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Objectives

The technical objective of Hyproline is to design, implement and validate a flexible high performance manufacturing line for serial fabrication of customized high quality metal parts that combines innovatively component technologies for net shape manufacture, direct write / structuring, inspection and intelligent automation. By further developing the manufacturing processes itself as well as by research and application work on materials, pre and post treatment of the parts produced and supporting software Hyproline adds capabilities to commercially available manufacturing systems, in terms of speed, product quality and versatility.

www.hyproline.eu

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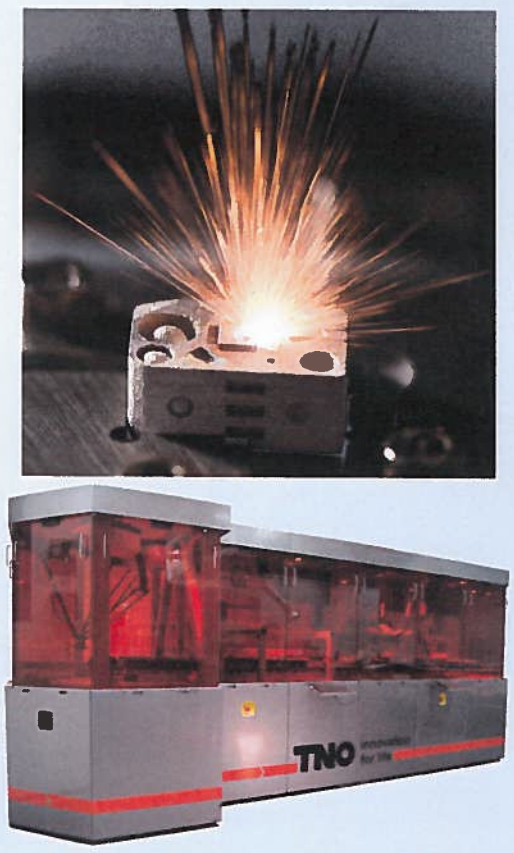
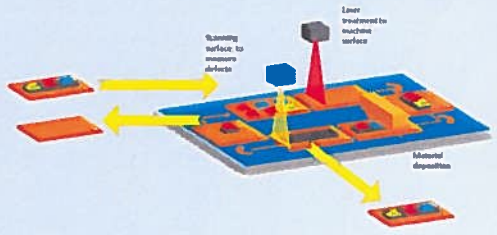
HYPROLINE

High Performance Production Line for Small Series Metal Parts



Hybrid platform

- 100 building / machining platforms
- 100 separate parts in operation
- High speed: 1m/s nominal (capable of 2m/s)
- Robotic high speed removal / placement of building platforms
- Modules for polmer 3D printing, curing, measurement and laser machining



Software

- Software for inspection and analysis of products
- Curved facet slicing for higher accuracy printing
- Comparisons between point clouds and nominal geometry.
- Creation of difference volumes and hatching patterns

AM Components

- Products manufactured at 20µm resolution.
- Low initial surface roughness
- Consistent surface quality
- Printing in steel, copper, titanium

Laser Machining

- On the fly laser machining
- Perform both ablation and polishing
- Improvement in surface roughness from 3µm to below 0.5µm.
- Use of inert gasses to improve surface finish
- Non-contact process
- Preserve sharp features

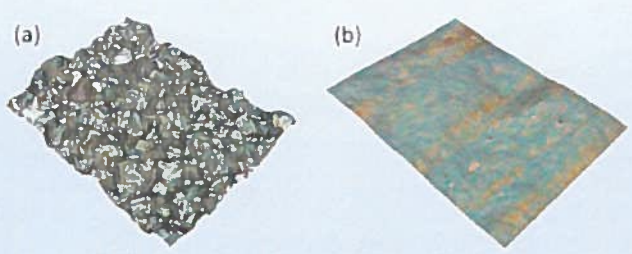


Fig. 9 Surface roughness (a) 3D printed SS 316 part and (b) after laser polishing

Measurement

- On the fly 3D measurement at reduced speed
- Uses Micro-Epsilon Scancontrol laser line scanner
- measurement volume of 4cm x 8cm x 4cm
- Resolution of 20 micrometers in X and Y