Roboze

Innovazione nel Settore Aerospaziale per un Futuro Interplanetario

Matteo Regé - Roboze R&D Technology Manager

Accelerating the world's transition to sustainable manufacturing

Company overview

+120
EMPLOYEES WORLDWIDE

+500
PRINTERS INSTALLED

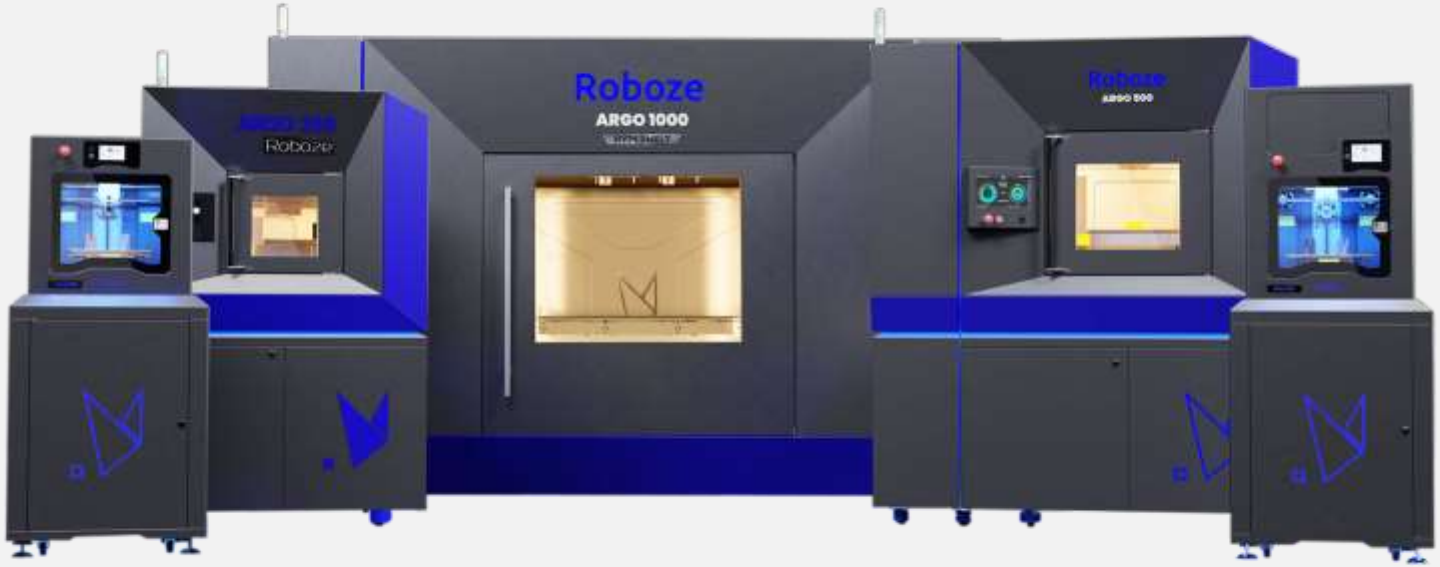
+50.000
PRINTED PARTS IN THE WORLD

+20
3D PARTS AND RESELLERS

#PrintStrongLikeMetal

Industrial 3D Printing solutions

Roboze Technological Ecosystem



Repeatable and scalable process

Get the utmost level of repeatability during manufacturing process. Fast, reliable, fully automated and engineered for production.

High performance super-polymers

Improve parts performances while reducing production times and costs through the use of high-performance materials for metal replacement.

Speed up innovation

Print and test components reducing validation times, accelerating product development.

#PrintStrongLikeMetal

Super polymers and composites

Roboze Materials

Bio-based PA
PA + Natural fibers

Excellent dimensional stability

Low hygroscopicity

Almost isotropic behaviour

Carbon Footprint

60% lower wrt. to
PAN CF reinforced PA

Carbon PA PRO
PA + Carbon Fibers

High tensile strength

High tensile modulus

Good thermal resistance

Tensile Strength

Test Method: ASTM D638
Value: **171 MPa**

ToolingX CF
PPS + Carbon Fibers

High stiffness

Chemical resistance

Low surface resistivity

Water Absorption

Test Method: ISO 69
Value: **<0.05%**

ULTEM™AM9085F
Polyether imide

Thermal resistance

Excellent FST rate

Dimensional stability at high temps

Flame Retardand

Test Method: UL94
Value: **V0**

#PrintStrongLikeMetal

Super polymers and composites

Roboze Materials

PEKK
Polyetherketoneketone

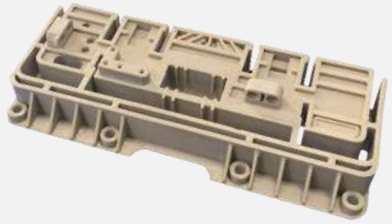
Low crystallization rate

Excellent printability

Good interlayer adhesion

Flame Retardand

Test Method: UL94
Value: **V0**



PEEK
Polyether ether ketone

Self lubricating

High thermal resistance

Extreme chemical resistance

Continuous Use Temp.

Test Method: ASTM D3045 Value: **250°C**

Carbon PEEK
PEEK + Carbon Fibers

High compression strength

High mechanical properties

Ideal for metal replacement in harsh environments

HDT (load 1.82MPa)

Test Method: ASTM D648
Value: **250°C**

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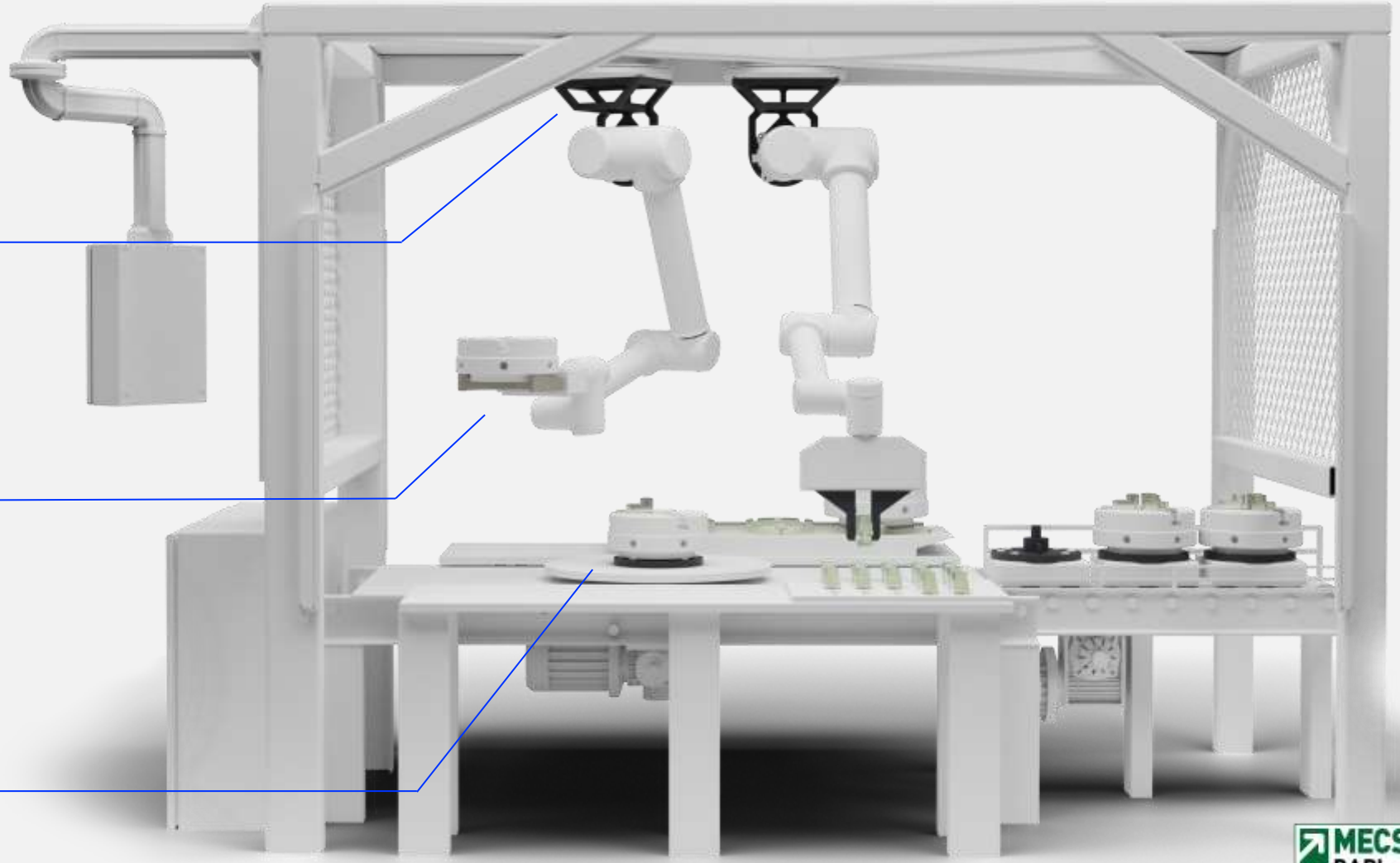
Industrialization of the production process

Improving manufacturing

Robot Frame Bracket
Carbon PA PRO

Robot Arm End-effector
PEEK

Centering device
Carbon PA PRO



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Low Earth orbit applications

Developing the Space Industry

Super Pressure Balloon 2

Telescope Holder
Carbon PEEK

CANVAS 4U Cubesat

MFD&Circuitry Holder
PEEK

Roboze Solution

- From Aluminium to Carbon PEEK
- Weight saving (-49%)
- Outgassing material for use in space
- Dimensional stability in the range of -40°C ÷ +80°C

Roboze Solution

- From CNC machining to PEEK 3D printing
- Several design iterations
- Cost savings (-88%)
- Design freedom for parts count reduction (-20%)

#PrintStrongLikeMetal

Space Medicine OPerationS (SMOPS)

Getting ready for the future

3D printing parts for space exploration

- Analogue mission that will take place at the **MDRS** (Mars Desert Research Station), a research facility in Utah, USA
- For two weeks in isolation, analogue astronauts will test different technologies and operational scenarios in the field of **space medicine,** in preparation for future human missions to Mars
- 3D printing is seen as a fundamental part of future space exploration and extra-terrestrial missions
- A **Roboze** printer will be taken on the mission for printing of objects for emergencies, scientific research, and everyday use

Advantages

- Custom designs
- Printing of spare parts
- Digital warehouse

MDRS facility

What's next

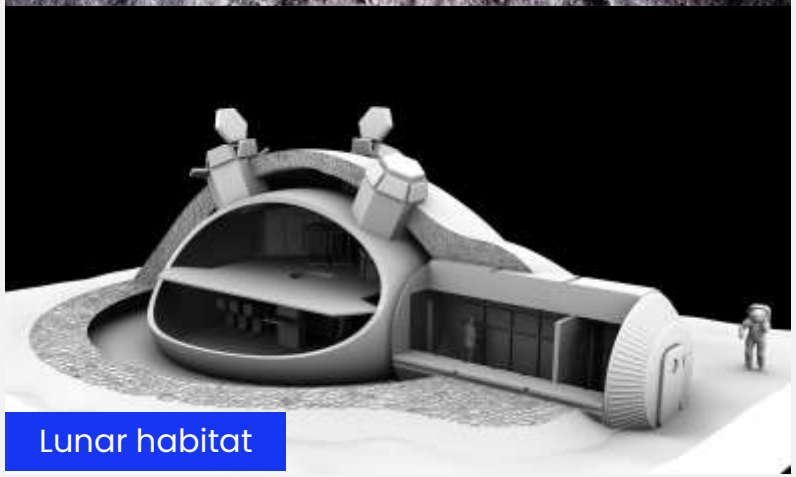
Mixing regolith and plastic for 3D printing

- **Regolith** (dust, broken rocks, and other related materials found on the surface of planets and moons) can be mixed with plastic to produce filament for FFF printing
- Filaments with different properties can be made and used to print various objects needed for extra-terrestrial settlements
- Bricks with custom geometries are a prime candidate for printing, enabling the construction of large structures such as habitats

Advantages

- ISRU **reduces the need for supplies from Earth**
- The design freedom in 3D printing allows objects to be manufactured for **specific applications**
- Recycling of old parts helps to **close the loop** and reduce the need for new resources


Regolith


Lunar habitat

Keep in touch

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