

CompPair's healable technology adapted to Liquid Composites Moulding processes: the Swiss company has manufactured a wind turbine blade section

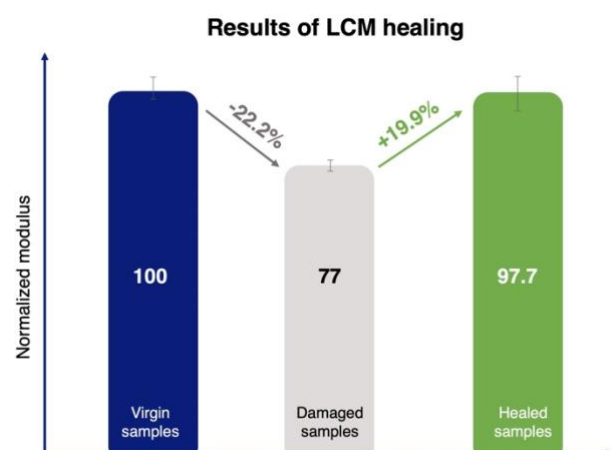
CompPair has taken the next step in producing the upcoming healable composites technology. The company has developed a system compatible with Liquid Composites Moulding (LCM) processes. In conjunction with other Swiss organizations, they have produced a section of a wind blade turbine using this new system to demonstrate the potential of bringing healing capabilities to LCM processes.

Following the successful market implementation of HealTech™, CompPair's first product family, currently sold as prepregs primarily in the sports and space sectors, the development potential of the infusion technology was recognized. The company decided to initiate the project, supported by Innosuisse, and collaborating with EPFL-LPAC, Tissa Textiles AG, and KATZ, experts in composites and polymers.

Specifically tailored to maintain CompPair's unique selling point, the new system enables composite structures made by infusion to be repaired in a few minutes while maintaining the structure and recovering all mechanical properties following the repair. The company's new infusion range plans to reach new markets, including the marine and wind energy sectors.

Typical damage events of a wind turbine blade are caused by the environment in which they operate, such as hail, gust, and lightning, but also include fatigue, which both lead to crack propagation and the failure of a composite part.¹ These are major causes of downtime and maintenance costs, bringing sustainability and financial issues. This project aimed to produce a large-scale manufacturing demonstrator for the wind energy industry, to demonstrate the value of CompPair's smart system. The wind blade was manufactured with a mould used by Agile Wind Power to produce their wind turbine blades. The healable infusion premiere wind demonstrator will be displayed at JEC World 2023 at the company's stand (D29).

The healing efficiency of composites made with this new process was measured using the flexural modulus as the parameter. Two sets of samples were impacted and one set was healed following the impacts. The flexural modulus of the two sets (damaged and impacted) was compared against virgin CompPair samples. The evaluated healing



¹ Wang, Xue , He and Zhao, (2022). Review of the Typical Damage and Damage-Detection Methods of Large Wind Turbine Blades

https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwipgaKX6a39AhXPyaQKHtmbBDAQFn_oECBgQAQ&url=https%3A%2F%2Fwww.mdpi.com%2F1996-1073%2F15%2F15%2F5672%2Fpdf&usg=AOvVaw1KxwOCgA1KSIJ3VKfFzUGA

gave positive results, demonstrating the healed samples recovered 98% of the initial mechanical properties.

CompPair's smart system is compatible with existing manufacturing, at comparable performances with commercial composites, while allowing in-situ damage repair. These benefits along with improving sustainability are the opportunities CompPair can provide to the composites industry. More specifically, extending the lifetime of composite parts is a key strategy to prevent waste in the industry. Companies can reduce their maintenance costs and drastically reduce their CO₂ emissions by reducing composite waste.

CompPair's healable infusion project for tomorrow's sustainable composite products is a big milestone for the company. Now, CompPair seeks partners wishing to improve their composite structures made with LCM processes. The future of the Swiss company is to continuously expand its resin systems and processes, globally tackling the composites industry and answering problems of durability and sustainability.

About CompPair Technologies Ltd.

CompPair is a world-class composite expert, providing the first healable and sustainable composite material, a ground-breaking innovation in the field of self-healing composites. Made with CompPair's material, their first product family being HealTech™, composite structures can heal damage on site in 1 minute and be better recycled. CompPair provides manufacturers with cutting-edge materials compatible with standard production processes. HealTech™'s value proposition is a 99% repair time reduction and significantly lower CO₂ emissions. CompPair tackles composite limitations and leads a paradigm change for the industry.

About the partners

Innosuisse is the Swiss Innovation Agency. They promote the partnership between academia and the market with innovation projects, networking, training, and coaching, laying the groundwork for successful Swiss startups, products, and services. Their financial support allowed CompPair to go ahead with the development of the infusion process.

EPFL-LPAC (Laboratory for Processing of Advanced Composites) is the laboratory from which CompPair's innovation originates, the result of thorough research during 12 years in the field of self-healing composites. Led by Véronique Michaud, self-healing composites expert, and co-founder of CompPair, she has built a laboratory experimenting with the latest composites findings and experimentations.

KATZ (Kunststofftechnologie für die Zukunftare) are experts in composites and polymers. They support and advise companies and universities in innovative technology and applied research and development projects. Their excellent infrastructure made the healable infusion project possible.

Agile Wind Power develops and sells the first large, scalable, and economic vertical-axis wind turbines.

Tissa Textiles AG processes technical yarns of Glass, Carbon, Aramid, Basalt Polyester, Polypropylene, Dyneema, or Zylon into special-purpose fabrics customized to their customers' needs.

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