

Green Rocket Engine Test Site for High Performance Green Propulsion

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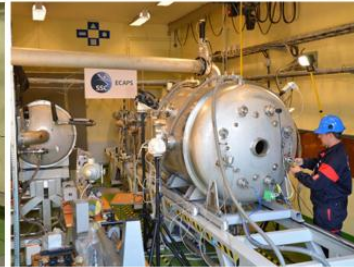
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The HPGP propulsion technology includes storable monopropellant blends based on Ammonium DiNitramide (ADN) and thrusters with a high temperature resistant thrust chamber and catalyst. After more than 2 years in space on the PRISMA mission, all planned firings with the High Performance Green Propulsion (HPGP) system using 1 N HPGP thrusters and the storable liquid monopropellant LMP-103S, have successfully been completed and all test objectives have been met. In order to support the development efforts, the test stands (TS) designated TS-1 and TS-2, have been established for hot-firing under vacuum conditions. ECAPS' hot-firing test facility is conceived as a "Green Rocket Engine Test Site" with minimal impact on the environment and greatly simplified operations - as SCAPE suits are not required for fueling or any other operations. The capacity of TS-1 is continuous firing of 1 N thrusters and the test stand is also used for the acceptance testing of the ECAPS 1 N HPGP Thrusters in production. The capacity of TS-2 is continuous firing of thrusters up to 22 N for 1 hour, and for pulse mode operation a 200 N thruster has successfully been tested. The test stand can be further upgraded for future testing of thrusters up to 500 N (100 lbf) at continuous firings (estimated to be up to 15 minutes at near vacuum conditions). The test facility and the aspects of operation will be presented in the paper.

ECAPS Hot Firing Test Facility *Thruster Development & Acceptance Firing*



Test Stand 1 (0.2 – 5 N)
2 Stage Roots Blower/Pump



Test Stand 2 (5 – 220 N)
2 Stage Air Ejector Pump

Test Stand 2 – Upgrade (for future development)

Test Stand 2 (500 N)
3 Stage Air Ejector Pump
Test duration @ 500 N up to 15 minutes

