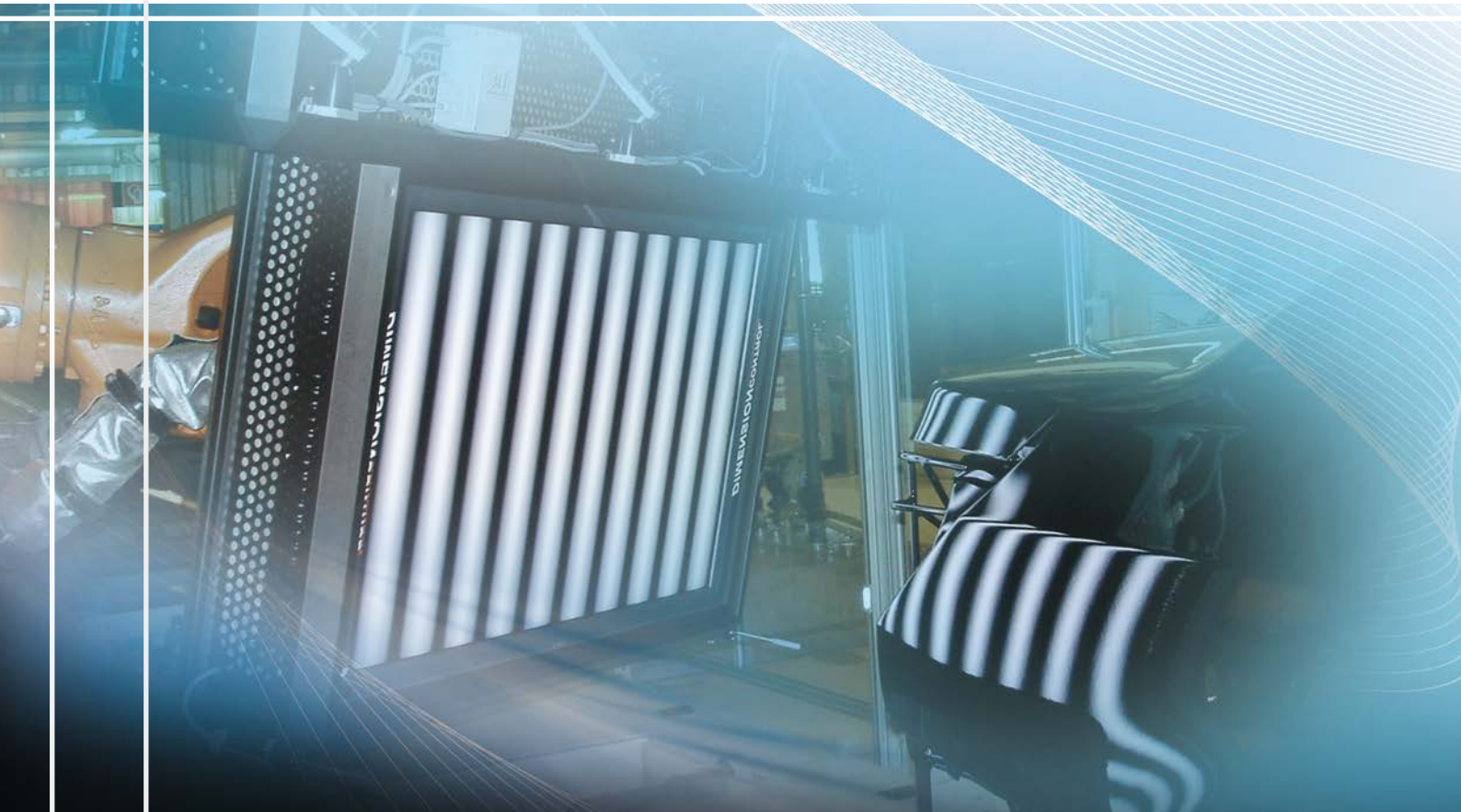**MICRO-EPSILON**

More Precision

reflectCONTROL PSS 8005.D // Automated surface inspection

- *100% inspection and defect marking in cycle time*

- *Color-independent 3D measurements*

- *Individual paint defect classification fulfills the requirements of the world's leading automotive groups*

- *Robot-based measurement technology*

- *Reliable system design and storage of statistical data*

- *Full integration into existing process lines*

reflectCONTROL PSS 8005.D

reflectCONTROL PSS 8005.D is a system for robot-based surface inspection tailored to the requirements of the automotive industry. It is used in paint shops for the overall inspection of the entire car body and ensures reliable paint defect recognition according to the specifications of leading automotive groups. Based on fully automatic defect marking, this cutting-edge system for paint defect inspection stands out due to comprehensive defect statistics of parts and zones. The PSS 8005.D inline measuring system is available in various configurations and can therefore be adapted to different customer cycle times.

PSS 8005.D - Structure

Paint defect inspection (PDI)   Paint defect marking (PDM)

RC3M: 3 inspection robots, 2 marking robots (stop & go)

RC4M: 4 inspection robots, 2 marking robots (line tracking)

RC6M: 6 inspection robots, 2 marking robots (line tracking)

Application areas
Automotive
- Primer (all shades)
- Base coat (all colors)
- Clear coat
- KTL (E-coat)

Aviation
- Surface coating materials
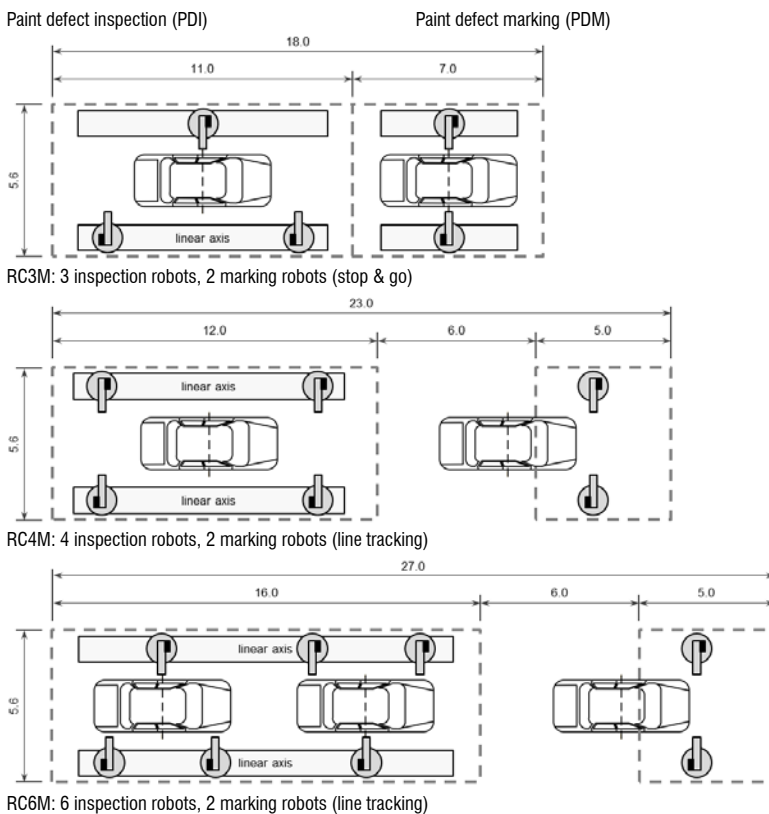
Material parameters
Gloss > 60 GU (at 60°)

Ambient conditions
Illuminance < 150 Lux

**Highlighted paint defects**
Automated defect detection for all colors. Optimized signal processing algorithms for paint defect detection.

reflectCONTROL PSS 8005.D

reflectCONTROL ensures advanced defect detection on shiny surfaces such as paint, metals, glass and many more. The phase-shifting deflectometry principle enables objective inspection processes regardless of human factors such as tiredness or lack of concentration. Smart image processing algorithms convert the measured data into three different channels: local curvature, reflectivity and base intensity.

By evaluating these channels, the automatic defect recognition detects anomalies in shape, reflectivity and contrast. Subsequently, the defects are reconstructed in 3D.

Defect detection rate

- Human auditor
- reflectCONTROL PSS 8005.D
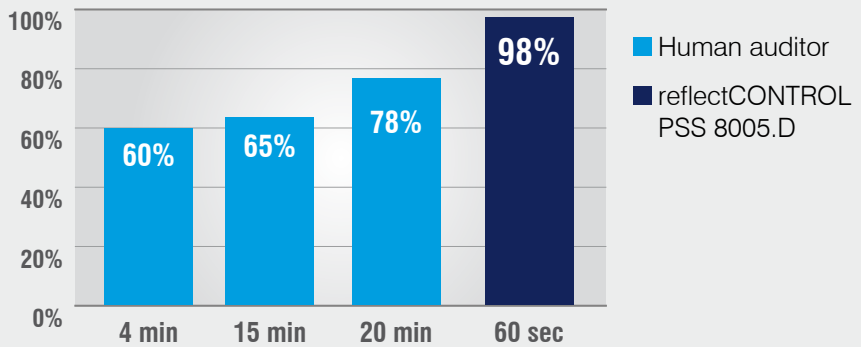
Automated surface inspection

The reflectCONTROL PSS 8005.D inspection system for painted surfaces and defect marking recognizes almost 100% of all relevant defects. It is suitable for any paint color and adapted to the requirements of 24/7 operation.

Automated inspection vs. human inspection

To date, visual surface inspections and quality control processes have been carried out by auditors. However, only 65% of all defects can be detected by visual, human inspection processes. The more time invested, the higher the detection rate. Even under offline conditions, not more than 78% of all defects can be found.

reflectCONTROL PSS 8005.D - Performance

	RC2M	RC3M	RC4M	RC6M	RC8M
Net inspection time (sec.)	110	73.3	55	36.7	27.5
Cycle time (sec.)	128	91.3	73	54.7	45.5
Units* per hour	28	40	50	66	79

*Car bodies, visible surfaces

reflectCONTROL - Defect classification

Primary zone

Category 0	(no defect)	<0.3mm
Category 1	(small)	0.3mm – 1.0mm
Category 2	(medium)	1.0mm – 2.0mm
Category 3	(large)	>2.0mm

Paint defects

Most paint defects are inclusions in the base and clear coat. The reflectCONTROL surface inspection system detects any defect that causes anomalies in shape, reflectivity or contrast.

Defect classification

All defects are classified according to size and OEM standards. Depending on the customer's demands, this evaluation takes into account car body parts and zones. The defect classification may vary depending on the respective zone. In the spot repair area, special marking stations highlight the relevant defects. The reflectCONTROL system also detects hair, dirt, craters, drops, polishing defects, runs, fat edges, contact points and many more.
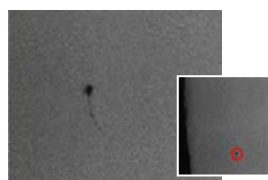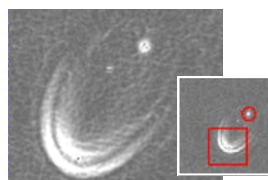
Typical paint defects detected by reflectCONTROL
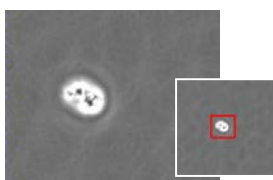
Inclusion
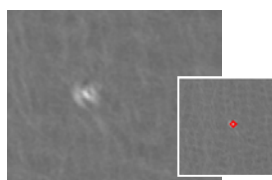
Inclusion in the base coat

Hair
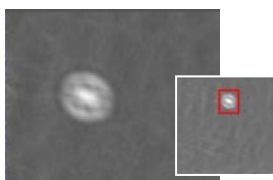
Contaminations

Craters

Drops

Micro-Epsilon (Germany)

ATENSOR (Austria)

ME Inspection (Slovakia)

Micro-Epsilon measuring systems are specialists within the company group on metrological system solutions. Measurement technology, software and mechanics are decisive components that are developed and produced at three different locations. All core competences and the related knowledge are reflected in innovative, reliable products arising from a company alliance.

ATENSOR Engineering and Technology systems GmbH based in Steyr, Austria, forms the competence center for robotics and robot-supported measurement technology. Integrated system solutions for automation and quality assurance are used in industrial environments.

ATENSOR LS1, a system for the automatic measurement and machining of complex parts carried out by robots, is one of the most innovative developments.

ATENSOR is part of the Micro-Epsilon system group.

ME-Inspection SK s.r.o. is a part of the Micro-Epsilon system group based in Bratislava – Slovakia. The company is specialized in measurement of geometric values and visual control in the rubber and automotive industry. The system group of Micro-Epsilon was ranked in the top positions worldwide among the suppliers in the area of measurement and visual control regarding quality and product range for the rubber industry.