



HEALABLE AND SUSTAINABLE
COMPOSITES

HEALTECH™ PRODUCTS

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BRINGING REPAIRABILITY TO COMPOSITES

CompPair is a material provider offering healable composites that extend product lifespan and reduce waste. Our semi-products integrate into existing production lines, tackling damage challenges while minimising environmental impact. By prioritising repair and waste prevention, we enhance durability, unlock economic benefits, and shape the future of composites.

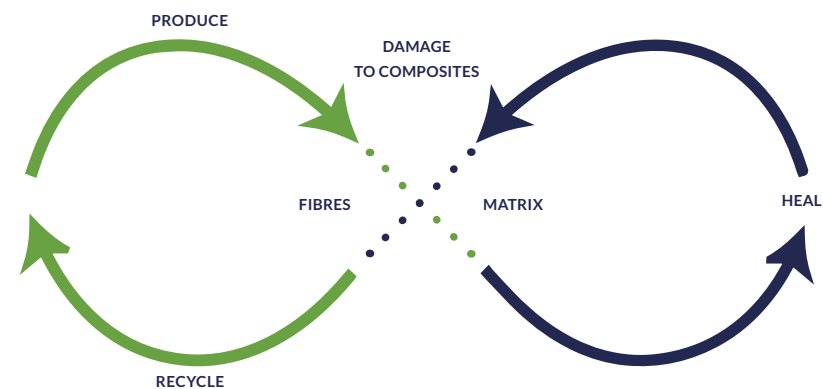
COMPPAIR ENABLES LIFETIME EXTENSION THROUGH REPAIR WITH HEALABLE COMPOSITE SEMI-PRODUCTS.

VISION

Bring full circularity to the composites industry.

MISSION

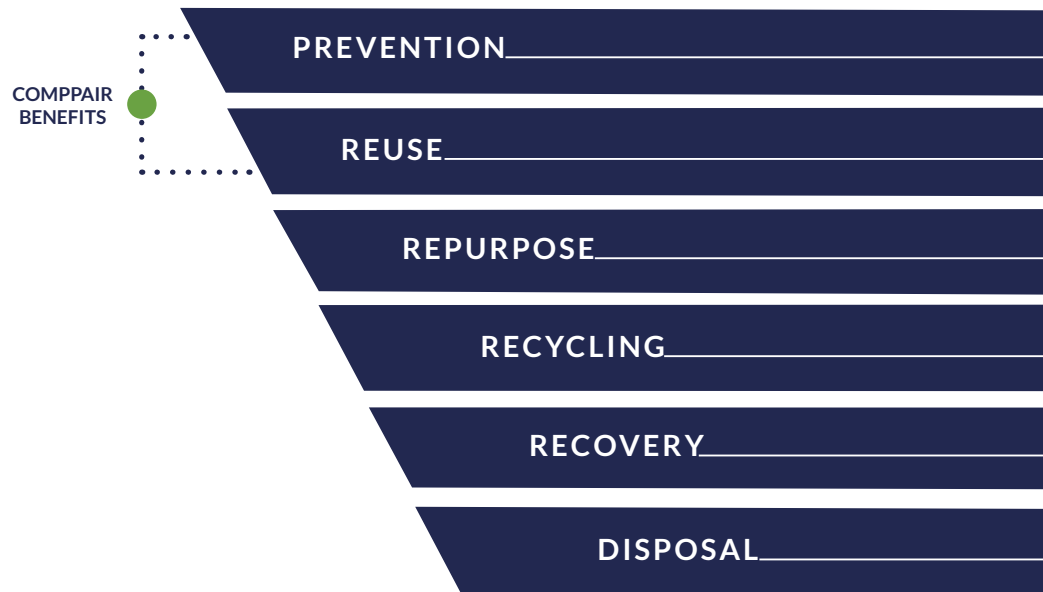
Solve economic and ecological challenges of industrial applications.



WHY REPAIR?

Healable materials drive circularity by prioritising waste prevention. By producing composites that are designed for repair, CompPair mitigates waste generation, while unlocking new levels of cost efficiency and keeping materials at their highest value for longer.

Waste Management Hierarchy



CompPair aligns with the EU's circular economy plan, offering materials promoting eco-design, product longevity and waste mitigation. Our solutions contribute to UN SDGs 7, 9, 12, and 13.



BENEFITS

+30%

Crack resistance

100%

Damage regeneration

+80%

Damping

60+

Healing cycles

60s

Today, two possibilities exist to repair composites:

(1) discard and re-produce;

(2) conventional repair taking 4+ hours and additional resources.

CompPair's solution can reduce CO₂ emissions by **258x** compared to option (1) and **129x** compared to option (2).*

*According to internal study

SPORT

Extended performance and sustainability



BENEFITS

- » Maintain performance for longer
- » Sustainability through life-time extension
- » Increased customer satisfaction
- » Increased lifetime value

APPLICATION
EXAMPLES:

SPACE AND AERONAUTICS

Improving sustainability while increasing cost-efficiency



BENEFITS

- » Performance: full recovery of mechanical properties
- » Operational efficiency: production defect reduction
- » Reduced downtime: regeneration 400x faster, in-situ structural regeneration
- » Improved sustainability: waste reduction through extended lifetime
- » Microcracks healing and reduced cryogenic microcracking
- » Unlock reusable structures

APPLICATION
EXAMPLES:

MOBILITY

Improving sustainability while increasing cost-efficiency



BENEFITS

- » Reduced downtime: regeneration 400x faster, in-situ structural regeneration
- » Performance: full recovery of mechanical properties
- » Improved sustainability: waste reduction through extended lifetime
- » Operational efficiency: production defect reduction
- » Microcracks healing and reduced thermal cycling microcracking

APPLICATION EXAMPLES:



LIFESTYLE AND LUXURY

A living material for a cutting-edge lifestyle



BENEFITS

- » Low footprint luxury materials
- » Scratch regeneration
- » Impact regeneration
- » Cost-effective maintenance
- » Customisable solutions

APPLICATION EXAMPLES:



HEALTECH™ SOLUTIONS

HealTech™ is a thermoset-based resin system giving composite parts the ability to heal cracks and delaminations in 1 minute by locally heating the part to 100-150°C.



HealTech™ Prepregs

- CS01 - high toughness
- CS02 - reduced cure time

HealTech™ LCM

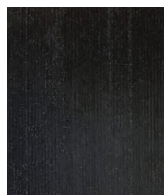
- LCS01 - long pot life
- LCS02 - reduced cure time, higher T_g

Other HealTech™ solutions

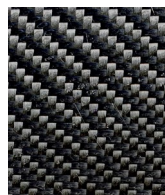
- Laminates
- Sandwich panels
- Monolithic plates
- Custom systems: slit tapes, bio-based

Available reinforcements

HealTech™ solutions are available with standard and custom reinforcements.



Carbon UD



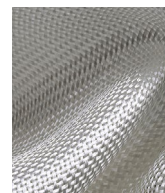
Carbon Twill



Recycled carbon



Glass UD



Glass Twill

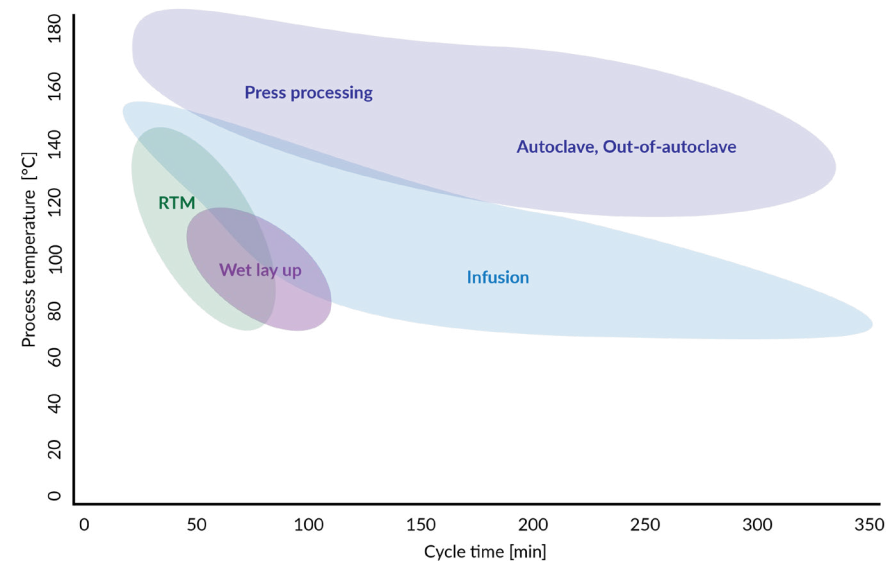


Flax

Technical datasheets available upon request.

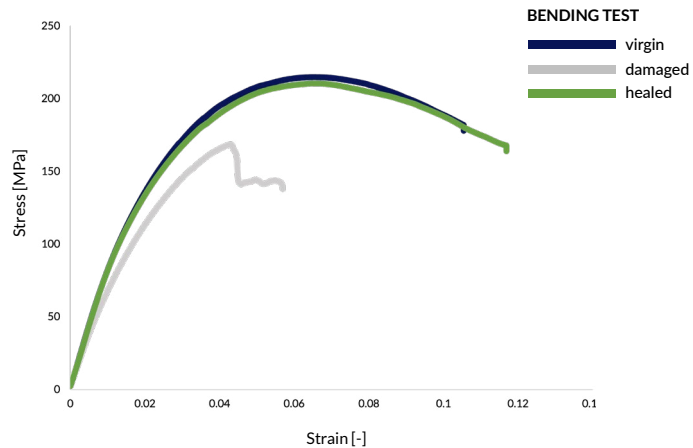
HEALTECH™ PROCESSING

An overview of process possibilities with HealTech™

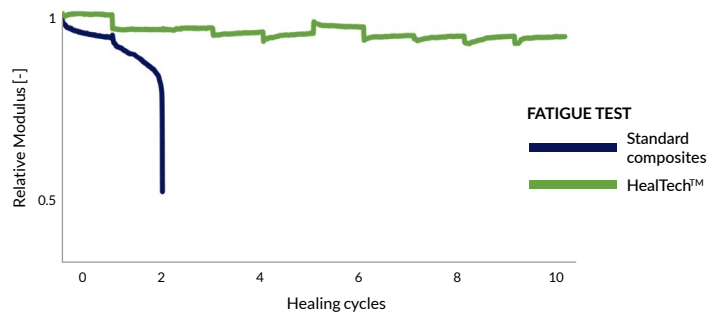


PERFORMANCE

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.

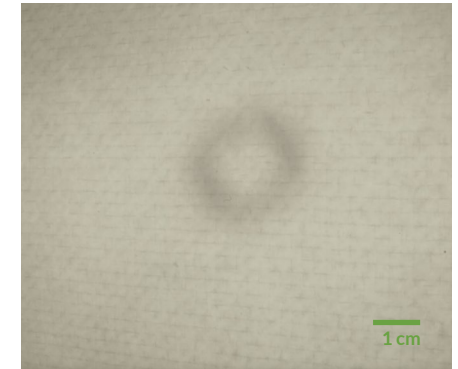
HealTech™ composites can repair typical composite damage, such as delaminations, dents and scratches.

Figured below:

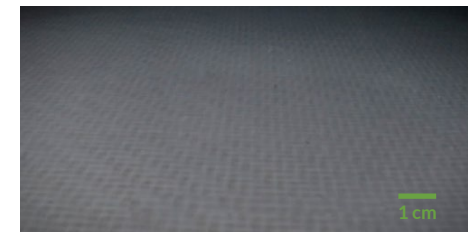
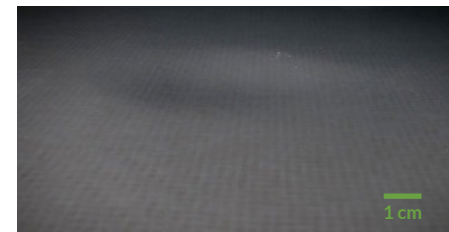
- A) glass composite impacted and healed
- B) sandwich structure indented and healed
- C) recycled carbon composite scratched and healed

All types of damage can be fully repaired following 1 minute heating to 100°C-150°C.

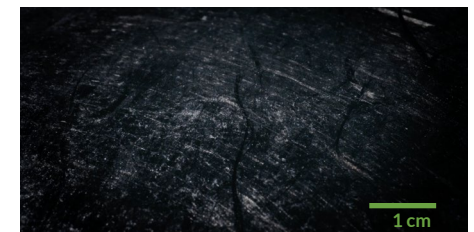
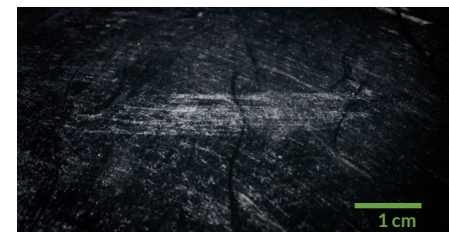
A) Delamination



B) Sandwich indentation



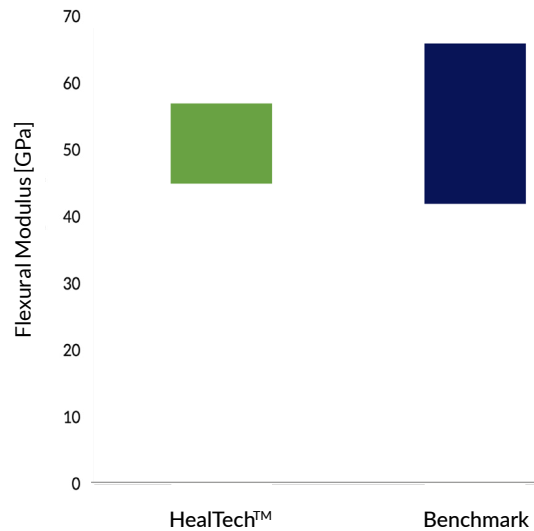
C) Surface scratches



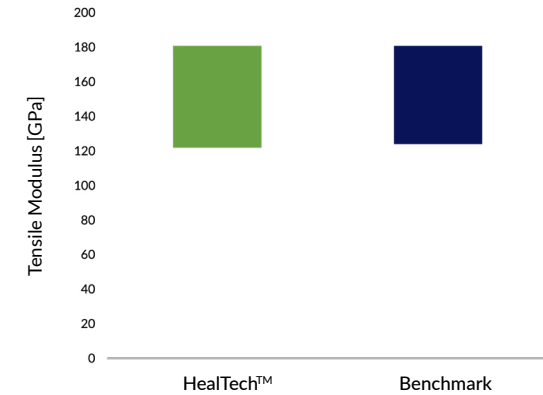
TECHNICAL INFORMATION

HealTech™ performances are in line with industry benchmarks, with a higher toughness. Recovering 100% of mechanical properties after repair of microcracks, the structure also maintains its integrity, profile, and weight.

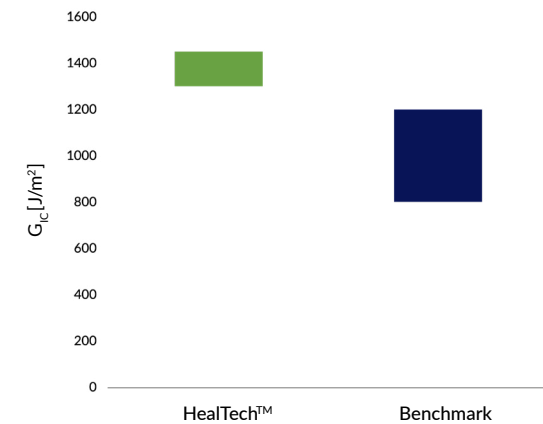
Three point bending | ASTM D7264 Tested on HealTech™ Carbon Twill ($V_f = 55\%$)



Tensile testing | ASTM D3039 Tested on HealTech™ Carbon UD ($V_f = 60\%$)



Crack propagation resistance | ASTM D5528 Tested on HealTech™ Carbon Twill



HEALTECH™ IN ACTION

HealTech™ solutions have demonstrated repair benefits in the sports, lifestyle, aerospace and mobility industries.

Repairable lightweight skis with Salomon



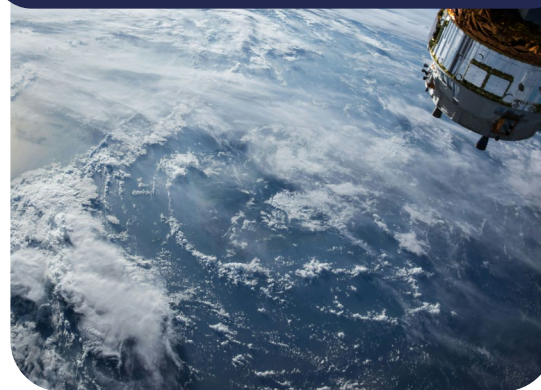
Recycled carbon Circular C watch with ID Genève

Eurostar initiative, NERTHUS, dedicated to revolutionising the future of mobility.

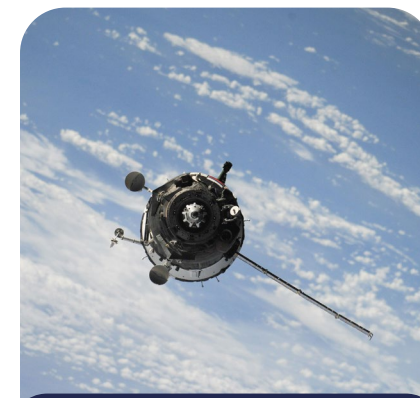


Clean mobility for the future with Eurostar consortium

Cassandra project backed by ESA to advance autonomous repair

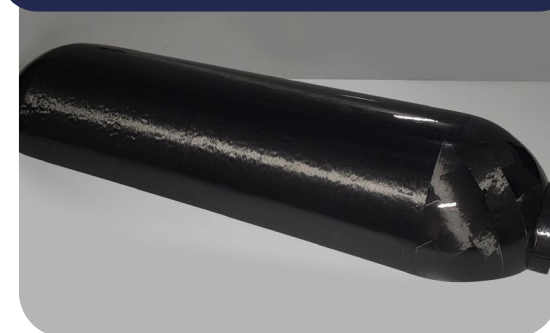


Contract in the ESA FIRST! campaign for autonomous damage sensing and repair (ESA contract n°4000143717).



Natural fibre and healable satellites with Airbus DS

Development of cryo tanks with ESA OSIP contract



Applying healable technology to slit tape manufacturing for cryo tank applications under ESA Contract No. 4000140708.

Recycled, recyclable and healable rally buggy parts



WORKING WITH US

CompPair leverages 12 years of EPFL research and industrial growth to offer a 360° approach to composite damage challenges.

We support clients from damage assessment and repair validation to industrialisation and commercial deployment of HealTech™ solutions.



ENGINEERING
SUPPORT

SUPPORT IN
REPAIR MECHANISMS

LIFE CYCLE ANALYSIS

IMPLEMENTATION OF
TAILORED SOLUTION WITH
COMPPAIR PRODUCTS



EXTRA DOCUMENTS



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