

## EddyCus® inline HF – High Frequency Monitoring

P\_inlineHF\_22



### Highlights

- ▶ Contact-free and realtime
- ▶ High repeatability and stability
- ▶ Large gap / distance to substrate
- ▶ High sampling rates with hardware trigger for monitoring of fast processes
- ▶ Complex impedance analysis for separation of electric, dielectric and magnetic properties

### Applications

- ▶ Composition assessment of electric, dielectric, magnetic properties
- ▶ Printing
- ▶ Impregnation
- ▶ Drying
- ▶ Curing
- ▶ Chemical reaction monitoring
- ▶ Mixing
- ▶ Sorting
- ▶ Defect analysis (anomalies, hot spots)

### Sensor Series

- ▶ Wet thickness ( $\mu\text{m}$ ) / weight ( $\text{g}/\text{m}^2$ )
- ▶ Drying status (%)
- ▶ Permittivity (F/m) *Beta*
- ▶ Conductivity / resistivity (mOhm cm)
- ▶ Permeability (H/m) *Beta*
- ▶ Sheet resistance (Ohm/sq)
- ▶ Electrical anisotropy (%)
- ▶ Metal thickness (nm,  $\mu\text{m}$ )

### Materials

- ▶ Wet thin films and surfaces
- ▶ Wet components and structures
- ▶ Liquids, slurries, inks, resins, dispersions, chemicals
- ▶ Powders and particle films (cosmetics and medicines)
- ▶ Bulk materials (plastics, ceramics)
- ▶ Composites (prepregs, impregnated fibers and tapes, CFRP)
- ▶ Compounds (casting compounds)

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Engineered and Made in Germany



## Working Principle

- ▶ EddyCus® sensors generate electromagnetic fields (EMFs)
- ▶ EMFs change when material with electric, dielectric and /or (ferro)magnetic properties is present
- ▶ The evaluation of the resulting change in the EMF provide information on
  - ▶ Conductivity (e.g. metals, semiconductors, graphite)
  - ▶ Permeability (e.g. Co, Ni, Fe)
  - ▶ Permittivity (e.g. water, solvent, polymers, chemicals)
  - ▶ Complex impedance analysis is used to separate properties

## Device Characteristics

Measurement technology	Non-contact high frequency eddy current sensor
Substrates	Foils, glass, pipes, various containers and transport items
Max. sample thickness/ sensor gap	Transmission setup: 3 – 50 mm (defined by the thickest sample) Reflection setups: infitive (only surface area is analyzed)
Number of sensor pairs / monitoring lanes	1 – 99
Sensor sizes (W x L x H) in mm	Sensor M: 80 x 100 x 66    Sensor S: 34 x 48 x 117
Measurement types	Wet thickness (µm) / weight (g/m <sup>2</sup> ) / drying status (%) / conductivity (MS/m) / resistivity (mOhm cm) / permeability (H/m) <i>Beta</i> / permittivity (F/m) <i>Beta</i>
Measurement range / accuracy	Depends on the measurement task and the material composition and test object volume. Please consult with the SURAGUS team
Further available measurements	Sheet resistance, metal thickness, anisotropy, optical transparency, reflection, haze
Environment	Ex-vacuo / in-vacuo / ATEX on request / T < 60°C (higher upon request)
Sample rate	1 / 10 / 50 / 100 / 1,000 measurements per second
Hardware trigger	5 / 12 / 24 V
Interfaces	UDP, .Net libraries, TCP, Modbus, analog/digital

## Device Control and Software

- ▶ Several views and user levels
- ▶ Live view with upper and lower limits and alarm functions
- ▶ Analysis view providing statistics
- ▶ Can handle data of several thousands measurements per second
- ▶ Data storage into SQL database
- ▶ Customizable automatic data export (csv, txt, xls,...)
- ▶ Several smart functions (automated DB cleaning, self-reference etc.)
- ▶ Parameterizable I/O modules (triggering of actions or alarms)

