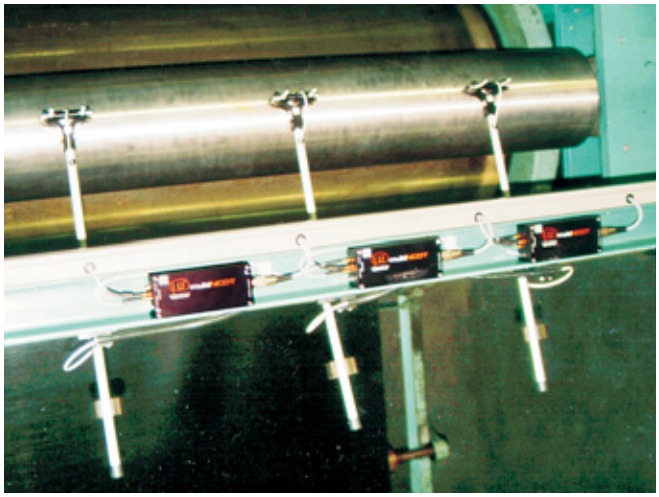
MICRO-EPSILON

Thickness measurement of rubber film

Close thickness tolerances are specified for the manufacture of rubber film which is rolled using calender rollers. Random-sample manual measurements, as previously carried out, are no longer sufficient for today's demands on quality assurance. Consequently, a system with three fixed tracks has been adapted for in-line inspection of the thickness. For each track an eddy current sensor of Type U6 is built into a jockey follower system which measures against an stainless steel roller. Controllers of the range multiNCDT series 100 are employed for the evaluation electronics. The stainless steel roller represents the reference system for the measurement. When the jockey follower is located on the roller, the measurement system supplies a thickness of 0 mm. When the jockey roller is located on the rubber material, then the eddy current sensor moves away from the calender roller and the distance of the sensor to the roller corresponds to the thickness of the material.



System structure, sensors

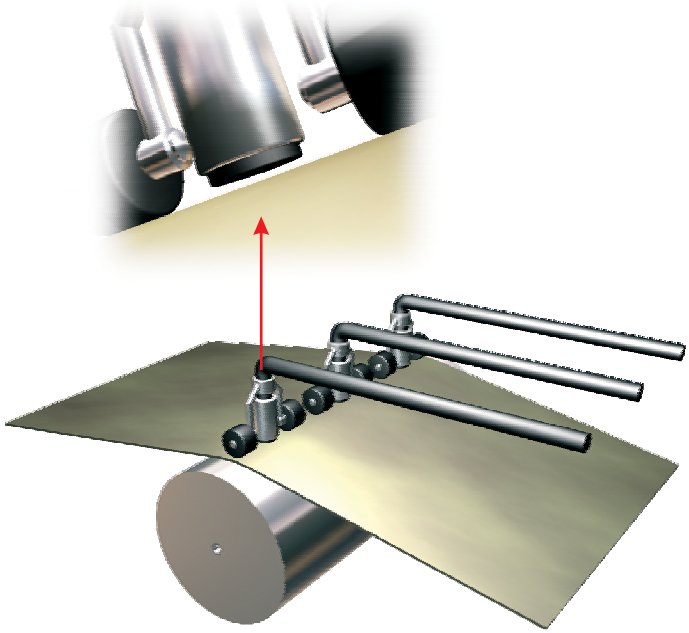
- 3 pcs. U6 Eddy-current sensors
- 3 pcs. DT 11 (Single-channel electronics)
- 1 pc. incremental encoder for length measurement

System structure, software

- The application is produced with the graphical development environment ICONNECT
- 3 concurrent signal graphs

System structure, mechanical

- 3 Sequential systems with pretensioned ball-bearings (eccentricity 2 µm)
- 3 Guide arms, adjustable for track and load pressure
- Stainless steel roll as reference system (diameter 250 mm)



Application

Requirements on the measurement system

Software:

Routine measurement:

- Measurement data acquisition and visual display (see Fig. 1)
- Trend display for the individual tracks- Computation of the measurement quantity
- Archiving the measurement data
- Creating a measurement log

Parameter / order data base:

- Linking to a data base via SQL interface
- Order management with archiving of the measurement data and statistics package (see Fig. 2)
- Parameter data base with tolerances and production data

Sensors:

- Measuring range 6 mm
- Precision ± 5 µm
- Reapeatability (stat) 0.2 µm
- Sensors for harsh environment

Fig. 1 Visualization transverse profiles

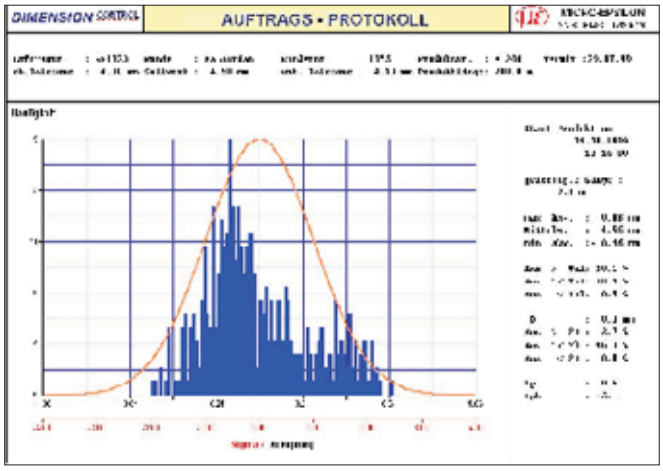


Fig. 2 Statisical analysis

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