

Avionics And Launch Opportunities For A European Microlauncher

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Head of EDL & Launchers, GMV

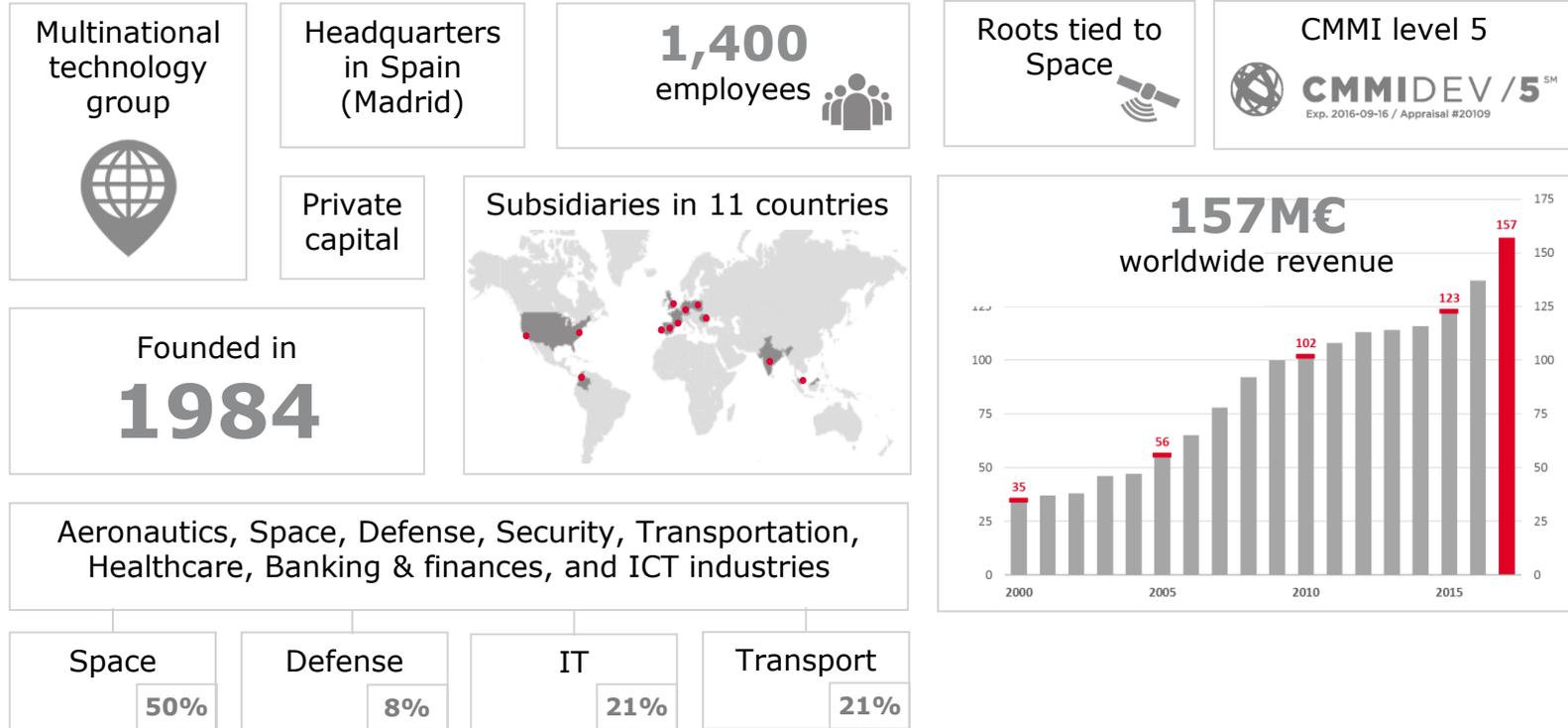
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A GLOBAL TECHNOLOGY GROUP



WHAT WE HAVE DONE FOR LAUNCHERS

GMV activities for European launchers have covered several domains:

- Trajectory Optimization
- Post Flight Analysis
- Missionization Architecture and Tool
- **Expertise in Avionics System Design, Assembly Integration and Validation**
- Advanced Hybrid Navigation
- **Onboard SW and GNC Algorithms Design Verification and Validation**
- **Avionics TestBench for GNC and OBSW V&V**
- Independent SW Validation
- Ground Segment Facilities



PLDSPACE™



“The European Microlauncher Company”

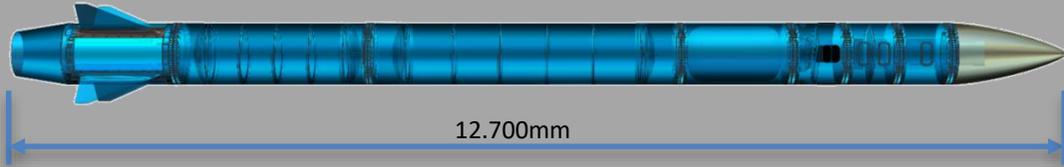
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PLDSPACE™



PLD SPACE: Launchers Models Definition

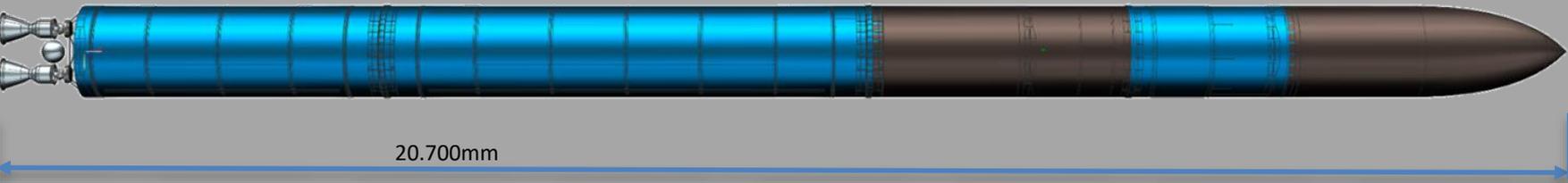


12.700mm

ARION 1



ARION 2



20.700mm

ARION1

Main characteristics

- 1 stage, 1 engine KeroLOX, pressure fed (30kN)
- 12 m height, 0.7m diameter
- Payload: 100kg (nominal) (up to 200kg)
- Max apogee: 150km
- Mission duration: 600s
- 5 minutes of microgravity exposure, 10e-3 baseline
- Recoverable and reusable
- Maiden flight: Q1 2019 from Spain
- 8 payloads in the testflight missions, free.
- **Now offering 3 payloads (free) for the Maiden flight.**



El Arenosillo Launch Base



ARION2

Main characteristics

- 3 stages, engine KeroLOX (280-30-6 kN), turbopump and pressure fed
- 20 m height, 1.2m diameter
- Payload: 150kg in LEO orbit 500km
- 1st stage Recoverable and reusable
- Maiden flight: Q1 2021 from Spain



PLD Space.

The European
Microlauncher Company.

ARION 2 , THE COMMERCIAL EUROPEAN MICROLAUNCHER



BOOSTING CONSTELLATIONS

ARION 2 is commercially focused on the small satellites constellations market

150 kg to LEO (500 km)



DEDICATED

- Micro satellite rapid constellation replacement



FOCUSED ON SMALL SATELLITES

Small satellite launcher for worldwide customers.

Polar orbits



RIDESHARE

- Dozens of commercial configurations to ensure a safe ride.



RAPID DELIVERY TO SPACE

Launching small satellites in less than 12 months.

Accessible via reusability of First Stage.

70% technology will be flight proven



RIDESHARE MICRO

- Picosatellite launch service for constellation delivery.



Main Facts

2011

PLD SPACE
FOUNDATION



Feb.
2015

PROPULSION TEST
FACILITIES

100% PLD Space engineering
development.

100% private.
[\(VIDEO\)](#)



Jun. 2015

FIRST SPANISH LIQUID
ROCKET ENGINE

First European KeroLOX engine to be
fully designed and tested.

[\(VIDEO\)](#)



Main Facts

Dec. 2016

HISTORIC GMV SUPPORT

GMV Joins PLD Space Microlauncher development program as Technological Partner and Shareholder.

May 2017

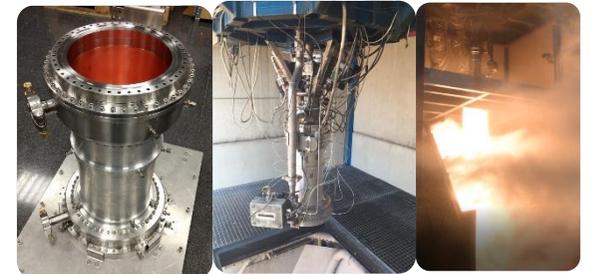
20TH EMPLOYEE

PLD Space has 32 full-time employees + GMV Technical staff.

Jul. 2017

THIRD ENGINE GENERATION DEVELOPED AND TESTED.

Fligh Engine in the final engineering stage. January 2018 expected manufacturing.



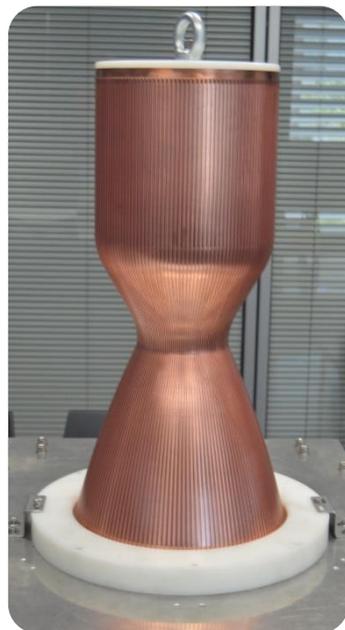
OUR EXPERTISE

GROUND-UP BUILT

Main Facts

TODAY

PLD Space engineering team.
WE DESIGN, WE CALCULATE, WE MANAGE PRODUCTION, WE INTEGRATE, WE TEST.



RECEPTION



ASSEMBLY



TESTING



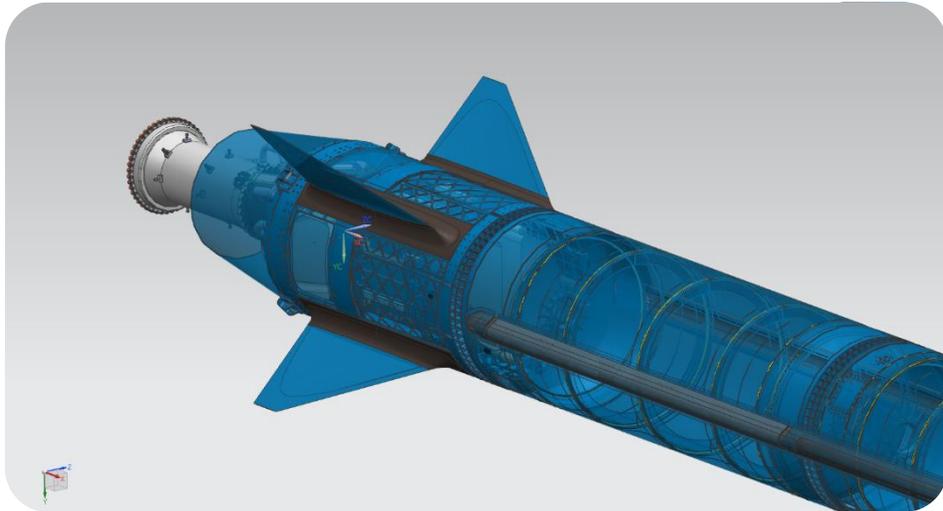
OUR EXPERTISE

GROUND-UP BUILT

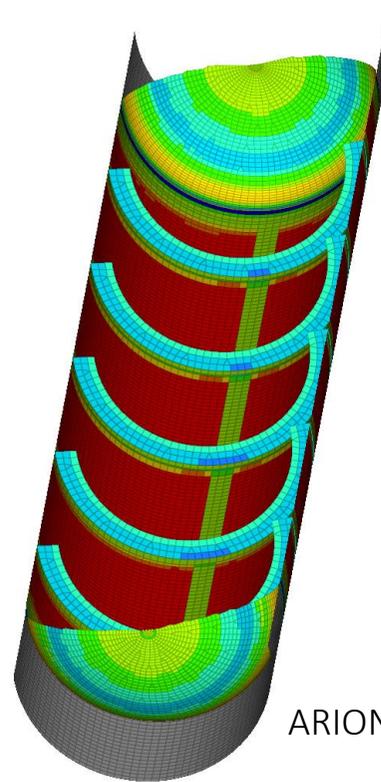
Main Facts

TODAY

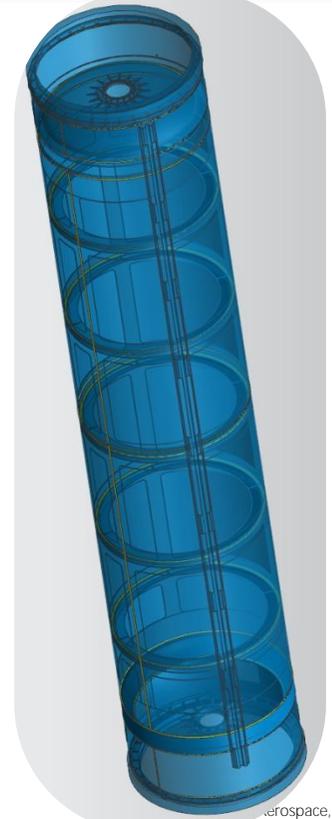
STRUCTURES. Design



ARION 1 rear section



ARION 1 LOX Tank



TODAY

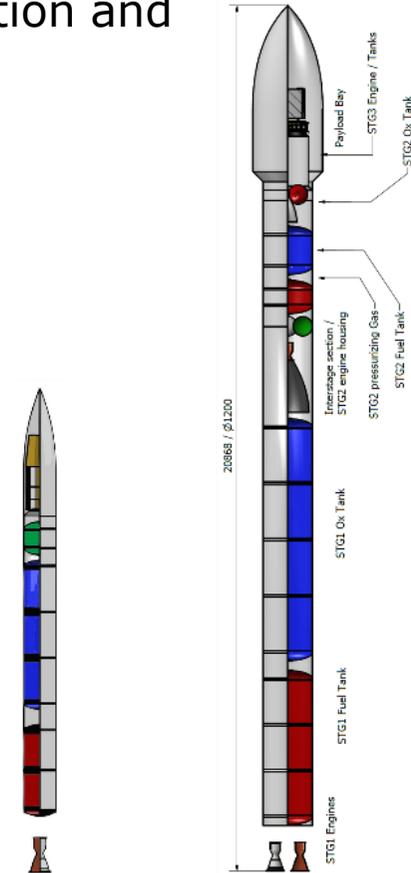
2+1 LOCATIONS

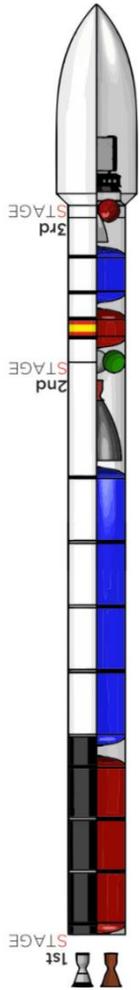


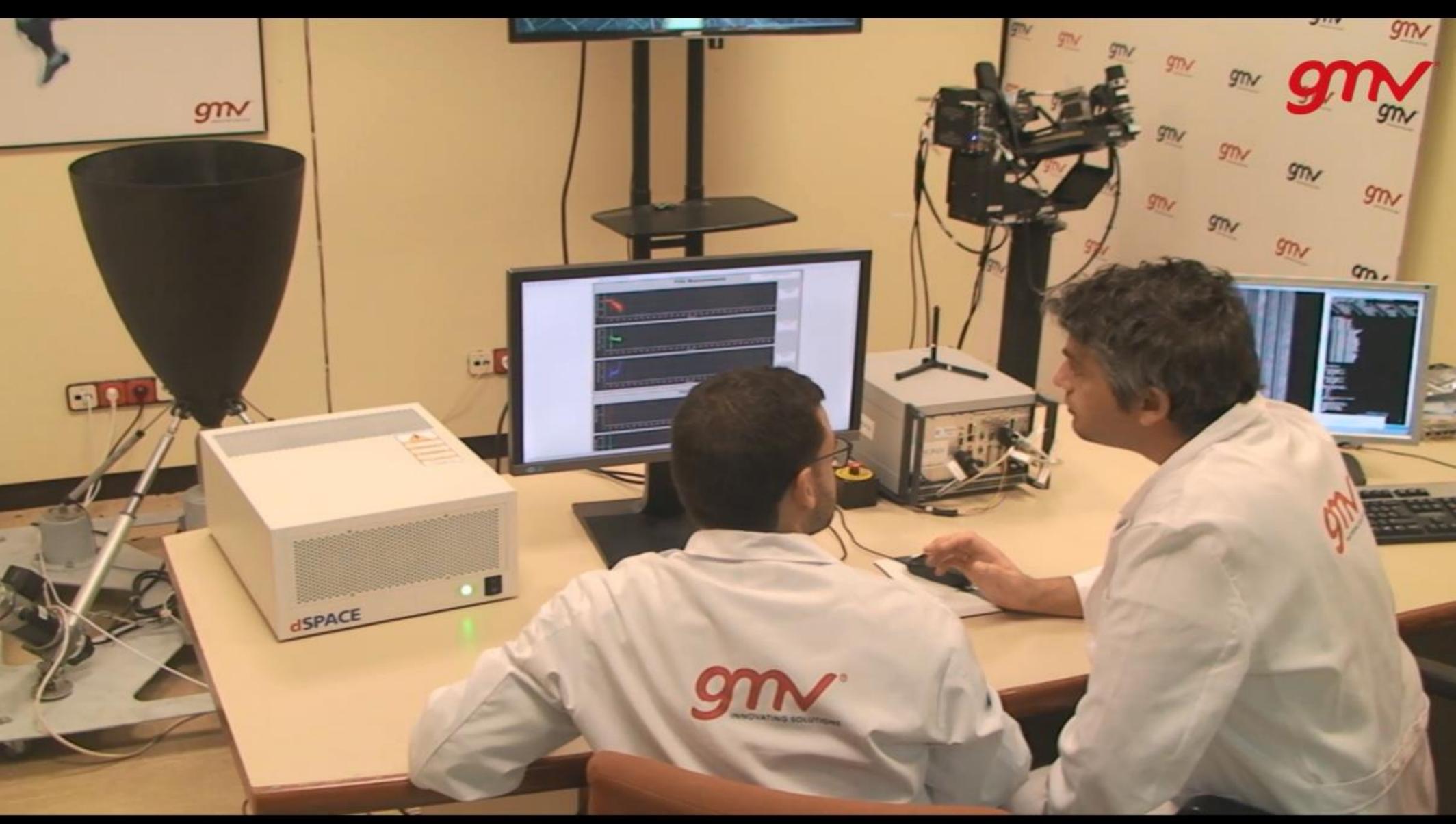
WHAT WE DO FOR PLD LAUNCHERS

GMV has taken the responsibility for the overall AVIONICS desing integration and Validation. This includes:

- The overall OBSW (including GNC, TLM and Monitoring and Commanding functions)
- Navigation Sensors including GNSS aided Inertial Navigation System (INS)
- On-board Computer (OBC)
- Communication buses
- Power Storage, Distribution and Conditioning
- Communication systems including TLM antennas, TLM transmitter and TLM encoder
- On-board Controlled Recovery System
- Payload Management System and Services
- On-board Flight Termination System
- Harness







AIV Full Closed Loop Test

