# Inline Isotropy, Fiber Weight & Orientation Measurement of Discontinuous Carbon Fibers

SURAGUS' **new 'EddyCus CF inline ISO'** enables inline assessment of uniformity and isotropy (alignment) of discontinuous carbon fiber materials. For recycled carbon fibers (rCF) especially, decisive properties on product quality and integrity such as **fiber orientation** or **degree of isotropy** and the **fiber distribution** or **weight uniformity** are measured. The EddyCus CF inline ISO determines these properties **non-destructively and without contact during production** and can be used to control the manufacturing of impregnated or dry airlayed, wetlayed, non-wovens and chopped fiber mats. When compared to alternative technologies such as Beta-Ray which can only measure fiber weight or optical systems which can only measure fiber angle, the EddyCus CF inline ISO incorporates a new sensor design with sensor focus and specialized algorithms enabling the simultaneous measurement of both fiber areal weight and bulk prevalent orientation for rCFRP or CF-SMC.

Based on **long-term proven** eddy current testing technology, the EddyCus CF inline ISO allows for inline testing of the **isotropic or anisotropic** character of **chopped, discontinuous, recycled mats or continuous carbon fiber non-wovens made for high performance application** in semi-structural parts.

Innovation Award by Free State of Saxony 2013
1st Place

TÜV SÜD
ISO 9001

JEC GROUP
WINNER OF 2016
INNOVATION AWARD

**Fiber Areal Weight**
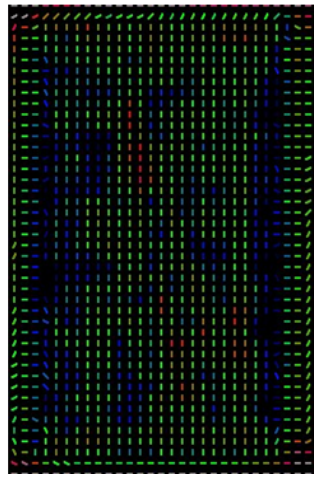


**Prevalent Fiber Orientation**



**Scaled Tensor**
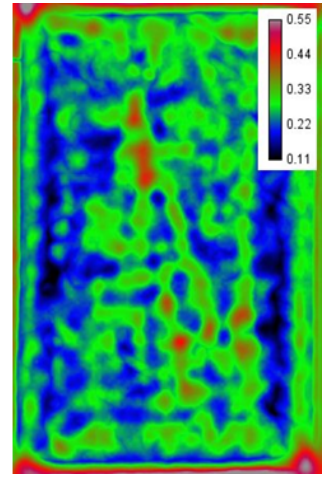


**Anisotropy Strength**

| | |
|---|---|
| Measurement technology | Non-contact high frequency eddy current sensor |
| Measurement area | 20mm in diameter |
| Required space | Small - approx. 300 mm in production line |
| Sample rate | 1 - 50 measurements per second<br>1 measurement/mm @ 5m/min production speed |
| Interface | Process control with uplink to PLC or production control system via UDP or TCP/IP and API integration |
| Value propositon | Degree of Isotropy (maximum orientation / min orientation<br>Ratio MD/CD - machine direction to cross direction<br>Fiber weight distribution [g/m²]<br>Fiber orientation in degree [°] |
| Carbon fiber materials | CF non-woven, CF chopped, recyled CF, CF mats airlayed; sprayed discontinous CF with theromplastic or thermoset matrix |
| Max. sample thickness | 15 mm (larger on request) |
| Web fluttering tolerance | 1 mm |

## Characterization & Application

**Results**

▸ Check local fiber orientation in cross section
▸ Identify high-/low density areas
▸ Non-destructive and no sample preparation

**Application and Value**

▸ Feedback of data into material flow simulation
▸ Evaluation of CF-SMC processing
▸ Distinction between GF / CF material
▸ Non-destructive material specification
▸ High quality short fiber product