

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

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

Device Series

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

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 provides information on
 - ▶ Conductivity (eg. metals, semiconductors, graphite)
 - ▶ Permeability (eg. Co, Ni, Fe)
 - ▶ Permittivity (eg. 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	Transmittance setup: 1 – 50 mm (defined by the thickest sample) Reflectance setups: infinite (only surface area is analyzed)
Measurement types	Wet thickness (µm) / weight (g/m ²) / 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, the material composition and the test object volume. Please consult the SURAGUS team
Device dimensions (w/h/d) / weight	11.4" x 17.5" x 5.5" / 290 mm x 140 mm x 445 mm / 10 kg
Further available measurements	Sheet resistance, metal thickness, anisotropy, optical transparency, reflection, haze

Device Control and Software

The screenshot displays the EddyCus TF Lab Control software interface. Key components include:

- Configuration / Drift Compensation:** A panel with a 'Self Referencing' checkbox.
- Real Time Measurement:** A central panel showing a 'Mapping' grid with numerical values (e.g., 64, 58, 65, 62, 62) and a 'Measurement Parameter' display showing '57.50 [Unit]'. Below the grid is a line graph with 'Ohm/Sq' on the y-axis.
- Data Tracker:** A table listing measurement data with columns for Id, Time, Series N., Value, and Unit.

Id	Time	Series N.	Value	Unit
1	11:27:05	wafer ser...	6.4e+01	[Unit]
2	11:27:25	wafer ser...	5.8e+01	[Unit]
3	11:27:30	wafer ser...	6.9e+01	[Unit]
10	11:27:43	wafer ser...	6.2e+01	[Unit]
12	11:28:38	wafer ser...	6.2e+01	[Unit]
13	11:29:04	wafer ser...	6.1e+01	[Unit]
14	11:29:29	wafer ser...	6.1e+01	[Unit]
15	11:29:55	wafer ser...	7.0e+01	[Unit]
16	11:30:21	wafer ser...	7.0e+01	[Unit]