

SAFRAN AND ONERA START WIND TUNNEL TESTS OF FUTURE OPEN FAN

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Safran Aircraft Engines and France's national aerospace research agency ONERA have begun first wind tunnel tests with the ECOENGINE, a 1:5 scale demonstrator of the future Open Fan. The trials are at ONERA's wind tunnel facility in Modane, France. This disruptive architecture, a key pillar of the CFM RISE technology demonstration program, is currently the most promising in terms of reducing the environmental footprint of aviation. The Open Fan aims to reduce fuel burn and CO2 emissions by 20% — and up to 80% when combined with SAFs or sustainable aviation fuels — for the next generation of single-aisle commercial jets by 2035.

Marie-José Martinez, Wind Tunnels Director for ONERA, commented: "As scientific experts in aerospace, ONERA is a key player in efforts to reduce the environmental footprint of aviation. The partnership we've set up with Safran reflects our shared drive to support the development of cleaner, greener aircraft. ONERA is proud to be making available our exceptional facilities, funded by the French government, and our world-renowned engineers and technicians."

Pierre Cottenceau, VP Engineering and R&T for Safran Aircraft Engines, said: "This series of wind

tunnel tests is a major milestone in our Research & Technology roadmap, which aims to develop the technological building blocks for the next breed of commercial jet engines. With the RISE program, Safran Aircraft Engines is contributing our long-standing expertise to the development of the fan module to demonstrate the benefits of an unshrouded engine architecture on the ground and in flight by mid-decade.”

To support the process of bringing the Open Fan’s aerodynamics and acoustics to maturity, Safran Aircraft Engines and ONERA recently signed a framework agreement for an ambitious test plan from 2024 to 2028, building on previous trials with the ECOENGINE.

Tests on the ECOENGINE backed by the French Civil Aviation Authority (DGAC) as part of the CORAC plan aim to demonstrate the aerodynamic and acoustic performance of the fan module by simulating real-world airspeeds in a wind tunnel and validate the design of the fan blades. The blades play a key role in the engine’s overall efficiency. In total, over 200 hours of testing will be performed during this campaign, followed by simulation tests with the engine mounted on a demonstrator plane wing section. For these tests, Safran Aircraft Engines benefits from the knowledge and expertise of the ONERA teams and use of the world’s largest sonic wind tunnel. The S1MA tunnel is a unique test facility in terms of size — 8 meters across or over 26 ft — and airflow speed, making it possible to test engines in isolation or mounted on a wing structure. It therefore plays a crucial role in the development of new propulsion systems for the next generation of planes.

The company is coordinating demonstration of the Clean Aviation OFELIA project, which involves 26 European partners, including ONERA. Safran is also working on a number of other major technological building blocks in conjunction with the Open Fan architecture, such as hybrid propulsion.

A wide-ranging test program is being rolled out across Safran sites to further the maturity of these technologies, which are key to helping air transport achieve carbon neutrality by 2050. For example, our Villaroche center in France has already completed ingestion tests on Open Fan blades and is currently building a new test stand facility. Operational in 2025, it will boast an 8-meter-wide (26 ft) chamber and will be used to carry out development and certification tests for the RISE program.

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