EddyCus® TF map 2530A – Anisotropy Imaging Device

P_T_2530A_20

Highlights

- Contact-free imaging
- High speed (10,000 points in 5 min)
- Repeatable and accurate
- High resolution (9 to 90,000 points)
- Mapping of encapsulated layers
- Homogeneity and defect imaging

Device Series

- Metal thickness (nm, µm)
- Sheet resistance (Ohm/sq)
- Emissivity
- Conductivity / resistivity (mOhm·cm)
- Electrical anisotropy (%)
- Weight (g/m²) and drying status (%)
- Permeabilty (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 (Fe3O4-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)

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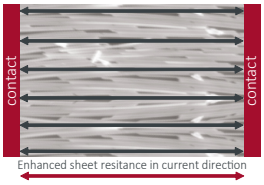
Made and Engineered in Germany

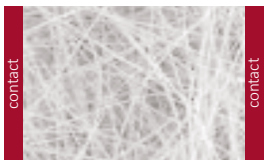
Anisotropy Term and Concept

- 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, eg. 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

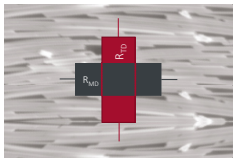


Isotropic Wire Film



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

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



Device Characteristics

Measurement technology	Non-contact eddy current sensor with directed current induction
Substrates	Foils, glass etc. ≥ 100 mm x 100 mm
Max. scanning area	12 inch / 300 mm x 300 mm (larger on 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	0.33 – 3 (larger on request)
Scanning pitch	1 / 2.5 / 5 / 10 / 25 mm (other on request)
Measurement points per time (square shape)	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 1.5 to 15 minutes (1 – 10 mm pitch) 12 inch / 300 mm x 300 mm in 2 to 15 minutes (2.5 – 25 mm pitch)
Device dimensions (w /h /d) @ weight	799 x 486 x 850 mm / 31.5 x 19.1 x 33.5 inch @ 90 kg
Available features	Metal thickness 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 (eg. to EddyEva, MS Excel, Origin)