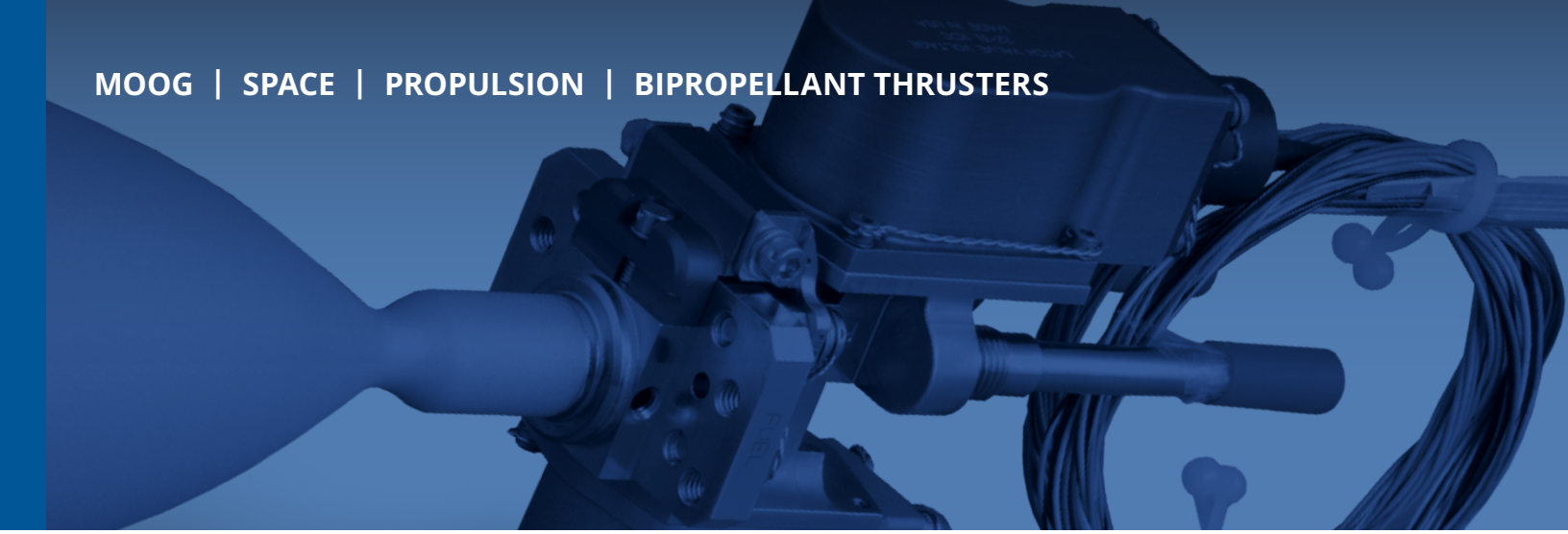
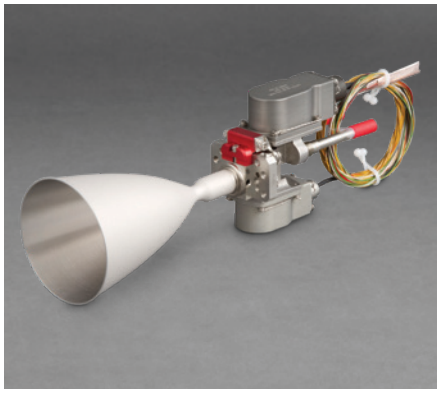
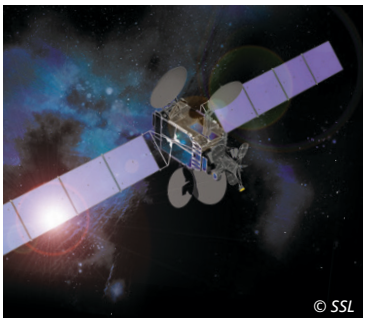
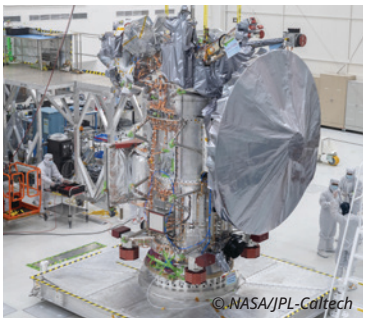


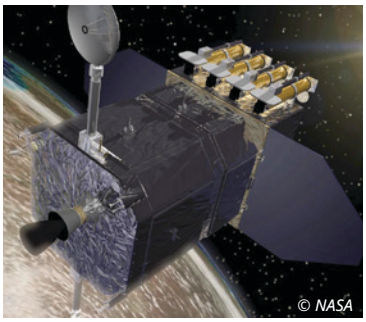
BIPROPELLANT THRUSTERS



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 a high temperature materials in order to provide industry leading performance in both steady-state and pulse mode operation. Our 5 lbf thrusters combines a high performance injector design with a high temperature Platinum/Rhodium chamber to provide industry leading performance. Moog also offers a new 25 lbf thrust class, which leverages Moog's experience designing high performance bipropellant engines. Moog ACS engines have been the industry standard with more than 2,000 delivered.







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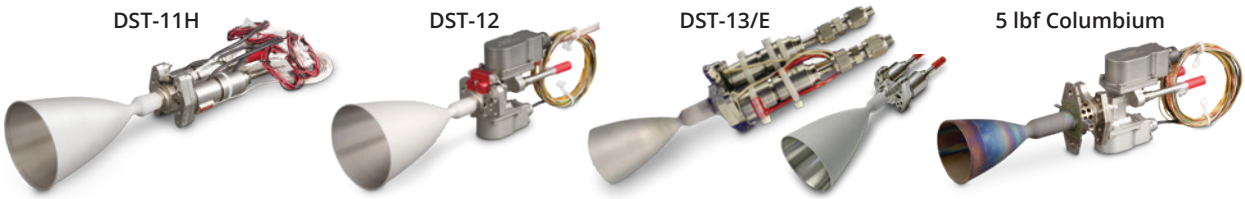
BIPROPELLANT THRUSTERS

PERFORMANCE CHARACTERISTICS

Model Family



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

Model Family

25 lbf MMH (Monomethylhydrazine)

25 lbf Hydrazine (N2H4)

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

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For More Information:
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www.moog.com/space

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