First Press Release

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pAIramid: A new era for composite aerostructures certification takes flight

*Officially launched on 1st December 2024, the **pAIramid project** aims to transform the aerospace industry with its **revolutionary approach to composite aerostructures certification**. Supported by nearly €5 million from the European Union's Horizon Europe programme (HORIZON-CL5-2024-D5-01) under Grant Agreement No. 101192736, this 45-month initiative leverages artificial intelligence (AI) **to streamline aerostructure design, development, and certification**, replacing costly and time-consuming physical tests with a groundbreaking digital framework of high-fidelity virtual testing tools.*

Breaking barriers in aerostructure certification

The project, titled "*AI-based testing pyramid towards virtual certification of next-gen composite aerostructures*", aims to replace the current sequential and labour-intensive aircraft certification pyramid with a digital, interconnected approach. By employing AI and data-driven simulations, pAIramid enables **faster decision-making, reduced physical testing, and optimised resource use** while maintaining stringent safety and performance standards. The project will test its methodologies through **four industrial use cases**, each addressing critical components of modern aerostructures. These include a vertical stabiliser box fairing and an aircraft door structure, as well as two versions of a wing leading edge, manufactured using advanced thermoplastic and thermoset composites. These demonstrators will showcase the versatility and effectiveness of the virtual testing framework in real-world applications, paving the way for faster market deployment. These demonstrators not only provide proof of concept but also aim to advance technologies in functionalised materials and sustainable manufacturing processes. By the project's end, these components will achieve Technology Readiness Level (TRL) 4, marking significant progress toward their potential deployment in future aircraft.

A collaborative effort across Europe

Led by IKERLAN S. COOP (Spain), pAIramid brings together a diverse consortium of **13 partners** from seven countries. This multidisciplinary team includes research institutions, industrial manufacturers, and experts in materials, processes, and AI-driven tools, collectively addressing the complexities of modern aerospace challenges. The consortium includes **experts in composite materials and manufacturing processes** – Institut de Recherche Technologique Jules Verne (France), Instituto de Ciência e Inovação em Engenharia Mecânica e Engenharia Industrial (Portugal), Fundación GAIKER (Spain), MECA S.A.R.L. (France), and Universitat de Girona (Spain), **specialists in digital tools and integration** – Brunel University London (United Kingdom) and LKS S. Coop (Spain), **and aerostructure manufacturers** – Turkish Aerospace (Turkey), POTEZ Aéronautique (France), Koninklijke Fabriek Inventum B.V. (Netherlands), and SOFITEC Aero S.L. (Spain). Finally, Zabala Innovation Brussels (Belgium) leads the **dissemination, communication, and exploitation** activities, ensuring the project's outreach and impact across key stakeholders.

A transformative vision for the aerospace industry

pAIramid aims to accelerate the development and deployment of lightweight, sustainable aerostructures by making the certification process more efficient and reliable. The tools and methods developed in this project will not only reduce costs and timelines but also enable the adoption of advanced materials and processes, setting a new standard for the industry. By addressing the growing need for sustainable and efficient solutions in aviation, pAIramid **aligns with Europe's goals for climate-neutral aviation by 2050**. With its innovative approach and strong consortium, the project is poised to make a **lasting impact on the aerospace industry and beyond**.

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Website and social media

Website		
https://pairamid.eu		
LinkedIn	**Twitter**	**YouTube**
@pAIramid_EU	@pAIramid_EU	@pAIramid_EU

Contacts

Project Mailbox	info@pairamid.eu
Project Coordination	**pAIramid Coordinator** Julen Manterola jmanterola@ikerlan.es
Media Contact	**pAIramid Communication Manager** Edoardo Genova egenova@zabala.eu
	pAIramid Communication Support Andreas Villarreal avillareal@zabala.eu

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