

Laboratory Color and Appearance Measurement

The main objectives and activities

- Use of advanced colorimetry for complex evaluation of product quality from different industry branches (textile, plastic, varnishes, cars, ceramics, paper, illumination, etc.),
- Development of new measuring systems and construction of optical devices prototypes,
- Research and development of color rendering indices and color quality control of light sources,
- Research related to conspicuity and visibility of pedestrians,
- Development and application of SMART textile sensors on the basis of color-changing pigments and dyes,
- Development of advanced camouflage systems (color changeable camouflage),
- Development of methods for physical activation of textile surface that enables reduction of the amount of dyes and chemicals necessary for production of final textile product,
- Research and development of techniques used for deposition of special textile modifications on the basis of nanotechnologies.

Specialization of the laboratory

- Colorimetry
- Lighting research,
- UV-VIS-NIR spectroscopy,
- Spectrophotometry and micro-spectrophotometry,
- Measurement of light sources,
- Measurement of chromic materials
- Camouflage systems, measurement and development
- Special optical microscopy (LSCM, Polarimetric Imaging),
- Physical surface activation,
- Design of special optical devices

LCAM was established in the 1999 as integral part of the department of textile materials in the Faculty of textile, Technical University of Liberec. It is a unique department not only within Czech Republic, but also in European Union. Evidence of this fact is that LCAM students from various countries like USA, UK, Japan or Australia finalize here special measurements for their PhD thesis. In this lab was developed adaptive camouflage changing its color. Currently, this laboratory consists of five departments namely; Laboratory of colorimetry, visual colorimetry, advanced colorimetry, spectrometry and technique of physical exposure.



Specific devices and outcomes

- spectrophotometers with diffuse and angle viewing geometry (d:0°, d:8°, 45°a:0°) for measurement of colorimetric and spectral properties solids, powders and liquids (Datacolor Int., Konica-Minolta, HunterLab, X-Rite),
- tri-glossmeter 60°, 20° and 85° (Zehnter),
- lighting cabinets equipped by D65 simulators, A, TL84, CWF, Horizon light sources (X-Rite, Datacolor),
- wide wavelength range spectrophotometer SHIMADZU UV-3101 PC that is mainly used for measurement of camouflage materials,
- micro spectrophotometer Nikon-Avantes-LIM mainly used for microscopic samples and forensic research,
- capturing systems LCAM IMAGER COLOR a LCAM IMAGER MULTIANGLE for evaluation of color of materials with variable surface, small color patterns, goniochromic paints and metallic paints,
- special measuring system LCAM PHOTOCHROM for measurement of chromic materials,
- spectroradiometer Photo Research SpectraScan PR740 with cooled detector (spectral resolution 1 nm, spectral range 380-780 nm, apertures 2°, 1°, ½°, ¼°, 1/8°, 0.2° a 0.1°, Luminance Sensitivity for Illuminant A = 0.0003 cd.m⁻²)
- portable spectrometers and radiometers (Avantes, Minolta, Goldilux),
- colorimeters used for monitor calibration (Minolta, Datacolor, X-Rite),
- spectrofluorimeters Jasco FP-8500 and Jobin Yvon FL 3-11
- exposure chambers with different light sources allowing surface activation,
- book of colors (Munsell, NCS, PANTONE, CIBA, CERAM) and reference optical standards (reflectance, transmittance) allowing validation of measuring systems