

More Precision.



Measuring Technology
for automotive
engineering,
test benches
and development



About us

Micro-Epsilon is a medium-sized, family-run company and one of the leaders in measurement technology. We have been producing top products for over 40 years and we provide our clients with first-class solutions for precision in measurements and control. Our portfolio includes sensors for distance and displacement measurements, IR temperature measurement systems, colour recognition systems as well as dimensional measurement and defect recognition systems.

Sensors for automotive engineering

Modern automotive engineering wouldn't be the same without sensors and measuring technology. The high level of automation in production requires precise sensors, and when new parts are developed they undergo comprehensive testing before being released for use. The Micro-Epsilon measuring technology portfolio provides innovative solutions for development, production and quality assurance.

Partnerships with customers

Above-average development efforts, extensive know-how and a wide cooperation network help us to create innovative high-precision sensor products. Such achievements would not be possible without partnerships, which is why we see our customers as business partners with whom we want to achieve win-win solutions.

Turbocharger speed

Task: Measuring turbocharger blade speed in tests

Solution: Eddy current sensor measures on the face of the blades

Sensor: Turbocharger sensor turboSPEED



Special feature:
Reliably measures rotations
between 500 and 400,000 rpm



Special feature:
Service life forecast for new engines

Measuring cylinder warpage

Task: Cylinder reaction under heavy load
Solution: Integrating sensors into the cylinder wall
Sensor: Eddy current sensors eddyNCDT

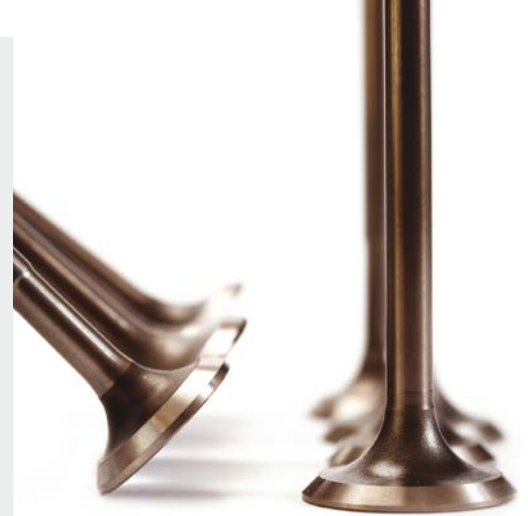


Valve lift movements

Task: Variable valve control within the engine

Solution: Position measurements for inlet and outlet valves

Sensor: Inductive sensor induSENSOR VIP



Special feature:
Non-contact measurements
without magnets



Cylinder head breathing

Task: Service life data for the cylinder head

Solution: Measuring cylinder head breathing in operation

Sensor: Eddy current sensors eddyNCDT

Special feature:

Miniature sensors are integrated in the engine

Piston ring movements

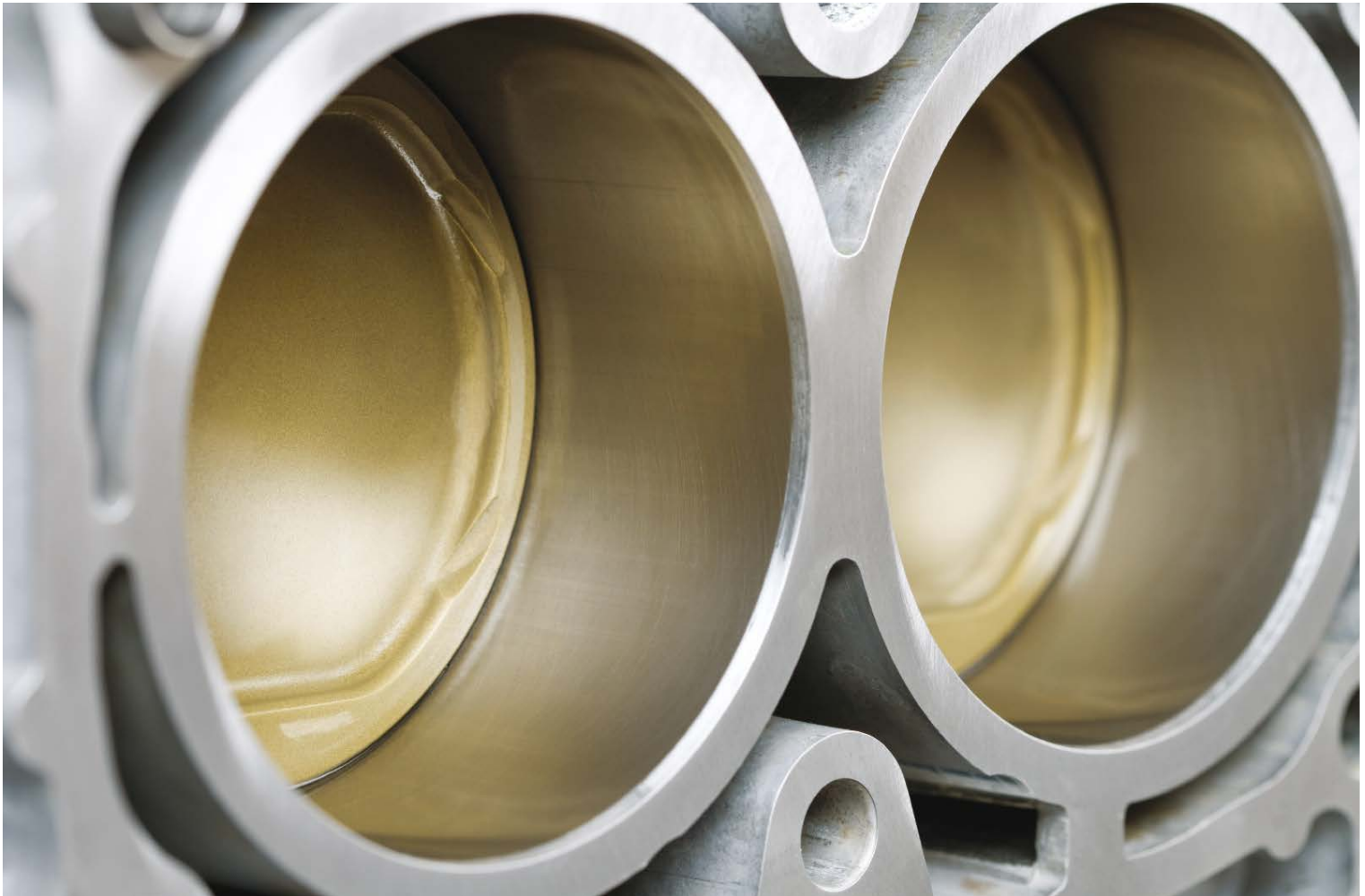
Task: Prognosis about piston ring wear and tear

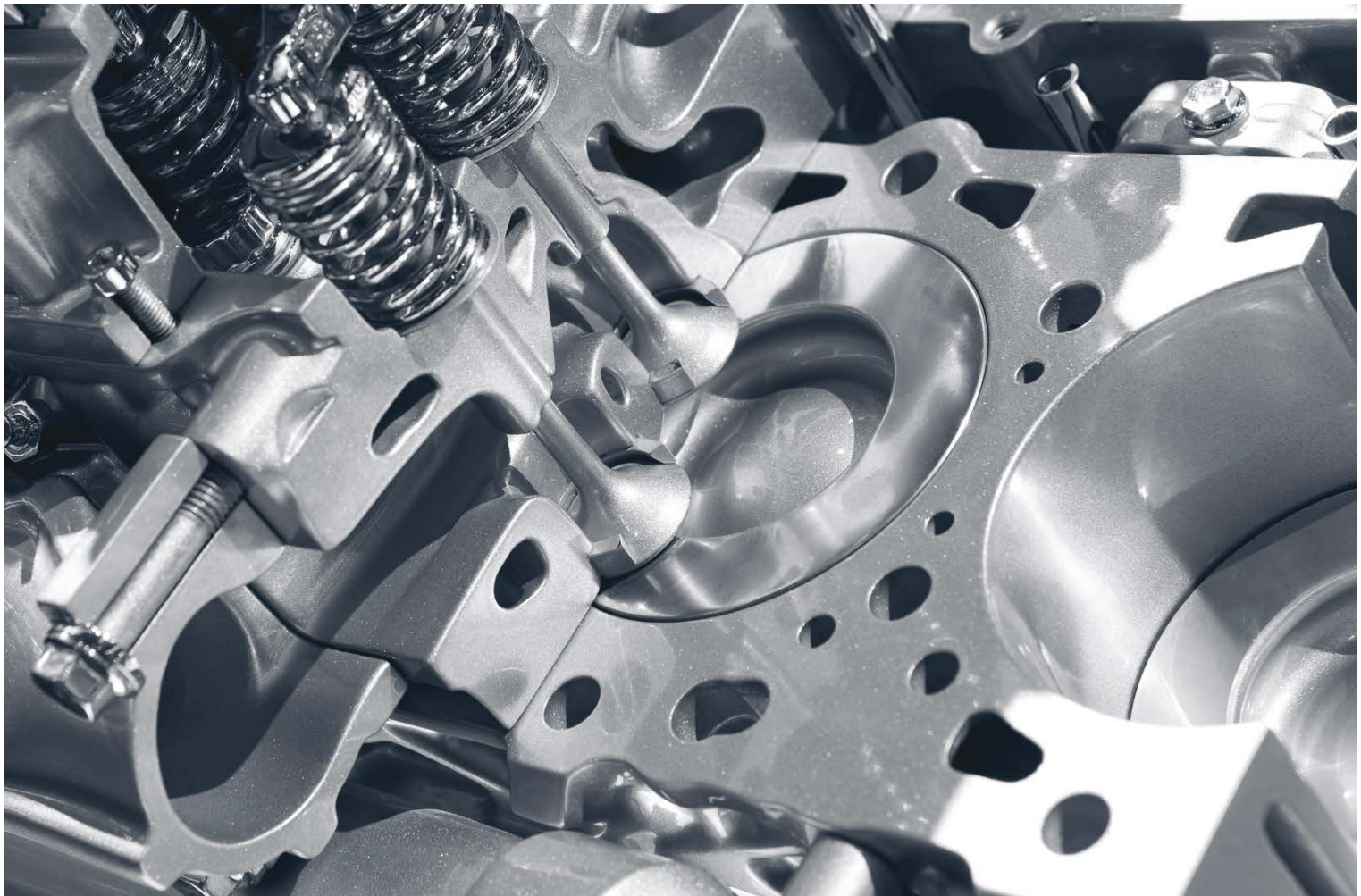
Solution: Measuring ring movements

Sensor: Eddy current sensor eddyNCDT

Special feature:

Miniature sensors that are integrated in the piston perform measurements in ignited operation





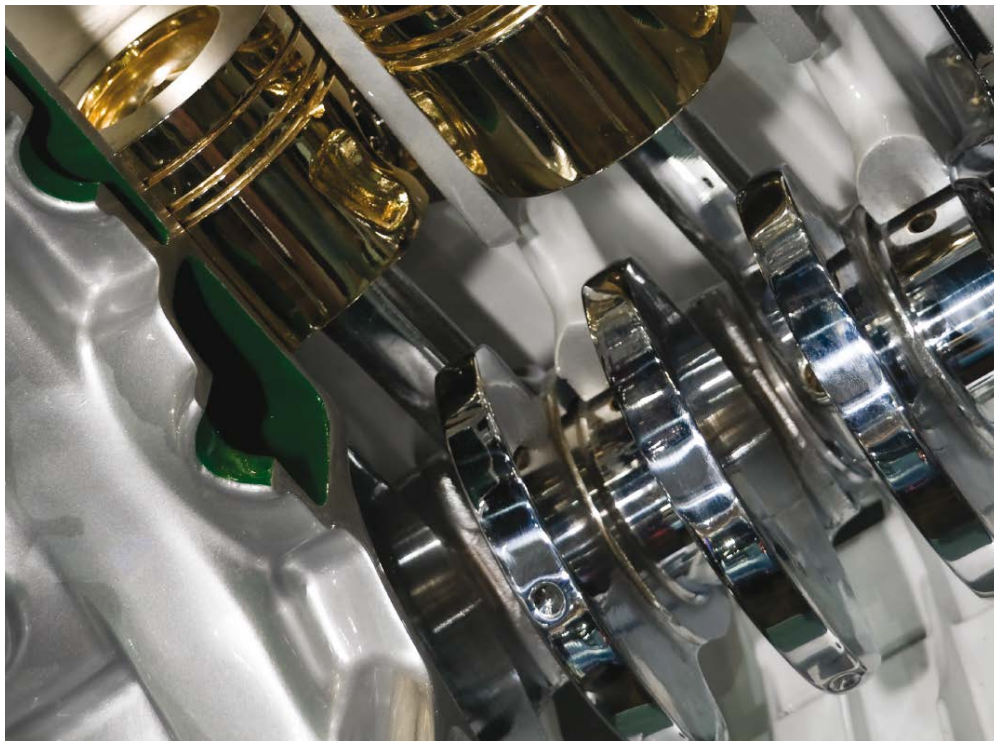
Special feature:
Sensors are integrated
in the cylinder wall

Lubrication gap

Task: Continuous piston lubrication
Solution: Measuring the gaps between pistons and
cylinder walls
Sensor: Eddy current sensor eddyNCDT

Crankshaft bearing gap

Task: Service life of the crankshaft bearing
Solution: Measuring the bearing gap in operation
Sensor: Eddy current sensor eddyNCDT



Special feature:
Service life forecast based
on gap measurements

Vehicle spring deflection

Task: Recording spring movements in operation

Solution: A displacement sensor is integrated to measure spring movements

Sensor: Draw wire sensor wireSENSOR



Special feature:
Draw wire sensors can
be attached easily to the
spring strut

Brake disc test bench

Task: Testing brake disc deformation, DTV
Solution: Geometry measurements of brake discs
Sensor: Laser sensor optoNCDT BL or capaNCDT

Special feature:
Brake disc temperature is
measured simultaneously
using a thermoMETER CT
infrared temperature sensor





Exhaust system vibrations

Task: Checking fastenings and propensity to vibrate

Solution: Manifold distance measurements using blue laser

Sensor: Laser sensor optoNCDT BL

Special feature:

Self-fluorescence of the glowing manifold does not affect the sensor

Vibration measurements for engine components

Task: Detecting engine vibrations during start/stop operations

Solution: Measuring the vibrations of individual components

Sensor: Laser sensor optoNCDT



Special feature:
Non-contact measurements
from a safe distance



Vibration testing in road tests

Task: Determining the tilt behaviour of a vehicle

Solution: Measuring the distances between vehicle and road surface

Sensor: Laser sensor optoNCDT

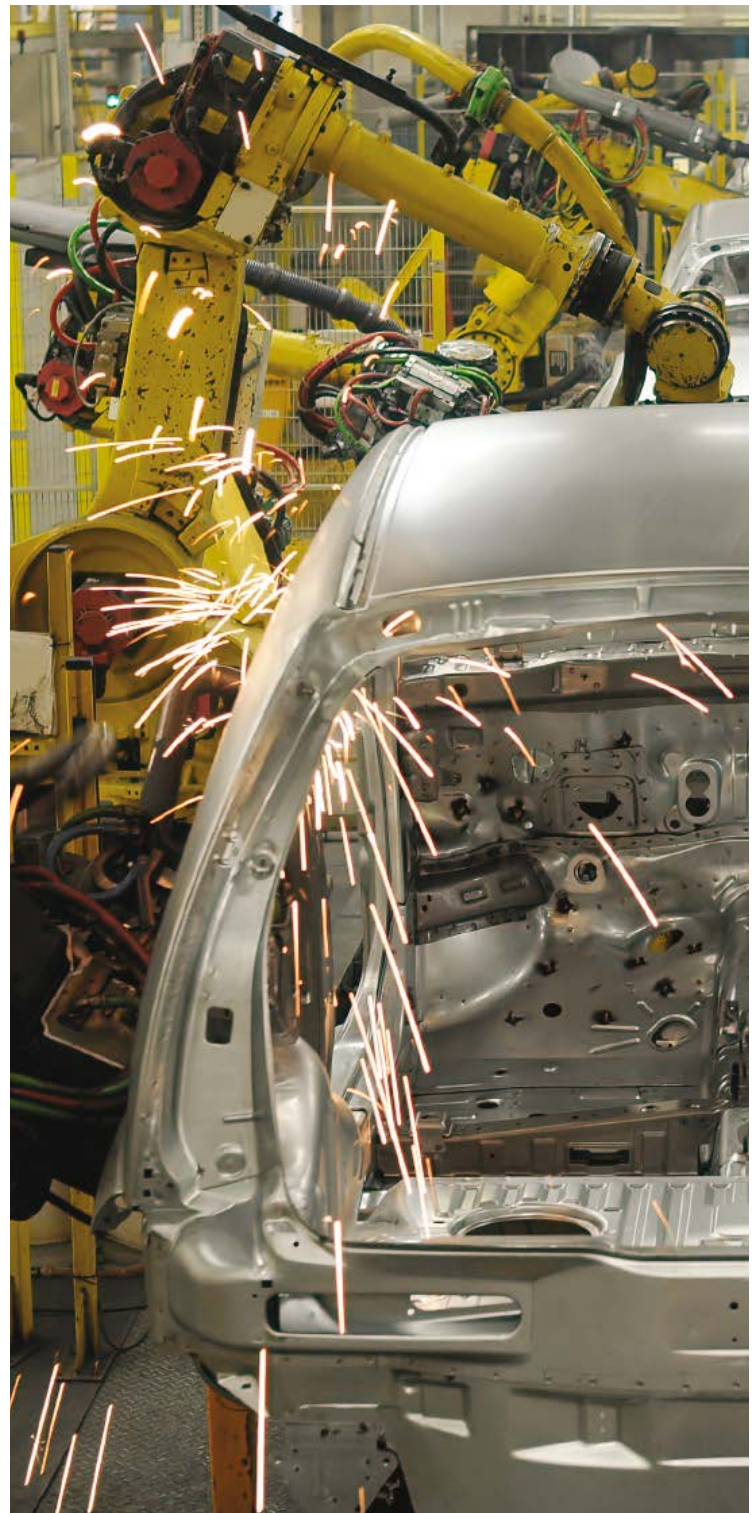
Special feature:
Special production processes
make the VT models
particularly resistant to
vibrations



Monitoring the welding temperature

Task: Ensuring optimum welding joints
Solution: Checking the temperature during welding
Sensor: Temperature sensor thermoMETER CT

Special feature:
Allows very stable and gentle
welding processes





Special feature:
Helps to avoid damage
due to incorrectly inserted
bearings

Inserting bearing shells

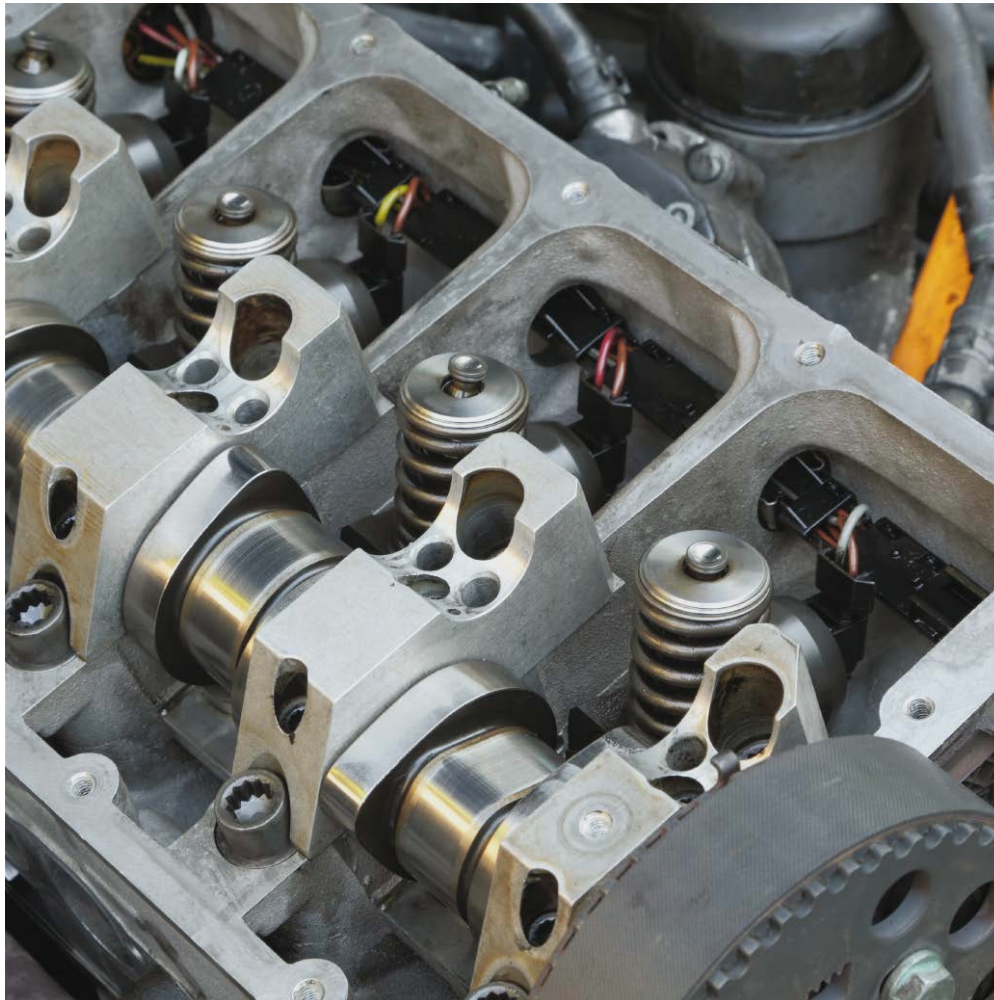
Task: Checking if bearing shells were inserted properly
Solution: Measuring the reduced diameter for the crankshaft bearing
Sensor: Optical micrometer optoCONTROL ODC

Detecting cam positioning

Task: Correct grip operation of the assembly robot

Solution: Checking cam edges

Sensor: Laser scanner scanCONTROL



Special feature:
The scanner data may be used
to control the robot



Special feature:
Laser triangulations
sensors are used to
perform measurements on the
sheet edge between matrices

Sheet feeding in presses

Task: During processing sheets are fed into the press

Solution: Measuring the warpage during processing

Sensor: Laser sensor optoNCDT

Position acquisition for the body shell

Task: Positioning the body shell in the production line

Solution: Non-contact distance measurements

Sensor: Laser sensor optoNCDT

Special feature:
In addition to the body shell, the
tailgate or bonnet positions are
also measured



Tyre production

Task: Check tyres for bumps and dents

Solution: Checking the surface profile from the sides

Sensor: Laser scanner scanCONTROL



Special feature:

In addition to detecting dents, laser scanners can also read the DOT code

CFRP parts thickness

Task: Gap measurements for
CFRP molds

Solution: Gap measurements using
eddy current sensors

Sensor: Eddy current sensor
eddyNCDT

Special feature:
Increased safety for more
complex CFRP parts



Gap measurements on body shell parts

Task: Even gaps between doors or windows etc. and body shell

Solution: Measuring gaps during installation

Sensor: Laser scanner gapCONTROL



Special feature:
Simultaneous gap measurements can be carried out for glass and painted body shell using gapCONTROL

Surfaces of attachments

Task: Checking the paint of attachments

Solution: Checking the surface before installation

Sensor: Inspection system reflectCONTROL



Special feature:
Test station can be fed
automatically or manually



Body shell paint check

Task: Quality checks to ensure flawless paint

Solution: Visual final inspection after the painting line

Sensor: Inspection system reflectCONTROL



Special feature:
Reliably detects paint defects
in the micrometre range

Detecting surface defects

Task: Evaluate smallest marks in the cockpit objectively

Solution: 3D surface inspection using a structured light sensor

Sensor: Inspection system surfaceCONTROL



Special feature:

The system works with high precision even for textured surfaces

Colour control for front spoilers

Task: Ensuring that body and spoiler paints match

Solution: Checking the spoiler colour prior to assembly

Sensor: Colour sensors colorSENSOR



Special feature:
High-precision sensors
detect even the smallest
colour differences

Function test for heating elements

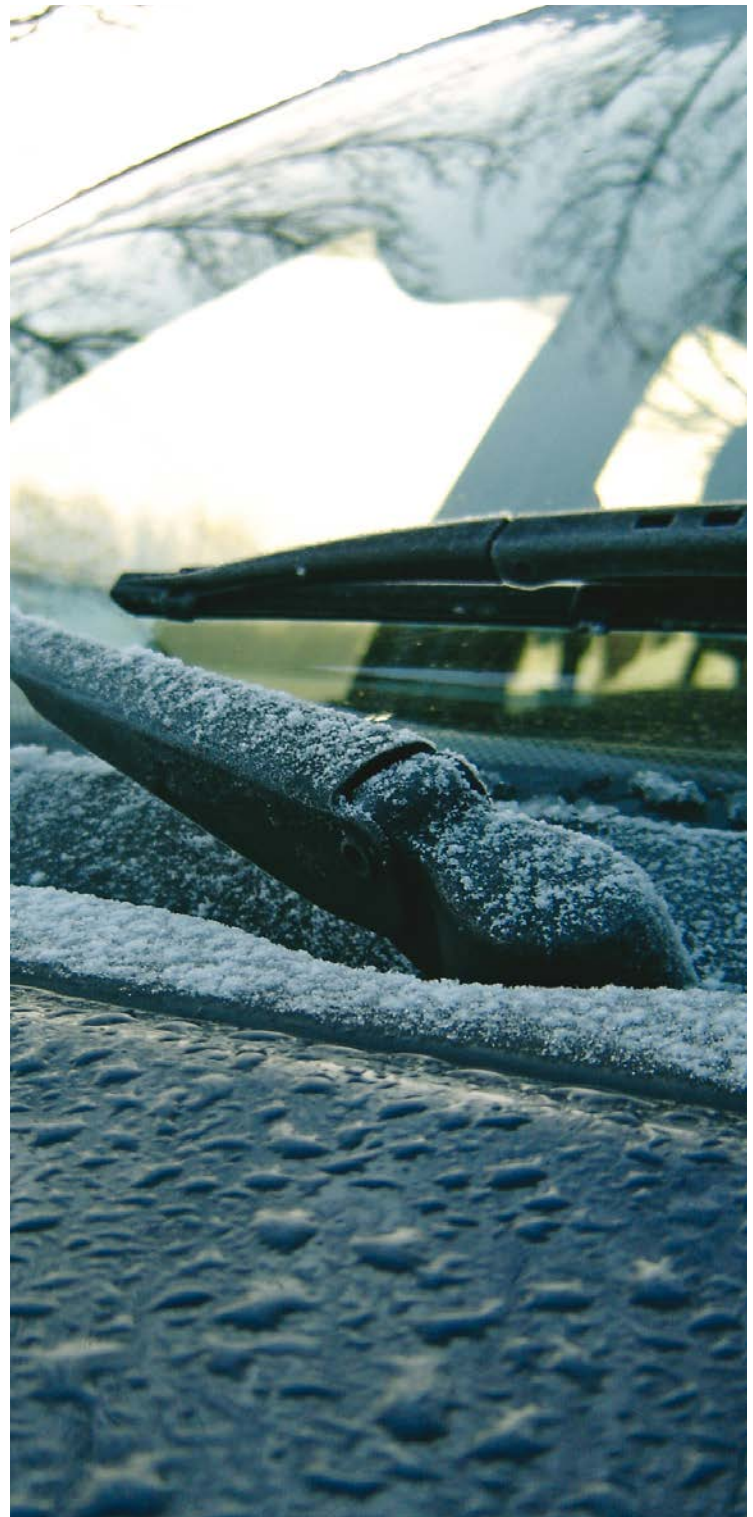
Task: Checking windscreen ventilation

Solution: Measuring the temperature distribution on the windscreen

Sensor: Thermal imaging camera
thermoIMAGER TIM

Special feature:

Seat heating and rear window heating are also checked using thermography





Special feature:
Non-contact colour measurements detecting even slightest differences

Colour recognition for roof strips

Task: Ensuring visual continuity for roof strips

Solution: Incoming goods colour inspection

Sensor: Colour measuring system
colorCONTROL ACS

Gap measurements for the interior

Task: Ensuring a high build quality

Solution: Precise gap dimensions for interior parts

Sensor: Gap sensor gapCONTROL

Special feature:

Non-contact, automatic gap
measurements during
assembly





Monitoring glue beads

- Task: Applying hot glue beads continuously in the interior
- Solution: Monitoring the temperature using thermography
- Sensor: Thermal imaging camera thermoIMAGER

Special feature:
Inspection can be carried
out at a large distance



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