CPS
CENTRE
OF POLYMER
SYSTEMS

CENTRE OF POLYMER SYSTEMS

Vladimír Sedlařík

October 2024

TOMAS BATA UNIVERSITY IN ZLIN

Univerzita Tomáše Bati ve Zlíně
Centrum polymerních systémů

6 FACULTIES
+
UNIVERSITY
INSTITUTE

278 DEGREE
PROGRAMMES

TBU

69
IN ENGLISH

8,933
STUDENTS

974
EMPLOYEES

1,129
INTERNATIONAL
STUDENTS

486 ACADEMICS

TOMAS BATA UNIVERSITY IN ZLIN

TBU

- Faculty of Technnology
- Faculty of Applied Informatics
- Faculty of Management and Economics
- University Institute
- Faculty of Humanities
- Faculty of Multimedia Communications
- Faculty of Logistics and Crisis Management

University Institute:

- Centre of Polymer Systems
- Footwear Research Centre
- Technology Transfer Centre
- Science and Technology Park

CENTRE OF POLYMER SYSTEMS (CPS)

WHO WE ARE

Research centre focused on R&D in the field of polymer science and further chemical and technological areas.

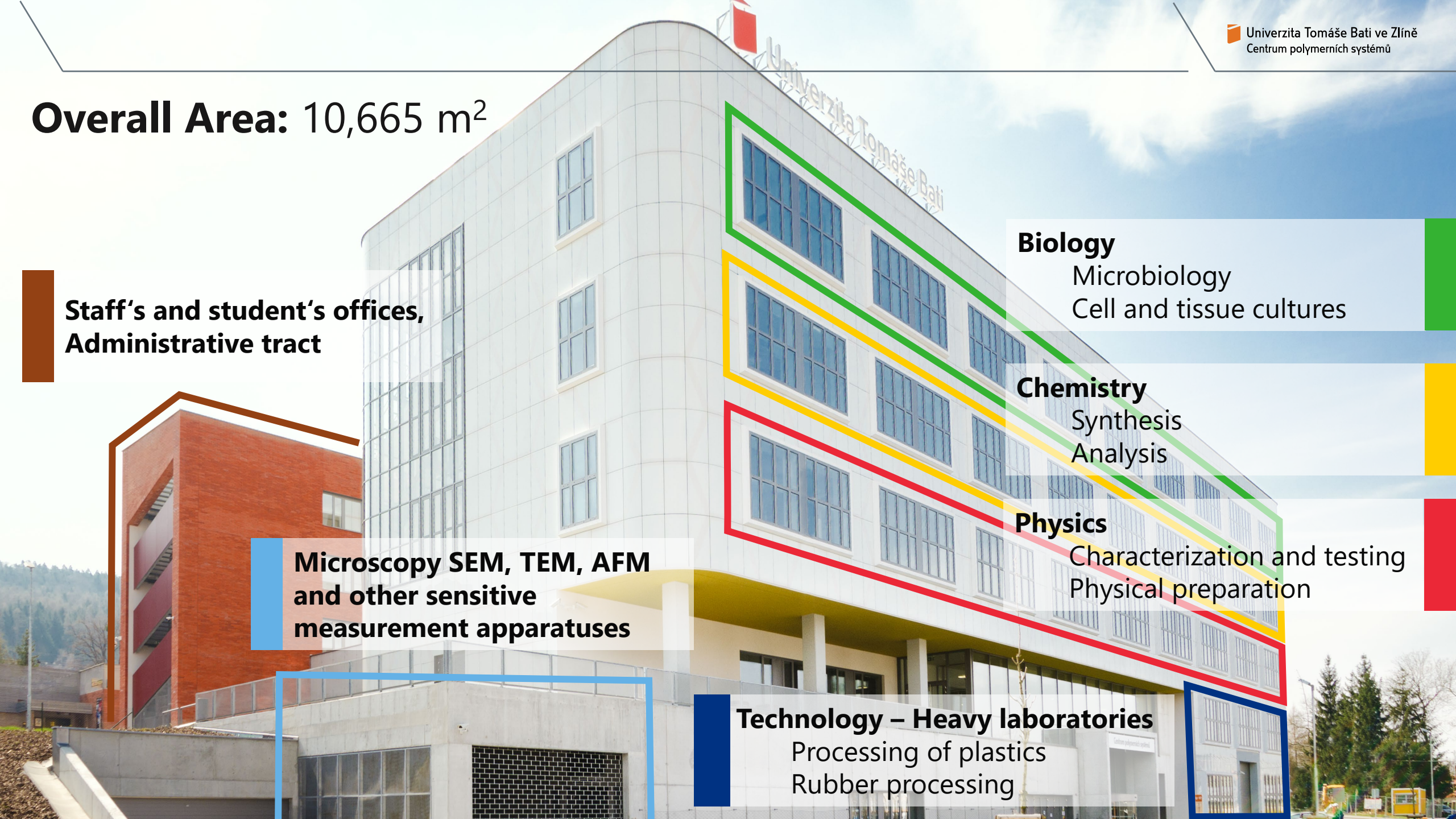
MISSION

Knowledge for sustainable development in practise.

OUR GOALS

- Excellence in polymer science and other relevant fields
- Following the strategy of the TBU – Entrepreneurial university
- National and international prestige development
- High quality education processes
- Sustainable development
- Cooperation with industry.

Overall Area: 10,665 m²



Staff's and student's offices, Administrative tract

Biology
Microbiology
Cell and tissue cultures

Chemistry
Synthesis
Analysis

Physics
Characterization and testing
Physical preparation

Microscopy SEM, TEM, AFM and other sensitive measurement apparatuses

Technology – Heavy laboratories
Processing of plastics
Rubber processing

VALUES

MOBILITY

CAREER

FLEXIBILITY

INNOVATION

PROFESSIONALISM

CREATIVITY

TRANSPARENCY

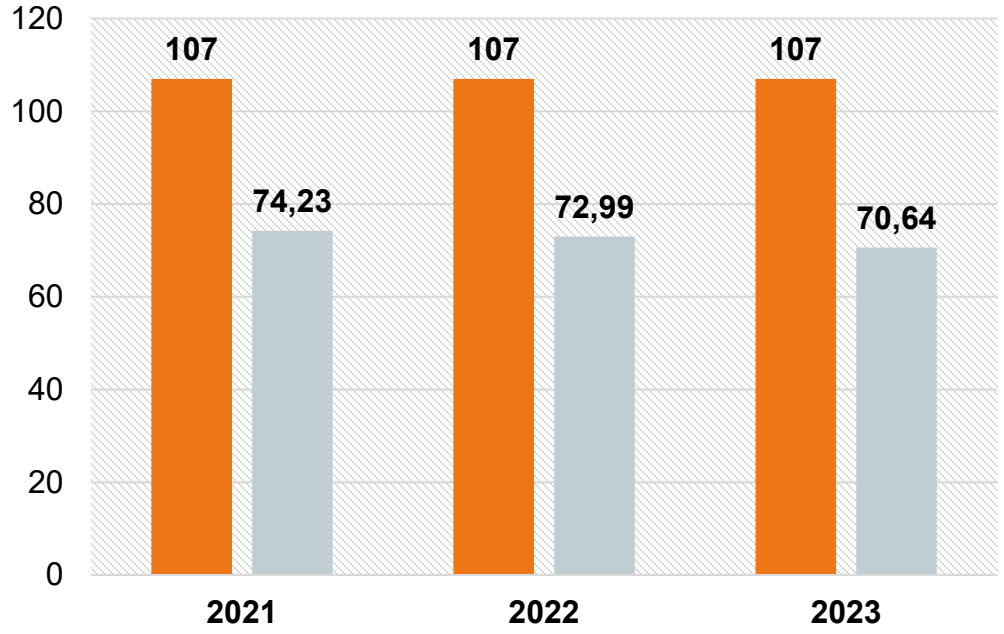
EXCELLENCE

HR EXCELLENCE IN RESEARCH

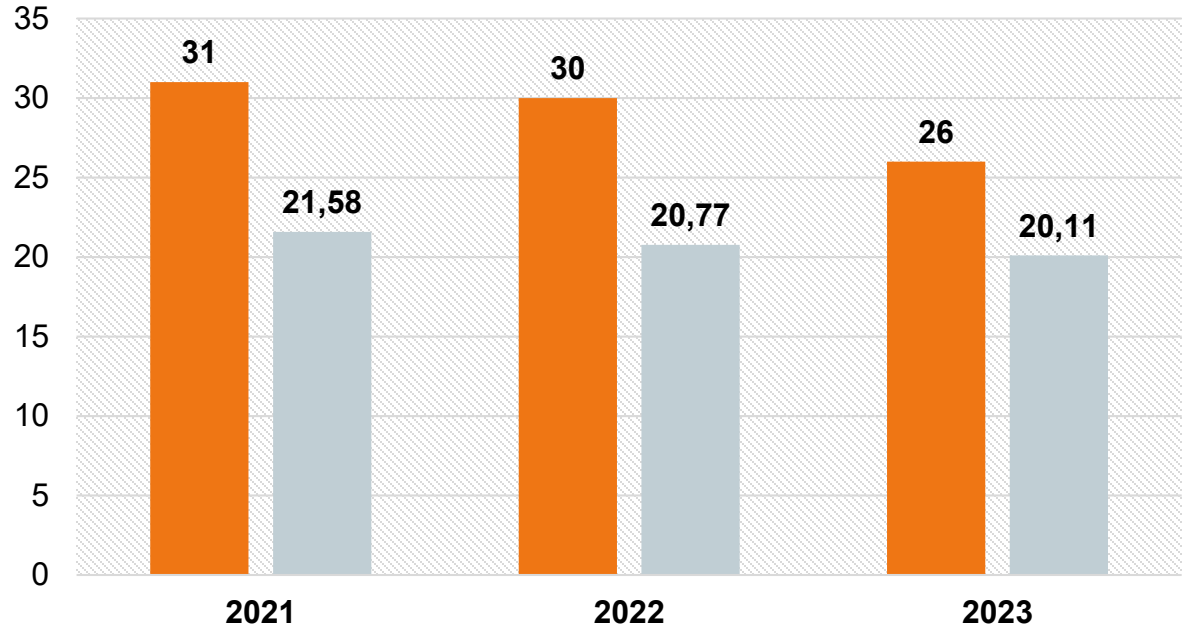
CPS STAFF

	2021	2022	2023
Total number of employees	138	137	133
Total number of FTE‘s	95.8 (0.69 per employee)	93.8 (0.68 per employee)	90.75 (0.68 per employee)

RESEARCHERS

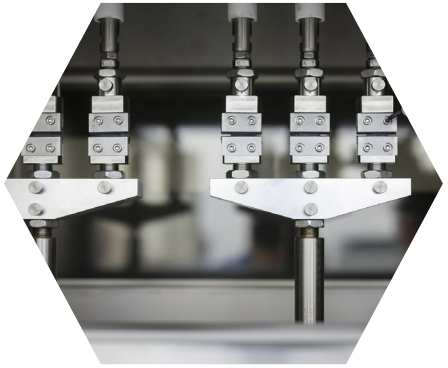


OFFICE & ENGINEERS



CPS STRUCTURE

- Polymers Processing



- Rubber Technologies

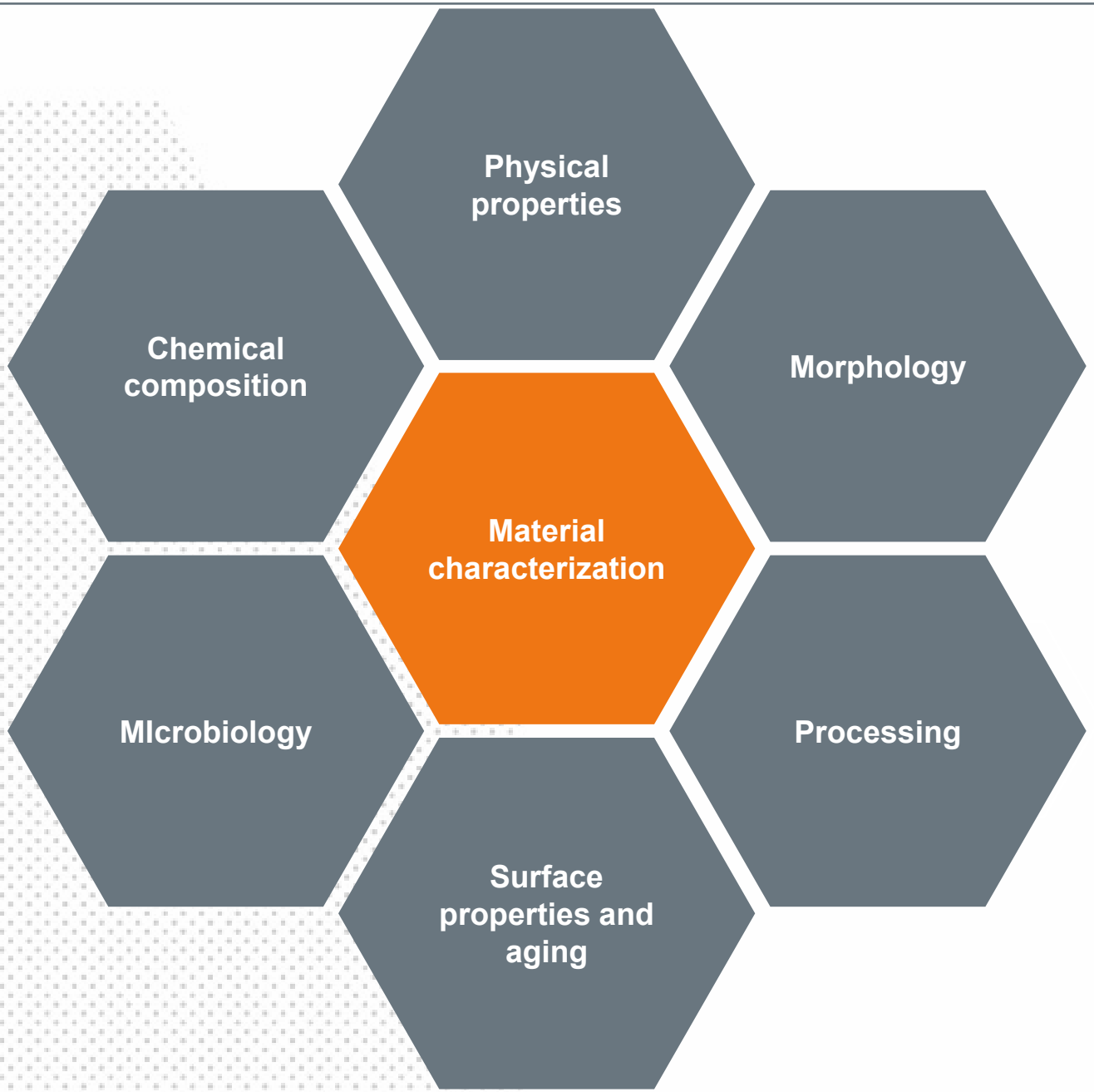
- Environmental Technologies

- Biomaterials

- Nanomaterials and Advanced Technologies

- Energy and Composite Materials and Devices

EXPERTISE - COOPERATION



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EXPERTISE - COOPERATION

Plastics and rubber processing:

- extrusion, injection, blow molding
- compounding
- spunbond, meltblown
- electrospinning
- 3D printing

Biocompatibility testing

- cytotoxicity tests
- cell adhesion tests
- cell proliferation tests
- scaffold growth tests
- transdermal absorption tests
- phototoxicity tests

Microbiological analysis:

- antibacterial activity of plastics / textiles / cosmetics
- determination of bacterial purity
- antiviral tests - bacteriophage simulation
- bacterial filtration efficiency (BFE)
- biodegradation of materials

Materials Life Cycle Analysis (LCA)

umberto®
know the flow.

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EXPERTISE - COOPERATION

Chemical analysis of materials:

- elemental analysis (EDXRF, AAS, TOC,)
- a wide range of chromatographic techniques (např. GC/QTOF, LC/QTOF, GPC atd.)
- spectroscopic analysis (FTIR, Raman spectroscopy)

Physical analysis of materials:

- mechanical and viscoelastic properties
- testing of rubber compounds
- thermal properties (DSC, TGA / MS)
- thermal insulation properties
- antistatic and dissipative characteristics
- surface analysis (AFM, porosimetry)
- barrier properties
- determination of filtration efficiency of materials (TSI filter tester)
- determination of particle size
- comprehensive rheological analysis

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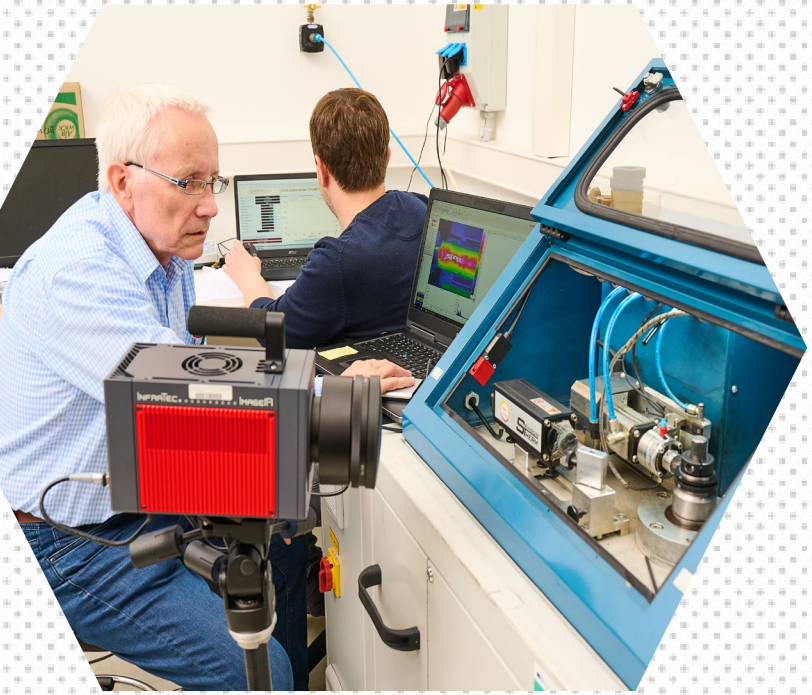
LIFELONG EDUCATION COURSES



Processing technologist*

Chemical technician analyst

Processing of rubber compounds*

The courses are accredited by the Ministry of Education, Youth and Sports..

*Two courses are also authorized by Ministry of Industry and Trade.

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Univerzita Tomáše Bati ve Zlíně
Centrum polymerních systémů

CENTRE OF POLYMER SYSTEMS

- expertise in sustainable materials and technologies,
- advanced instrumentation,
- personal capacities competencies,
- project implementation and dissemination experience,
- internationalization activities, exchange programmes,
- research of advanced materials for

  - space applications,

  - electromobility and energy storage.

www.cps.utb.cz
www.utb.cz

CPS
CENTRE OF POLYMER SYSTEMS

Interreg Danube Region
Co-funded by the European Union
Plan-C

PolyEnvi21
National Competence Center

AGROECOLOGY PARTNERSHIP

PolyEnvi21

National Centre of Competence - Polymer Materials and Technologies for the 21st Century

T A C R Technology Agency of the Czech Republic

Project agenda
Science and research agendas include advanced materials, environmental and process engineering and consumption in circular environments.

Project Duration: 2023 - 2028

Amount of aid from national funds CZK 313,222 thousand

Financováno Evropskou unií NextGenerationEU

Coordinator: Centre of Polymer Systems, University Institute, Tomas Bata University in Zlín

Partners:

VYSOKÉ UČENÍ TECHNICKÉ V BRNĚ

VYSOKÁ ŠKOLA CHEMICKO-TECHNOLOGICKÁ V PRAZE

Univerzita Palackého v Olomouci

UNIVERZITA J. E. PURKYNĚ V ÚSTÍ NAD LABEM

Univerzita Pardubice

VŠB TECHNICKÁ UNIVERZITA OSTRAVA

+ industrial partners,
private R&D institutions,
clusters and professional associations

PolyEnvi21

National Centre of Competence - Polymer Materials and Technologies for the 21st Century

OBJECTIVES

- waste management, including positive impacts on national climate and other environmental goals
- security of supply of materials and reducing dependence on sources of materials imported from outside the EU
- increasing the competitiveness of businesses
- reduction of fossil fuel consumption.

FOCUS

- Advanced materials
- Environmental Process Engineering
- Consumption in the circular economy
- Communication, dissemination, creativity

PolyEnvi21

National Centre of Competence - Polymer Materials and Technologies for the 21st Century

IMPLEMENTED PROJECTS

- Polymer marking system for digitized waste sorting systém
- Thermosetting Compound with the Absence of Evaporation of Additives during the Subsequent Surface Treatment Process
- Removing additives from plastics using solvents
- Triboelectric sorting of waste plastic granulate/grit
- Thermochemical processing of waste plastics using pyrolysis, catalytic and purification processes
- Functional polyurethane polymers
- Sludge processing technology from plastic recycling
- Nanofibrous polymer materials with antimicrobial protection
- Biopolymers for agrochemical applications
- Evaluation of polymeric materials by the fractionation method
- Utilisation of 2nd Generation Biopolymer Feedstock Sources for Value-added Products
- Recycling of waste polymers from car batteries using mechanical and chemical recycling
- Plastics with increased thermal conductivity

www.polyenvi21.cz

INTERNATIONAL COOPERATIOON WITH CLUSTERS

Interreg Danube Region

Co-funded by the European Union

Plan-C

The Plan-C project boosts the **transformation of the plastics value chain** in the Danube countries towards circularity through the transnational cooperation of plastics processors/producers and the machine industry. Based on transnational technology transfer and a design thinking process, both actor groups jointly develop prototype solutions of plastics products + machine concepts designed for circularity to demonstrate the benefits of recycling, reuse, remanufacturing through innovative business cases.

Danube region

https://interreg-danube.eu/projects/Plan-C

THANK YOU FOR ATTENTION

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