Unlocking Serial Additive Manufacturing

Automation & Robotics in the food industry

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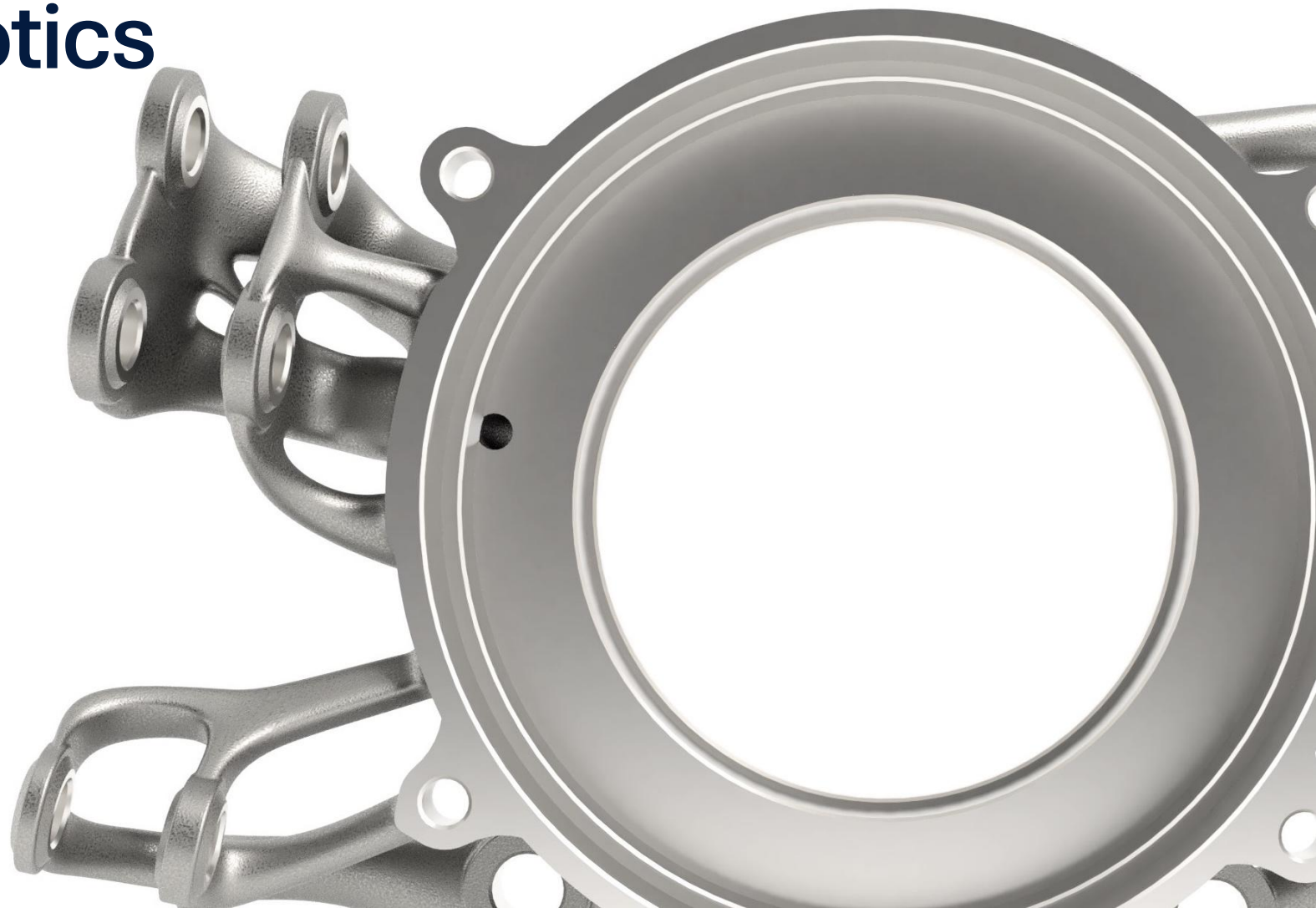
Forum: AM4industry Enabling Robotics

Additive Industries



01 About

Additive Industries

Born & growing in Eindhoven's Brainport region – the world leading optics & mechatronics cluster

Family owned

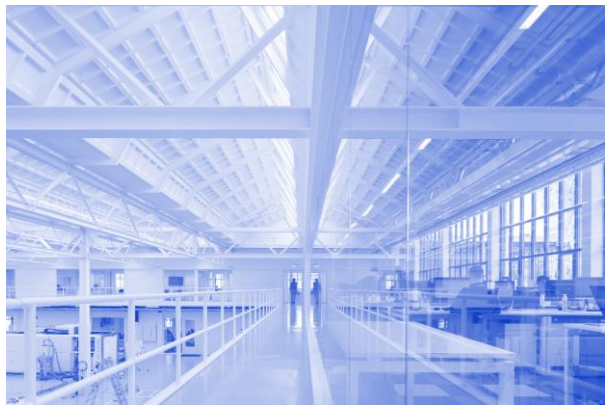
High innovation level

ASML
Lithography Equipment

PHILIPS
Medical Systems

ThermoFisher SCIENTIFIC
Electron Beam Microscopy

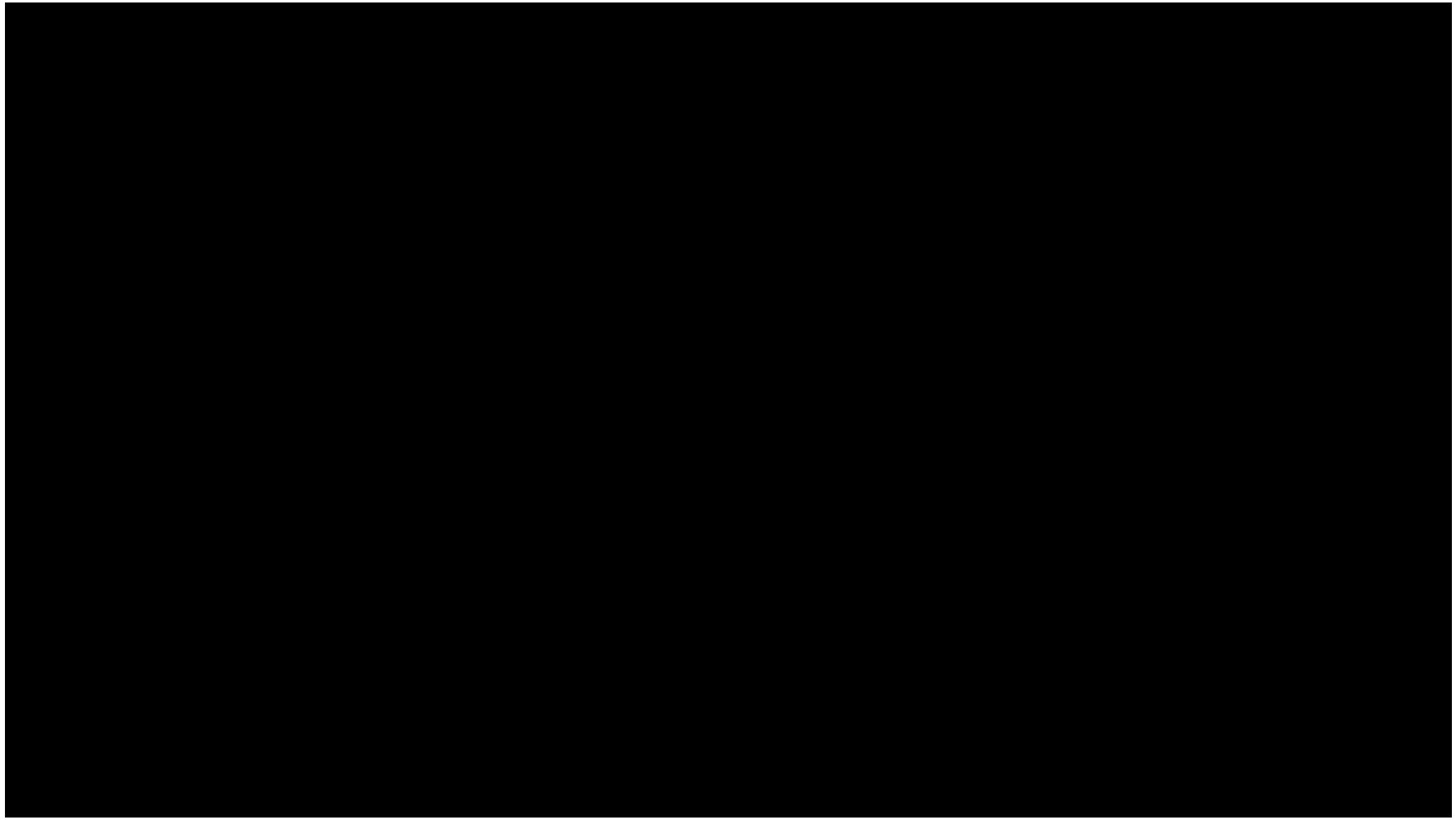
Canon
Professional Printing



02 Automation in L-PBF

Automation

What it looks like in today's production



source: Volkswagen Production in Germany – Wolfsburg Plant (Volkswagen Golf, Tiguan, Touran) (youtube.com)

Automation and Modularity

Prerequisites for scaling serial production

Manual machine setup

Manual powder handling

Scaling with standalone printers and FTE’s

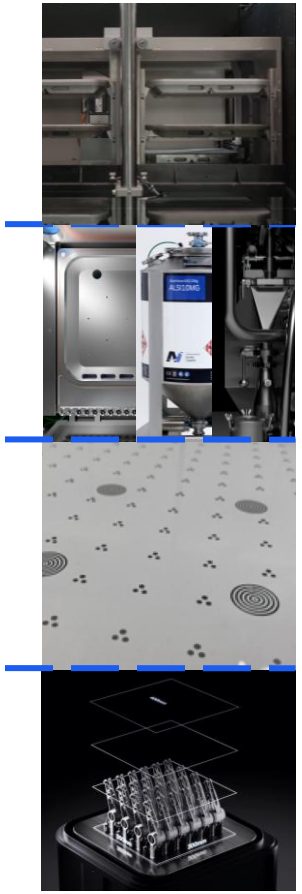
missing flexibility

Automated build changeovers

Automated powder handling

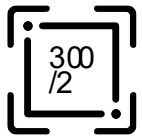
Automated calibration & laser alignment

Flexibility with size on demand and modular scale up path



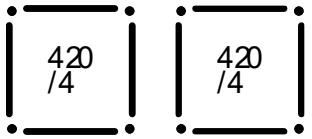
Additive Industries
MetalFab Series

MetalFab 300
Flex



MetalFab G2
Core

MetalFab G2
Dual Core

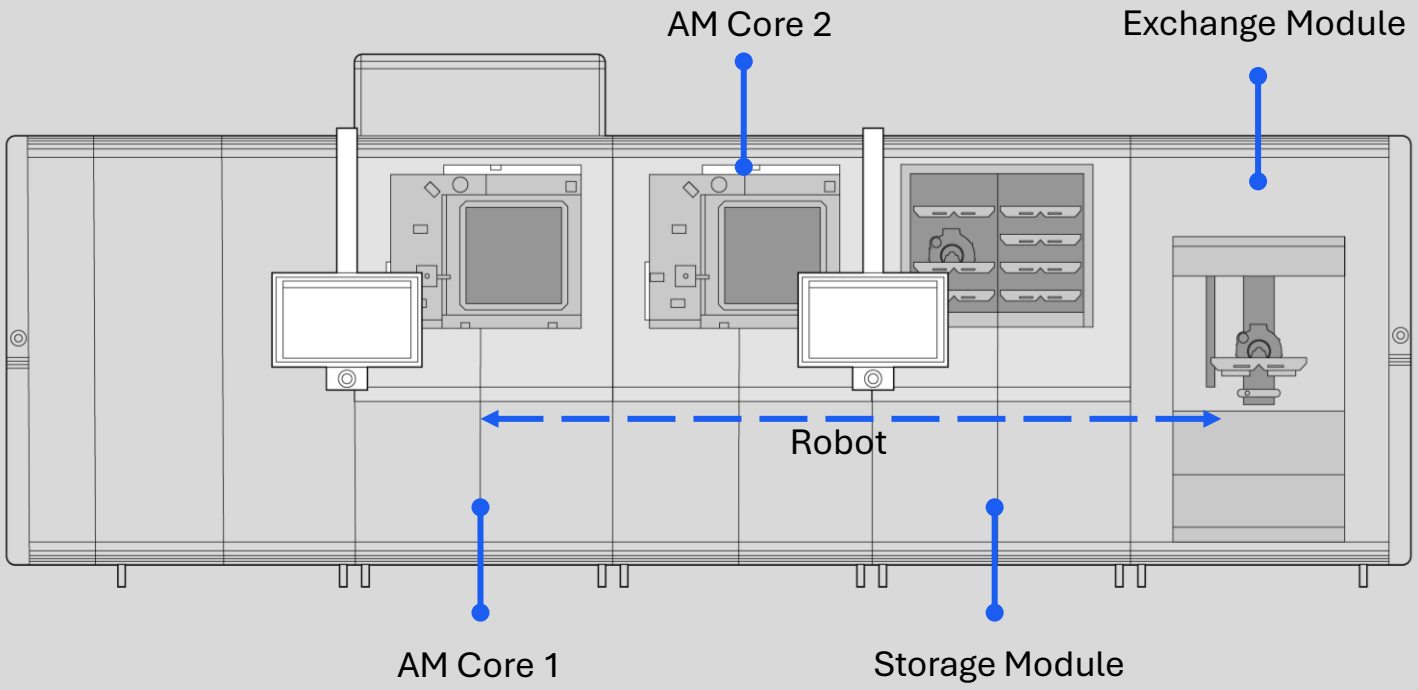


MetalFab G2
Continuous Production

Automation and Modularity

De-risking our customers growth

Continuous job operations with a high degree of automation increases part productivity and reduces cost



Start Print in AM Core 1

Once finished the exposure module moves to AM Core 2

Start Print in AM Core 2

Whilst powder from build in AM Core 1 is extracted automatically and finished job is moved to Storage Module, replaced by new build plate and AM Core 1 prepared ready to start next print

Storage Module

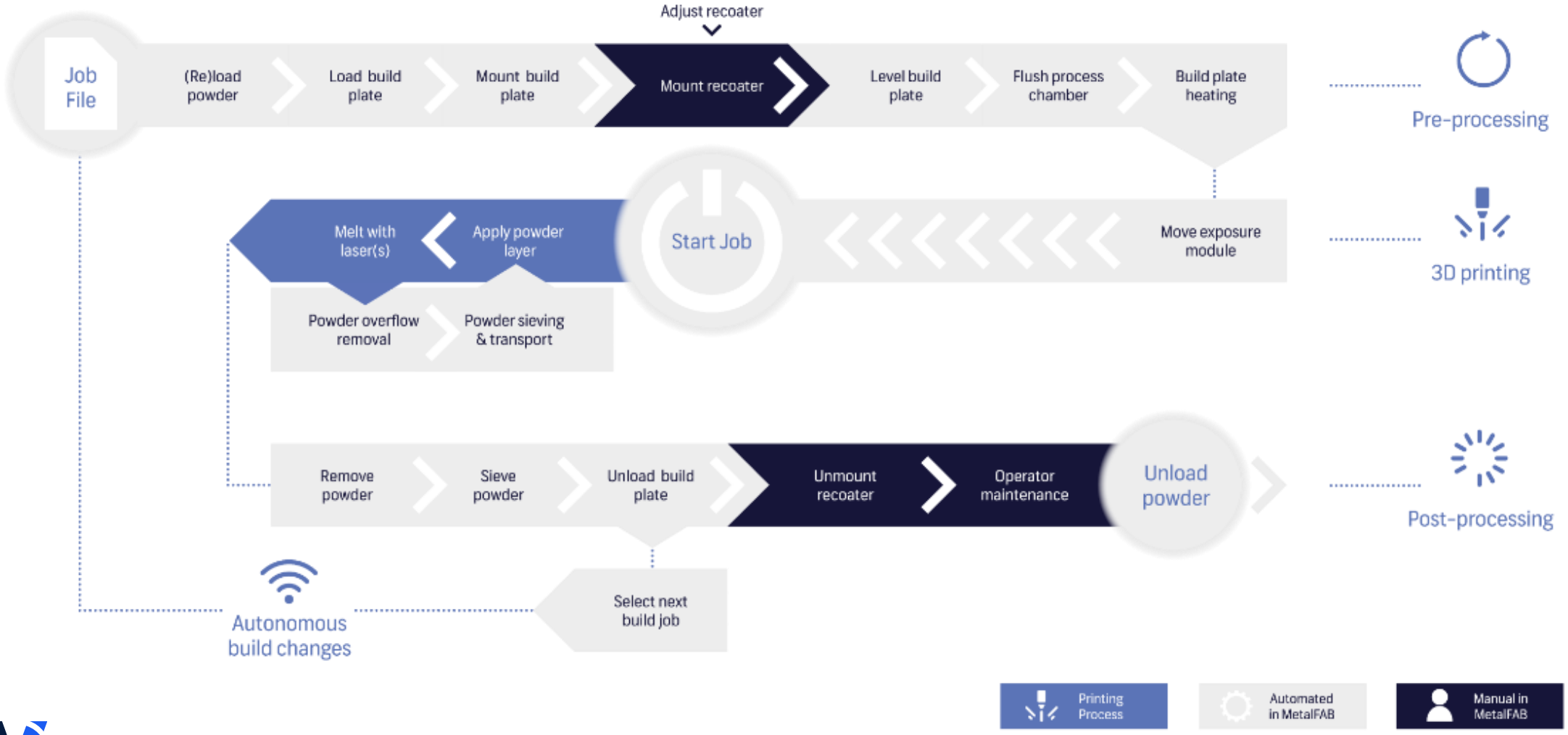
Use storage module for storing completed build jobs and empty build plates. Robot loads/unloads build plates automatically

Exchange Module

Safe removal or parts and loading of new build plates. Vacuum cleaner and air gun included

MetalFab System

Automates 15 non-value adding steps in the AM value stream



03 Case Study

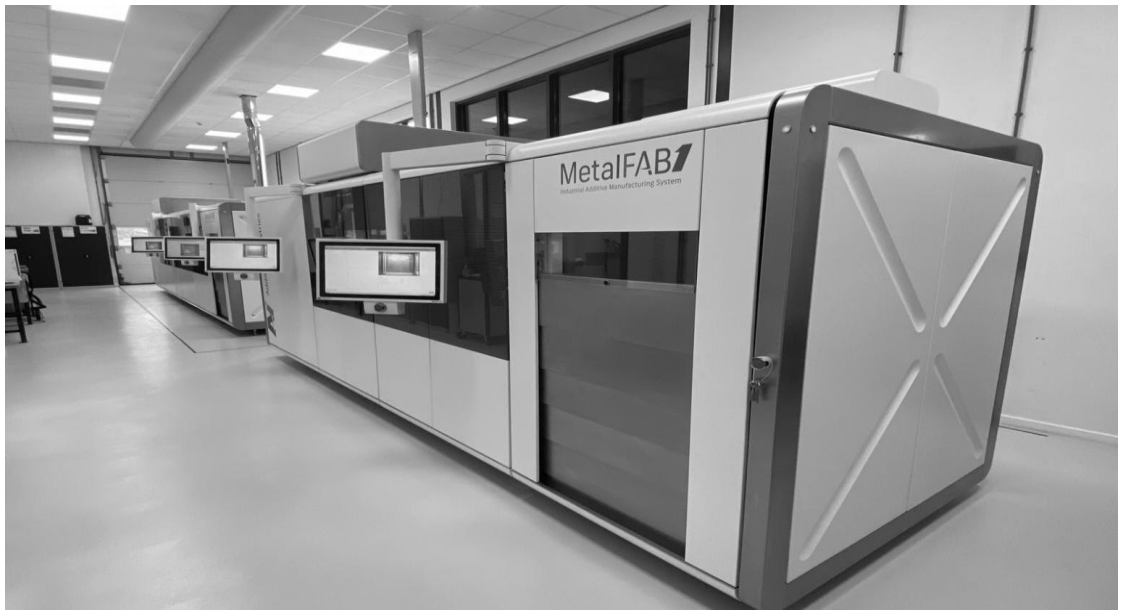
K3D

Luuk Wissink
CEO

3D printing company focus on metal

Our services:

- Design
- Development
- Production



5x

4x

> 1.000.000 Metal 3D printed parts for various industries

Royal Kaak / K3D

Production lines for industrial bakeries

Family owned
1000 employees

Operates Worldwide

300 mil. EUR turnover

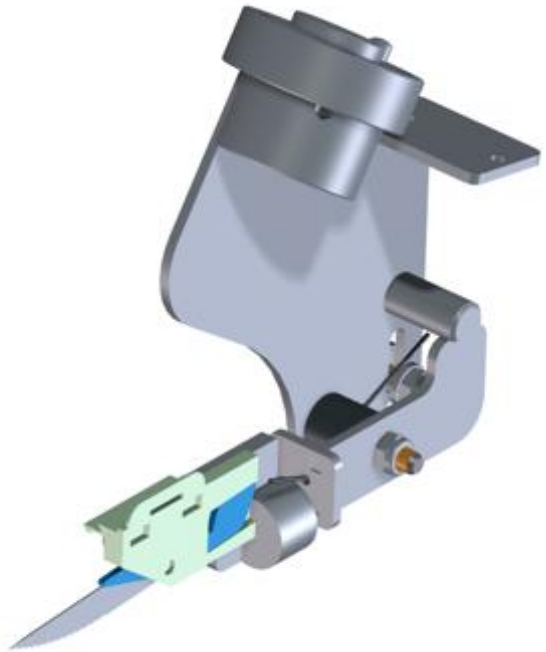
Robot dough cutting application

Background

Robot dough cutting application

OLD DESIGN

- Many components
- Heavy
- Long lead time
- Many production steps
- Dough sticks to knife
- …

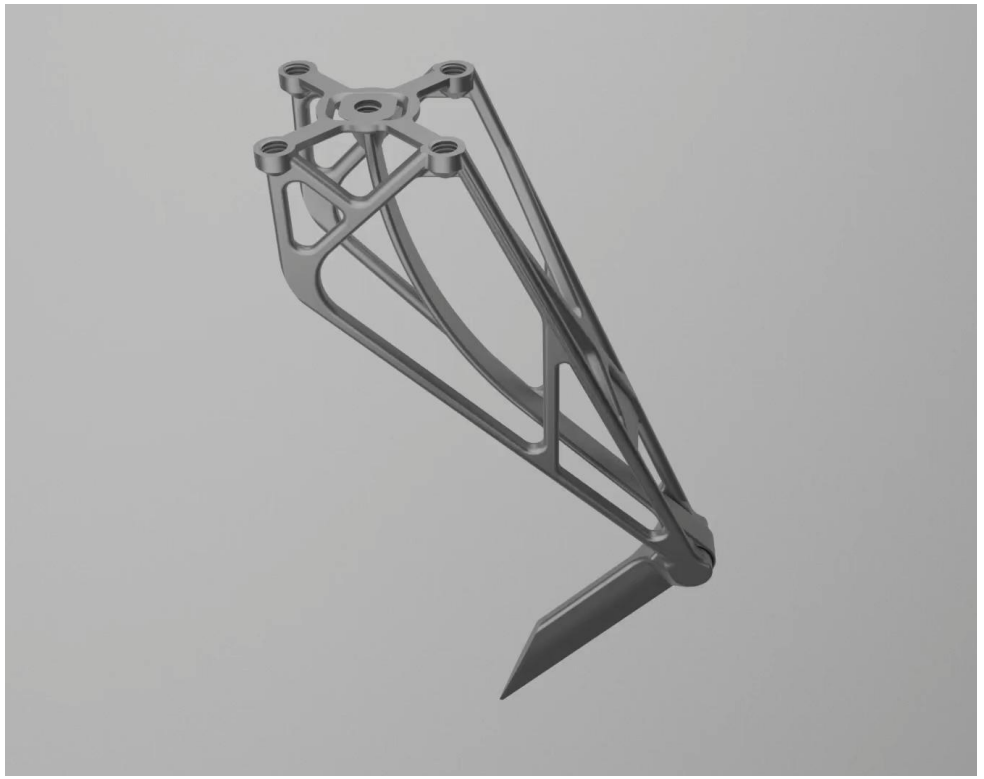


Robot dough cutting application

REDESIGN FOR AM

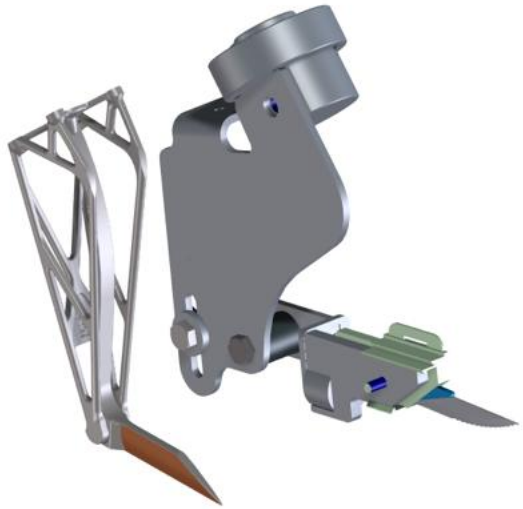
Several technological improvements can be applied within 1 part

- Porosity
- Air channels
- Screw thread
- Hinges
- Article numbers
- Leaf spring



Robot dough cutting application

BUSINESS CASE

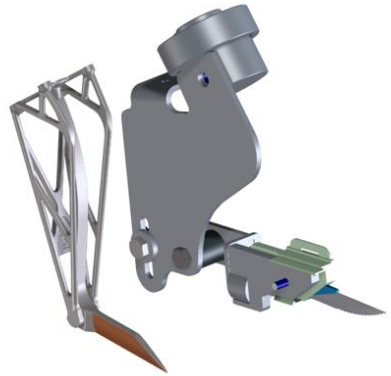


-90 % ••• Mass from 811g to 80 g

-60% to - 1000% ••• Production price: -60%
Bigger impact: Faster acceleration
6 robots in stead of 8!

-95% ••• From 20 parts to 1

Robot dough cutting application
BUSINESS CASE



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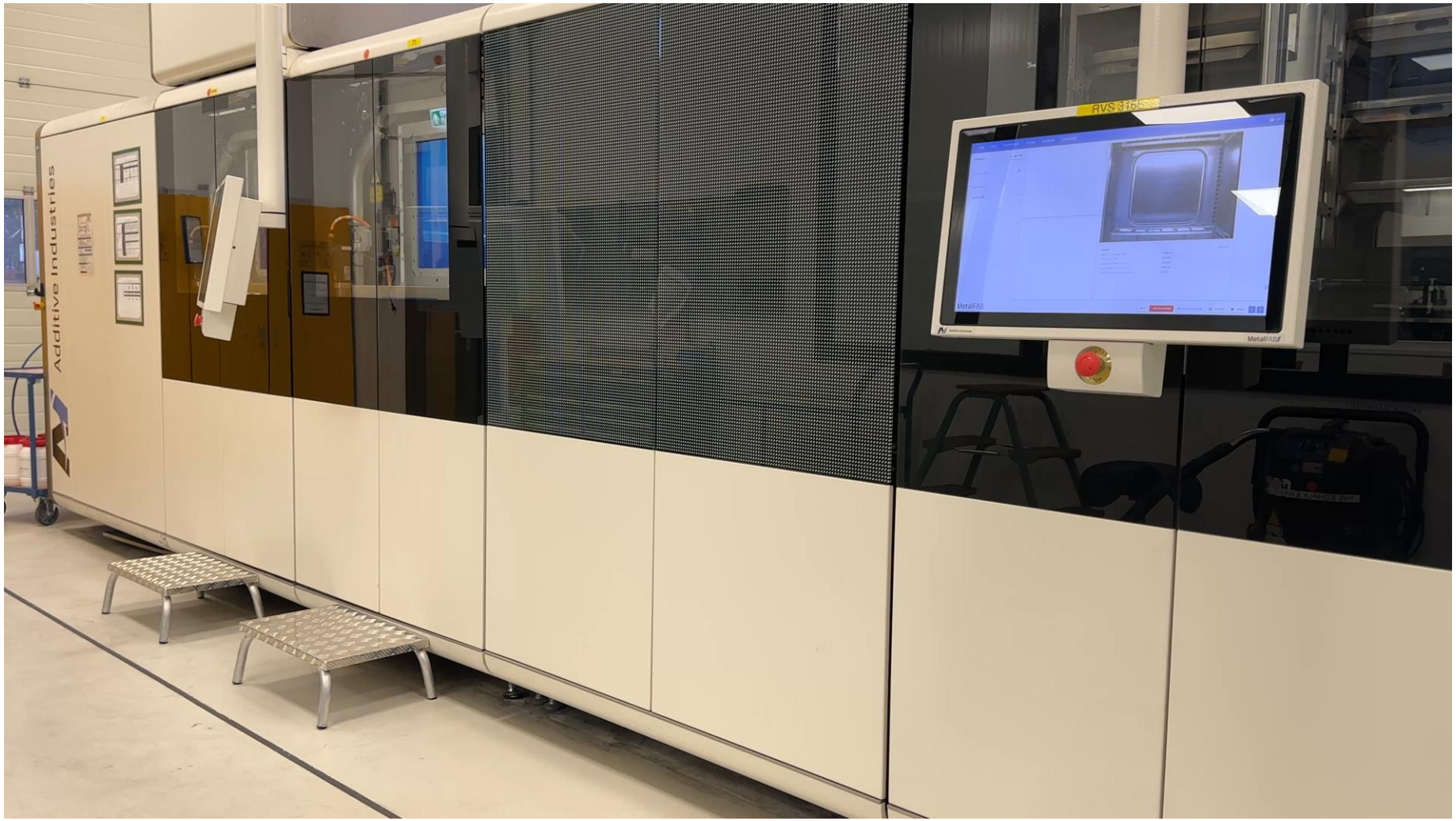
Old BOM vs New BOM

Robot dough cutting application
The impact of controlled porosity

Robot dough cutting application

L-PBF production environment & finished build job



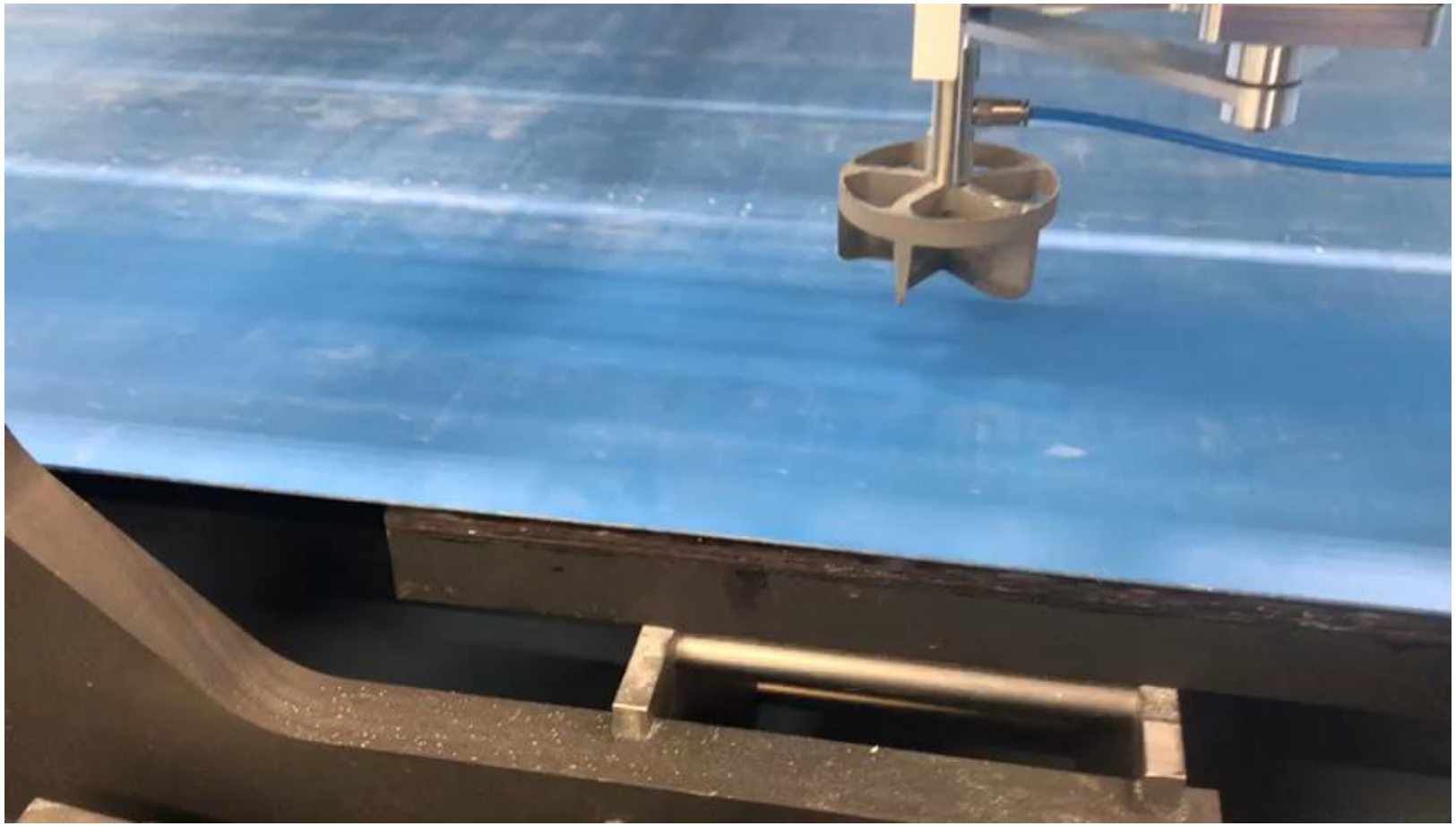
Robot dough cutting application

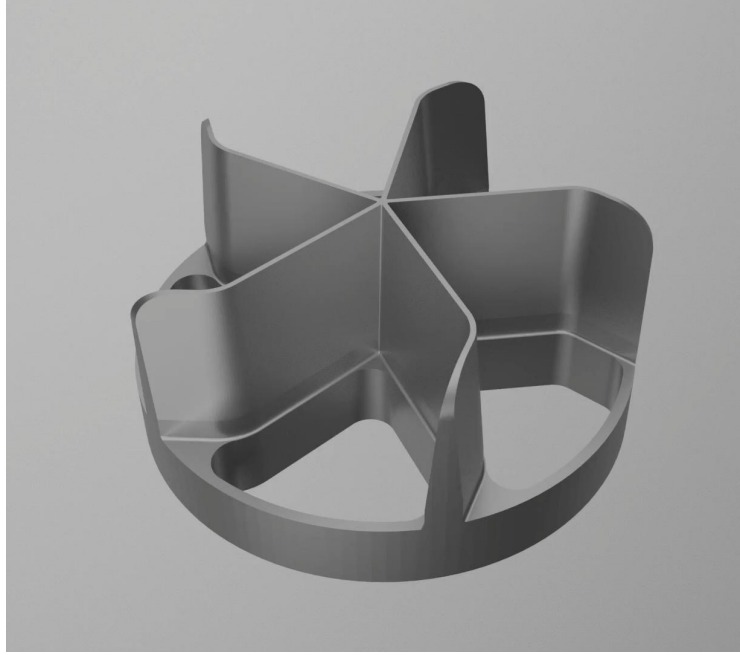
Robot application #2

21/05/2025

Robot dough cutting application

Robot application #3





Additive Industries & K3D

Summary

Through designing and developing a new production tooling concept for dough production lines K3D has achieved:

➢ new design possibilities	Porous properties, function integration, weight reduction, improved stiffness
➢ smart manufacturing	No tooling, no waste, no minimum order quantities, no post processing
➢ competitive advantages	Fast design iterations, shorter lead times, reduced part count, no assembly steps, increased performance

printing with fully automated MetalFABs from Additive Industries K3D has achieved:

- ✓ cost reduction and control on part level
- ✓ maximum reliability in reproducible part quality
- ✓ specific porous parameter set due to the open machine architecture
- ✓ high production flexibility due to machine modularity and build-size on demand

Thank you!

Additive Industries

K3D

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