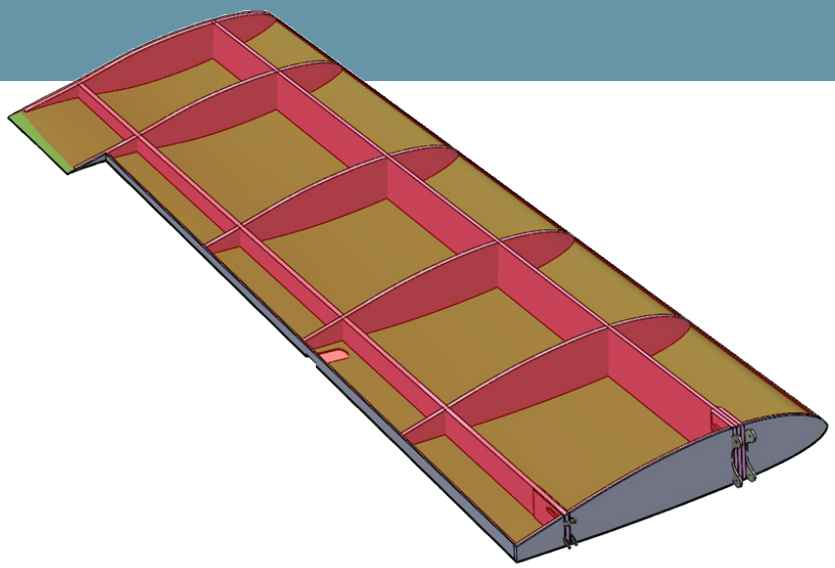
CASE STUDY

PROJECT DAEDALUS UNIVERSITY OF SHERBROOKE
End of studies project - Design of composite wings



The KR-2 wing as re-designed by the University of Sherbrooke students

WING DESIGNED WITH GURIT COMPONENTS

The wing's main elements integrated Gurit products in their design. The spars and ribs are sandwich structures using Corecell I-80. The top and bottom skins are made similarly, using Corecell™ I-60. Its flexibility and thermoformability make it perfect for this use. Finally, the Kerdyn™ foam was used to fabricate the aileron (not depicted). Two layers of Kerdyn™ were stacked together and then shaped to the final form using hot wire cutting.

RIBS AND AILERON

The ribs offer structure against wing torsion. Fiberglass was applied to the Corecell™ I-80 using wet layup. To obtain the shape needed, the ribs were then cut using a water-jet cutter available at the University of Sherbrooke's mechanical engineering department.

OVERVIEW

Homebuilt kit planes as part of an end of studies project for mechanical engineering students

TARGET

Design and construction of new lightweight, performant, composite wings for a KR-2 plane

SOLUTION

Gurit Corecell™ I-60 and I-80, Kerdyn™ recycled PET core

BENEFITS

Gurit products allowed adapted solutions to manufacturing methods (hot wire cutting and vacuum wet layup)

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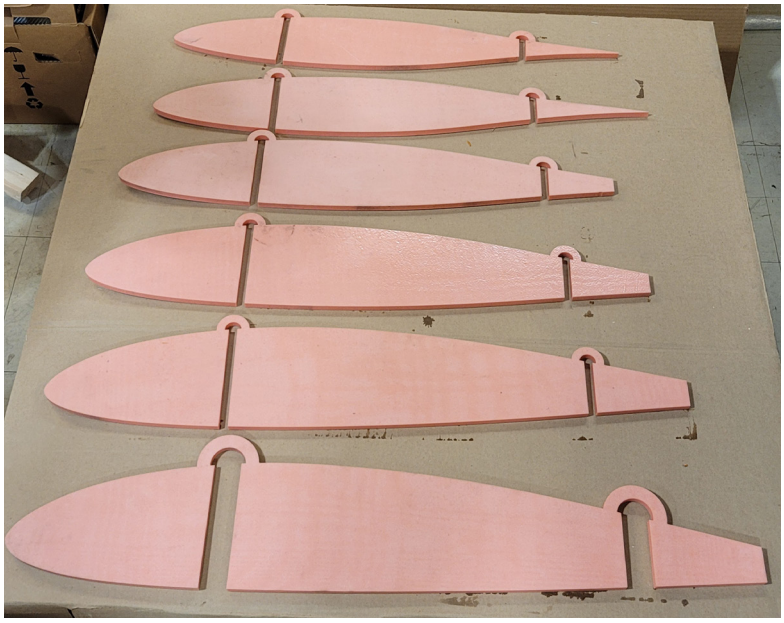

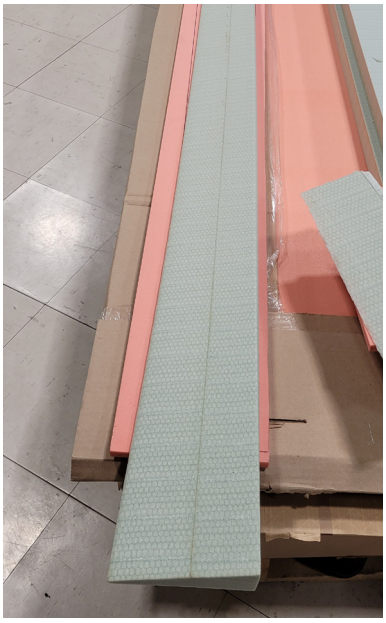

Wing ribs (left) and aileron (right)

The ailerons are the control surface of the wing, allowing it to raise its nose up and down. Two sections of foam were glued on top of each other. Then, its shape was manufactured using hot wire cutting, with very satisfactory results. The image depicts the foam after wire cutting before any layup was done on this part.

Main spar at different stages of completion

MAIN SPAR

The main spar supports a majority of the wing's bending load. It is a critical part of the wing that must be manufactured with care.

The first picture depicts the foam before wet layup and before it is cut to its final geometry.

The second picture shows the main spar after wet layup, before a groove is cut to insert a carbon fiber rod, adding bending strength.

Dry test of the positioning of I-60 Corecell™ in the mould

SKINS

The wings are the aerodynamic surface of the wing and therefore require very fine adjustments in shape and dimensions to offer optimal performance. The use of Gurit's Corecell™ I-60 allowed the skin to match the shape of the mould used. Wet layup was performed in the mould itself, followed by 8 hours of vacuum bagging to optimize material properties

About Gurit

Gurit is specialized in the development and manufacture of advanced composite materials, composite tooling equipment, structural profiles and core kitting services. The product range comprises core materials, prepregs, formulated products such as adhesives, resins as well as structural composite engineering. Gurit supplies global growth markets such as the wind turbine industry, marine, architecture & building, transportation & rail and many more.

Gurit operates production sites and offices in Australia, Canada, China, Denmark, Ecuador, India, Italy, Mexico, New Zealand, Poland, Spain, Switzerland, Turkey, United Kingdom and the United States.
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Composite Engineering

Gurit Composite Engineering is the specialist consulting arm of Gurit Group, providing independent services within the field of Structural Engineering for Fibre Reinforced Polymers (FRP) and Carbon Fibre Reinforced Polymers (CFRP) since the 1980s.

A core team of around 20 qualified and dedicated composite engineers in the United Kingdom, France and New Zealand offers independent composite engineering services to designers and manufacturers and has a solid track record of key engineering services for racing boats, superyachts, production boats, workboats, cars, buses, civil and architectural structures as well as industrial components worldwide.

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