

Mühlbauer AUTOMATION

TEMA Vision

Inspection Drives Automation

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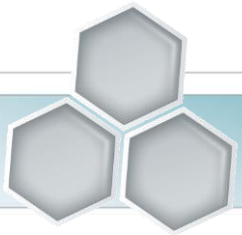
Today's Agenda

- 09.00 a.m. Key Note: Inspection drives Automation
- 09.30 a.m. Banknotes, Passports, Security Documents –
One Inspection Solution for a Variety of Applications: Christopher Ledutke/Regine Pflamminger
- 10.30 a.m. Looking at Coins and Blanks in Different Ways: Visible Light, X-Ray, Electro-magnetic Sensors: Ralf Freiberger
- 11.30 a.m. Latest Technology for Can Inspection at the Outlet Conveyor: Ralf Freiberger
- 01.30 p.m. Company Tour Focus TEMA Vision
- 04:00 p.m. Individual Customer Meeting
- 07.00 p.m. Get-Together / Lobby City Hotel
- 07.30 p.m. Dinner / City Hotel





COMPANY



- Owner-managed group
- International market leadership in the fields of
 - Parts & Systems
 - Semiconductor Related Products
 - Document Solution Related Products
 - TECURITY® Solutions
- The Mühlbauer Group's philosophy: Our customers are our partners!





BASIS

- 3,500 employees at 35 sites worldwide
- 400 engineers in R&D
- 400 trainees
- Excellent sustainability standards



INVESTMENTS

- Annual investments (approx. 15 million EUR) in
 - Latest technologies
 - Infrastructure
 - Systematical & logical completion of the product chain

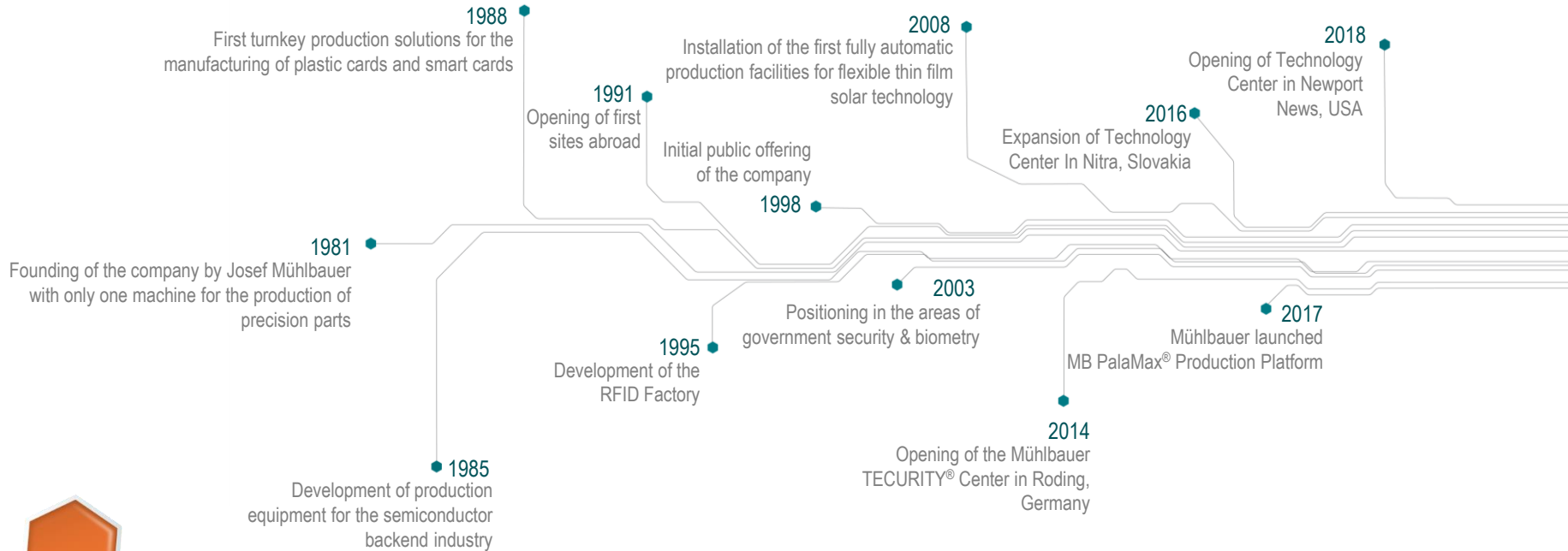


MARKET POSITION

- PARTS & SYSTEMS – intersectoral parts manufacturing
- AUTOMATION – market leader in the areas of RFID
- TECURITY® – solution partner for identification & verification projects



History





- 35 production & service locations
- Technology centers in USA, Slovakia, Serbia, Malaysia & China
- Inhouse precision-part production
- Provision of
 - High-end semiconductor & RFID systems
 - Reliable vision inspection technologies
 - Innovative ID document end-to-end-solutions
 - Secure access & border control systems



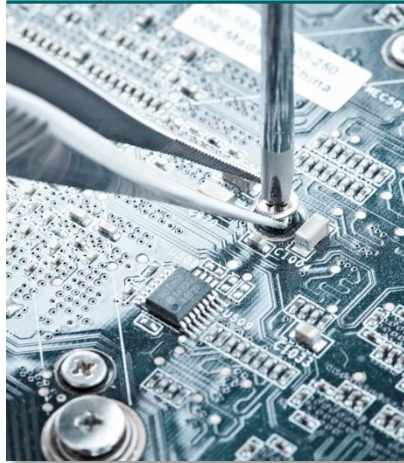
PARTS & SYSTEMS

Precision Parts for Aerospace,
Automotive & Engineering



AUTOMATION

Machines for
SRP & DSRP



TECURITY®

Solutions for
Governments



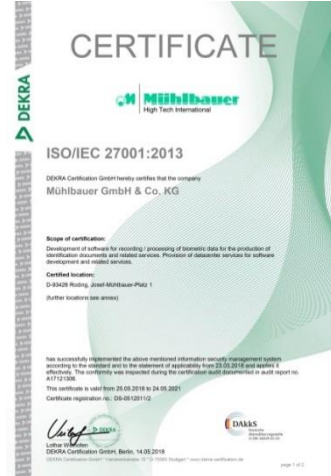
Security Printer



Security Supplier



IT Security ISO IEC 27001



QM System ISO 9001:2015



MEMBERSHIP IN GOVERNMENTAL INITIATIVES, WORKING GROUPS AND COMMITTEES

- INTERPOL Project S-Print
- German-African Business Association
- Ghorfa Arab-German – Chamber of Commerce and Industry e.V.
- IATA Strategic Partner
- Operation Genesis – U.S. Department of Homeland Security



Mühlbauer AUTOMATION

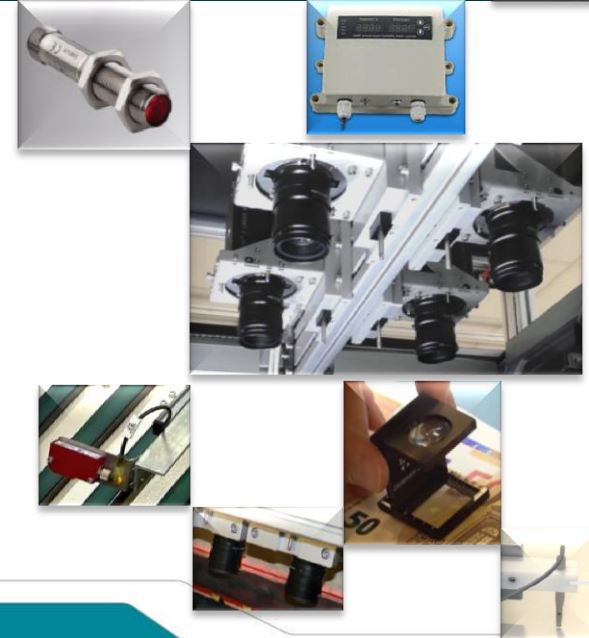
Inspection Drives Automation

Jonas Auerswald
Sales TEMA VISION



Modern industrial production processes are controlled by a variety of sensors & cameras

- Position control, e.g. to control a robot
- Temperature control
- Speed control
- Tracking & counting
- Last but not least: **Quality Control**



Inspection as Integral Part of the Production Process: Example Aerosol Can Production

- 100% inspection
- No interruption of production process – inspection at line speed

Inside Coating



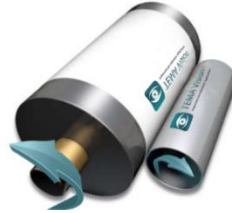
INSPECTION

Base Coating



INSPECTION

Decoration



INSPECTION

Shaping



INSPECTION

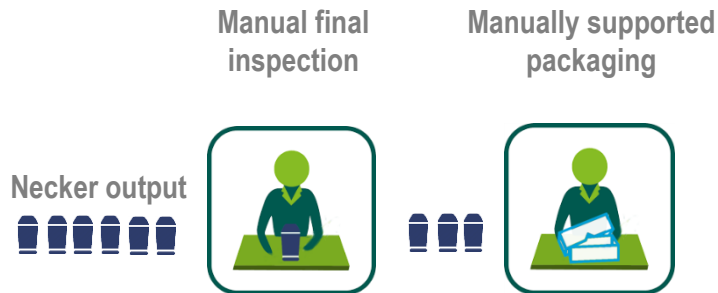
Packaging



Next Step: Automatic Final Inspection – Example: Aerosol Can Production

Final Inspection is necessary since defects can develop at every production step !

Up to now:



In the future:

Automatic optical inspection

Necker output

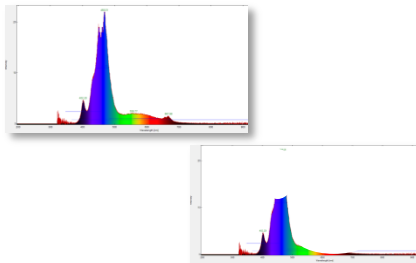


Example: Color Control

Printing →

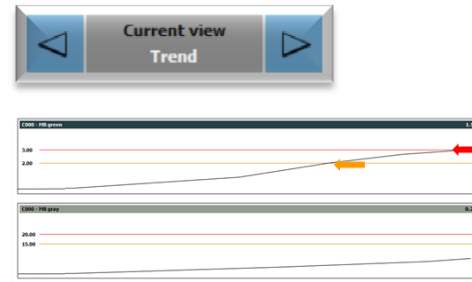


Color measurement →



Hyper-spectral imaging

Color monitoring →



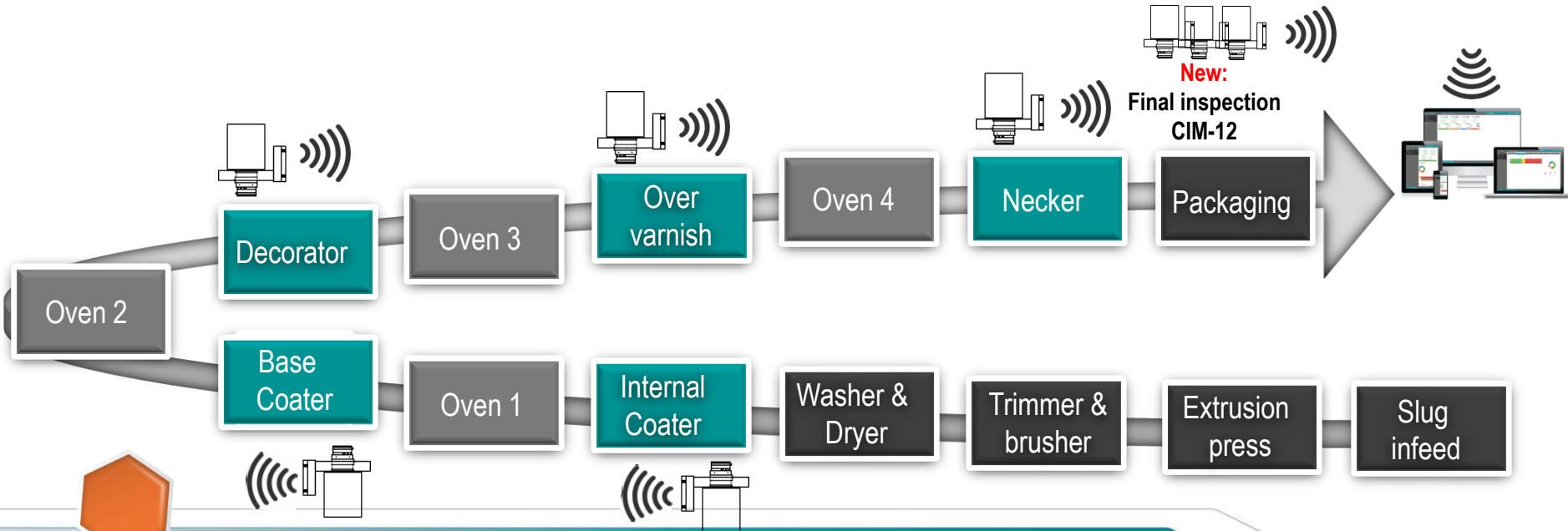
Information to machine / operator



Color adjustment

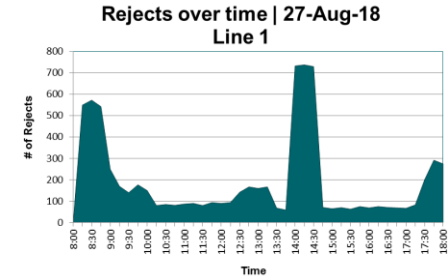


Data Collection, Evaluation, Networks & Automatic Correction – Example: Aerosol Can Production

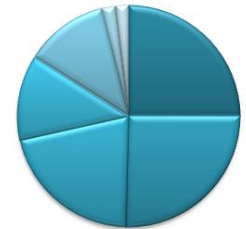


Get answers to the following crucial five questions:

- **Where** does the problem occur (production step – machine – IoT – inspection area, etc.)?
- **Which** problem occurs (machine – material – process)?
- **When** does the problem occur (day – shift – time)?
- **How often** does the problem occur (occasionally – frequently – constantly)?
- **What kind of** relevant parameters are involved in the problem (material, environment, manual interventions, etc.)?



Defects per Type / 27-Aug-18
Line 1 / Necker Process



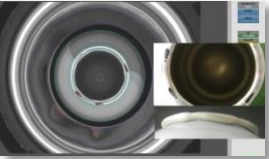
Automatic Evaluation & Provision of Information: The Key for Immediate Action



Print Inspection reports:
Color is fading

↓

Action:
Adjustment inking unit



Can Top Inspection reports:
Curl defect

↓

Action:
Check of corresponding necking tool
necessary



Print Inspection reports:
Misprint

↓

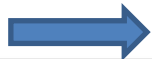
Action:
Check of corresponding blanket
necessary



Print Inspection reports:
Frequent misprint

↓

Action:
Stop the machine – prevent
further scrap



Real-time information is available for immediate action or subsequent analysis !

Advantages of a web-based modular data logging and information tool like PalaMax[®]



Optimize your **production quality**.



Maximize your **equipment utilization**.



Improve your **productivity** by 50%.



Increase your **efficiency & speed** by 30%.



Reduce your **costs** by 20%.



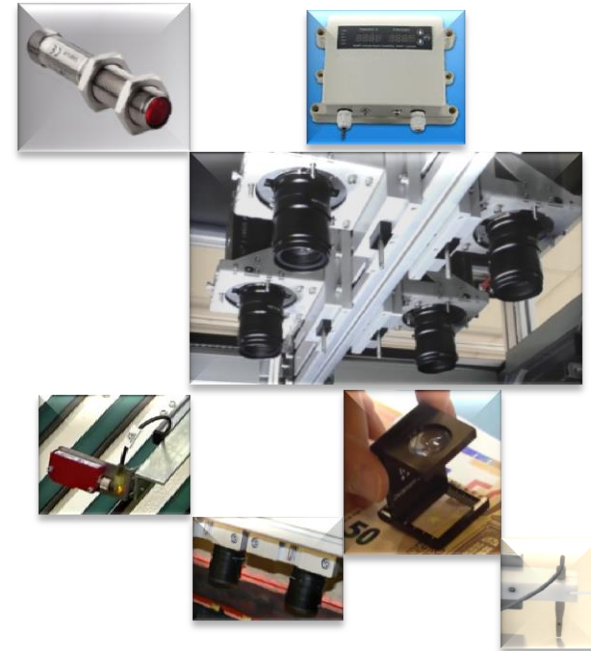
Access from all over the world – check and control your production wherever you are.



Responsive design: Adaptable to any end device



- Cameras & sensors control industrial processes.
- Inline inspection systems are integrated into the production line & work at line speed.
- Inspection systems
 - enable automatic production from production start to the packed product.
 - enable automatic process adjustments.
 - connect different production steps by collecting, evaluating & editing essential process data.
- Data collected by inspection systems & processed by systems such as PalaMax® which directly control the production process.



Thank you very much
for your attention!

