MANUELA Open Call

Technical Possibilities

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n°820774.

Introduction

- This presentation provides technical details regarding design for AM, 3D printing capabilities including qualified materials and post-processing capabilities
- For general information regarding the whole MANUELA project offering please refer to the Handbook:

https://manuela-project.eu/wp-content/uploads/2020/05/ManuelaHandBook_v6_FINAL.pdf

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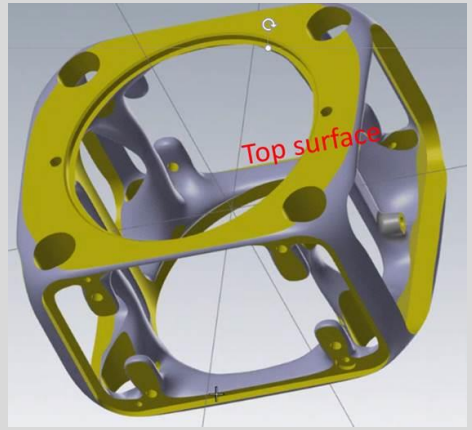
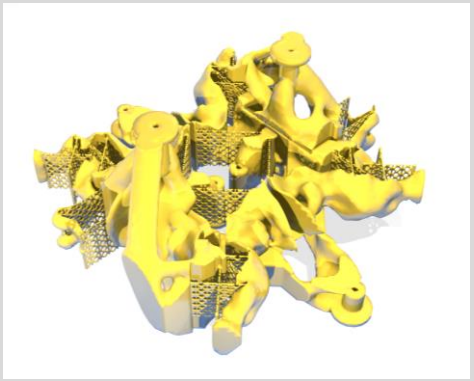
Design & Digital Twin

- Benefits from design for AM & design optimization
  - Mass optimization
  - Minimal deformation
- Full process simulation
- Process optimization via continuous learning
- Fault detection





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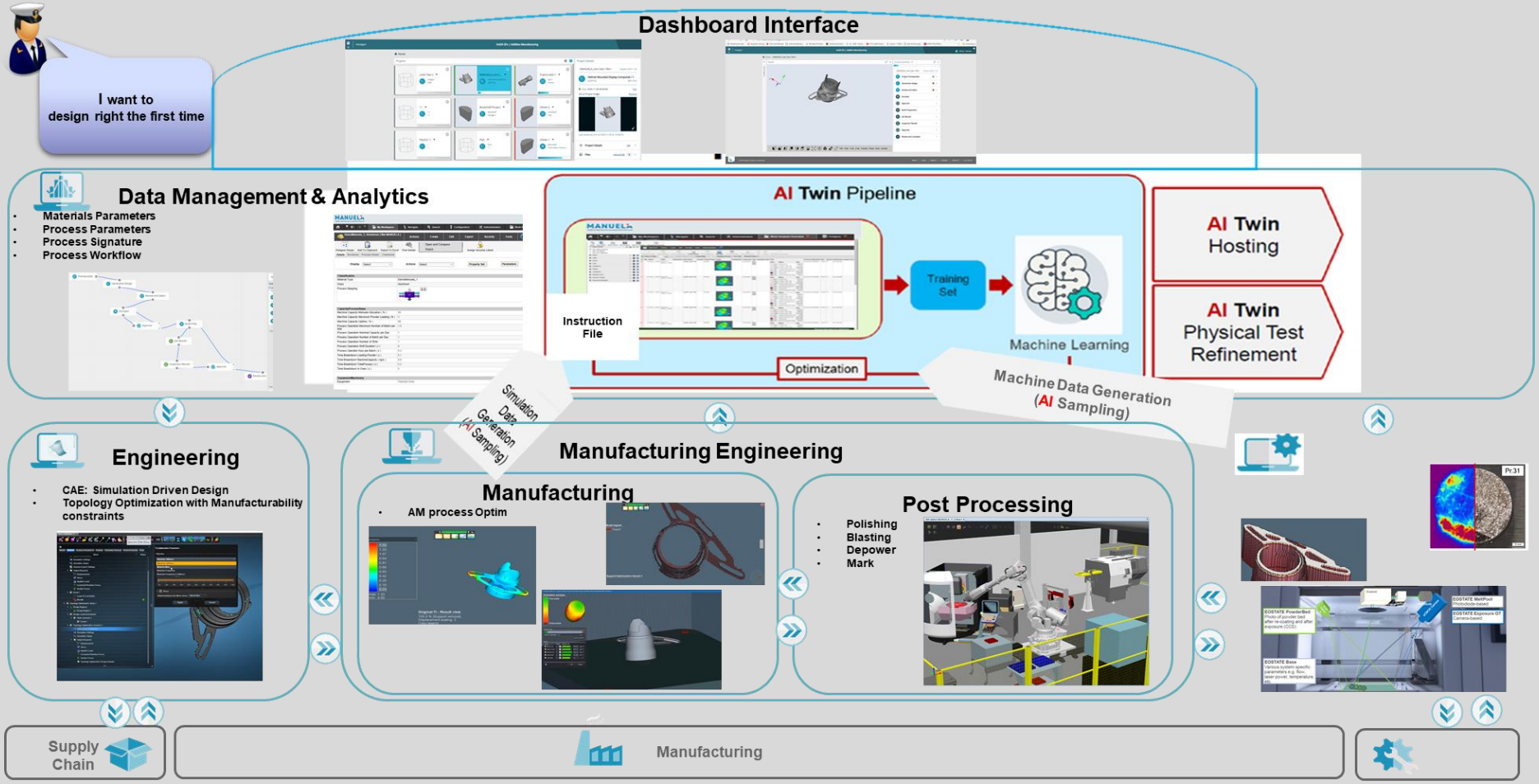
Software tools



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Printing capabilities

*** Material available and process window defined*
** The possibility to optimize other materials can be discussed*

Technology	Powder Bed Fusion Electron Beam (PBF-EB) Retrofitted Arcam S12 Build envelope: 120 x 120 x 200 mm³	Powder Bed Fusion Electron Beam (PBF-EB) Freemelt One Build envelope: Φ 110 x 100 mm³	Powder Bed Fusion Laser Beam (PBF-LB) EOS 270 Build envelope: 250 x 250 x 325 mm³	Powder Bed Fusion Laser Beam (PBF-LB) EOS 290 Build envelope: 250 x 250 x 325 mm³	Powder Bed Fusion Laser Beam (PBF-LB) EOS M100 Build envelope: Φ 90 x 70 mm³	Powder Bed Fusion Laser Beam (PBF-LB) EOS M400 Build envelope: 400 x 400 x 400 mm³
Materials	** Current available: Ti alloys Ti-6Al-4V ELI	** Current available: Cu Pure Cu * Possible optimization: Cu alloys Cu-Cr Cu-Ni-Si (UN3S) Cu-Al (10 wt.% Al) Cu-Al (50 wt.% Al) Co-Cr alloys Ti-Al TiAl48-2-2 TNM etc. Ni alloys Inconel 718 CMSX 4	** Current available: Ti alloys Ti-6Al-4V Ti-6Al-4V ELI Ti-6Al-2Sn-4Zr-6Mo Al alloys AlSi10Mg F357 A20X Ni alloys Inconel 625 Inconel 718 * Possible optimization: Ti alloys CP Ti Al alloys Scalmalloy Steels Stainless steel 316L Stainless steel 17-4PH	** Current available: Ni alloys HastelloyX Inconel 718 Steels Stainless steel 316L Stainless steel 420s Low-alloy steel, subject to C-level *Possible optimization: Steels Stainless steel 17-4 PH Tool steel, subject to C-level	** Current available: Cu alloys Bronze (Cu-11Sn) Ni alloys HastelloyX Inconel 718 Steels Stainless steel 316L Stainless steel 420s Low-alloy steel, subject to C-level * Possible optimization: Al-alloys Any kind Steels Tool steel, subject to C-level Ni alloys Other kind Medium-high entropy alloys (Ni-Cr-Co)	** Current available: Al alloys F357 Ni alloys Inconel 718 Co-Cr alloys CoCr 538

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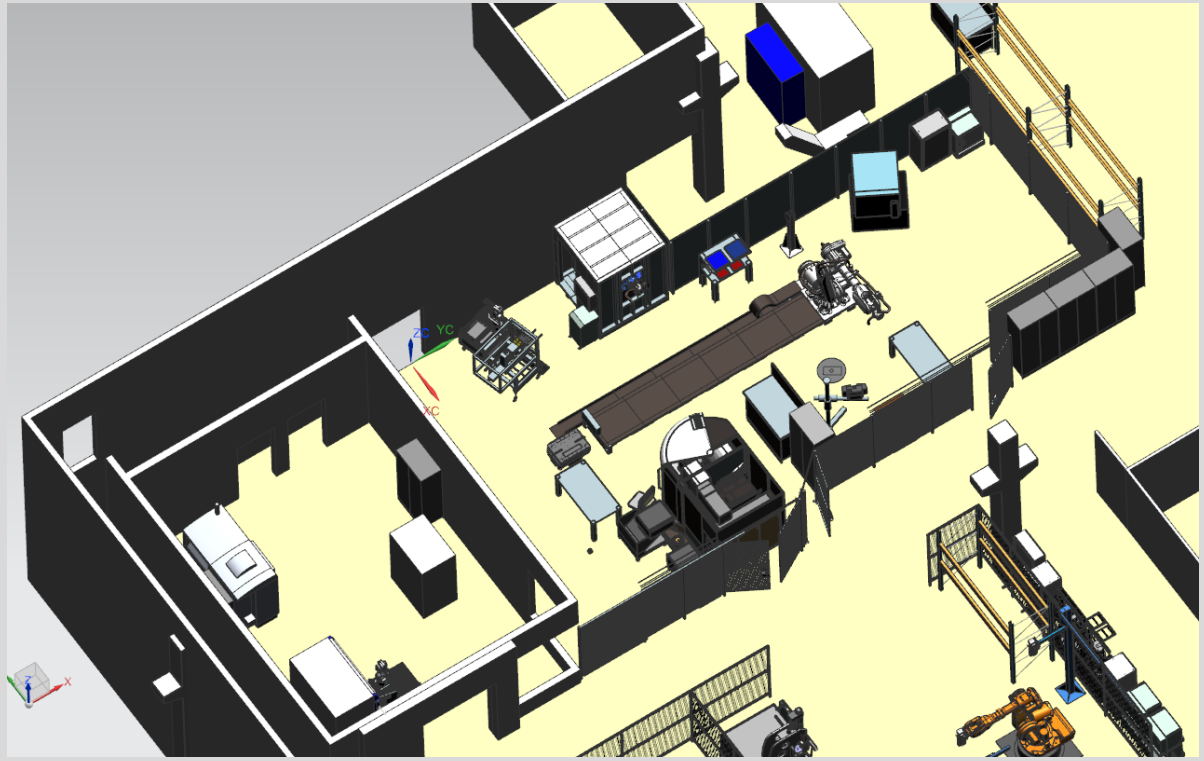
Post-processing offering

- Machining:
  - CNC machining
- Surface improvement:
  - Blasting
  - Surface laser treatment
- Heat treatment:
  - Heat treatment
  - Hot Isostatic Pressing (HIP)
- Geometry assurance:
  - 3D scanning
  - X-ray tomography



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