DAWN
AEROSPACE



B20 THRUSTER

The B20 Thruster assembly includes the thruster body, valves, and control electronics. The thruster body is additively manufactured as a single structure using Inconel 718 and includes the injector, combustion chamber, and nozzle. Isolation valves are included upstream of the firing valves for added redundancy. Health monitoring instrumentation includes an integrated and isolated thermocouple and chamber pressure sensor. With standard data and power interfaces, thrusters are easy to command and operate. The B20 is also operable under ambient conditions to enable fast turnaround ground testing.

Green propellants

The B20 utilizes nitrous oxide (N2O) and propene (C3H6), which are safe to handle and widely available, unlike ADN or HAN.

Superior reliability

B20 propellants are self-pressurizing and don't require complex controls or moving parts to maintain performance.

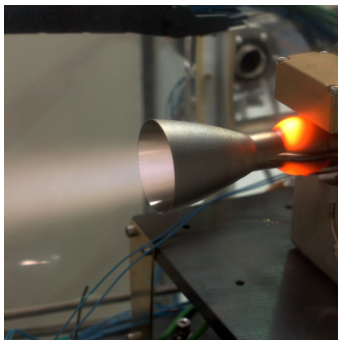
High performance

Delivers 285 s of Isp, similar to bi-propellant hydrazine-based alternatives, but with less mass and smaller volume.

Modular and scalable

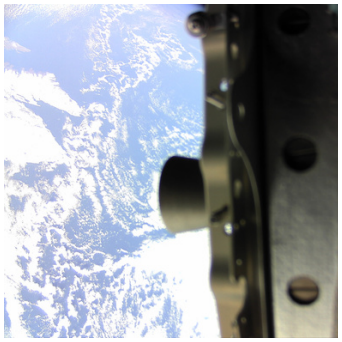
Dawn can provide stand-alone thrusters or a complete propulsion system including tank, feed, and instrumentation & control.

Physical			
Propellants	N_2O and C_3H_6		Domestically available propellants: no lead time
Pressurization	Self-pressurizing		No PMD or complex regulation required
Thruster dimensions	6.58 x 3.15 x 2.68 in	167 x 80 x 68 mm	
Nozzle expansion ratio	100:1		
Dry mass	1.37 lbm	610 g	
Valves	Solenoid Dual-seat (Firing and isolation)		Four valves per thruster
Environmental			
Operational temperature	23°F to 95°F	-5°C to 35°C	
Survival temperature	-22°F to 149°F	-30°C to 65°C	
Regulatory	ITAR free, REACH compliant		
Interfaces			
Data	CAN bus, RS-485 or RS-422		
Fluid connection	1/4 in (Swagelok)		
Valve power	Hit: 12 W for 50 ms Hold: 0.8 W		12 V and 28 V options are available
Ignitor	9 W Max for 50 ms		
Mounting	3x M5 threaded holes		
Performance			
Inlet pressure, range	Ox: 402 to 1044 psia Fu: 72.5 to 213 psia	Ox: 27.7 to 72.0 bar Fu: 5.0 to 14.7 bar	
Flow rate, range	Ox: 0.005 to 0.015 lbm/s Fu: 0.0006 to 0.01 lbm/s	Ox 2.3 to 6.9 g/s Fu 0.26 to 0.88 g/s	
Chamber pressure, range	29 to 72.5 psia	2 to 5 bar	
Thrust, range	1.48 to 4.34 lbf	6.6 to 19.3 N	Throttle enabled through closed-loop control of bulk propellant temperature
Isp, vac	285 s		
Cold-start capable	Yes		Spark-based ignition allows for rapid and highly repeatable (12,000+) cold-starts
Minimum impulse bit (Bi-prop mode)	0.22 lbf.s	1 N.s	
Maximum impulse bit (Bi-prop mode)	28 lbf.s	125 N.s	
Minimum impulse bit (Cold-gas mode)	0.01 lbf.s	0.05 N.s	Cold-gas mode can utilize either N_20 or C_3H_6





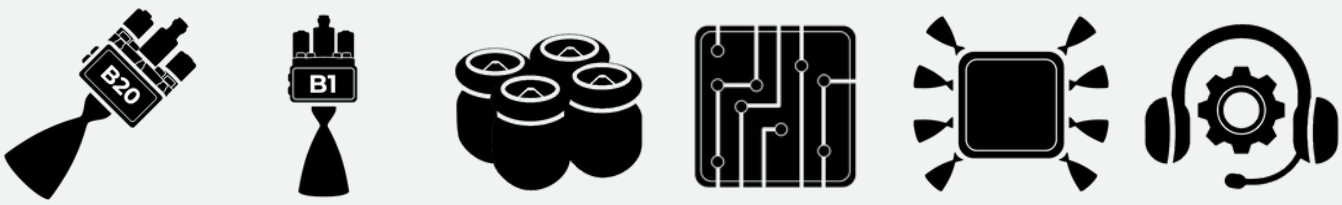




We'll design the exact system you need

using Dawn's off-the-shelf, space-proven components

0.5 to 250+ kN.s



B20 Thruster | **B1 Thruster** | **Tanks & feed systems** | **Control electronics** | **6-axis control capable** | **Launch support services**

Order now

www.dawnaerospace.com/products/satdrive
sales@dawnaerospace.com

Revision E September 2021 Copyright © 2021 Dawn Aerospace
NO RIGHTS MAY BE DERIVED FROM THIS DOCUMENT