AMATHO

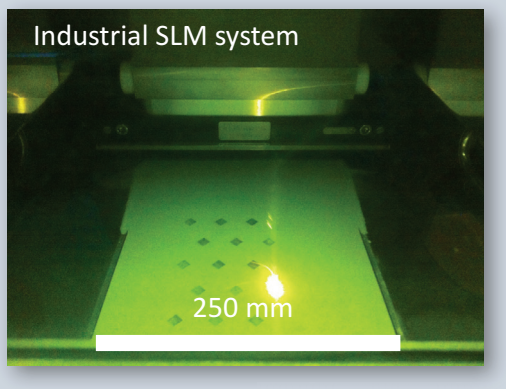
A.dditive MA.nufacturing of TI.ltrotor HO.using

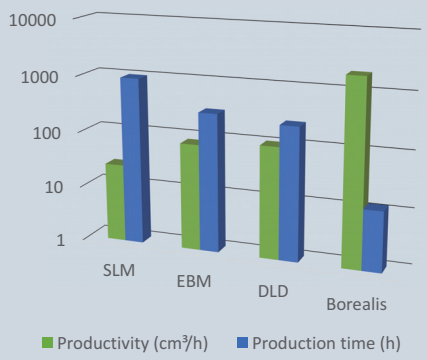
Programme: H2020 — H2020-CS2-CFP02-2015-01
Call: H2020-CS2-CFP02-2015-01 — JTI- CS2-2015-CFP02-FRC-01-03
Partners: Politecnico di Milano, SUPSI – Scuola Universitaria Professionale della Svizzera Italiana, Prima Industrie

AIMS:

- Manufacturing of a **principal gear box of a tiltrotor**
- *Additive Manufacturing* (AM) for **large components** and **small batches**
- **Titanium** and **aluminium** alloys
- Adopted processes: **SLM, EBM**, and **DLD**
- **Three production routes**: assembly, combination, and direct production

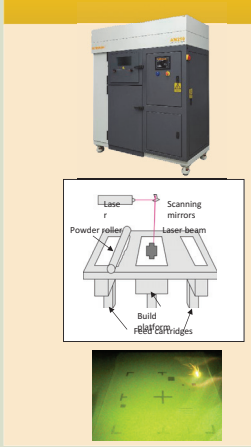
Limitations in the production of large components by AM



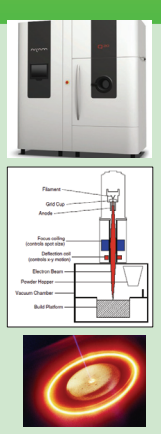


Processes of AMATHO

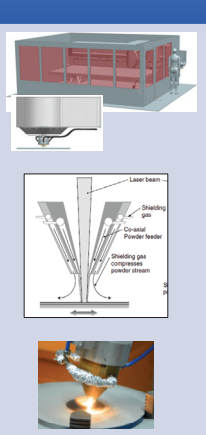
SLM



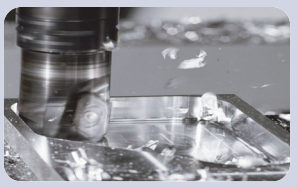
EBM



DLD



Systematic approach



Feedstock

- Powder characteristics
- Effect on part quality

AM Process

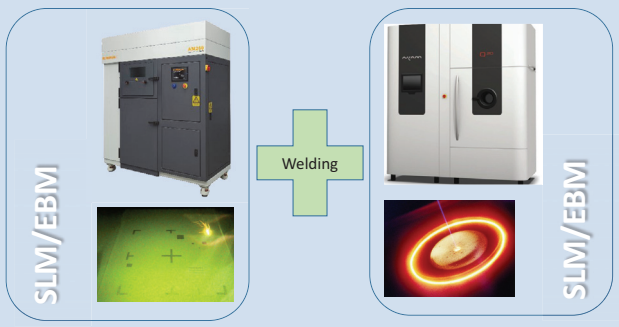
- Powder bed and directed deposition
- Single or combined
- Process monitoring

Post processing

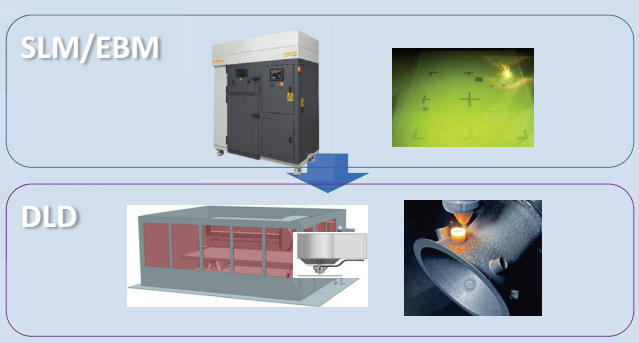
- Welding
- Heat treatment
- Finishing

Production routes

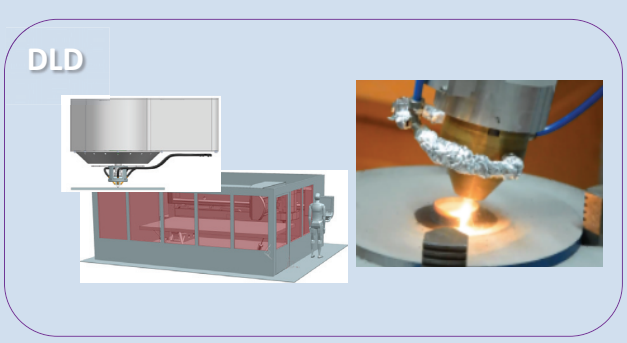
Assembly



Combination



Direct



THE EXPECTED IMPACTS OF AMATHO:

- AM production strategies for realizing large components
- AM design rules as a function of applications, material, and part dimensions
- Optimization of the whole production chain: production by AM, heat treatment, and finishing
- Monitoring and control of the AM process