

## EddyCus® TF inline HF – High Frequency Monitoring

P\_T\_inlineHF\_20



### 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 ( $\text{mOhm}\cdot\text{cm}$ )
- ▶ Permeability (H/m) *Beta*
- ▶ Sheet resistance ( $\text{Ohm}/\text{sq}$ )
- ▶ 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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Made and Engineered in Germany 



## Working Principle

- ▶ EddyCus sensors generate electromagnetic fields (EMFs) consisting of electric and magnetic fields
- ▶ EMFs change when material with electric, dielect and /or (ferro)magnetic properties is present
- ▶ The evaluation of the resulting change in the EMF provide information on (amount / volume and its properties)
  - ▶ 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.

## Data Sheet

|   |  |
|---|--|
| Measurement technology                    | Non-contact high frequency eddy current sensor   |
| Substrates                                | Foils, glass, pipes, various containers and transport items  |
| Max. sample thickness/ sensor gap         | Transmittance setup: 1 – 50 mm (defined by the thickest sample)<br>Reflectance 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 / 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 on 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)

