



Metal Additive Manufacturing I



NCS TECHNOLOGIES

Authorized TRUMPF Distributor

TRUMPF



TRUMPF is...



... a technology leader in two business divisions



Machine Tools



Laser Technology /
Electronics

... an independent family business



since **1923**

13.400

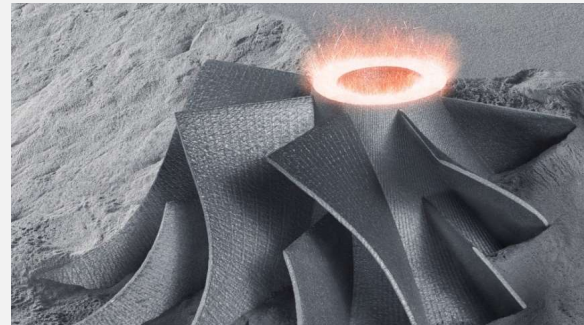
4.1bn

10%

... close to its customers



... an innovation promise – holistically and constantly



**Additive
Manufacturing**

since **1999**

250

600*

*Installed base: LMD & LMF



The product portfolio

Additive Manufacturing

Portfolio | LMF

TruPrint 1000



Compact and robust 3D printing

- Build cylinder: Ø 100 x H 100 mm
- Max. laser power at the workpiece (TRUMPF fiber laser): 1 x / 2 x 200 W
- Beam diameter: 30 / 55 µm

TruPrint 2000



Economical 3D printing with premium quality

- Build cylinder: Ø 200 x 200 mm
- Max. laser power at the workpiece (TRUMPF fiber laser): 1 x / 2 x 300W
- Beam diameter: 55 µm
- Preheating: up to 200 °C
- Inert powder handling: yes

External powder management

Powder management on an industrial scale

TruPrint 3000



Flexible solution for industrial 3D printing

- Build cylinder: Ø 300 x H 400 mm
- Max. laser power at the workpiece (TRUMPF fiber laser): 1 x 500 W
- Beam diameter: 100-500 µm
- Preheating: up to 200 °C

External part and powder management

Part and powder management on an industrial scale

TruPrint 5000



Highly productive 3D printing for industrial serial production

- Build cylinder: Ø 300 x H 400 mm | Ø 290 x H 400 mm (reduction if preheating is >200 °C)
- Max. laser power at the workpiece (TRUMPF fiber laser): 3 x 500 W
- Beam diameter: 100-500 µm
- Preheating: up to 500 °C (optional)
- Automatic process start: yes

Video Links:

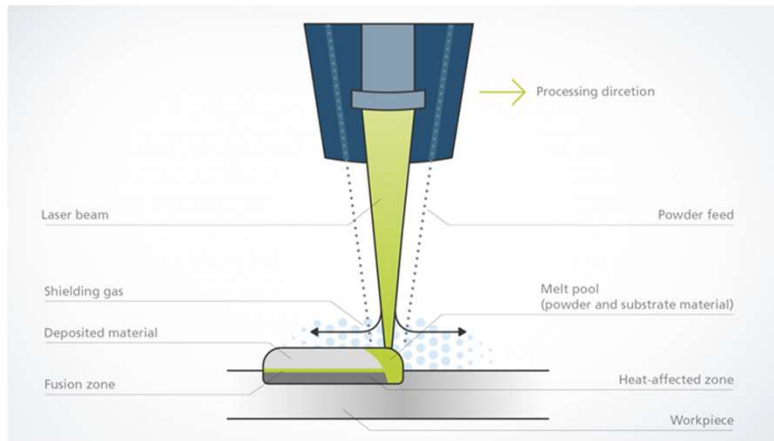
TruPrint 1000: <https://www.youtube.com/watch?v=x5q8SEhYahY>

TruPrint 2000: <https://www.youtube.com/watch?v=4K9wGhoT4L4>

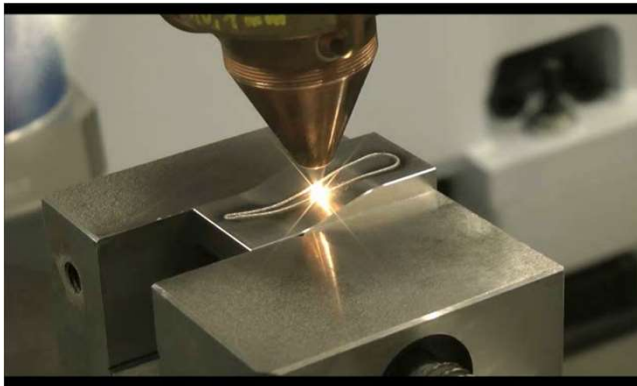
TruPrint 3000: <https://www.youtube.com/watch?v=zoX873e1ITQ>

Laser Metal Deposition – LMD

An Introduction



Example:
Build-up of
Blade Mock-Up



Principle of the process:



- Surface of workpiece is heated by laser and a melt pool is produced
- Powder particles are injected into the melt pool
- Deposition of welding seams by relative movement between nozzle and workpiece

Advantages:



- Production of coatings and volumes on 3D free form surfaces
- High deposition rates possible
- Low heat input into workpiece and low distortion
- Combination of materials

Additive Manufacturing

Portfolio | LMD

TruLaser Cell 3000



Axis travel range:

X-axis: 800mm
Y-axis: 600mm
Z-axis: 400mm

Available Lasers:

TruDisk 1kW-8kW
TruDiode (FD26) 2kW-4kW

TruLaser Cell 7040



Axis travel range:

X-axis: 2000mm/ 4000mm
Y-axis: 1500mm/ 2000mm
Z-axis: 750mm

Available Lasers:

TruDisk 1kW-8kW

Custom Integration



Axis travel range:

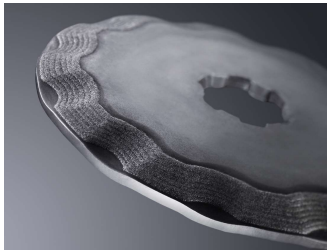
Custom depending on
Robot integration

Available Lasers:

TruDisk 1kW-16kW
TruDiode (FD26) 2kW-4kW

Application Fields for LMD

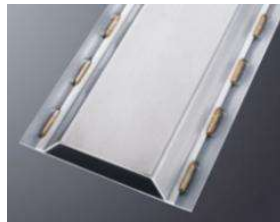
Cladding of functional surfaces



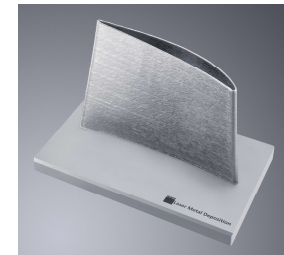
Repair



LMD as joining technology



Additive Manufacturing





TRUMPF Industrial Additive Technologies

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