PARADIGM3D
on the fly manufacturing

THE REGION'S FIRST STATE OF THE ART DIGITAL MANUFACTURING CENTER

Corporate presentation 2024

AGENDA

01 Company Mission and Vision

02 Market dynamics for Additive Manufacturing

03 Our Current Capacity

04 Why Additive Manufacturing?

05 Markets and Services

06 Certifications, Safety, and Compliance

05 Examples of Work

1. Mission & Vision

MISSION

To transform the perception of 3D printing into a competitive manufacturing process that can help local industrialists explore new concepts for localization and value-added product innovation.

Vision

To align with UAE's vision of becoming a hub for MRO in Aerospace by decentralizing the standard supply chain to create a unique made in UAE manufacturing environment to serve this vision.

2. Market dynamics for Additive Manufacturing

3D Printing Is Shifting Towards Manufacturing

Prototyping

The process of manufacturing singular products/geometries for design and testing purposes

Airplane Wing Prototype

Manufacturing

The process of producing parts/components for the purpose of end use (production parts) or use in shop floor application (manufacturing tooling)

Electric connectors

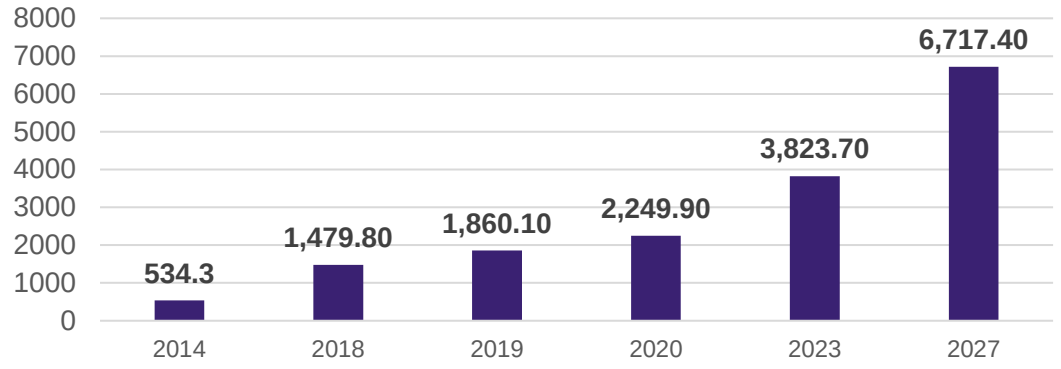
Weldment fixture

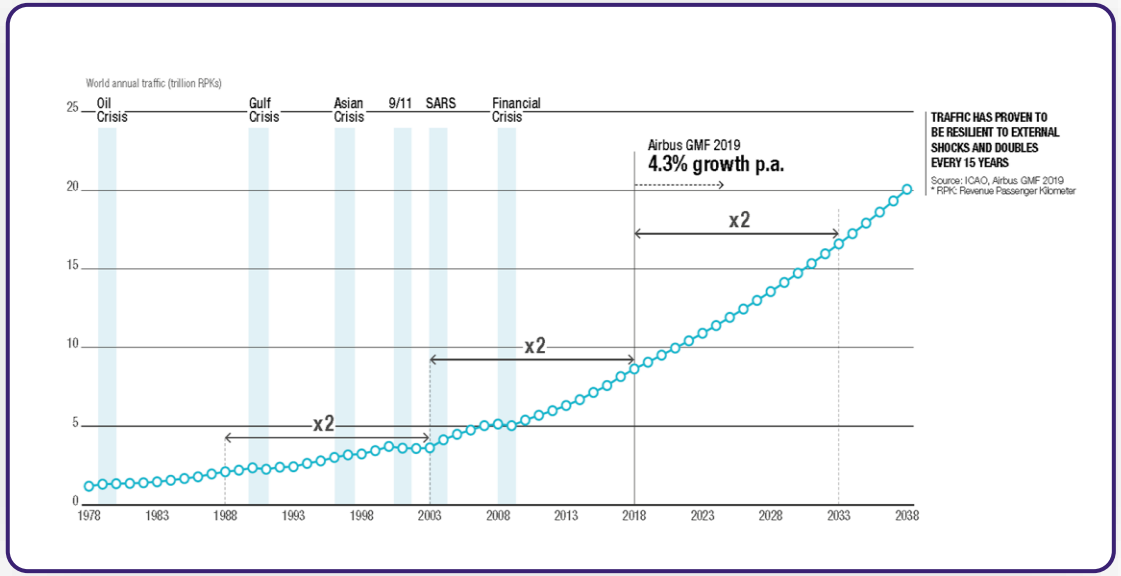
Transition is key challenge for incumbent OEMs

2. Market dynamics for Additive Manufacturing

Aerospace industry & AM

Aerospace 3D printing Market Trend & Forecast (US$ Million)





Aero 3DP has nearly tripled in 5 years, and the pace isn't letting up

FDM and Metals are the Aerospace technologies of choice

Aerospace is remarkably resilient to shock over the long term (RPK – revenue passenger kilometers doubles every 15 years)

3. Our current capacity

AM materials

2 x Stratasys F900 FDM 3D Printers

1 x F450 FDM 3D Printer

1 - EPlus Metal 3D Printer

Polymer Materials: High performance- ULTEM, Antero, PC, Nylon and Regular – ABS, ASA

Metal Materials: Aluminum, Steel, High Temp Alloys, Magnesium Alloys, Titanium, Other (tungsten)

3. Our current capacity - facility

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4.Why additive Manufacturing

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Additional design freedom

- Increased part functionality through unique design solutions
- Potential for weight saving and
- Decreased number of components (smaller assemblies).

Reduction of waste material

- More sustainable than conventional manufacturing.
  - No unrecyclable composite waste
  - Eliminate use of hazardous materials
  - Reduced logistics-related costs & carbon footprint

“Bottleneck” reduction

- Reduced labor intensiveness and dependency on specific skills (in-house CNC work, CAM, bonding, etc.)

Supply chain simplification

- No MoQs
- No requirement for part storage
- On-demand (JIT) manufacturing
- Digital inventories

5. Markets and Services

- Comercial Aviation
- Space & Transportation
- Oil & Gas

- Re engineering of mechanical parts for additive manufacturing (Dfam & 3d printing)
- Manufacturing of certified interior cabin components for Aviation
- Reverse Engineering of mechanical components
- Customized (individualized) design solutions based on customer needs
- Managements of Digital inventories

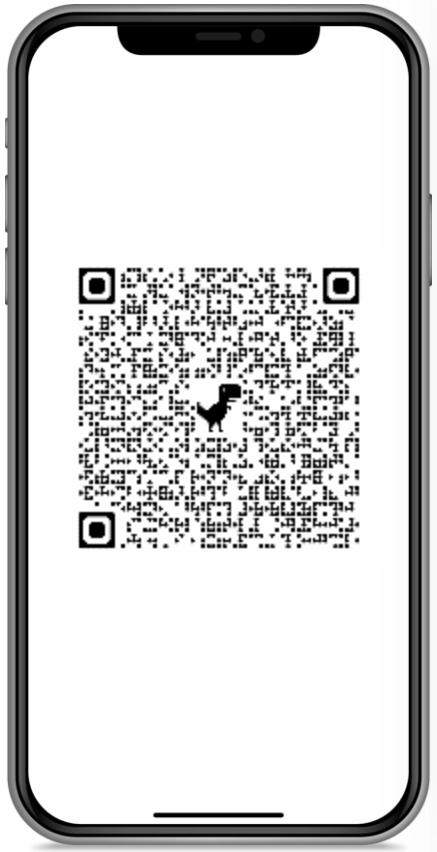
Strategic engagement with our customers to allow them to exploit the full capabilities of additive as an alternative manufacturing process

CERTIFICATIONS

EASA Part 21G approval

POA certification scope:

“Non-structural parts in non-metallic material for aircraft systems, cockpit and passenger cabin, produced by Fused Deposition Modelling (FDM) additive manufacturing technology”



Valsts aģentūra "Civilās aviācijas aģentūra"

Apstiprinājuma nosacījumi / Terms of Approval: TA.LV.21G.0002

Šis dokuments ir daļa no Ražošanas organizācijas apstiprinājuma apliecības Nr. LV.21G.0002, kas izsniegta:

Organizācijas nosaukums: SIA "AM Craft"

1. sadaļa DARBA APJOMS

RAŽOŠANA / PRODUCTION OF: RAŽOJUMU KATEGORIJAS / PRODUCTS CATEGORIES

C2 Daļas / Parts: Nestrukturālas detaļas no nemetāliskā materiāla gaisa kuģu sistēmām, pilotu kabīnei un pasažieru kabīnei, ražotas ar kausētās nogulsnēšanās modelēšanas piedevu ražošanas tehnoloģiju / Non-structural parts in non-metallic material for aircraft systems, cockpit and passenger cabin, produced by Fused Deposition Modeling additive manufacturing technology

Detalizēta informācija un ierobežojumi norādīti Ražošanas organizācijas pārskatsrujuma 1.9. sadaļā.

2. sadaļa ATRAŠANĀS VIETAS: SIA "AM Craft" Braslas iela 22D, Rīga, LV-1035, Latvija

3. sadaļa PREROGATĪVAS

Sākotnējās izdošanas datums: 14.04.2022

Pārskatīšanas datums: 14.04.2022

Pārskatīšana Nr.: 0

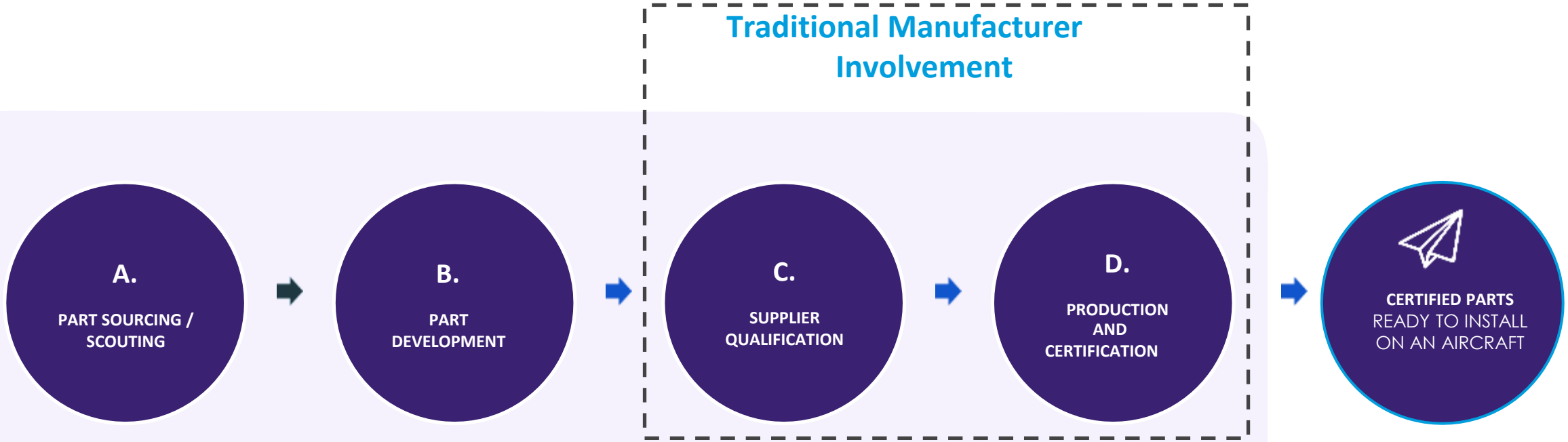
Paraksts:

Valsts aģentūras „Civilās aviācijas aģentūra” vārdā: Lidotspējas daļas vadītājs G. Lapi

UNDARS LAPIŅŠ

Paradigm 3D operates under AM Craft EASA Part 21G to deliver certified cabin interior parts for EMEA clients.

End-to-End Delivery of Certified Parts



- **Engage earlier**
- **Co-develop and finance parts**
- **Decentralized manufacturing**
- **Fully certified** (Design & Production)
- **12 Design Partners**

USE CASES (REAL EXAMPLES)

AIRCRAFT SEATS

Current situation:

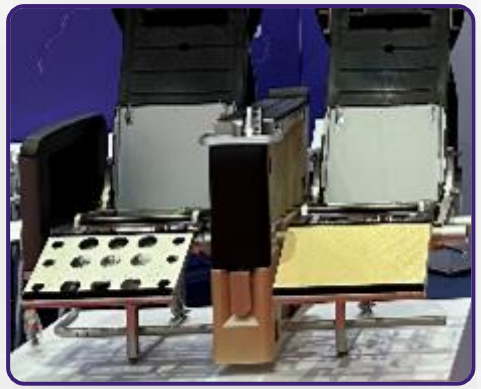
- Custom structures (i.e. middle console, leg rest, seat back cover bracket) made out of several hundred of sheet metal parts
- Long assembly times
- Expensive customization (both assembly and design)
- Cable management problematic during assembly and maintenance

Results:

Reduction of assembly time: 8-> 3 -38%

Reduction of number of components: 700+ -> 300+ -40%

- Seat back bracket, middle console & leg rest sheet metal components replaced with polymer parts of higher rigidity and reduced complexity
- Structural components kept in their original CNC milled form to ensure structural integrity (i.e. the pull out table assembly)
- Cable management streamlined with labeled and correctly angled channels



USE CASES (REAL EXAMPLES)

CABIN INTERIOR

Current situation:

- B/C seat compartment door originally constructed using aluminum sheet metal infill with thermoformed shells
- Complex construction requires at least 3 different machining steps with intermediate assembly

Results:

Weight reduction
913 g -> 496 g
- 46%

Subcomponent consolidation
10 -> 3
- 66%

Reduction in production processes
12 -> 2
- 84%

Possibility to easily change the product to fit new hardware or another seat model.

USE CASES (REAL EXAMPLES)

AERO

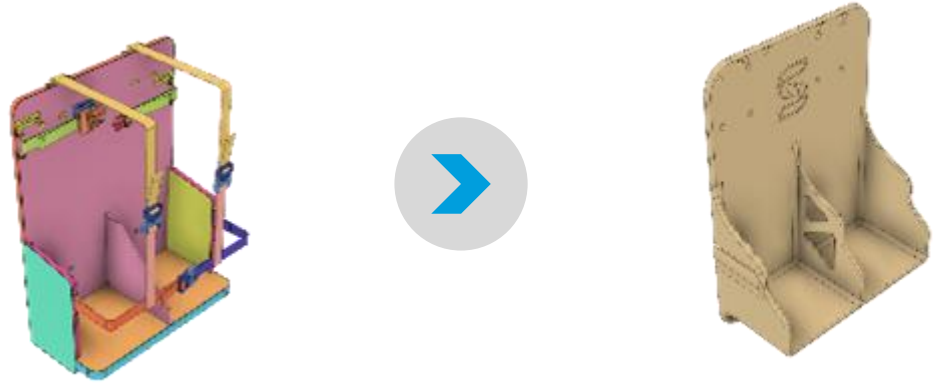
Current situation:

- Customer manufactures equipment bag holders for MedEvac helicopters using known and proven honeycomb construction
- Waste generation: composite panels are supplied in specific sizes, cuttings are discarded; excess mixed bonding adhesive must be discarded as well
- Manufacturing composite panel shelf involves at least 13 production steps; lead time is typically 4-5 weeks

Results:

Subcomponent consolidation	Reduction in production processes
47 -> 12	13 -> 5
- 74%	**- 61%**

Possibility to easily implement changes to fit different equipment and improved hygiene and cleanability due to a reduced number of crevices and sharp corners.



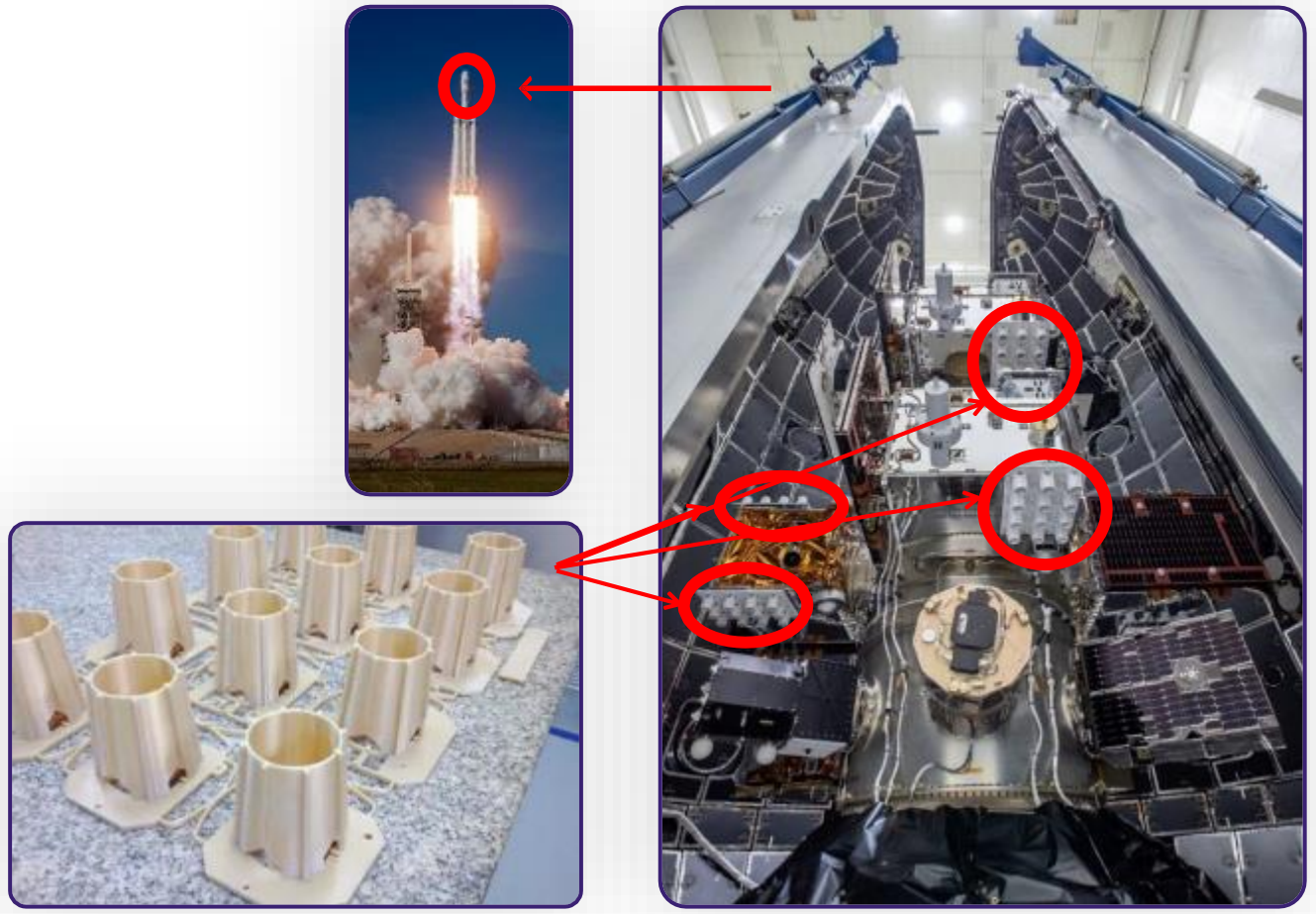
USE CASES (REAL EXAMPLES)

SPACE

NASA JPL
Satellite Parts

ULTEM antenna parts

produced at Stratasys Direct

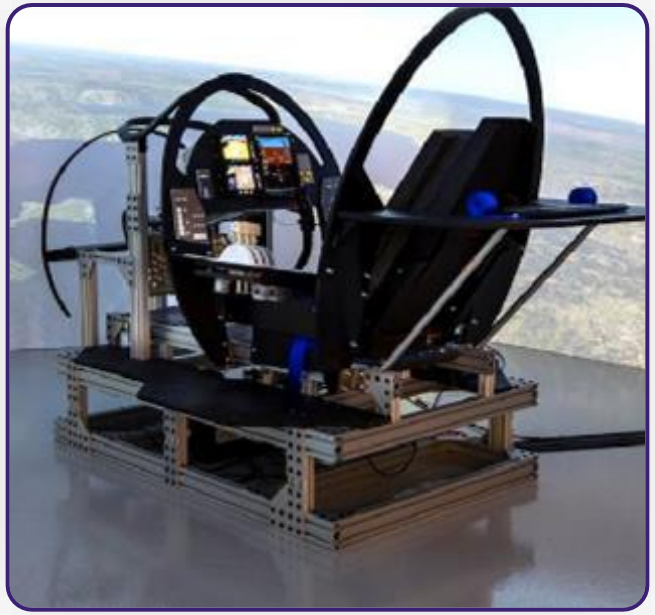


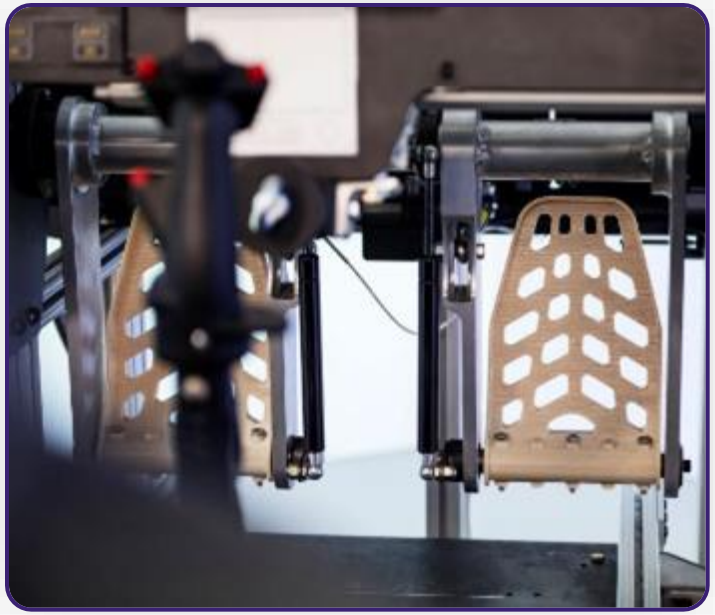
USE CASES (REAL EXAMPLES)

DEFENCE

Simulator Throttle

Functional hardware in the flight simulator: throttle controls and the q-feel mechanism





USE CASES (REAL EXAMPLES)

DEFENSE

Results:

World's first jet-powered, 3D printed UAV tops 150 mph with lightweight Stratasys materials.

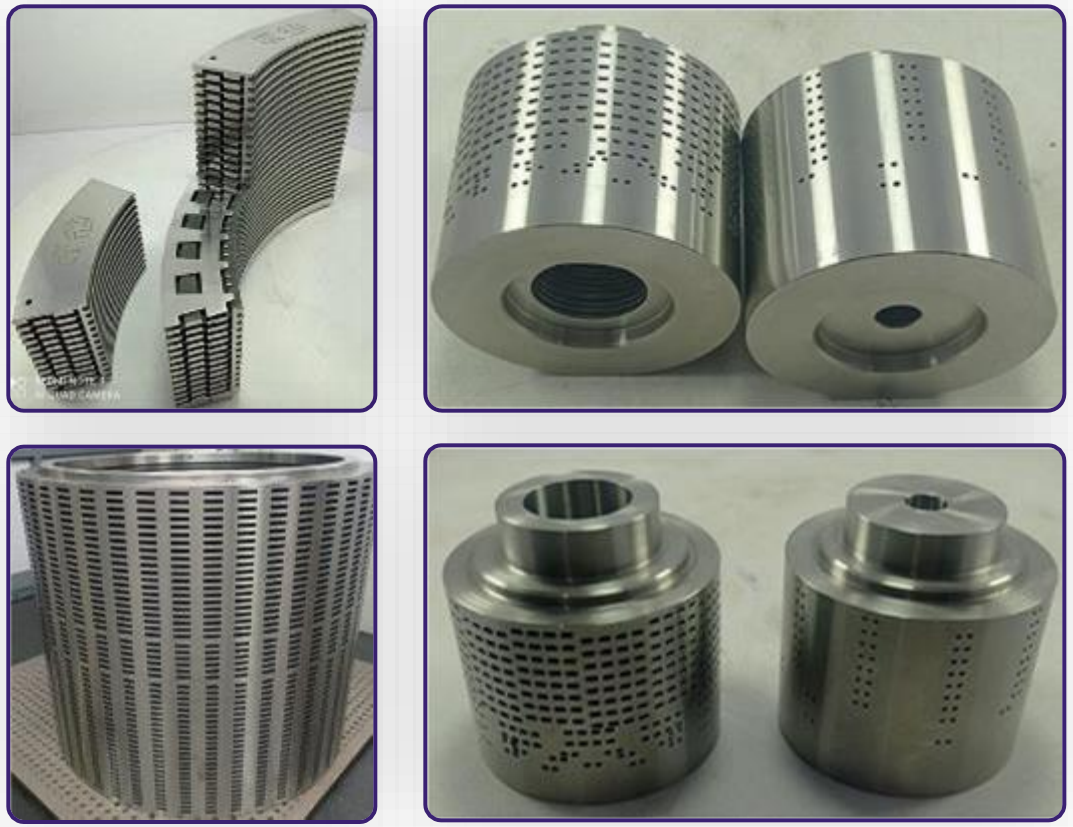
Using 80% 3D printed parts, the UAV is composed of Stratasys' ULTEM™ 9085 resin lightweight material to achieve flight speeds of over 150 mph.

The high-speed system boasts an impressive 9-foot wingspan and weighs in at only 33 lbs

USE CASES (Control valve- labyrinth cage) – OIL & GAS

Results:

- Innovative use of additive manufacturing to improve traditional manufacturing techniques (from weeks to days).
- 20%-30% reduction on price.
- Possibility to also repair damaged cages.



Customers

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STIRLING DYNAMICS
an expleo company

rega

Specialist Aviation Services

ATKINS

VIPE 21

euro Atlantic airways

FACC

FINNAIR

APTOZ

الإتحاد ETIHAD ENGINEERING

ZIM AIRCRAFT SEATING

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