



Measurement of sprayed skin thickness

Sprayed skins for vehicle instruments and controls and for airbag cladding are sprayed in a heated mold using a robot-guided nozzle. Here, tight tolerances are required, particularly with the airbag as a safety-critical part. For this reason the thickness of the sprayed skin must be inspected during the spraying process. To achieve this, the combination sensors are attached directly to the robot arm. An EU15(05) eddy current sensor in combination with an optoNCDT laser-based optical triangulation sensor is used. The eddy current sensor measures the distance to the nickel-coated spray mould and has an opening in the centre through which the optoNCDT laser sensor measures the distance to the sprayed part. When subtracted, both signals provide the thickness of the applied sprayed skin.

Requirements for the measurement system

- Measuring range: 1.3mm
- Minimal reference distance: 10mm
- Accuracy: 50 μ m
- Resolution ILD 1800-20: 16 μ m
- Resolution EU15(05): 0.75 μ m

Ambient conditions

- Tool material temperature: 65°C
- Target material (eddy current): nickel-plated steel bath
- Target material (laser): PU, shiny black
- Thickness sprayed skin: 0.7 - 1.3mm
- Spray mold: 2mm nickel layer on steel

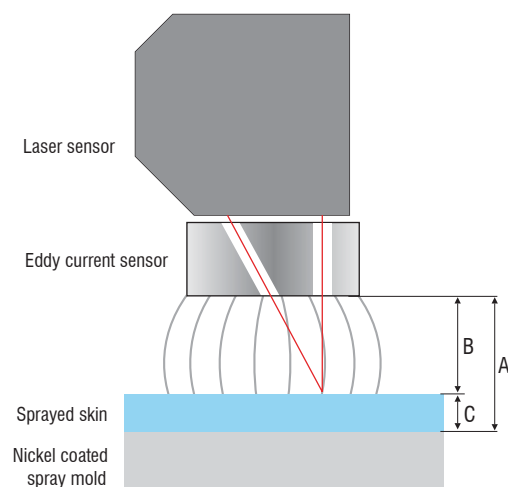
System design eddyNCDT/optoNCDT

- DT3300 multi function controller
- EA3025-EU15(05)M-EC3 adaption board
- EU15(05) eddy current sensor with through hole for laser triangulation sensor

- EC3 sensor cable
- SCA3/5 signal cable for analog output
- PS300/12/5 power supply
- ILD1800-20 laser triangulation sensor
- PC1800-3 supply and output cable

Reasons for choosing the system

- Non-contact measurement
- High precision against shiny black PU surface
- Easy, precise sensor mounting
- No axis displacement, because the laser triangulation sensor measures through the eddy current sensor.



Principle: The eddy currents go "through" the sprayed skin to the nickel coated spray mold. The laser sensor supplies the reference distance to the skin surface. The processed signals are computed with each other to result in the exact thickness signal ($A - B = C$).