wir automatisieren Qualitätsprüfung

MABRI.VISION
BEYOND MATTERS

INSPECTION INNOVATION:
MABRI.VISION

NEED?

IVAM 14.09.2022
Mid-Week Coffee Break - September

"We automate quality inspection - MABRI.VISION GmbH"

Dr. Ulrich Marx

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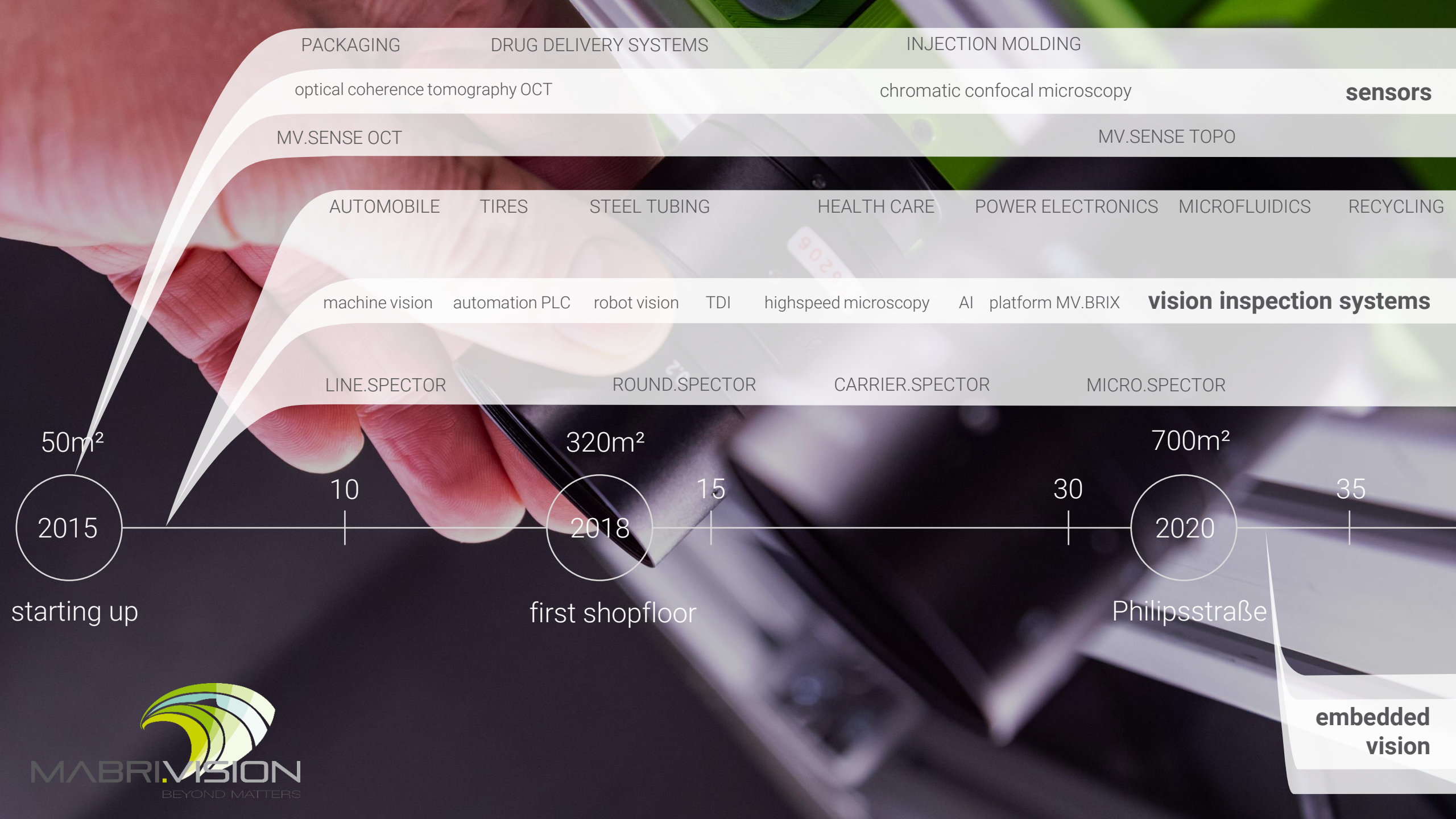
PACKAGING
DRUG DELIVERY SYSTEMS
INJECTION MOLDING
optical coherence tomography OCT
chromatic confocal microscopy
sensors
MV.SENSE OCT
MV.SENSE TOPO
AUTOMOBILE
TIRES
STEEL TUBING
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MICROFLUIDICS
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50m²
320m²
700m²
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10
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starting up
first shopfloor
Philipsstraße
embedded vision
MABRI.VISION
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WE AUTOMATE QUALITY INSPECTION

MABRI.VISION GmbH

„Innovative technologies and smart software solutions are our key for efficient quality control automation."

consulting
- planning & optimization of QC processes
- vision concepts
- feasibility studies

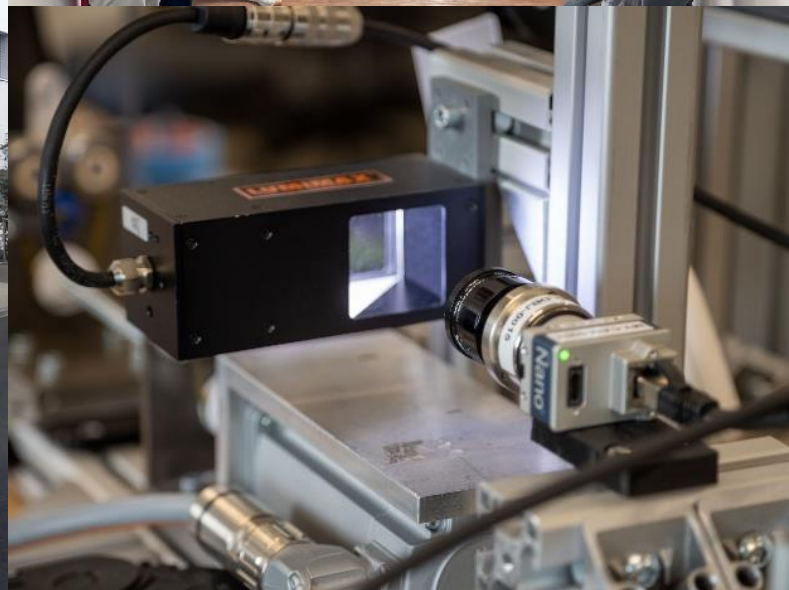
engineering
- designing vision systems
- mechanical and electronical engineering
- PLC and software engineering

process automation
- automation of QC processes
- stand alone and integrated solutions
- turn key solutions

Service and Maintenance
- on site support
- remote service
- availability packages

IMPRESSIONS

HEADQUARTER AACHEN



IMPRESSIONS

MABRI.VISION
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IN-HOUSE MANUFACTURING

IMPRESSIONS

MABRI.VISION
BEYOND MATTERS

R&D DEPARTMENT

IMPRESSIONS

MABRI.VISION
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WORK AND CHILL

COMPANY & GOALS

OUR CORE BUSINESS

since 2015 we automate production quality inspection processes with innovative machine vision solutions.

35 employees

9 IT specialists

8 vision experts

7 engineering

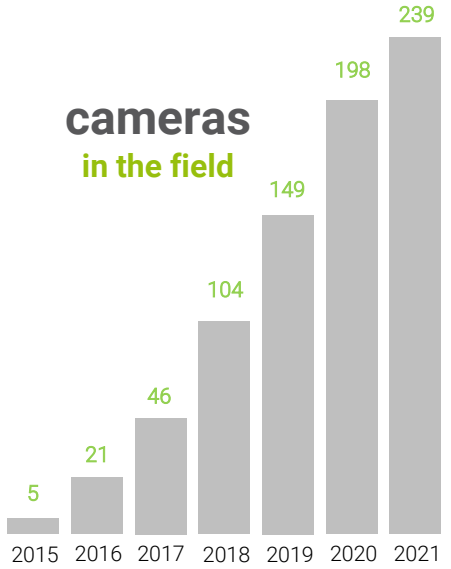
∞ AI

WHAT WE DO

- consulting
- engineering
- machine vision systems
- service

OUR GOALS

- **shape industry 4.0:** inspection concepts for a dynamic production environment
- **AI:** make deep learning and AI usable for production inspection
- **modular system:** inspection systems build by software and hardware modules: MV.BRIX
- **growth:** with our partners



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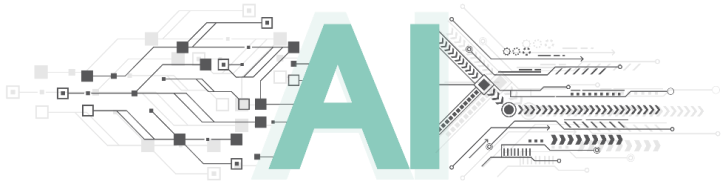
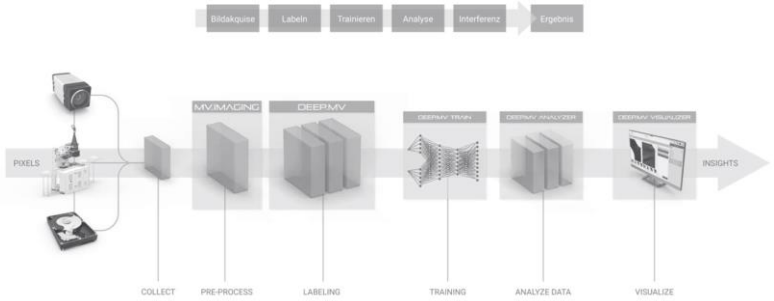
FORSCHUNG & ENTWICKLUNG



KI für Industrie nutzbar machen - Fertigungstechnik optimieren

SOFTWAREPLATTFORM DEEP.MV
End-to-End KI Lösungen für die Produktion



Standardisierung von Produktentwicklungsprozessen

manuelle Prüfung | Beratung & Konzept | Tests & Feasibility | Anlagenbau

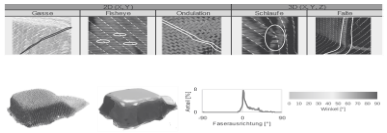
UNSERE PARTNER

Fraunhofer IPA | RWTH AACHEN UNIVERSITY | Fraunhofer ITWM | LFB Institute of Imaging and Computer Vision | RWTH AACHEN UNIVERSITY

TRUMPF | QIAGEN | ITA | Infineon | PULSAR PHOTONICS a schunk company | UNIKLINIK RWTH AACHEN

KIQS

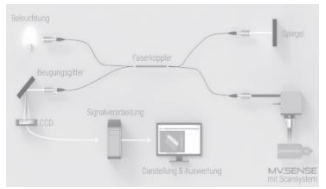
KI-basierte Defekterkennung von CFK-Strukturen



GEFÖRDERT VOM Bundesministerium für Bildung und Forschung

Dünnschicht-OCT

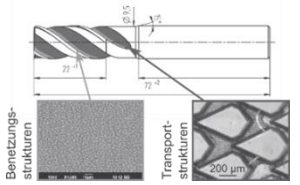
OCT Entwicklung für Schichten <10 µm



AiF Forschungsnetzwerk Mittelstand

BIONICTOOLS

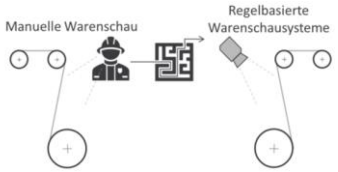
Mikrostrukturierung von Fräswerkzeugen



GEFÖRDERT VOM Bundesministerium für Bildung und Forschung

SchauML

automatisiertes Lernen von Fehlerbildern



IN BEANTRAGUNG Bundesministerium für Bildung und Forschung

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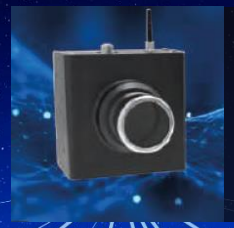
technology

One step ahead



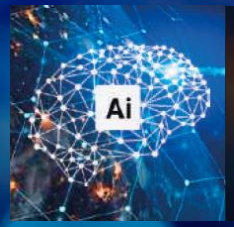
sensors
- We develop inhouse OCT sensors
- Inspection of surfaces, thinknesses
- High speed: 240.000 scans/s

Line & matrix cameras
- Machine vision inspection systems
- Geometry inspection
- Defect inspection

TDI – high speed microscopy
- Large scale inspection of microstures
- Inspection of lab on a chip applications
- Inspection of 1.000.000 features/s

3D – triangulation
- 3D – surface inspection
- Fast wafer inspection
- High resolution surface scans

3D – structured light imaging
- 3D – presence detection
- 3D – defect detection
- Shape from shading



Machine Vision with neuronal networks
- AI based defect detection
- OCR applications
- MV.AI – software platform for machine learning

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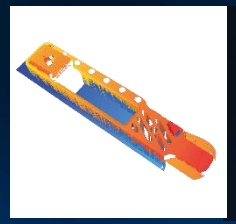
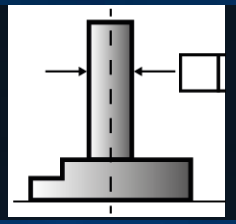
metrology

Our DNA



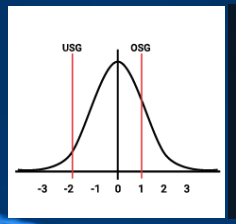
2D/3D signal and data processing

- AI-based data processing
- Neuronal networks
- Data visualisation



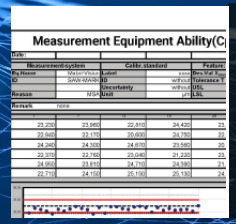
Geometric tolerances

- Determining tolerances based on ISO 1101
- Generation of automatic reports



Process capability

- Generation of process capability reports
- Audit trail, change management
- Process optimisation

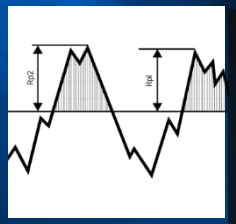


MSA Measurement system analysis

- Six Sigma processes
- Traceability calibration standards

Six Sigma tools

- Quality management tools
- Fault analysis tools
- Change management



Roughness inspection

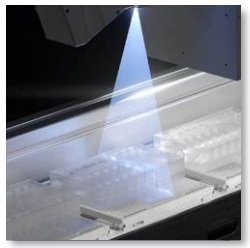
- Determination of 2D roughness parameters via ISO 4287 & 13565
- Determination of 2D roughness parameters via ISO 25178

our markets: now & tomorrow

With machine vision QC inspection equipment and solutions, we aim to support the development of new industries and fast-growing sectors. We are already involved in many growth markets.

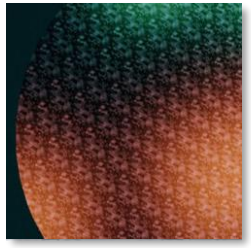
e-mobility

power electronics, tires, circuit boards



health care

microfluidics, implants, microsensors, disposables



semiconductor

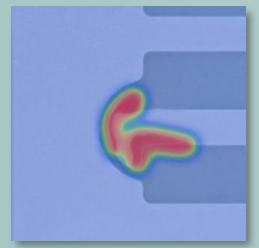
microstructures, electronics

renewable energy

electronic components, power electronics

logistics

label detection, high content applications



embedded / ai vision

ML, deep learning, cross platform solutions

resources management

deposit systems, product recognition, recycling

sustainable global nutrition

packaging inspection, label inspection

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INSPECTION SYSTEMS

sensor technologies

no moving parts

with moving parts

MV.SENSE OCT

layers & thickness scanner

MV.SENSE TOPO

microscopic 3D inspection

INLINE.SECTOR

tube thickness inspection

MV.EYE

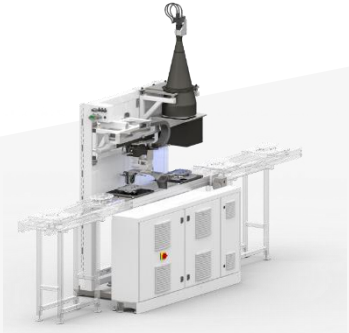
camera, line, 3D, multi camera

LINE.SPECTOR

fast line scanning system, scan gate QR, DOT, DMC, barcode

ROBOT.SPECTOR

Universal: versatile in use



CARRIER.SPECTOR

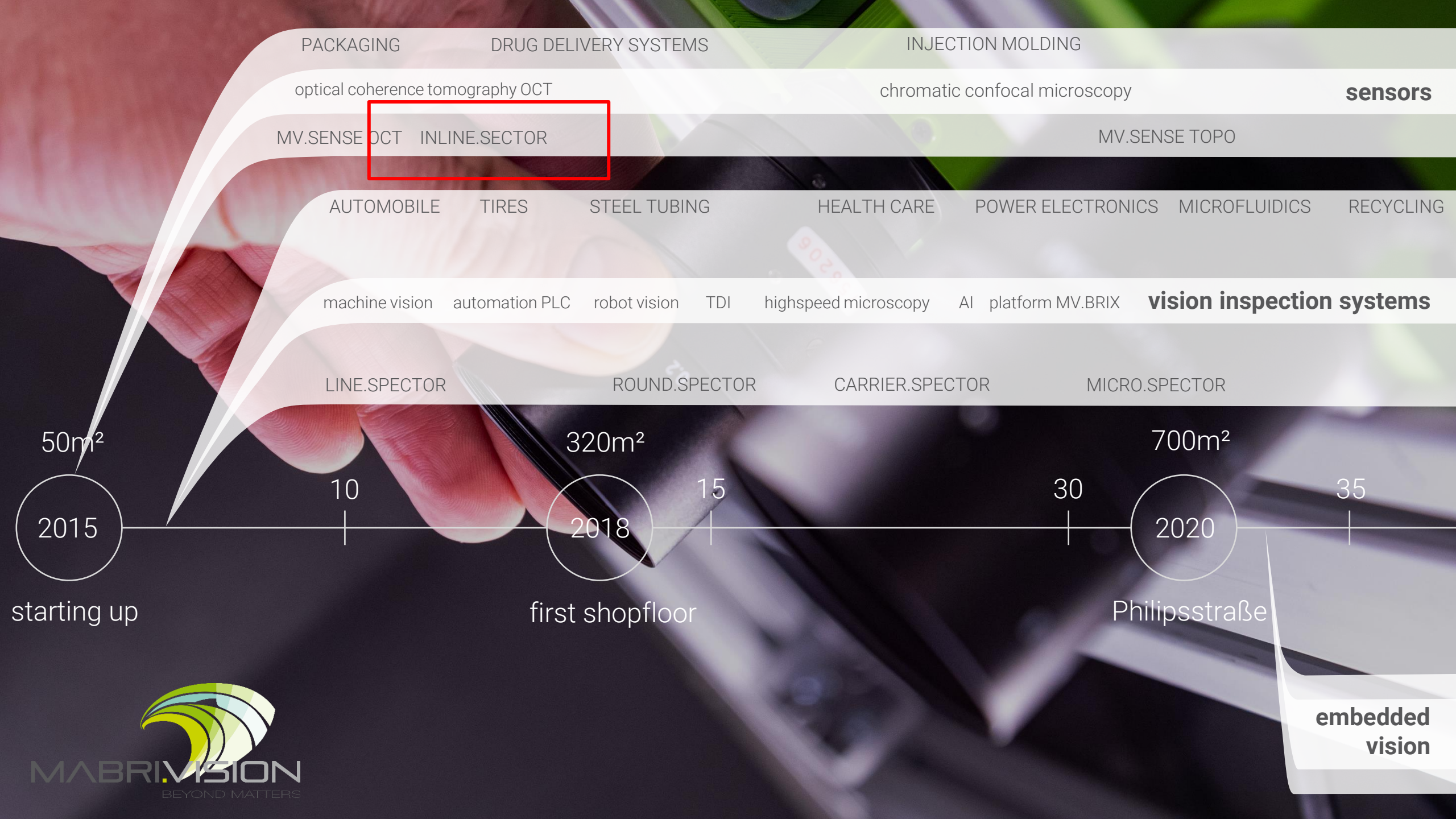
2D/3D inspection for carriers

ROUND.SPECTOR

rotary inspection systems

MICRO.SPECTOR

Inline microscopic inspection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MEDICAL TUBING
WALLTHINKNESS | SHAPE

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SEMITRANSPARENT TUBING

› Wall thickness 0,1 mm - 4 mm

› Tubing diameter 0,5 mm - 20 mm

› Silicon, PVC, PMMA

› Acromatic and colored

› Assembly line speed up to 400 m/min

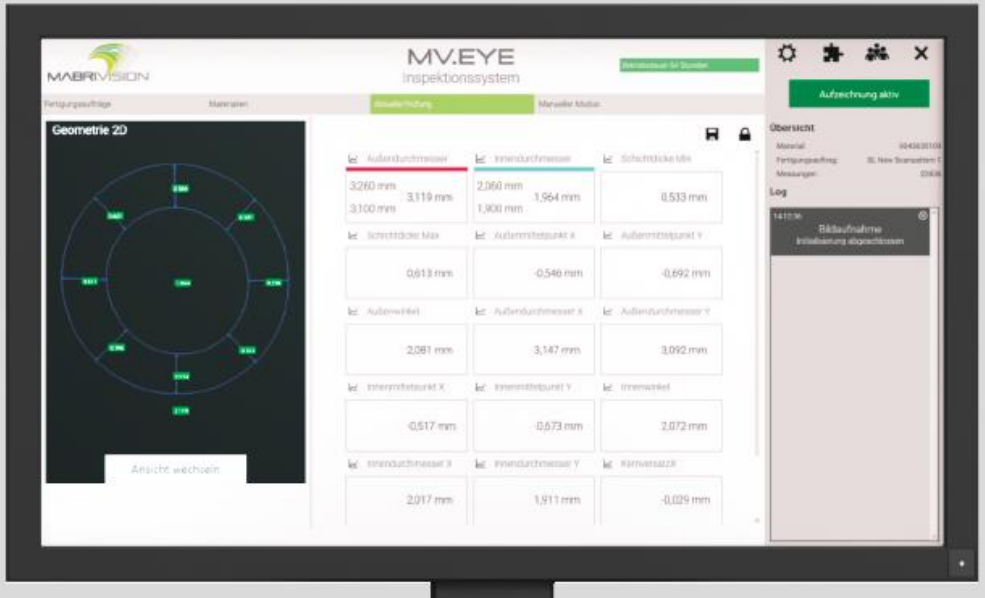
FEATURES

› Outer diameter

› Inner diameter

› Eccentricity & ovality

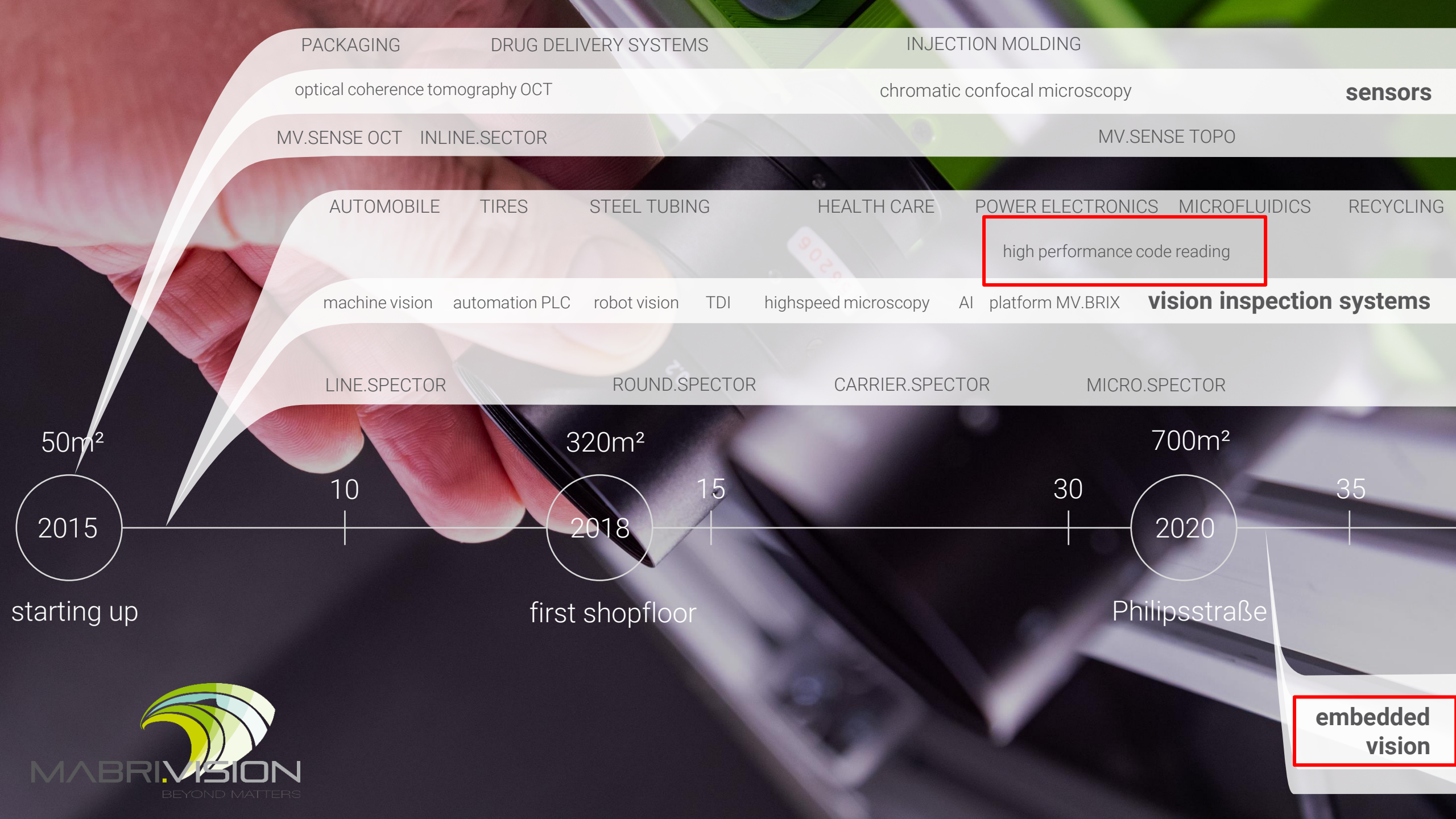
› Wall thickness on 8 Positions



ANALYSIS

› Daten-Visualization and -Analysis

› Fully automatic inline inspection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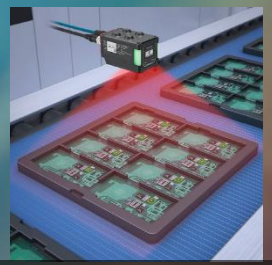
Code Reader Lösungen

- ✓ Embedded System
- ✓ Kosteneffizient
- ✓ Plug and Play

Mehrere Codes auf Motorblock



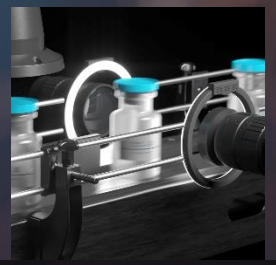
Codelesen auf Platinen

Zuordnung und Tracking von Trays

Erfassung von Codes in der Bewegung

High Performance Lösungen

- ✓ High Content Architektur
- ✓ für Anspruchsvolle Anwendung
- ✓ Vollwertiges BV SYSTEM



Gelaserte Codes in der Medizintechnik

2D-Datacode Erkennung auf Reifen

Codeverarbeitung im B2C

High content Prüfung am Band

Highspeed Komplettlösungen für Codes

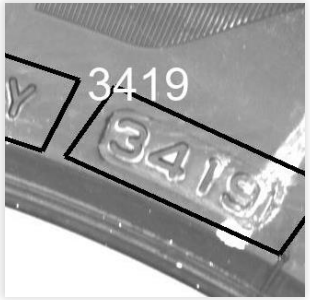
Was prüfen wir?

1D-Codes

Lesung und Verifikation sämtlicher 1D-Datacode Formate.

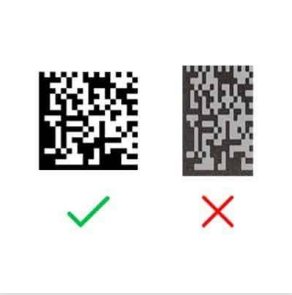
2D-Codes

Lesung und Verifikation sämtlicher 2D-Datacode Formate.



OCR-Lösungen

Mit unserem KI-Modul für OCR-Anwendungen bieten wir maßgeschneiderte Lösungen zum Lesen von schwer lesbaren Codes



Qualitätsmerkmale

Ausgabe sämtlicher Qualitätsmerkmale. Gemäß den Normen ISO/IEC 15415 / 15416 und ISO/IEC TR 29158

komplexe Oberflächen

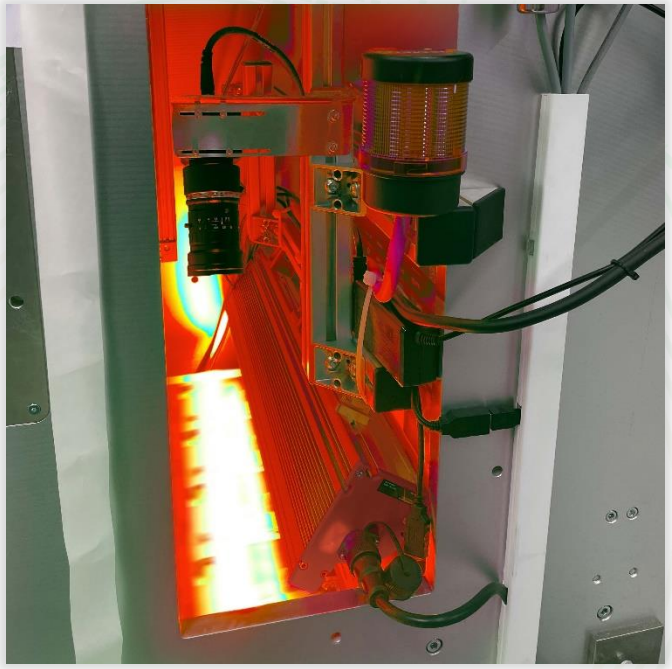
Unser System eignet sich sowohl für den klassischen und farbigen Code-Druck als auch für DOT-Codes, gelaserte Codes und verschiedene Oberflächen wie beispielsweise Metall.

Flexible Anzahl & Bildfelder

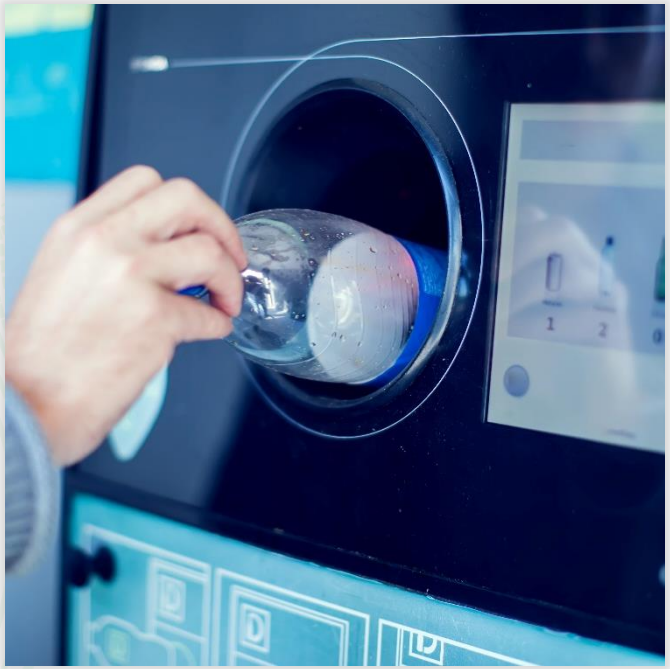
Modular anpassbare Bildfelder ermöglichen die Identifikation mehrerer Codes in einem Schritt.

Highspeed Komplettlösungen für 1D- und 2D-Datacodes

2D-Code lesen auf Reifen

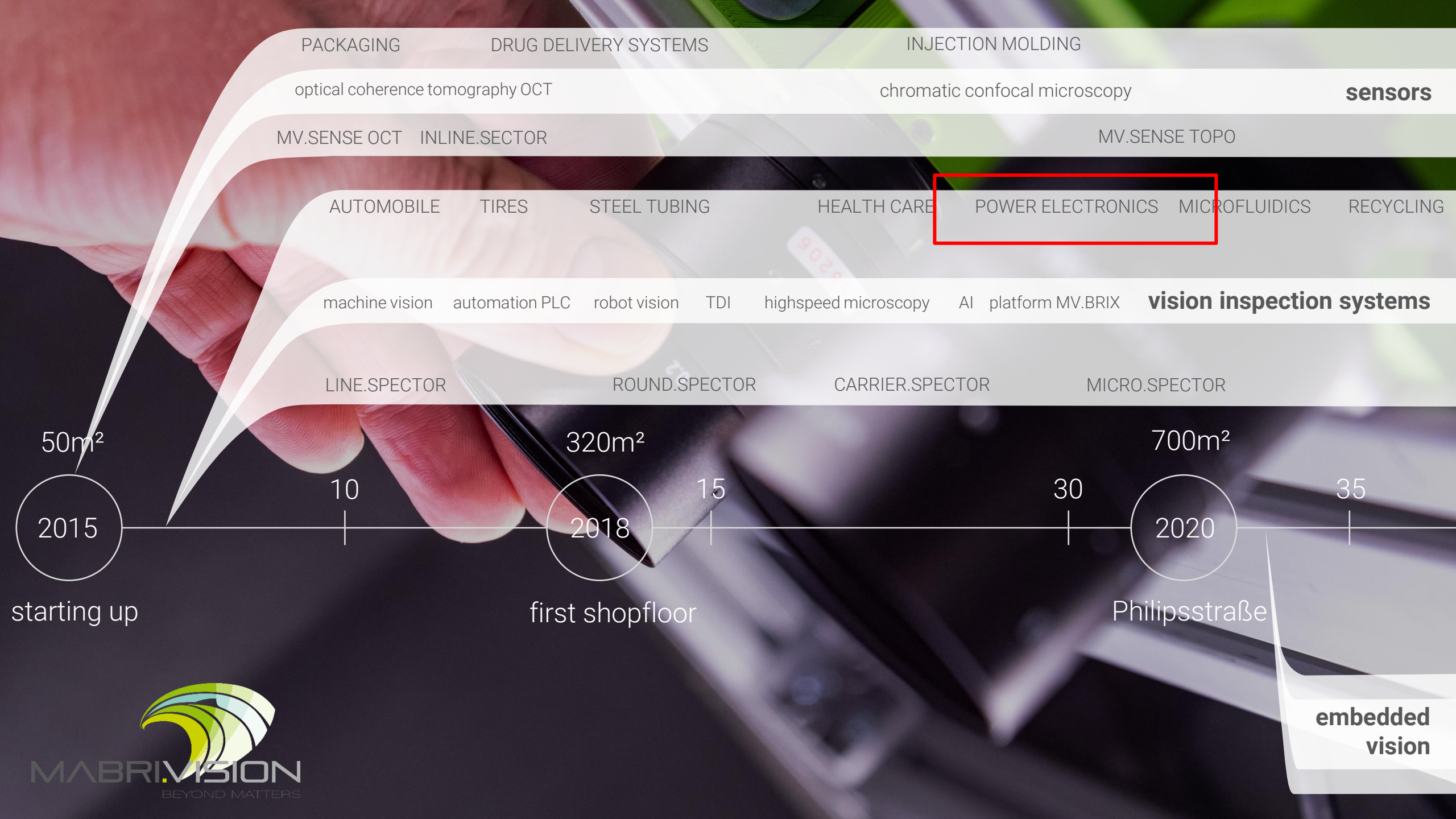


2D-Code lesen von Druckerzeugnissen



Codes auf Endverbraucherprodukten

Andwendungen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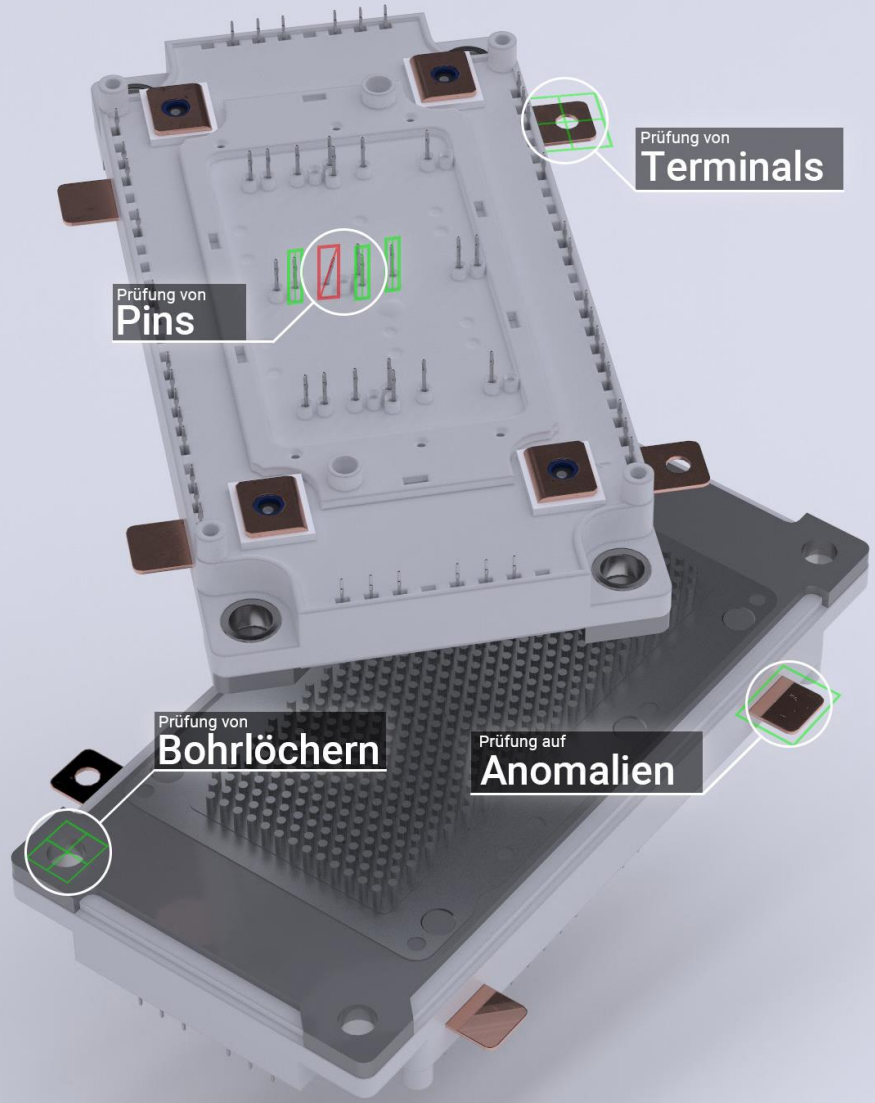
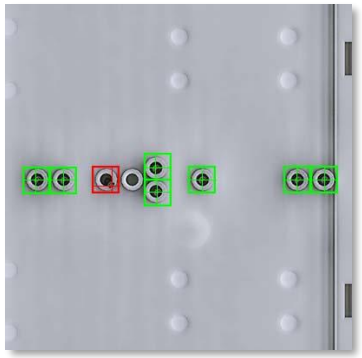
Automatische optische Prüfung von IGBT-Leistungsmodulen

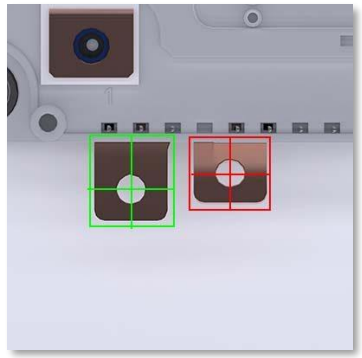
Automobil, E-Mobilität, Energie





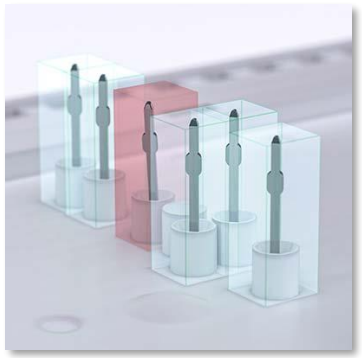
Pins

- Verbiegung von Pins
- Pin-Position (X,Y)
- Pin-höhe (Z)
- Taumelkreis



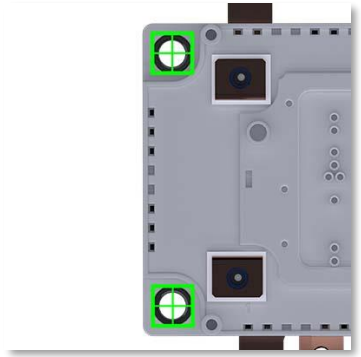
Terminals

- Verbiegung von Kontakten
- Durchmesser
- Position (X,Y)
- Höhe (Z)



Alignment Pins und Kontakte

- Defekte
- Durchmesser
- Position (X,Y)
- Höhe (Z)



Bodenplattenbohrungen

- Defekte
- Durchmesser
- Position (X,Y)
- Höhe (Z)

Defekte und Anomalien

- Kratzer
- Verschmutzung
- Fehlbilder
- Verfärbungen

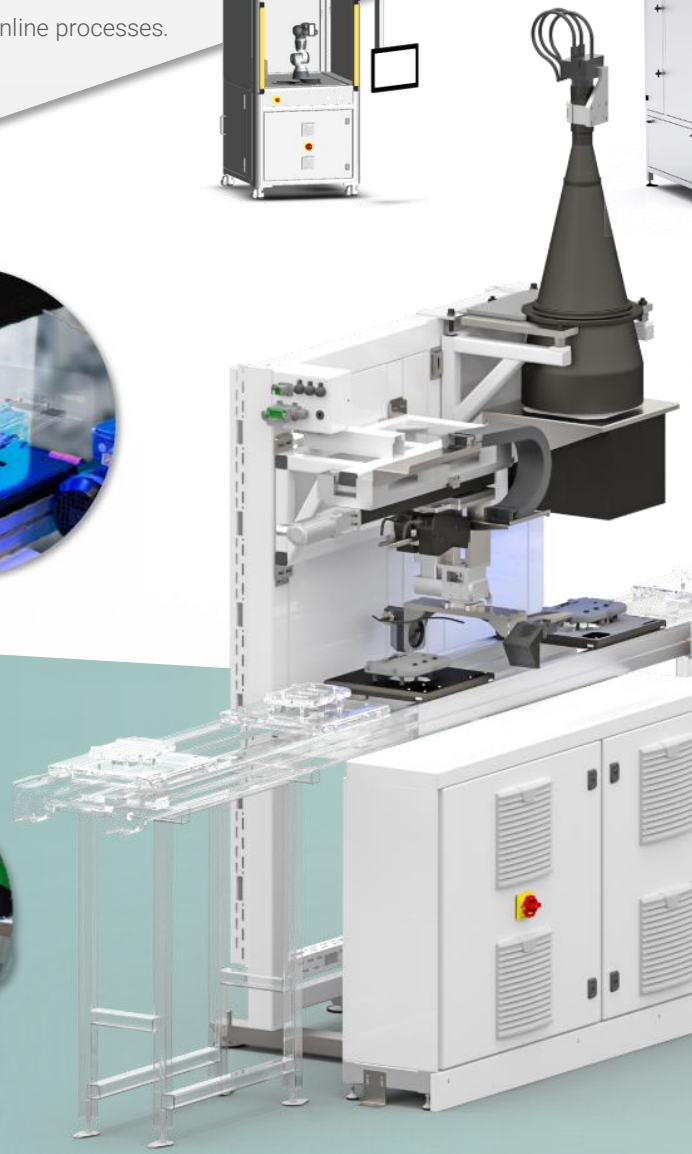
Schriftbilder und Druck

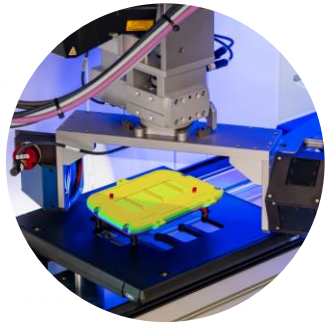
- OCR, Texterkennung
- Fehlende Schrift
- DMC / QR-Codes

CARRIER.SPECTOR

2D/3D end of line inspection system

The CARRIER.SPECTOR inspection system is built for fast inline processes. The Inspection is performed on carriers. This allows high precision and high throughput at the same time.





Combine 2D and 3D

We combine 2D and 3D results based on triangulation and telecentric measurements.

Data fusion

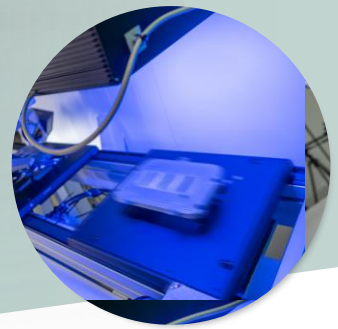
We combine data from 3 metrology instruments to extract 2D and 3D features.

Precise

We provide calibration standards based on ISO 10012. This allows highest quality for inspection systems.

Clean room

All hardware and software components are designed for clean room applications



Speed and cycle time

All processes and processing times are optimized for fast cycle times.

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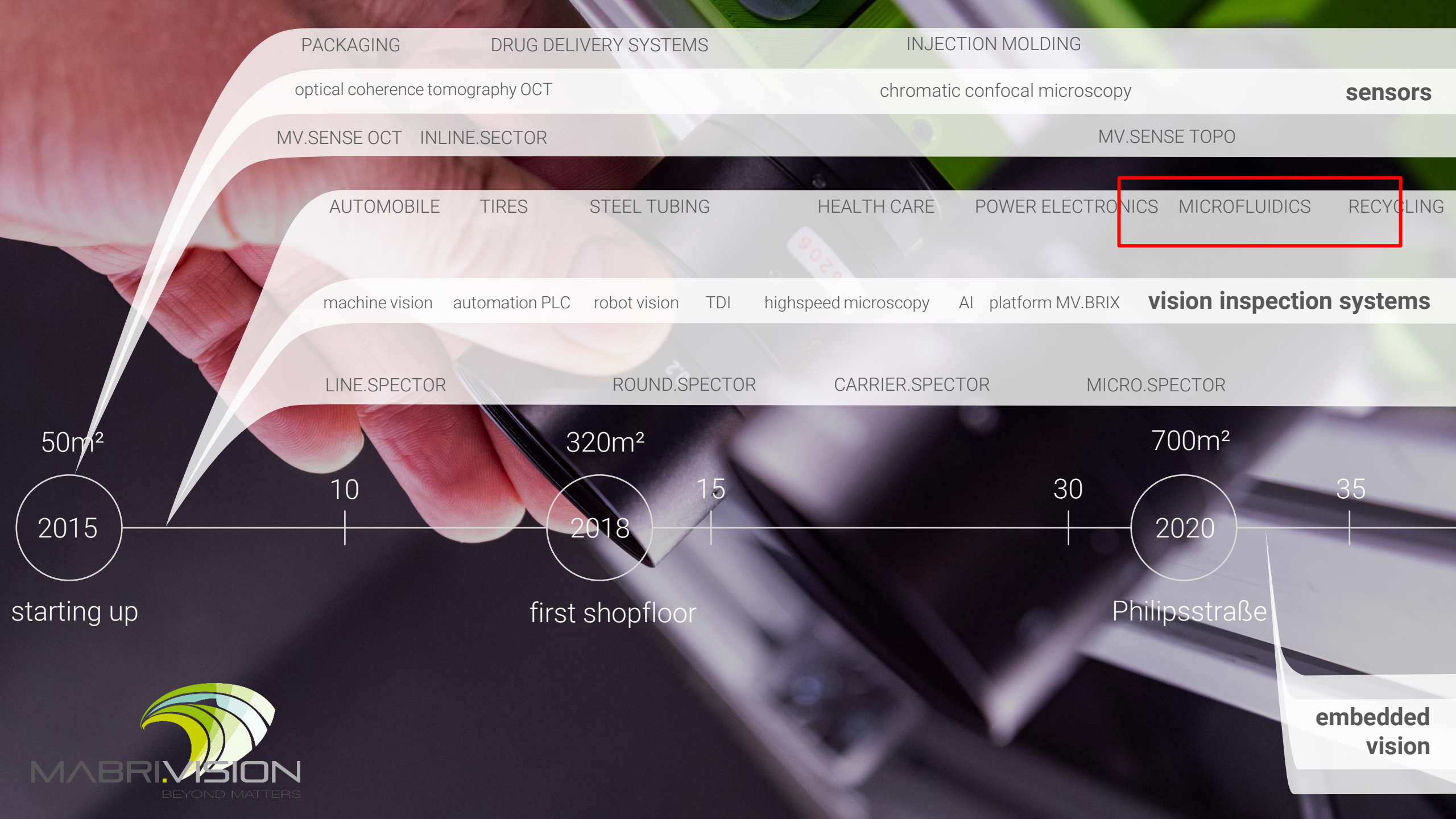
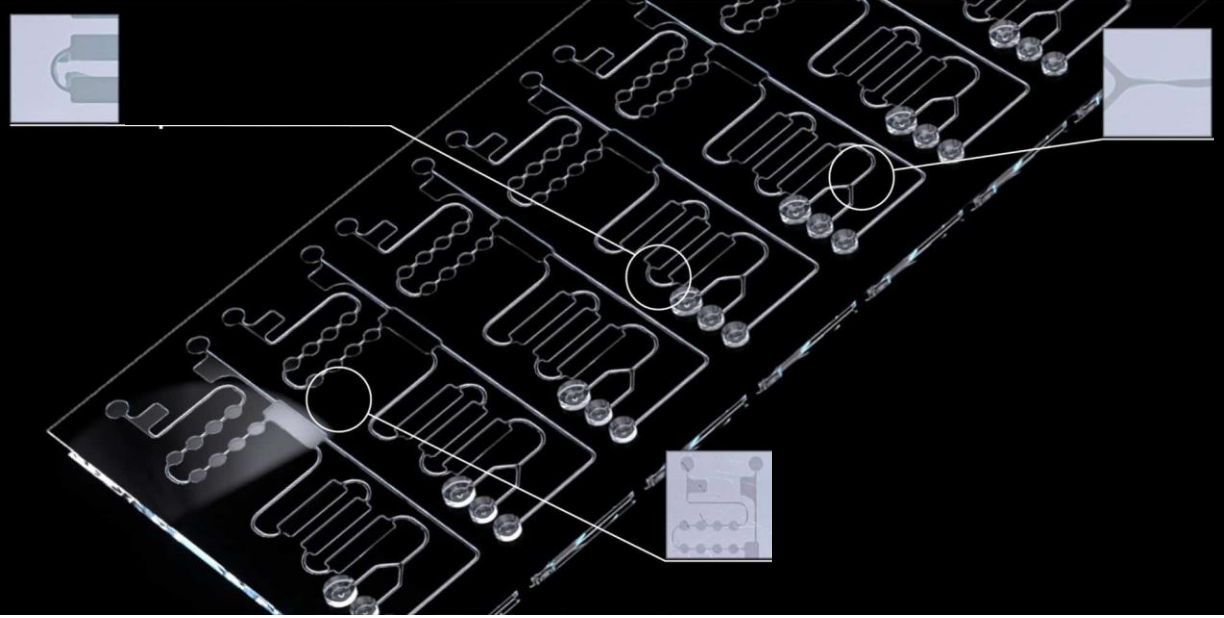
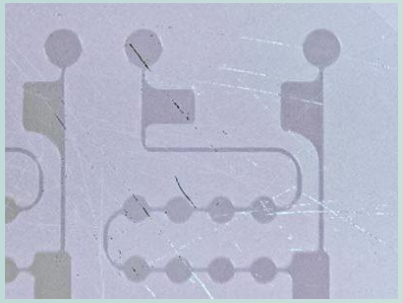
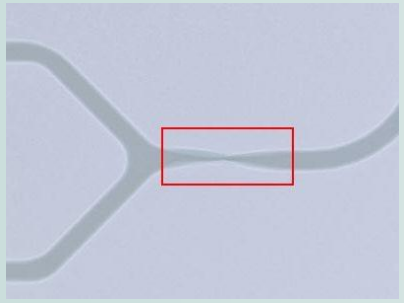

PACKAGING
DRUG DELIVERY SYSTEMS
INJECTION MOLDING
optical coherence tomography OCT
chromatic confocal microscopy
sensors
MV.SENSE OCT
INLINE.SECTOR
MV.SENSE TOPO
AUTOMOBILE
TIRES
STEEL TUBING
HEALTH CARE
POWER ELECTRONICS
MICROFLUIDICS
RECYCLING
machine vision
automation PLC
robot vision
TDI
highspeed microscopy
AI
platform MV.BRIX
vision inspection systems
LINE.SPECTOR
ROUND.SPECTOR
CARRIER.SPECTOR
MICRO.SPECTOR
50m²
320m²
700m²
2015
10
2018
15
30
2020
35
starting up
first shopfloor
Philipsstraße
embedded vision
MABRI.VISION
BEYOND MATTERS



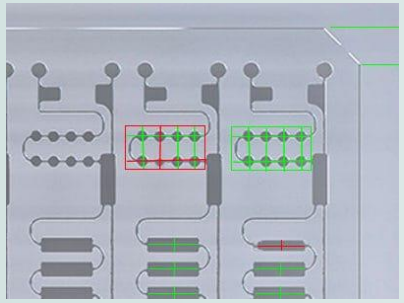
automated inspection of microfluidic devices



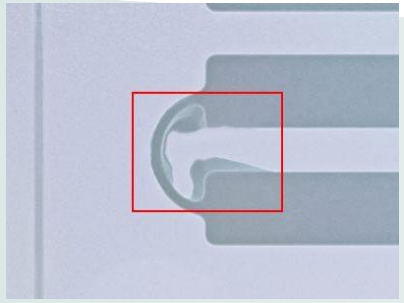
scratches & particles



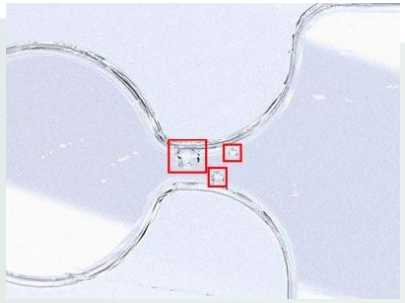
thin spots & lamination issues



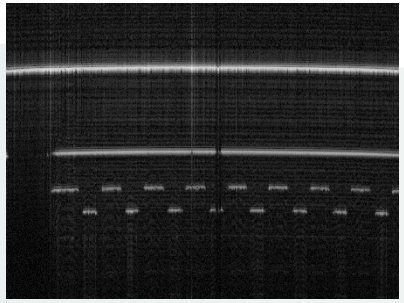
dimensional accuracy & tolerances



molding defects



particles, inclusions, air bubbles



layers, thickness, shape

QC-technologies for high precision injection molding

MABRI.VISION provides a unique set of QC-technologies and systems to improve quality of high precision injection molding processes. From automatic scans of molds to 100% inline QC-vision systems – we detect, check and inspect.

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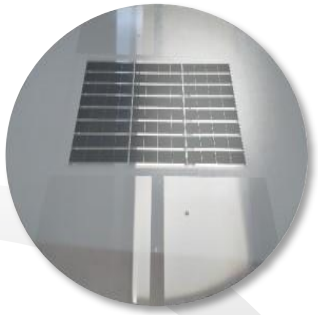
BEYOND MATTERS

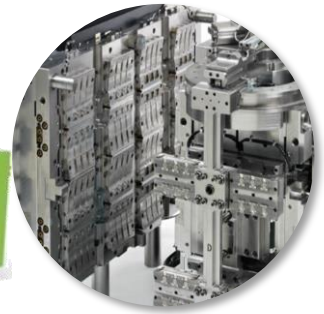


Mold manufacturing

- wafer and electroform microscopic inspection
- 3D surface inspection
- detection of defects and tolerances

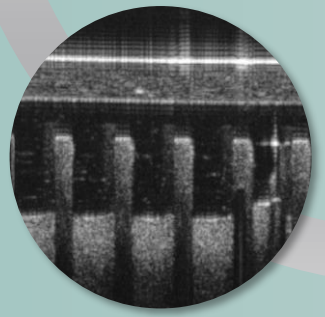
100% product inspection

- highspeed microscopic inspection
- defect detection
- inspection of tolerances



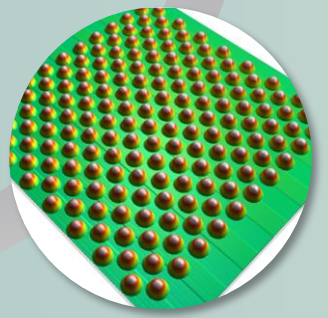
Mold inspection

- automatic microscopic inspection
- detection of defects
- detection of contamination



sample inspection of layers

- 3D layer inspection
- OCT based inspection



sample inspection surface shape

- Chromatic confocal inspection
- 3D Shape inspection
- inspection under stress

MV.SENSE OCT

tomographic layers & thickness scanner

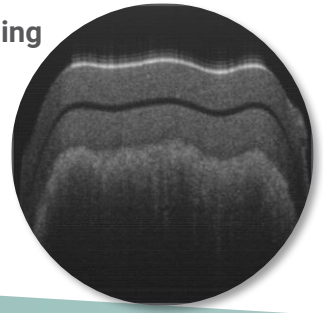
With the non-destructive cross-sectional imaging technology, our MV.SENSE OCT imaging system is built for 3D-profiling of micro-structures, layer thickness measurements and defect detection. We are specialized on developing OCT solutions for production applications.

technology features

MABRI.VISION
BEYOND MATTERS

non-destructive cross section imaging

OCT generates cross sectional images like ultrasound based on light up to 240.000 scans/s

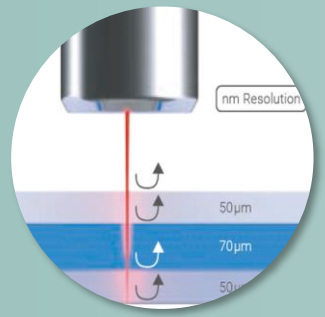


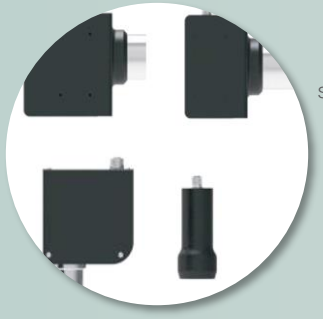
high resolution

our high resolution OCT-systems achieve 1µm z-resolution, perfect for microstructure inspection

profile, layer & thickness

scan microstructure profiles and layer thicknesses of semitransparent material starting at 10µm





flexible scanning optics

scan with point, line (flying spot) or large scanning (range up to 300mm) optics

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our advantages

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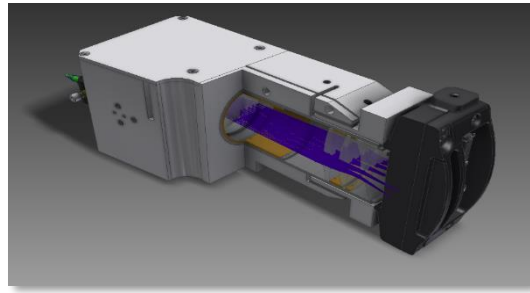
BEYOND MATTERS

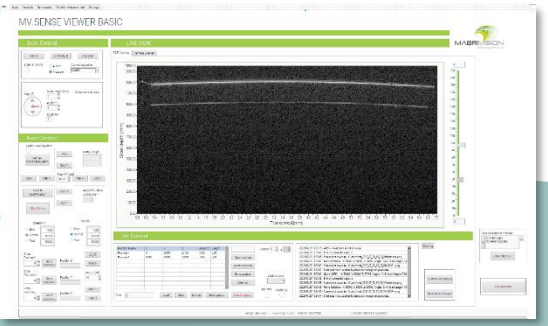
inhouse OCT and optics development

we develop OCT from the scratch – optics, electronics, software



lab solutions

our stand-alone lab OCT-system is perfect of lab-QC applications and hands-on OCT inspections

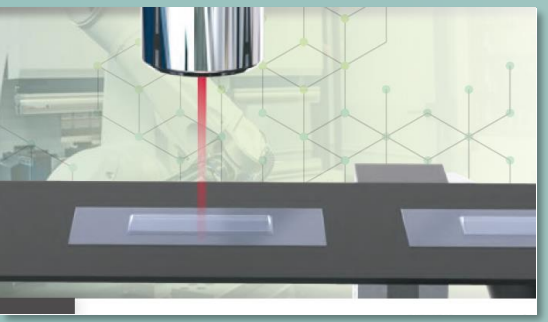


End-to-end solution builder

we are provider of end-to-end OCT-projects: consulting, development, integration, service

production solutions

our OCT are build for the integration in production applications in packaging, health care and more



open platform /SDK

we provide an SDK for the integration of our OCT systems

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MV.SENSE TOPO

highspeed 3D surface inspection system

Our MV.SENSE TOPO inspection system is built for high speed 3D scanning of microstructured products. We provide solutions for product handling and clamping, automation and data processing to provide end-to-end QC-solutions to your needs.

technology features

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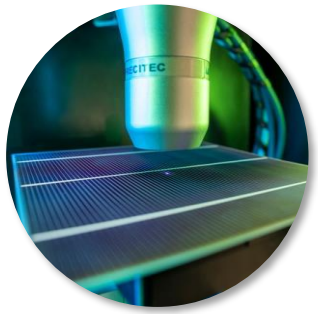
BEYOND MATTERS

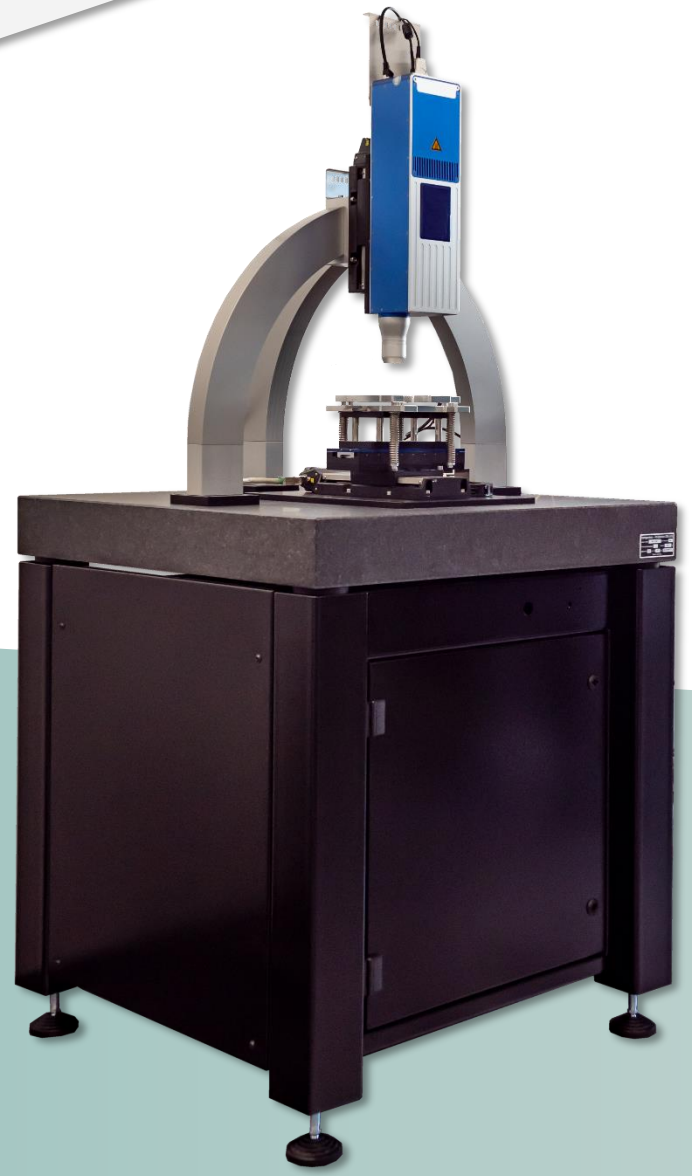


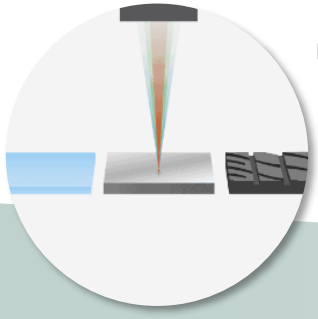
Highspeed Inspection

Confocal sensor with up to 192 parallel lines. Up to 1.152.000 scans/s.

high precision

surface scan with a resolution up to 20nm, lateral 2µm



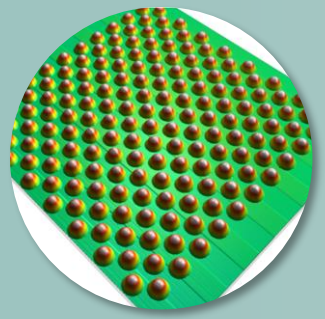


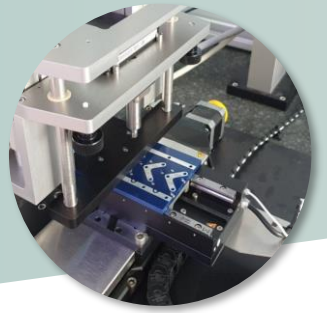
robust sensor technology

chromatic confocal sensors work on many materials: transparent, black, glossy, diffuse

3D surface scanning

High point rate allows the inspection of microstructures like micro lenses or fluidic channels.





scanning of large areas

with fast scanning speeds it is possible to scan large areas, such as MTP-formats

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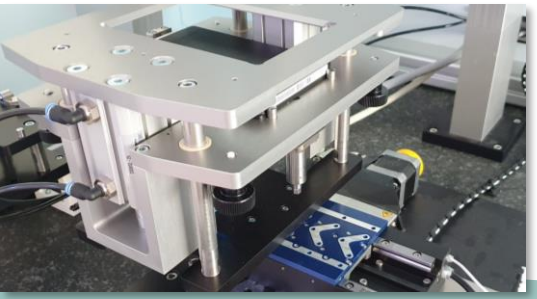
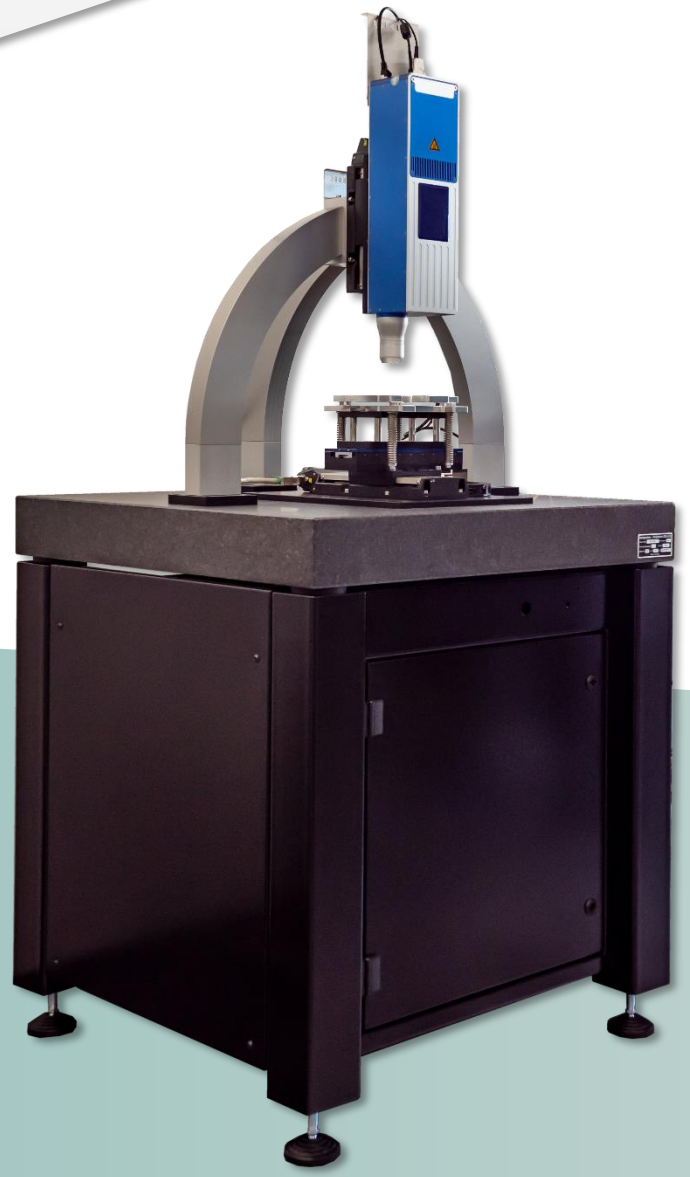
Our MV.SENSE TOPO inspection system is built for high speed 3D scanning of microstructured products. We provide solutions for product handling and clamping, automation and data processing to provide end-to-end QC-solutions to your needs.

our advantages



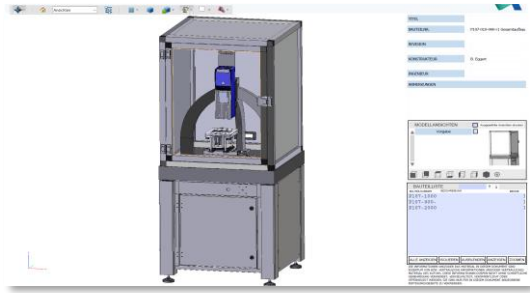
custom device layout

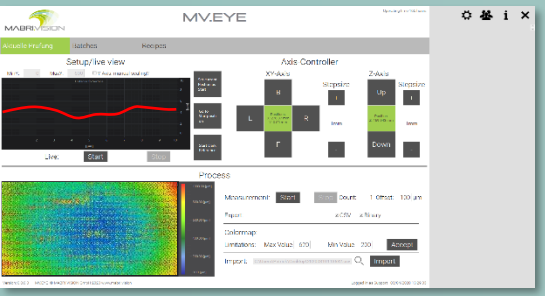
with our platform based approach, we build QC systems to your needs



automation

we develop stand-alone solutions and systems for automatic in-process QC



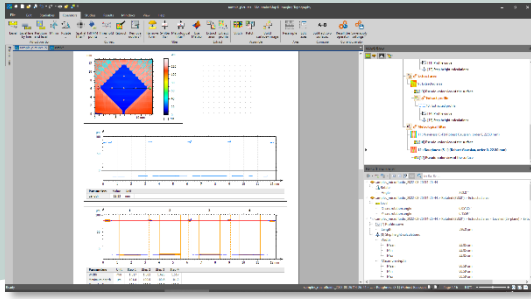


processing

if needed, we provide software modules for custom data processing and machine vision solutions

interfacing & QC-reports

all data is stored in standard formats, this makes QC-reporting easy in surface analysis software as MountainsMap



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MICRO.SPECTOR WI1

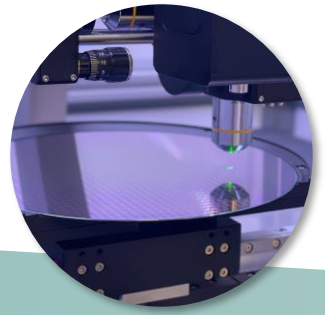
High precision surface inspection system

Our MICRO.SPECTOR WI1 inspection system is built for a high resolution inspection of surfaces und microstructures. With our AI based anomaly detection software, we detect smallest defects and particles. The system is set up for clean room operation.

technology features

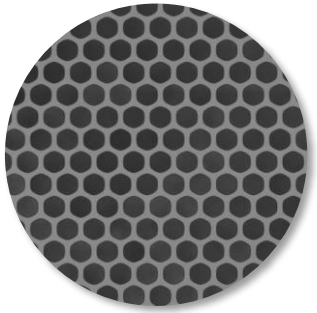
MABRI.VISION
BEYOND MATTERS

high resolution



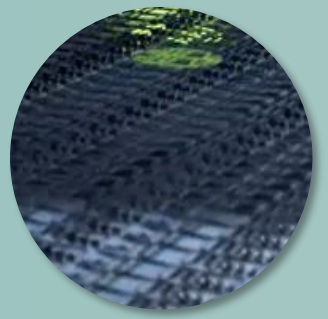
with our standard 10x microscopic lens we achieve a pixel resolution of 0,48µm

auto focus algorithm



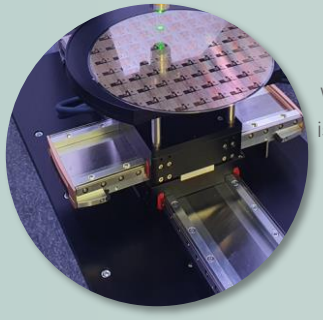
to overcome the challenges with a very small focal depth in microscopy, we implemented an auto focus algorithm

multi layer surface imaging



the system is set up to inspect multiple layers, like top and bottom layers in microfluidics

scanning of large areas



with our MV.SENSE xyz-platform it is possible to perform microscopic imaging and inspection of large surfaces

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our advantages

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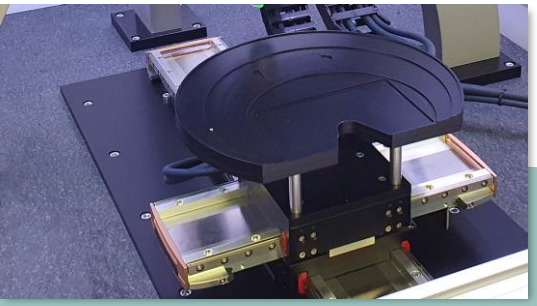
BEYOND MATTERS

automation

we automate the data acquisition, data processing and product handling

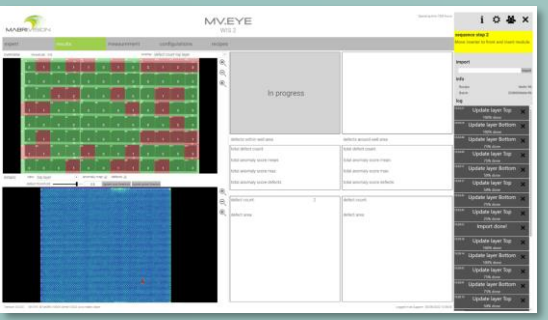


modular platform

with our platform based approach, we build QC systems to your needs

integration

the MICRO.SPECTOR is set up for clean room integration. We provide all common industrial communication standards

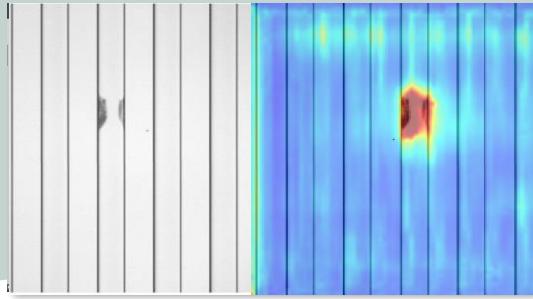


inspection software

if needed, we provide software modules for custom data processing and machine vision solutions and handle large images sizes.

AI-based anomaly detection

all data is stored in standard formats, this makes QC-reporting easy in surface analysis software as MountainsMap



MICRO.SPECTOR MI1

Highspeed microstructure inspection

The MICRO.SPECTOR MI1 inspection systems is built of fast inspection of microstructures parts for semiconductor and diagnostics applications. The automation system is scalable
And provides fast throughputs.

technology features

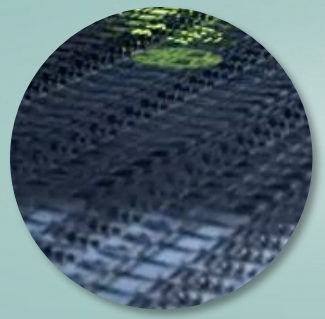
MABRI.VISION
BEYOND MATTERS

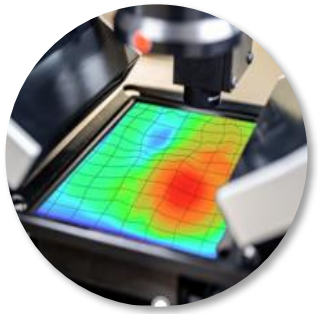
fast imaging technology

we integrated the TDI line scanning camera to maximize the imaging speed on a microscopic scale

high resolution

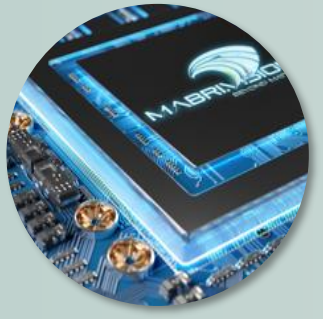
most common lens setup reaches 0,75 µm/px with 17.824 px line





on the fly auto focus

integrated surface sensor for surface shape detection



Neuronal networks

To process the high quantity of data we use GPU computing and neuronal networks.

MICRO.SPECTOR MI1

High precision surface inspection system

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our advantages

MABRI.VISION
BEYOND MATTERS

end-to-end solution

we are the right partner, when it comes to the implementation of innovative inspection technologies – from the idea to the upscaling

QC-solutions

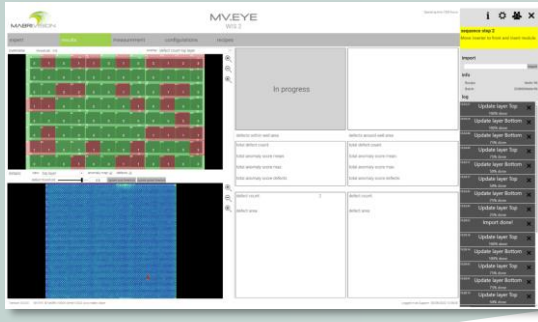
storing of data, results, audit trail, change log,..

automation

the system is designed for automatic inspection on the large scale 100k+ parts/year

inspection software

for defect detection we integratedd a powerful AI anomaly detection tool. Our software platform MV.IMAGING is signed as a modular toolbox



IN PRODUCTION HIGHSPEED INSPECTION OF MICROSTRUCTURES

MABRI.VISION
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MICRO.SPECTOR MI1

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platform MV.BRIX
vision inspection systems
LINE.SPECTOR
ROUND.SPECTOR
CARRIER.SPECTOR
MICRO.SPECTOR
50m²
320m²
700m²
2015
10
2018
15
30
2020
35
starting up
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