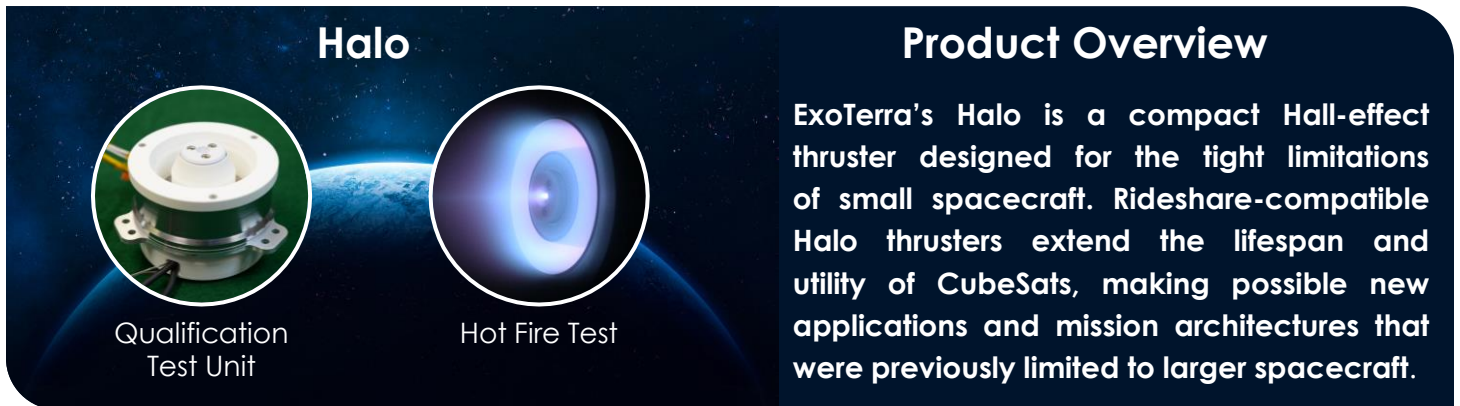


## Halo Hall-Effect Thruster



### Product Overview

ExoTerra's Halo is a compact Hall-effect thruster designed for the tight limitations of small spacecraft. Rideshare-compatible Halo thrusters extend the lifespan and utility of CubeSats, making possible new applications and mission architectures that were previously limited to larger spacecraft.

### Rideshare Orbit Optimization and Deorbit

ExoTerra's revolutionary Halo Hall-Effect Thruster allows CubeSats to escape their rideshare drop-off orbits to reach optimal orbits, maintain them, and deorbit on command. Halo meets the tight mass, volume, and thermal constraints of CubeSats and other rideshare spacecraft, and its high  $I_{sp}$  and total impulse expand the mission potential of CubeSats by enabling them to attain and maintain targeted orbits for the first time. With Halo, CubeSats can perform better science, extend their useful lifetime, operate together in structured constellations, and even conduct low cost lunar and interplanetary missions.

**Mass:** 0.75 kg

**Volume:** 0.25 U

**Input Power Range:** 125-450 W

**$I_{sp}$  Range:** 730-1400 s

**Thrust Range:** 4-30 mN

**Impulse:** Up to 300 kNs

**Flexible Propellants:** Xenon or Krypton

Halo has demonstrated operation at input power levels between 100 and 450 W, making it the perfect choice for satellites from 6U CubeSats to ESPA class microsattellites.

### Big Propulsion for Small Satellites

Hall-effect thrusters provide superior total impulse performance to combustion, electrospray, or pulsed plasma propulsion options for CubeSat and small satellite applications. This enables a broader spectrum of missions and greater satellite lifetime.

Halo's demonstrated thrust range of 4 to 30 mN decreases total transfer time over ion engine alternatives. Total Specific impulse correspondingly ranges from 730s to 1400s, allowing Halo to produce greater  $\Delta V$  from a given propellant volume than other options.

This high thrust and high efficiency fits into a compact space. Halo weighs a mere 0.75 kg and fits within a 76 mm diameter by 50 mm long envelope (excluding mission-unique gas fittings). This is half the mass of competing Hall Thrusters. Adding to operational flexibility, Halo can use Xenon or Krypton as a propellant.

For more information contact:

## About ExoTerra

ExoTerra was founded in 2011 with a vision of reducing the cost of space exploration. We pursue this goal by developing affordable technologies that minimize spacecraft mass and volume while enhancing their performance and offering unique capabilities.

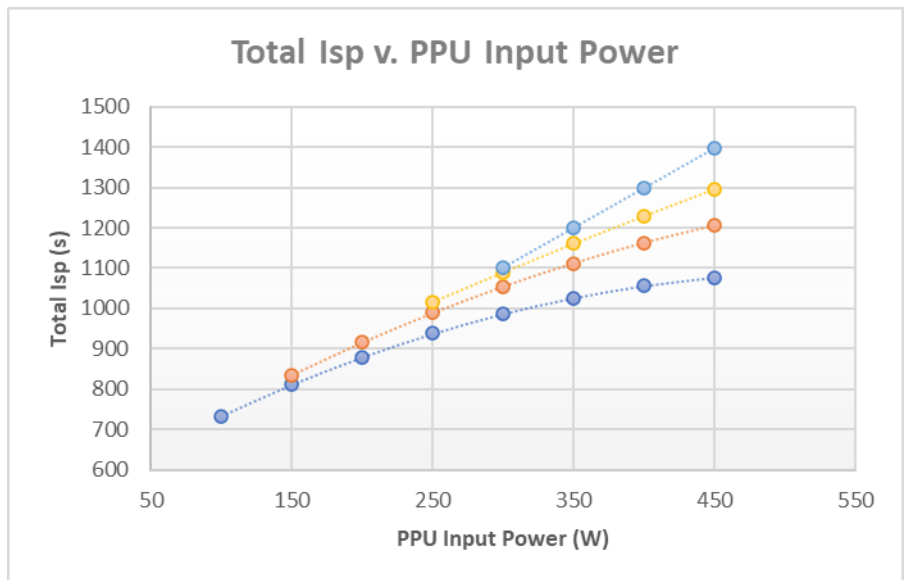
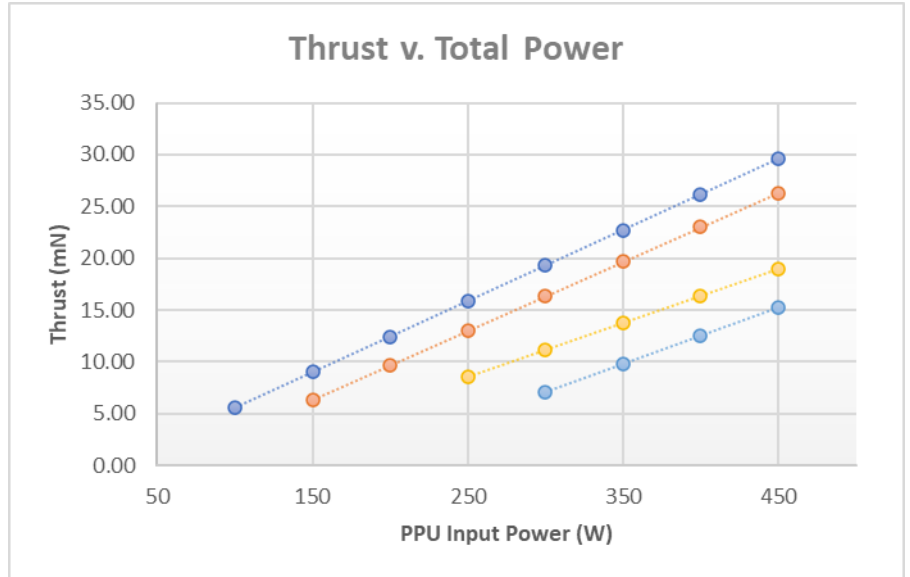
## Halo Development

The Halo Thruster & PPU have completed environmental testing to NASA GEVS load profiles. Life Testing is ongoing with a projected lifetime of 4000 hrs. First flight is scheduled for 1Q22 with follow-on flights in 2Q22 & 3Q22.

## Part of an Integrated Propulsion and Power System

ExoTerra provides a full solar electric propulsion system solution for CubeSats and microsattellites. Built around the Halo thruster, our Courier SEP Module includes a propellant storage and distribution system, power processing unit and distribution, thrust vector controller and high-specific-power fold-out solar arrays. The 12U module comes in full bus or SEP only configurations and reserves 3U & 4 kg for payload accommodation.

## Demonstrated Thrust and Total Specific Impulse



For more information contact: