EddyCus® TF map 5050A – Anisotropy Imaging Device

P_T_5050A_21

Highlights

- Contact-free imaging
- High resolution imaging (25 to 1,000,000 points)
- Defect imaging
- Mapping of encapsulated layers

Device Series

- Metal thickness (nm, µm)
- Sheet resistance (Ohm/sq)
- Emissivity
- Conductivity / resistivity (mOhm·cm)
- Electrical anisotropy (%)
- Weight (g/m²) and drying status (%)
- Permeability (H/m) Beta

Applications

- Touch panel sensors (TPS)
- Printed electronics
- Wearable electronics
- Smart textiles
- Photovoltaics
- Smart / switchable films
- Medical surfaces and devices
- Biological sensors
- Aerospace, automotive, transport
- Semiconductor and memory
- Energy storage

Materials

- Nanowire films
  - Conductive NW (Ag, Ni, Pt, Au)
  - Semiconductor NW (Si, SiC)
  - Magnetic NW (Fe_3O_4–AgNWs)
  - Multilayer NW (ZnO/AgNW/ZnO)
- Carbon Nano Tubes and Buds
- Fiber reinforced composites
- Metal meshes, smart meshes
- Anisotropic grain / domain materials
- Anisotropic effect / defect directions (cracks, line defects)

SURAGUS GmbH
Maria-Reiche-Strasse 1
01109 Dresden
Germany

For further questions:
+49 351 32 111 520
sales@suragus.com

Visit us at:
www.suragus.com
www.suragus.com/calculator
www.suragus.com/EddyCusMap5050

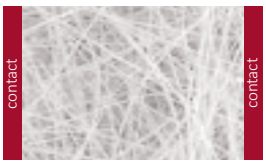
Engineered and Made in Germany

Anisotropy Term and Concept

- Electrical anisotropy refers to a difference in electrical resistance depending on the direction of current flow
- Wire and mesh structures can have anisotropic resistances
- Bulk materials with dominant directional characteristics / effects / defects can also have electrical anisotropy
- Anisotropy can be optimized to the layout of the contacts
- Anisotropy can save material and improve optical transparency to sheet resistance ratio
- Described by anisotropy direction and strength
- Both characteristics must be obtained at the same position
- The anisotropy strength is calculated using the lowest and highest resistance that align in perpendicular directions
- Inline deposition, e.g. slot die coating on moving web, tends to create lower resistances in machine direction "MD" and higher resistance in traversing direction "TD"
- Calculation as ratio of lowest and highest resistance

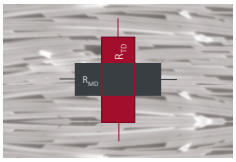
Anisotropic Wire Film

Isotropic Wire Film



$$\text{Anisotropy Ratio} = \frac{R_{HIGHEST}}{R_{LOWEST}}$$

$$\text{Anisotropy Ratio} = \frac{R_{TD}}{R_{MD}}$$



Device Characteristics

Measurement technology	Non-contact eddy current sensor with directed current induction
Substrates	Foils, glass, wafer, etc.
Max. scanning area	20 inch / 508 mm x 508 mm (larger upon request)
Max. sample thickness / sensor gap	2 / 5 / 10 / 25 mm (defined by the thickest sample / application)
Sheet resistance range	0.01 – 1,000 Ohm / sq; 1 to 5 % accuracy
Anisotropy range (TD/MD)	0.33 – 3 (larger upon request)
Scanning pitch	1 / 2 / 5 / 10 mm (other upon request)
Measurement points per time (square shaped samples)	10,000 measurement points in 5 minutes 1,000,000 measurement points in 30 minutes
Scanning time	8 inch / 200 mm x 200 mm in 0.5 to 5 minutes (1 – 10mm pitch) 12 inch / 300 mm x 300 mm in 1.5 to 15 minutes (1 – 10mm pitch)
Device dimensions (w/h/d) / weight	46.5" x 11.4" x 35.4" / 1,180 mm x 290 mm x 900 mm / 120 kg
Further available features	Metal thickness, sheet resistance, resistivity imaging

Device Control and Software

- Pre-defined measurement and product recipes (sizes, pitches, thresholds)
- Line scan, histogram and area analysis
- Black and colored image coding
- Csv & pdf export
- SPC summary and export
- 3 user levels
- Material database for parameter conversion
- Edge effect compensation
- Storage and import of data
- Export of data sets (e.g. to EddyEva, MS Excel, Origin)