SpaceLAB aims to develop test systems for the aerospace sector in highly critical areas for the qualification, acceptance of flight components and subsystems, with the goal of improving performance, reducing the number of tests to be conducted, and minimizing in-service failures. It also promotes the relationship between space and the green economy. Specifically, the two main areas of interest are Pyroshock tests and vacuum Outgassing tests.

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THE SPACELAB PROJECT IS REALIZED THANKS TO EUROPEAN FUNDS FROM THE EMILIA-ROMAGNA REGION.

SpaceLAB

Design, Implementation, and Validation of Test Systems for Strategic and Advanced Environmental Testing in the Aerospace Sector.

Activity Plan

The SpaceLAB project has two primary focuses: the development of a test bench for Pyroshock and the development of a test bench for Outgassing.

Goals

SpaceLAB aims to conduct tests and simulations to predict and enhance the behavior of satellites and onboard instruments to be sent into space, drastically reducing in-service incidents and failures. Improving the efficiency of onboard instrumentation is an objective that impacts daily life, considering the activities that satellites perform daily on Earth's status, such as monitoring pollution, traffic, mobility, public health, etc.

Results

- Design and build a test bench for Pyroshock tests
- Develop and integrate shock test design and optimization techniques into a single software
- Define a new CAx methodology to guide design activities to predict how to modify the design and structure to withstand the required shock during testing
- Design and develop the Outgassing test system, implementing the gas emission measurement system under vacuum conditions with TQCM sensors

Pyroshock TESTS

Developed from modeling the main dynamics of the test to enable the simulation of various experimental setup configurations in a short time, followed by the development of a predictive Pyroshock model, which is essential for equipment design and experimental validation.
The project then involves developing a calculation model to predict test results.

Outgassing TESTS

The development of this test bench is based on using DTM test equipment to simulate conditions similar to those in the space vacuum. An upgrade to the equipment will be designed, which will include the installation of a TQCM system and the necessary acquisition and cooling systems to conduct the test.