successfully engaged with more than two dozen composite materials manufacturers to build prototypes using its structure and test them for various applications. Along with improving the capabilities of the wind turbine blades, the company is also working with electric vehicle companies to design and manufacture a chassis with embedded lithium-ion batteries that will help protect them in the event of an accident. "We look to collaborate with global leading composite companies to help them improve the performance of their products. At the same time, our Helicoid® architecture will reduce the amount of raw materials required to manufacture products which results in energy efficiencies and a more environmentally sustainable footprint," concludes Wasilenkoff.

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The annual listing of 10 companies that are at the forefront of providing Advanced Material solutions and impacting the industry