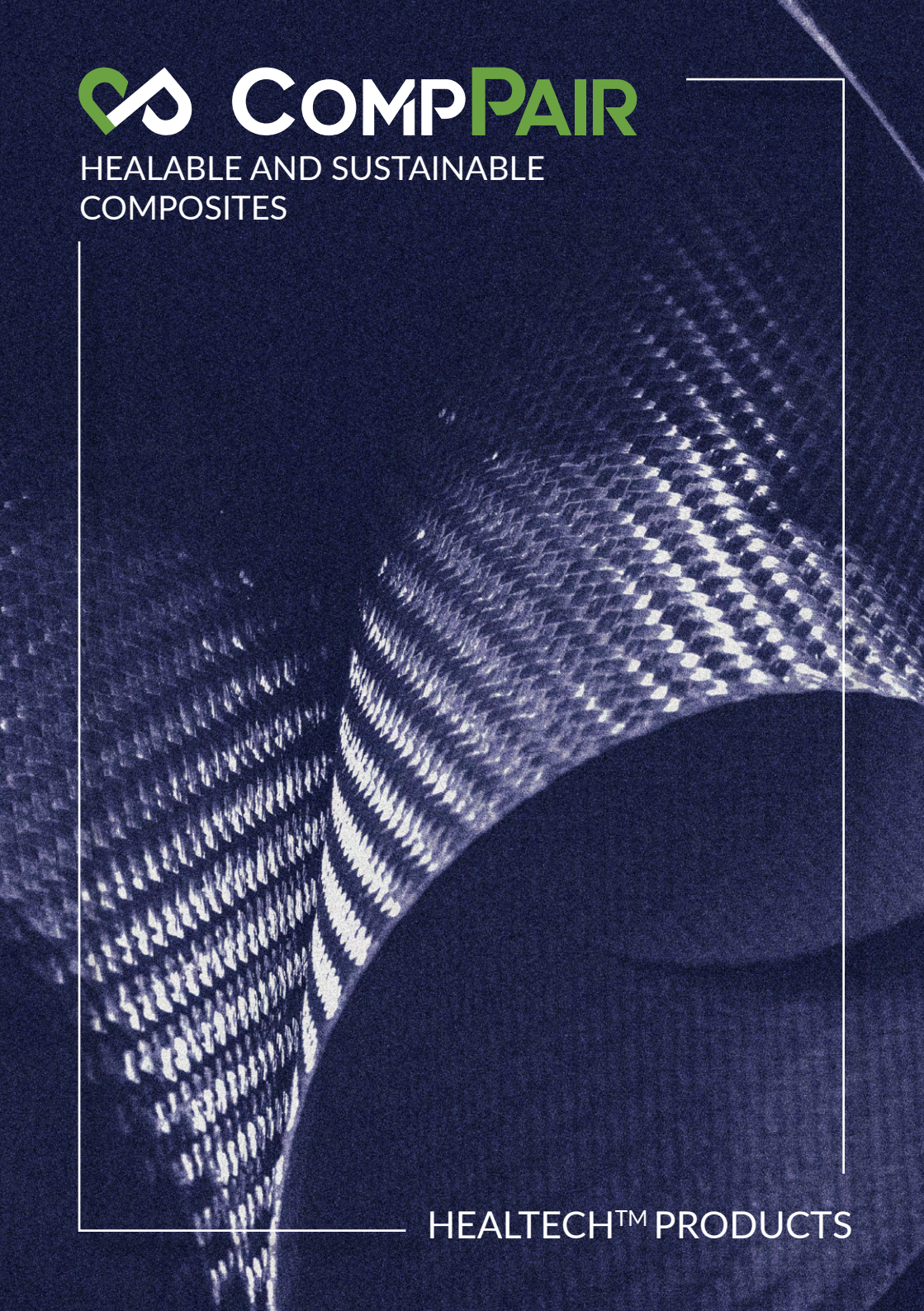
CompPair

HEALABLE AND SUSTAINABLE COMPOSITES



HEALTECH™ PRODUCTS

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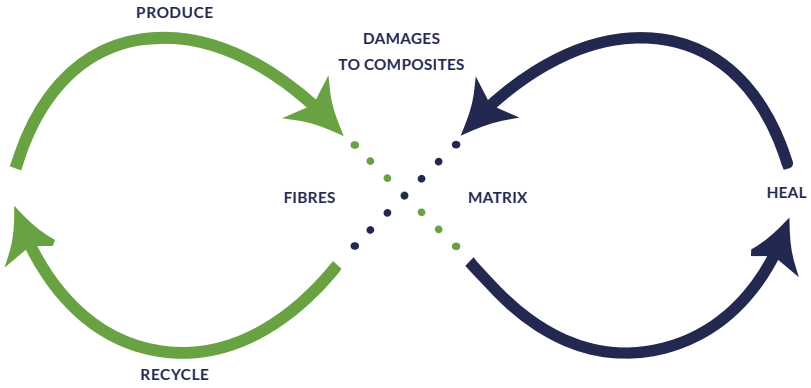
BRINGING REPAIRABILITY TO COMPOSITES

CompPair brings repairability to composite applications: the key to meeting sustainability targets. Embracing repair as the cornerstone of sustainability, CompPair is committed to waste prevention and extending the lifetime of composite materials, while unlocking new economical benefits. As a 360° solution provider, CompPair offers various products and services such as eco-design, ensuring a full range of options to build the next generation of composite parts.

COMPPAIR BRINGS CONTINUOUS SUPPORT IN ECO-DESIGN AND REPAIRABILITY SOLUTIONS.

CompPair's vision is to bring full circularity to the composites industry. Our mission is to help manufacturers, consumers, and the planet.



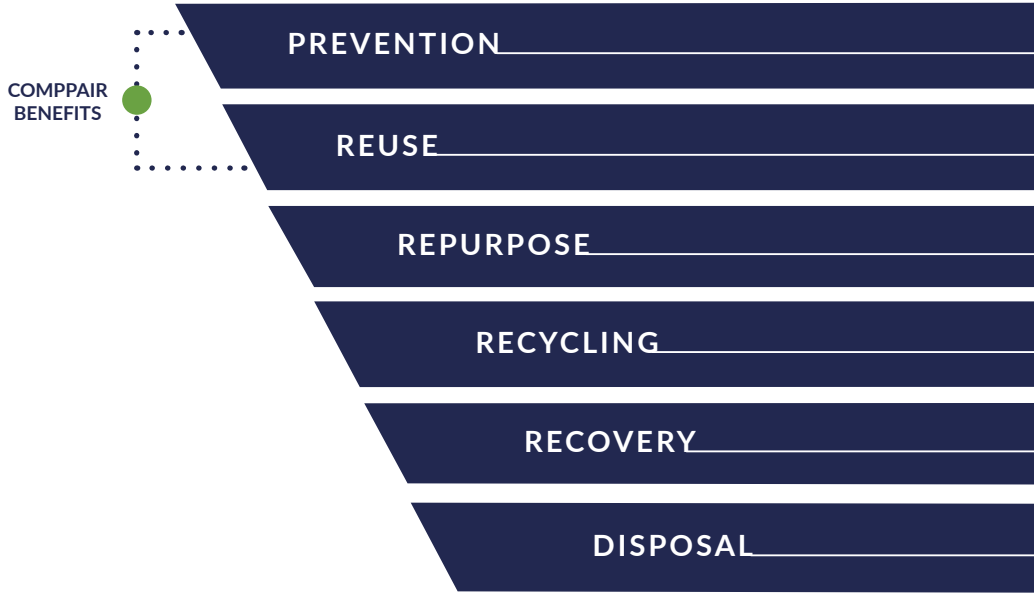
CompPair acts according to the waste management hierarchy figured below, prioritising waste prevention as the most effective action, as it decreases the extraction of raw materials, and valuable resources are used longer.

Healable materials are a great asset in promoting a circular economy for the industry, waste prevention being the preferred option for waste management.

By producing composites that are designed for repair, CompPair avoids the manufacture and creation of unnecessary waste.

Maintenance and repair during the use phase of composite parts significantly extends their lifetime. This allows to retain the economic value of materials and valuable resources are kept at their highest value for longer.

Waste Management Hierarchy



SPORT

Extended performance and sustainability

References available on www.comppair.ch

BENEFITS:

- Maintain performance for longer
- Sustainability through lifetime extension
- Increased customer satisfaction
- Increased lifetime value
- Repair vs. replace
- In line with the upcoming European Digital Product Passport (DPP)

SOLUTIONS:

- Prepregs: Carbon, Glass, Flax
- Resin-fibre LCM systems
- Thermoformable sheets
- Semi-finished products: sandwich structures, tubes

APPLICATION EXAMPLES:

SPACE AND AERONAUTICS

Improving sustainability while increasing cost-efficiency

BENEFITS:

- Reduced downtime: 400x faster repair, in-situ structural repair
- Performance: full recovery of mechanical properties
- Improved sustainability: waste reduction through extended lifetime
- Operational efficiency: production defect reduction
- Microcracks healing
- Properties at cryogenic temperature

SOLUTIONS:

- Prepregs: Carbon, Glass, Flax
- Semi-finished products: sandwich structures, tubes
- Towpregs

APPLICATION EXAMPLES:

MOBILITY

Improving sustainability while increasing cost-efficiency

BENEFITS:

- Reduced downtime: 400x faster repair, in-situ repair
- Performance: full recovery of mechanical properties
- Improved sustainability: waste reduction through extended lifetime
- Operational efficiency: production defect reduction
- Microcracks reduction

SOLUTIONS:

- Prepregs: Carbon, Glass, Flax
- Thermoformable sheets
- Resin-fibre LCM systems
- Semi-finished products: sandwich structures, tubes

LIFESTYLE AND LUXURY

A living material for a cutting-edge lifestyle

BENEFITS:

- Low-footprint luxury material
- Scratch repair
- Impact repair
- Cost-effective maintenance
- Efficient post-sales service

SOLUTIONS:

- Prepregs: Carbon, Glass, Flax
- Eco-responsible fibres
- Custom solutions

HEALTECH™ SOLUTIONS

HealTech™ is a thermoset-based resin system giving FRPs the ability to heal cracks and delaminations in 1 minute by locally heating the part in a range of 100°C-150°C. HealTech™ is suitable for autoclave, out-of-autoclave, and press curing, and in a range of composite processes, including prepregs and liquid solutions. CompPair continuously develops new solutions compatible with various manufacturing processes and adapted to extended composite applications.

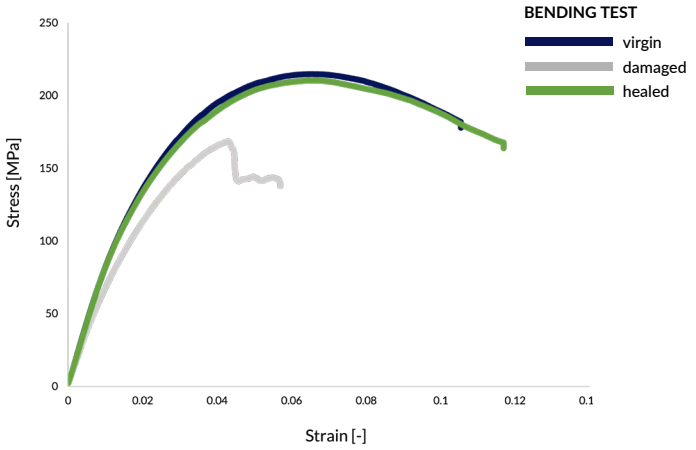
MATERIALS TYPE	PROCESS TYPE	NAME	CHARACTERISTICS
Resin systems* *HealTech™ solutions are proposed as reinforcement-resin systems*	Prepregs	CS01	High toughness
		CS02	Reduced curing time
	LCM	LCS01	Long pot life
		LCS02	• Reduced cure time • Higher TG
	Custom System		• Cure time reduction • Slitted tapes • Bio-based
Reinforcements		Carbon	• Twill • UD Tapes • HS to HM fibres
		Glass	• Twill • UD
		Sustainable fabrics	• Flax • Recycled CF • Repurposed CF
		Carbon-Kevlar	Twill

SEMI-FINISHED HEALTECH™ PRODUCTS

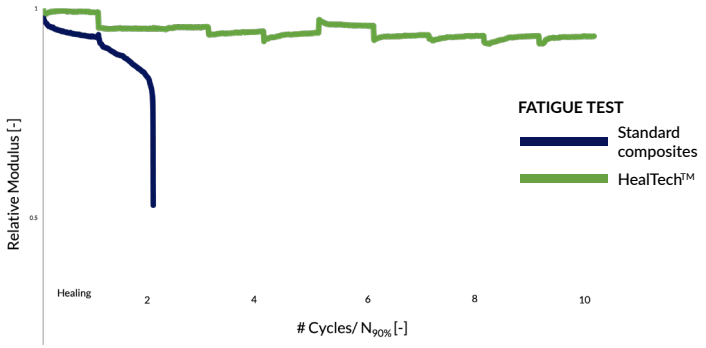
TYPE	MATERIALS	CHARACTERISTICS
Laminates	Customizable product	Thin conformable sheets
Sandwich panels	Adhesive film	Co-curing compatibility
	Cores	• Foams: PET, PVC, XPS & PU • Honeycombs
Monolitic plates	Customizable product	• Adapted to high precision machining • Outstanding results with low-cost drills and mills

PERFORMANCE

While damaged composites show reduced modulus and strength compared to a virgin sample, healed HealTech™ composites regain initial mechanical properties.



HealTech™ extends lifetime, reduces failure risks and keeps constant properties, thanks to regular healing and preventive healing cycles.

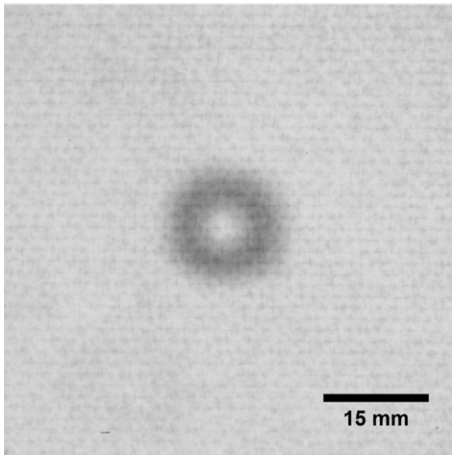


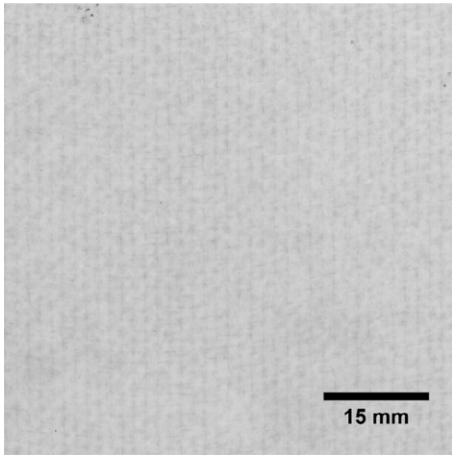
**The information provided in this document is without legal responsibility. Users are required to perform testing to confirm that the product meets their requirements.*

HealTech™ composites can repair typical composite damage events, such as delaminations and scratches.

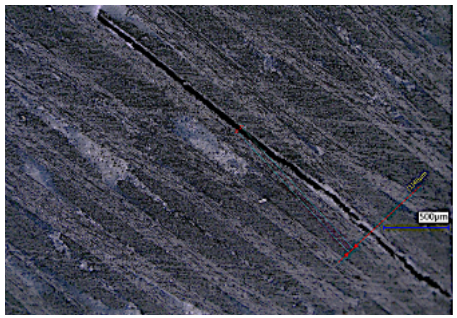
Figured below :
A) GFRP that has been impacted and healed, B) CFRP that has been delaminated and healed.
Both damage events can be fully repaired following 1 minute heating at 100°C.

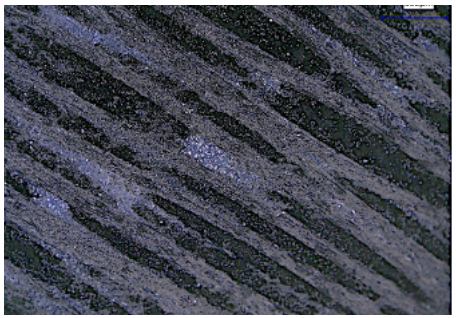
A)





B)

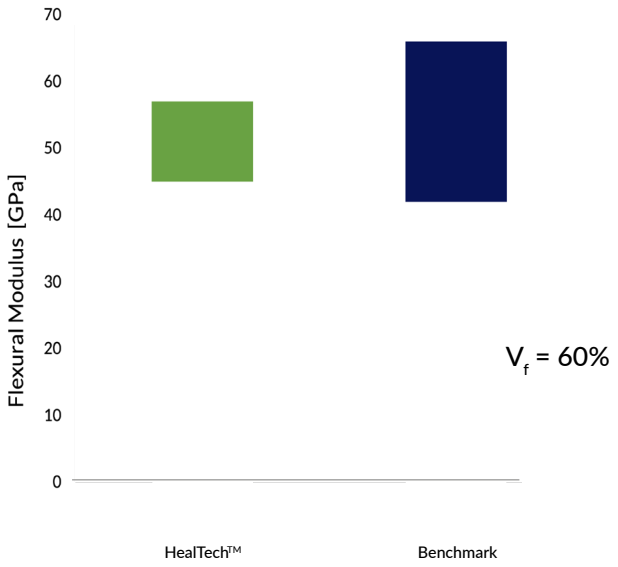




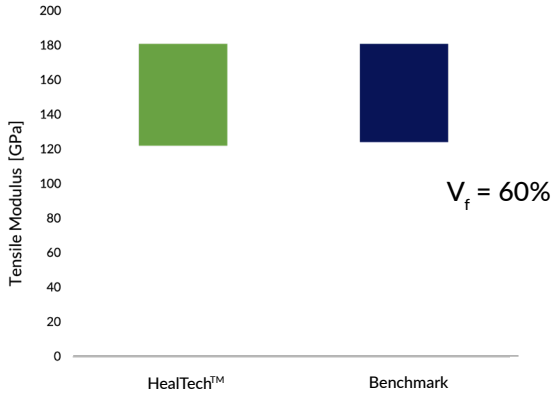
TECHNICAL INFORMATION

HealTech™ performances are in line with industry benchmarks, with a higher toughness. Recovering 100% of mechanical properties after repair, the structure also maintains its integrity, profile, and weight. The graphs below display how HealTech™ composites compare to benchmark composites in terms of three-point bending, tensile testing and crack resistance.

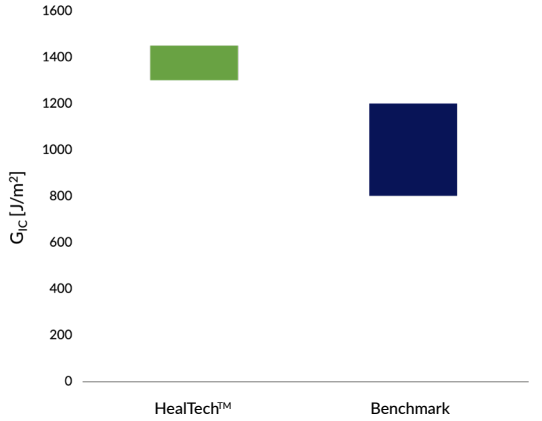
Three point bending | ASTM D7264



Tensile testing | ASTM 3039



Crack resistance | ASTM 5528



WORKING WITH US

Offering a 360° approach to address composite damage challenges, CompPair contributes throughout the entire process of launching an improved product.

CompPair guides clients from quantifying the damage issue, validating repair solutions, and streamlining the industrialization process, to deploying HealTech™ products in commercial applications.

CompPair plays a crucial role in advancing sustainability and efficiency throughout the lifecycle of composite structures.

ENGINEERING SUPPORT

SUPPORT IN REPAIR MECHANISMS

LIFE CYCLE ANALYSIS

IMPLEMENTATION OF TAILORED SOLUTION WITH COMPPAIR PRODUCTS

BENEFITS

+30%

Crack resistance

100%

Damage regeneration

+80%

Damping

60+

Healing cycles

60s

CompPair's innovation, HealTech™, gives composites the ability to heal delaminations, extending the lifetime and avoiding sudden failure of composites. Products made with HealTech™ can be repaired on site in 1 minute, answering a growing problem in the industry.

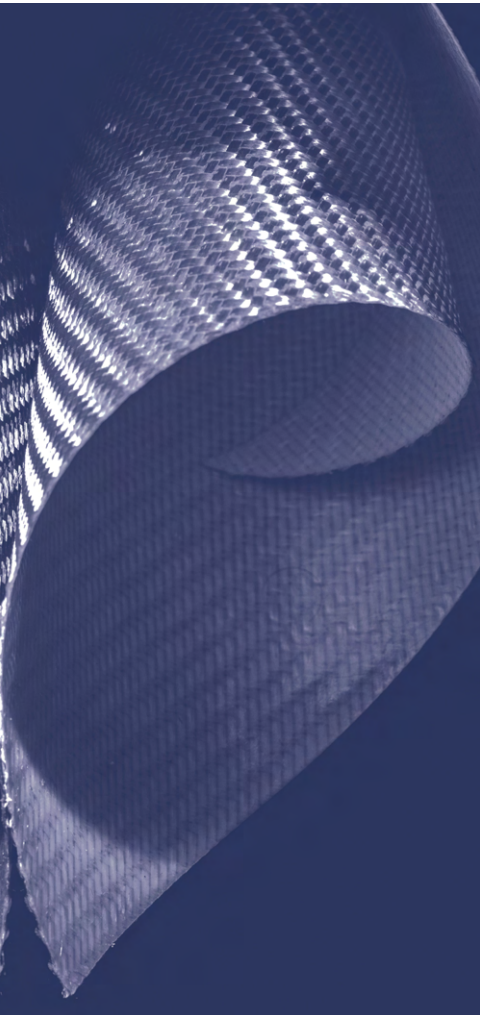
Today, two possibilities exist to repair composites :
(1) discard and re-produce;
(2) conventional repair taking 4+ hours and additional ressources.

CompPair's solution can reduce CO_2 emissions by 258x compared to option (1) and 129x compared to option (2).*

According to internal study

ABOUT US

Dedicated to finding better solutions, our background is 12 years of research at EPFL in Lausanne and 4 years of company growth in Switzerland. Founded in 2020 by Dr. Amaël Cohades, Robin Trigueira and Prof. Véronique Michaud.
The Swiss company, based in Lausanne, has grown to 25 team members, with strong industry references and is backed by experienced shareholders.



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