

ADDILÁN

WAAM TECHNOLOGY MACHINES

SAVE  
THE DATE!



**SPEEDTECH-
FORUMS**

17th March 2023 – Leioa, Spain

17/03/2023  

 Co-funded by the Horizon 2020 programme of the European Union under grant agreement No 952917

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addilan.com

Who we are

- March 2017 (established)
- Outcome of business cooperation between two main machine tool manufacturers (2014-2017)

ADDILÁN

Industrial Partner



MAHER HOLDING

Technology Partner



Public Investment



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WAAM TECHNOLOGY MACHINES

WAAM benefits

- **Lead time:** fewer production steps reduces production time allowing better control of the process. Local production.
- **Geometry freedom:** option for smaller weight and production time with improved material properties: Design for AM. Reverse engineering.
- **Material:** tested for high mechanical and fatigue properties.
- **Sustainability:** smaller material and energy consumption. Local production.
- **Cost:** allows full control of production and material costs.
- **Customizable:** flexible process that adapts to different production requirements.

WAAM vs traditional manufacturing methods

- Alternative mainly to casting, forging or machining
- Clearly beneficial for:
 - ✓ Big “buy-to-fly ratio”
 - ✓ Spare parts (each part different, low volumes, low lead-times, MOQ)
- ADDILAN performs business cases for specific parts/projects



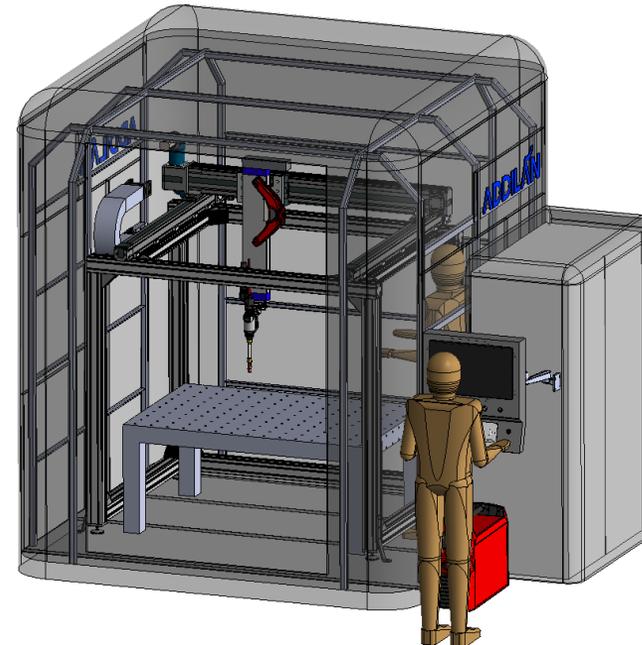
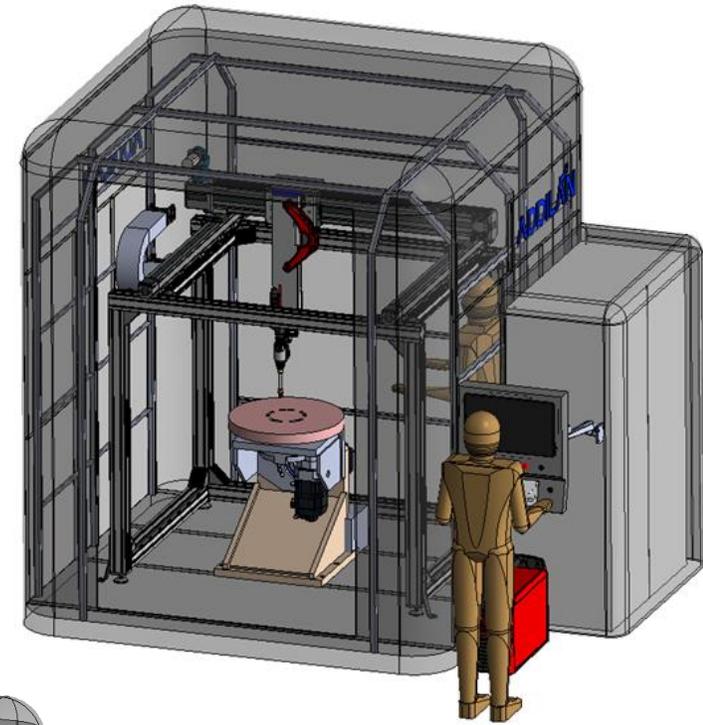
ARCLAN

Modular solution

- **Printing volume:** 1000x1000x500mm/D600x700mm
- **Maximum part weight:** 300-500 kg
- **Axis:** 3-5
- **Technology:** PTA, MIG, CMT
- **Deposition rate:** 0,5-10 kg/h
- **Monitoring system:** pyrometer, laser sensor & cameras
- **Layer height:** 1-3 mm
- **Min. layer width:** 4 mm

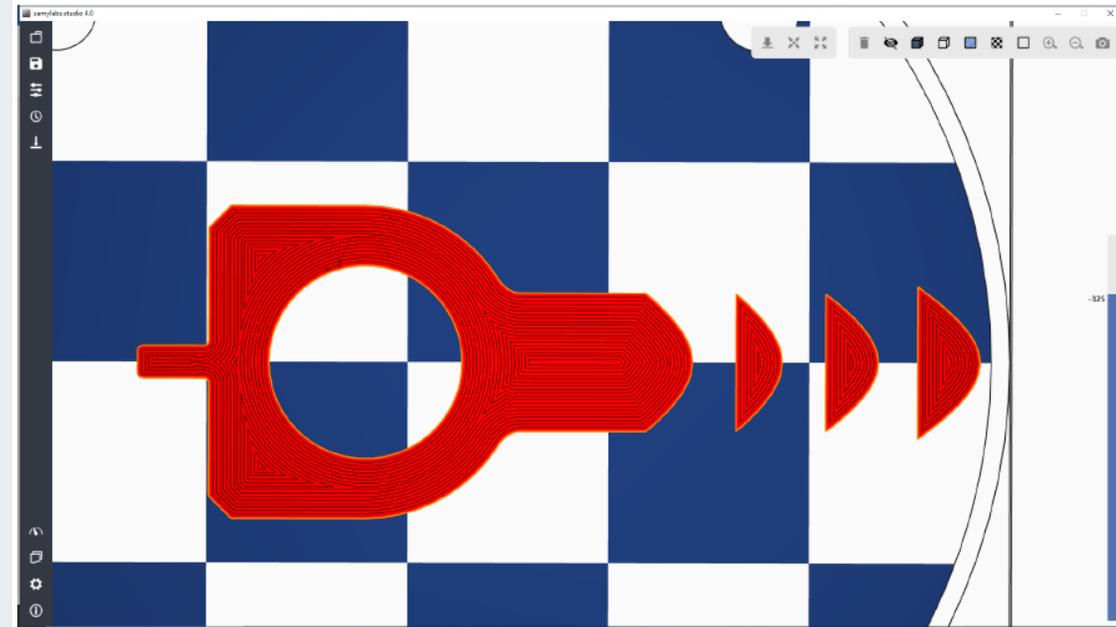
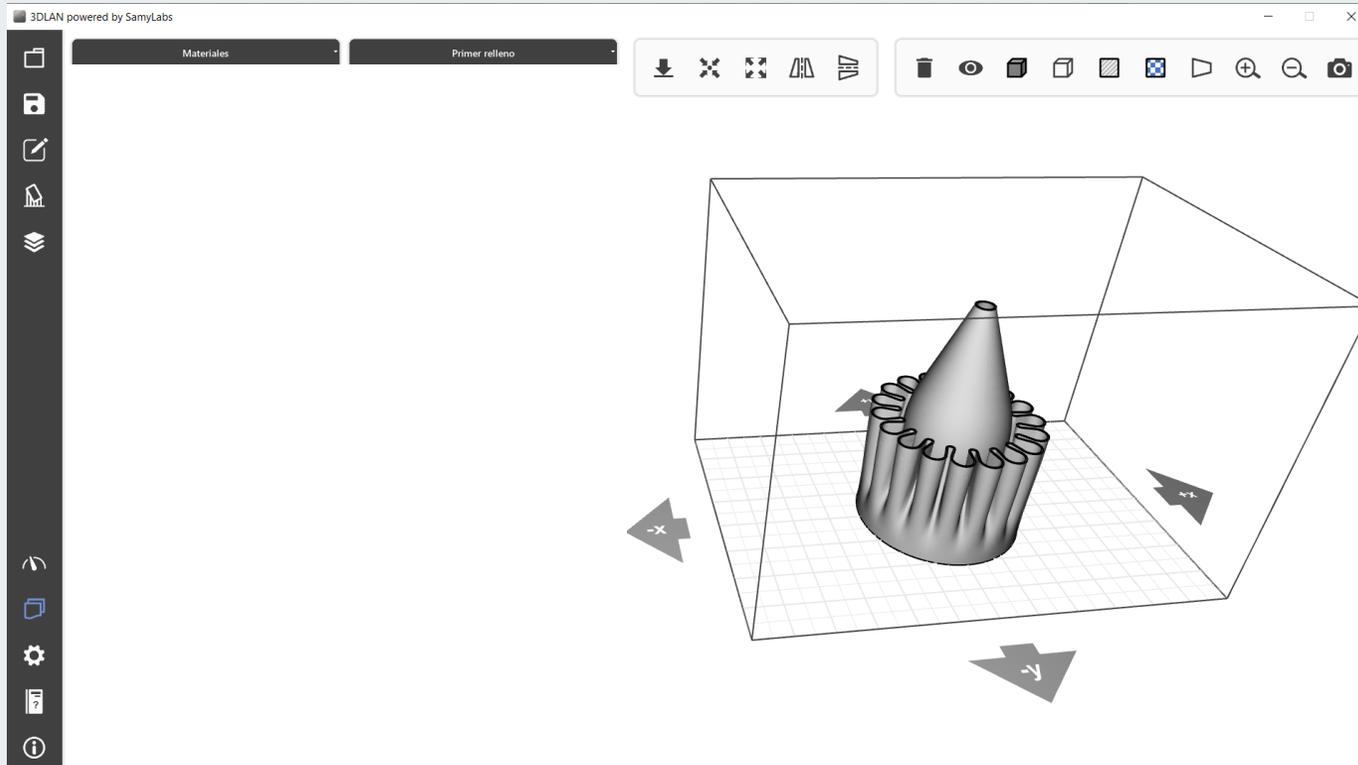
Options

- **Inert atmosphere chamber**



3DLAN

- Own developed software to minimize preparation time
- Full control of the parameters during the whole process
- User-friendly HMI



Monitoring System

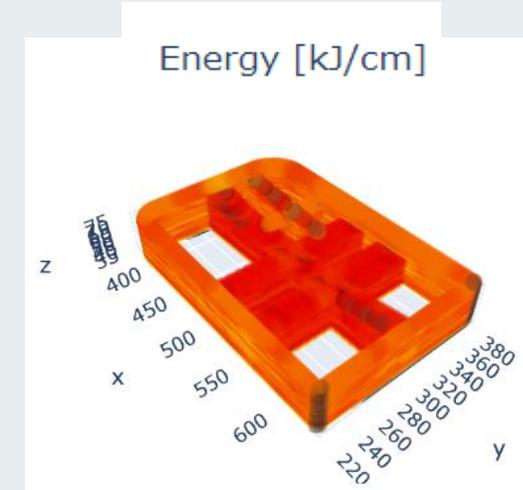
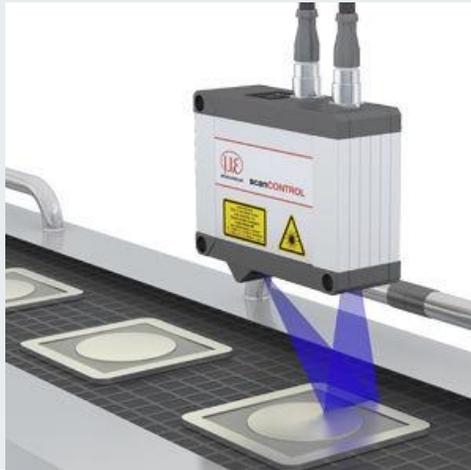
- **Basic Monitoring System:**

- Pyrometer
- Laser sensors for displacement
- Visible Camera. Operator Camera
- Welding Parameters.



- **Advanced Control Camera Solution, “ThermLan Control”, a solution based on:**

- Infrared Camera in process. Monitoring and control Melt pool
- Full Integration in the control and HMI extension

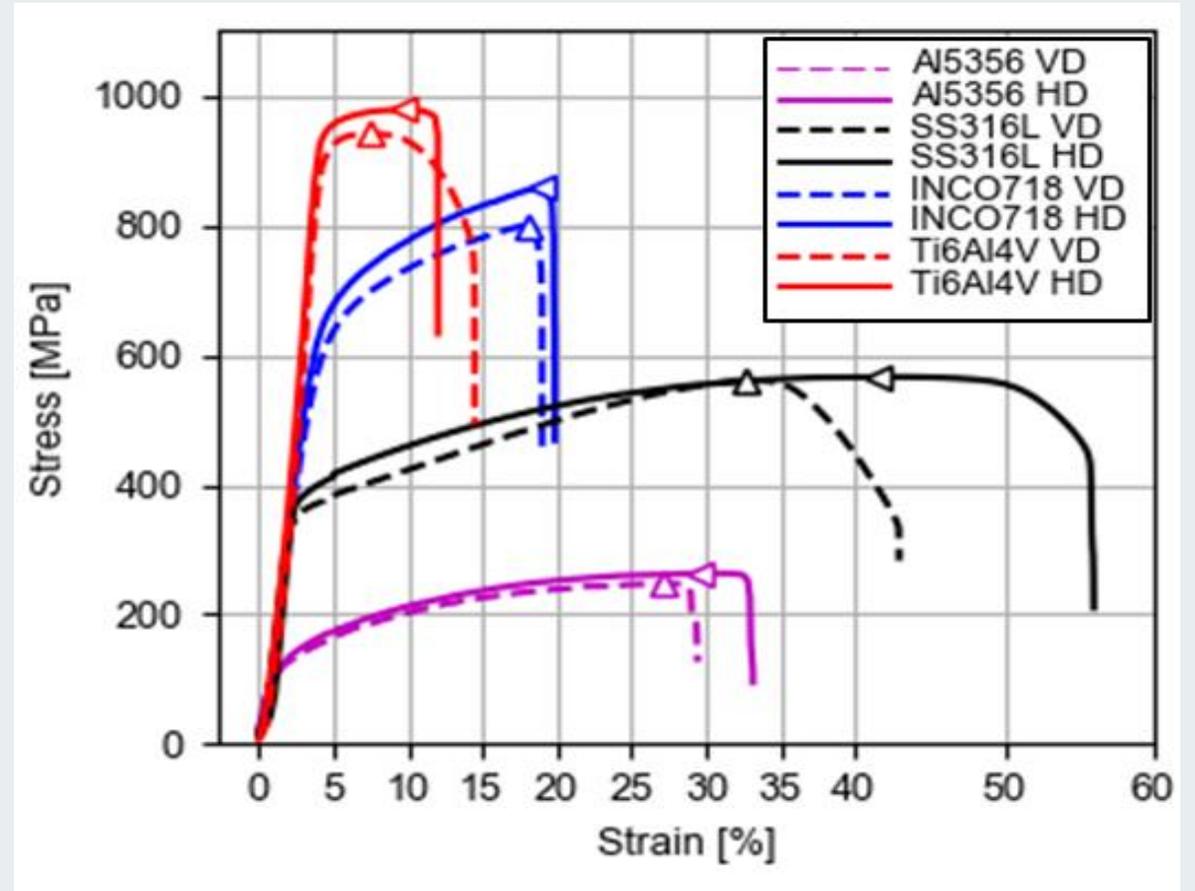


OPTIONAL

MATERIALS & TESTING

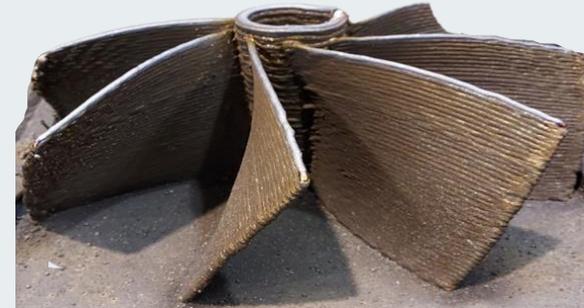
Tested materials by ADDILAN

- Aluminum 5356 and Al 4040 (MIG)
- Low alloy steel (ER70) (MIG)
- 316L stainless steel (PTA/MIG)
- Titanium 6Al4V (PTA)
- Invar (PTA/MIG)
- Inconel 718 (PTA/MIG)



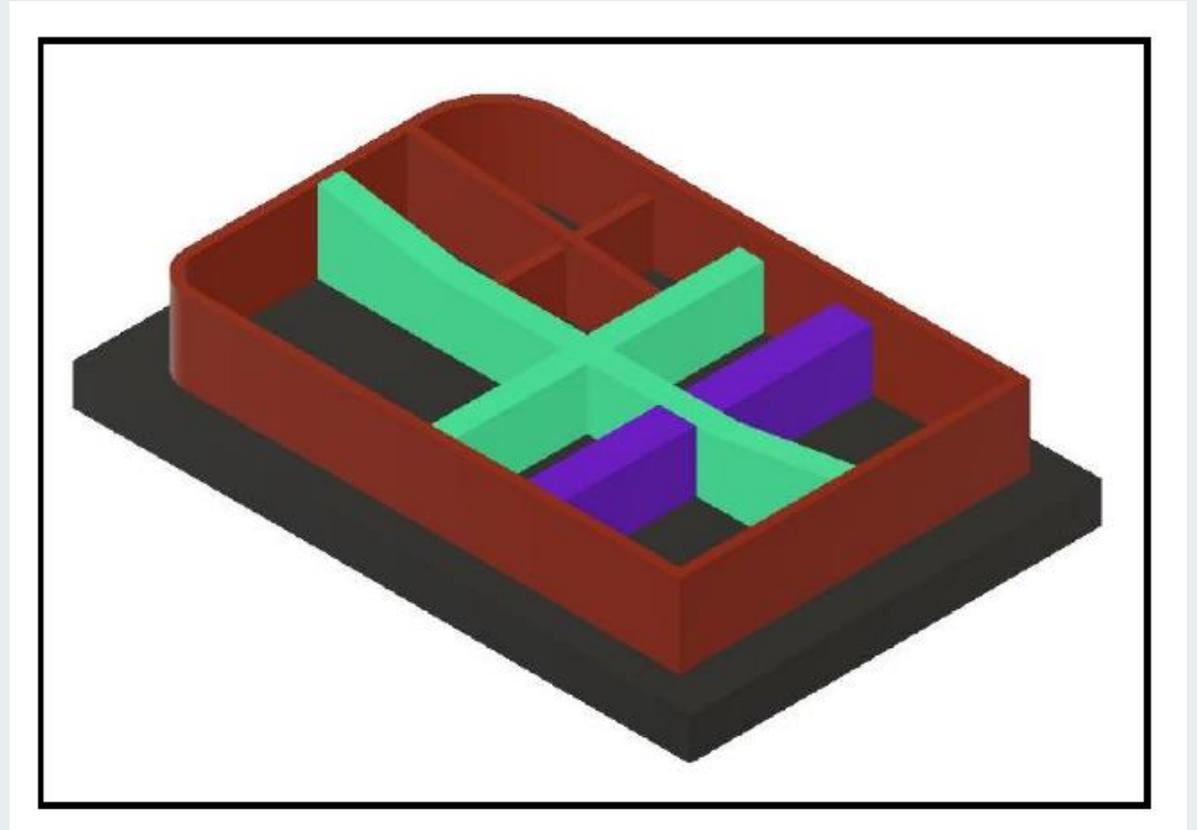
APPLICATIONS

- **Manufacturing of medium to large size**
- **Highly demanding industrial sectors:**
 - Aerospace
 - Trains
 - Energy
 - Shipbuilding
 - Oil & gas
 - ...



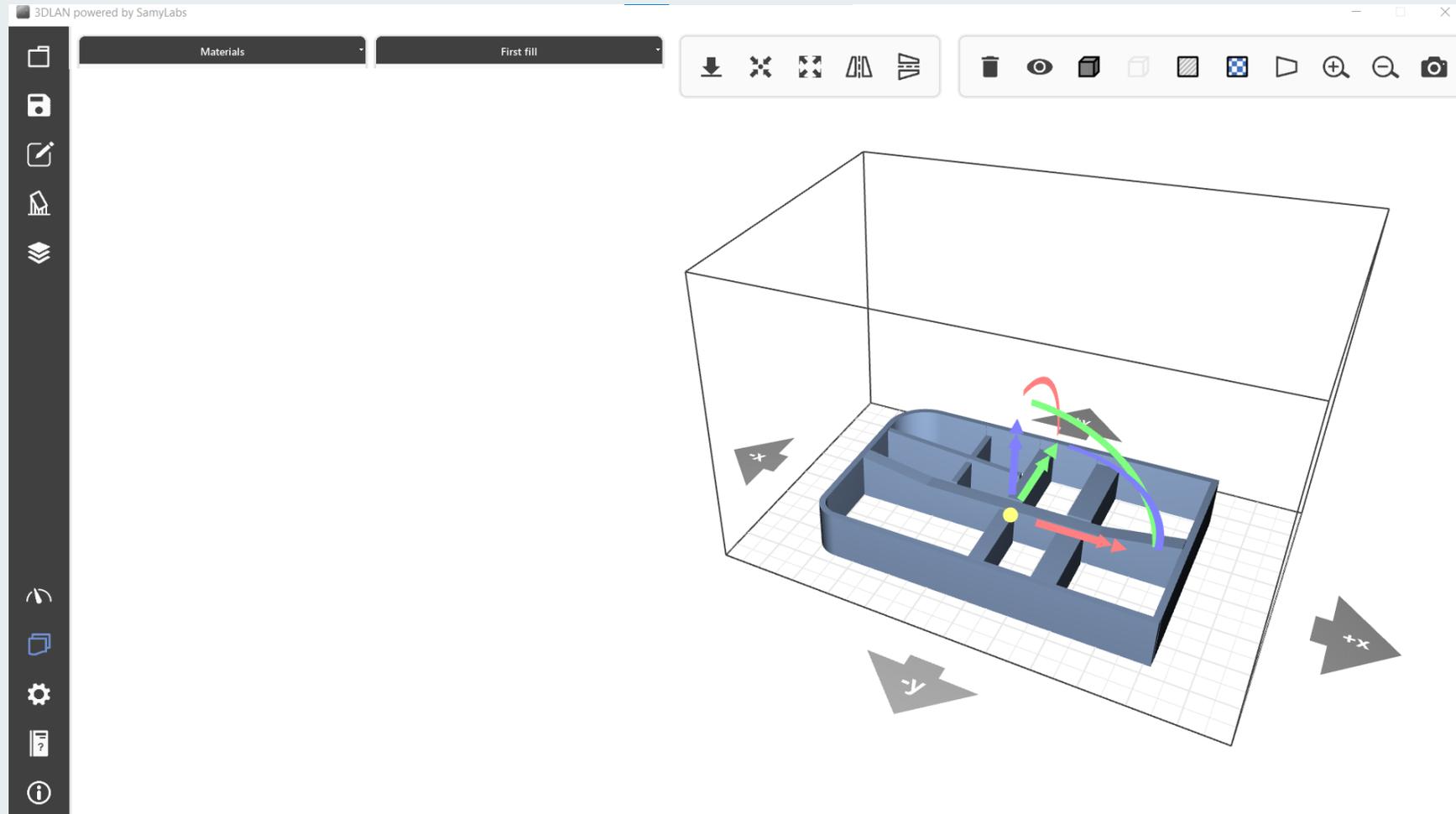
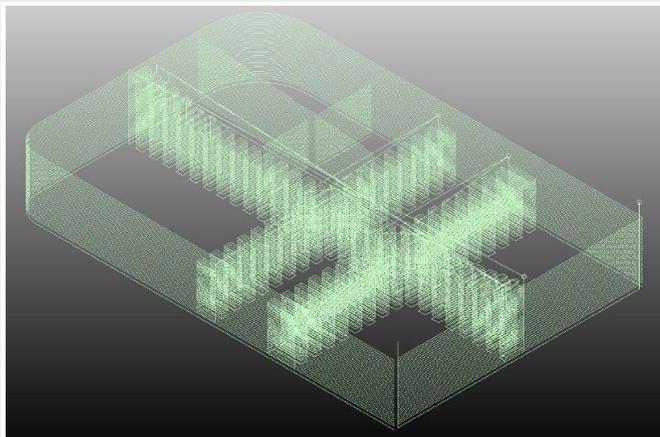
Demonstrator

- **Part weight:** 3kg
- **Material:** Ti 6Al4V

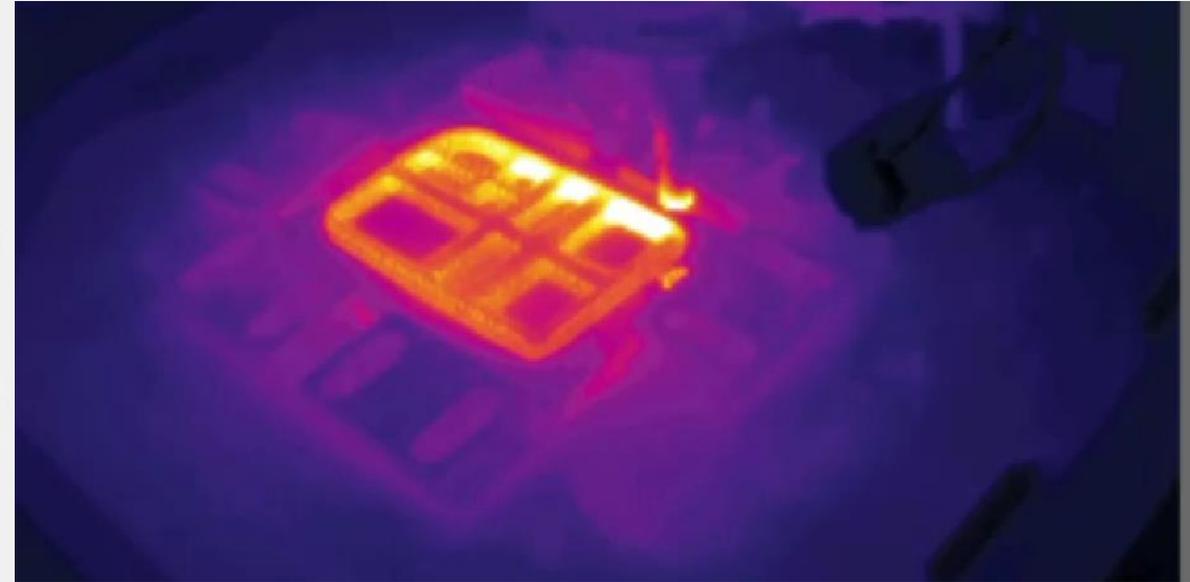
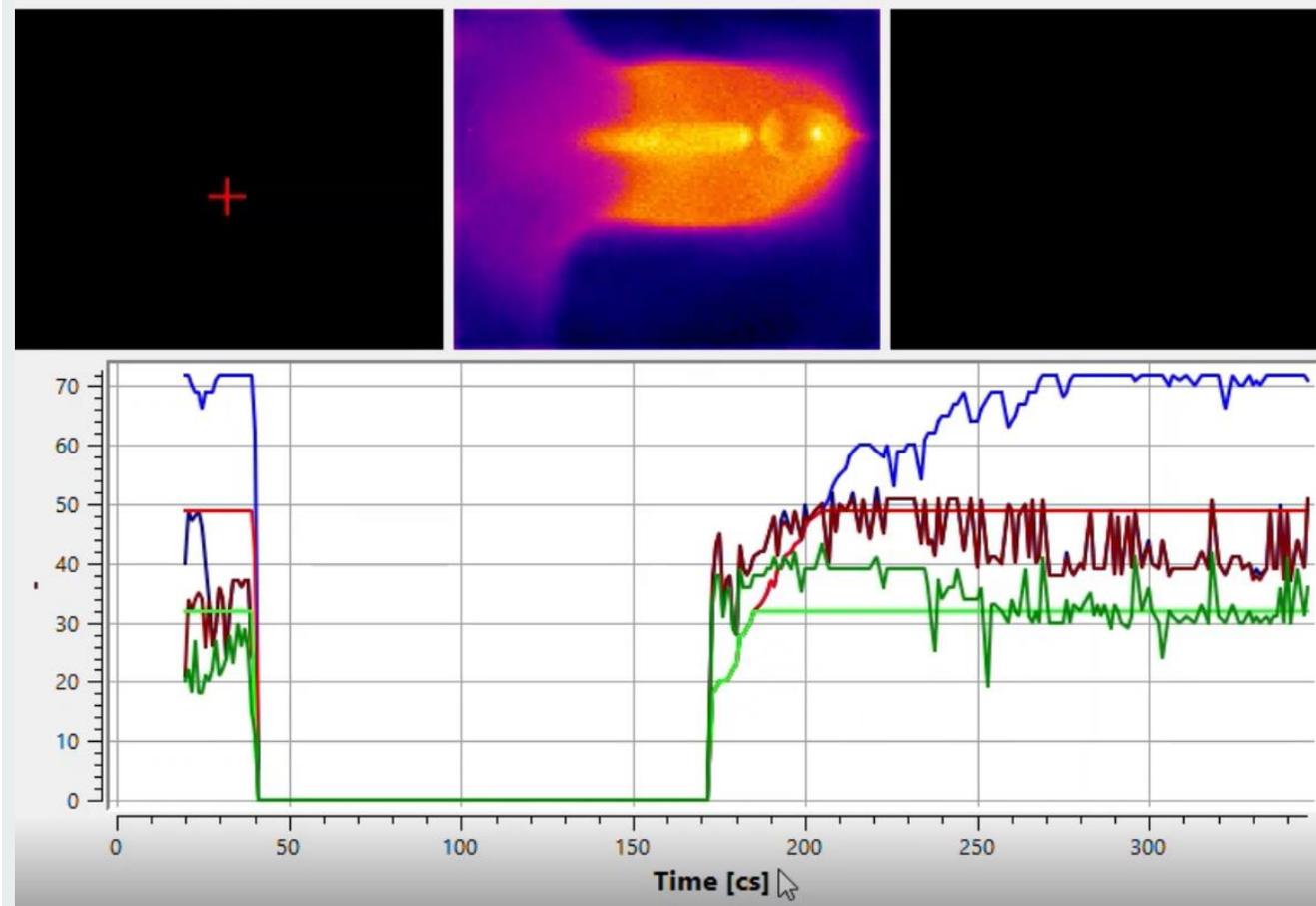


1- Preparation

- **Printer:** ARCLAN
- **Technology used:** PTA
- **Layer height:** 1,3 mm



2- Monitoring



3- Printed result

- Inert gas: Ar 100%
- Substrate: 10kg
- Layers: 30
- Printing time: 3h30
- Deposition rate: 2,8 kg/h
- Postprocessing: machining



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Thank you for your attention!

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