Laboratory of Numerical Simulations

Principal goals and activities

- Numerical simulation of glass forming processes.
- Optimization of technological conditions, design and cooling of forming tools.
- Solution of strongly nonlinear problems: material and geometric nonlinearities, large displacement, finite strain, contact influence of temperature. Dynamic nonlinear analysis. Multiphysics.
- Contact tasks for description of gripping process: interaction of the product, clamping device, functional accessories, etc.

General focus of laboratory

- Identification of technology problems and their causes.
- Identification of production defects (striae, cracks, shape or size tolerances …).
- Optimization of technological parameters.
- Optimization of design and cooling of forming tools.
- Strength analysis considering real load and real material behaviour.

Specific instruments and outcomes

Work stations, nonlinear solver MSC Marc, Catia, Autodesk Inventor, MATLAB, etc.

Offer of technology and expertise

- Numerical simulation of technological processes. Identification and localisation of technological problems (forming) and their solution in the pre-production stage.
- Increase in quality level, increase in production speed, increase in life of forming tools, increase in dimensional and geometric accuracy of finished products.
- Determination of technological limits and cost reduction for individual production steps.
- Optimization of glass material forming, design and cooling of forming tools.
- Analysis of rheological properties of viscoelastic materials, especially silicate glass.
- Product stress and strain analysis and optimization.
- Analysis of gripping element´s behaviour interacting with the object.