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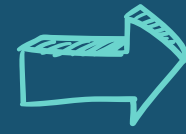
DEPARTMENT OF TECHNOLOGY AND POLYMER PROCESSING

Head of the department:
Tomasz Klepka, DSc (Eng)





One of the most dynamically progressing Departments amongst all of the Faculty of Mechanical Engineering at the Lublin University of Technology. With experienced team members.



The Laboratory, where short series of traditional and innovative products obtained by various processing methods:

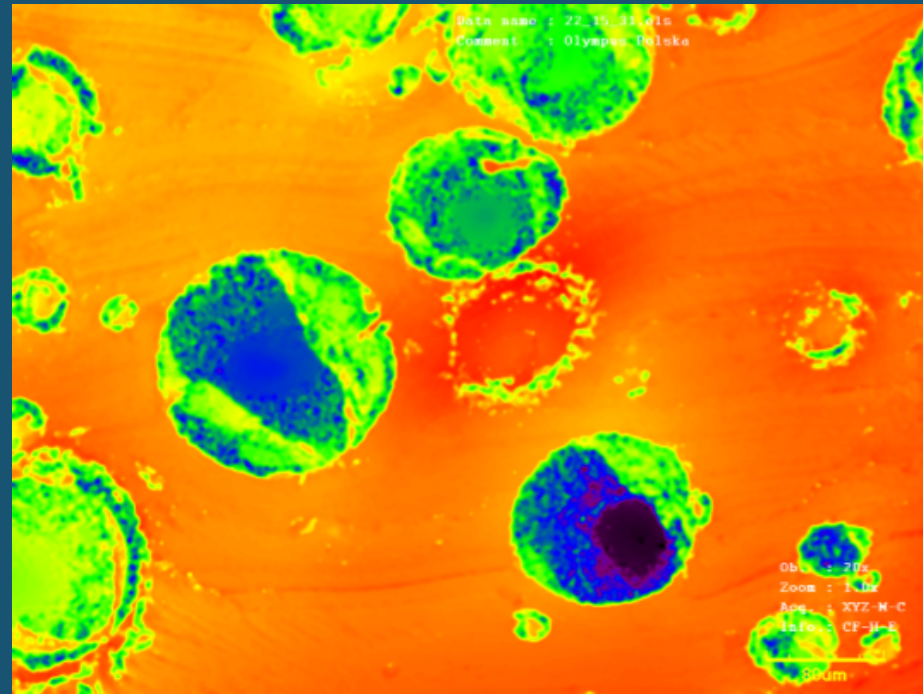
- The extrusion (single and twin-screw),
- injection,
- compression pressing,
- heating and welding of plastics,
- growth forming, metallization and vacuum shaping of plastics.

With the latest research and measurement equipment the comprehensive tests can be run.



Commercialising new ideas and numerous patents in cooperation with various companies from the SME sector. Furthermore consultations on the implementation of technological innovations, not exclusively in the field of processing polymer materials.

DEPARTMENT'S SCIENTIFIC FIELDS AND MAIN RESEARCH AREA



THEORY AND POLYMER PROCESSING TECHNOLOGIES

Processing Technologies impact on the product quality.

- Classic and Twin screw extrusion
- Thermal extrusion
- Composition and processing of the fireproof and flammability materials.
- Processes computer simulation.
- New matrix composition



POLYMER PROCESSING

grinding, shredding and mixing of the polymer (granules, powder, porous structure)

- Polymer cutting, drilling also for glasspolymer compositions
- Design and Development mixing and cutting polymer's blades



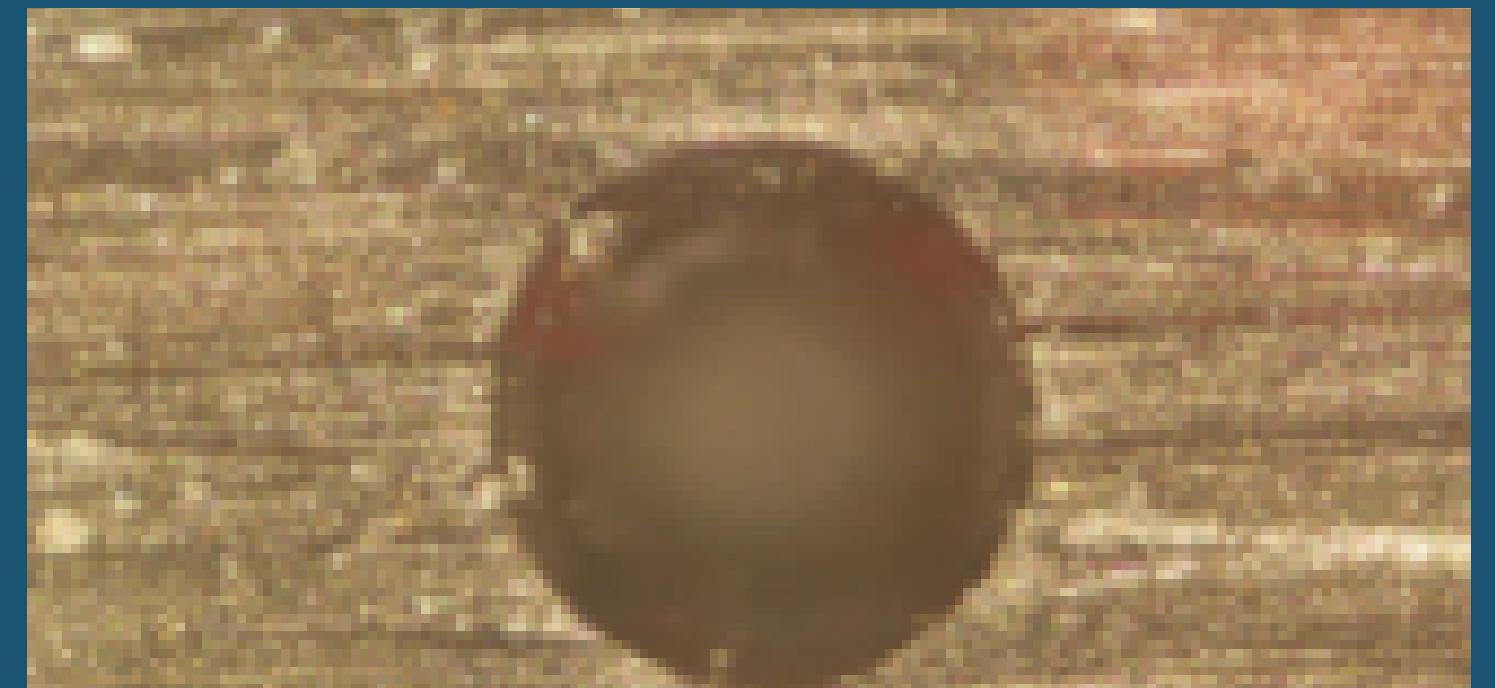
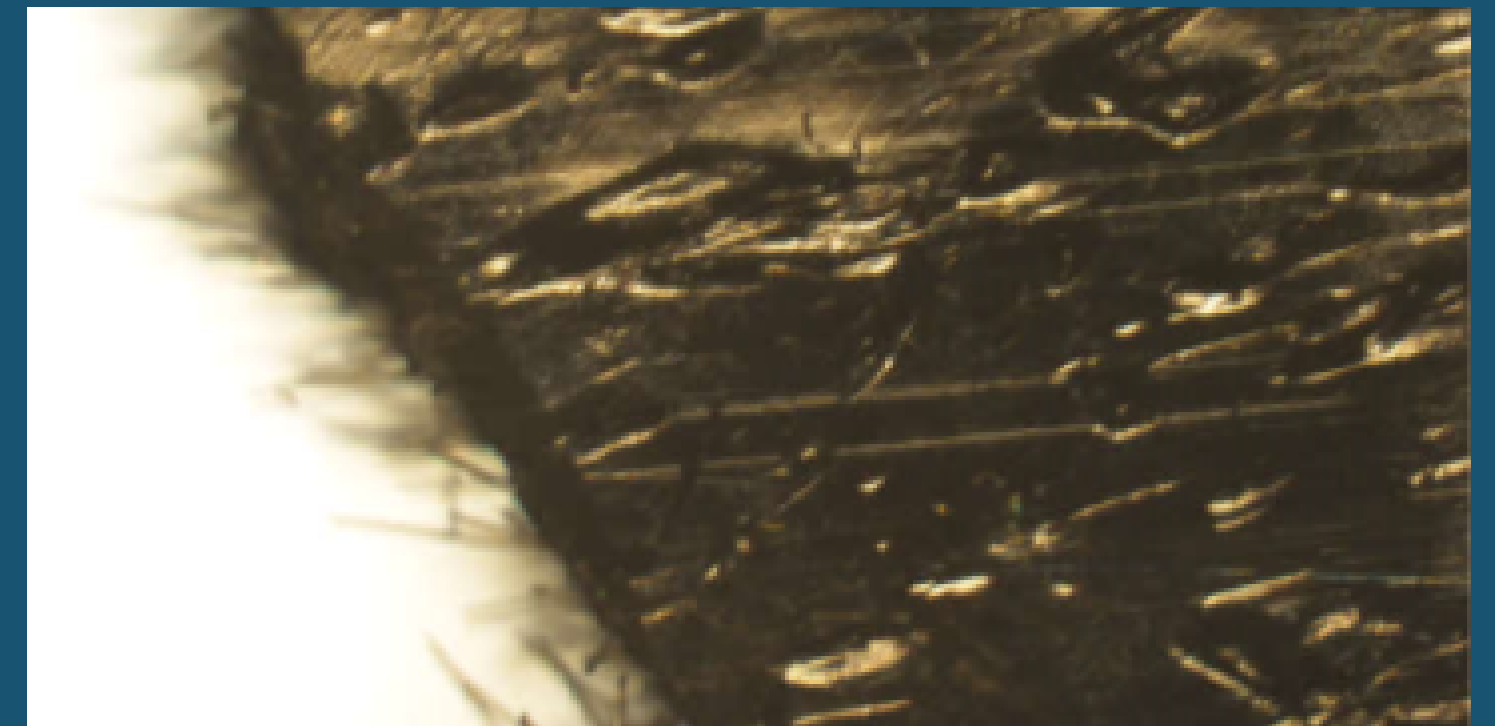
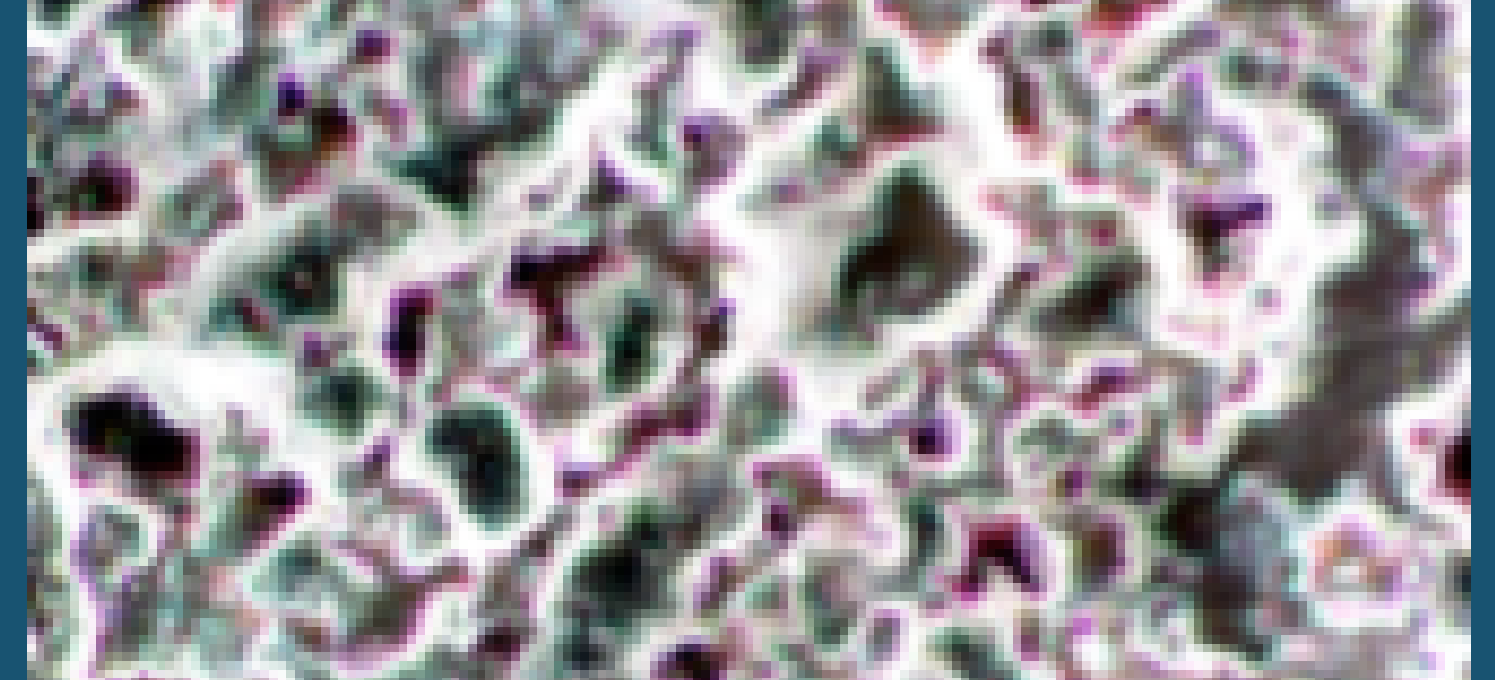
POLYMER PROCESSING EQUIPMENTS

Design, Development and testing of the injection moulding tools,

- Design, Development and testing Extruders classic and thermal, in particular those used in plastising system ,
- Development and testing extrusion heads and injection moulding forms

PHYSICAL, MECHANICAL AND THERMAL PROPERTIES RESEARCH

- Absolute, apparent density
- tensile strength, compression strength, bending strength, deflection arrow (Zwick/Roell Z010 with the climatic chamber od -70 do 350 oC);
- impact strength by: Charpy, Izod, Dystat, impact stretching (Comatech 639F);
- the film's resistance to the impact of the falling arrowhead method;
- the film's puncture test;
- hardness of plastics by: ball pressing, IRHD, Shore (scale D, A, 00);
- surface roughness (13 parameters, TR 200 profilographometer),
- water and oil absorption,
- thermal properties assessment of plastics and plastic products: p-v-T characteristics (pressure - specific volume - temperature) and parameters of the thermodynamic equation of state (pvT-100 device), determination of the softening point (Vicat) and deflection (HDT) of plastics from +80 to +250 0C , (Ceast HV3);
- flammability of plastics, optical smoke density
- thermal imaging (thermal imaging camera V-20 ER005-25);
- abrasion of materials using the Schopper-Scholbach method,
- ultrasound examinations (Olympus Epoch 4 flaw detector);
- colour evaluation (X-Rite Ci4200 spectrophotometer);
- barrier analyzer of materials for O2 CO2 gases;
- surface tension analysis (Kruss DSA25 goniometer).
- Tests in the climatic chamber and in the UV chamber;
- thermal analysis by STA/TG-DSC (Netzsch);
- assessment of the kinetics of vulcanization of rubber mixtures (Mooney plastographometer);
- processability of thermoplastics and thermosets using the spiral cavity method and the flow rate index method (load plastometer, BIP plastographometer and plasticity of the Raschig-Krahl method),
- rheological properties rotary rheometer (Haake);
- supramolecular structure - optical microscopy method in polarized light (Nikon LV 100 ND).





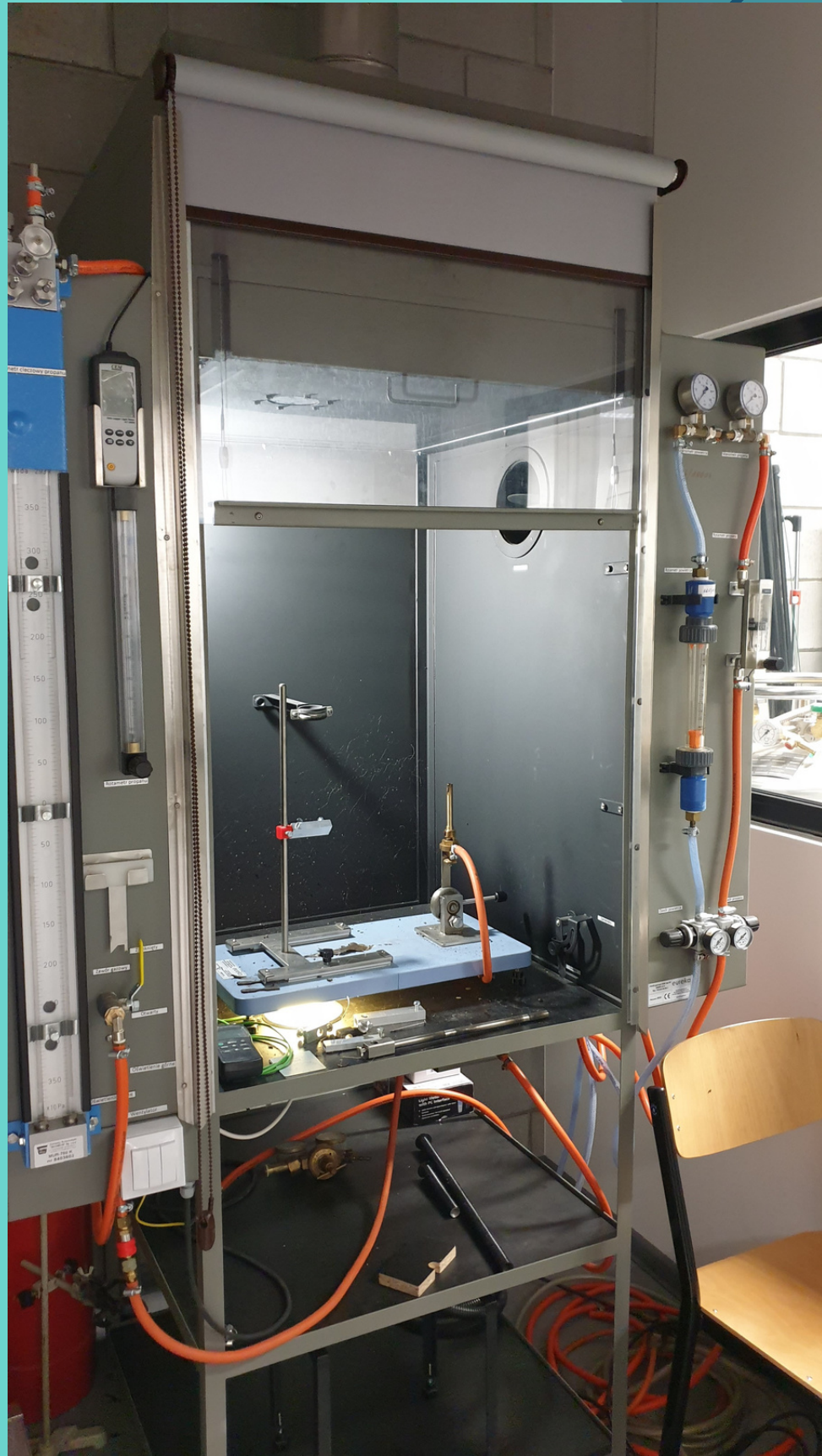
Due to the solution which has joined a business with an education system. We have obtained state-of-art injection moulding machine, free of charge, in return of education future employee's.

Tomasz Klepka
Ph.D. D.Sc. Eng
Head of the Department

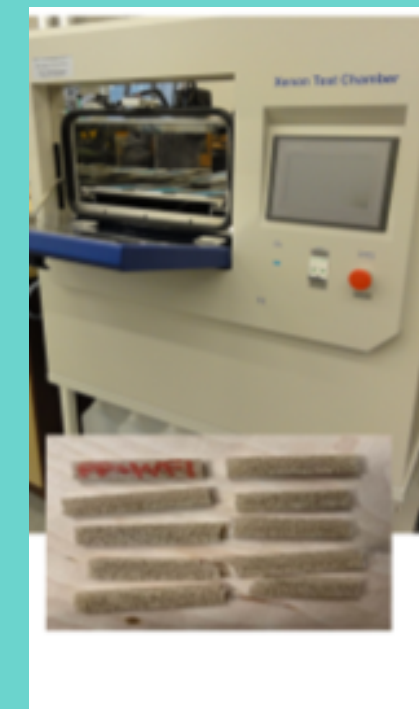
lab's new edition



FLAMMABILITY OF
PLASTICS, OPTICAL
SMOKE DENSITY



ZWICK / ROELL Z010
TENSILE STRENGTH



AGEING CHAMBER
XENON TEST



CLIMATIC CHAMBER

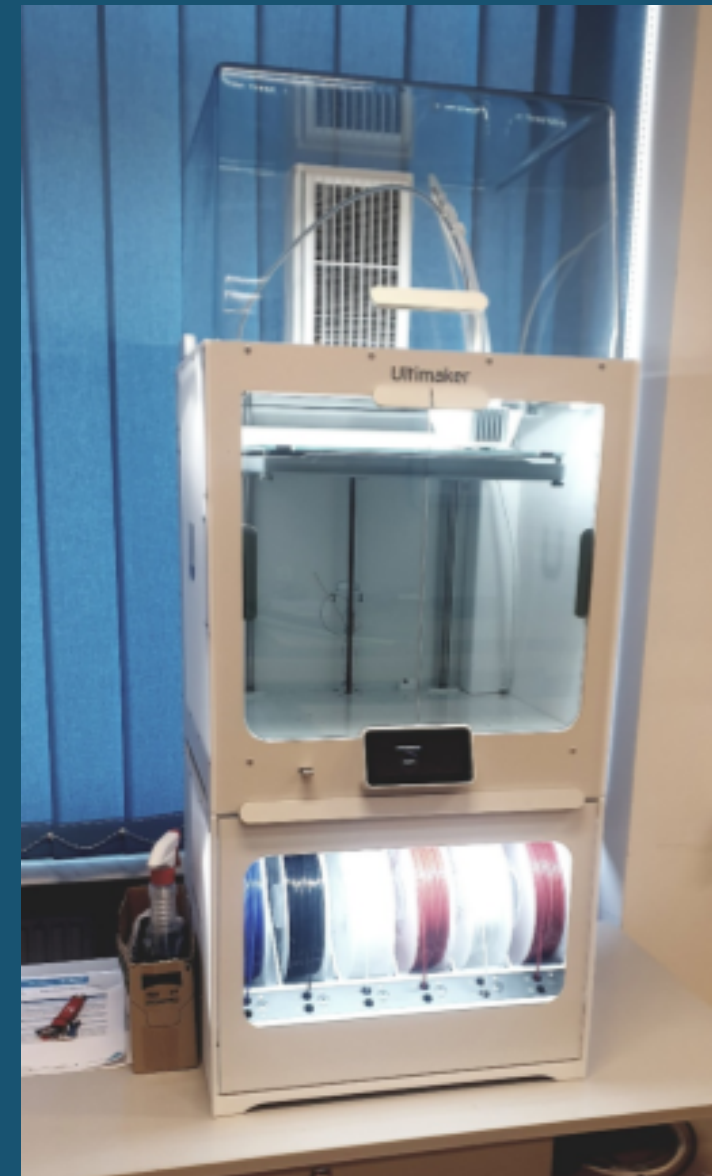


SURFACE TENSION
ANALYSIS (KRÜSS
DSA25 GONIOMETER).

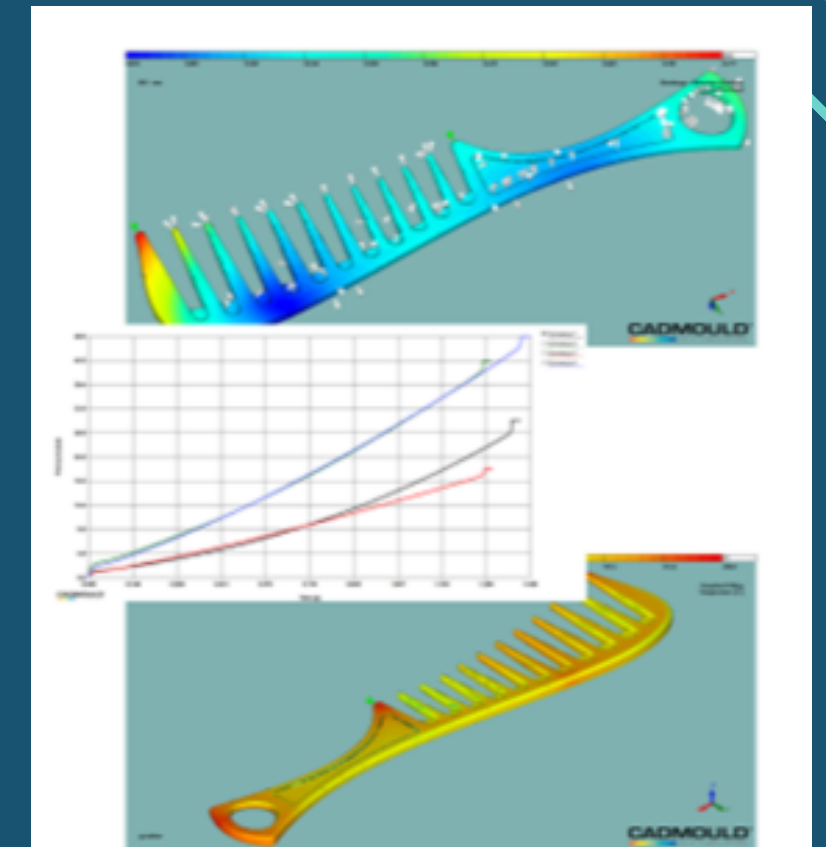
ALSO AVAILABLE



ReMi-Plast APG-80
barrier analyzer of materials
for O₂ CO₂ gases



ULTIMAKER S5
Pro Bundle
Technologia FFF
3D PRINTER
330X240X300 MM



COMUTER SIMULATIONS-
CAMOULD 3D- FIT





EXTRUSION TECHNOLOGICAL RESEARCH

- CLASSIC EXTRUDER (T-32),
- TWIN EXTRUDER (EHP 2x20 Sline),
- EXTRUDER HEAD for pipes and circular bars),
- EXTRUDER HEAD tape and flat tape, film blow moulding (wytłaczarka W-25D);
- Extrusion with active porous structures (change in number of porous, its depth, camber angle, direction and twist angle),
- Extruder with the rotating cylinder.



TECHNOLOGICAL RESEARCH OF POLYMER PROCESSING METHODS

- pressing press (PH-M 63h);
- welding of plastics (pulse welder for PSV 650 foil,
- heat sealer for FR-900 film,
- high-frequency welder ZUT-2B), welding of plastics (Ghibli welding device by Leister),
- foil shaping using Blister, Skin methods (PEX B3F thermoforming machine with a set of replaceable stamping moulds



INJECTION MOULDING TECHNOLOGICAL RESEARCH

- Injection moulding (Arburg Allrounder 320 C 500-170 seria Golden Edition),
- Injection moulding (CS 88/63),
- Piston injection moulding (WT 20Ap).

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