

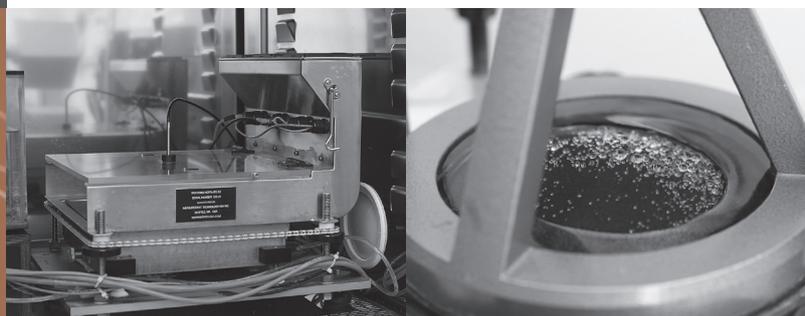
Laboratory of comfort and physiology

The main objectives and activities

- Development, production and testing of textile structures with adaptive heat absorption, specific optical effects and protection against electromagnetic smog,
- Development of smart textiles with enhanced comfort for workplaces with excessive exposure to pollutants (e.g. heavy security forces or chemical production / industry),
- Applied research in the field of technical clothing to enhance the comfort of automobile seats,
- Address problems of thermoregulation, transmission of heat and moisture, uptake and expenditure of energy in the system of organism-clothing-environment,
- Technical environment to design new types of clothing constructions and 3D products,
- Application of textile sensors into bed and clothing for detection of vital signals, bedsores (decubitus), kinesic behavior, incontinence, sweating, hypothermia etc.,
- Development, production and testing of special sensors in textiles for indication of location, movement and condition of carrier, evaluation of sleep quality or monitoring of vital functions.

Specialization of the laboratory

- Analysis of thermal insulation properties, air, water and water vapour / steam permeability in textile and composite materials,
- Evaluation of transport processes in conditions of practical clothing with monitoring of temperature, moisture and physiological manifestation of the wearer,
- Evaluation of all aspects of physiological hygienic properties of clothing and clothing materials for recognition of textile comfort,
- Complex analysis of signals for monitoring health and identification of problems with sleep like frequent movement, apnoea and unrest, which is a special solution for small children and elderly people.



Specific devices and outcomes

- Evaluation of air permeability in textiles and other porous materials according to standards ČSN EN ISO 9237, ČSN EN ISO 7231, ASTM D 737, DIN 53 887 with devices like SDL M 021 S, FX 3300 from TEXTEST Instruments.
- Determination of heat resistance and heat conductivity according to ISO 5086-1 with Togmeter SDL M 259, evaluation of thermal properties with ALAMBETA, measurement of relative water vapor permeability (RWVP) and evaporation resistance (R_{eT}) with Permetest.
- Evaluation of water vapor permeability of textiles and porous materials by using FX 3180 CM 12 instrument according to ISO 11092 and ASTM F1868 for SGHP (Sweating Guarded Hotplate).
- Determination of water vapor transmission (WVT) the method gravimetric or cup test according to ASTM E96 (FX 3180 CM 12).
- Measurement of thermal insulation of clothing by means of a thermal manikin according ČSN EN ISO 15831 (Child Thermal Manikin).
- Measurement of thermal and/or evaporative resistances of a seat by Seat Test Automotive Manikin (STAN).
- Monitoring, measurement and recording of liquid propagation through textile with MMT 290.
- Determination of hydrostatic resistance against water permeation under pressure (special clumping also for durable materials):
 - Determination of water column according to ČSN EN 20811 (80 0818), ISO 811, BS 2823, BS 3321, BS 3424, DIN 53889, AATCC 127 with SDL M018.
 - Evaluation of resistance of fabrics against water absorption during water spraying with artificial rain, determination of impregnating effect of water-repelling materials, determination of waterproof materials and visual comparison of samples, determination of the amount of water absorbed and transmitted through the sample during the test according to ČSN EN 29865 (ČSN 80 0856) with Bundesmann BP 2.
 - Analysis of physical processes and phenomena using high-speed color digital cameras and Speed 3 Olympus (150000 obr s⁻¹) with special optics and premium SW and special lighting technology Boxer BLK, 200 W (10°, 40°, 80°).
 - Non-contact measurement of temperature distribution of the surface of the human body and clothing at different physical load and climatic conditions, thermal leakage detection from buildings, thermovision defectoscopy and active thermography.
 - Monitoring and visualization of degree of load and pressure with the X-Sensor blanket.

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