ENPULSION

SPACECRAFT TECHNOLOGY

*At ENPULSION,
NewSpace agility and
Heritage Space experience
are converging to a new
norm of how to build
spacecraft technologies.*

The rapid developments of space infrastructure that we see today are just the beginning of a thriving near-earth economy. At the core of it lies the need for effective in-space mobility. This is what we do at ENPULSION every day, providing dozens of customers with the mobility that they need, when they need it.

But ENPULSION is much more than just a supplier of high-performance propulsion solutions. In the dynamic environment of the space industry, NewSpace agility and Heritage Space experience are converging to a new norm of how we build space-based assets. And ENPULSION is already there. We maintain the highest levels of product reliability, while offering fast, flexible and affordable solutions. We have an agile, inclusive, and fun workplace, while implementing quality standards which are suitable for even the most complex space missions.

I believe that in a time where we are building the infrastructure to connect all global citizens to the world economy, this new approach of manufacturing at ENPULSION — and in the space industry as a whole — will act as an enabler for everyone who thrives to use space in a responsible way for the good of humankind here on earth and beyond.

Alexander Reissner

DR. ALEXANDER REISSNER
FOUNDER & CEO

ENPULSION'S STORY

AIMING FOR THE STARS

Space is big — so big that it is hard to visualize. But we believe that big spaces hold big opportunities. We also believe that we can be a major driver in space flight by making propulsion accessible for virtually everybody. The propulsion solutions we provide are environmentally friendly, sustainable, and scalable. To sum it up, our vision is of a clean and easy–to–reach space environment near Earth and beyond.

The origins of ENPULSION's story are both in its founder's vision of a more affordable space exploration and in the quest to develop a superior propulsion technology. FOTEC, the research arm of the *University Of Applied Sciences* (FH) in Wiener Neustadt, started its research in this area more than 25 years ago in cooperation with the *European Space Agency (ESA)*. The outcome was the development of the *Field Emission Electric Propulsion (FEEP)* technology (see pages 4–5).
In 2016 FOTEC decided to spin off the company *AMR Propulsion Innovations* in order to produce and commercialize the technology for the global market.
The company changed its name to **ENPULSION** in 2017.
In January 2018 the first satellite using the company's thrusters was launched in SSO orbit.
In the same year state-of-the-art laboratories and production facilities were installed with the capacity of more than 20 thrusters per month.

We are looking into the future with a lot of optimism. Our team consists of professionals who believe in what we do, and we are delivering innovative products of superb quality to great customers. We are doing our best to support them at all stages of the integration of our thrusters because our philosophy is simple: our customer's success is also our success!

February 2022

ENPULSION has launched its 100th thruster. More to come...

30.06.2021

ENPULSION broke another record launching 25 thrusters on 11 satellites of 4 commercial customers onboard the Falcon X Transporter-2 rideshare mission *

01.10.2020

ENPULSION MICRO is launched to cover the propulsion needs of heavier satellites

15.08.2020

Reaching a milestone: 50 thrusters in space

11.12.2019

ENPULSION receives ISO 9001:2015 certification

12.01.2018

First satellite with ENPULSION NANO Thruster is launched

09.10.2017

The first ENPULSION NANO Thruster (formerly 'IFM Nano') is delivered to a commercial customer

01.03.2016

ENPULSION was founded (first under the name 'AMR Propulsion Innovations') to commercialize the FEEP technology

13.03.1991

More than 120 Liquid Metal Ion Sources (LMIS) operated in space for a total of more than 20.000 h

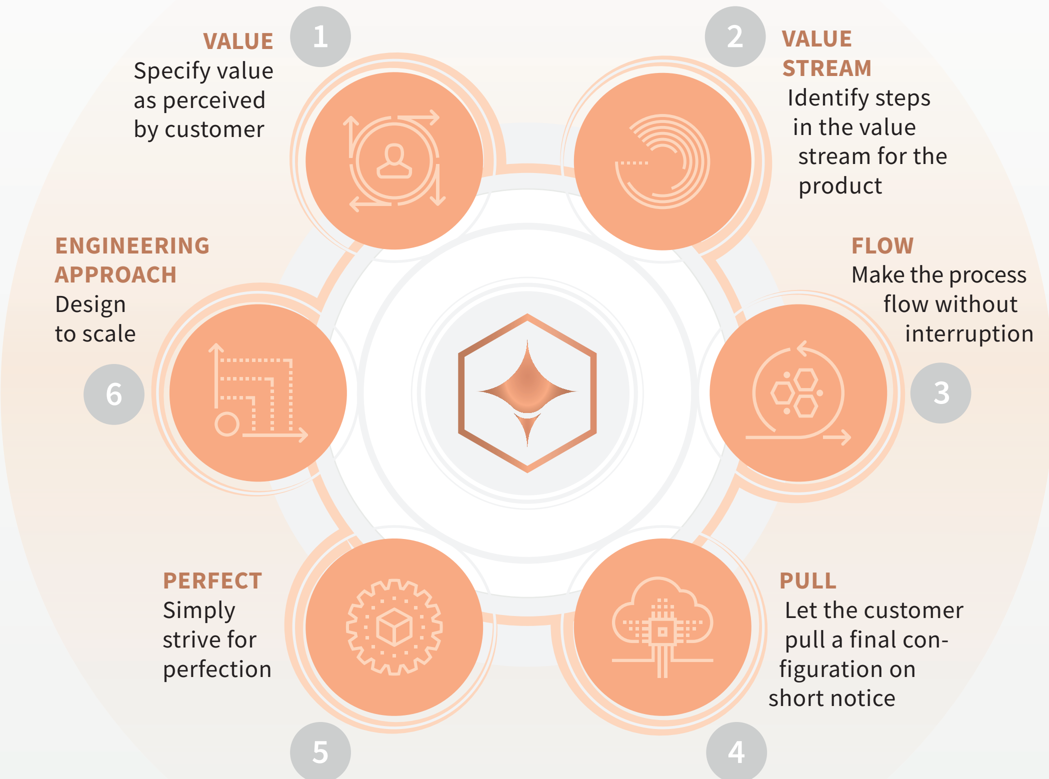
01.01.1989

At the Austrian Institute of Technology (AIT), the first Liquid Metal Ion Sources are developed, producing a precise beam of high-energy indium ions

* Having produced half of all thrusters on this launch is demonstrating the company's position as market leader for nano- and microsatellites as well as one of the leading private actors contributing to Space Sustainability.

LEAN MANUFACTURING IN THE SPACE INDUSTRY

ENPULSION IS LEADING INDUSTRIAL INNOVATION

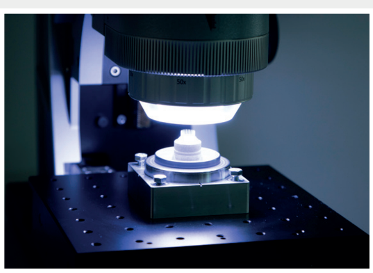


ASSEMBLY & INTEGRATION

Our ISO-class-6 clean room provides optimal conditions for the assembly and integration of our products. Each workstation is ergonomically optimized and can easily be configured for a new product to support flexibility and efficiency.

ACCEPTANCE TESTING

All our products pass several steps during acceptance testing. These include thermal, vibration and final performance test, which verifies the thruster's function and measures its key characteristics. Several units can be included in a single test run in order to increase the possible throughput.



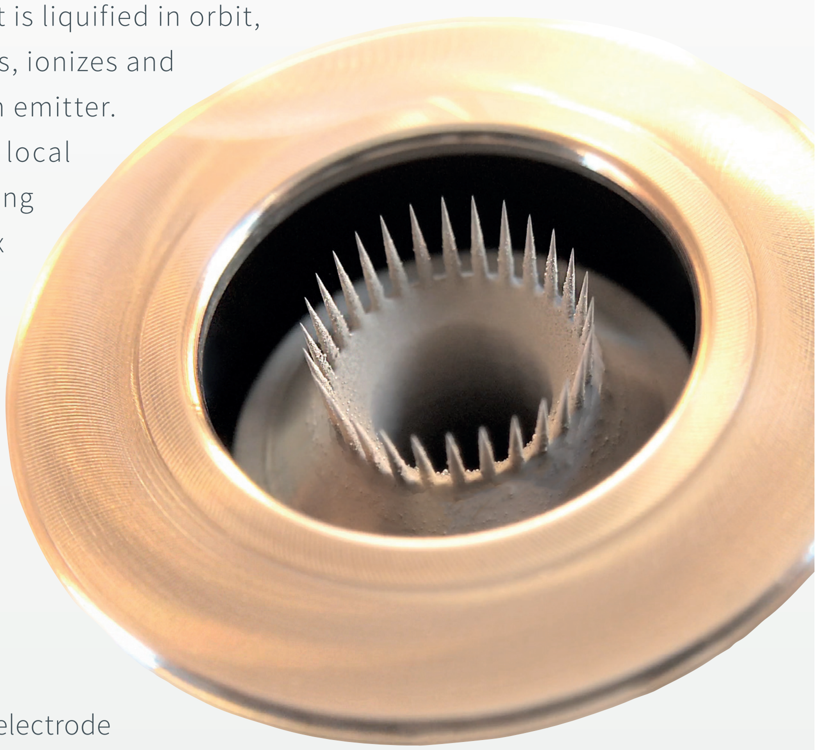
CONTINUOUS IMPROVEMENT

We are continuously improving our processes and products, identifying opportunities for streamlining work and assuring product quality. For instance, high precision 3D maps of our emitters are created at an early step in manufacturing in order to predict their later performance.

FEEP TECHNOLOGY

THE BEST IN PROPULSION

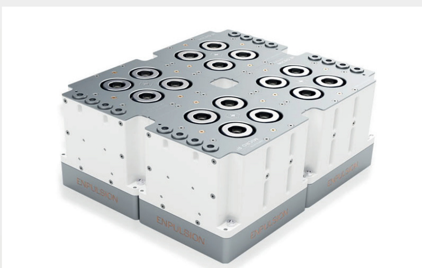
Field Emission Electric Propulsion (FEEP) produces thrust by ions and an applied electrostatic field. By changing the field's parameters, thrust and specific impulse can be varied as required.



In a FEEP thruster, the metal propellant is liquified in orbit, and a strong electrostatic field extracts, ionizes and accelerates the propellant from the ion emitter. The extraction process requires high local field strength, which is achieved by using the field enhancing effect at the apex of sharp needles. When applying the electric field to the liquified metal propellant, a so-called 'Taylor cone' is formed on top of the emitter needle, balancing the forces of electrostatic pull and surface tension of the propellant. Ion emission occurs at the apex of this cone.

The electrostatic potential is applied between the metal emitter and a counter electrode (extractor) designed to maximize transparency for emitted ions. In such a geometry, ions are then accelerated by the same field used for extraction and ionization, making this process very efficient. The ion emission is supplemented by electron emission from neutralizers to maintain charge stability of the spacecraft. Emitted propellant is replaced in a fully passive manner by capillary forces which maintain propellant supply from the propellant reservoir up to the emitter tips, relying on surface tension of the propellant itself. A FEEP thruster therefore does not require any external forces like pressurization or pumps.

Since propellant liquification is only done once in space and for ground vacuum testing, the FEEP system is fully solid and inert during ground handling, integration, and launch.



ADVANTAGES OF FEEP TECHNOLOGY

FLIGHT HERITAGE

The ENPULSION NANO Thruster (formerly named 'IFM Nano') had its first successful In-Orbit-Demonstration with independently confirmed orbit changes in January 2018. Since then, it has been successfully tested in orbit on multiple customer spacecraft.

COMPACT BUILDING BLOCKS

IFM Thruster modules can be used as compact pre-qualified building block in order to provide custom solutions at a commodity price and ultra-short lead times. A whole cluster can be operated as a single plug-and-play unit.

MATURE TECHNOLOGY

The IFM FEEP technology was developed under ESA contracts for >15 years. 1 000+ emitters have been tested and an ongoing lifetime test has demonstrated >30 000 hours of firing without degradation of emitter performance.

INSTANTANEOUS THRUST

FEEP emission is an electrostatic process from a Taylor cone with a *ms* response time. IFM Thrusters can enter a hot-standby mode where propellant stays liquified. Response time is then only limited by electronics control.

CONTROLLABLE SPECIFIC IMPULSE UP TO 6000 S

Due to the efficient process in which up to 60 % of the evaporated indium atoms can be ionized, IFM emitters can provide a very high specific impulse and can accurately control the I_{SP} anywhere from 1 000 s to 6 000 s.

DYNAMIC PRECISE THRUST CONTROL

Thrust can be controlled through the electrode voltages, providing excellent controllability over the full thrust range down to a precision of a few μN, as well as low thrust noise.

DEBRIS SAFETY

Even when active, no part of the thruster is pressurized, and no chemical energy is stored. This means that no explosive reaction can harm the spacecraft system and create additional debris in case of collision.

SAFE PROPELLANT

IFM emitters use indium, a non-toxic, non-reactive and non-radioactive metal as propellant, with negligible evaporation even in vacuum at high temperature.

NO PROPELLANT CONTAINMENT ISSUES DURING LAUNCH

IFM technology has no moving parts, and the propellant is in solid state during launch. The lack of pressurized tanks and gaseous, liquid, and reactive propellants avoids any risks of propellant containment during launch.

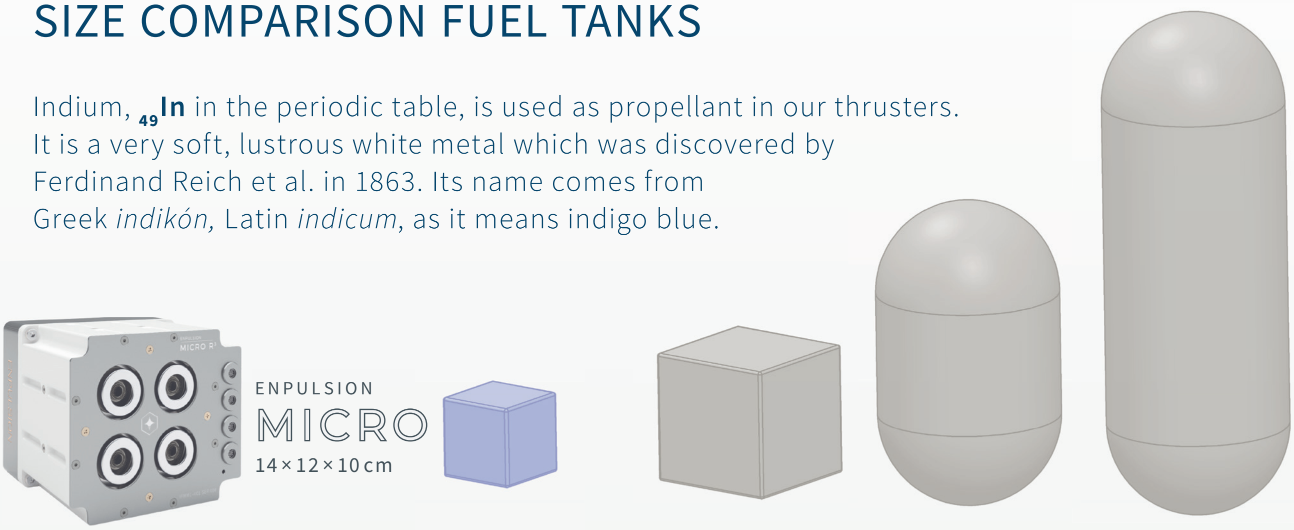
FAST INTEGRATION SIMPLE HANDLING

The IFM Technology is an entirely passive system using no hazardous materials and an unpressurized solid propellant during all process stages. Thrusters are delivered in a ready-to-fly state and are designed for simple and fast integration.

ADVANTAGES OF INDIUM AS PROPELLANT

SIZE COMPARISON FUEL TANKS

Indium, $_{49}$**In** in the periodic table, is used as propellant in our thrusters. It is a very soft, lustrous white metal which was discovered by Ferdinand Reich et al. in 1863. Its name comes from Greek *indikón,* Latin *indicum,* as it means indigo blue.



	INDIUM	IODINE	XENON	KRYPTON
	SOLID		SUPERCRITICAL FLUID	
DENSITY (IN FLIGHT TANK)	7.3 G/CM³	4.9 G/CM³	1.6 G/CM³	0.6 G/CM³
PRESSURE	0 BAR	< 1 BAR	> 100 BAR	> 100 BAR
TOXICITY*	NONE	0.1 PPM PER 8H	NONE	NONE
LAUNCH WAIVER REQUIREMENTS	NONE	VARYING	PRESSURE VESSEL	PRESURE VESSEL
PRICE OF PROPELLANT	$$	$$	$$$$	$$
AVAILABILITY	~1000 TONS/YEAR	UNLIMITED	~10 TONS/YEAR	~100 TONS/YEAR

INDIUM HAS SEVERAL IMPORTANT ADVANTAGES AS A PROPELLANT:

- ***It is compact due to its higher density*** — The graph above presents a comparison of tank sizes between the ENPULSION MICRO and a Hall-Effect thruster (operating at 1200 s I_{SP} @ 100 w) of same total impulse using different propellants.

- ***Thrusters are shipped full*** — Propulsion systems using other propellants usually have to be shipped empty and filled at the launch facility, introducing additional expenses and procedures.

- ***It is safe*** — Indium is non-toxic and easier to handle than other propellants. It is stored unpressurized and, unlike high pressure tanks, it does not need special authorizations (launch waivers) to be launched as secondary payloads, and is RoHS and REACH compliant.

- ***It is readily available*** — Indium is currently a by-product of zinc refining and benefits from industrial scale production. Since peaking at $700/kg in 2007 indium prices have stayed below $400/kg.

* According to OSHA

OUR PRODUCT LINE PHILOSOPHY

FRAMEWORK

Our approach to product development is based on the key requirements of our customers. This is why we have deployed a product line classification which immediately shows how our thrusters perform on three main dimensions:

First Dimension: thrust

The primary dimension of a thruster is its *thrust*. This thrust is either *intensive* (a large amount of force applied over a rather short period of time) or it is *extensive* (a rather small amount of force applied over a long period of time).

I: INTENSITY	*max. power/force*
E: EXTENSITY	*max. endurance/range*

Second Dimension: mobility

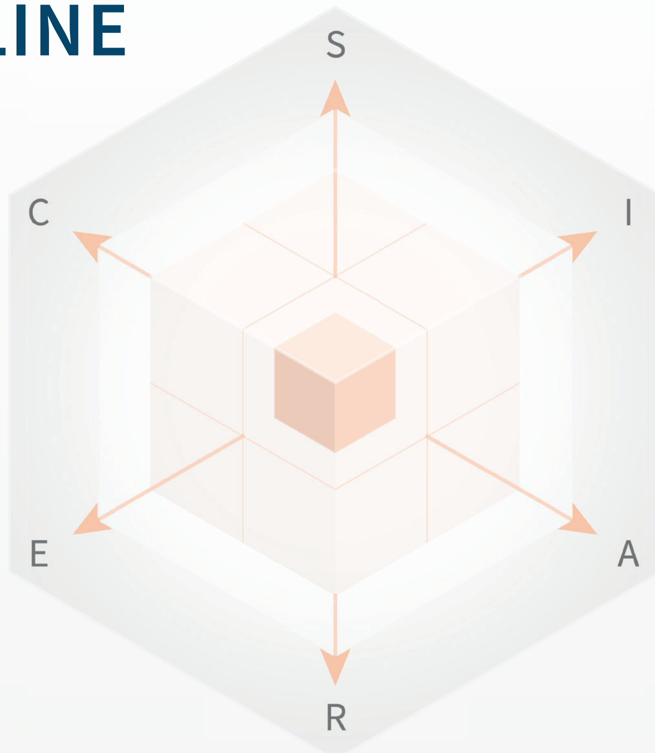
The second dimension of a thruster is its *mobility*. This movement is either *agile* (with high dynamics and agility) or it is *precisely defined* (with high certainty and reliability).

A: AGILITY	*max. mobility/dynamics*
C: CERTAINTY	*max. certainty/precision*

Third Dimension: complexity

The third dimension of a thruster is its *smartness*. The level of complexity is either *elementary* (hardly integrative control processes, but resilient) or *intelligent* (automated cognitive optimization processes).

S: INTELLIGENCE	*max. system integration/ adaptation ('smartness')*
R: RESILIENCE	*max. resistance/reliability*



Depending on their performance on these dimensions, our thruster solutions are classified in the following classes:

S-CLASS	smartness, intelligence
R-CLASS	robustness, reliability, stability, resilience, and failure safety
I-CLASS	intensity, force, power peaks for maximum driving power
E-CLASS	extensity, economy, and endurance
A-CLASS	maximum agility, dynamics, versatility, and mobility
C-CLASS	outstanding precision, accuracy, and durability
X-CLASS	all-rounder that combines most or all advantages

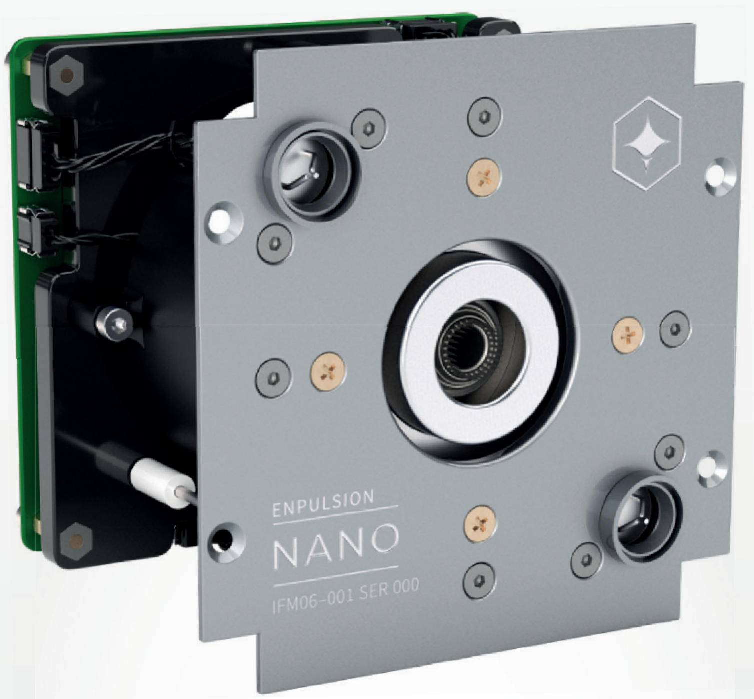
Products can belong to several classes (e.g. ENPULSION NANO AR^3 or ENPULSION NANO IR^3). Classes can also be qualified with superscripts to signify the different levels of performance within them (e.g. R^3, R^{10}).

The basic building block of our product hierarchy remains the ENPULSION NANO (formerly called the 'IFM Nano Thruster'), of which more than 90 were in space as of January 2022.

ENPULSION NANO THRUSTER

After many years of research and development, the FEEP technology was turned into a first commercial product as the ENPULSION NANO Thruster*.

A FLIGHT-PROVEN VERSATILE SOLUTION FOR YOUR LOW-POWER APPLICATIONS



DYNAMIC THRUST RANGE:	10–350 µN
NOMINAL THRUST:	330 µN
SPECIFIC IMPULSE:	1500–5000 S
PROPELLANT MASS:	220 G (INDIUM)
TOTAL IMPULSE:	MORE THAN 5000 NS
TOTAL INPUT POWER:	40 W INCL. NEUTRALIZER
OUTSIDE DIMENSIONS:	100.0 × 100.0 × 82.5 MM
SUBSYSTEM MASS:	680 G (DRY) / 900 G (WET) INCL. PPU
TOTAL SYSTEM POWER:	8–40 W

With less than 1U in size, less than 1 kg in mass, and only 40 W of power demand, the ENPULSION NANO fits in even the smallest satellites and can be easily bundled together as a module for satellites with a higher thrust demand.

A successful in-orbit demonstration in early 2018 marked the world-first use of a FEEP in space. The ENPULSION NANO has been chosen as propulsion system by many customers world-wide due to its very high specific impulse, its compact design, and its simplicity of integration — unmatched by any other technology on the market.

Its unique properties and its wide range of operational performance yield application possibilities like orbit maintenance and station-keeping, orbit changes and transit manoeu-vres, attitude maintenance, end-of-life disposal, formation deployment, reaction wheel desaturation, and the like.

* Formerly 'IFM Nano Thruster'

ENPULSION NANO THRUSTER VERSIONS

Building on the flight-proven success story of the ENPULSION NANO we have developed the next generation of FEEP propulsion systems.

RELIABLE PROPULSION SOLUTIONS TO MATCH YOUR MISSION'S NEEDS

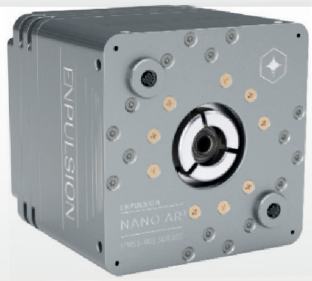
ENPULSION
NANO R³

ROBUST

The ***ENPULSION NANO R³*** *features increased reliability, radiation tolerance, and environmental resilience.*

ENPULSION
NANO AR³

ENPULSION NANO AR³ *combines advanced vector controllability*



VERSATILE

with increased reliability and environmental resilience.

ENPULSION
NANO IR³

POWERFUL

Configured to enable higher thrust operating points the ***ENPULSION NANO IR³*** *also features increased reliability and environmental resilience.*

	NANO R³	NANO AR³	NANO IR³
DYNAMIC THRUST RANGE	10–350 µN	10–350 µN	10–500 µN
NOMINAL THRUST	350 µN	350 µN	500 µN
SPECIFIC IMPULSE	1500–5000 S	1500–5000 S	1500–4000 S
PROPELLANT MASS	220 G INDIUM ±5%	220 G INDIUM ±5%	220 G INDIUM ±5%
TOTAL IMPULSE	MORE THAN 5000 NS	MORE THAN 5000 NS	MORE THAN 4000 NS
POWER (AT NOMINAL THRUST)	45 W INCL. NEUTRALIZER	45 W INCL. NEUTRALIZER	50 W INCL. NEUTRALIZER
OUTSIDE DIMENSIONS	98.0 × 99.0 × 95.3 MM	98.0 × 99.0 × 95.3 MM	98.0 × 99.0 × 95.3 MM
MASS (DRY/WET)	< 1180 G / < 1400 G	< 1230 G / < 1450 G	< 1180 G / < 1400 G
TOTAL SYSTEM POWER	8–45 W	8–45 W	8–50 W

ENPULSION MICRO THRUSTER

The ENPULSION MICRO Thruster builds on the flight heritage of the ENPULSION NANO Thruster to meet the requirements of more demanding missions. Its first in-orbit commissioning and use was in March 2021 in OHB Sweden's GMS-T mission. Many further missions are expected to launch in 2022 and beyond.

NEED MORE THRUST FOR CHALLENGING MISSIONS?
ENPULSION MICRO PROVIDES THE ANSWER.

DYNAMIC THRUST RANGE:	0.08 – 1.2 mN
NOMINAL THRUST:	1.0 mN
SPECIFIC IMPULSE:	1000 – 5000 S
PROPELLANT MASS:	1300 G (INDIUM)
TOTAL IMPULSE:	UP TO 40 KNS
TOTAL INPUT POWER:	100 W INCL. NEUTRALIZER
OUTSIDE DIMENSIONS:	120.0 × 140.0 × 98.0 MM
SUBSYSTEM MASS:	1.9 KG (DRY) / 3.2 KG (WET) EXCL. PPU (PPU 0.7 KG)
TOTAL SYSTEM POWER:	30 – 120 W

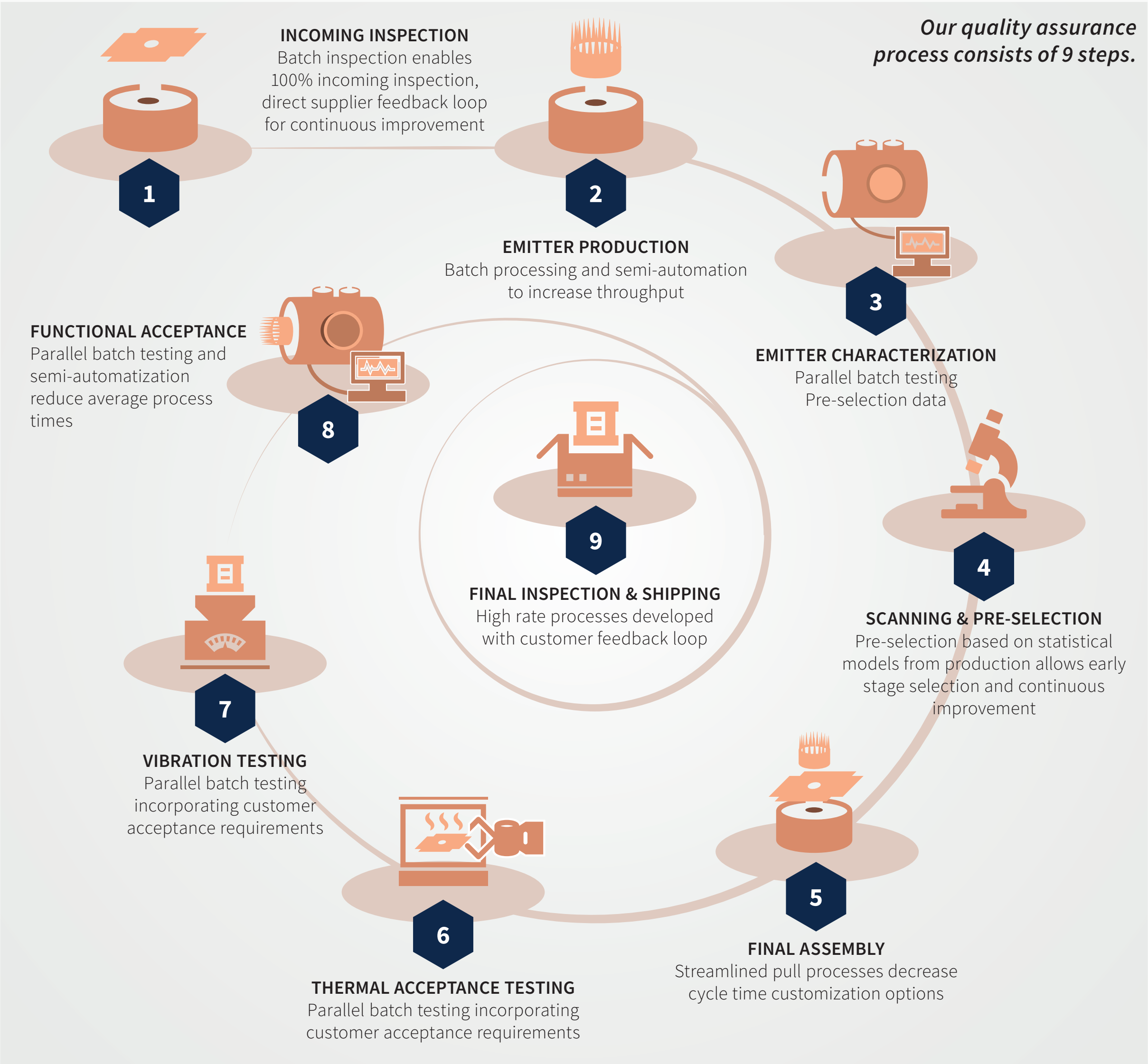
With an input power of 100 W it produces up to 1.4 mN of thrust and provides 50 kNs of total impulse, which makes it particularly adapted to small and medium size spacecraft.

It can be launched on any rocket or even deployed from the ISS as it contains no pressure vessels or energetic chemical. The thruster and propellant are all contained in a 14 × 12 × 10 cm module bolted directly to any flat panel. No accommodation for a separate tank or fluid piping is required. The ENPULSION MICRO is inherently redundant with more than a 100 parallel ion emissions. Its large specific impulse range and the unrivaled control precision are perfect for station keeping and attitude control. End-of-life operations can be performed at the most optimal operation point depending on remaining propellant quantities.

QUALITY ASSURANCE

YOUR SPACECRAFT DESERVES THE BEST

Our commitment to quality is absolute and unconditional. Every component goes through a rigorous incoming inspection. Step-by-step process and final inspections ensure that the quality level is maintained throughout the production chain and allow for early detection of non-compliant parts. The performance of the ion emitters is characterized before they are assigned to a thruster.



Customization* of the mechanical interface and several possible PPU configurations are available in our modular design. We are taking into consideration what fits best your electrical system without compromising its quality. The plug-and-play design makes it easier to scale up your propulsion system without having to consider additional propellant mass, plumbing and storage. Our final assembly line and testing facilities are located fully inside an ISO-certified clean room. As our thrusters are inert and not pressurized during acceptance testing, integration, and launch, we are able to perform acceptance-tests in a very economic and highly scalable manner. Therefore, even at high production rates, each thruster is subjected to environmental acceptance testing, (i.e., thermal and vibration), according to your mission and launch profiles. And lastly, a functional test checks the performance of the ion emitter.

* Customized designs must be approved by Enpulsion GmbH. Enpulsion GmbH reserves the right to decline any modification to the thruster design for technical, financial, or other reasons.

OUR TEAM

What unites us is our big passion for space exploration, natural curiosity, and quest f
rapidly grown from 2 to more than 53 employees who come from different countries, spe

Common Goal — Innovation — Improvement — Commitment —

Celebrating our success together forms

Our company's culture of open collaboration and mutual support enables our employees to further develop their skills and to consistently surpass their goals. ENPULSION invests in their professional development, encourages their suggestions for improvement, and invests in their innovative ideas. We also support a good work-life balance for our employees by providing flexible worktime and home office options.

AT THE HEART OF NEW SPACE | DRIVEN BY A COMMON GOAL | FOSTERING INNOVATION | DIVERSITY

OUR ROAD TO ENPULSION

Dr. David Krejci

CTO

"At MIT I was researching microchip sized propulsion technologies but I felt ready for the challenge of commercial space. I was excited to join ENPULSION and work on the FEEP thruster with a great team."

Elisa Pennelli

QUALITY ASSURANCE MANAGER

"New challenges: This is what joining ENPULSION means to me. I am proud to be part of an innovative team in an international company that has great ambitions for future projects and growth."

Dr. Tony Schönherr

PRODUCT MANAGER ENPULSION NANO

"Working at ESA provided me with a broad experience to succeed in the space market. ENPULSION allows me to apply this knowledge to a real product, and to grow with the company during the process."

t for perfection. Since the company's founding in 2016 the team has speak different languages and have diverse experiences in many fields.

— Decisiveness — Team Spirit — Appreciation — Diversity

the core of our company philosophy!

Our team is the perfect combination of youthful drive and solid experience in top 500 companies in Space and other industries. Some companies and institutions in which our team members have worked are: Ariane, ArianeGroup, BMW, ESA, FOTEC, Fraunhofer, ICARE-CNRS, Knorr Bremse, MIT, NRC, Philips, RUAG, University of Tokyo, Austro Engine/ Diamond and many others.

SITY MATTERS | LIVING QUALITY EVERY DAY | FLEXIBILITY IS KEY | ACHIEVING MORE TOGETHER

IN FOCUS

Dr. Lou Grimaud, Product Manager ENPULSION MICRO
Year of birth: 1990 | Nationality: French | Joined: Fall 2018

Describe your typical day at the company.

My typical day can be pretty varied. I can be developing new designs, writing qualification documentation and talking with suppliers in the morning, but also supporting our production team, doing hardware testing and working with clients on their requirements in the afternoon.

Why did you decide to join ENPULSION?

As I was completing my PhD in electric propulsion I had the chance to talk with a lot of the different propulsion companies and startups. What attracted me to ENPULSION was the fact that the company had a deep technical knowledge of the mature and flight-proven FEEP technology and of the corresponding market. As early as 2017 ENPULSION already had a finished product, not just a laboratory technology demonstrator. This put them several steps ahead of the competition.

Their concern was not just making something that works but how to produce several thrusters a week. This represents an unprecedented manufacturing volume in space propulsion! Another important reason to choose ENPULSION was that it is a fast-paced environment where the time between first customer contact and in orbit commissioning is counted in months or even weeks, not in years.

CUSTOMER SERVICE AND TRAINING

Our products deserve the best support.

WE WILL HELP YOU GET THE BEST FROM YOUR PROPULSION SYSTEMS

We do not stop at simply delivering a propulsion solution. As we are well aware of the importance and complexity of thruster integration, we offer our customers a flexible and quick engineering support as well as technical trainings on our premises in Wiener Neustadt. During these workshops our experts instruct customer's specialists on best integration options and provide them with the opportunity to operate a real thruster in a vacuum chamber. Different simulations with customer's software are also performed to best approximate real-life conditions. If the customer needs to perform additional pre-flight tests, we can also supply on demand *Engineering Qualification Models (EQM)* of our thrusters.

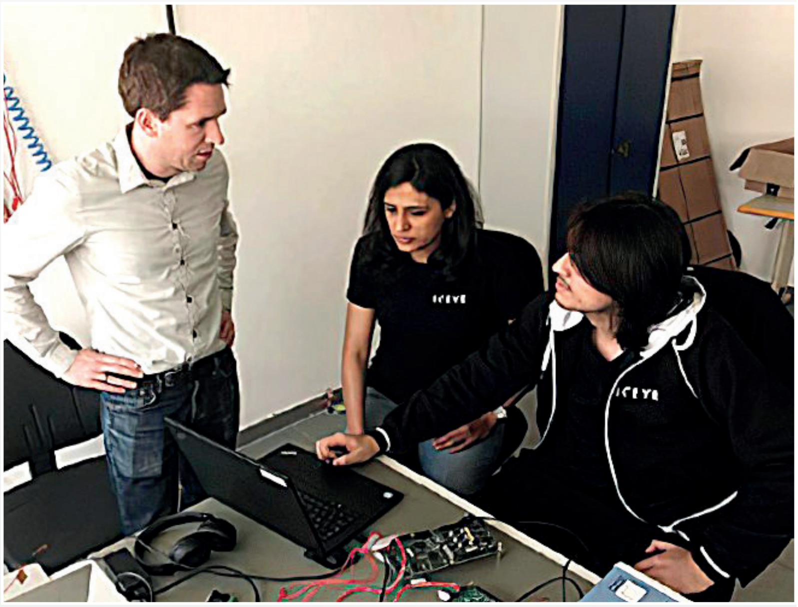
SALES NAME	PPU ENGINEERING MODEL	FLAT SAT SIMULATOR *(available from Summer 2022)*	THRUSTER ENGINEERING QUALIFICATION MODEL	WORKSHOP WITH COUPLING TEST	THRUSTER FLIGHT MODEL
Part Number	**MCE01 or NCE01**		**IFMXX-XXX-EQM**	**S_ES-[033/044]**	**IFMXX-XXX**
Summary	Logic side of the electronics and in box. No power section	Engineering model that can draw power	Full thruster not capable of ion emission		
Use	*Flat sat testing* Communication checks with OBC	*Flat sat testing* Communication tests, verify ground test procedures covering command of all subsections	*Integration tests* Mechanical and thermal testing, communication tests, verify ground test procedures covering command of all subsections	Hardware in the Loop testing	
Flight like communication interface	✓	✓	✓	✓	✓
Flight like software logic	limited due to no feedback	✓ *(with possibility of artificial fault trigger)*	✓	✓	✓
Flight like electrical interface	✓	✓	✓	✓	✓
Flight like power draw	only cold standby	✓	cold and hot standby + neutralizer	✓	✓
High voltage capable	X	X	✓	✓	✓
Flight like mechanical properties (mass, CoG, Moments of inertia)	X	X	✓	X	✓
Flight like thermal behaviour	X	X	representative emissivity, hot standby capable in vacuum environment	X	✓
Engineering name(s)	Customer test board	Advanced flat sat with load box *(coming mid 2022)*	Engineering qualification model	Workshop	Flight model

CUSTOMER CASE STUDY

Together on the road to success.

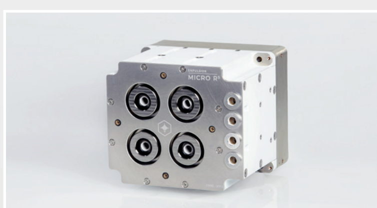
ICEYE AND ENPULSION

Finnish company ICEYE is a leader in the development and deployment of state-of-the-art *Synthetic-Aperture Radar (SAR)* technologies in space. In May 2020, ICEYE became the first company in the world to demonstrate interferometric capabilities from SAR satellites under 100 kg (220 pounds) in mass. Because of these technological advances, the company can provide innovative satellite data solutions for land and sea applications like pipeline and crop monitoring, flood mapping, oil spill monitoring, disaster response activities, etc. A key part in the deployment of such complex solutions is a propulsion system which allows precise control and flexibility. ENPULSION thrusters are based on the FEEP technology which uses the solid propellant indium and thus eliminates the need to take care of issues like pressure and toxicity. ENPULSION and ICEYE have worked together for several years.



ENPULSION CTO David Krejci and ICEYE specialists discuss propulsion solutions during the workshop in Wiener Neustadt.

Along the way, we have worked with ICEYE on manoeuvring capabilities, and we have provided them with engineering modules to test and optimize communication. During a workshop on our premises in Wiener Neustadt, ENPULSION and ICEYE specialists operated a real thruster in a vacuum environment using ENPULSION's control software. We also coupled the thruster with an engineering module of ICEYE's onboard computer so that all software scripts could be tested under real conditions. ICEYE's control software was used to verify that all thrusters were working properly.



Why Us?

*WITHIN **5 YEARS***, ENPULSION…*

*… has **successfully brought six products to market** to serve diverse customer needs,*

*… has **more than 60 thrusters already flying in orbit** and another 150 delivered to customers, waiting to be launched,*

*… has **implemented an ISO-certified lean manufacturing process,** designed for high-rate production, all the while meeting the demands of space product assurance standards,*

*… has managed to assemble a **unique team** of highly qualified aerospace engineers, technicians, and business professionals,*

*… holds a **worldwide exclusive perpetual license to commercialize 30 years of know-how and IPs** related to the electric propulsion technology.*

Follow us:

Twitter

LinkedIn

** Figures as of Juni 2021.*

ENPULSION

Viktor Kaplan-Strasse 2
2700 Wiener Neustadt, Austria

www.enpulsion.com