

## EddyCus® lab 2020HF – High Frequency Thin Film Tester

P\_T\_2020HF\_23



### Highlights

- ▶ Contact-free and realtime
- ▶ Accurate single-point measurement
- ▶ Manual mapping guided by easy-to-handle software
- ▶ Measurement of encapsulated layers
- ▶ 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)

### Device 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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## 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, various containers
Substrate area	8 inch / 204 mm x 204 mm (open on three sides)
Max. sample thickness/ sensor gap	Transmission setup: 3 – 50 mm (defined by the thickest sample) Reflection setups: infinite (only surface area is analyzed)
Measurement types	Wet thickness ( $\mu\text{m}$ ) / weight ( $\text{g}/\text{m}^2$ ) / drying status (%) Conductivity / resistivity ( $\text{mOhm}\cdot\text{cm}$ ) / permeability (H/m) <i>Beta</i> Permittivity (F/m) <i>Beta</i>
Measurement range / accuracy	Depends on the measurement task, the material composition and the test object volume. Please consult the SURAGUS team
Device dimensions (w/h/d) / weight	11.4" x 5.5" x 17.5" / 290 mm x 140 mm x 445 mm / 10 kg
Further available measurements	Sheet resistance, metal thickness, anisotropy

## Device Control and Software

The screenshot shows the EddyCus TF Lab Control software interface. The main window is titled "EddyCus® TF Lab Control" and features a menu bar (File, Measurement, Info) and a toolbar (Measuring, TempOk, CaOk). The interface is divided into several panels:

- Configuration / Drift Compensation:** Includes a checkbox for "Automatic" and a "Self Referencing" option.
- Data Tracker:** A table listing measurement data with columns for Id, Time, Series N., Value, and Unit.
- Real Time Measurement:** Displays a "Mapping" grid (5x5) and a "Measurement Parameter" of 57.50 [Unit]. The Mapping grid shows values ranging from 57 to 85. The Measurement Parameter panel includes a "Set No of Digits" control set to 0.00 and a "Unit Standard" option.
- Graph:** A line graph is visible at the bottom of the interface, showing a fluctuating signal over time.