Composites Evolution

Flax: A greener option for composite reinforcement

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Company overview

- Developer, manufacturer and supplier of prepregs
- Established in 2009
- Based in Chesterfield, UK
- In-house prepreg development and manufacturing
- ISO 9001:2015 certified

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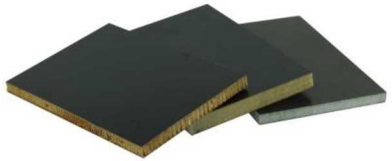
Products and services

Epoxy Component Prepregs

Epoxy Tooling Prepregs



Fire-Resistant PFA Prepregs

Natural Fibre Prepregs

Toll Manufacturing & Specials

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Environmental benefits of flax

- Sustainable material source, readily available in Europe
- CO_2 neutral resource
- Lower production energy than carbon and glass
- Biodegradable
- Higher calorific value than carbon/glass composites, increasing energy capture from incineration processes

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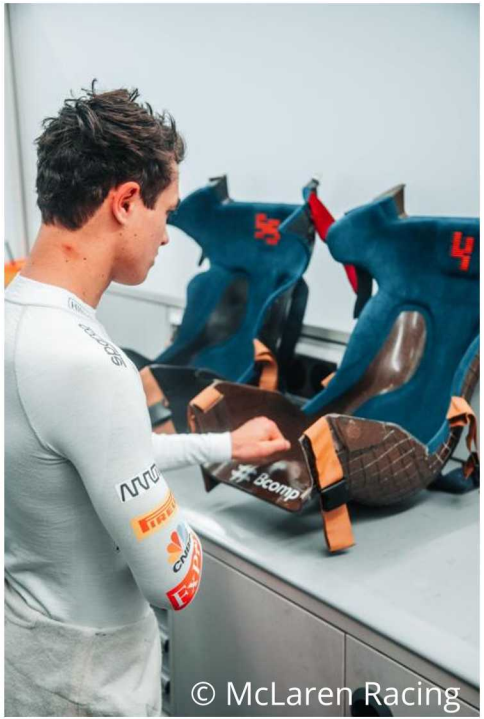
Performance benefits of flax

- Technical
  - Lightweight, good specific properties
  - Noise/vibration damping
  - Thermal insulation
- Aesthetics
  - Natural finish
  - Colour options through resin pigmentation or fibre dyeing
- Social
  - Safe to handle, non-toxic, non-irritating
  - Safer failure mode

	Flax	Glass	Carbon
Strength	***	****	*****
Lightweighting	*****	***	*****
Economy	***	****	**
Sustainability	*****	**	*
Vibration damping	*****	**	*

Example: McLaren F1 racing seat

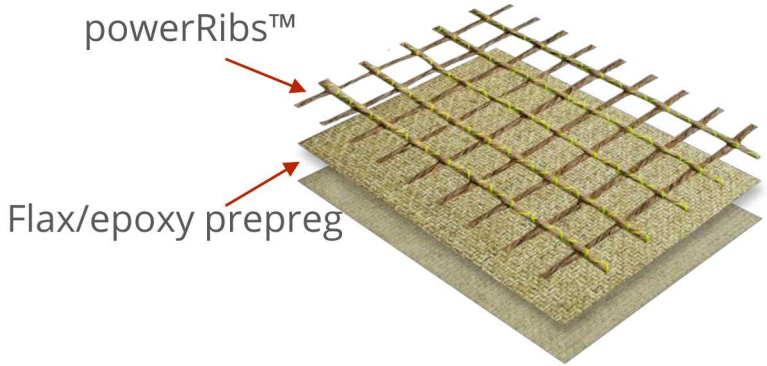


*"...a seat with the required strength and stiffness, but with a **75% lower CO_2 footprint** compared to its carbon fibre counterpart."*

"Greater vibration absorption and impact resistance "

McLaren F1

Seats: ampliTex™ flax/epoxy prepreg + powerRibs™



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Images courtesy of Bcomp Ltd

Challenges

- Variability
  - Higher variability than synthetic fibres - properties, thickness etc.
- Moisture
  - Natural fibres absorb moisture - increased volatiles, risk of porosity
  - Coating may be necessary to protect parts in-service, seal cut edges etc.
- Temperature
  - Natural fibres can degrade/burn at high temperatures (>150°C)
  - Limit cure, post-cure and in-service temperatures
  - Thermoplastic matrix materials with high processing temperatures cannot be used

Summary

- Flax fibre composites can offer significant improvements in sustainability, without compromising performance
- Increased demand is likely due to more environmental legislation and public awareness
- Development of fibre extraction and surface finishing processes could enhance properties further

Any questions?

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