



Technologie mit Weitblick

Automated DecoCheck

Technology Overview - Use Cases overview / Costs

Dr. Pavel TUČEK

Hella Autotechnik Nova, s.r.o.

Mohelnice

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Podpořeno z projektu OP VVV „Partnerská síť v oblasti výzkumu a vývoje zobrazovací a osvětlovací techniky a optoelektroniky pro optický a automobilový průmysl“, registrační číslo: CZ.02.1.01/0.0/0.0/17_049/0008422.



EVROPSKÁ UNIE
Evropské strukturální a investiční fondy
Operační program Výzkum, vývoj a vzdělávání



MINISTERSTVO ŠKOLSTVÍ,
MLÁDEŽE A TĚLOVÝCHOVY

Automated DecoCheck Introduction & Content

SKIPPING DECO CHECK

- Fully stable process needed,
- If DecoCheck -> Only 1x

Operational Standard –precise technical documentation with respect to all used technical solutions and with respect to all potential application will be provided

DFMA – DecoCheck is stand alone solution/station and this needs to be combined with other topics (Manipulation, Packaging,...). Only this synergy enable the full power and potential of DecoCheck.



Palacký University
Olomouc



Technical background: Most complex and sensitive part of automation project. Critical combination of Illumination system, Camera Systems and SW for Evaluation. Various technical solutions exist, but reliability and robustness of them are questionable.

StandAlone solution: In case of positive technical evaluation, roll-out will fully depend on capa of VMK. If VMK is not possible to support at least of FIRST after-pilot equipment, we will need local integrator, detailed description of technical background will be provided.

BALLUFF

CONTENT

1. Overview of DecoCheck
2. Price Indication
3. Detailed Information
4. OS overview
5. Strategy for Roll-out



ROSSUM
integration

KEYENCE




COGNEX vision


Complete Automation Chain in Preproduction


4 main areas to investigate


Leader Automation Preproduction: Pavel Tucek

Technology Leaders:

 P. Tucek HAN

 Jernej Lajevec

 Thomas Hansmeyer

 Martin Eickenbusch

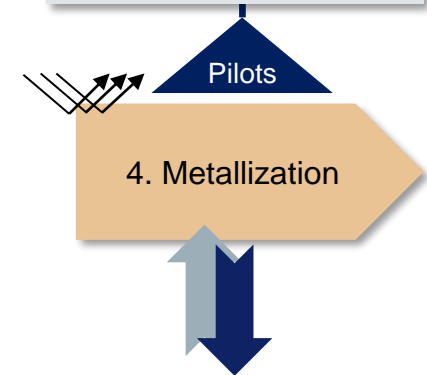
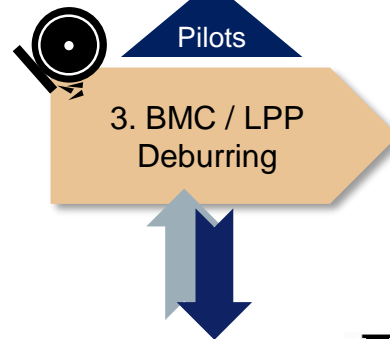
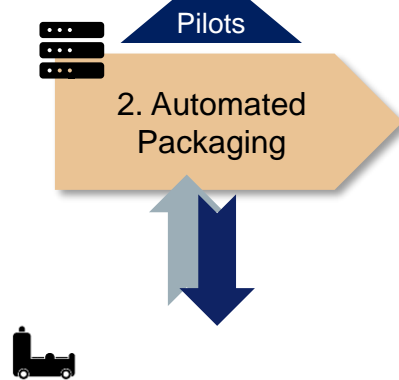
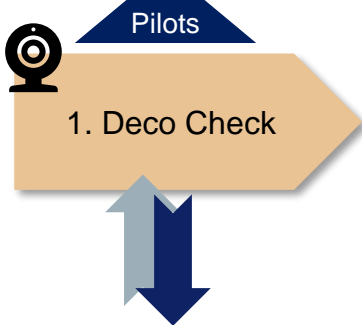
Solutions

1. KAS / RCL inspection
2. Thick wall Lens inspection
3. Lightguides & Radoms
4. Decorative plus functional metallized parts
5. **SKIPPING DECO CHECK**

1. Tray feeding station with lift in HSS
2. Gripper solution in Plant 2
3. Further Pilot in HSKF

1. Chain head deburrers and brushes
2. Granulate blasting
3. Cleaning by air or dry ice
4. Perspectively: CO₂-pellets

1. Vertical and Horizontal "Quick Change planets" (FoiK in HSKS-B)
2. Reorganization of layout / process flow
3. "Line Met" new metallizing Machine

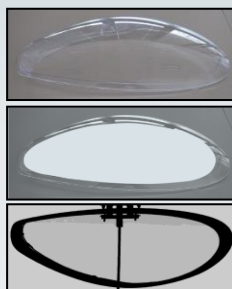



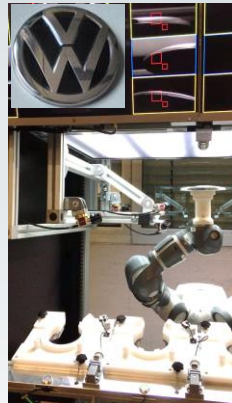



More complex, cross-functional linked use-cases
>> Integrated System solution increasing <<

Deco-Check at HELLA

Overview of current Prototypes

Development of universal inspection software – Fraunhofer, SW for VMK equipment A-LOOK, Cognex Vision, Keyence VISIO

<p style="text-align: center;">✓</p> <p style="text-align: center;">1</p> <p style="text-align: center;">Deco KAS, 2K KAS and RCL</p> <p>1K-KAS, 2K – KAS and RCL inspection</p>   <p style="text-align: center;">10/2020</p>	<p style="text-align: center;">✓</p> <p style="text-align: center;">2</p> <p style="text-align: center;">Optical Lenses</p> <p>Lens inspection</p>   <p style="text-align: center;">06/2019</p>	<p style="text-align: center;">✓</p> <p style="text-align: center;">3</p> <p style="text-align: center;">Radomes</p> <p>Radomes inspection</p>  <p style="text-align: center;">09/2019</p>	<p style="text-align: center;">✓</p> <p style="text-align: center;">4</p> <p style="text-align: center;">Lightguides plus Thickwall</p> <p>LG plus TW inspection</p>  <p style="text-align: center;">09/2019</p>
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Deco-Check at HELLA

Overview of current Prototypes

Development of universal inspection software – Fraunhofer, SW for VMK equipment A-LOOK, Cognex Vision, Keyence VISIO

5	6	7	8	9
<p>Inspection system KEYENCE</p>	<p>Inspection System BALLUFF</p>	<p>Inspection System COGNEX</p>	<p>Integrated Solution M.A.I.</p>	<p>Integrated Solution Rossum</p>
<p>RCL Transparent parts Non-transparent parts</p>	<p>Transparent optical Parts and black Molded parts</p>	<p><u>COGNEX VISIO</u> system for metallized parts</p>	<p>Easy to apply solutions <u>BUILT FOR</u> Keyence, Cognex, <u>FRH</u></p>	<p>Rossum integration system with Keyence <u>cameras</u></p>
				
<p>10/2019</p>	<p>10/2019</p>	<p>05/2020</p>	<p>10/2020</p>	<p>10/2020</p>

DecoCheck – Operational Standard Status

DecoCheck – General OS Document

- Description of DecoCheck inspection preconditions, skipping DecoCheck, general overview of available technical solutions. Evaluation matrix for technical solutions. Precise approach step by step, how to introduce DecoCheck to the IMM, Metallizer, Final Station, etc.

There will be other five OS devoted to

- **Lenses inspection (almost finished)**

Based on FRH inspection system and SW. Already fully available solution. Full inspection system. Other inspection systems based on Keyence and Cognex vision inspection systems are described based on different Deco approach.

- **KAS and RCL inspection (started)**

Based on FRH inspection system and SW. Both pilots already available, but need to be discussed with respect to other available solution from MAI concept with Cognex and Keyence vision inspection systems.

- **Lightguides and Thickwall optics (started)**

Fully developed solution by VMK at HAN. Inspection systems from Keyence and Cognex available. Could be switched to other.

- **Metallized parts in Metacircle (started)**

Available just for MetaCircle and LineMet metallizers. Feasibility study with Cognex and Keyence systems available at HAN. First application just started.

- **Nonmetallized parts (started)**

DecoCheck – Current strategy for HELLA worldwide

DecoCheck – LG and TW

Easy and ready to apply solution exists for LG and TWO functional and decorative inspection. BlackBox designed by VMK and ready for Cognex, Keyence, A-look, FRH based decorative inspection.

KAS, 2K KAS and RCL

Based on FRH inspection system and SW. Systems already available, but need to be implemented to some standardized solution for handling and packaging. This exists only for integrators MAI and ROSSUM concept with Keyence vision inspection systems. FRH installation needs to be verified.

Metallized parts in Metacircle (started)

Most of parts with scrap rate less than 2%, mostly skipping decocheck. Decocheck on primary optics based on cognex inspection started – complex manipulation is much more important (masking, unmasking, packaging). Available just for MetaCircle and LineMet metallizers. Feasibility study with Cognex and Keyence systems available at HAN. First application just started.

Non-metallized parts (started)

Decorative inspection based on linescanning system from Keyence, important task is manipulation and packaging – mostly depends on cycle time. ROI calculation is not reached sometimes due to add invest to IMM.



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Dr. Pavel Tuček
Operations Product Management
HAN-OPM
HELLA AUTOTECHNIK NOVA, s.r.o.
Družstevní 338/16
789 85 Mohelnice / Czech Republic

Tel.: +420 583 497 604

Cell: +420 778 451 914

Email: pavel.tucek@hella.com

www.hella.cz

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