

Mini space thruster that runs on water

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Credit: URA Thrusters

This tiny fingernail-length space thruster chip runs on the greenest propellant of all: water.

Designed to maneuver the smallest classes of satellite, the operation of this Iridium Catalyzed Electrolysis CubeSat Thruster (ICE-Cube

Thruster) developed with Imperial College in the U.K. is based on electrolysis.

Avoiding any need for bulky gaseous propellant storage, an associated electrolyzer runs a 20-watt current through water to produce hydrogen and oxygen to propel the thruster.

The ICE-Cube Thruster is so small in scale—with its [combustion chamber](#) and [nozzle](#) measuring less than 1mm in length—that it could only be assembled using a MEMS (Micro-Electrical Mechanical Systems) approach, borrowing methods from the microelectronics sector.

A test campaign achieved 1.25 millinewtons of thrust at a specific impulse of 185 seconds on a sustained basis. Testing took place through an ESA General Support Technology Program De-Risk activity, to prove the thruster's feasibility in a laboratory testing.

The [experimental data](#) gathered during this activity will help guide development of a flight-representative "Engineering Model" of the propulsion system, including the electrolyzer. This [development](#) will be led by URA Thrusters in collaboration with Imperial.

Provided by European Space Agency

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