MICHELIN SUPPORTS VOLIRIS IN THE DEVELOPMENT OF ITS NEXT- GENERATION AIRCRAFT: THE NATAC

News / Manufacturer

Michelin Inflatable Solutions will collaborate on the development of NATAC, the automatic air shuttle for containers developed by Voliris. Michelin Inflatable Solutions brings its expertise in composite materials and their assembly to the service of growing technological products. By developing innovative industrial methods for assembling technical textiles, Michelin shares its knowledge of materials to support the manufacture of the NATAC's wing envelope.The Voliris NATAC aims to transport freight with zero CO2 emissions, using a flying wing suited to areas with limited infrastructure. Heavier than air, this aircraft requires no ballast when unloading its cargo and could transform the air freight sector.

Michelin is applying its innovation prowess and expertise in polymer composites and their assembly to aircraft development

The wing envelope is one of the NATAC’s most innovative features, due to the major technical constraints to which it is subjected. Segmented into five lobes, the envelope has a total volume of 25,000 m³ and arrives folded at the deployment site before being inflated. Its geometry is maintained by a pulley system that varies the volume by adjusting its aerodynamic shape at different altitudes. In addition to this internal tension, the envelope must withstand significant external loads from the cables carrying the cargo (up to 30 tonnes), mechanical stresses caused by inflation pressure across a large surface area (8,000 m²), and the requirement to remain

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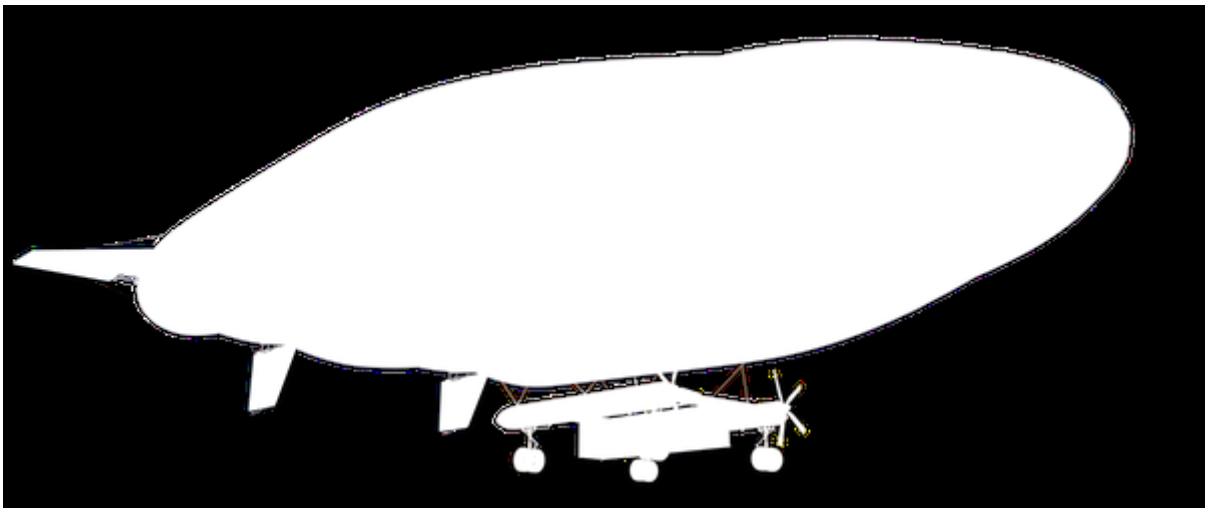
impermeable to helium and, ultimately, hydrogen.

Through its subsidiary Michelin Inflatable Solutions, Michelin is leveraging its technical coated textiles expertise to qualify the materials for the flexible envelope and develop assembly processes.

Voliris and Michelin Inflatable Solutions plan to manufacture a first full-scale demonstrator of the NATAC wing by 2028 for ground testing and validation of the shuttle's on-site deployment. This full-scale ground-based envelope will be the second key milestone for the Voliris NATAC project, following successful flight tests of a 1/7-scale shuttle prototype. To operate in any location, the NATAC has a distinctive feature: it can be shipped in 10 standard 40-foot containers and assembled directly at the departure site. The envelope must therefore be foldable without compromising its integrity – an additional challenge for Michelin Inflatable Solutions that requires an innovative approach combining materials science with expertise in folding-induced stresses.

The NATAC aircraft: a futuristic, innovative solution for decarbonizing air freight

This air shuttle is a hybrid solution combining features of airships and cargo aircraft. The NATAC requires no paved runway for takeoff, helping to limit the impact of land artificialization. To transport freight with zero CO_2 emissions, the aircraft is designed to be 100% hydrogen-compatible, with hydrogen eventually serving as both fuel and lifting gas. Lastly, its autonomous flight system enables safe, unpiloted operations, allowing it to reach areas that are difficult to access or lack heavy infrastructure. By partnering with Voliris, Michelin Inflatable Solutions is shaping the future of composites and air freight.



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