



Haute école d'ingénierie et d'architecture Fribourg
Hochschule für Technik und Architektur Freiburg

Hes·SO

Haute Ecole Spécialisée
de Suisse occidentale
Fachhochschule Westschweiz



PLASTICS INNOVATION COMPETENCE CENTER

PICC

Facing innovation

**PLASTICS
INNOVATION**
Competence Center

Member of the



**swiss plastics
cluster**

The Competence Center

The Plastics Innovation Competence Center (PICC) is a Research & Innovation center developing sustainable solutions to the challenges of the plastics industry. PICC is part of the School of Engineering and Architecture of Fribourg (HEIA-FR), Switzerland, and brings together multidisciplinary expertise, processing equipment, analytical and modelling tools.

PICC strategically positions itself near the end of the plastics value chain to interact with converters, retailers, brand-owners, and after use recyclers. PICC aims at bridging the gap between academia and industry in a socially responsible way by offering innovative and nature-inspired solutions. Short and long-term technical challenges are addressed by engaging multiple experts as needed to deliver prototype products and offer alternatives for the industry partners. This approach enables companies to explore new fields and extend their reach beyond the scope of their internal R&D programs.

The PICC focuses on:

- Conventional plastics processing including selection, process optimization, and product design to support local and international companies as well as develop bio-based products using existing or novel plastics;
- Optimisation of engineering plastics processing and design for re-use, and recycle preserving their value and allow for fit with the circular economy;
- Extracting, processing and product development of natural plastics (proteins, carbohydrates) from bio-based coproducts or waste streams;
- Modelling, including multi-scale simulations - from the atomistic to the continuum level - for predicting processing performance and product properties. Modelling equally entails data-driven modelling combining experiment and simulation, as well as IoT and Industry 4.0 approaches for predictive maintenance, quality surveillance, business decision support and process optimization and automation.

The Vision

PICC is to become a leading and internationally recognised competence center that provides advanced and innovative plastics, processing technologies, and application designs for supporting industry partners and incubating start-ups to address critical societal challenges in a circular nature-inspired economy.

The Mission

- PICC delivers industry-relevant science and technology solutions to foster economic growth;
- PICC leverages science and technology knowledge with the innovative power of global partnerships in high-value added applications;
- PICC performs world-leading industry-related R&D in plastics development, processing, and application design contributing to a circular natureinspired economy;
- PICC's international top-talent is committed to improve the quality of life with sustainable plastics.

The Services

PICC is a "one-stop shop" for industry to address technological challenges related to plastics, and to find innovative solutions for the short & long- term. Each project engagement is tailored to the specific needs of the industry partner, being small and medium-sized enterprises (SMEs) or large corporations. Intellectual property (IP) resides with the industry partner on a "first right of refusal" basis.

The Network

PICC has its own research staff and also leverages the competences of three HEIA-FR institutes: institute for Plastics Processing (iRAP), the institute of Chemical Technology (ChemTech), and the institute of Complex Systems (iCoSys). PICC seeks strategic industry partnerships to fund long-term R&D programs. PICC is a member of the Swiss Plastics Cluster, to consult its members. PICC has an extensive network of partner universities and knowledge institutes on regional, national, European or international level. An active exchange program for MSc, PhD and PostDoc students is in place. The PICC initiates, manages or participates in multiple research projects funded by Regional, Swiss or European organisations and is notably involved in several EU Framework Programs.

The Equipment

The PICC has access to state-of-the-art pilot scale polymer synthesis, plastics processing, analytical equipment and ICT and the associated expertise

The specific PICC equipment consists of:

4 injection molding machines (50 to 110T of clamping force) - 1 lab scale single screw extruder - 1 twin screw co-rotating compounding extruder - Atmospheric Plasma device - Rheological equipment - Surface tension goniometer - Ceramics injection molding technology including debonding and sintering ovens - Metal Injection molding - Physical testing laboratory.



Research team

Director: 1

Professor: 8

Staff: 12

Contact and information

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