Laboratory of Thermal, Thermomechanical and Electrical Properties

Thermo

The main objectives and activities

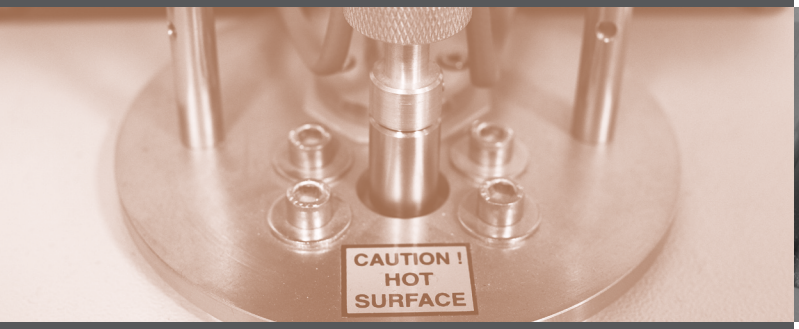
- Study of structural parameters of textiles and materials using thermal analysis methods,
- Identification of the material,
- Tracking of mechanical, structural and reaction properties of materials in relation to the thermal load.

Specific devices and outcomes

- Differential Scanning Calorimetry (DSC)
- Thermomechanical Analysis (TMA)
- Dynamic-Mechanical Analysis (DMA)
- Thermogravimetry (TGA)

Specialization of the laboratory

- Measurement of transition temperature (Melting, Glass transition, Crystallization),
- Determining the degree of crystallinity and thermal coloration,
- Evaluation of enthalpy of thaw, enthalpy networking and curing, reaction kinetics and efficiency of antioxidants,
- Analysis of copolymers and blends of polymers,
- Thermal and oxidative stability,
- Effectiveness of fire retardants,
- Volatilization of low molecular weight, polycondensation product, solvents, determination of fillers,
- Coefficient of thermal expansion,
- Thermo-mechanical properties, tensile modulus and shear, real and imaginary component module, loss angle.



Electro

The main objectives and activities

- Modification of conducting fibers for new uses,
- Development of textile sensors and sensors suitable for use in textiles,
- Modeling of electrical properties of textile fibers using computer assisted designing,
- Development of evaluation methods of anisotropy electrical properties of materials.

Equipments

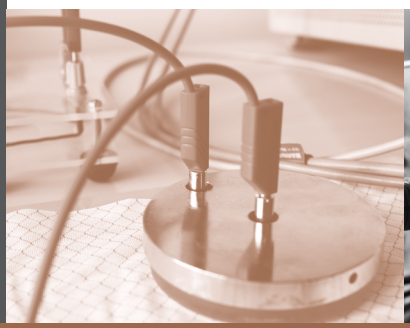
- Circumferential analyzers (Rohde & Schwarz) - preparation of samples for measurement of electromagnetic shielding (textile, sandwich structures, composite materials and other specific materials, etc.),
- Impedance / material analyzer – Agilent E4991A + Dielectric material test fixture – Agilent 16453A (measurement of dielectric permittivity in a range 1 MHz - 1 GHz),
- Universal frequency counter – Agilent 53131A,
- Resistance meter – HP 4339B + extenders on measuring volume resistivity, surface resistivity, of surface directional resistivity,
- Stat – charge FD-28 (for measurement of electrostatic hubs),
- Polystat (for measurement of potential of the sample),
- LCR meter–measurement of resistance, capacitance and inductance,
- TEPAO MMETP E6-13A (for resistance measurement),
- Handheld meter for measurement of microwave radiation leakage.

Specialization of the laboratory

- Measurement and analysis of electrical properties of textile structures,
- Development of special materials with the use of conducting fibers.

Evaluation of material parameters

- Surface resistivity of materials [Ω] and bulk resistivity materials of [Ω.m],
- Anisotropy of surface and volume resistivity of materials,
- Capacity of materials (including dependence on deformation of test material),
- Measuring the percolation threshold of conductive material with the proportion of conductive phase,
- Measuring the polarity and amount of charge generated by rubbing two materials and its size in the range of 3-30 kV.cm-1,
- Surface potential of insulators,
- Permittivity of materials and electromagnetic shielding of materials.



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