



Capability Statement

Rocket propulsion
Design, integration & test
United Kingdom

Atlas Propulsion is a UK engineering start-up focused on practical rocket propulsion development. Our six-person team brings together aerospace graduates with postgraduate expertise and practical experience in aerospace equipment maintenance. We have taken liquid rocket engines from concept to hot fire, combining analytical modelling with mechanical design, manufacturing coordination, hardware integration and testing.

Selected Project Experience

Founding-team projects delivered through student rocketry and academic work.

Noble 1 | Ablatively cooled bipropellant engine

Concept to hot fire: approx. 6 months

Designed, manufactured, assembled and tested a 2 kN-class nitrous-oxide/alcohol engine. Work covered injector and nozzle sizing, ablative thermal analysis, structural assessment, sealing, cold-flow characterisation and hot-fire data reduction. Achieved design thrust and the Race2Space *Best Newcomer* award.

Noble 3 | Additively manufactured cooled engine

Concept to hot fire: approx. 7 months

Developed a CuCrZr chamber with integral cooling channels and demonstrated deep throttling during hot-fire testing: approximately 1.8 kN peak thrust and over 50 seconds of cumulative firing. Delivered cooling and injector design, thermal/fluid modelling, structural FEA, manufacturing coordination and test integration. Analytical water-cooling predictions closely agreed with temperatures and pressure losses measured during testing; a propellant-regenerative configuration was also designed.

Further Propulsion & Analysis Experience

Hardware, modelling & validation

Completed and commissioned a remotely operated dual-branch cold-flow rig, including wet testing, transient fluid modelling, instrumentation, control/DAQ, P&IDs and operating procedures. Additional projects include nitrogen cold-gas thruster design and development, CFD and advanced re-entry thermal analyses. Team-developed computational tools cover cooling-channel pressure losses, injector sizing and two-phase propellant flow.

Contribution to the ESA Heat-Exchanger Activity

Working alongside Astrostructures' heat-exchanger and thermal leadership, we can take responsibility for defined propulsion work packages:

- **Engine development:** requirements and trade studies, engine/injector sizing, chamber and nozzle design, CAD, drawings, sealing and design for manufacture.
- **Propulsion integration & analysis:** engine/cooling-system interfaces, feed-system and pressure-loss modelling, supporting CFD, thermal and structural analyses.
- **Manufacture & test coordination:** supplier liaison, assembly and inspection planning, instrumentation, test procedures, facility coordination and test-data evaluation.

We can deliver documented models, manufacturing drawings and test plans through agreed design reviews, with traceable assumptions and results. Our experience designing fluid systems and validating analytical models against test data supports iterative development from initial concept through to demonstrated hardware.

Resources & Delivery

Confirmed access to workshop, additive-manufacturing and metrology facilities complements our own polymer prototyping capability. Existing relationships with Race2Space, ProtoLaunch and Airborne Engineering support access to specialist expertise and potential testing services. Commercial software procurement will be included in project mobilisation and budget planning.