

The Institute of Polymer Extrusion and Compounding (ipec) was founded at the Johannes Kepler University of Linz in 2010 when research in polymer sciences was extended. The institute focuses on research in process-, product- as well as material technology with the intention to increase the efficiency in production and savings of resources. ipec counts about 20 employees at the moment.

***Our passion is the transmission of new materials into innovative products
by use of modern process technologies.***



Fundamentals for basic as well as applied research topics are:

- Single- and twin screw extruders: research and optimization of screw plasticating units,
- Pipe-, profile and film/sheet extrusion: processing-, die- and product development,
- Compounding and recycling: processing and material development,
- Lightweight design with thermoplastics: thermoplastic-pultrusion,
- Generative production engineering: 3D-FFF-printing/extrusion free forming,
- Semi-analytical and numerical modelling of transport phenomena in polymer processing technologies as well as experimental analysis,
- Material characterization and applied rheology: process characteristics, polymer degradation, elongational rheology, wall slip, rheology of compounds, thermodynamic properties,
- Sensor and process measurement techniques for optimizing of material quality: e.g. residence time distribution with fluorescence spectroscopy, pulsed wave Doppler ultrasonic measurement techniques, optical coherence tomography as well as
- Self-optimizing complex extrusion line concepts and soft sensors.

Laboratory equipment:

- Single screw extrusion with additional sensors: 19/33D, 25/18D, 35/24D, 2x35/34D, 45/28D, 45/36D, 60/33D, and other coextruders,
- Coextrusion: two Coex-pipe extrusion lines (DN 32 up to DN 125; DN 6 up to DN 32), profile extrusion, 7-layer sheet-/film extrusion line (die width 750 mm), Coex-sheet extrusion line (die width 250 mm),
- Counter-rotating conical twin screw extruder 50,
- Co-rotating parallel twin screw extruder/compounder: 27/24,40,48D and 25/40D with up to 6 gravimetric dosing systems, material drying equipment, underwater and strand pelletizing,
- Rheometry: different continuous inline as well as online shear or elongational rheometers, rotational rheometers, capillary rheometers,
- Desktop 3D FFF/FDM printer (fused filament fabrication or fused deposition modeling printing, extrusion free-forming),
- Measurement device for thermodynamic properties like thermal conductivity of melt as well as solid material, pvT-data.

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