

# LINEO - FlaxPly

## FlaxPly set for transatlantic adventure



### Case History

## Pioneering eco-friendly mini transat 6.50 sailing boat prototype made with flax fibers.

Lineo supplied flax reinforcements for the first ever racing boat prototype to incorporate up to 50% of natural flax fiber in the composite structure.

The boat, which has been called the 'Araldite', takes its name from Huntsman's award winning Araldite® range of products.

The initiative is also in line with Lineo's ongoing commitment to enriching lives through innovation by supporting the development of ecofriendly, sustainable and safe technologies. Lineo supplied Flaxply for the 'Araldite' in the Mini Transat 6.50, the first solo transatlantic yacht race for boats measuring 6.5 metres in length.

'Araldite', is a 6.5m long and 3m wide, ergonomic, lightweight Mini Transat racing boat prototype – the smallest offshore racing boat allowed to cross the Atlantic.

Designed by Régis Garcia to showcase the possibilities of incorporating flax fibers into the composite structure of an open sea sailing prototype, the boat was built at the well-known IDB Marine de Tregunc shipyard in Brittany, France.

With acceptance and funding received from C.I.P.A.LIN, the French Interprofessional Committee for the Agricultural Production of Flax, the project has been completed in just over 12 months.

Thibault Reinhart, the main skipper and naval engineer, Julien Marin, naval architect and Régis Garcia, co-skipper, represent the project team.

The ultimate goal was to adopt a cleaner production process whilst combining the renewable properties of flax with the well-known, high-performance characteristics of carbon fiber, without compromising the light weight or mechanical properties of the sailing prototype.

Lineo, specializing in flax reinforcements, provided the diverse fibers, specially treated to ensure perfect compatibility between the flax and the Araldite® warm curing system.

Lineo uses new technology to coat flax fibers with epoxy resins in such a way that absorption of water from the flax is prevented and strong bonds between the flax and the epoxy resin are created, guaranteeing the quality of the laminate.

Working closely in partnership, Lineo research laboratories and the skipper issued the necessary laminate mechanical properties used for designing the prototype's diverse parts, including the deck, hull, helm and toe-rails. In total, flax fiber constitutes 50% of the boat's reinforcement fibers, [->]

### Application

- Flaxply used for infusion process to build pioneering Mini Transat 6.50 sailing boat

### Special service conditions

- Adopt a cleaner production process in combining flax with carbon fiber, while maintaining the light weight and mechanical properties of the sailing prototype

### Advantages for customers

- Lineo developed new technology to coat flax fibers with epoxy resin, preventing water absorption, creating strong bonds and guaranteeing the laminate quality
- Flaxply allow good fiber impregnation and reinforcement properties
- Flax fibers offer potential for a reduced environmental footprint, greater sustainability and lower costs

### Advantages over the competition

- As a result of Lineo's partnership with Huntsman, a flax prepreg for vibration damping applications is created, providing specific benefits for the sports market

### Lineo Advanced Materials used

- FlaxPly





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*“With the help of Lineo and Huntsman we have undertaken many, many trials to find and validate the right blend between flax, epoxy resin and carbon fibers, so as to realize the optimum performance for the boat.”*



*Thibault Reinhart in the hull of the ‘Araldite’ racing boat*



*The ‘Araldite’ Mini Transat racing boat is the smallest offshore racing boat allowed to cross the Atlantic and the first ever prototype to incorporate natural flax fiber in the composite structure*



*Hull of ‘Araldite’ racing boat*

[...] with the remaining 50% being traditional carbon

Commenting, Thibault Reinhart, co-owner and main skipper of the ‘Araldite’ said: “Constructing the ‘Araldite’ using flax fibers represented a big challenge, especially when considering how all the other prototypes in the Mini Transat category only consider using the tried and trusted formula of deploying carbon. Since the start of this project 12 months ago, with the help of Lineo and Huntsman we have undertaken many, many trials to find and validate the right blend between flax, epoxy resin and carbon fibers, so as to realize the optimum performance for the boat. Reducing the impact on the environment is not the only advantage of flax fibers. Imbued with their intrinsic technical properties, we have high hopes for our unique sailing prototype as we prepare to take part in our maiden competition across the Atlantic.”

Francois VANFLETEREN, Lineo Director added: “Our involvement in this radical venture illustrates Lineo’s ongoing commitment to creating sustainable and eco-friendly technologies. Bio-derived composites, such as flax fibers offer potential for a reduced environmental footprint, greater sustainability and lower costs, providing advantages for an increasing number of marine applications and beyond.

*“Reducing the impact on the environment is not the only advantage of flax fibers. Imbued with their intrinsic technical properties, we have high hopes for our unique sailing prototype...”*

It just goes to show that flax fibers can now be considered as a genuine reinforcement composite, with the potential to take on the mass fiber market and to even penetrate the carbon market.



*Design of ‘araldite’ racing boat*

The launch of the ‘Araldite’ took place on 9th September 2010 at a ceremony at the Maison du Nautisme at Douarnenez, France. In its maiden competition, the boat competed in the Mini Empuries twohanded prototype race, sailing 300 miles around the Balearic Islands before crossing the finishing line at L’Escala in Spain. This was followed by the Mini Barcelona solo race in October, another 300 mile race which saw the ‘Araldite’ sail from Barcelona and back again.

Lineo worked with Huntsman to win the Bio-Based Materials category of the JEC Innovation Awards 2010. Huntsman supplied the Lineo development team with resins for both the pre-treatment and final impregnation of flax fibers. The result is a flax prepreg for vibration damping applications which are particularly suited to the sports market.

