A090

Combination sensor
combiSENSOR

Non-contact, inline measurement of film thickness

In film production, inline process monitoring assures constant product quality. KSH combination sensor measures the film layer thickness in a non-contact and thus wear-free process.

The measurement of film coatings (e.g. adhesive layer on self-adhesive film) is based on the capacitive principle. A non-contact, capacitive displacement sensor is positioned at a fixed distance from a metal surface (e.g. transport roller). The film passes through the measuring gap and, as a dielectric, changes the capacity of the sensor. With constant film thickness, the output signal only depends on the layer thickness.

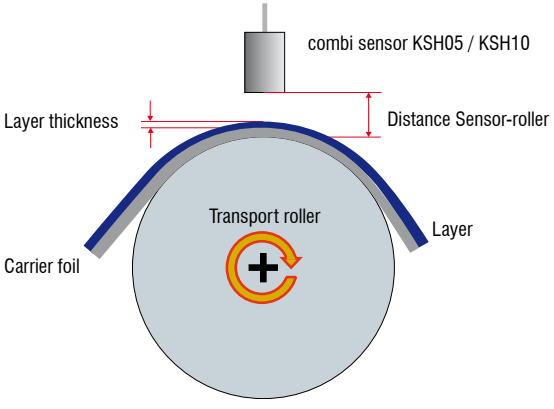
In addition to the capacitive displacement sensor, an eddy current displacement sensor is also integrated into the sensor housing and arranged in the same measuring axis. Measuring coil and measuring electrodes are of concentric design, i.e. they both measure against the same target surface. The eddy current displacement sensor measures the distance from the transport roller and thus compensates for mechanical changes of the system (e.g. thermal expansion, vibration).The signals of both measuring principles are combined arithmetically. This combination sensor principle assures that the measured thickness value is not influenced by possible distance changes.

If a cross-profile is necessary during production, this requires a sturdy mechanical construction with a traversing facility. The combination sensor assures that inaccuracies in the mechanical construction (e.g. bending, eccentricity) are compensated for in the measurement. This allows accuracies of 1μm in the layer thickness.

Advantages
- Non-contact, wear-free measurement process
- Precise, non-destructive test
- Compensation of thermal expansion, eccentricity uncerainty
- Cross profile by way of traversing
- Adjustable tolerance limits
- Scalable display

Requirements for the measurement system
- Measuring range: 5 / 10mm
- Linearity: ±0.02%
- Thermal stability: ±0.02%/°C

Ambient conditions
- Operating temperature: 50-95°C
- Medium: air
- Target: electrical conductor
- Constant dielectric figures of carrier film and layer



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