CASE STUDY

SONNTAG FINS CONFIRM GREENPOXY® 33 AS BEST SOLUTION FOR CUSTOM CARBON WINDSURF FINS

Sicomin's latest marine collaboration sees its industry leading GreenPoxy® bio-based epoxy resins used for custom carbon fibre windsurf fins, combining speed, fatigue performance and sustainability for some of the fastest sailors afloat.

Joerg Sonntag, owner and founder of Sonntag Fins, has been involved with windsurfing since the 80's but decided to launch the company's custom carbon fibre windsurf fin brand around 12 years ago. Using the latest composite materials, new research results, CNC machined tooling and, most importantly, a fully integrated software package for simulation, design, calculation and testing, Sonntag fins deliver the ultimate in performance and consistency.

Targeted at windsurf slalom sailors, racers and speed sailors, every Sonntag fin is a custom made product, tailored specifically to the user based on a discussion about their riding style, their physical size and weight, as well as how they like to load the fin whilst sailing.

All of this attention to detail and bespoke manufacturing places a huge importance on the performance and consistency of the raw materials used in each fin. New materials have to be validated not just in production, but also on the test rig in the lab and on the water by the team riders.

With this in mind, Joerg started to work with Time Out Composite, Sicomin's German distributor, when the company was looking for a new resin system that could reduce cycle times and improve manufacturing output. Bio-based systems were discussed at this time, but the first product used by Sonntag was Sicomin's SR1280 laminating system which delivered immediate results, enabling shorter cure cycles, and exceeding all of the previous mechanical test targets.

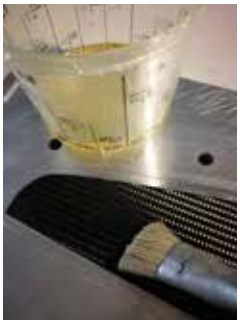
In 2020, Sonntag and Time Out Composite revisited the topic of a more sustainable epoxy resin system. It was the perfect time for Sonntag Fins, with their unique bright green UV resistant outer finish, to go green on the inside too with Sicomin's GreenPoxy® 33 resin.

Test fins were produced with the new material performing well in production trials. Pure resin samples were also tested and post-cured at 140 °C, with the new GreenPoxy® 33 samples showing significantly higher elongation at maximum resistance, meaning the cured epoxy was less brittle and susceptible to damage should a customer's fin meet a rock. With mechanical properties

>>>

equivalent or improved versus the established SR1280 resin, Sonntag switched production to GreenPoxy® 33 in August 2020.

Sonntag fins are manufactured in CNC machined aluminium moulds using GreenPoxy® 33 and a bespoke lay-up of woven, stitched biaxial and heat-set unidirectional carbon fibre fabrics..



• The first step in the moulding process is the application of Sonntag's unique green in-mould coating.

• Next, the individual fabric plies, cut using precisely machined templates, are placed into the mould and then wet-out with the low viscosity epoxy. With the laminate stack complete, the mould is closed and loaded into a heated press for around 2 hours to consolidate and cure the fin.

• After curing, the demoulded fins are tempered in an oven at 140°C, then only a light sanding is required to create the final surface roughness for optimum flow characteristics in the water.

• Finally, the fins are cut to the required length and the base adapter is molded to the epoxy-carbon blade in a specific mould.

With each fin being optimized for its rider, it is critical that each piece produced will bend and twist in exactly the way it has been designed to do so, providing the rider with exactly the feel and feedback they want for their board and fin. Each Sonntag fin is tested on a unique CNC controlled servo and stepper motor driven test bench that Joerg has developed, building a database of test results that not only ensures the products perform as designed but also validating the consistency of the manufacturing process and raw materials.

"We produce high-performance windsurfing fins that get very significant loads during sailing. Fins need to combine flexibility with extremely high torsion stiffness which places high interlaminar shear forces on the resin, especially in our softer fins." commented Joerg Sonntag, "So a key requirement for us is a resin that maintains its mechanical properties for many years, and this is where the Sicomin systems really deliver"

Sicomin GreenPoxy® resins have been a great success for Sonntag Fins - seamlessly integrated into serious production and providing more sustainable materials with uncompromising performance.

No matter what the scale, Sicomin offers the perfect solutions for high-performance bio-based epoxy resin systems.

Sicomin, 31 avenue de la Lardière, 13220 Châteauneuf les Martigues, France
T: +33 (0)4 42 42 30 20 / E: info@sicomin.com / www.sicomin.com

Sicomin Epoxy Systems