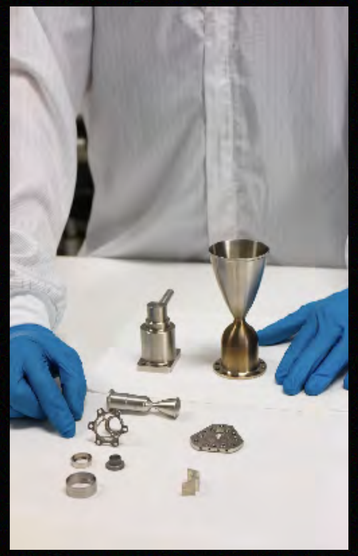
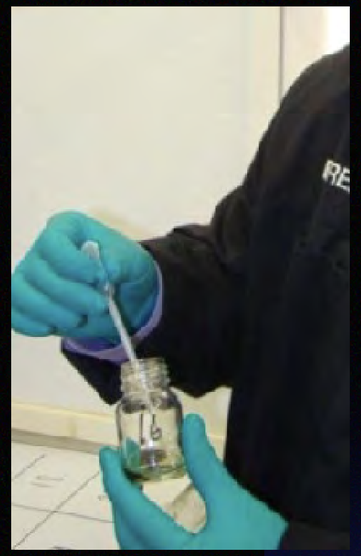
# ECAPS

PIONEERING THE FUTURE OF PROPULSION

# ECAPS AT A GLANCE

At ECAPS, we specialize in the production of thrusters and non-toxic "green" propellants for the modern space industry. Our standout innovation, the LMP-103S propellant, not only reduces environmental impact but also offers superior propulsion performance. Our commitment to innovation and sustainability makes us a trusted choice in the aerospace sector.





CERTIFIED BY :

nqa AS9100 AEROSPACE & DEFENSE

nqa ISO 9001 QUALITY MANAGEMENT

| ECAPS FOUNDED | BASED IN | PRODUCED |
|---|---|---|
| 2000 | Sweden | +300 Thrusters |



ECAPS

# ROCKET ENGINES

POWERING SPACE WITH HPGP TECHNOLOGY

## THRUSTERS  ENHANCED BY ECAPS'S HPGP TECHNOLOGY

### DIVERSE THRUSTER RANGE

From 100mN for small satellites and CubeSats to 220N for upper stages and deep space missions, catering to various aerospace needs.

### OPTIMIZED FOR HPGP

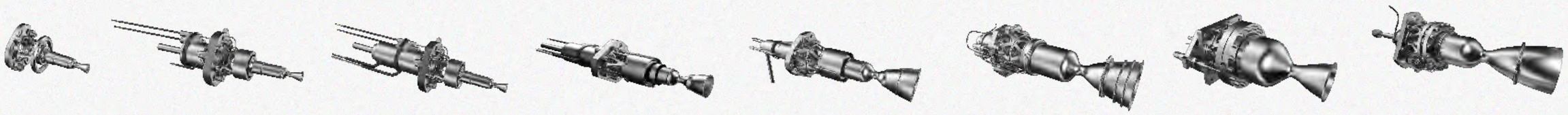
Our thrusters are specifically designed to harness the full potential of our proprietary High Performance Green Propulsion Technology.

### VERSATILITY IN ACTION

Efficiently powering diverse space missions, from satellite launches to profound deep space explorations.

### FUTURE-ORIENTED

Engineered to meet the ever-evolving demands of the space industry and to fuel the next generation of space endeavors.



100 mN HPGP THRUSTER

1N GP THRUSTER

1N HPGP THRUSTER

5N HPGP THRUSTER

22N HPGP THRUSTER

50N HPGP THRUSTER

200N HPGP THRUSTER

220N HPGP THRUSTER

# ROCKET FUEL

PROPELLING INNOVATION WITH TANGIBLE BENEFITS

## UNVEILING HPGP: HIGH PERFORMANCE GREEN PROPULSION - THE POWER BEHIND ECAPS SUCCESS

ECAPS proprietary HPGP propellant, LMP-103S, based on Ammonium DiNitramide (ADN), sets a new standard in the aerospace domain. It not only offers up to 30% better performance per volume than traditional monopropellant hydrazine but also champions a sustainable and efficient future with its environmentally friendly nature.

### COST EFFICIENCY

Reduced costs by up to 72% in typical NASA loading scenarios compared to Hydrazine.[1]

### PERFORMANCE BOOST

30% more performance, paving the way for more efficient space missions.

### GREEN AND SUSTAINABLE

Compliant with Europe's REACH regulations, ensuring a sustainable use of space.

### ENHANCED LIFECYCLE

Lower lifecycle cost and sustainable "green" profiling for satellite integrators.

| ADN | SOLVENT | FUEL |
|---|---|---|
| Energetic Material Highly Soluble Oxidizer | Water | Methanol and Ammonia |

LMP-103S
High Performance Green Propellant

**CO-PRODUCED WITH EURENCO BOFORS.**
Invented and supplied by ECAPS

| LMP-103S MONOPROPELLANT | |
|---|---|
| ADN | 60-65% |
| METHANOL | 15-20% |
| AMMONIA | 3-6% |
| WATER | BALANCE (BY WEIGHT) |

HIGHER PERFORMANCE (vs. hydrazine):

- Isp ≥ 6%
- Density ≥ 24%
- Density Impulse ≥ 30%

REDUCED PERSONAL AND ENVIRONMENTAL HAZARDS

- Low Sensitivity
- Low Toxicity
- Non Carcinogenic

SIMPLER AND LESS COSTLY HANDLE AND TRANSPORT:

- SCAPE not required
- Approved for commercial air transport
- Enables 'fuel at the factory'

[1] Henry W. Mulkey, Green Propellant Loading Demonstration at U.S. Range

# ECAPS IN ACTION

100+ THRUSTERS IN SPACE ACROSS 26 SATELLITES I MARKING 10 LAUNCHES OVER 3 CONTINENTS

**PRISMA**

Dnepr 15
Yasny,
Russia
June 15,
2010

**SKYSAT 3**

Pslv C-34
Shar
Chennai, India
June 22,
2016

**SKYSAT 4-7**

Vega 007
CSG Korou
French Guiana
September 15,
2016

**SKYSAT 8-13**

Minotaur-c
Vandenberg,
USA
October 31,
2017

**SKYSAT 14-15 STP SAT-5**

Falcon-9
Vandenberg,
USA
December 3
2018

**SKYSAT 16-18**

Falcon-9
Cape
Canaveral,
USA
June 13, 2020

**SKYSAT 19-21**

Falcon-9
Cape
Canaveral,
USA,
August 18,
2020

**ELSA-D**

Soyuz
Baikonur,
Kazakhstan
March 22,
2021

**NROL-111 ALTAIR 1-3**

Minotaur 1
Wallops,
USA,
June 15,
2021

**ARGOMOON**

Artemis-1
KSC, USA,
November 16,
2022

# CUTTING-EDGE FACILITIES

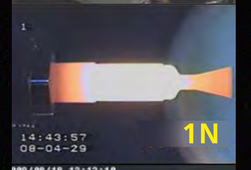
FOR NEXT-GENERATION PRODUCTION

At ECAPS, our state-of-the-art facilities allow us to maintain our position as one of the top suppliers of Green Propulsion solutions. Our capabilities include in-house design, engineering, production, testing and verification.

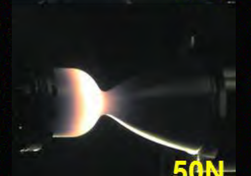
**Solna, Sweden**
Production, Research & Development, Testing Facilities

**Grindsjön**
Space test center at Swedish Defense Research Agency (FOI)

**Karlskoga, Sweden**
Propellant production in cooperation with EURENCO Bofors







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# ECAPS JOURNEY

KEY MILESTONES IN OUR STELLAR JOURNEY

## 1999

Pioneering steps with the first hot-fire test using ECAPS's Green propellant in Grindsjön, Sweden.

## 2001

ECAPS established for further development of HPGP solutions as a joint venture between Swedish Space Corporation and Volvo Aero.

## 2006

ECAPS became a fully owned subsidiary of Swedish Space Corporation.

## 2010

First launch of ECAPS products to space. ECAPS 1N HPGP thruster got flight proven on PRISMA. The PRISMA mission has provided a back-to-back performance comparison of HPGP versus hydrazine.

## 2012

ECAPS signed its first commercial contract for the design and delivery of a complete 1N HPGP propulsion system for Skybox's Earth observation satellites.

## 2016

ECAPS moved to its current site in Solna upgrading its cleanroom facilities and production capabilities.

## 2017

In July ECAPS was acquired by AIAC becoming a sister company of Bradford Engineering.

## 2022

ECAPS proudly secured AS9100:2016 and ISO9001:2015 certifications from National Quality Assurance (NQA) USA, emphasising our quality standards.

## 2023

ECAPS establishes TS-3 at FOI as an additional space test centre for hotfire testing of thrusters.

Oak Universe acquires ECAPS AB

# CUSTOMERS AND PARTNERS

## COMMERCIAL SPACECRAFT BUILDERS AND OPERATORS

SIERRA NEVADA CORPORATION
planet.
argotec
ASTROSCALE
BOEING
nano avionics
MILLENNIUM SPACE SYSTEMS A Boeing Company
bradford space
VACCO
MOOG

## SPACE AGENCIES

NASA
esa
Rymdstyrelsen Swedish National Space Agency
DLR
KARI

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