



MS3D
IN LINE 3D DIMENSIONAL INSPECTION

In Line 3D Dimensional Inspection Systems



An activity launched in 2005

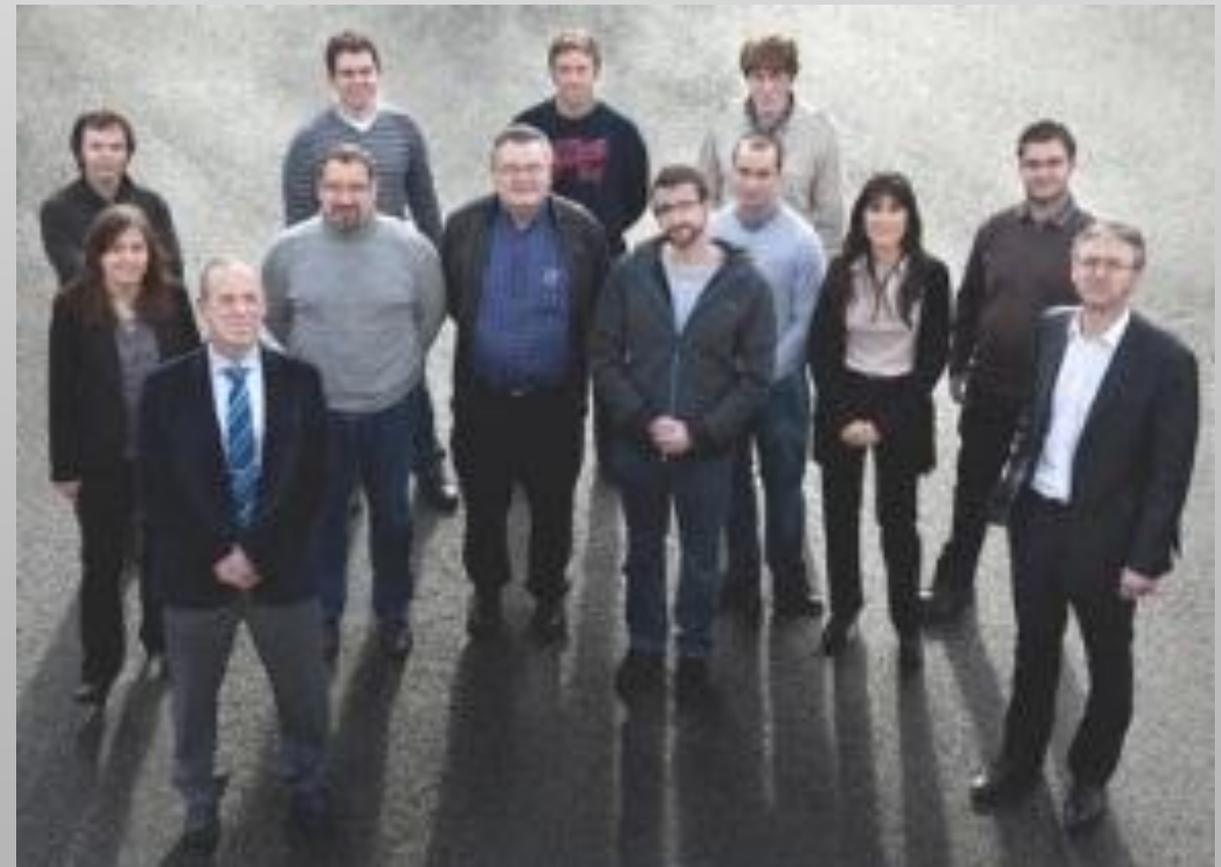


MS3D
IN LINE 3D DIMENSIONAL INSPECTION

- **MS3D designs, develops, promotes and integrates automatic industrial parts 3D geometry conformity inspection systems using non contact sensing technology directly on production lines.**

The activity was launched in 2005 by the Companies Micro-Epsilon (Ger) – manufacturer of non contact distance measuring sensors – and Algoss (Fra) – an integrator specialist of measurement systems and automation

It led to the creation of MS3D early 2010 jointly by Micro-Epsilon and Algoss Managers Marc Rosenbaum & Didier Le Néel.





■ Pressure on prices increases:

- Competition from low cost manpower countries
- Manufacturing overcapacity (automobile)
- Offers galore

■ Decrease prices **➡** Decrease Costs

⇒ Increase throughput

⇒ Suppress scrap

➡ improve inspection

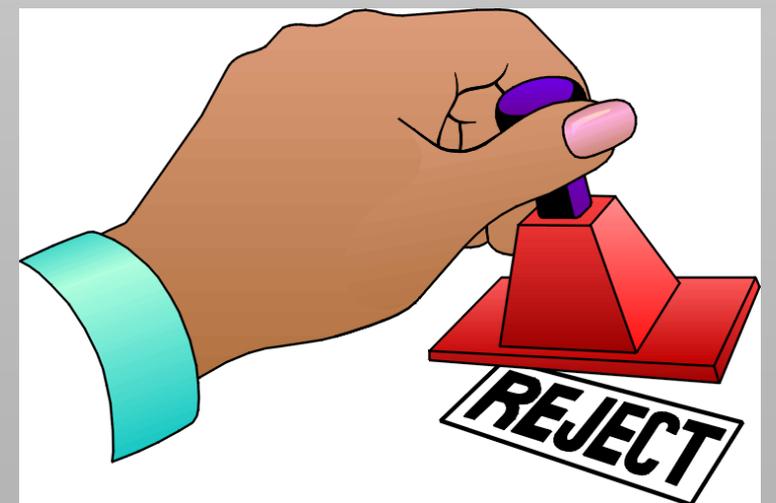
but decrease inspection costs!





■ Protecting Market share

- ⇒ Increase products sophistication in order to maintain high prices and preserve margins
- ⇒ For Tier suppliers, improve competitiveness with “ZERO DEFECT” proposals
- ⇒ ***Inspecting products becomes more difficult and costs more!***

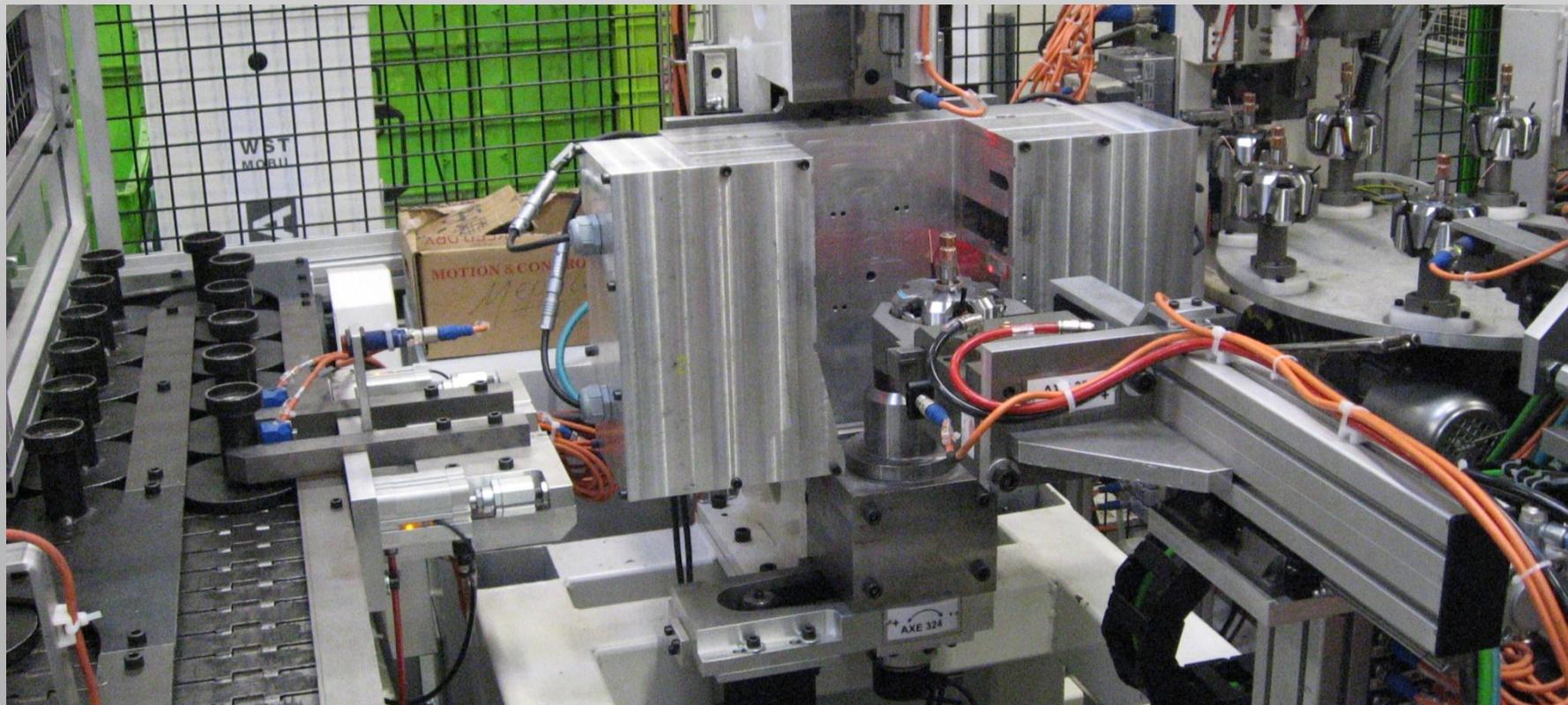


Solution: In Line 100% automatic inspection



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- **The MS3D offer: 3D dimensional conformity in line inspection of 100% of production**
- Performed by integrated inspection systems (machines) installed directly on the production line

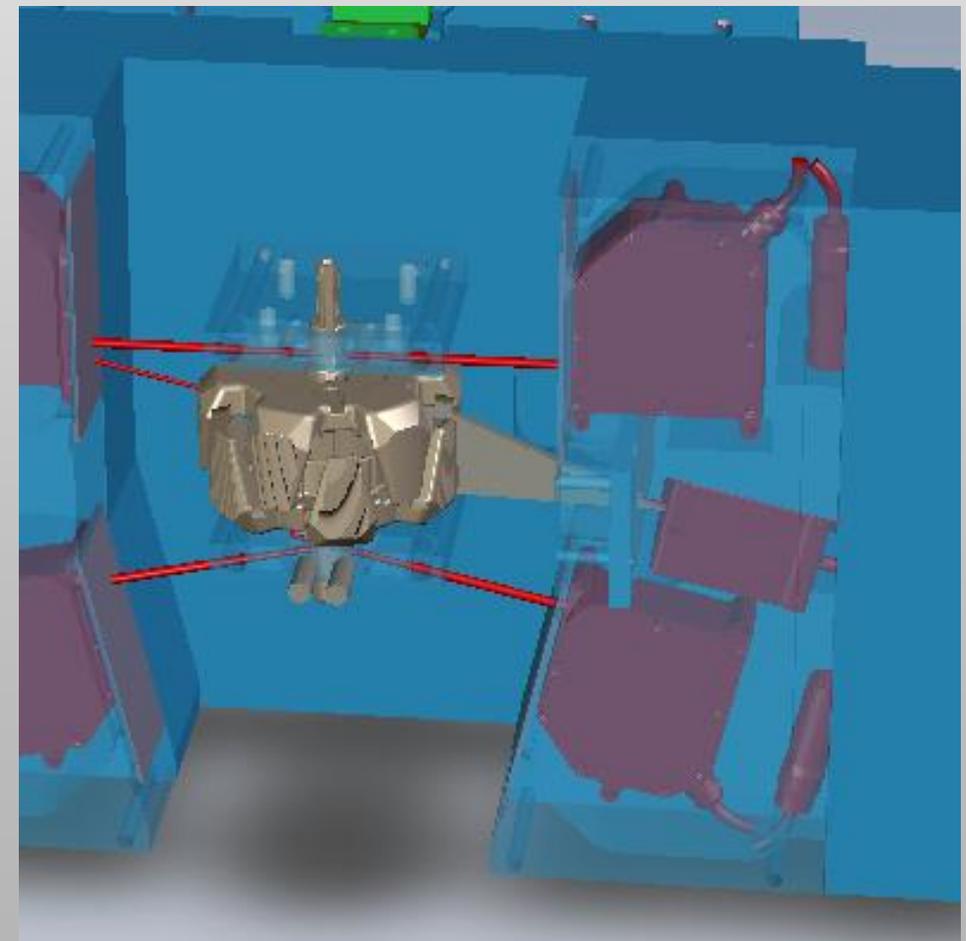




MS3D inspection machines are designed to function with very reliability in hostile Workshop environment

100% of production Inspection

- ✓ Flexible
- ✓ Fully automatic
- ✓ 3D geometries
- ✓ Complex geometries
- ✓ Internal & external geometries
- ✓ Very High speed measurements
- ✓ Very high accuracy (0.1 μ m)
- ✓ Non contact sensing



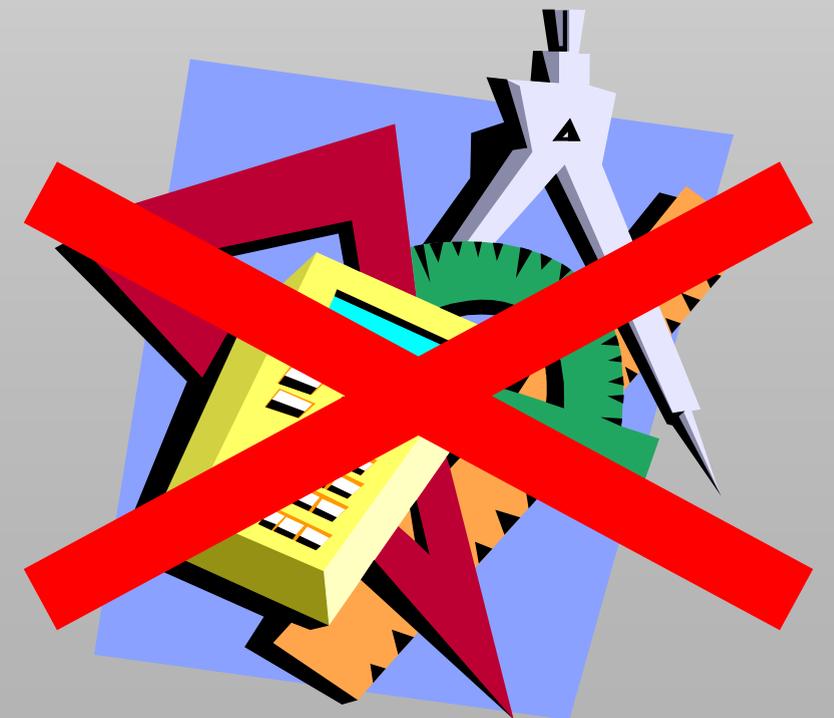
100 % inspection & Non contact sensing advantages



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- ✓ No scrap passed to customers
- ✓ Saving time of final inspection
- ✓ Manufacturing process monitoring
- ✓ Saving inspection personal costs
- ✓ Suppressing part-specific inspection toolings
- ✓ Suppressing time lost in inspection tooling changing
- ✓ Suppressing inspection systems maintenance costs
- ✓ Very long active life: 100 000 hours

 **Productivity Gains**



What, where?

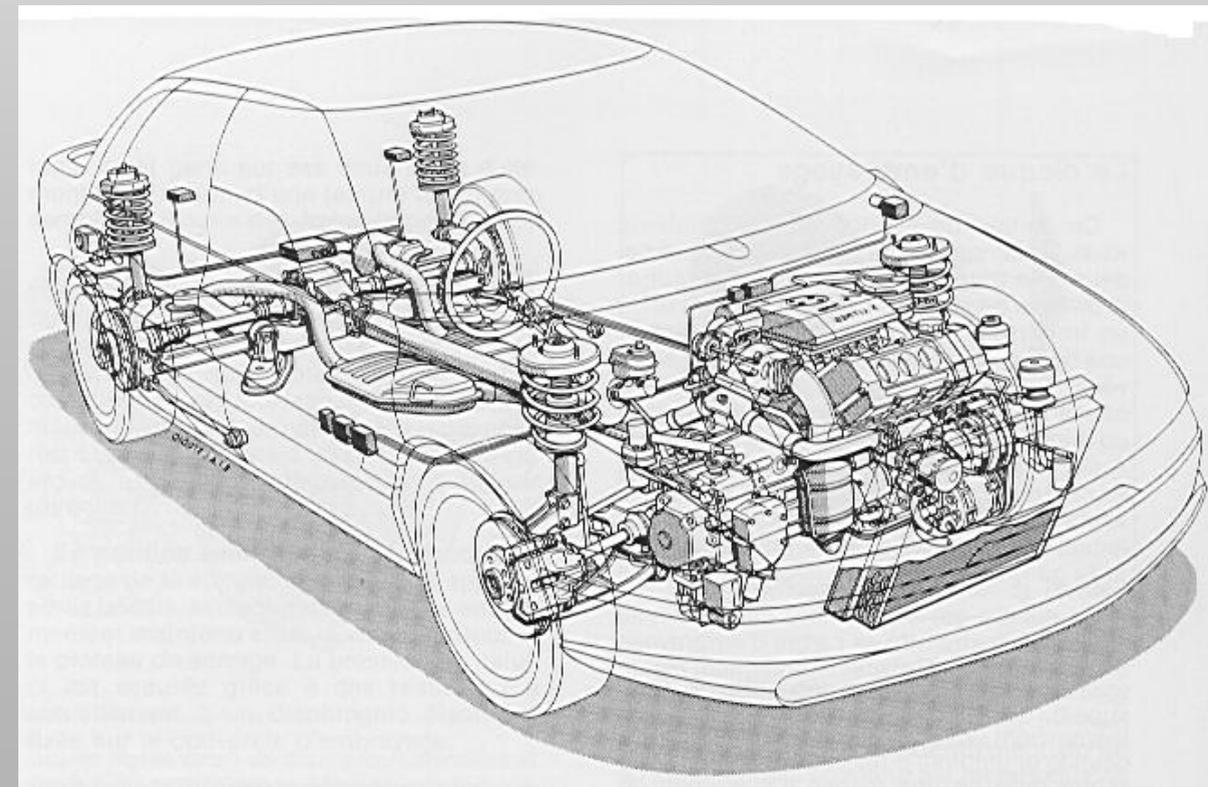


■ Solutions:

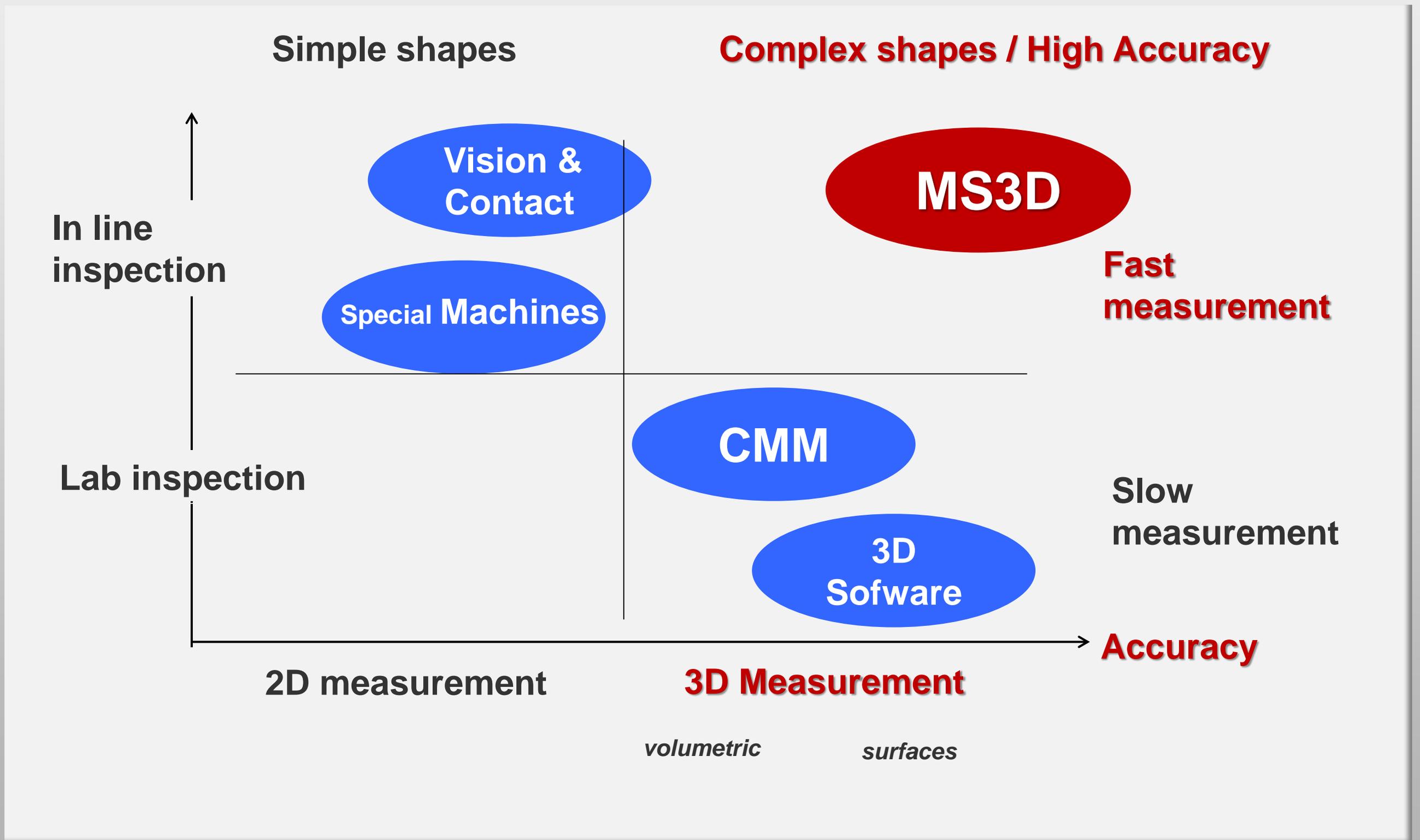
- **Specific modular Systems** developed upon customer's guidelines
 - Multiple systems: duplication on several manufacturing lines
 - Standard systems: Bores inspection, Rotation symmetric parts

■ Priority markets:

- **Automotive, Aerospace, High precision mechanics, Energy, Customers:**
Tier 1 suppliers and manufacturers
- **Countries:**
 - **Europe, USA & Canada**



Competitive positioning





2D:

- Diametre, Depth, Thickness, Angles...
- Ovality, Circularity, Concentricity, Perpendicularity...

3D:

- Cylindricity, Coaxiality, Conicity, Parallélism...
- Planeity, Straightness
- Shape defects
- Surface aspect defects

Developing and Manufacturing your inspection system



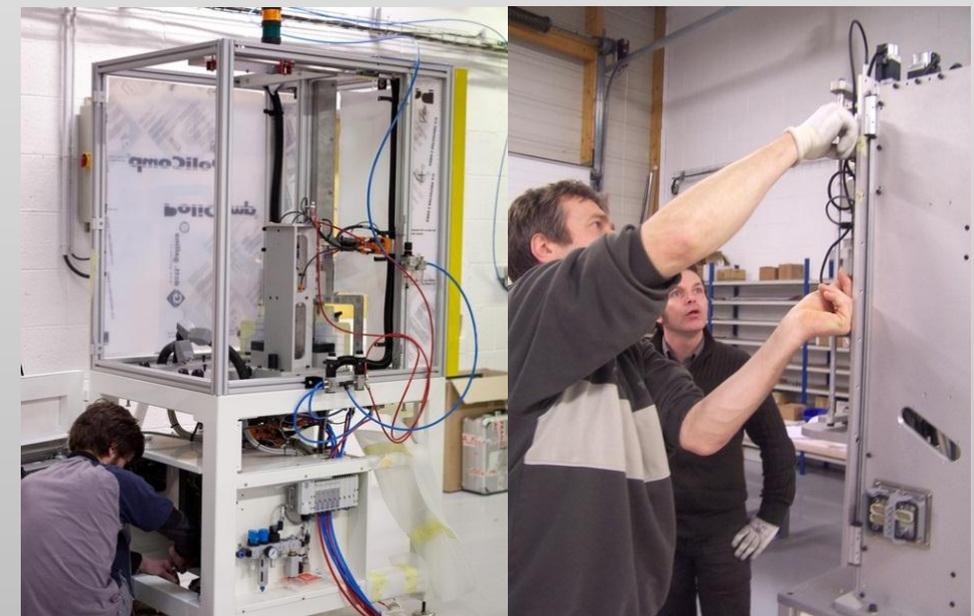
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- 1. Studying functional guidelines**
- 2. Overall concept technical proposal**
- 3. Validating with customer concept and technical solutions**

4. Feasibility study (optional)

5. Technical and commercial detailed quote



Activity	Personnel	Start	End
1. Functional analysis	1 person	01/01/2010	01/01/2010
2. Overall concept technical proposal	2 persons	01/01/2010	01/01/2010
3. Validating with customer concept and technical solutions	2 persons	01/01/2010	01/01/2010
4. Feasibility study (optional)	1 person	01/01/2010	01/01/2010
5. Technical and commercial detailed quote	2 persons	01/01/2010	01/01/2010
6. Manufacturing and in line integration and set up planning...	2 persons	01/01/2010	01/01/2010

6. Manufacturing and in line integration and set up planning...

Some references



- Valéo
- Bosch
- Delphi
- Continental
- Hutchinson
- Thalès
- ST Microélectronique
- Snecma
- Vallourec
- Corus Tubes
- Essilor
- Howmet
- ArcelorMittal
- Large (swiss) watchmaker



Snecma
Groupe SAFRAN



DELPHI
Automotive Systems

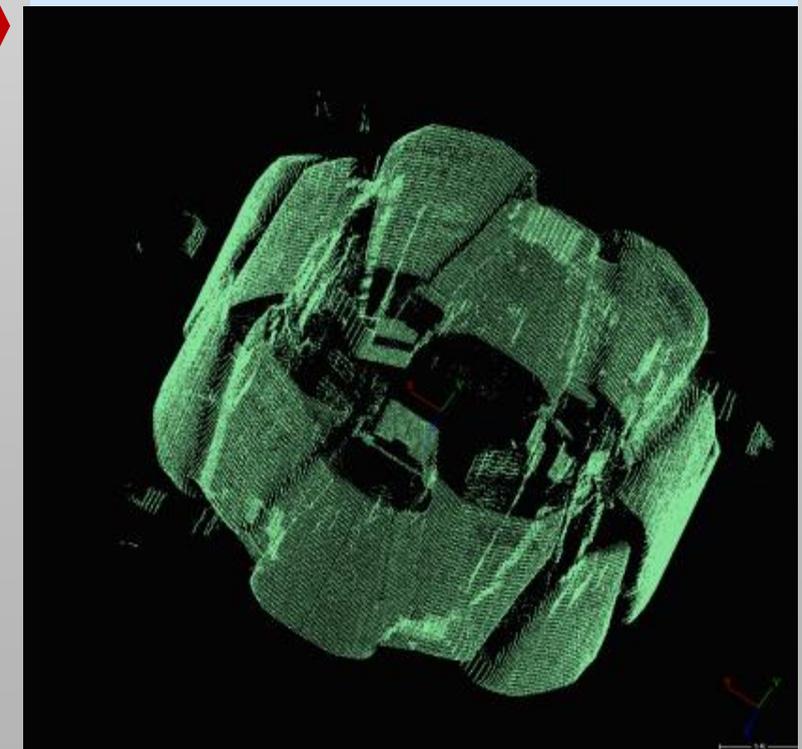
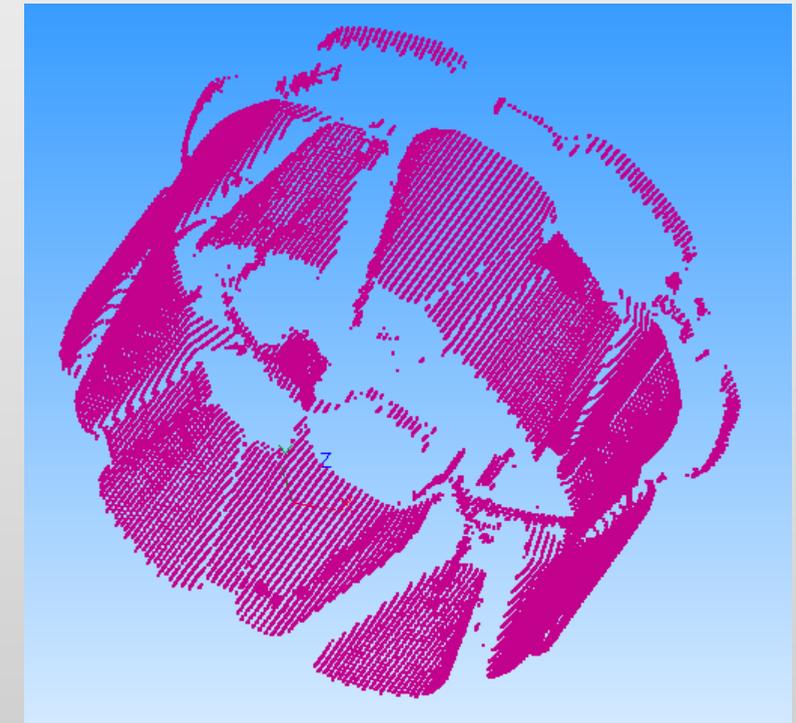
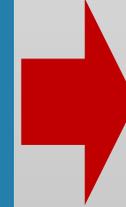
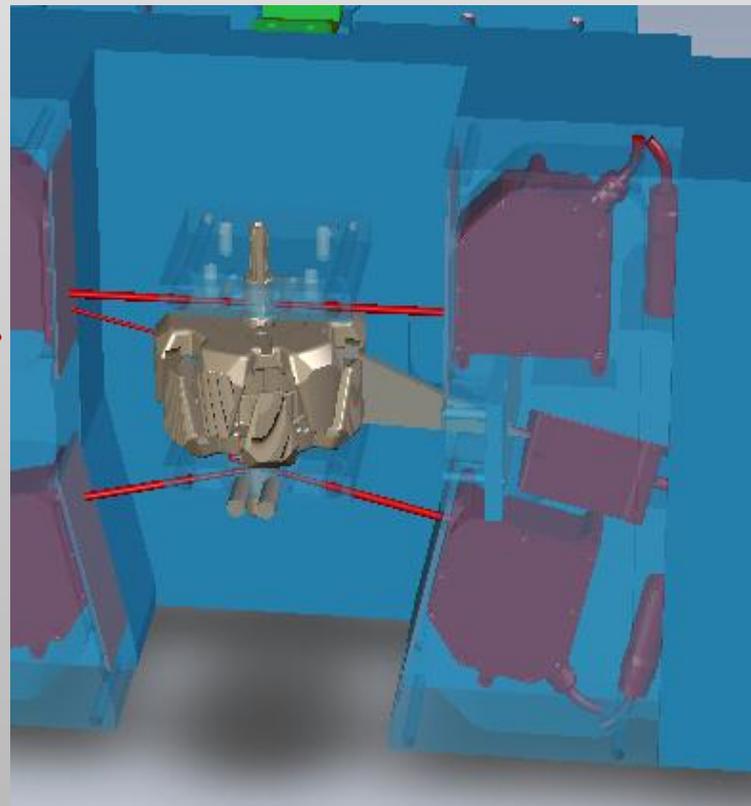
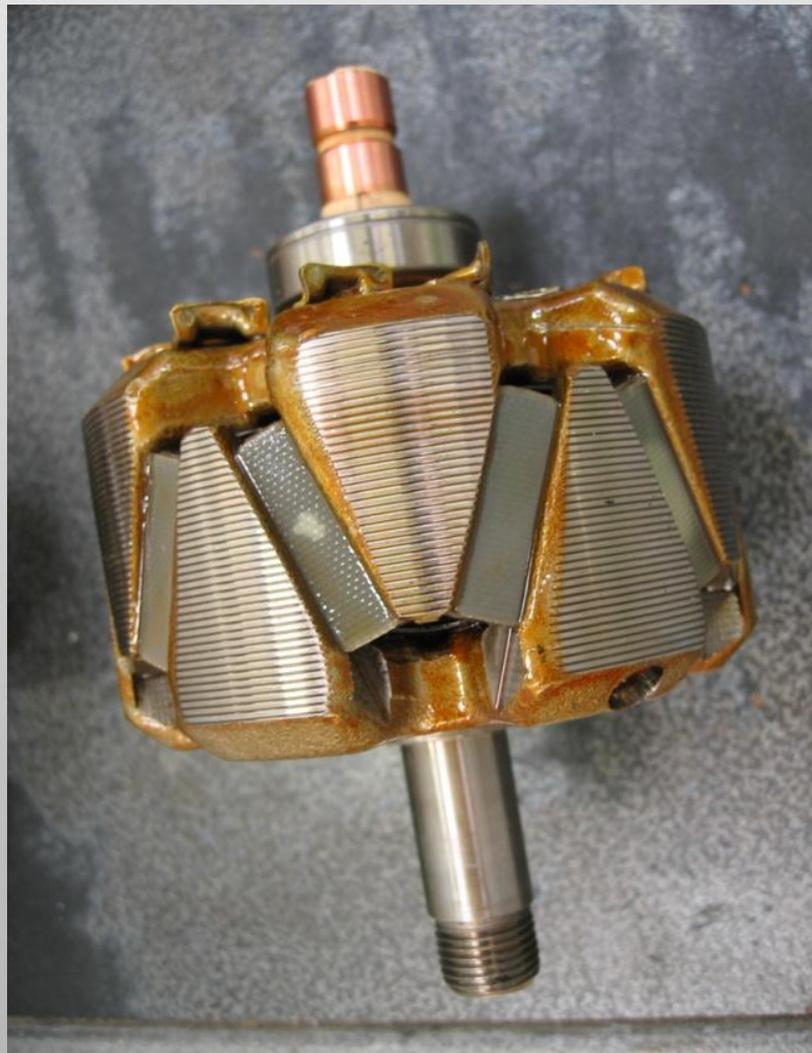


A New Way to measure in 3D

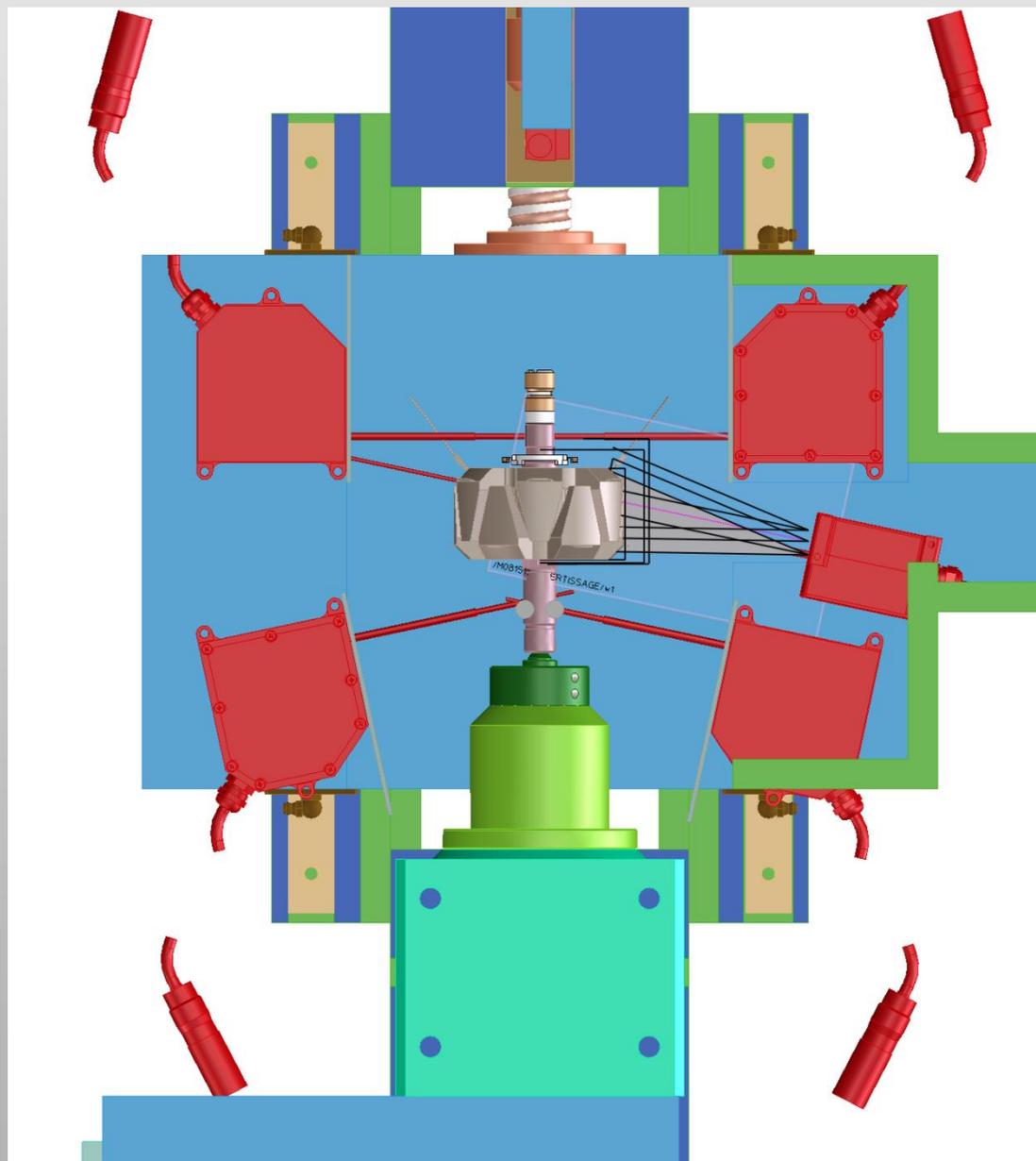


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Acquiring a dense 3D cloud of points to measure geometrical elements gives speed, accuracy and flexibility



Acquiring a dense 3D cloud of points to measure geometrical elements gives speed, accuracy and flexibility



Customer: Valeo

Features measured:

- Diameter
- Double run out
- Inter teeth magnet position
- Magnet cover position
- Teeth height and angular position
- **18 references at random on the line**
- Cycle time: 6.5 sec
- Tolerances: 10 μm
- System measurement reproducibility:
< 1 μm
- System in service since 2007

Diesel injectors Bodies internal features inspection

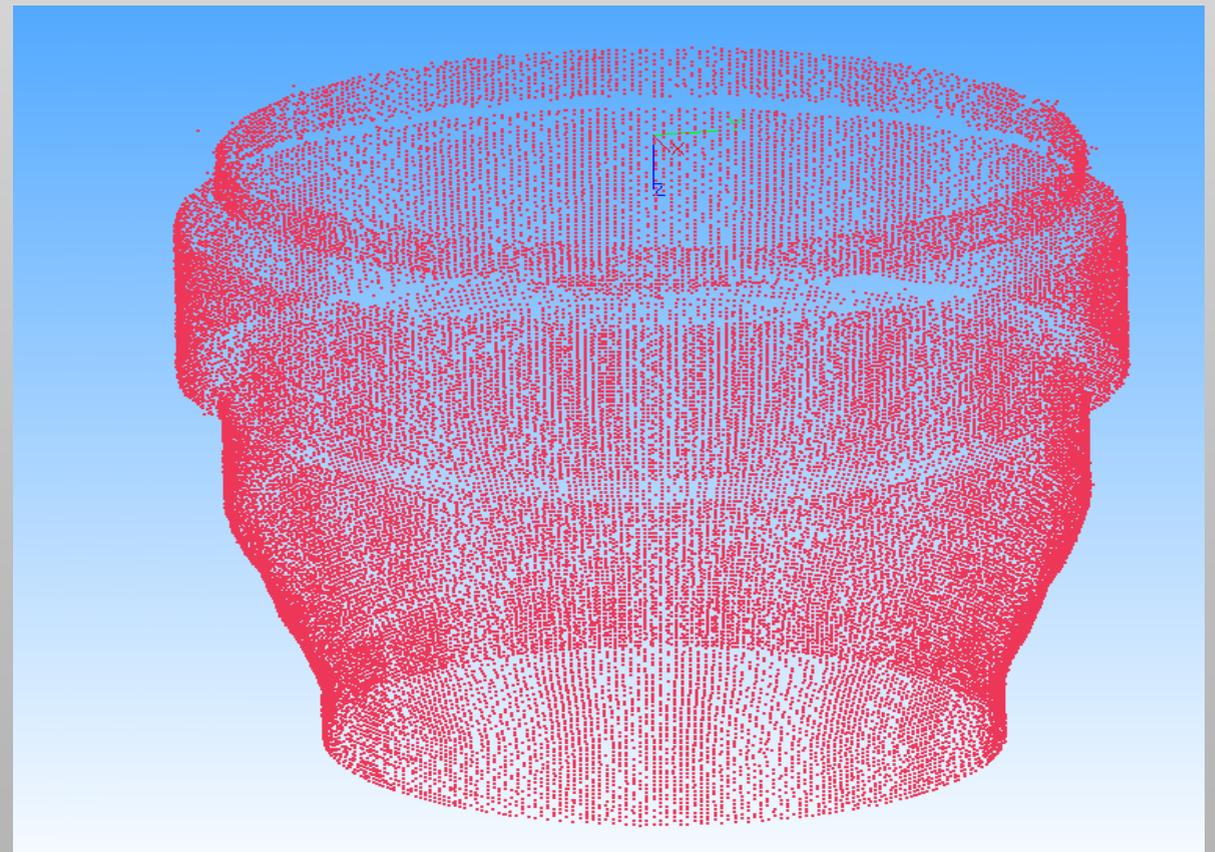


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Customer: Delphi:

Internal features non contact automatic inspection

- Tolerances : 30 μm
- System accuracy: 2 μm
- Cycle time: 8 sec



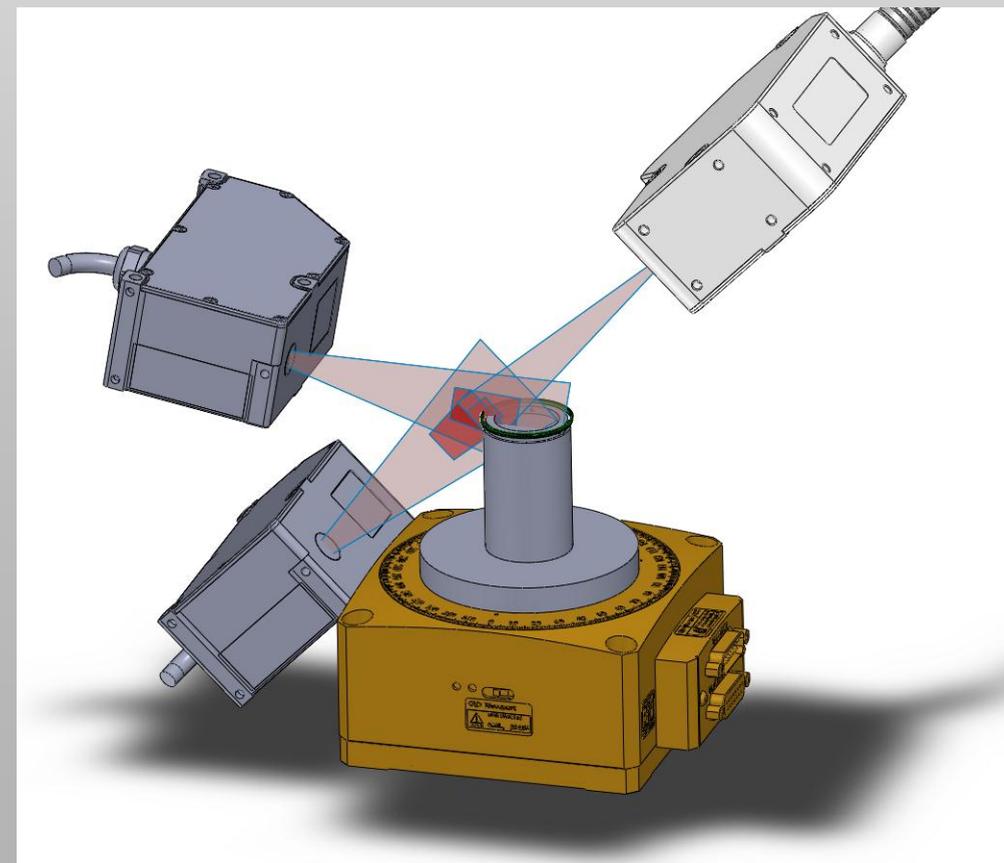
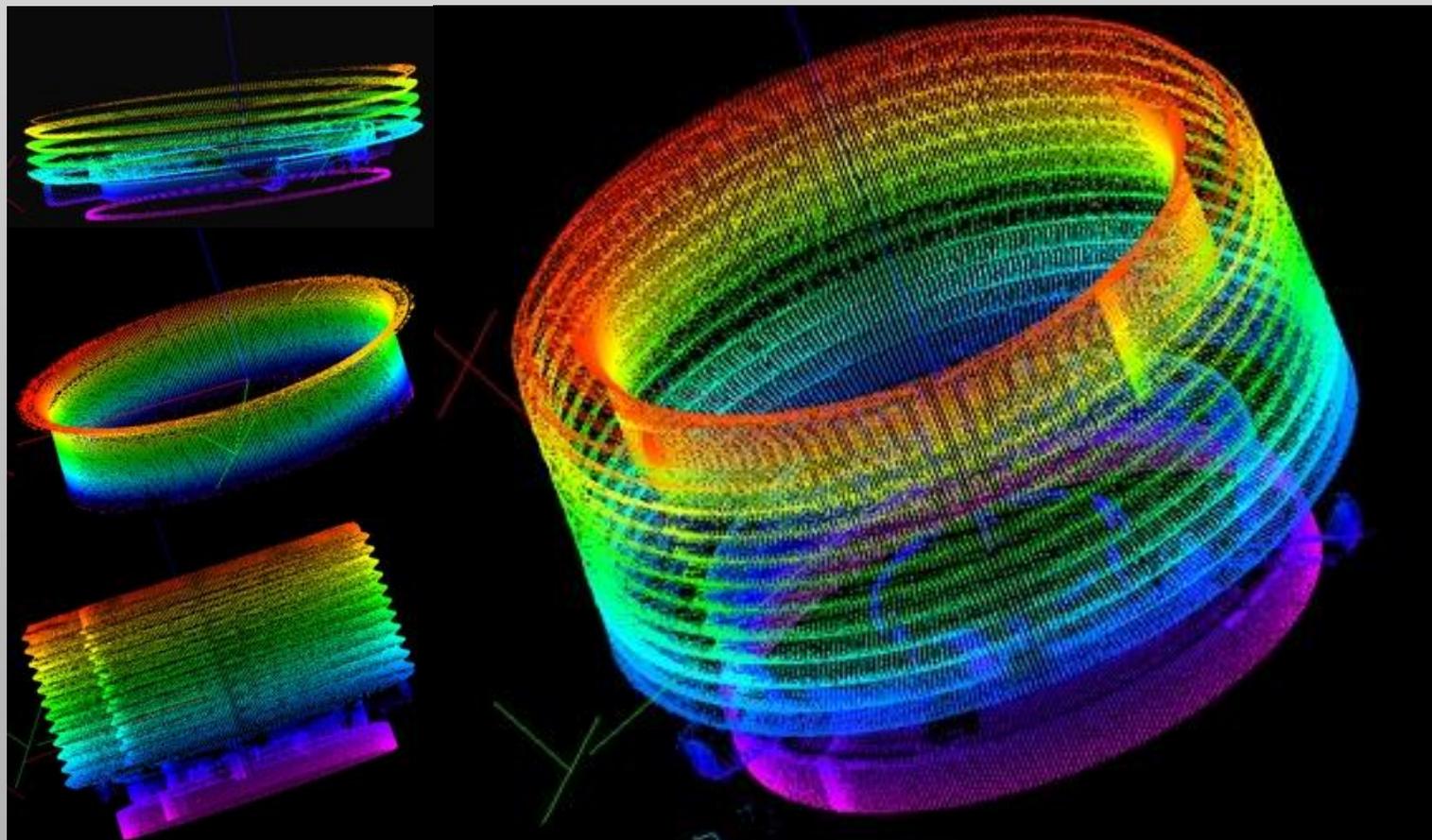
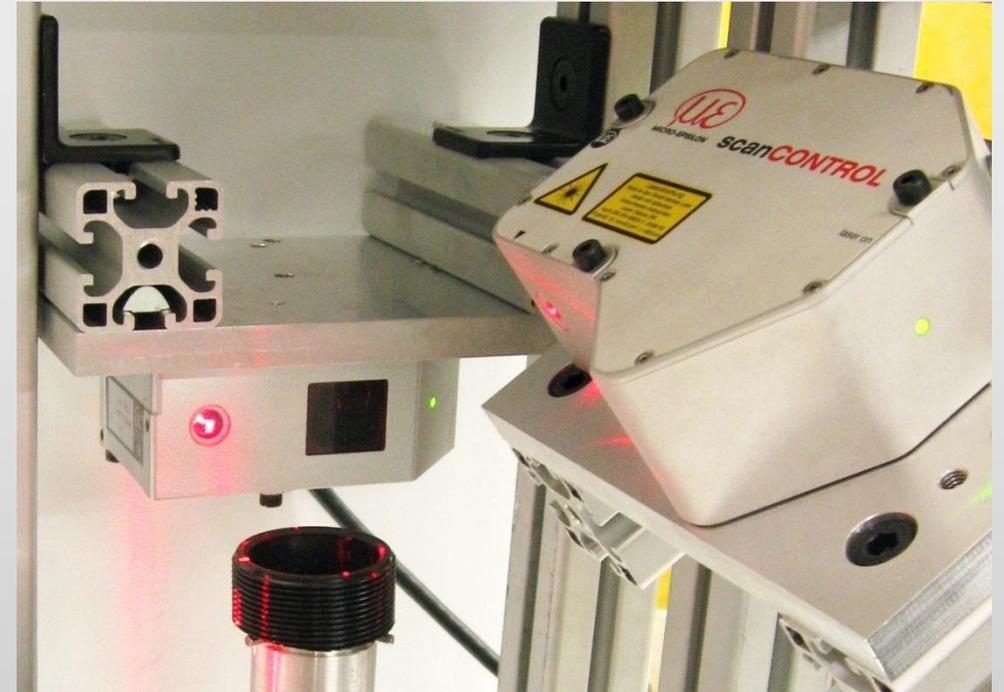
ShapeINSPECTION

3D inspection of internal and external shapes



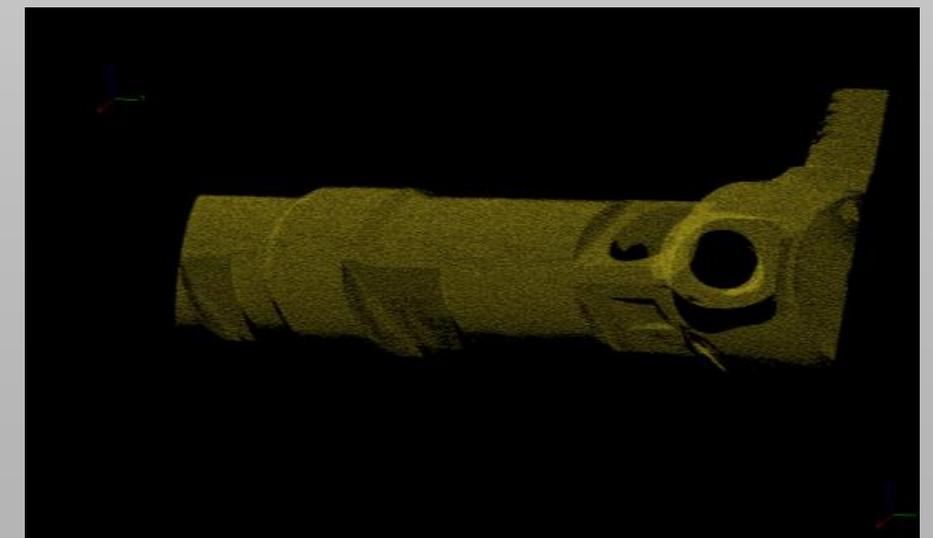
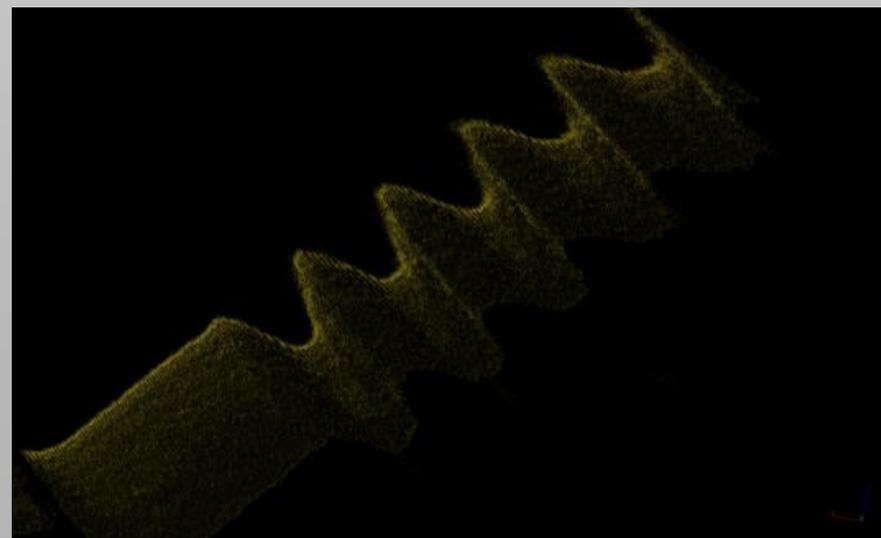
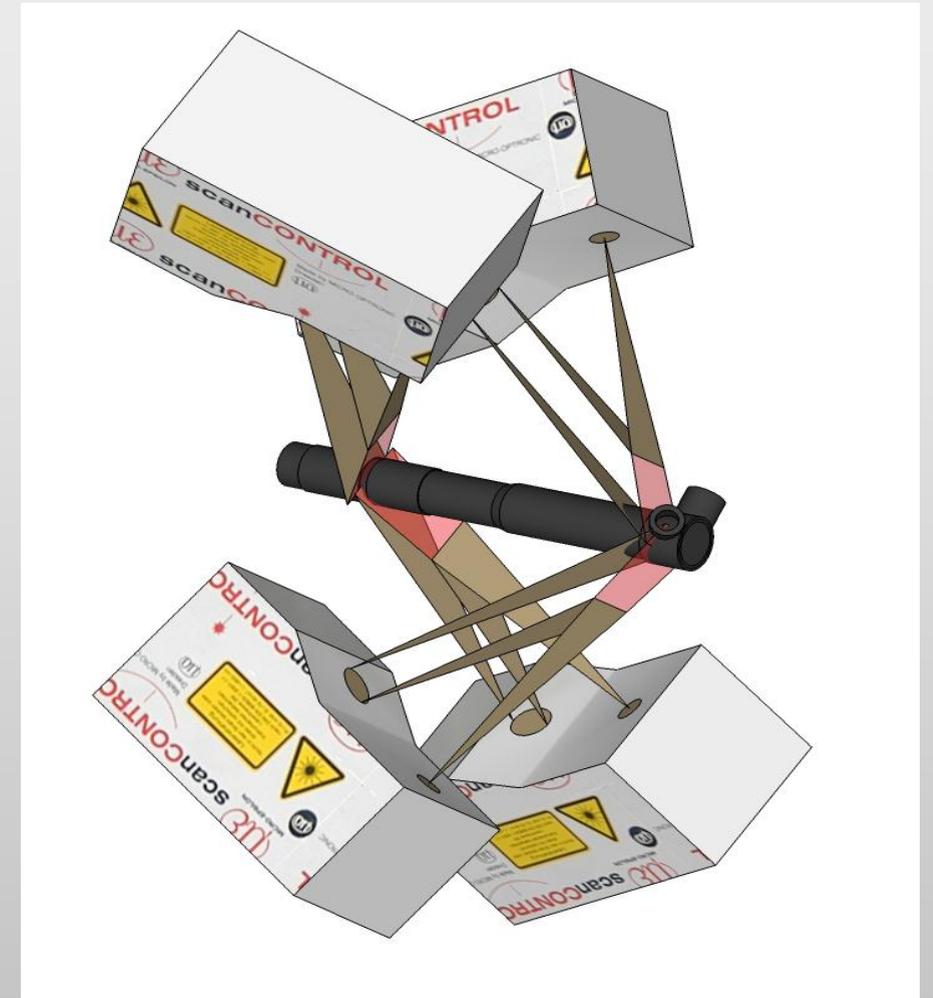
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3D complete inspection of complex internal and external shapes with multiple sensors



Non contact In line External geometry inspection (Feasibility)

- Tolerances: 50 μm
- Flexible line (min 3 types of parts)
- Cycle time: 8 sec



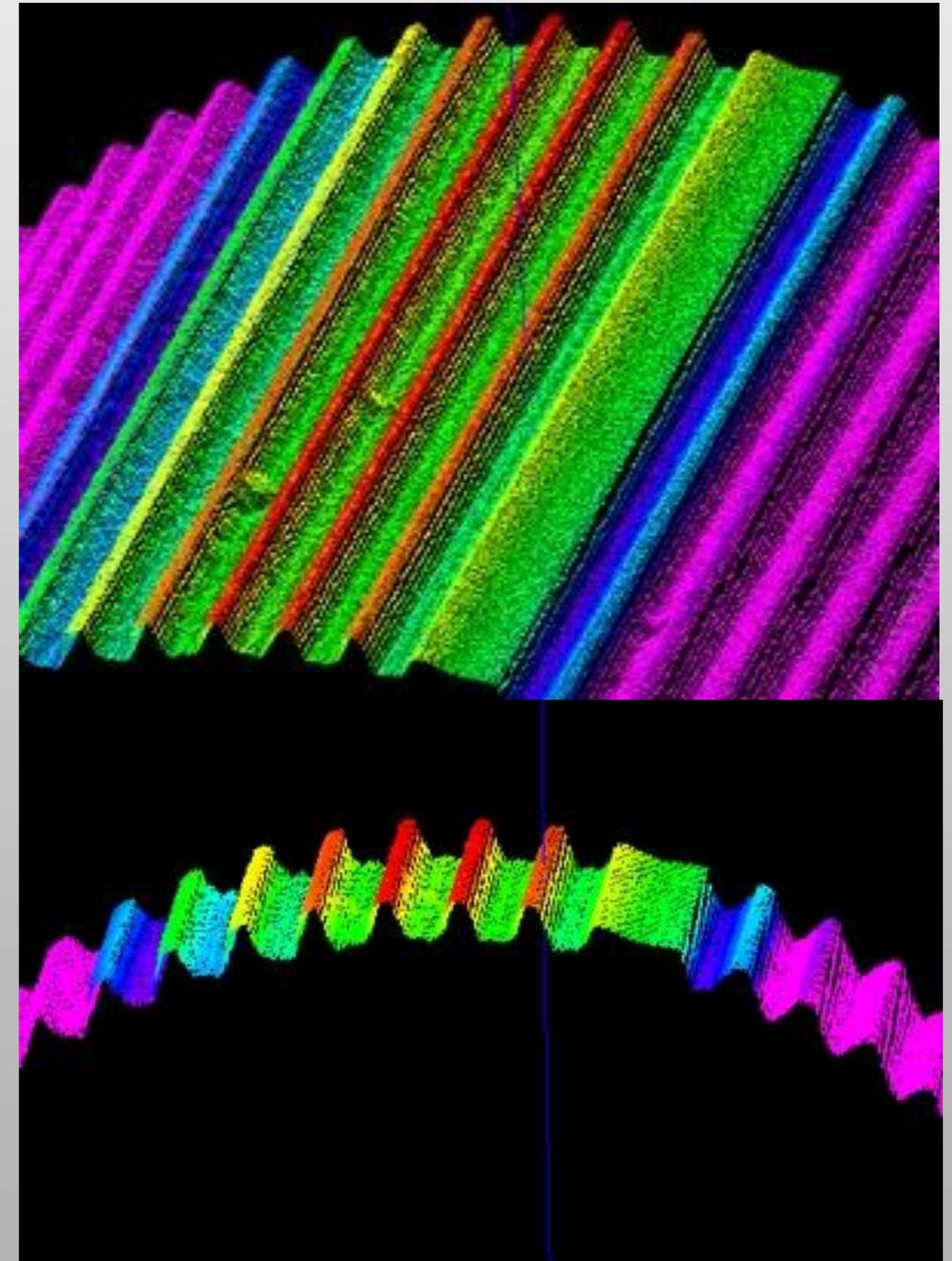
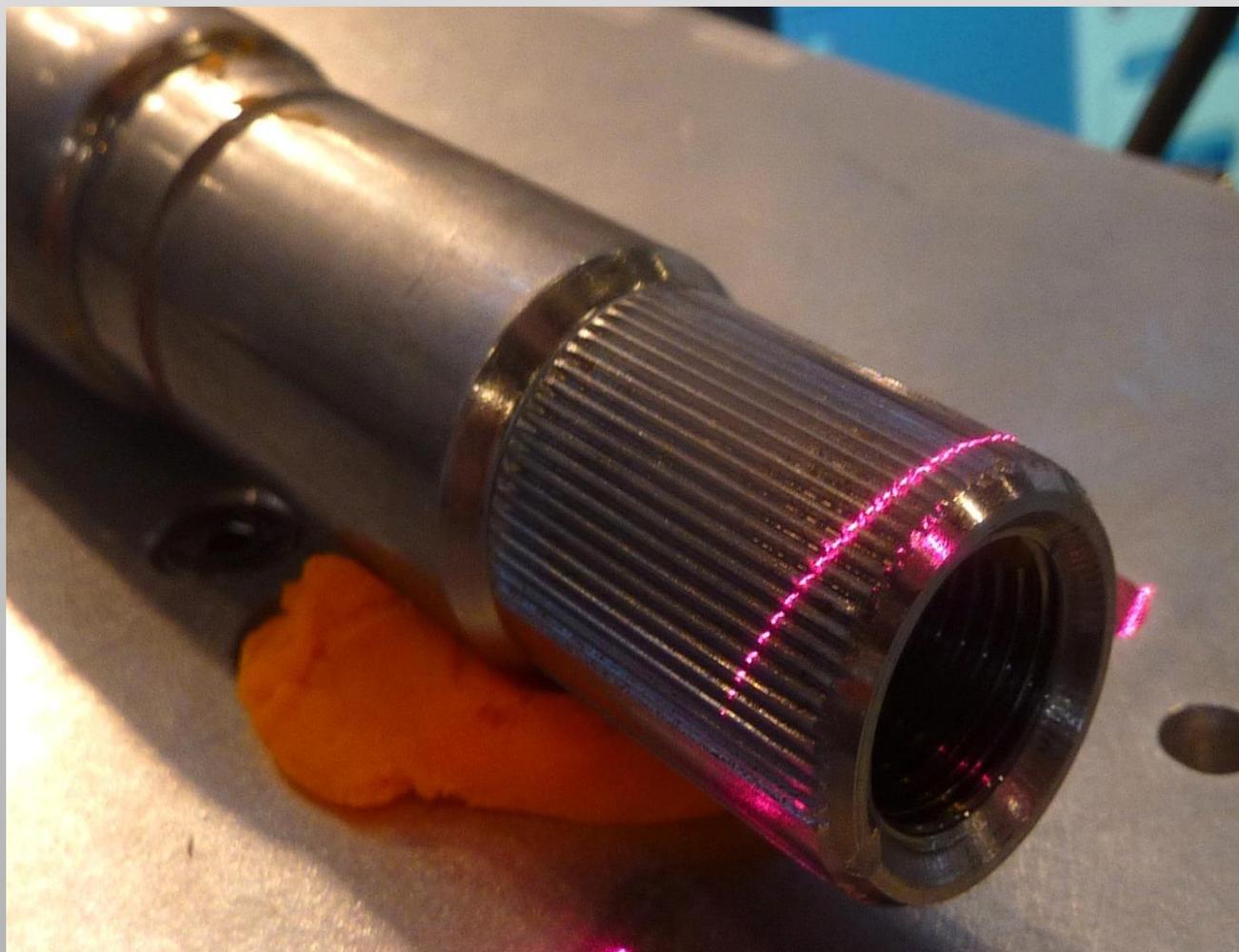
ShapeINSPECTION

External features geometry inspection



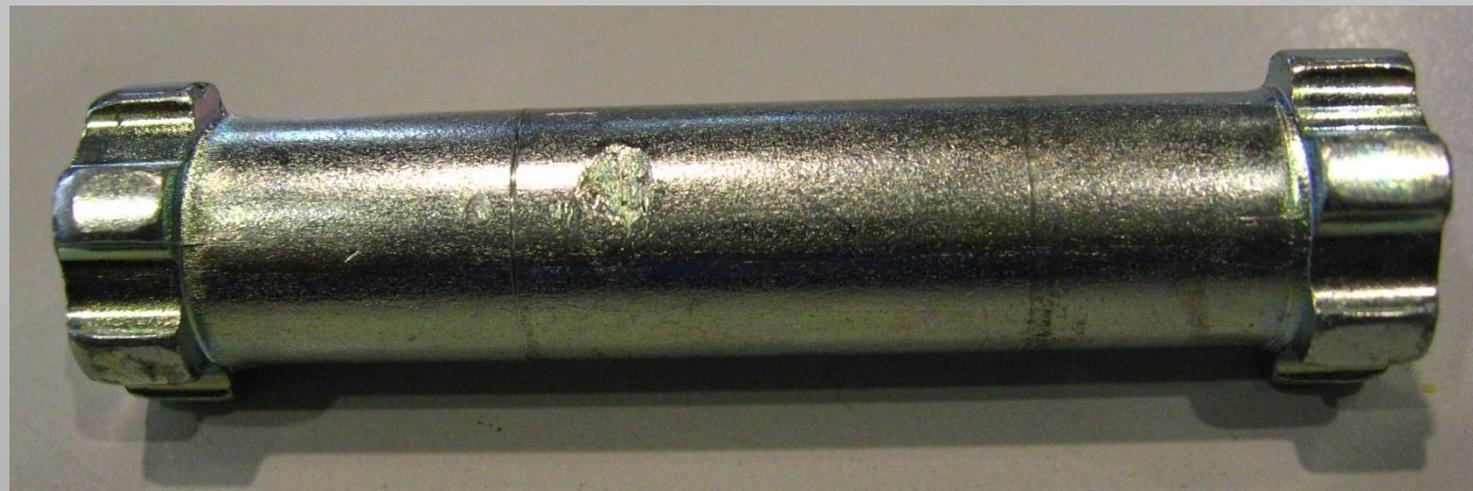
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- **Spline inspection**





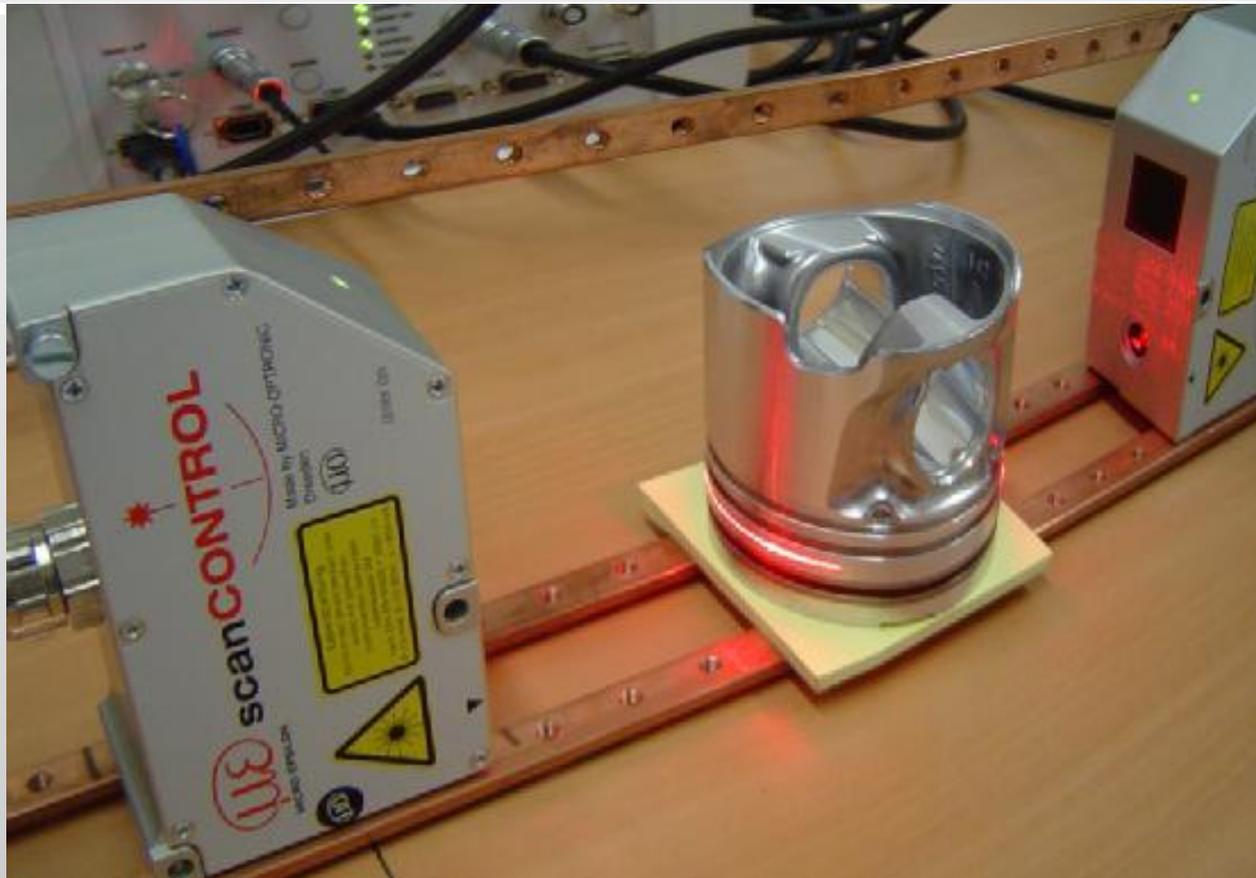
- **Customer: Lazpiur (Esp.) manufacturer of sorting machines:**
- In line surface aspect defects inspection at very high speed:
- Defect depth to be identified: > 0.1 mm
- Cycle time: **0.3 sec**
- 2 systems installed



Piston Heads defects and geometry inspection



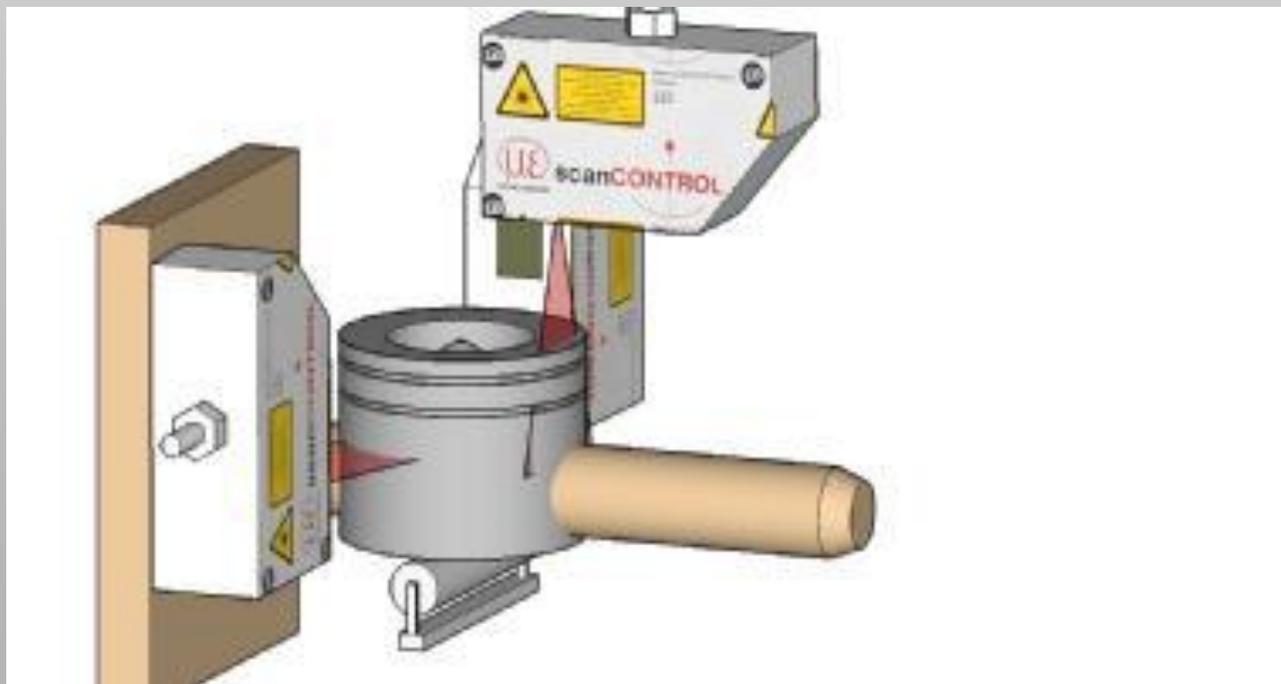
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Customer: Mahle: (feasibility)

Features to be measured:

- Diameter, axis position, porosities
- Cycle time: 15 sec
- Accuracy: 1 μm
- Reproducibility: 0.1 μm



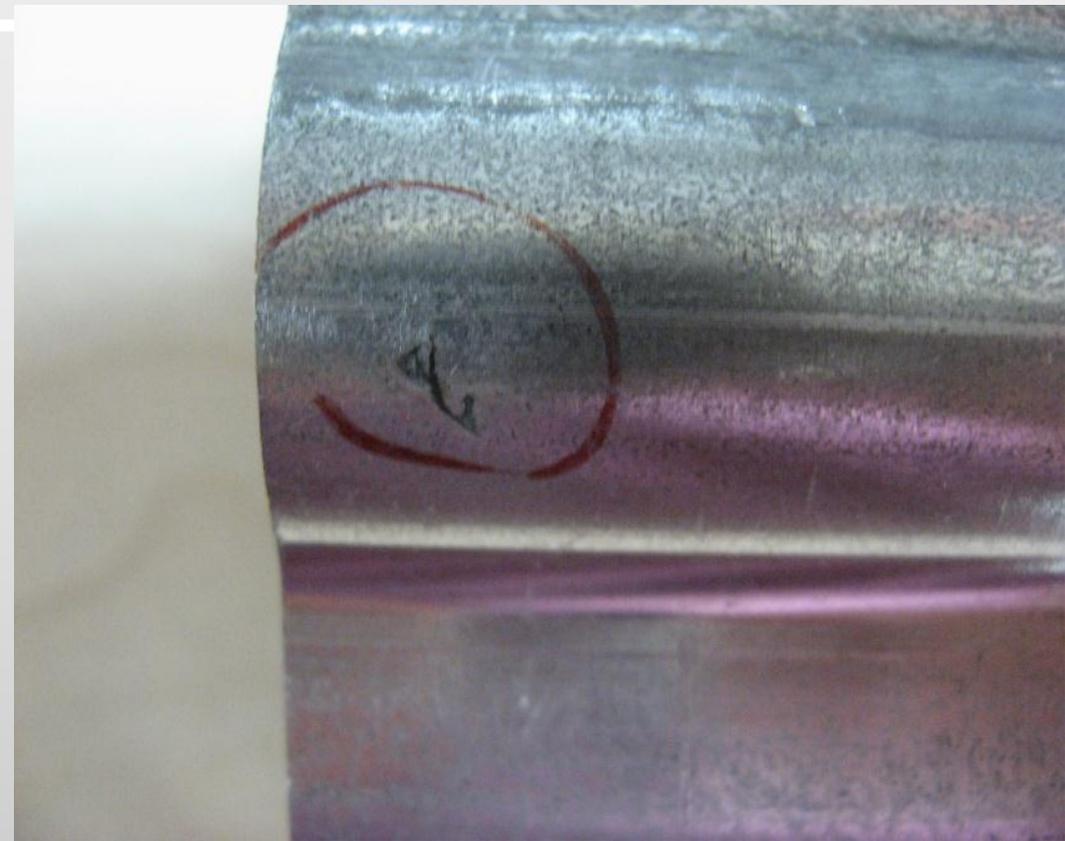
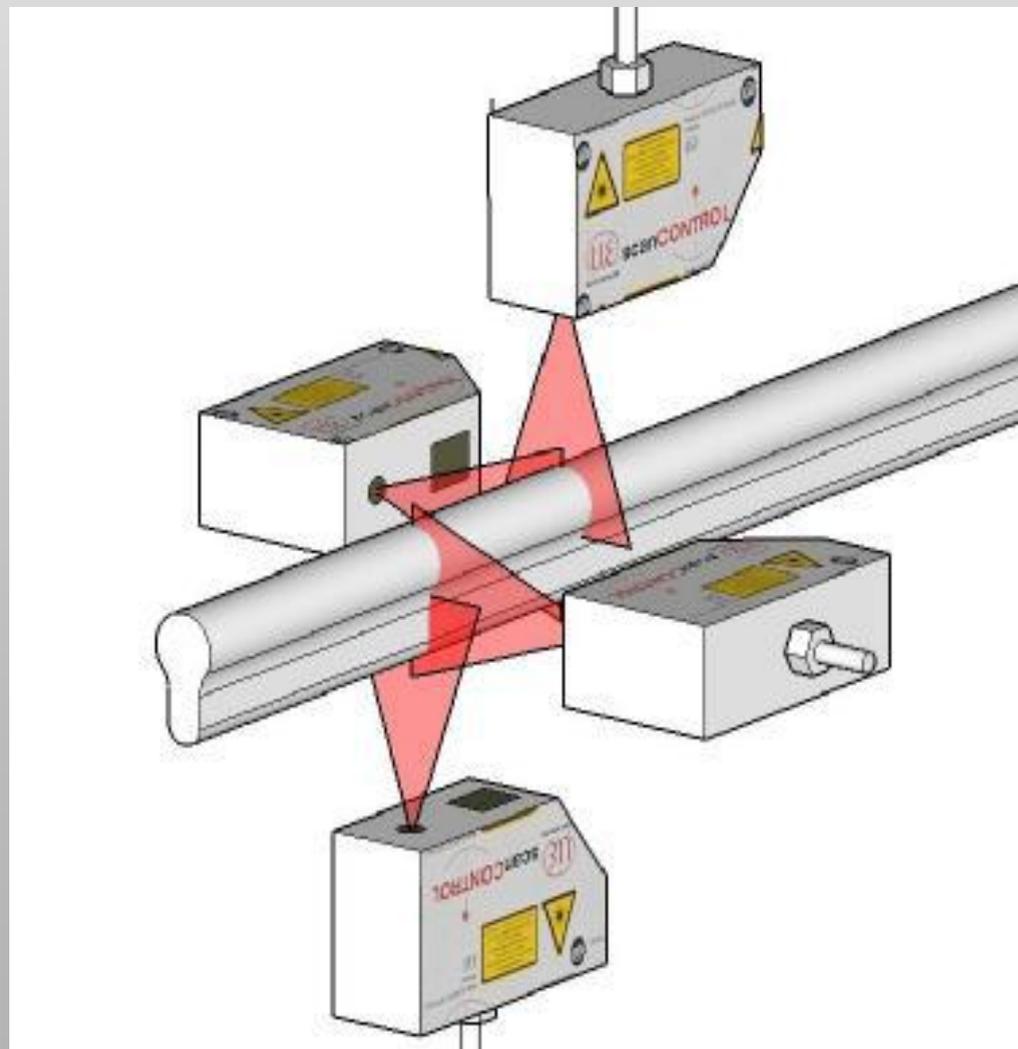
Automatic detection of cracks on elongated steel



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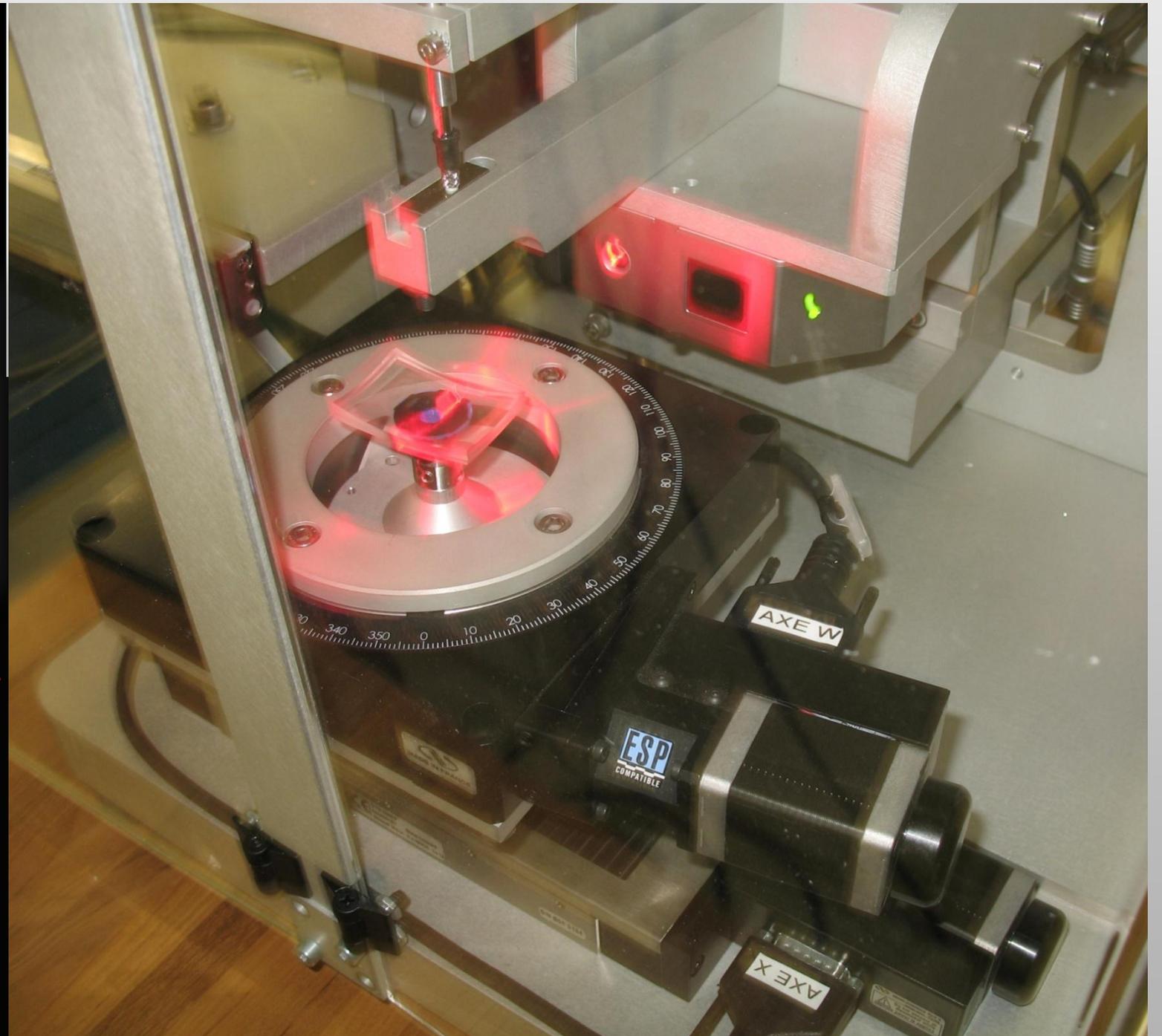
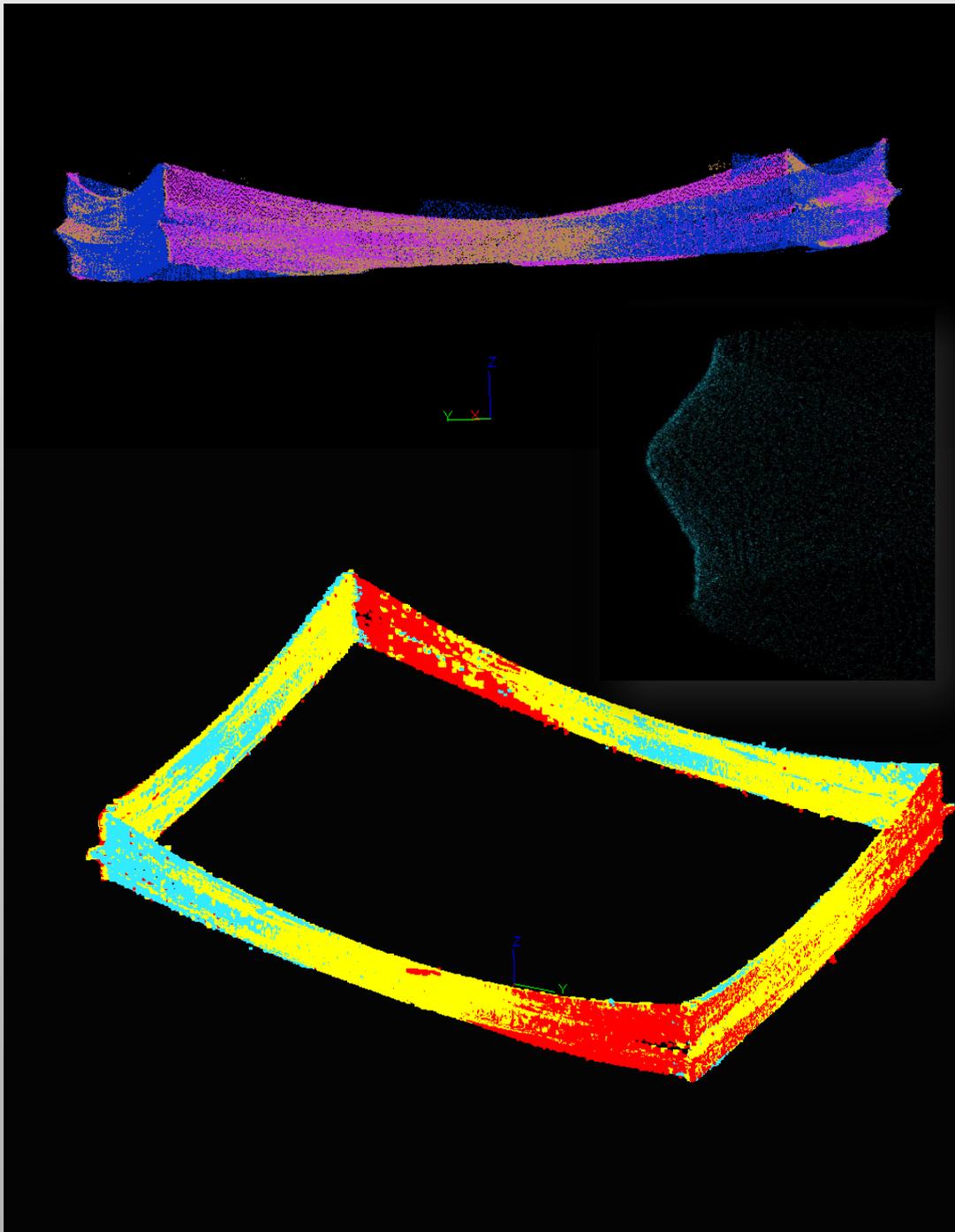
Customer: Aciéries de Bonpertuis
Identification of « scales defects in line
(Feasibility)

- Depth identification limit : 50 μm
- (surface roughness 40 μm)



Customer Essilor:

Accuracy on Glass perimeter measurement: 2 μm



In line inspection of Rubber transmission Belts



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Customer: Hutchinson
Automatic inspection of transmission belts geometry defects

System installed since 2008

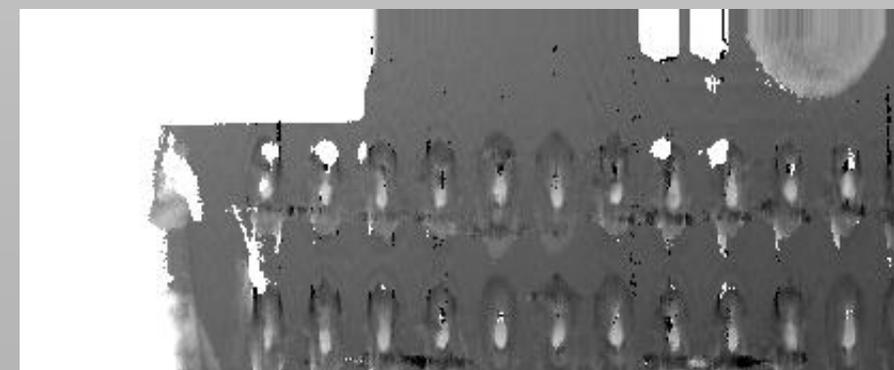
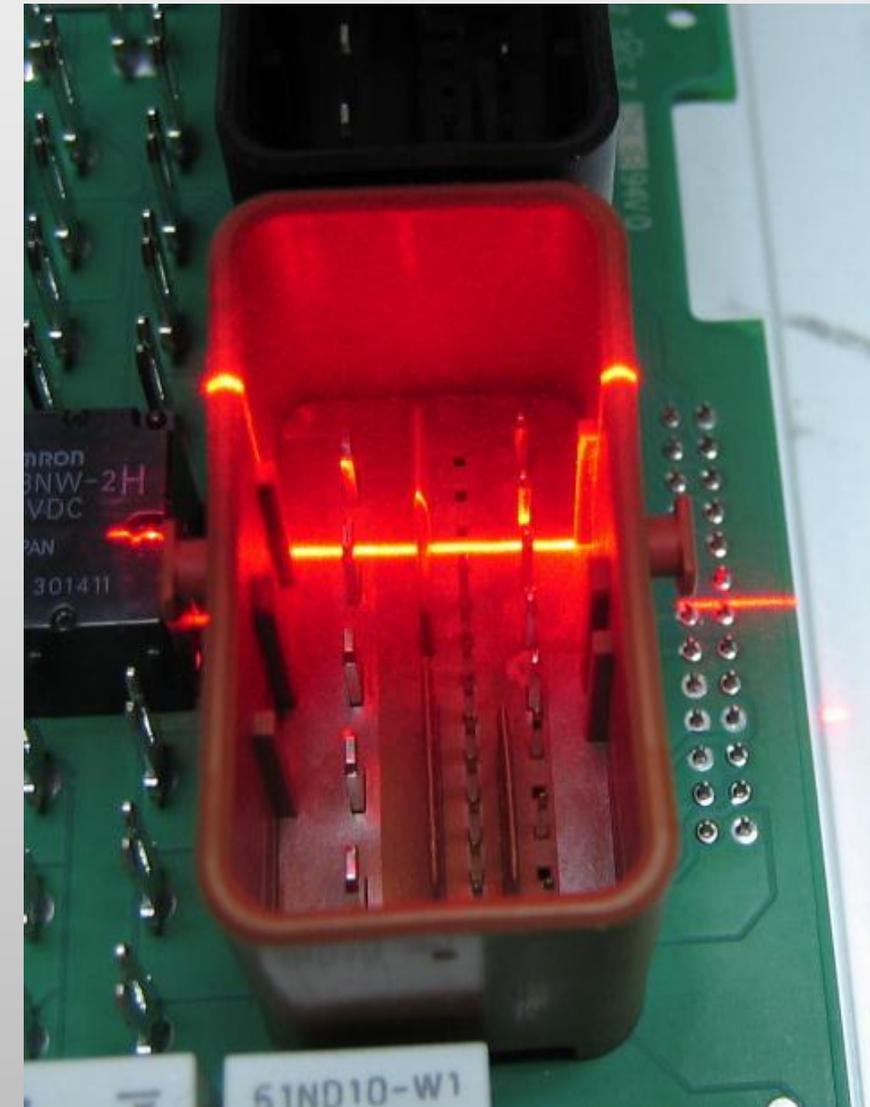
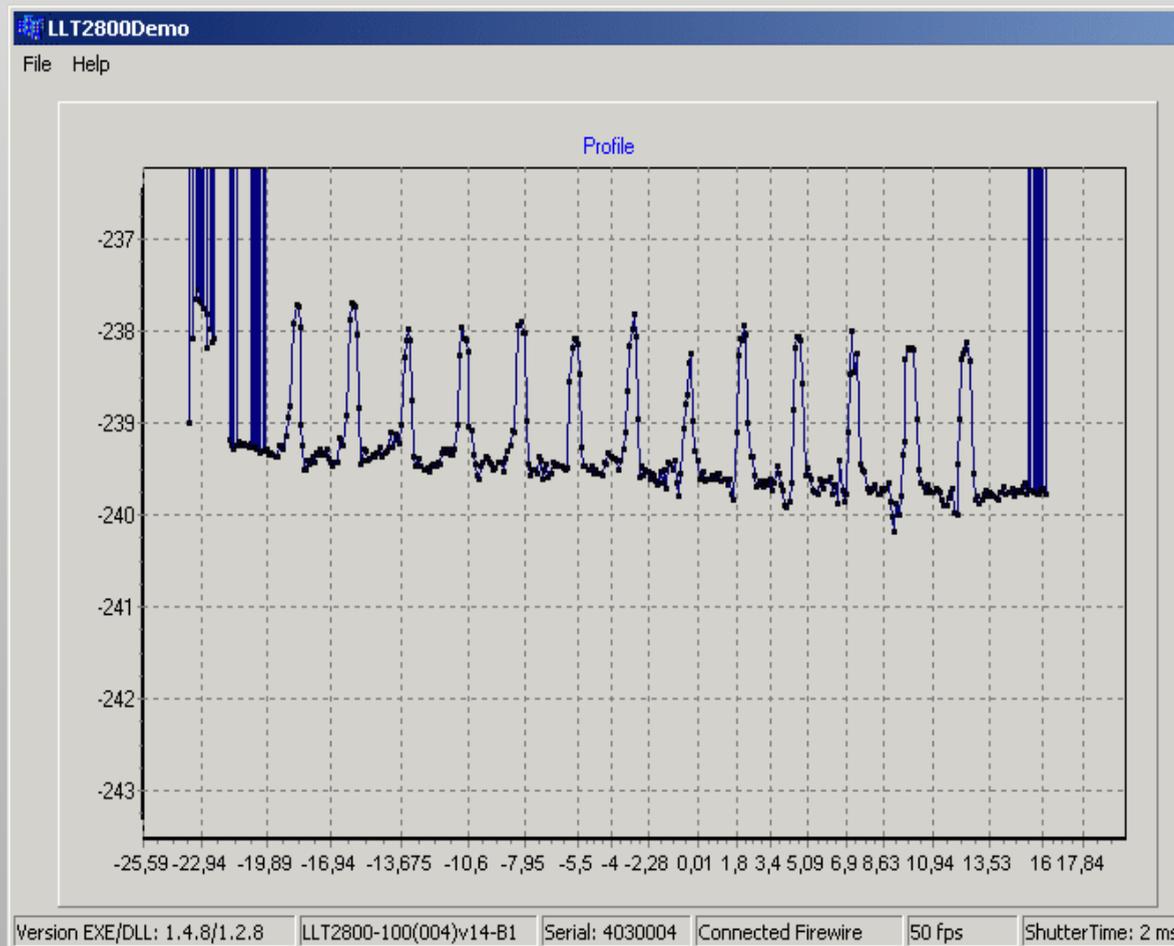


Electronic Boards Connectors inspection



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- Customer: Continental , (4 systems)
In line detection of connectors defects:
- Wrong Pin height
 - Missing pin
 - Bent Pin



Electronic Boards Connectors inspection

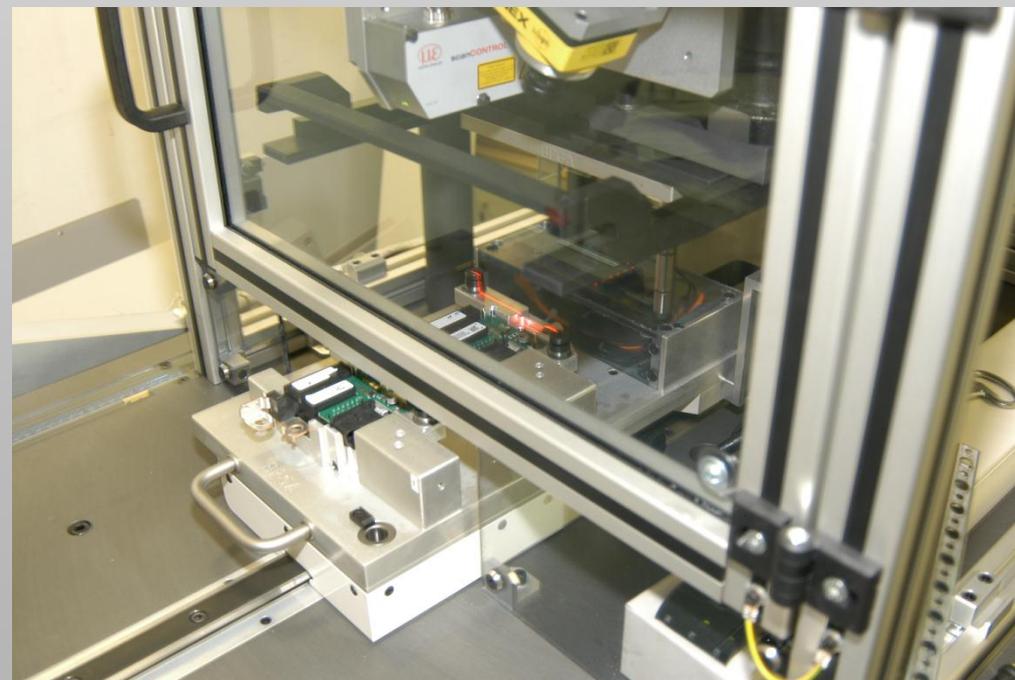
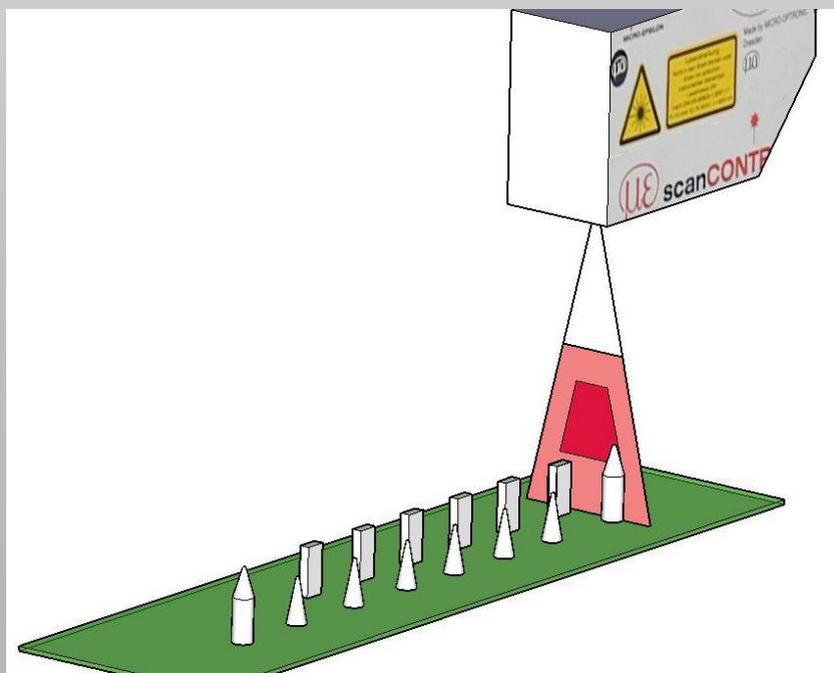


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Customer: Delphi, Bosh (3 systems installed)

In line detection of :

- Wrong Pin height
- Missing pin
- Bent Pin
- Pin not Welded
- Insufficient Welding (Truncated welding cone)



In line inspection of Wafer polishing pads wear

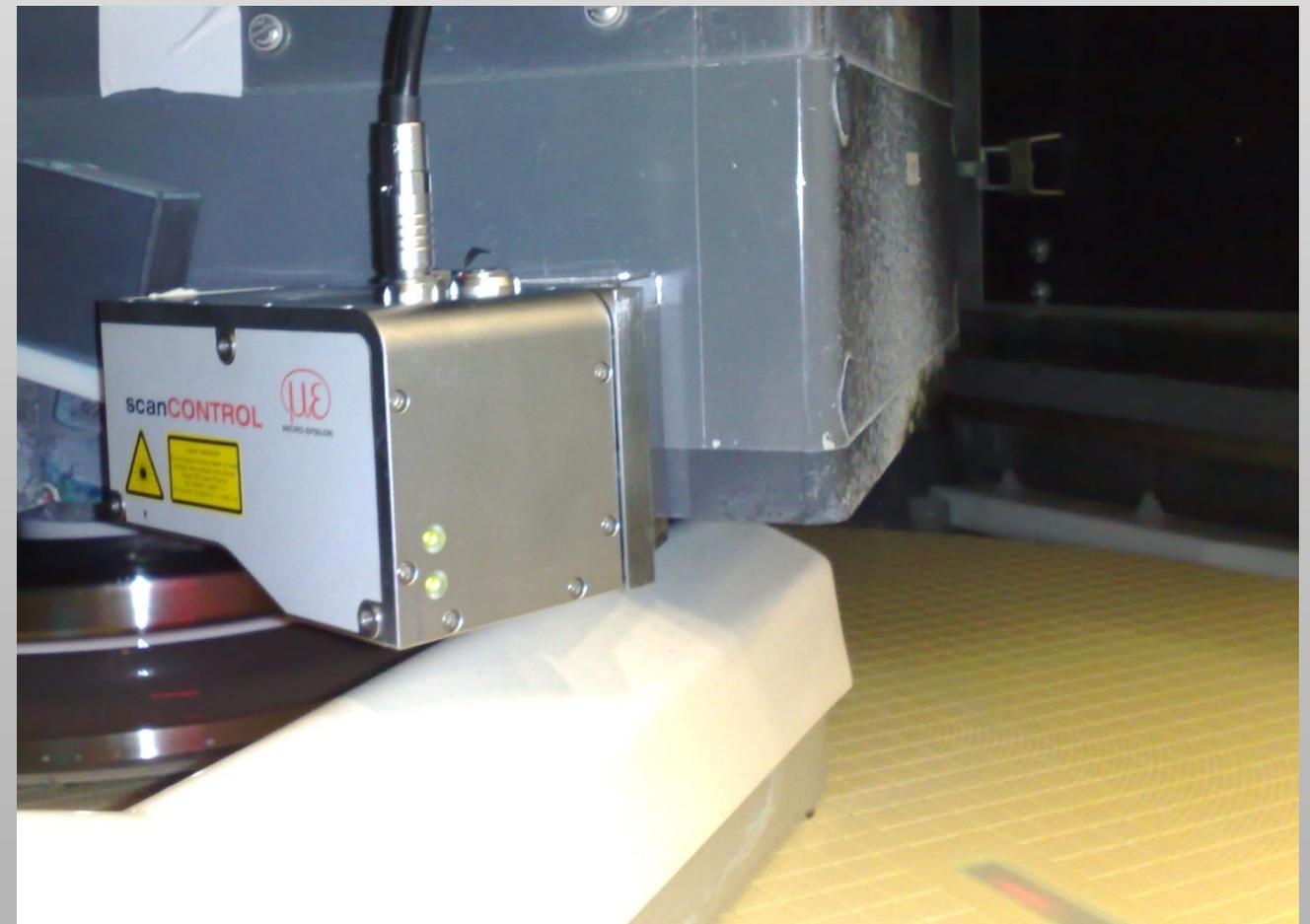
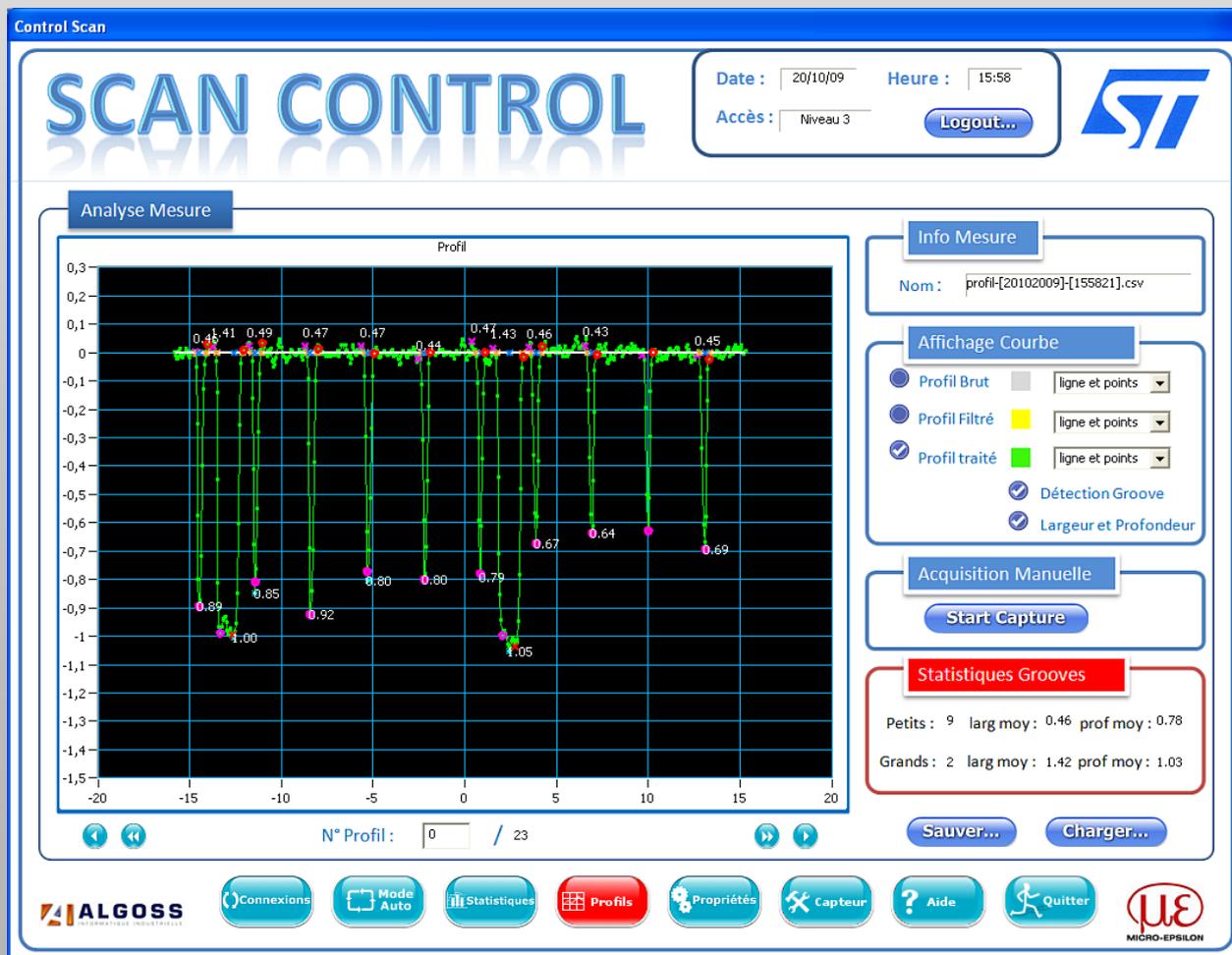


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Customer: ST Microélectronique

10 systems installed on polishing machines

-In Machine Inspection of polishing pads wear



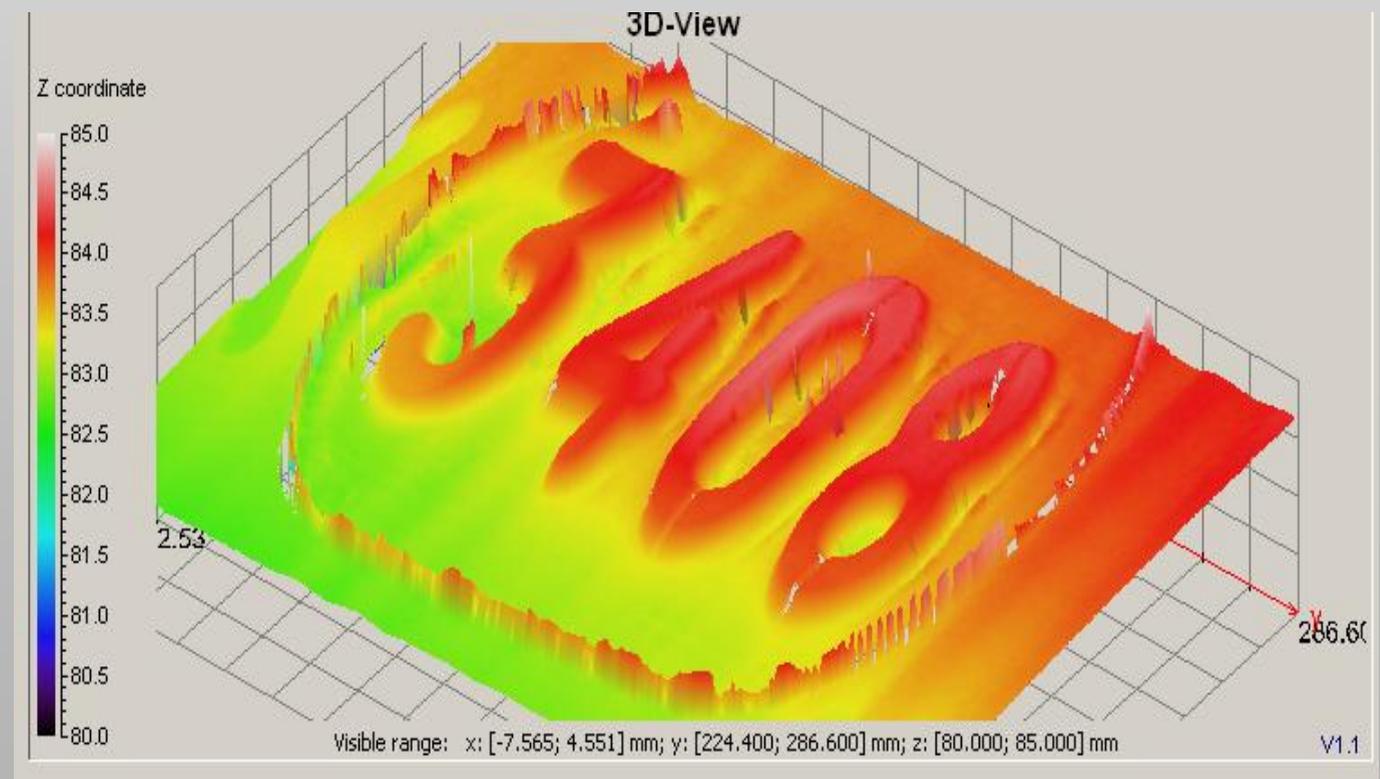
Tires Automatic Identification



Customer: Volvo

Automatic reading of DOT Code

- Cycle time: 2.5 sec



MS3D a complete proposal



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Studies:

Our team investigates with you your requirements, design a solution proposal that will be validated when needed by a feasibility study.

Manufacturing:

Manufactured and assembled in our workshop our machines are installed and maintained worldwide.



Training:

MS3D ensures customer(s) personal training directly on customer's manufacturing sites worldwide.



Thank you for your attention

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SAS au capital de 35 200 €

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