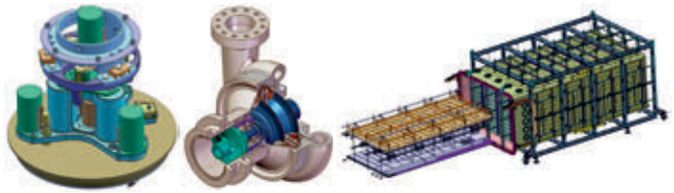
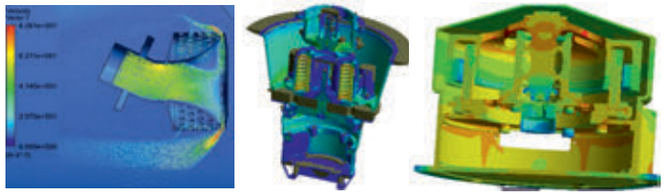
COMOTI's Capabilities for Space Market

Design and 3D Modeling



CFD, Stress and thermal analyses



MAIT facilities

- Test benches for pumps, e-pumps, turbopumps and cryogenic tanks components (AVD and diffusers)
- Testing facilities for thrusters:
  - ➔ Electric thruster;
  - ➔ Green and storable gas thrusters;
  - ➔ Pulse and Rotating Detonation Thrusters;
- Clean room facilities (ISO 8 60 sqm, ISO 7 40 sqm);
- Shock response spectrum facility
- 2kN shaker;
- Laboratory for materials characterization

Manufacturing (CNC Machining, ALM-SLM, Composite Autoclave)

COMOTI in Space - Topics of interest -

Spacecrafts and Satellites equipment

- Mechanisms;
- Pumps for MPFL Systems;
- Sample containers;
- Satellite structures/components (design and manufacture metallic/composite parts);
- Mechanical Ground Support Equipment (MGSE);
- Space components developed through additive manufacturing (SLM).

Propulsion

- Green propulsion;
- Storable gas propulsion;
- Electric propulsion;
- Pulse and Rotating Detonation Propulsion systems;
- Equipment and components: turbopumps, pumps.

Launchers

- Flanges, interstages;
- Separations systems;
- Mechanisms;
- E-Pumps, Turbopumps;
- Propulsion systems for launchers;
- Cryogenic tanks AVD (antivortex devices) and diffusers.

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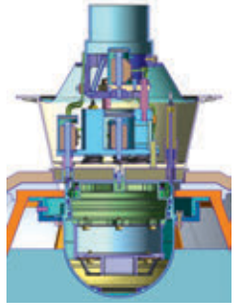
COMOTI IN SPACE

Space Equipment

Closing and Sealing System for Sample Return Missions

ESA Program: MREP-2 (Mars Robotic Exploration Programme 2)

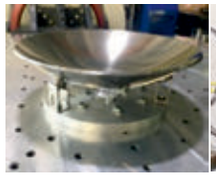


HDRMs for Robotic Arms

ESA/NASA Program: Mars Sample Return Mission.
Contractor: Leonardo.

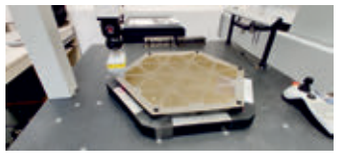
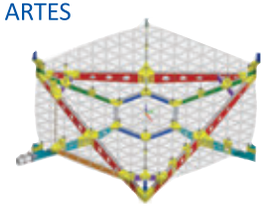
High Geometrical Accuracy and Low Mass Metallic Antenna Reflector

ROSA (Romanian Space Agency) Program: STAR



CFRP Structure for Metallic Mesh Antenna

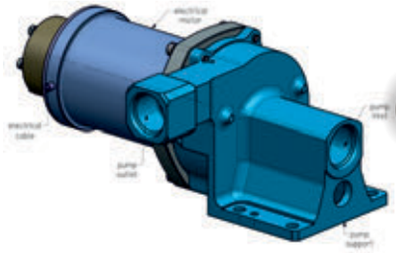
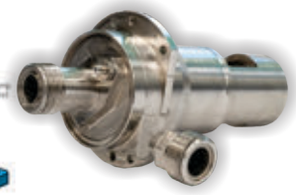
ESA Program: ARTES

Space Equipment and MGSEs

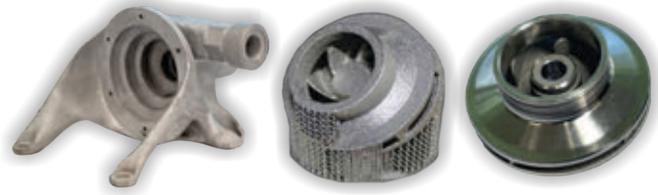
Centrifugal Pumps for Thermal (MPFL) Systems

Program: ESA's Romanian Incentive Scheme and GSTP

Additive Manufacturing Expertise

ESA Program: GSTP



Mechanical Ground Support Equipment (MGSE)

Proba 3 mission – entire MGSE family and
ASPIICS Instrument Transport Container.
Contractor: Airbus DS and CSL (Centre Spatial de Liege).

JUICE mission – Wide Range Thermal Test Facility.
Contractor: CSL (Centre Spatial de Liege).

COMOTI designed and manufactured two stainless steel thermal enclosures for JUICE mission testing campaign.

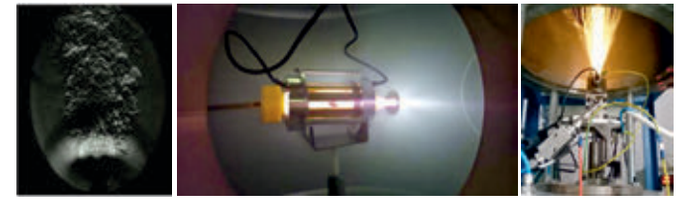
Operational temperature cycles: 80K – 400K;
Pressure:
- Outside: 10-5 mbar;
- Inside: 1 mbar.

Overall dimensions:
- Big box: 4.5m x 2m x 3m;
- Small box: 3.8m x 2m x 1.2m.

Propulsion & Launchers

Electric and Green Propulsion

Program: ESA's Romanian Incentive Scheme and GSTP



Launchers Cryogenic Tank Components and Tools

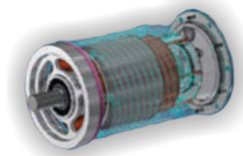
ESA Program: FLPP. Contractor: MT Aerospace.

Anti vortex devices and diffusers for LOX, LH2 and LCH4 Cryogenic Tanks.

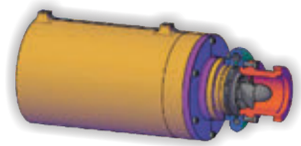
E-pump development for upper-stages LOX/LCH4 rocket engines

ESA Program: GSTP

- high speeds centrifugal electropumps for a 25 kN LOX/CH4 rocket engines for future suborbital flights and micro launcher applications;
- efficient, reliable and lightweight electric pump systems.



Integrated cooling system nto the E-Motor housing



Electropump partial section view

Turbopump Testing Facilities

Centrifugal pump water similitude test bench:
- Max. power on shaft: 600 kW;
- Max. speed on shaft: 25.000 rpm.

Turbine test facility:
- Pressure to turbine inlet: 50 bar to 100 bar;
- Gas flow: 4 kg/s – 6 kg/s.