



ZeroAvia Reduces Greenhouse Gases and Drives Toward More Sustainable Air Transport with Ansys

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Ansys solutions enable development and certification of ZeroAvia's hydrogen-electric powertrain for aircraft that emits only water

/ Key Highlights

- Ansys simulations are applied from early design stages through certification of all critical aspects of ZeroAvia's sustainable powertrain
- ZeroAvia is using Ansys simulation to help address challenges linked to thermal management, safety, fatigue, and lifting, along with Ansys' certified model-based solution to develop and certify the embedded engine controls

PITTSBURGH, Oct. 19, 2022 /PRNewswire/ -- [ZeroAvia](#) is leveraging [Ansys](#) (NASDAQ: ANSS) simulation solutions in the development of its new, sustainable hydrogen-electric powertrain developed to reduce aircraft emissions. Hydrogen-electric propulsion technology can produce 90% less lifecycle emissions than jet fuel-powered turbines, and ZeroAvia predicts its powertrain will result in substantially lower operating costs.



A leader in sustainable aviation, ZeroAvia demonstrated the potential for zero-emission flight through flying the world's largest hydrogen-electric powered aircraft, a Piper Malibu. ZeroAvia engineers leveraged Ansys multiphysics simulations — including structural analysis, fluid dynamics, FSI, electromagnetic, and electromechanical analysis — to help make this electric-powered plane a reality. The ZeroAvia system uses electricity generated by a solar panel to run an air compression pump. When combined with hydrogen stored in an on-board tank, oxygen from the compressed air reacts with hydrogen in the fuel cell to produce electricity to power an electric airplane motor. Water is the only emission from this process — no carbon-based greenhouse gases.

The ZeroAvia team used [Ansys® SCADE®](#) to automatically generate the code controlling the motor, which helps reduce human error and costly coding mistakes. ZeroAvia also leveraged [Ansys® medini analyze](#) software to validate the safety of the aircraft's hydro-electric systems – supporting and accelerating the stringent certification process.

"Without Ansys, we would still be writing code for high-level application, which would have increased the development and verification," said Youcef Abdelli, chief technology officer and chief engineer of electric propulsion systems at ZeroAvia. "For system certification, we use Ansys simulation to support the critical aspects of hydrogen-electric engine design - including thermal, safety, certification, stress, fatigue, and lifting."

ZeroAvia will soon fly a retrofitted Dornier 228 aircraft to flight test its market-entry product - a 600kW hydrogen-electric powertrain designed for 9-19 seat aircraft to be commercialized by 2024. ZeroAvia is also already working on developing a 2-5MW powertrain capable of flying 40-80 seat aircraft by 2026. For these two certified-intent systems, ZeroAvia is working with Ansys software.

"Ansys simulation has long been used for aircraft control code, so we are excited to see that startup companies with new ideas like ZeroAvia are turning to Ansys to accelerate development of their hydrogen fuel cell aircraft," said Walt Hearn, vice president of global sales and customer excellence at Ansys. "By reducing aviation emissions, their hydrogen-electric powertrains will support global efforts to halt climate change."

/ About Ansys

When visionary companies need to know how their world-changing ideas will perform, they close the gap between design and reality with Ansys simulation. For more than 50 years, Ansys software has enabled innovators across industries to push boundaries by using the predictive power of simulation. From sustainable transportation to advanced semiconductors, from satellite systems to life-saving medical devices, the next great leaps in human advancement will be powered by Ansys.

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/ Contacts

Media Mary Kate Joyce
724.820.4368
marykate.joyce@ansys.com

Investors Kelsey DeBriyn
724.820.3927
kelsey.debriyn@ansys.com



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