

Innovation Club 2025

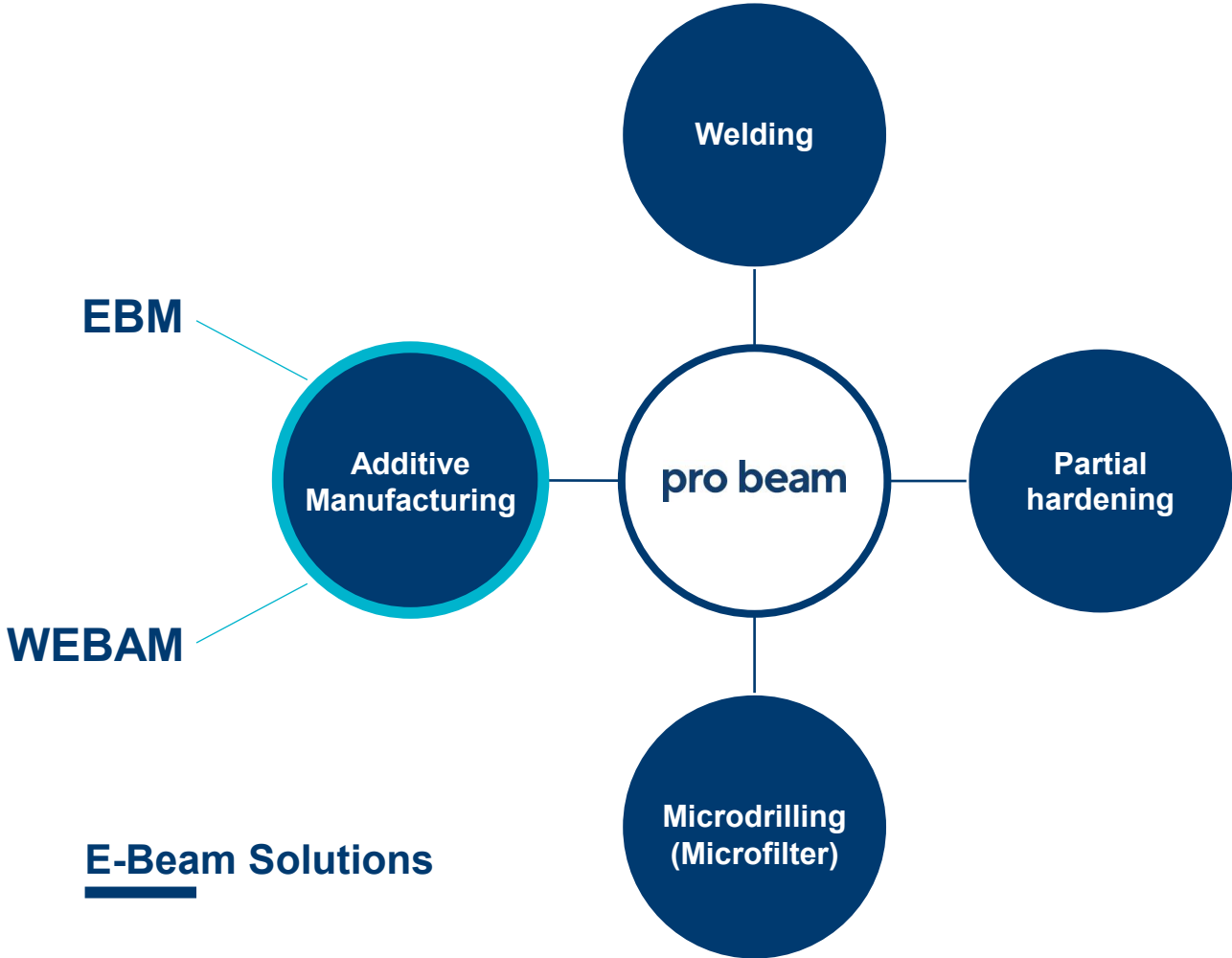
EBM at pro-beam additive

Robert Ortmann

pro-beam additive GmbH



September, 2025



400 +
Employees

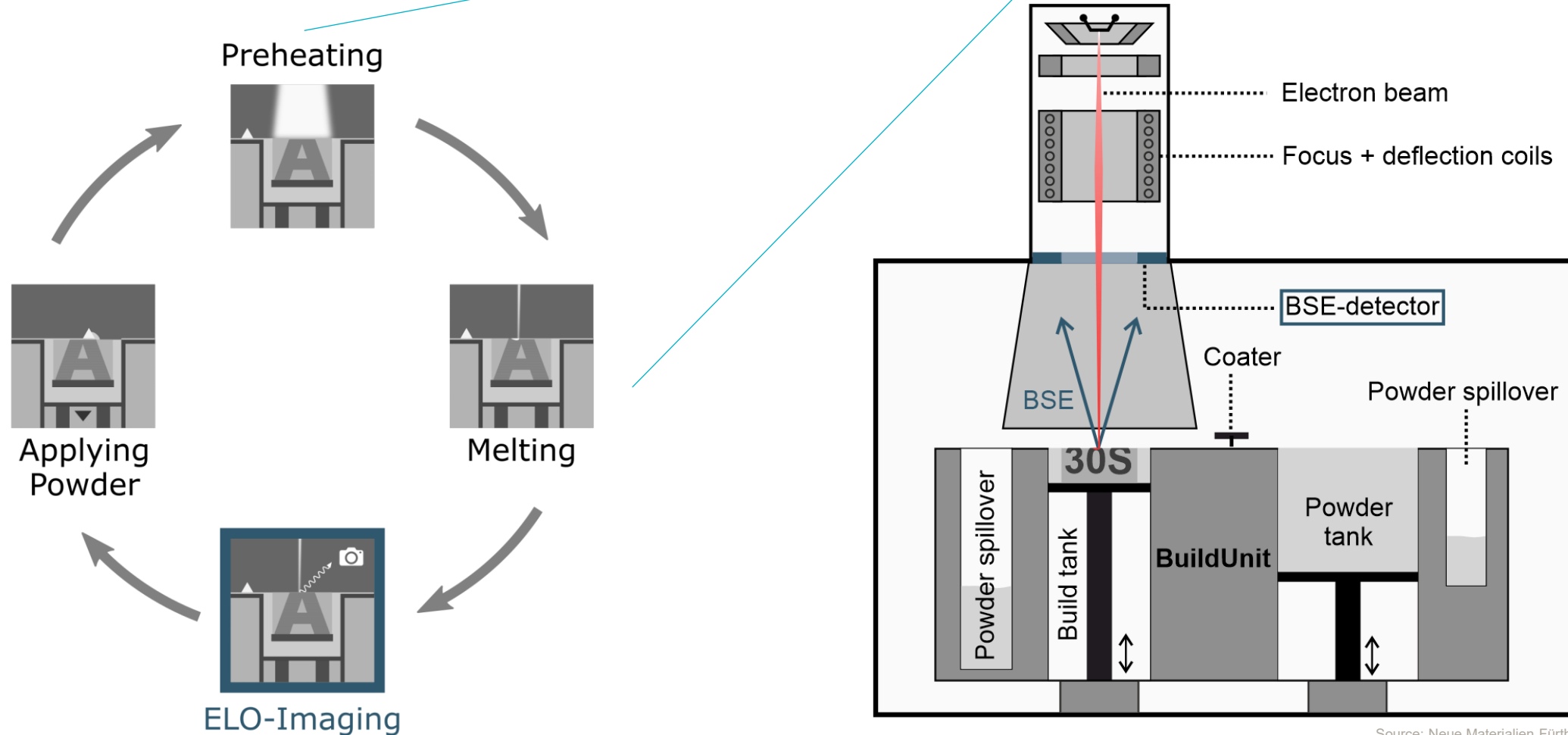
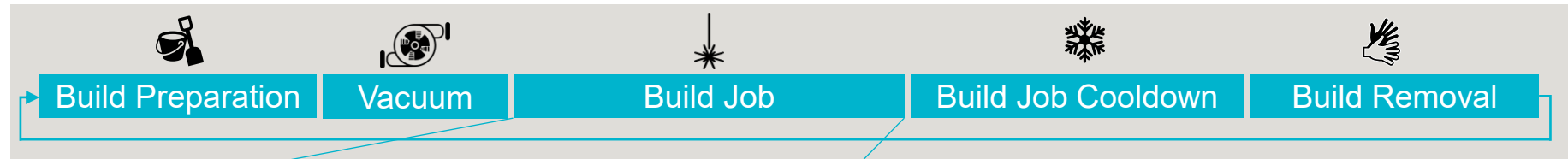


6
Locations



50 +
Years of experience

State of the art EBM



Source: Neue Materialien Fürth

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© pro-beam

EBM system that can be successfully used for serial production in an industrial environment:



High productivity



Safe and easy powder handling



Machine to be placed in normal industrial environment



High flexibility

Specifications

- Acceleration voltage: 150 kV
- Max. beam power: 15 kW
- Variable build space, up to 300 x 300 x 400 mm
- Robust monitoring system using backscattered electrons (ELO® monitoring)
- High vacuum, no additional process gas
- Novel machine concept with high productivity
- Robust equipment



Machine layout

Airlock

Loading and
unloading station

Transport Unit



Build chamber
with EB generator
and control panel

POWERCUBE
with HV tank,
control cabinets,
vacuum pumps
and cooling
water supply

BuildUnit

Recoater system

Powder container

Build container

Powder overflow
container

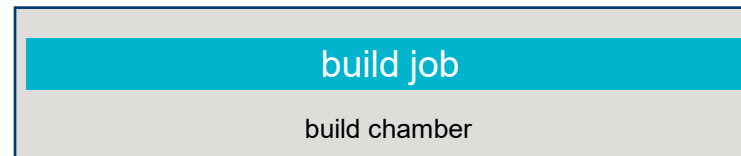


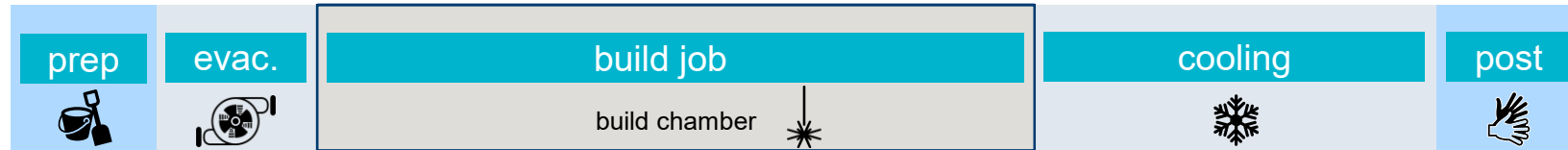
	Dimensions build container	Recommended build volume
M	260x260x400 mm ³	~ 200x200x400 mm ³
L	400x400x400 mm ³	max. 300x300x400 mm ³

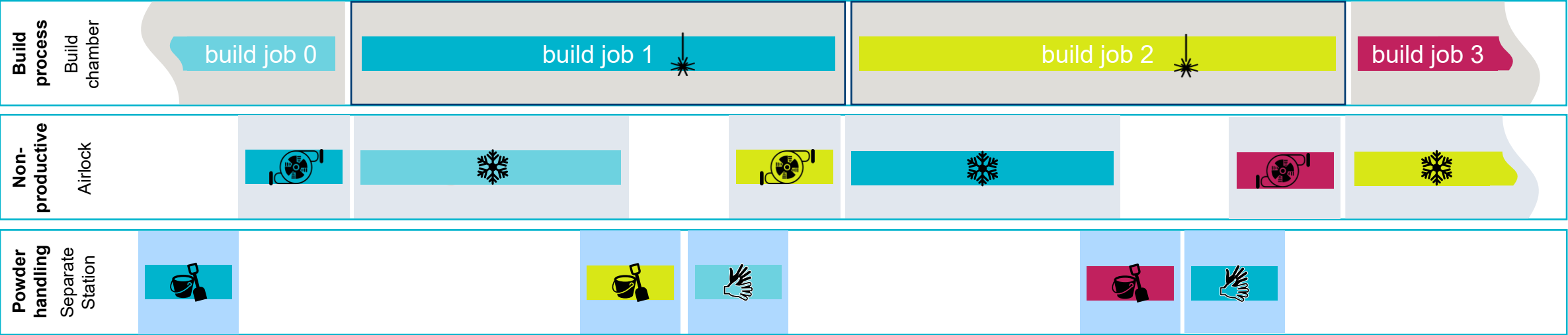
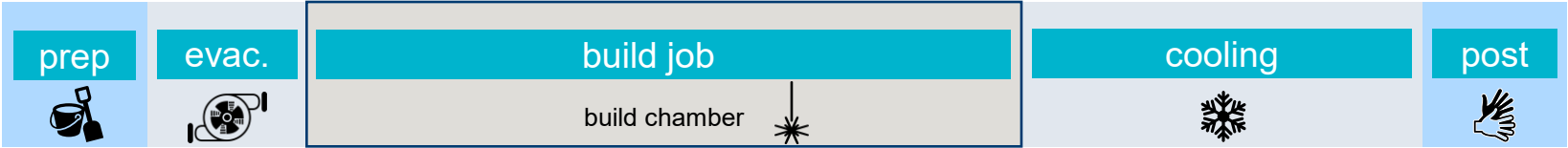
State of the art



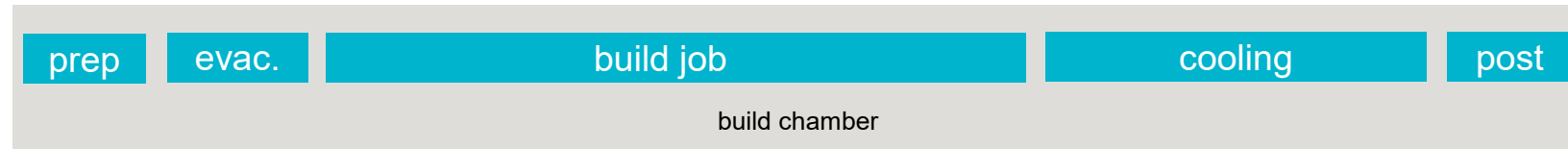
pro-beam solution



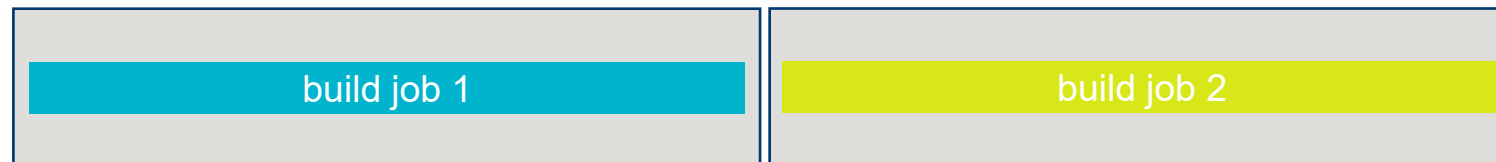




State of the art



pro-beam solution



Elimination of non-productive times

Avoiding non-productive times by parallelisation and optimization of the process steps.

Animation of automated
BuildUnit handling:



Machine set-up without regular powder exposition

- For regular build jobs, no PPE outside of powder handling room necessary
- For maintenance, only very little amounts of powder in process chamber. Chamber fully accessible.

Powder handling with BuildUnits on set-up and depowdering station

- Ergonomically
- Fully accessible & flexible
- Replacement of recoating system outside of machine possible
- Special room concept in small scale

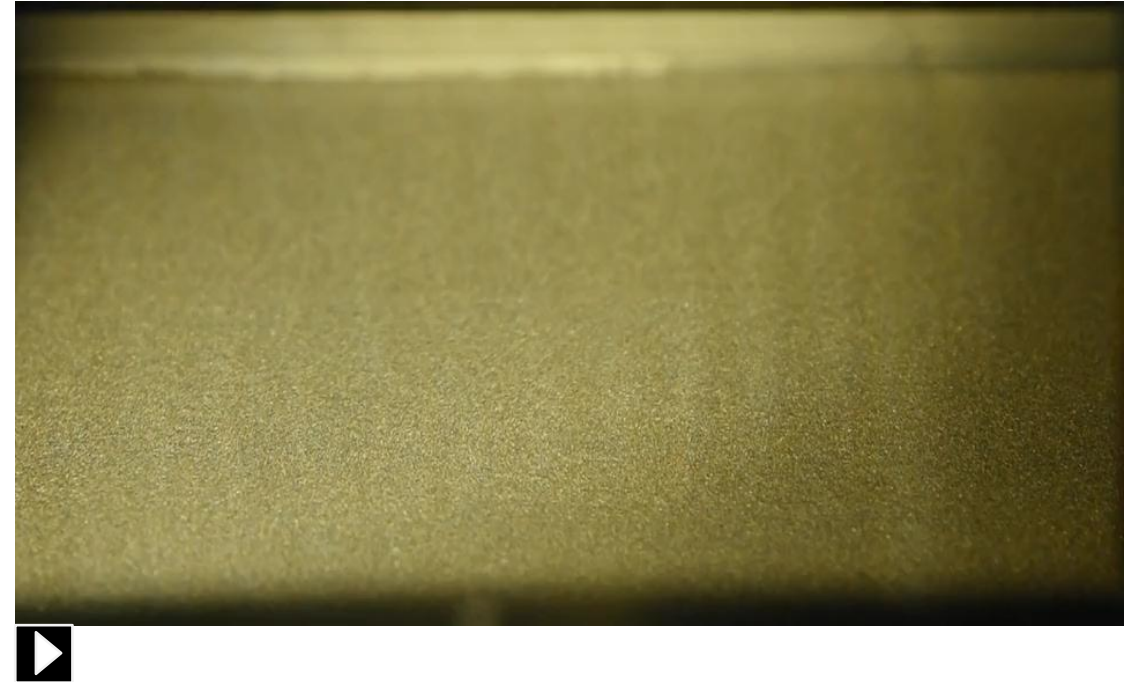


150 kV - Higher process stability and better quality

- High vacuum - Clean processing conditions
- High quality thanks to isochore heating of the powder
- Absolute resolution and speed of the electron beam
- Avoidance of smoke due to less electrostatic charging in the process (helium-free)

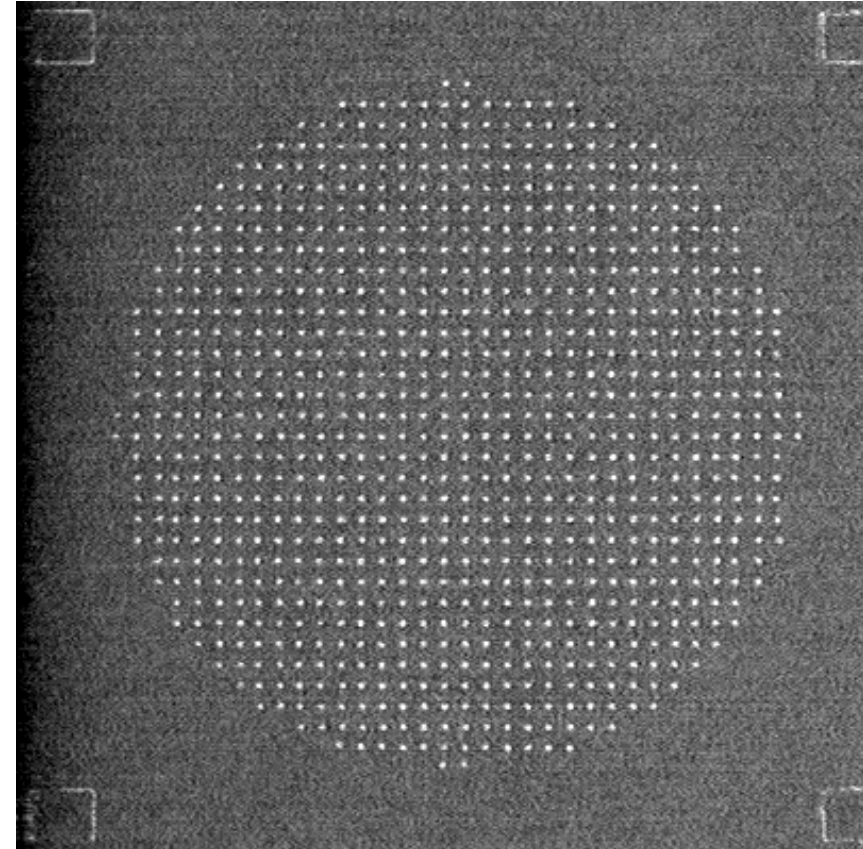
Raintec® Spot-based Exposure

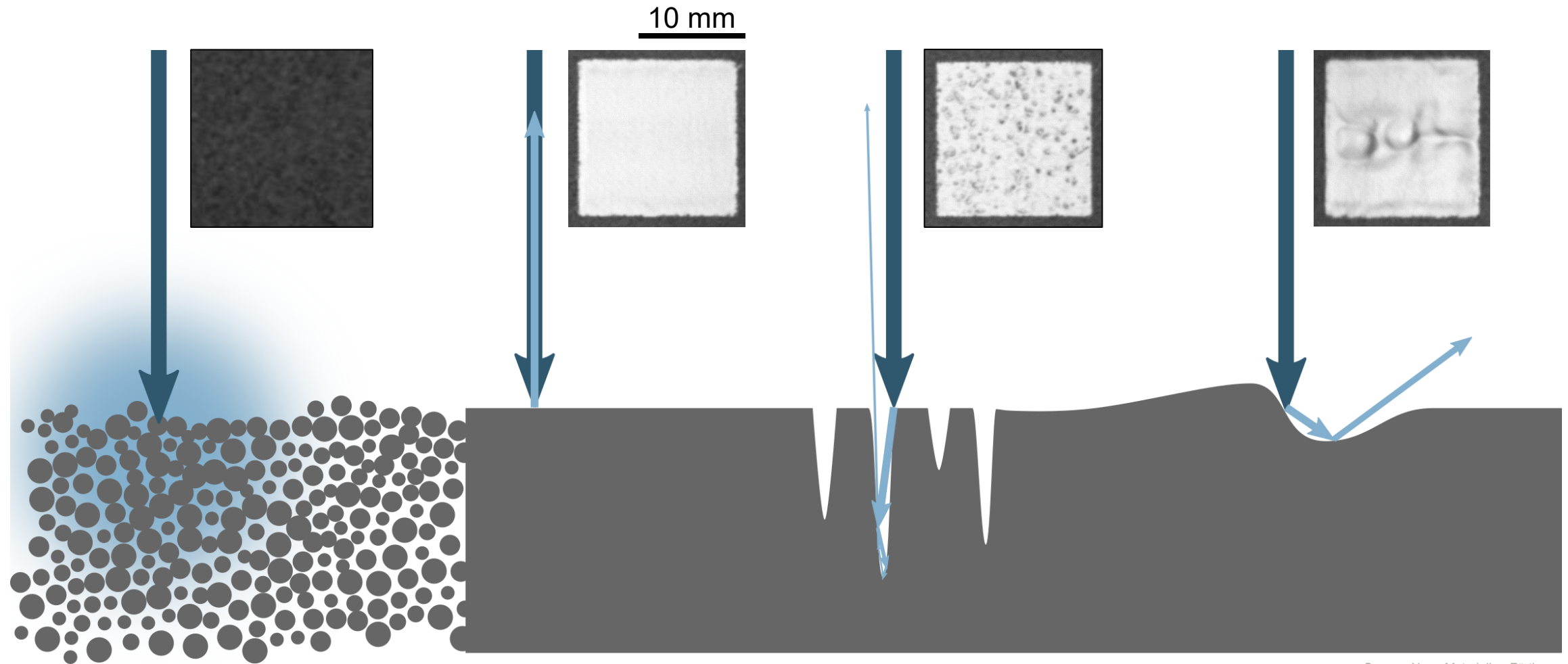
- Thermally independent melt pools
 - Geometry independent
 - Control of local melting conditions
 - Increased productivity
- Not just producing geometries – producing material properties



ELO[®] quality control instead of CT

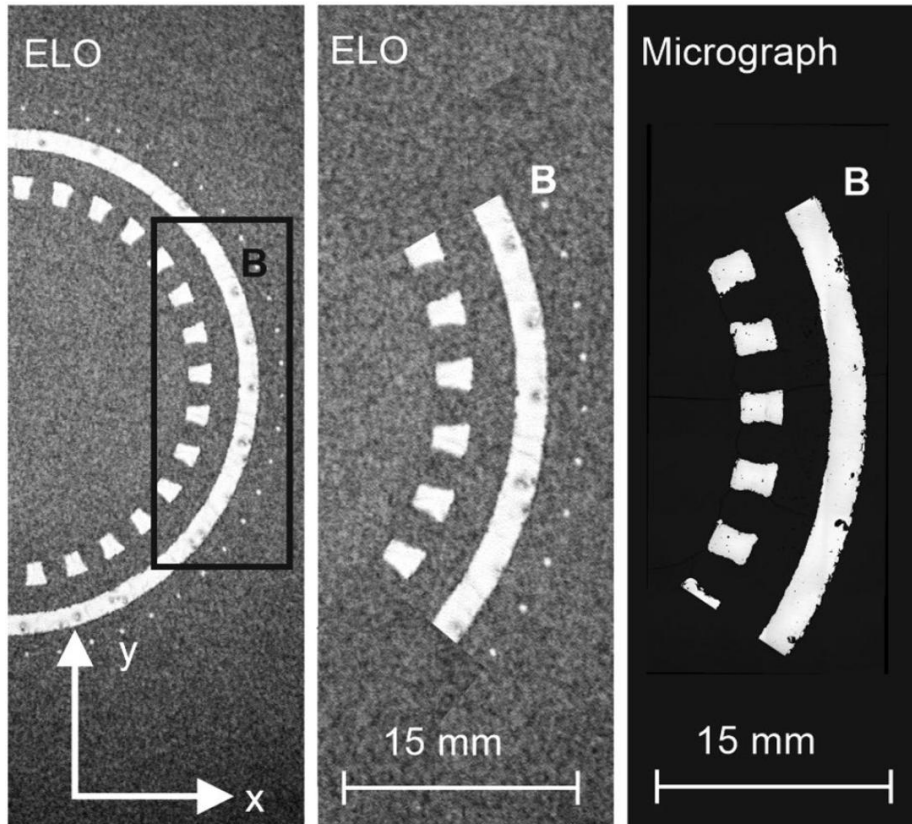
- In-situ Quality Inspection by ELO[®]
- ELO[®]-system based on backscattered electrons
- High contrast imaging of each single layer during the building process
- Generating a digital twin of the part volume



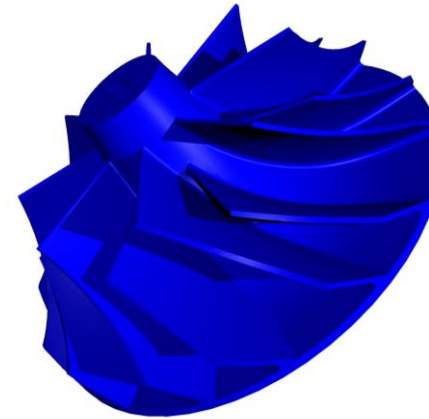


Source: Neue Materialien Fürth

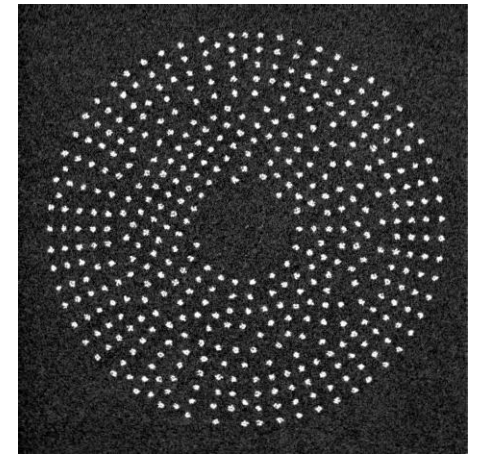
In-Situ Defect Detection



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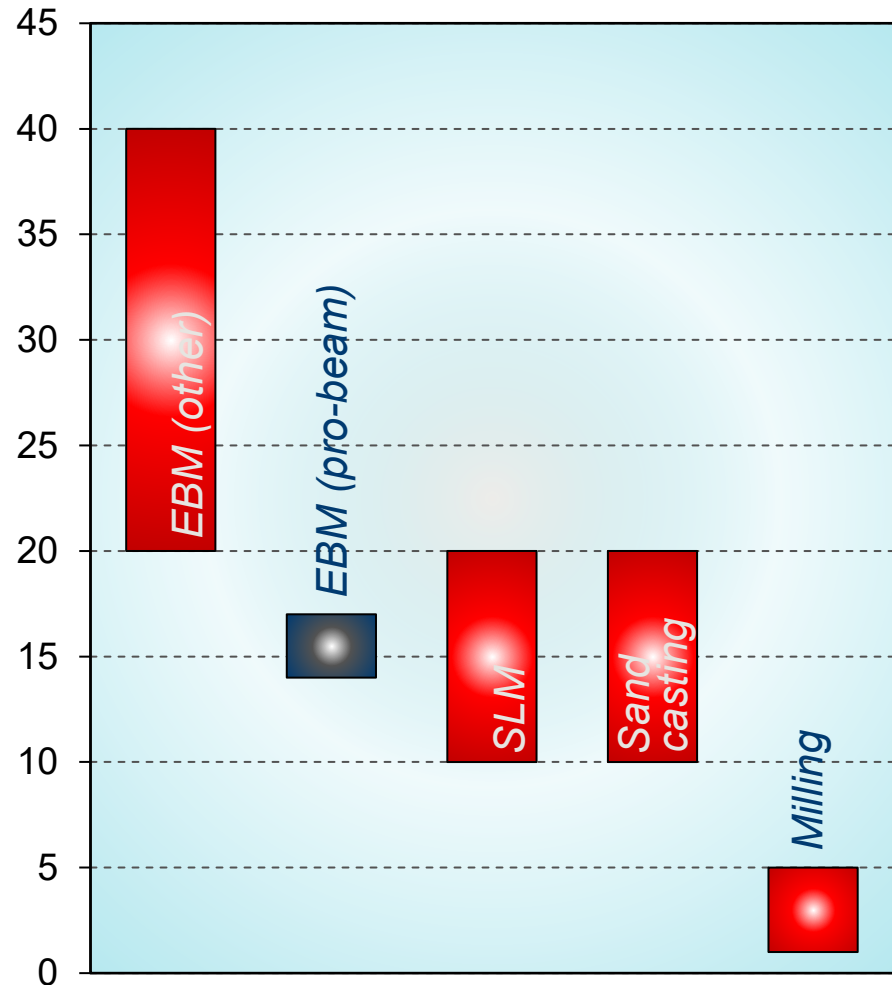


CT-scan

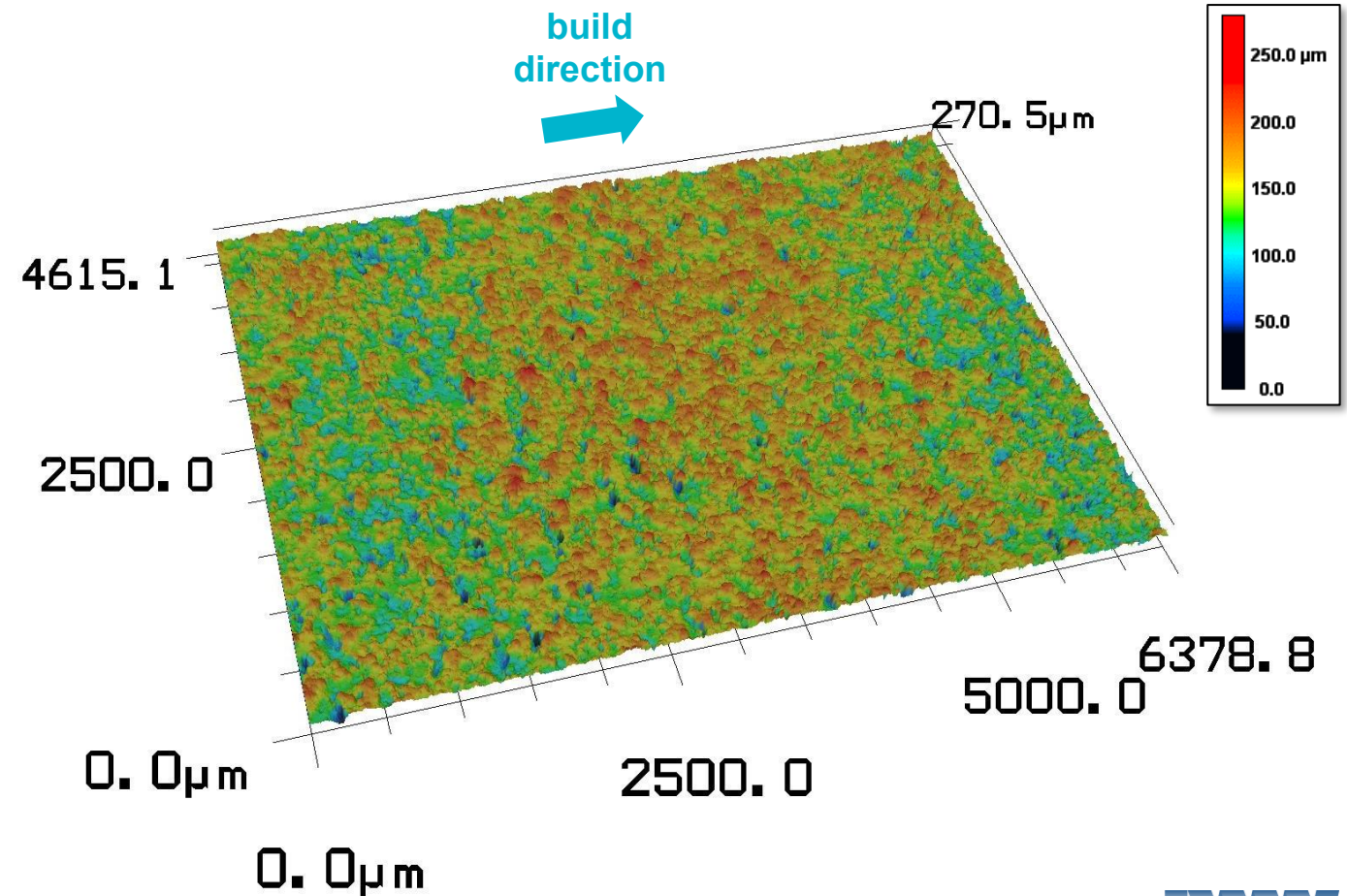


Reconstructed ELO[®]-images

Ra in μm



Laser scanning microscopy



Open system for full transparency

- Full access to all parameters enables the user to develop their own process
- Complete transparency for a standardized qualification

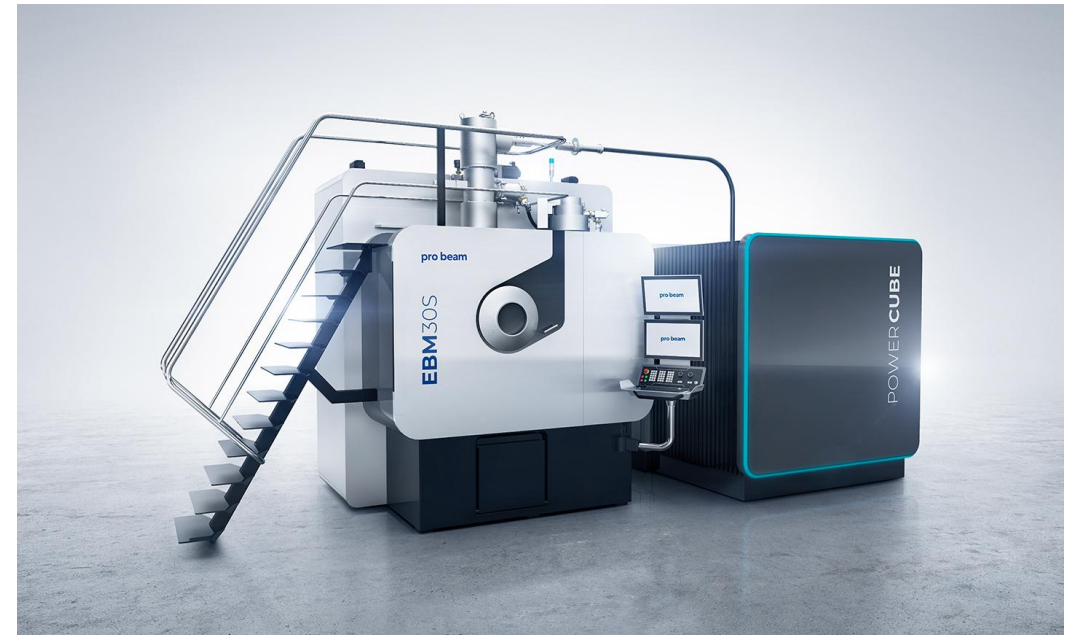
Ready for industrial applications

- The electron beam enables manufacturing parts from the most challenging materials
- Clean processing conditions ensure excellent part quality
- Serial production enabled by machine concept and robust equipment



pro-beam EBM technology USPs

- 150kV accelerating voltage and 15kW beam power
- In-situ quality control with online electron-optical imaging (ELO®)
- Optimized parallel process task execution for peak productivity
- Highly innovative spot-exposure strategy for high quality and best material properties at maximum performance
- Industrial standards for machine-control components
- Open system for full transparency



Thank you very much
for your attention.

Robert Ortmann
pro-beam additive GmbH



September, 2025