TECHNISCHE UNIVERSITÄT WIEN
Vienna | Austria

TU Wien Space Team
Gusshausstr. 27-29/E376/CA0415
1040 Vienna
Austria
spaceteam.at

GATE One

The deep-throttle, green, and highly cost-effective chemical propulsion system for the New Space Economy

Within less than 100 years, humankind has perfected commercial aviation, transforming a low-volume, high-cost, and high-risk business niche into a safety-driven, multi-trillion dollar industry. The space industry has only been around for about 50 years but might just be on a comparable trajectory.

Taking into consideration the trends towards commercialization, standardization, ridesharing, and space traffic control, in-space mobility solutions are more relevant than ever.

GATE directly addresses this market need with our chemical space propulsion system for satellites in the range of 50 to 500 kg. GATE started off as a project of the TU Wien Space Team and has grown into Gate Space Systems, a spin-off company from TU Wien.

Objective

GATE Space Systems will provide customers with green, plug-and-play chemical propulsion systems which address the New Space Economy trends.

In-space mobility and maneuverability: Generally speaking, most spacecraft benefit from mobility. This need will only increase in the future due to ridesharing, the growing demand for custom orbit deployment, and the need for in-space traffic control and end-of-life management.

Green technologies: Environmental protection extends to space. The use of green, non-toxic propellants comes with a plethora of benefits. Apart from increasing safety for human operators during testing and launch preparations, their impact on the environment is negligible compared to current non-green alternatives such as hydrazine which was added to the ESA's "candidate list of substances of very high concern for authorization".

Commercialization and standardization: During the last few decades, the satellite sector underwent a massive transformation. The development and operation
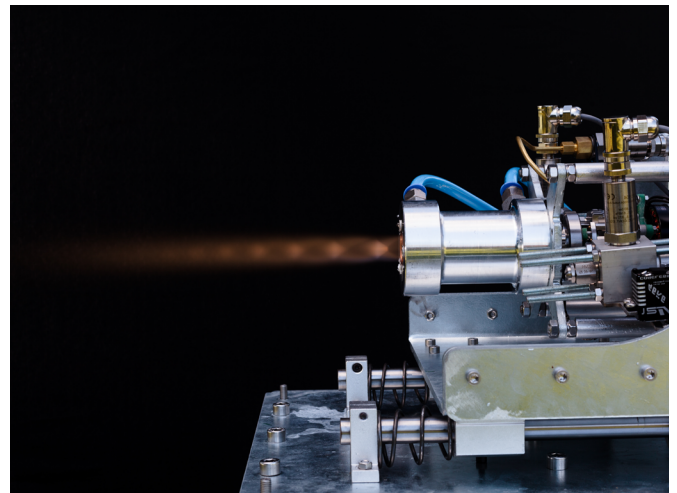
of satellites have shifted from governmental institutions to New Space entrants challenging established legacy players. They are outcompeting their counterparts due to their higher cost-effectiveness and quality, and their significantly faster delivery speed of products and services. The private space sector is on the rise and benefits from the trend towards commercial off-the-shelf components and standardized components in spacecraft.

Approach

GATE Space System's first commercial product is called GATE One – a highly flexible chemical propulsion system based on the non-toxic, self-pressurized propellants ethane and nitrous oxide. GATE One is more cost-effective and more flexible than other propulsion systems on the market. A novel injector, which allows for continuous deep thrust throttling is at the heart of GATE One.

Results

Successful hot-fire tests of the GATE One thruster have already been conducted, demonstrating the capability of stable steady-state combustion, continuous deep throttling as well as spark-based ignition.

Your Advantages

GATE One thrusters are more capable and cost-effective than any other product on the market. They offer great benefits to a wide range of highly-mobile spacecraft such as those needed for in-orbit servicing, space debris removal or landing vehicles.

GATE One is especially attractive for manufacturers and operators of spacecraft who are looking for third-party integrated mobility solutions. It addresses customers who:

- are searching for affordable and cost-effective propulsion systems

- are interested in green, sustainable, and truly non-toxic propulsion systems

- want continuous throttling capability

- need to implement short lead times

- require modularity and customizability

- are in the process of developing space tugs or kickstages

- develop landing vehicles

- plan in-space refueling and maintenance missions

- plan space debris removal or space mining missions

GATE Space gives your space mission a boost!

Notes

Contact

Moritz Novak
GATE Space
Myrthengasse 17/4
1070 Vienna, Austria
www.gate.space
+43 660 3839341
+43 1 58801 166366
moritz.novak@gate.space, rema@tuwien.ac.at