



elkamet

Extrusions for Automobiles

Plastics for lighting applications

Rotomolding for vehicles

Automation

Case Study: Elkamet

23rd October 2018

1. Introduction

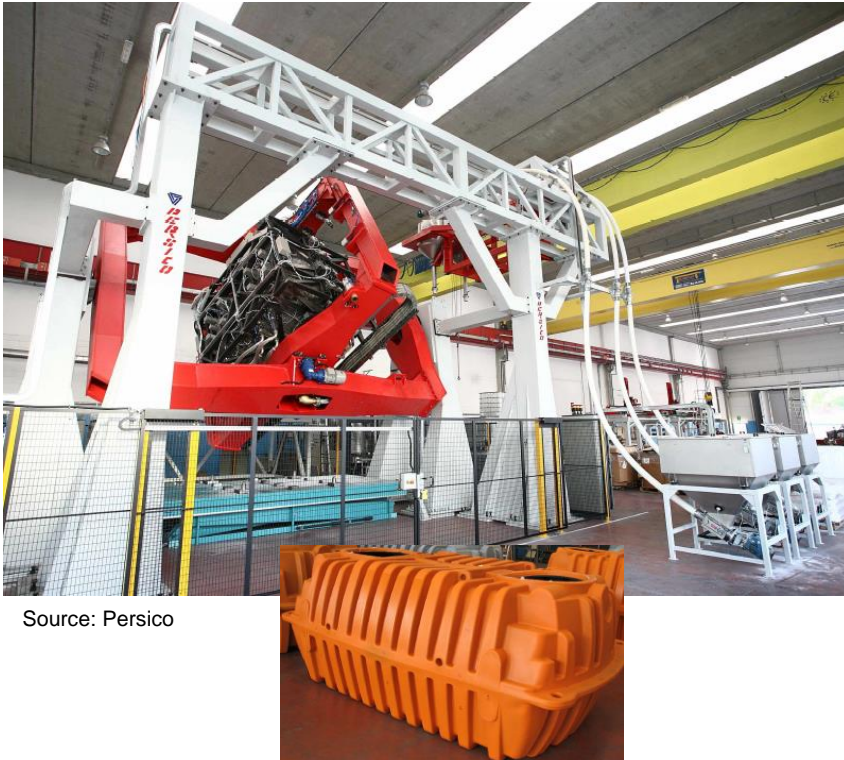
2. Automation areas

- Receiving inspection
- Demolding/Loading
- Finishing
- Quality control
- Logistics

3. Conclusion

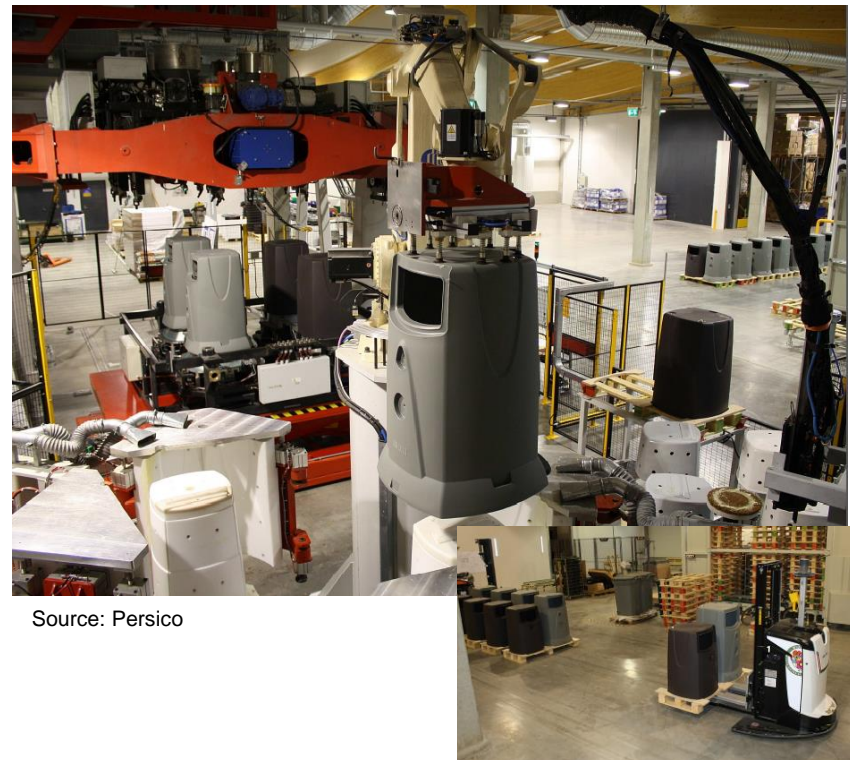
Automation is the technology by which a **process or procedure** is performed without human assistance.

Fully automated rotomolding machines



Source: Persico

Demolding, trimming & storage



Source: Persico

- Is automation on small quantity rotomolded products feasible?
- Do automation projects have a ROI of 12 / 24 months or less?

YES, here are some examples!



Source: Keyence

Use of an optical instant measurement system






- Measurements performed in seconds
 - Measurements feed directly into CAQ-System
- Increased efficiency in QA



PDA – Production Data Acquisition

Rückmelden

Maschine Rotation M1.1




| WERKZEUG 1 | | WERKZEUG 2 | |
|------------------------------------|---|---|--|
| ARM 1 |  Typ <input type="text" value="5470"/> BA <input type="text" value="266331"/> <input type="button" value="P"/> Nr <input type="text" value="15952"/> | | |
| WKZ <input type="text" value="1"/> | <input type="button" value="RÜCKMELDUNG"/> | | |
| ARM 2 |  Typ <input type="text" value="5811 00"/> BA <input type="text" value="266424"/> <input type="button" value="P"/> Nr <input type="text" value="10136"/> | | |
| WKZ <input type="text" value="3"/> | <input type="button" value="RÜCKMELDUNG"/> | | |
| ARM 3 |  Typ <input type="text" value="5470"/> BA <input type="text" value="264184"/> <input type="button" value="P"/> Nr <input type="text" value="15952"/> | | |
| WKZ <input type="text" value="2"/> | <input type="button" value="RÜCKMELDUNG"/> | | |
| ARM 4 |  Typ <input type="text" value="5649"/> BA <input type="text" value="266335"/> <input type="button" value="P"/> Nr <input type="text" value="22220"/> |  Typ <input type="text" value="5746"/> BA <input type="text" value="266341"/> <input type="button" value="P"/> Nr <input type="text" value="7503"/> | |
| WKZ <input type="text" value="1"/> | <input type="button" value="RÜCKMELDUNG"/> | WKZ <input type="text" value="1"/> | <input type="button" value="RÜCKMELDUNG"/> |

One click completion confirmation in ERP-System

Automated QR-code label printing



Immediate production data in ERP-System

| | Datum | MGR | | Schicht (Früh) | Gut | Ausschuss | Leer | Produktivität | Trend |
|---|------------|------|---|----------------|-----|-----------|------|---------------|-------|
| 4 | 02.03.2018 | M1.1 |  | F | 27 | 1 | 0 | 5,6 | 0,0 |
| 5 | 01.03.2018 | M1.1 |  | F | 21 | 6 | 0 | 5,4 | 0,0 |
| 6 | 28.02.2018 | M1.1 |  | F | 20 | 6 | 2 | 5,0 | 0,0 |

Using the CAQ-System for QA purpose as well as operator instructions

Order: **WA-5597-01**

Part: **1770 - Oiltank 5597-01**

Inspection Plan: **WI-5597-01 (4)**

Operation: **Scrape & Tap**

Number of Parts to inspect: **10000**

1. Characteristic: Remove Flash


☒ OK ☐ not OK

Sample: 1 (1 / 10000)

1. Remove Flash

Characteristics Instruction Information Statistics Documents

Image:



Instruction:

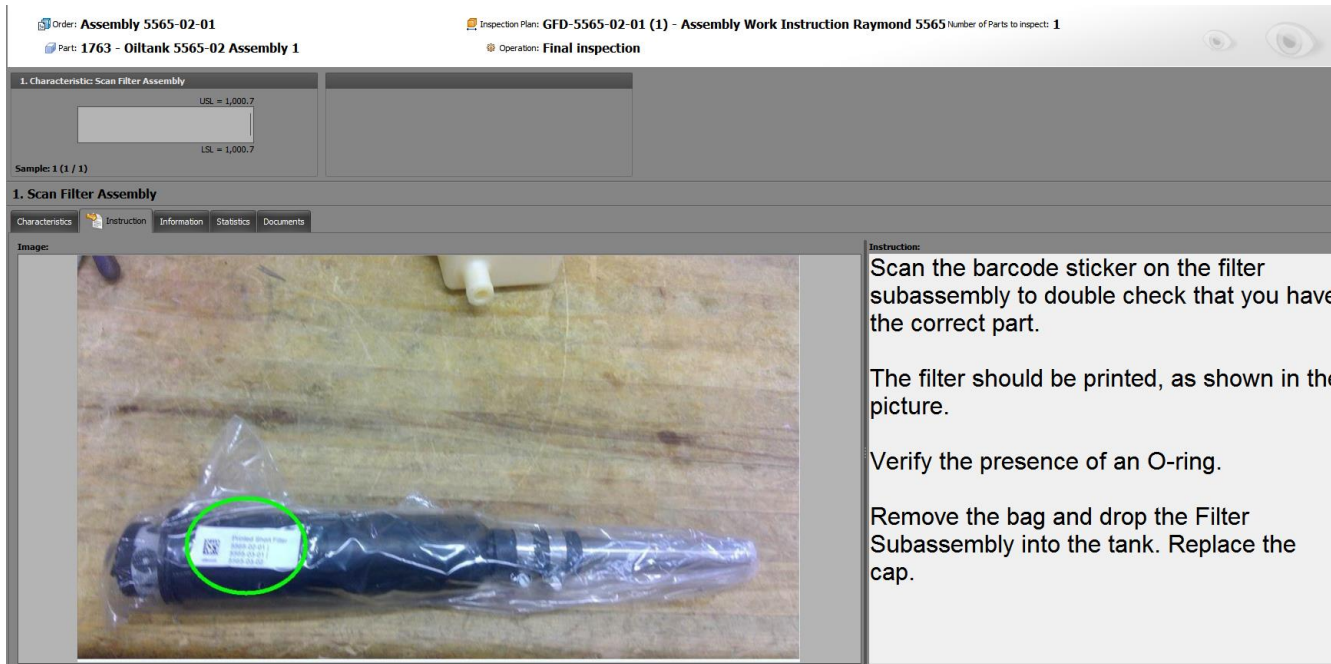
Remove all flash from parting lines and all external surfaces.

De-bur all tank openings and hose barbs.

Remove all plastic debris from inside the tank with a vacuum or by shaking the debris out.

Use a flashlight and turn the tank to inspect the inside to make sure there is no debris inside.

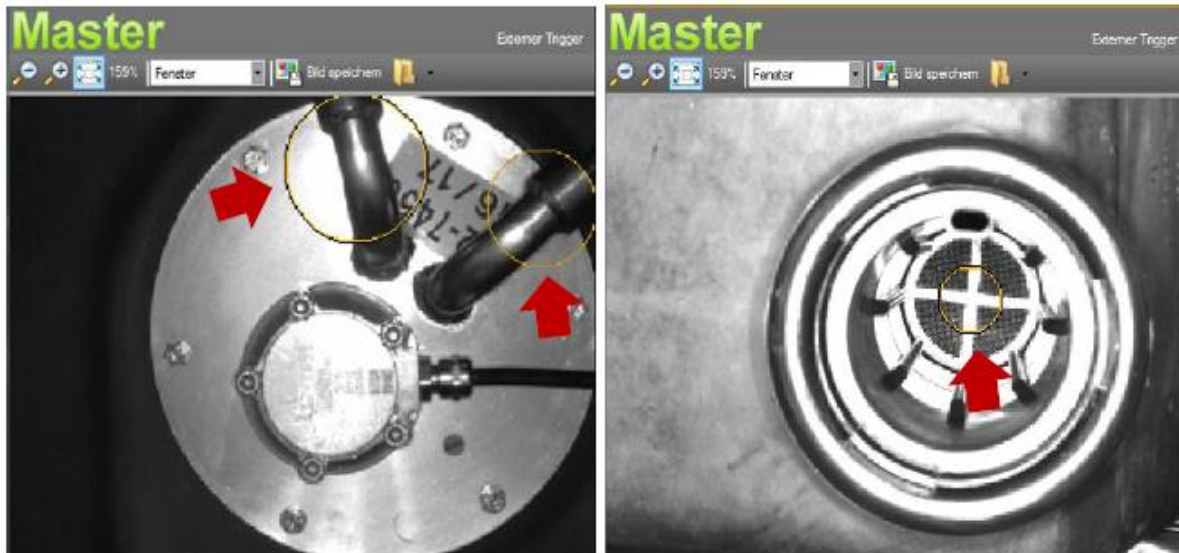
Using the CAQ-System for QA purpose as well as operator instructions



- Using the QR-code of the tank to identify the correct assembly part
- Using the CAQ-System to instruct operators on how to do it
- Have operators acknowledge that they did it according to instructions

- Use of vision sensor to make sure assembly orientations are correct and assembly is complete
- Use of electronic testers, to ensure flow switches and fill gauges are working according to specification
- Test data is automatically imported into CAQ-System

Vision sensor quality control



Source: Elkamet

Wireless scanners enable chaotic storage

- Each pallet or skid is identified by a barcode or QR-code label
- Each storage location (e.g. Rack shelf) is labeled
- The material handler scans the storage location and then the pallet or skid to match the skid to that location. Data is immediately available in the ERP-System.
- ERP-System tells material handler, which products to ship/use next to ensure FIFO



| | | | |
|---|------------------------------------|---|---------------------|
| Art.-Nr. 123617  | | Menge 1250 kg  | |
| Artikel Borealis HD-PE BB 2581 natur, Polyethylen hoher Dichte | | | Freigabe QM-geprüft |
| Lieferant Borealis GmbH, A-4021 Linz | | | |
| Bestell-Nr. 624179 | Anlieferdatum 07.09.2011 | Lieferanten-Nr. 700700 | |

- Automation of parts of processes or procedures is always possible
- Think outside the box: 'What reduces operator time?'
- Keep trying, even if you fail at first

The reasonable man adapts himself to the world: the unreasonable one persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man.

George Bernard Shaw

