

FME AI FOR INDUSTRY JAAREVENT



**Op weg naar
Autonome Productie-
systemen met AI**

11 december 2024

AGENDA

1. Reinder Hoekstra – Meijer Metal:
Transformatie tot een Smart Factory
2. Pieter Janssen – Prodrive Technologies:
Op weg naar een volledig geautomatiseerde productieomgeving
3. Vragen & discussie

Transformatie tot een Smart Factory



RECEIVED

MEIJER

METAL

- Sint Jacobiparochie, The Netherlands

MEIJER

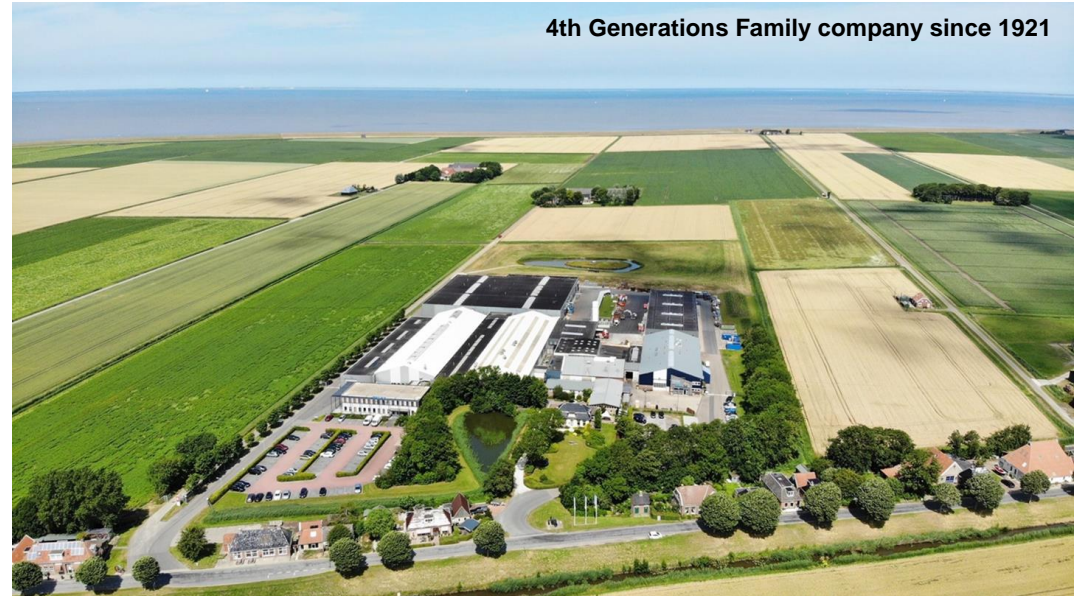
HANDLING SOLUTIONS

- Sint Jacobiparochie, The Netherlands



KOOI®

- JV Cascade Meijer, North America



4th Generations Family company since 1921

Meijer Metal

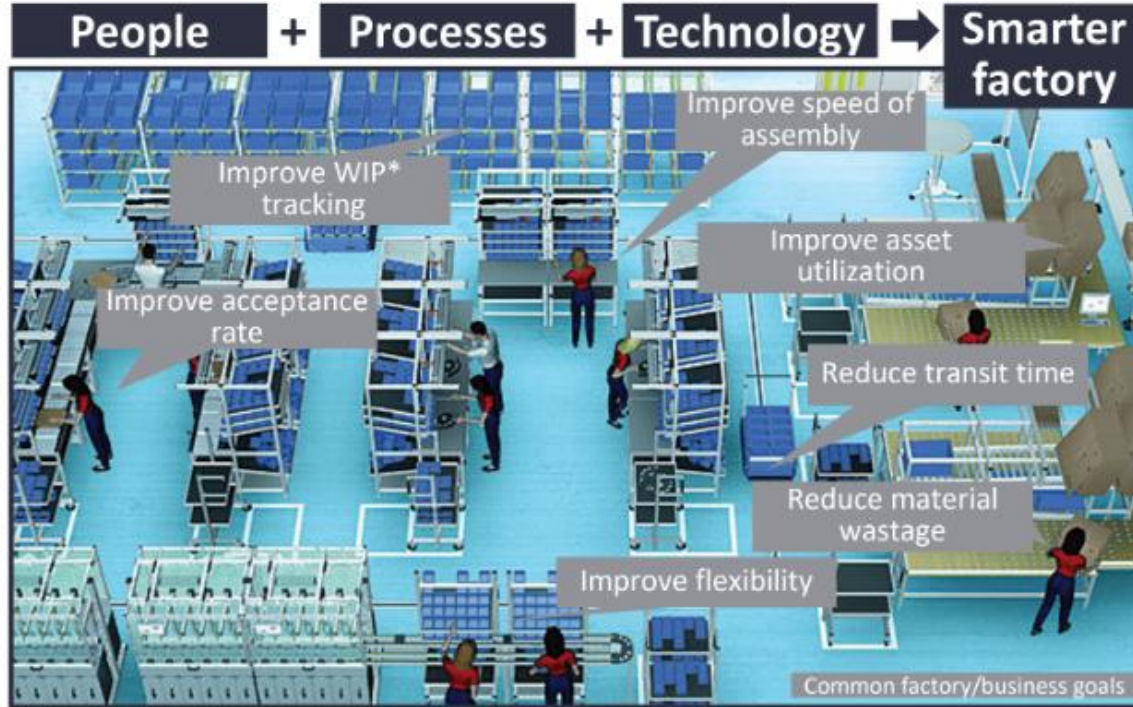












- **Duidelijke visie en strategie**
- **Urgentie en duidelijk doel**
- **Draagvlak**
 - **Mensen betrekken/enthousiastmeren, angst weg nemen**
 - **Kar trekkers**
 - **Verantwoordelijkheid geven (teams)**
- **Communiceren**
- **Successen vieren**
- **Verandering borgen**



- **Breng de bestaande processen in kaart (flowchart)**
- **Analyseer invloeden (visgraaddiagram)**
 - **Mens (Instructie, opleiding, motivatie, etc.)**
 - **Materiaal (toleranties, gedragingen)**
 - **Machine (preventief onderhoud, toolcheck)**
 - **Methode (beheersing, toolcheck/zoeken, bewaking)**
 - **Omgeving (temperatuur, vocht, etc.)**
- **Flexibiliteit**
- **Redundancy**



- **Big data (sensoren, status meldingen, ERP order data)**
 - **Wat wil je weten en waar?**
 - **Predictive maintenance AI**
 - **Actief gereedschap wisselen**



- **KISS het is vaak al complex genoeg (handshake)**
- **Digital twin (Machine communicatie, aansturing, visualisatie)**
- **Planning (AI, Algoritmes)**

PRODRIVE TECHNOLOGIES

A journey towards a "Lights out factory"
Prodrive Technologies
• by Pieter Janssen

Reference :

Date:

Author(s):

Distributi
on:

• 2024-12-11

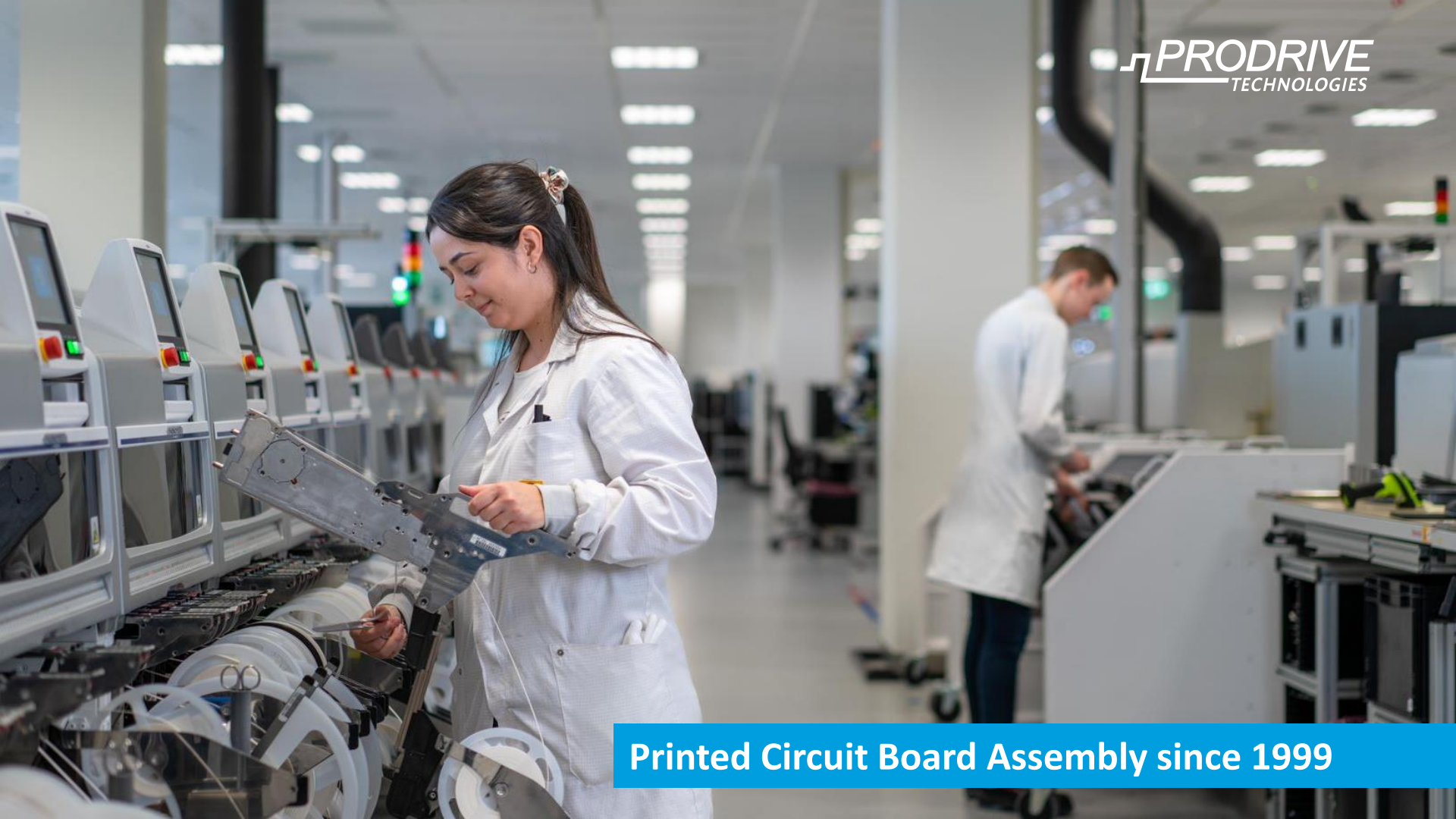
Pieter Janssen

2000 FTE (NL)
>500 Meuro revenue
>2000 product types
Volumes 10pcs – 400kpcs

 **PRODRIVE**
TECHNOLOGIES

- Business Models:**
- Off the shelf products
 - Technology solutions
 - Manufacturing Services

Prodrive Technologies Campus Eindhoven



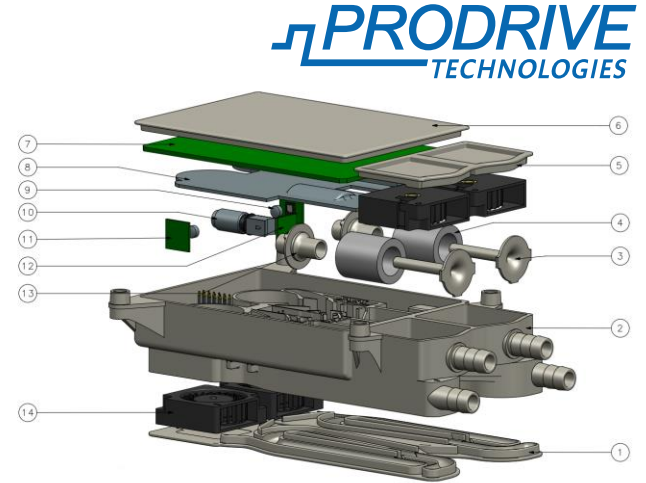
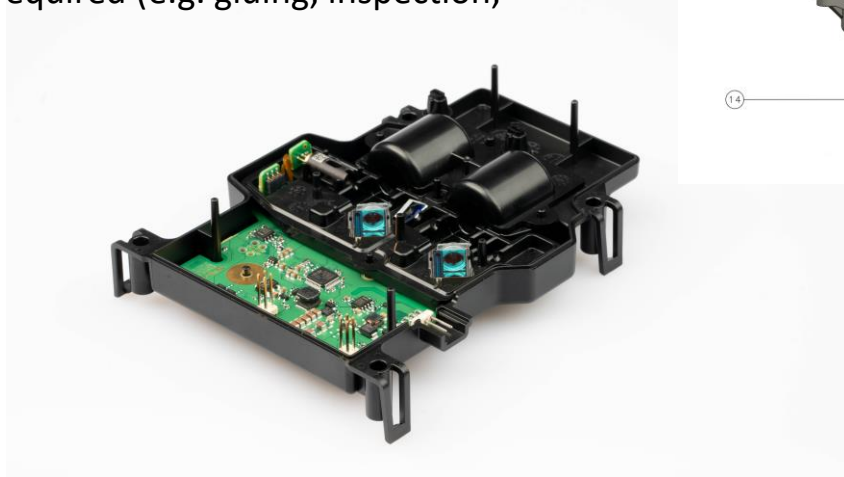
Printed Circuit Board Assembly since 1999



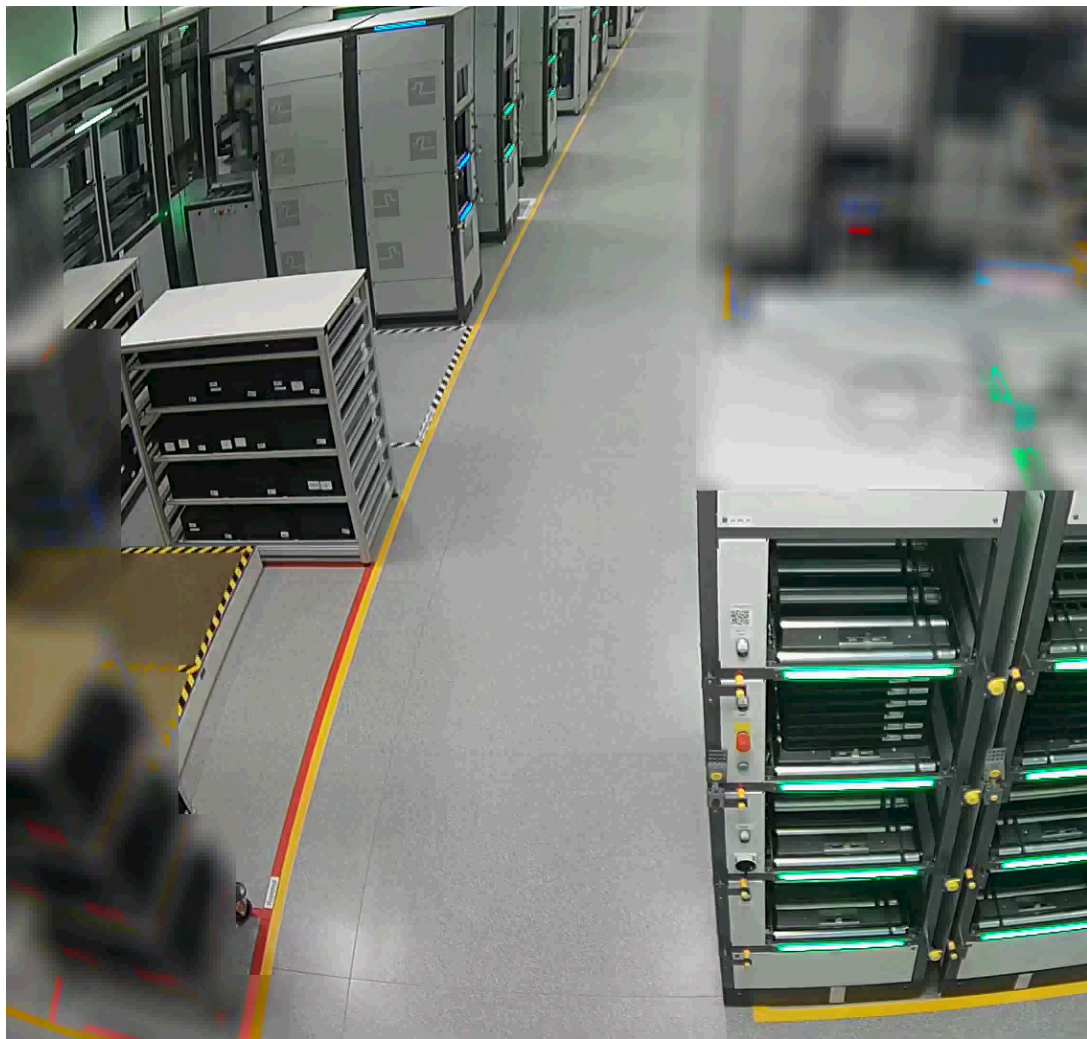
Fully automated injection moulding since 2018

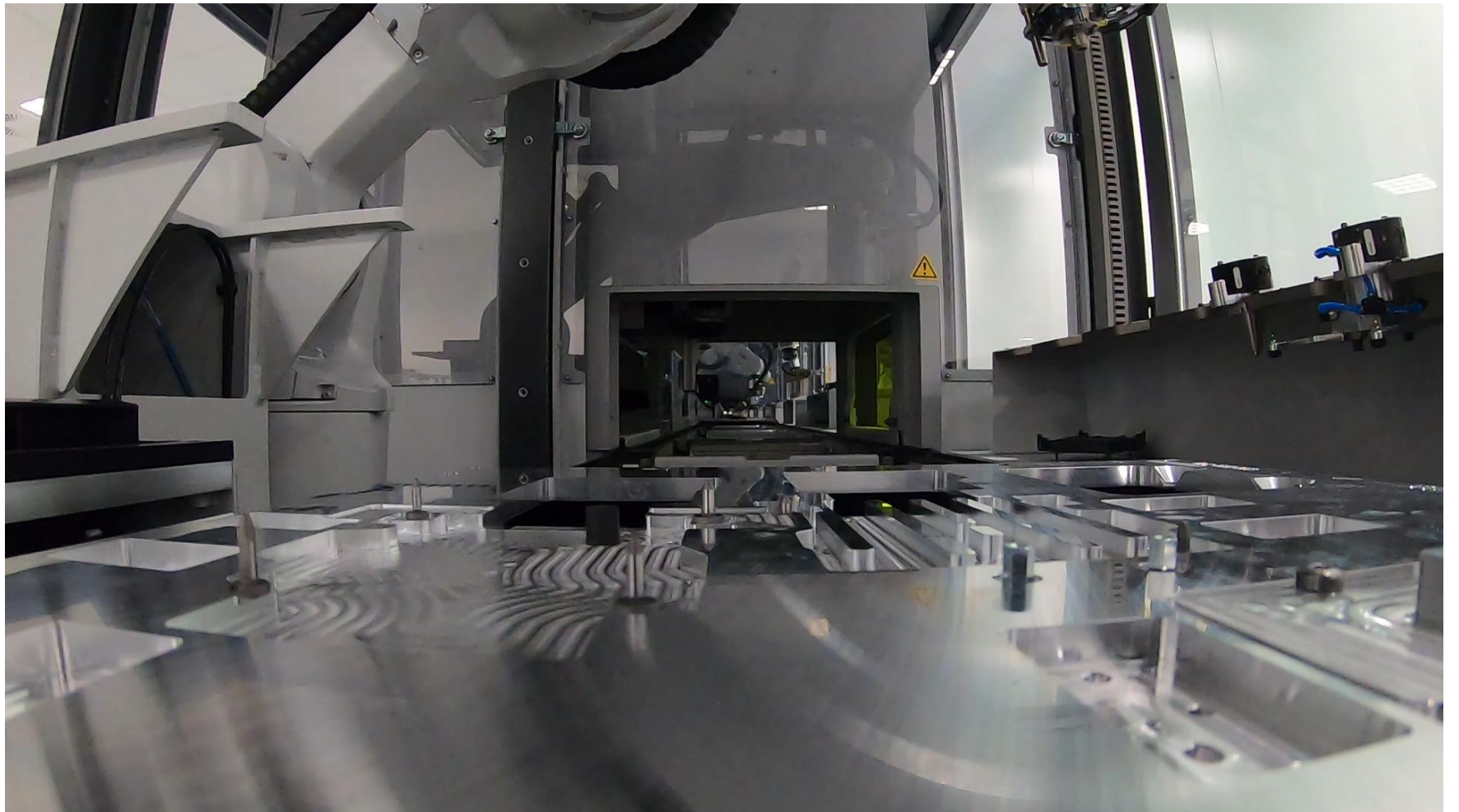
Automated Solution Line: Particle Sensor

- 32 individual robotic cells
- 13 different parts to assemble
- 8 main functionalities required (e.g. gluing, inspection, curing and assembly)
- 57s cycle time
- 9000 pieces per week



Increase the level of automation for [manufacturing processes](#) towards our common goal: the lights out factory

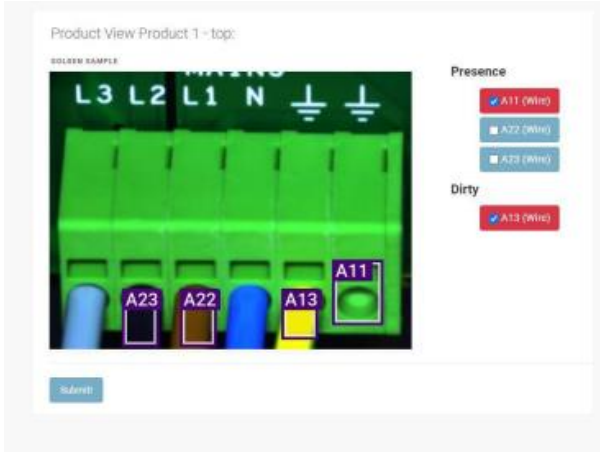
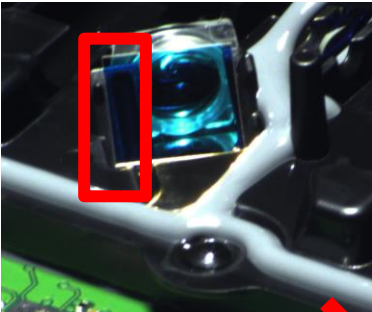




Inspection using AI (Machine learning algorithms)

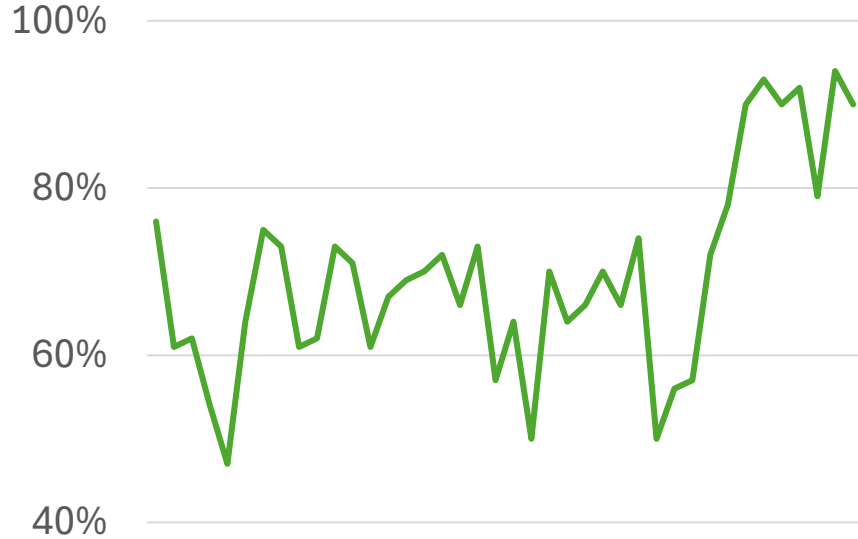


- In house developed AI framework
- Trained model delivers good results (without AI not successful)
- Requires sufficient data-set
- Used for different inspection tasks



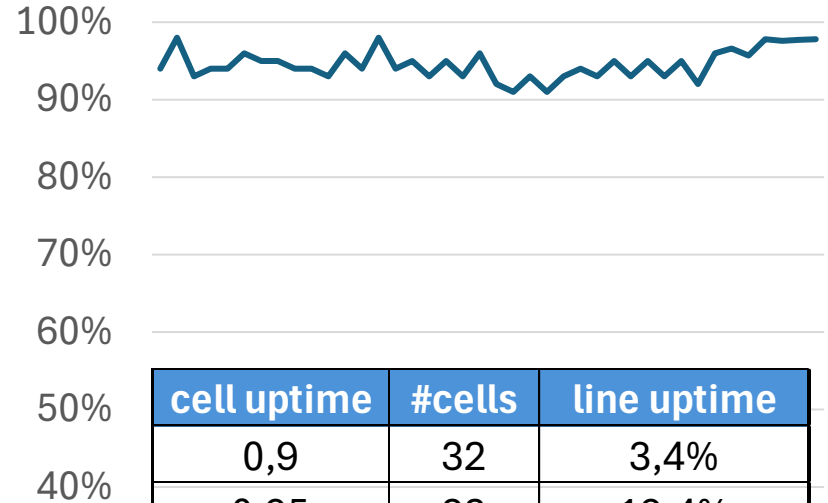
Overall Equipment Efficiency (OEE) and Yield

OEE



OEE = Availability x Performance x Quality

Inline First Pass Yield



cell uptime	#cells	line uptime
0,9	32	3,4%
0,95	32	19,4%
0,99	32	72,5%
0,999	32	96,8%
0,9999	32	99,7%



Lessons learned

- Governance structure & Stage gating
- No single point solutions (enable re-use)
- Use your data
- Make or Buy?

Elon Musk's "Algorithm"

1. Question Every Requirement
2. Delete any part or process you can
3. Simplify and Optimize
4. Accelerate Cycle Time
5. Automate





Q & A

Chat GPT 4o:

Create image of 2024 Mini Cooper car in Cape Town Bo-Kaap district with backdrop of colored houses and mountain

BEDANKT VOOR JE AANDACHT!

Meer informatie:

- Reinder Hoekstra – Meijer Metal:
rhoekstra@meijer-group.com
- Pieter Janssen – Prodrive Technologies:
pieter.janssen@prodrive-technologies.com

FME Platform AI for Industry:

Patrick Blommerde – FME: patrick.blommerde@fme.nl

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**Bedankt voor
je aandacht!**