

HYBRID ROCKET ENGINE





PRODUCT DESCRIPTION

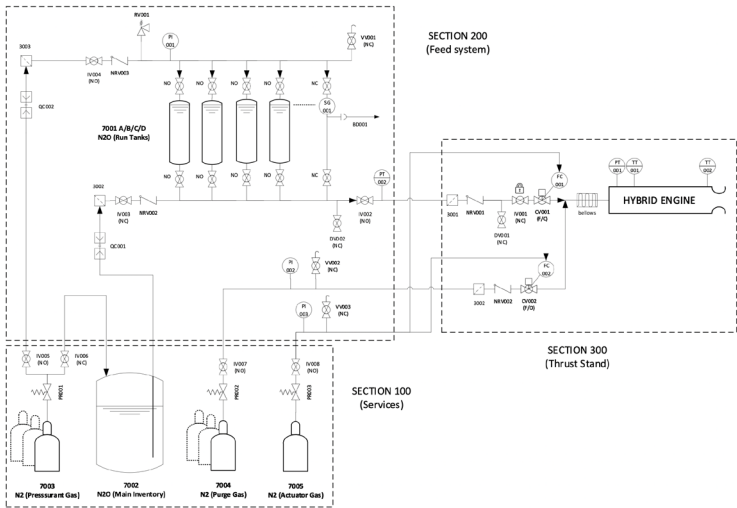
Hybrid rockets avoid some of the disadvantages of solid rockets like the dangers of propellant handling, while also avoiding some disadvantages of liquid rockets like their mechanical complexity. The Pulsar Fusion Hybrid rocket engine is operated by a liquid oxidant fed from either self-pressurised or over-pressurised inventory tanks, through a system of tubing and actuators, into a combustion chamber lined with solid propellant, then ignited with a high temperature pilot flame. The firing is remotely managed via a manually operated data acquisition and control system.

TESTING

Pulsar has tested its Hybrid Thruster System on three occasions since its rapid development program at the end of 2021. The first of these was a low-pressure system shakedown test at the MOD COTEC facility in the UK where the team’s ability to manage operations safely during a test campaign were proven alongside the system’s ability to function safely. This was followed by a high-pressure test at Gstaad airport in Switzerland where the system was successfully tested at full thrust and under adverse environmental conditions. A third test campaign was conducted at an independent test facility at RAF Westcott UK to validate performance using high fidelity sensor systems. The thruster system completed all testing with no failures or damage.

APPLICATION

Hybrid rocket propulsion is used in several specific areas of space transportation. Those applications are microsatellites (manoeuvring and orbit transfer), lunar and planetary landers, suborbital and orbital tourism vehicles. The most positive qualities of a hybrid propulsion are simplicity, safety, stop and restart ability, throttling ability. Hybrid propellants are mostly storable and non-toxic. What is more, fuel and oxidiser are separated and stored in different phases, which positively effects on the safety level.



Product Description

Propellant	N2O/HDPE
Thrust	6kN – 12kN
Specific Impulse	180s
Chamber pressure:	35bar
N2O flowrate:	4.61kg/s
Nozzle Dimensions	135mm length x 120mm width
Exhaust Velocity	1780 m/s
Mixture Ratio	13

