

**RELEVANCE OF PROTOTYPE PRODUCTION AT RESEARCH AND DEVELOPMENT OF NEW  
STRUCTURAL MATERIALS AND PROCESSES**

NOVÝ Zbyšek

*COMTES FHT a.s., Dobřany, Czech Republic, EU***Abstract**

Investigation of new materials and processes usually starts at laboratory scaled stage. Relatively small samples are model processed on different equipment. If resulted material properties are favourable, it is very useful to realize the next stage of the research – a prototype production. Parameters achieved on laboratory scale should be attainable on larger semiproducts. Possibilities to transfer proper technological conditions from small samples to real size prototypes are represented by the procedure using the synergy of both physical and numerical modelling.

Laboratory samples are processed on physical simulators, which load the material of sample by specified deformation and thermal process which had been previously determined by numerical simulation an industrial process. The thermomechanical process should be modified until the material reaches optimal parameters. Another numerical simulation of the industrial process follows, where boundary conditions are adapted to achieve optimized deformation and thermal loading on large semiproducts.

Prototype production regarding forming is performed on hydraulic presses, reversible rolling machine, swaging machine and extrusion equipment in COMTES FHT centre. In the field of heat treatment different furnaces with and without protection atmosphere are available, as well as induction heat treatment facility. Experimental material itself could be casted In vacuum induction melting furnace, which makes it possible check chemical composition and alloying elements during melting.

**Author did not supply full text of the paper/poster.**