

WG#3 SIM-PLAST

Working Group General Information	
Working Group Title	Simulation accuracy for plastics and rubber production
Working Group Short Name	Sim-plast
Short Summary of the Working Group Topic	
The aim of the working group is to develop better understanding of plastics behaviour during the process to predict with better accuracy the filling and deformation of the plastics products.	
Short Summary of the Working Group Goals	
Better simulation software and material data to get more accurate results in simulations.	

Working Group Description

Short description of the Working Group topic
<p>The accuracy of the virtual injection moulding offers huge possibilities to save in the production itself as well as in the investments in production tools. Moreover, virtual injection moulding offers a way to speed up the start of serial production, which is one of the most important factors affecting the profits of European companies.</p> <p>The goal is to create an overall chain from product design to reliable, optimized production with no steps that are not planned and optimized at the earliest possible phase to guarantee optimal output of the production in the fastest time possible. The virtual environment enables the use of new technologies in the development phase (rapid tooling, structural analysis, etc.), tools manufacturing, actual production, statistical quality control and artificial visual inspection.</p> <p>Developing software versions that will also run through the Internet will offer smaller and medium-sized companies an opportunity to use these new sophisticated methods with no big investments, providing them the economical possibilities to optimize their production, too. This, however, requires the training of several technical support persons in all regions of Europe, so they can give to these smaller companies the support they need to benefit from these new technologies.</p>
Background. Reasons why this Working Group is needed.
<p>At present, there are only few simulation software packages on the market, and they do not have a sufficient accuracy to allow the simulation to indicate the real behaviour of the injection moulding process. While the simulation can be used to avoid major flaws in production tools, it is not suitable for precise planning of the injection moulding process or for optimizing the processing window to minimise waste and quality problems. At the same time the competition in telecommunication and medical equipment market and in automobile industry is intensifying and the products are getting thinner and lighter. Production cycles are also getting shorter, which is particularly true of the ever shorter time-to-market. Companies in these sectors have sought methods to get more precise devices to estimate and pre-evaluate their products and processes.</p>
Working Group goals.
<p>By means of this better accuracy it is possible to develop procedures</p> <ul style="list-style-type: none"> • to optimize the quality and measures of expensive production tools. • to optimize the strength of rapid tools • to optimize the process window of production machines • to optimize statistical quality control limits • to minimize waste percentage and costs • to minimize time-to-market

- to shorten the time required to teach artificial vision and automatic quality control devices
- to get savings of about 30% in production costs and 50% in time-to-market

The expected impact of the working group.

The goal of the working group is to achieve such quality and accuracy of the virtual injection moulding process that European companies could compete on the market with far better optimized and automated production, and benefit from the maximal use of automation and quality control in their production. If the goal is attained, it will be possible to achieve 30% savings in the production costs and 50% savings in the time-to-market delay. The total savings of European companies would amount to about EUR 40 billion and would increase their market share in telecommunication, medical devices and vehicle industries by about 20%.