

# Magnetic Measurement and Testing Equipment for the Characterization of Soft Magnetic Materials

## Metrological Characterization

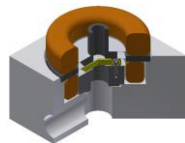
- Magnetic characterization of soft magnetic materials
- Determination of material characteristics for numerical simulation
- Modelling of soft magnetic materials
  - Development and validation of hysteresis and iron loss models
  - Identification of separated loss contributions
  - Detection of quasi-static magnetisation energy
- Identification of production, processing and manufacturing influences and their impact on the design of electrical machines



Maximum field strength	100,000 A/m
Maximum frequency	10,000 Hz
Epstein sample	300 mm x 30 mm
Single sheet sample (1-D)	120 mm x 120 mm
Single sheet sample (2-D)	60 mm x 60 mm
Single sheet sample (1-D, tensile stress, 5kN)	600 mm x 100 mm
Ring core	User-definable

## 1 & 2 Dimensional Testing

- Metrological characterization of ferromagnetic laminations up to 10 kHz
  - SST (low and high frequencies)
  - Ring Cores
  - Epstein Frame (low and high frequencies)
- Sinusoidal magnetic flux density waveform up to 2 T
  - PWM waveforms, arbitrary shape of magnetic flux density waveform
  - DC-measurements (virgin curve, normal magnetization curve, DC hysteresis loop)
- Brockhaus MPG 200D
- Brockhaus RPT (Rotational Power Loss Tester)



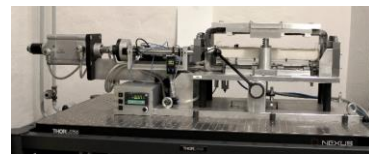
## Material Properties

- Specific electrical resistance & thickness:
  - Burster Gernsbach micro-ohmmeter type 2302
- Specific density:
  - Kern ABT 220 4M
  - Satorius TE 601 D



## Magneto-Mechanical Effect

- Tensile and compressive stress (up to 5 kN):
  - Brockhaus MST 500
  - Sample size: 600 mm x 100 mm (or narrower)
  - Controlled field and flux density waveform
    - Arbitrary waveform
    - DC-measurements



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