Development of innovative methodologies for the numerical treatment of CFRP components

Summary

Profile type	Company's country	POD reference
Technology offer	**Italy**	**TOIT20240509006**
Profile status	**Type of partnership**	**Targeted countries**
PUBLISHED	**Research and development cooperation agreement** **Commercial agreement with technical assistance**	**• World**
Contact Person	**Term of validity**	**Last update**
Johannes BÖHMER	**13 May 2024** **13 May 2025**	**13 May 2024**

General Information

Short summary

An Italian SME has developed an innovative methodologies to develop mechanical components and systems with new materials. The methodologies involve new production processes and new technologies for high-tech fields and space-applications even with Artificial Intelligence support. The SME is already working on both launchers and satellites market. The partner sought for are public and/or private entities. The SME is looking for commercial collaboration to develop new families of components.

Full description

The Italian SME's skills have been acquired over the last 30+ years activities in supporting the development of products/systems in different application fields having high technological content environments as a common basis.
The SME experiences and internal research and development activities are permitted the development of innovative methodologies for the mechanical components and systems manufacture using innovative materials, new production processes and new technologies for high-tech fields and applications as well as in the field of Artificial Intelligence.
Actual application fields is the space field: both launchers and satellites and implies the deep knolede and application of integrate production systems involving several disciplines.
Infact, the SME has developed innovative methodologies for the numerical treatment of CFRP components and thermal blankets in the explicit domain (high and low speed transients).
Vibrational, thermal, thermo mechanical, fluid dynamic, non-linear calculations.

These simulation activities are coupled with Additive Manufacturing tecnologies for the optimization of the design and redesign of 3D-printed components manufacturing in both metallic and polymeric materials (even for metal replacement). The SME is particularly skilled in the redesign and structural optimisation of complex mechanical and thermal systems for space applications.
These competences are supported by artificial intelligence and surrogate models to drive the topological optimization of space components towards new shapes (less expensive, more performing, more reliable).
As a references the SME is currently working on several main Space Programme, such us: Vega, Vega-C, Vega-E, Space Rider, MPGE engine, Flight Demonstrator, Italian Satellite Constellation IRIDE, Orbital Propulsion Module OPM projects/products.

Advantages and innovations

The main advance of the Italian SME technology offer is the capability to integrate simulation , optimisation services with 3D-printing manufacturing capabilities and validation on prototypes manufactured on customer design. The use of AI and additive manufacturing technologies permit a very rapid and definitive results in prototypes manufacturing

Technical specification or expertise sought

Stage of development

Available for demonstration

Sustainable Development goals

- **Goal 7: Affordable and Clean Energy**
- **Goal 9: Industry, Innovation and Infrastructure**

IPR Status

Secret know-how

IPR Notes

Partner Sought

Expected role of the partner

The partners sought for are:
- public and/or private entities interested in Research activities and large space companies or R&D centres for partnering in research projects

Type of partnership

Research and development cooperation agreement

Commercial agreement with technical assistance

Type and size of the partner

- **Big company**
- **R&D Institution**
- **University**

Dissemination

Technology keywords

- **02011004 - Satellite Navigation Systems**
- **02011005 - Space Exploration and Technology**
- **02007005 - Composite materials**
- **02001 - Design and Modelling / Prototypes**
- **02011006 - Propulsion**

Market keywords

- **02007011 - Manufacturing/industrial software**
- **02007016 - Artificial intelligence related software**
- **02007007 - Applications software**
- **08006001 - Process control and logistics**
- **02007015 - Integrated software**

Targeted countries

- **World**

Sector groups involved

- **Aerospace and Defence**