



More Precision

reflect**CONTROL** PSS 8005.D // Automated Surface Inspection



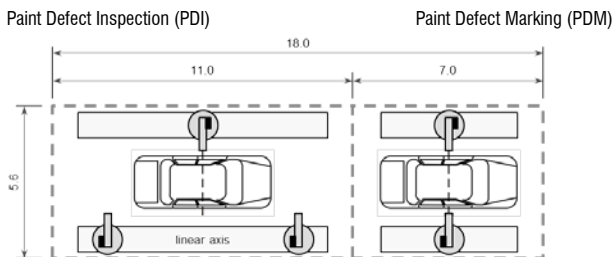


- 100% inspection and defect marking in tact time
- Color independent 3D measurement
- Paint defect categorization according to OEM standards
- Robot-based measurement technology
- Reliable system architecture and statistical data repository
- Full line integration

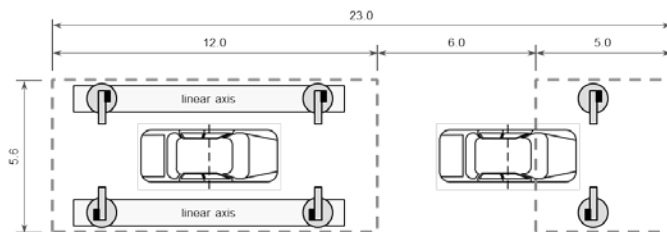
reflectCONTROL PSS 8005.D

reflectCONTROL PSS 8005.D is a robot-based surface inspection system for automotive and other industries. Located in a plant's paint shop after the dryer the system inspects the whole surface of a car body for paint defects according to OEM standards. Defect statistics on parts and zones and operator-free marking of all relevant defects are part of delivery. The in-line measurement system PSS 8005.D supports several configurations to meet a wide range of tact time requirements.

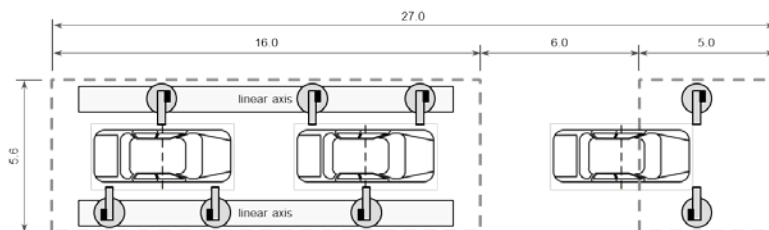
PSS 8005.D Typical Configuration Layouts



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

Aerospace

- Surface coating material

Material parameters

Gloss > 60 GU (at 60°)

Environmental conditions

Illuminance < 150 Lux



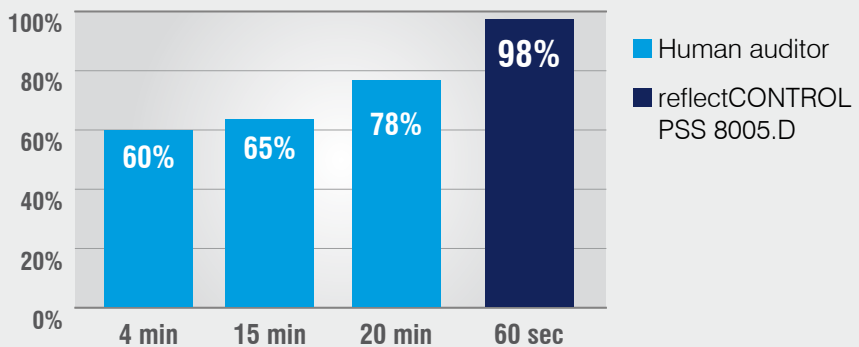
Highlighted paint defects

Automatic defect recognition takes place on all colors. Sophisticated signal processing algorithms are optimized for paint defects.

reflectCONTROL PSS 8005.D

reflectCONTROL provides high level defect recognition on glossy surfaces surfaces like paint, metal, glass, and others. This process is performed without fatigue and objectively by using the measurement principle phase shifting deflectometry. Sophisticated image processing algorithms, optimized for paint defects, convert measurement data into three different channels: local curvature, reflectivity and base intensity. By evaluating these channels the automatic defect recognition detects anomalies in shape, reflectivity, contrast and allows to reconstruct defects in full 3D.

Detection rate over all relevant defects



Automatic surface inspection

The reflectCONTROL PSS 8005.D paint surface inspection and marking system delivers detection rates of 98% and higher. The system delivers reliable results in 24/7 mode and supports all colors.

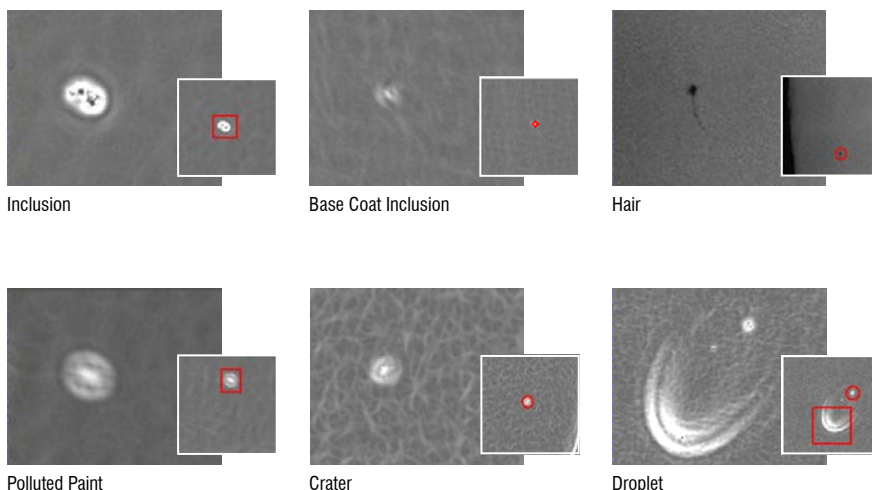
Human surface inspection

Most surface inspection and quality checks are performed visually by auditors. Depending on the amount of time given, human results may vary and reach a 65% detection rate. More time usually leads to better results, however benchmark tests showed detection rates of 78% maximum under offline conditions.

reflectCONTROL PSS 8005.D system performance	reflectCONTROL PSS 8005.D system performance				reflectCONTROL defect classification		
	RC2M	RC3M	RC4M	RC6M	Primary zone		
Net inspection time (sec)	146	98	74	51	Category 0	(no defect)	< 0.3 mm
Transport time (sec)	16	16	16	16	Category 1	(small)	0.3 mm – 1.0 mm
Cycle time (sec)	162	114	90	67	Category 2	(medium)	1.0 mm – 2.0 mm
Units* per hour	22	32	40	54	Category 3	(large)	> 2.0 mm

* Car bodies, visible surfaces

Typical paint defects identified by reflectCONTROL



Paint defects

Most common paint defects are inclusions in base and clear coat. However, any defect causing anomalies in shape, reflectivity or contrast is detected.

Defect Classification

All defects are classified in size according to OEM standards, the evaluation takes place on parts and zones in accordance with the manufacturer's specifications. The categorization of defects may vary from zone to zone. All relevant defects are marked by marking units at the spot repair area. Other types of defects found by reflectCONTROL PSS 8005.D are hair, polluted paint, crater, droplet, polishing defect, dirt, planning mark, runner, fat edge, contact and many more.



Micro-Epsilon (Germany)

Micro-Epsilon Systems technology is specialised on system solutions within the group of companies.

The required components such as measurement technology, software and mechanics are developed and produced on three locations. All core capabilities and the corresponding know-how come from one group of companies – and this is mirrored in the innovative and reliable products of Micro-Epsilon.



ATENSOR (Austria)

ATENSOR Engineering and Technology systems GmbH based in Steyr, Austria, forms the competence centre 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 (Slovakia)

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