

Kingston University Higher Education Corporate; Low cost ceramic ablative nozzle for Access to Space applications

Project Summary

Kingston University is developing a series of low cost, small bipropellant rocket engines as research tools for a future small satellite launch vehicle. These are currently designed to operate uncooled for short durations only, using the low cost materials graphite, steel and copper.

The project proposes to investigate whether the graphite throat and combustion chamber can be inexpensively coated to resist oxidation and degradation during high temperature operation, extending the operating duration and enhancing the utility of the engines while maintaining their low cost. Archer Technicoat Ltd has partnered with Kingston to share its understanding of chemical vapour deposition of an oxidation / ablation proof coatings onto small nozzles. ATL has previous experience doing this for another customer and is able to deliver coated nozzles at a very low cost.

The project will provide a number of nozzle substrates for coating, which will then be returned to Kingston for hot fire tests in its chemical propulsion laboratory. Nozzles will be examined to assess coating robustness and oxidation resistance and a roadmap to scale up and improve the coating for large nozzles will be produced as a deliverable for the project.

A successful completion of this project will enhance UK space industry knowledge of low cost space propulsion, supporting the 'Access to Space' element of the National Space Technology Strategy.

