bradford ecaps

22N HPGP Thruster



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Bradford ECAPS's **22N HPGP Thruster** is designed for attitude, trajectory and orbit control of larger satellites and for systems such as propulsive payload adaptor rings.

- **Non-toxic propellant** makes for easier and less costly integration on secondary or 'piggy-back' missions.
- Propellant loading is simple, fast and avoids the cost associated with loading hydrazine. Allows the operator to spend less time on ground operations and more time on space operations.
- '**Fuel at the factory**' – be ready for launch vehicle integration upon arrival at the launch pad.
- Non-toxic propellant makes payload adaptor rings suitable for a new class of small satellite launchers, where handling hazardous hydrazine may impede operations or where fully equipped hydrazine processing facilities may be non-existent.
- **Higher performance** over hydrazine allows for more payload or longer mission durations.
- Allows for more secondary or 'piggy-back' launch opportunities, especially missions where there is concern about the hazards of hydrazine and its risks to the primary payload.
- Allows for more capable missions than spacecraft without propulsion.
- Allows for more agile mission profiles than electric propulsion. Spacecraft take significantly less time to execute maneuvers and orbit changes.

The **22N HPGP thruster** is currently undergoing a test fire campaign with the **NASA Goddard Space Flight Center**, characterizing the performance of the thruster. This is intended to prepare the **22N HPGP thruste**r for use on future NASA missions, such as observatory or interplanetary science missions.

Specifications Table

Thruster Type	HPGP
Propellant	LMP-103S
Thrust Class	22 N
Primary Operational Mode	RCS + Δ v
Inlet Pressure Range	5.5 - 24 Bar
Thrust Range	5.5 - 22 N
Nozzle Expansion Ratio	150:1
Steady State ISP (vacuum) Typical	2385 - 2500 Ns/Kg (243 -255 s)
Density Impulse (vacuum)	2957 - 3100 Ns/L
Minimum Impulse Bit	≤0.44 Ns
Overall Length	260 mm

Mass	1.1 kg
FCV Type	Solenoid
- No of Seats	Dual Seat
- Pull-in Voltage	28 ± 4 VDC
- Holding Voltage	10 ± 1 VCD
- Coil Resistance (each coil)	64 Ω
Nominal Reactor Pre-heating Voltage	28 VDC
Regulated Reactor Ore-heating Power	25 - 50 W TBC
Target Life - Qual. Level	
Pulses	50,000
Propellant Throughput	150 kg
Longest Continues Firing	45 minutes
Accumulated Firing Time	7.6 hours
Firing Sequences	350
Demonstrated Life	
Pulses	26,481
Propellant Throughput	53 kg
Longest Continues Firing Time	38 minutes
Accumulated Firing Time	3 hours
Firing Sequences	282
Maturation Level	TRL 5/6
Current Status	
	EQM in Qualification