

CONSULTING SERVICES FOR INNOVATION AND TECHNOLOGICAL EXPERTISE FOR ULTRASONIC ACTIVATED INJECTION MOULDS

Goal of the project

In a first stage of the project POS-CCE nr. 439/14.01.2013, Politehnica University Timisoara participated as partner (contract no. BC 19 /20.02.2013) of S.C. Nano Inteliform srl Timisoara for the industrial implementation of a new design concept, with ultrasonic activation of an injection mould, for the manufacturing of the thin wall and small parts formed by injection from thermoplastic polymers.

Short description of the project

As revealed for extrusion, the flow of the melted polymer, under pressure, through the extrusion head is ameliorated due to a synergy between the thermal and the surface effect.

Looking at this possibility, of an improved polymer flow through the mould as consequence of applied vibration, it would be presumed that using ultrasonic energy into an injection mould may :

- reduce the energy requirement in melt processing
- reduce the boundary of the product wall thickness

Two mould configurations with ultrasonic activation (patent applications CBI 00793/2006 and CBI 00792/2006) have been ceded to Nano Inteliform for industrial implementation.

Main activities

- Evaluation of the application opportunities of the ultrasonic activation for the injection moulds.
- Case studies: Technical solutions of the transferred patent applications v. other patents on the theme.
- Design concept of the experimental mould with ultrasonic activation. Technological configuration restrictions.
- DoE and in-situ research.
- Analysis and interpretation of experimental results.

Conclusions for the design of the prototype mould and for optimal parameters settings.

Results

- Industrial implementation of a new design concept for injection moulds, with ultrasonic activation, proposed by the UPT research team in two patent applications
- Improvement of the basic knowledge, technical expertise and design skills of the team in the field of industrial ultrasonic applications.
- Improvement of the technological capabilities and performances of the classic injection moulds and of the parts quality, especially for small and thin wall thermoplastic components

Research Centre

Research Centre for Integrated Engineering

Applicability and transferability of the results

For injection moulds providers, as design concept and an innovative technical solution for improving the performances of the forming devices, transferable within the framework established by the contract with ANCS and by the IP specifications of POS-CCE grant program.

Project implemented by

S.C. Nano Inteliform srl Timisoara, Calea Mosnitei, nr. 21, Timisoara

Implementation period

February 2013 – October 2013

Financed through/by

MEdCI-ANCS, contract de finantare POS-CCE nr. 439/14.01.2013, cod SMIS-CSNR: 41361

Fields of interest

Manufacturing of the small and thin wall thermoplastic components in various industrial branches: home appliance, automotive, electronics, domestic goods e.a.:

- increase productivity and quality of the above mentioned products;
- decrease the manufacturing costs.

Research team

Daniel Stan, Aurel Tulcan, Cristian Cosma, Adrian Dume, Liliana Tulcan, Cristian Turc, Andrei Adam



Contact information

Assoc. Prof. Daniel STAN, PhD
Department of Materials and Manufacturing Engineering
Address: Bd. Mihai Viteazu, No.1, RO300222, Timisoara
Phone: (+40) 256 403 611
E-mail: daniel.stan@upt.ro
Miomir Perita Vlascici
S.C. Nano Inteliform
Calea Mosnitei, nr. 21, Timisoara, mv@inteliform.ro