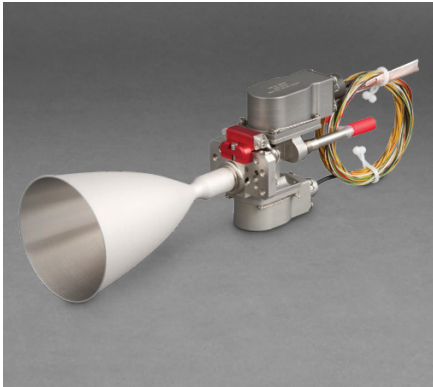
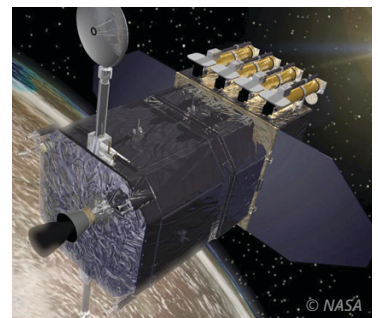
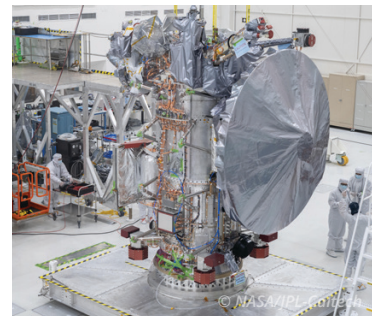
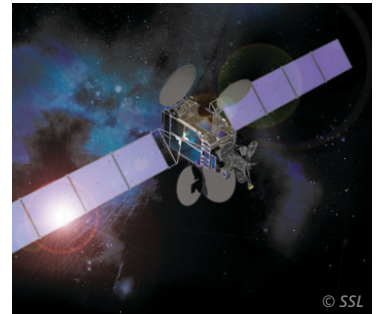


BIPROPELLANT THRUSTERS



Moog is a world leader in bipropellant thruster offerings for commercial, defense, and space exploration missions. Our family of thrusters combines a high performance injector design with high temperature materials in order to provide industry leading performance in both steady-state and pulse mode operation. Our 5 lbf thrusters are designed with a high temperature Platinum/Rhodium chamber. Moog also offers a new 25 lbf thrust class,

which leverages Moog's experience designing high performance bipropellant engines. Moog attitude control system (ACS) engines have been the industry standard with more than 2,000 delivered.



BIPROPELLANT THRUSTERS

PERFORMANCE CHARACTERISTICS



Model Family	DST-11H	DST-12	DST-13/E	5 lbf Columbium
Propellant	Hydrazine/MON	MMH/MON	MMH/MON	MMH/MON
Nominal Steady State Thrust	5 lbf (22N)	5 lbf (22N)	5 lbf (22N) / 6.2 lbf (27.5N)	5 lbf (22N)
Feed Pressure Range	80 – 400 psia (5.5 – 27.6 bar)	60 – 400 psia (4.1 - 27.6 bar)	80 – 400 psia (5.5 - 27.6 bar)	39 – 320 psia (2.8 - 22.1 bar)
Nozzle Expansion	300:1	300:1	300:1	150:1/300:1
Nominal Mixture Ratio	0.85	1.61	1.65/1.62	1.61/1.65
Valve	Solenoid	Latching Torque Motor	Solenoid	Latching Torque Motor or Solenoid
Valve Power	41 watts max (2 coils wired in series)	6 watts max (latch) 7 watts max (primary) 9 watts max (secondary)	41 watts max (2 coils wired in series)	6 watts max (latch) 7 watts max (primary) 9 watts max (secondary) (torque motor) 15.6 watts max (solenoid)
Mass	1.7 lbm (0.77 kg)	1.4 lbm (0.64 kg)	1.5 lbm (0.68 kg)	1.4 – 2.0 lbm (0.64 – 0.91 kg)
Length	10.3 in (262 mm)	9.6 in (244 mm)	10.4 in (264 mm)	9.7 – 13.5 in (248 – 343 mm)
Chamber Material	Platinum/Rhodium Alloy	Platinum/Rhodium Alloy	Platinum/Rhodium Alloy	C-103
Minimum Specific Impulse	307 sec	297 sec	297 sec	284 sec/288 sec
Throughput	2019 lbm	1402 lbm (uncoated) 2342 lbm (coated)	1404 lbm/2169 lbm	1600 lbm
Highlights	DST-11H provides highest performance available in a hydrazine/MON ACS Thruster	DST-12/13 Provides highest performance available in MMH/MON ACS Thruster		Engine has been in production for more than 30 years, with > 2000 delivered and flown

25 lbf MMH
(Monomethylhydrazine)



25 lbf
Hydrazine (N2H4)



Model Family

Propellants (Ox/Fuel)	NTO/MMH	NTO/N2H4
Thrust @ Feed Pressure	25 lbf @ 230 psia	25 lbf @ 250 psia
Specific Impulse	~ 306 sec (nominal)	~ 311 sec (nominal)
Nozzle Area Ratio	300:1	300:1
Mixture Ratio	1.62	0.85
Valve Type	Latch/Thruster Redundant Torque Motor	Latch/Thruster Redundant Torque Motor
Nozzle Material	Pt/Rh (Chamber) Inconel 625 Nozzle	Pt/Rh (Chamber) Inconel 625 Nozzle

MOOG

For More Information:
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Moog Space and Defense



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