



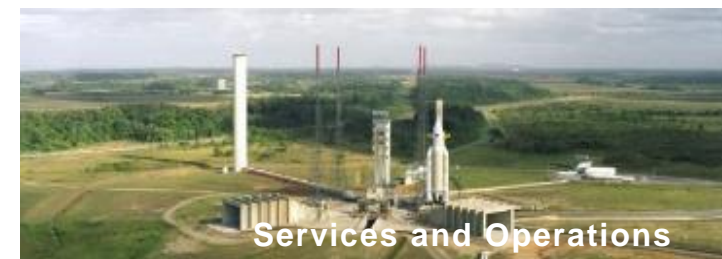
OHB GROUP AEROSPACE BUSINESS

HANS J. STEININGER
MT AEROSPACE AG

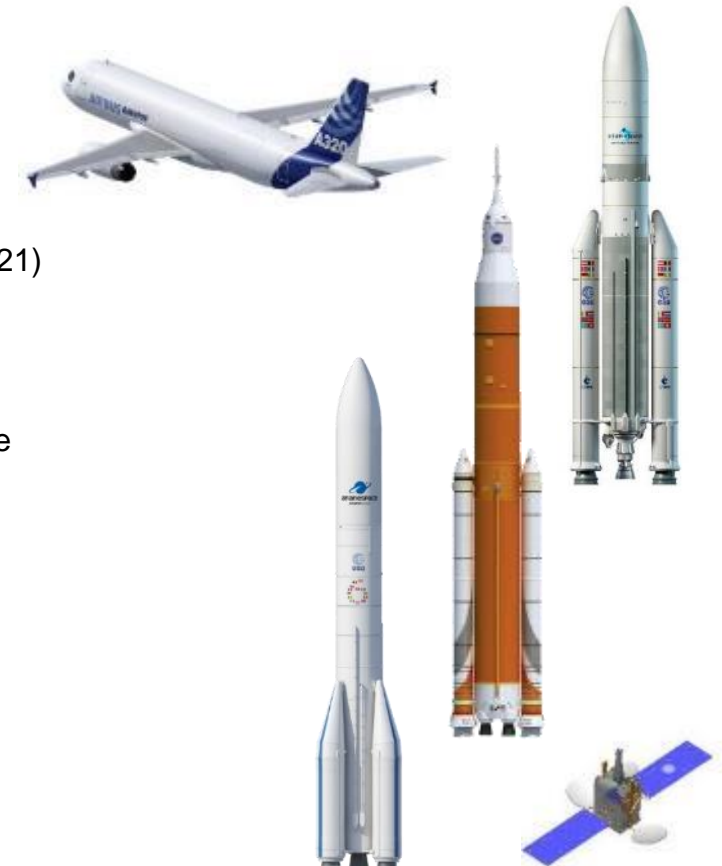
OHB CAPITAL MARKET DAY 2021



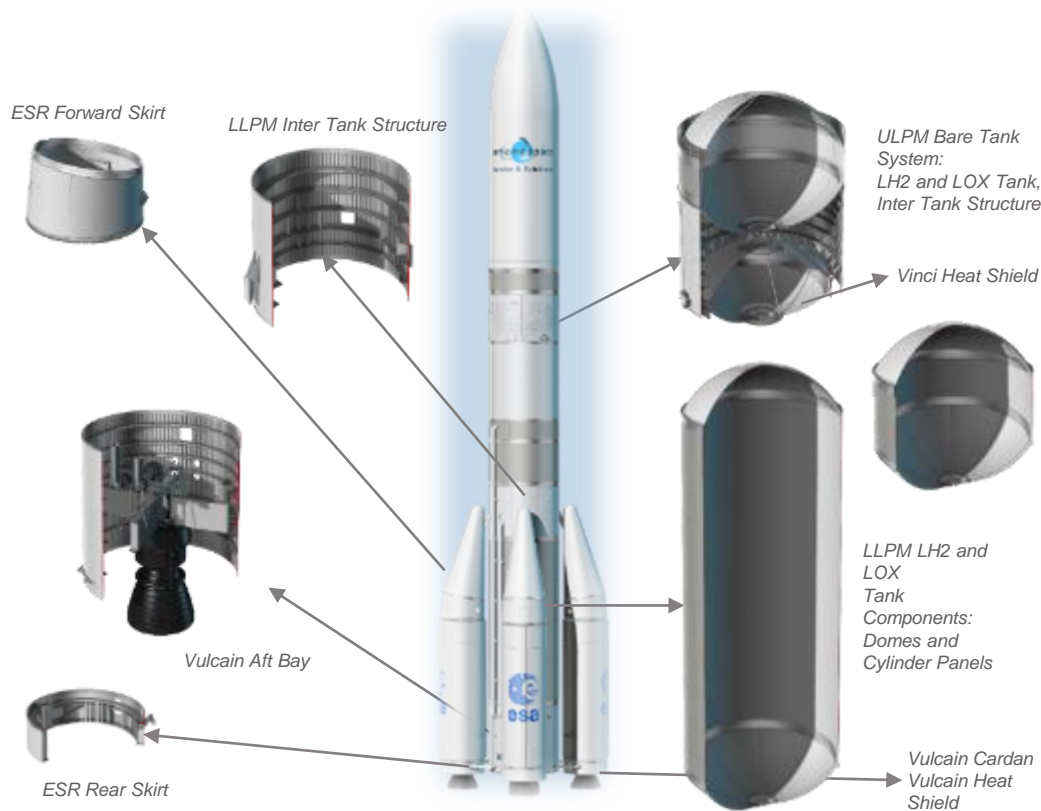
40 YEARS OF EXPERTISE IN
SPACE FLIGHT, AERONAUTICS,
ENGINEERING, AND PRODUCTION



- ▶ **Ariane 5**
 - Ramp-down with successful delivery of last Lot PC shipsets
- ▶ **Ariane 6**
 - Flight Model 2 and 3 (FM2/3) delivered
 - Development: qualification and first tests started (finalization in 2021)
- ▶ **International Launcher**
 - Boeing: Gore panel production of 2 shipsets for 2021 started
 - Delivery of Gore Panels, Transfer Lines & Spun Caps for US prime
- ▶ **Space Craft Tanks**
 - Qualification of L-XTA family (300-900 ltr) successfully finished
 - First tank (Electra, 440 ltr) delivered
- ▶ **Aviation**
 - 786 Water Tanks delivered in 2020 (772 Airbus, 14 Falcon)

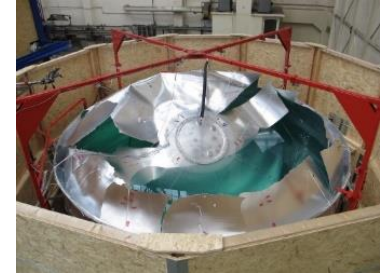


- ▶ MT Aerospace with about 11% workshare of Ariane 6
- ▶ Design definition authority for metallic aero structures
- ▶ Risk sharing partner with significant own investment



Ariane 6 Development and Qualification

- ▶ Additional budget to be confirmed during ESA council in March 2021
- ▶ Qualification campaign ongoing
- ▶ Delivery of all qualification models to test centres
- ▶ Successful qualification test of Upper Stage LH2 Tank
- ▶ Final qualification (pMG11) of A6 tanks and structures in 2021



Ariane 6 Series Production

- ▶ MT-A production plan: 3 shipsets in 2021 and 4 shipsets in 2022
- ▶ Minimum viable production (MVP) agreed with customer



Ariane 6 Carbon Fibre Reinforced Plastic (CFRP)

- ▶ Start of project for a performance and cost optimized black Upper Stage (PHOEBUS, ESA)





Program Schedule & Launch Scenario

- ▶ New A6 maiden flight date communicated by ArianeGroup: 2022
- ▶ Less than half of initial ramp up cadence planned: 0-0-3-5-9
- ▶ End of transition in 2024

MT-A Production Plan

- ▶ Continuous changes to ramp-up and production plans make efficient operational planning difficult
- ▶ Continuous reduction of Ramp-up for three years leads to adaptation of MT production plan
- ▶ Minimum viable production for 2021/2022 = 3 to 4 shipsets p.a.
- ▶ Prices per shipset will be adapted; additional costs of decreased cadence covered by compensation programs
- ▶ Confirmation of minimum production, Ramp-up, and Financing Plan expected in Q1/2021 by ArianeGroup and ESA

- **Main focus: Stabilization of production at lower cadence level and efficiency program (see next slide) will lead to positive margins in 2022**
- **Financial stabilization through ESA Transition Compensation programs**

- ▶ Lean in engineering and production
- ▶ Increase of agility level
- ▶ Enlargement of processes and company digitalization
- ▶ Potential adjustment of HC
- ▶ Transition to project-driven company
- ▶ Horizon 25+ program for central coordination of all necessary measures to ensure a successful transition phase and restructuring of MT Aerospace AG



BEYOND ARIANE 6

Kourou

- ▶ 50% MT-A share in upgrade of launch site & control center and operations of launch site in Kourou

Export

- ▶ Selling expertise in spaceflight and aeronautics engineering and production on export markets

Future Technology Program

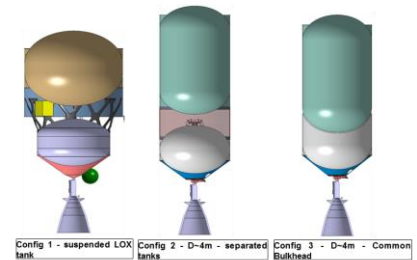
- ▶ Next Upper Stage preparation - Black Upper Stage, Metallic Stage Technologies (SCOUT)
- ▶ Automated Panel Production Line - Shot Peening development, Automated Production Line with AI elements
- ▶ Technology improvement
 - ▶ Material: “smart structures” with integrated sensors assessments
 - ▶ Processes: ISC - next generation flow forming
 - ▶ Digitalization: Factory 4.0: in development: “digital twin” concepts & manufacturing



A6 Launch Site Kourou



ULA Space Launch System



Black Upper Stage configurations

BEYOND ARIANE 6

CSTS – Mini Launcher

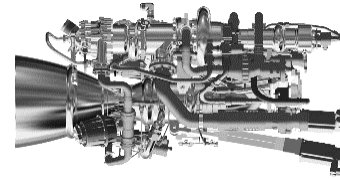
- ▶ Technology Development and Launch Support for Rocket Factory - Staged Combustion & Low Cost Tanks/Structures

NESTS

- ▶ New European Space Transportation Solutions Study – OHB, MTA, and RFA to prove capability of own launcher system

Technological Future

- ▶ CFRP – ComET, PHOEBUS, CompACT/HERA
- ▶ AM
 - ▶ SLM, DED, and AFSW technologies
 - ▶ entire additive value chain offered: digital design, additive manufacturing, post processing, certification/qualification
 - ▶ EUR 11 Mio. ESA FLPP contract expected
- ▶ H₂ - derive heritage from spaceflight projects for on-earth usage



Staged Combustion Motor



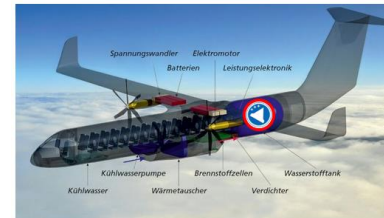
NESTS Setup



AM Ti6Al4V tank structure



DED unit at MTA



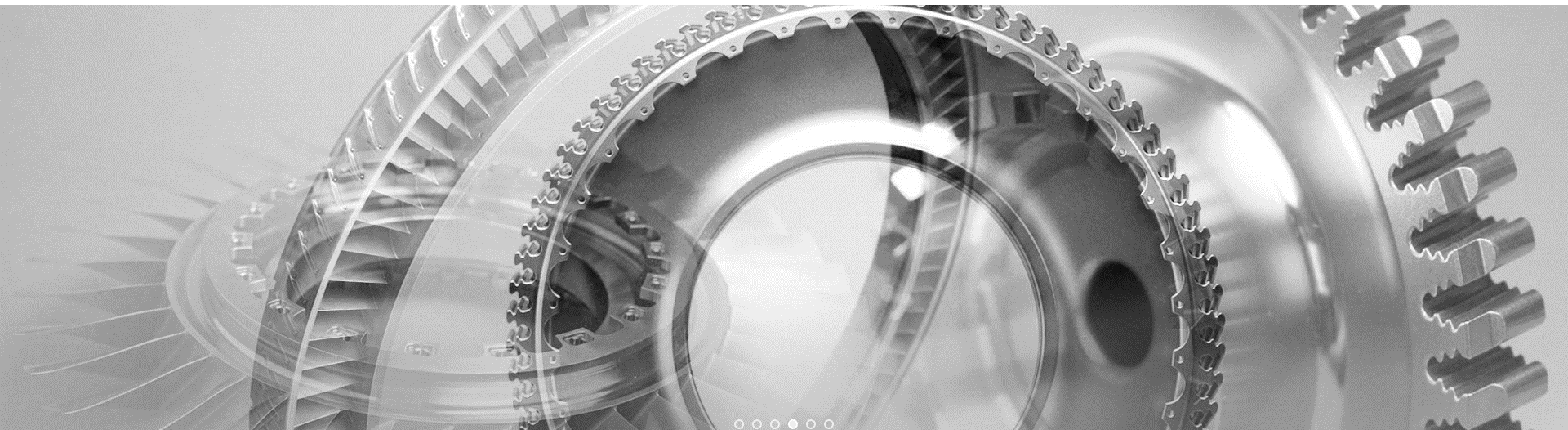
H₂ Concept



H₂ CFRP cryo tank



AEROTECH
PEISSENBERG



AEROTECH PEISSENBERG

WELCOME TO AEROTECH (THE AEROTECH GROUP IS A NON-CONSOLIDATED PARTICIPATION OF OHB SE)



Aerotech Peissenberg GmbH & Co. KG

- Headquarters of the Aerotech Group
- Founded in 1970



ATC Space

- Founded in 2018
- ARIANE 6 footprint
- Aluminum Structures and Components



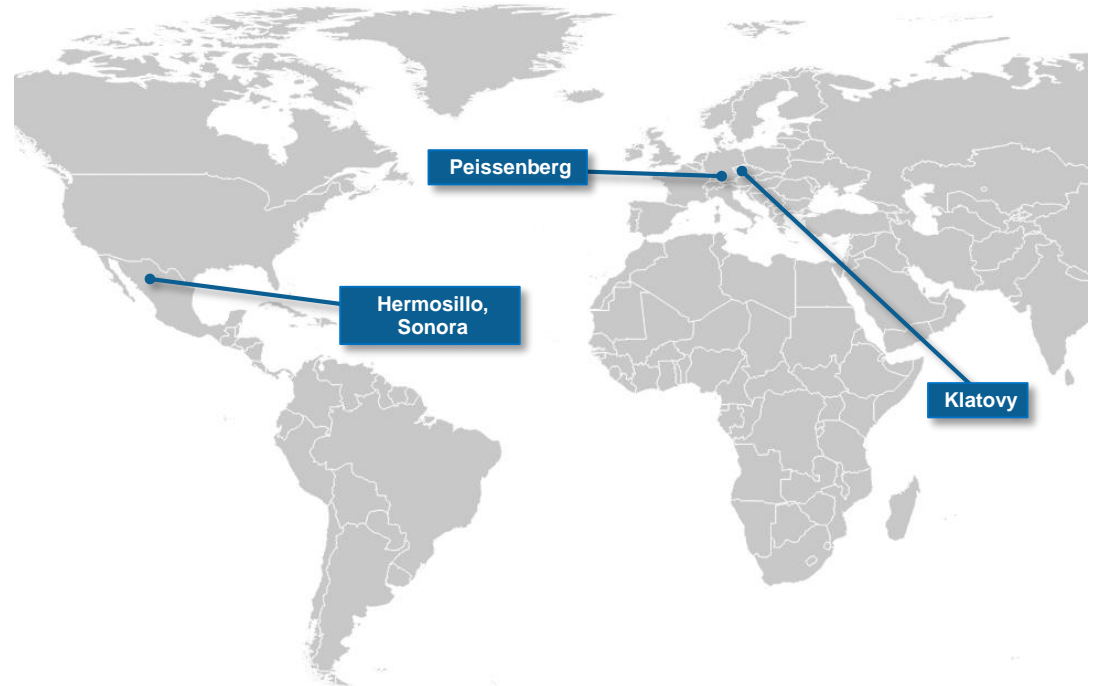
Aerotech Czech s.r.o.

- Founded in 2005
- Best-cost production site

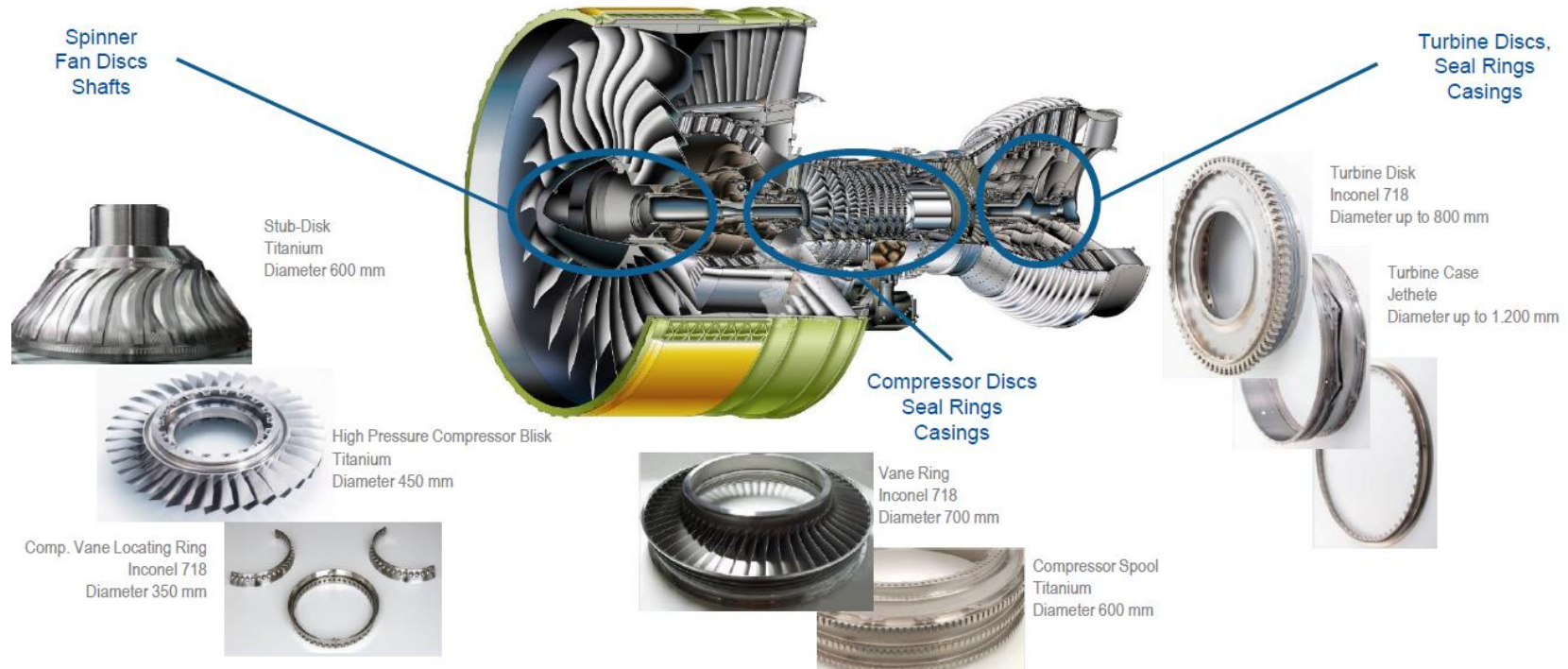


AT Engine Mexico S.A.P.I. de C.V.

- Founded in 2016
- Single purpose



AEROTECH PEISSENBERG PRODUCT EXAMPLES



AEROTECH PEISSENBERG PRODUCTS IN NEARLY EVERY FLYING ENGINE



AS A TECHNOLOGY PARTNER FOR ENGINE MANUFACTURERS, THE AEROTECH GROUP WILL REALISE GROWTH ON THE BASIS OF INITIATIVES ALREADY LAUNCHED



Despite the current difficult situation in the aviation industry, the company is in a stable business situation and generates a sufficient Cash-flow



AEROTECH PEISSENBERG PRODUCT EXAMPLES



Turbine Disk
Inconel 718
Diameter up to 800 mm

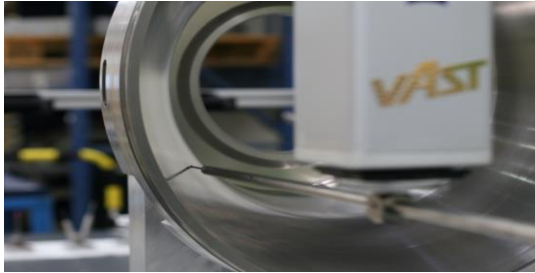


Turbine Case
Jethete
Diameter up to 1.200 mm



Seal Ring
Waspaloy
Diameter up to 1.200 mm

STANDARD & SPECIAL PROCESSES



CMM inspection



Visual inspection



Plasma Coating



Etching AtFin



FPI Testing

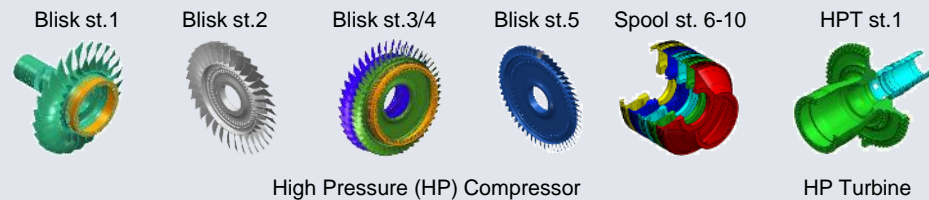
AT ENGINE MEXICO



ATEM – THE CONTRACT



- **Customer:** GE Aviation
- **Signature:** 2017
- **Term:** 2017 - 2037
- **Value:** 2.8 bn\$
- **Scope:** 6 p/n, 2 variants
- **Volume:** 1200 engine sets p.a.
- **Turnover:** ~200m\$ p.a. (at full rate)



**LEAP
Engine**



ATEM FACILITY – FROM DESERT TO HIGH-TECH



AT ENGINE
MEXICO

2017



2019



2020/21



inauguration 2021

EQUIPMENT – BEST IN CLASS



AT ENGINE
MEXICO



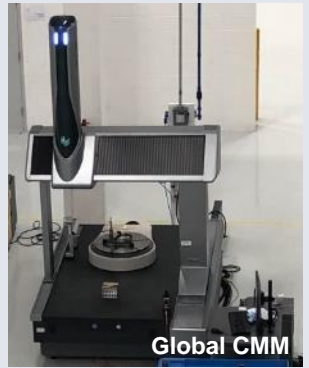
CTX1250



DMC100FD



DMC125FD



Global CMM



MTI 480S Inertia welder



Grit blasting & Plasma spray

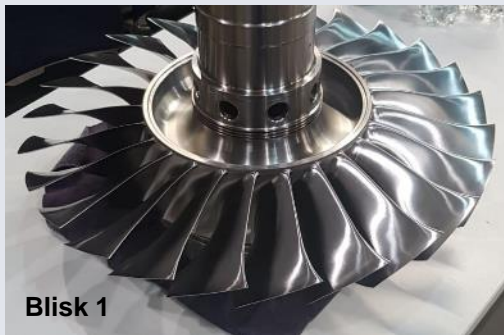


Blue Etch Anodize

PRODUCT PORTFOLIO



AT ENGINE
MEXICO



Blisk 1



Blisk 3/4



Blisk 5



Blisk 2



HPT s11



Spool 6-10



RFA
Rocket Factory

Your Launch into the New Space

**Reaching orbit with
groundbreaking efficiency**

Launching a new age of space

We are announcing an unmatched price for future launches of our rocket

3m€

Making space easily accessible

We are preparing for an unprecedented number of lift-offs per year

50 launches

Robust capacity for cargo

We are creating record payload-lifting-power to boost cost-efficiency

1,300 kg

Creating a Henry-Ford-moment

We are combining landmark engineering with unrivaled serial space flight production skills

Technology + Industry

Democratizing access to space

We are fostering industrialization by putting cutting-edge technology to large scale use

From rocket science
to rocket factory



**We have precious planet
Earth to take care of.
A new generation of satellites
enables us to better manage it.**

**We are losing control of
our life support system.
Let's put eyes in the
skies
to better understand it.**





**We are drowning in man-made problems.
Earth can best be fixed by understanding
it.**

**Bringing connectivity to
places that need it the most.**



**Enabling autonomous driving
with extremely low latency.**

An aerial, long-exposure photograph of a complex highway interchange at night. The image is dominated by vibrant light trails from cars, creating a sense of motion and speed. The trails are primarily in shades of blue and cyan, with some warmer orange and red tones. The interchange features multiple levels of overpasses and ramps, creating a complex, multi-layered structure. The overall scene is illuminated by the city lights and the headlights/taillights of the vehicles, creating a high-contrast, futuristic atmosphere.

We are addressing three key problems

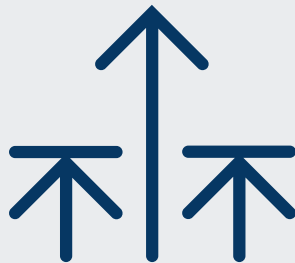
...

Limitations of today's offerings for satellite launches create pain points for customers



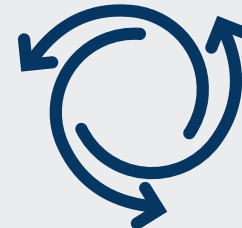
High Prices

Space Transportation is the highest cost block for small satellite operators to bring constellations into use



Inflexibility

Launch is the bottleneck in small satellite value chain deployment, since heavy launchers have inflexible launch schedules and no last mile delivery for dedicated orbits



Complexity

Immense handling and organisational efforts, no end-to-end service for small satellite launches to LEO

... with three innovative key solutions

We are easing our customers' pain points with cutting-edge technology delivering robust results



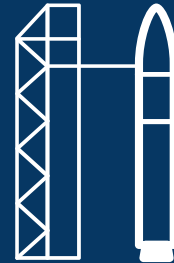
Lowest price

We industrialize rocket production. Standard industrial parts and highly efficient production technologies create unique cost advantages.



Last mile delivery

We go the extra mile. Our orbital stage can precisely position up to 100 satellites. Entire satellite constellation deployments are possible with just one launch.



Superior technology

Our propulsion system is more powerful, more efficient and significantly more sustainable than conventional technologies.

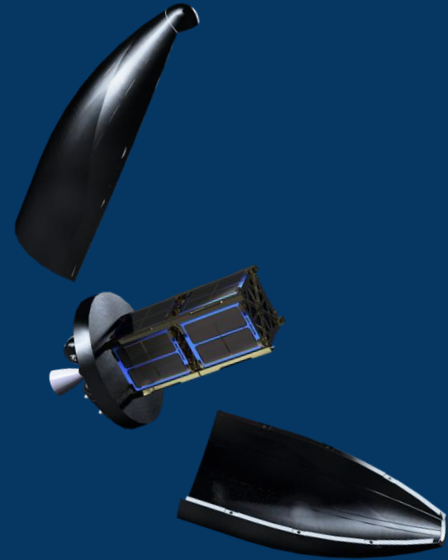
A unique combination of features

The most impactful technological highlights of our launcher



Propulsion System Cluster

Our staged-combustion technology combines high performance with cost efficiency transferred from automotive serial production.



A unique combination of features

The most impactful technological highlights of our launcher



Second Stage Tank

We use a common tank design made of inexpensive stainless steel for maximum cost efficiency.

A unique combination of features

The most impactful technological highlights of our launcher

Orbital Stage

Our in-house developed orbital stage allows us to deliver a payload of 1,300 kilograms to space, bringing satellites to the specific orbits our customers desire.



Eight key takeaways from today

Core advantages created by the unique combination of skills and access to markets

Team

- 1 Experienced founding team with proven track record
- 2 85 highly skilled and ambitious employees with entrepreneurial drive

Production

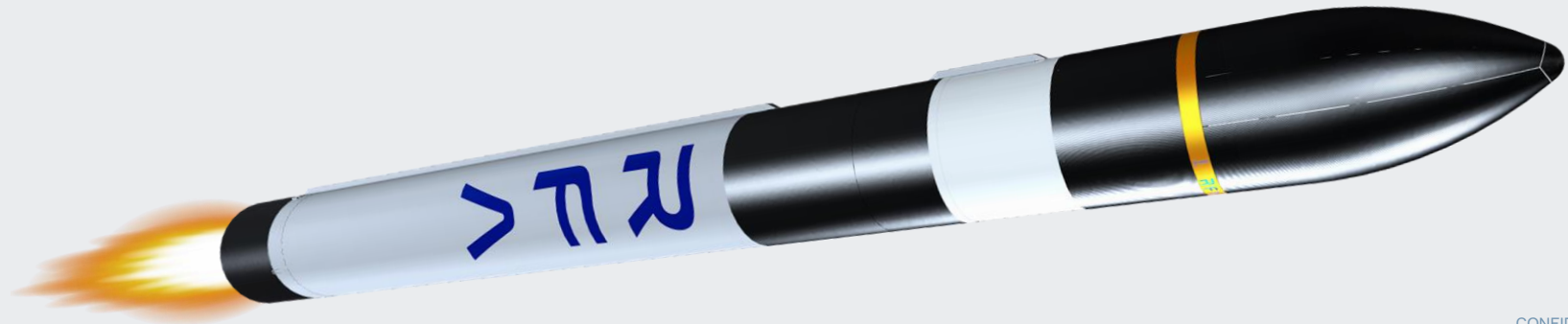
- 3 Industrialization inspired by the German automotive environment
- 4 High vertical integration with production and test inhouse (e.g. 3D Printing)

Technology

- 5 Propulsion system efficiency: 30% more cost efficient
- 6 Automated and AI driven optimization of parts through data analytics

Anchor customer

- 7 Lol for 25 launches with OHB
- 8 Several hundred millions of sales pipeline with worldwide customers



Next funding round is about to open

Clear roadmap for investors with precisely defined milestones of technical progress

Series A
15m€

Series B
25m€

Series C
75–100m€

Proof of concept

Validation of core technologies

- ✓ Test site implemented
- ✓ 5,000 sqm production facility set-up
- ✓ Proof of concept for main propulsion, structures and avionics elements
- ✓ Own spaceport in the Azores secured
- ✓ 10m€ institutional contracts
- ✓ Pipeline of 400m€+ in Lols and MoUs

Qualification at stage level

Validation of all required technologies

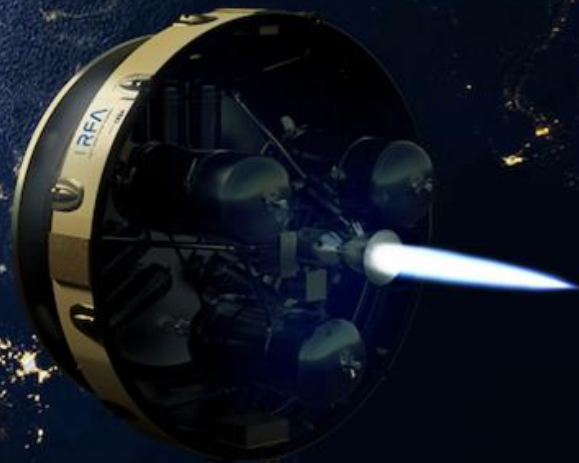
- Orbital stage prototype finalized
- Propulsion system qualified
- Hot fire at stage level
- Launch site implementation
- 20m€ institutional contracts
- Pipeline of 500m€+ in signed contracts and Lols, MoUs

Launch and industrialization

Implementation of mass production

- Optimizing technology
- Preparation of industrialization processes
- Launch site to host 1st and 2nd test flight
- First commercial launches from own space port
- 30m€ institutional contracts
- Scaling production and flight cadence

Thank you for joining our mission



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