

### Scientific leader

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### ABSTRACT

Injection Moulding is one of the main polymer forming process, offering high volumes, high precision and high added values. Polymer parts are used for large consumption applications (automotive industry, domestic and electric applications, toys...) but also for sophisticated high technology products (electronic devices, biomedical implants, lenses, optic fibres connectors, DVD...). Part dimensions range from very large size (automotive dashboards) to very small ones (micromechanics, electronic components...). Polymer converters are numerous (and relatively scattered) in Europe, close to 30000 companies, often SME, involving over one million employees.

In "classical" injection moulding, there are increasing demands for process control, dimensional stability and properties insurance. More demanding are "emerging technologies" such as microproducts or large size parts but with surface reproduction at the microscale. Strong limitations remain due to a lack of knowledge of the physics of these small scale non equilibrium processes. Only a combined effort of advanced numerical and experimental expertise will allow significant improvements in these two domains.

The Piam Coordination Action Proposal aims at initiating a wide consortium of European experts involved in all aspects of the injection moulding process (processing, material science, physical and numerical modelling, mechanical properties...). These experts belong to academic and industrial research centres, but also to technological research centres which are closely connected to SME. Putting together this wide range of expertise will result in setting the basis for the development of a new generation of predictive tools for polymer injection moulding accounting for the more achieved physical models and numerical techniques.

Such tools should contribute in lowering the cost, improving the quality and enlarge the domain of application of injection moulded parts. It will then increase competitiveness of any of the industrial partners involved: polymer suppliers, machine and mould designers, polymer converters and end-users. Moreover, the Coordination Action will induce a broad dissemination in a wide range of other polymer forming processes (extrusion and film processing for example)

Finally PIAM Coordination Action will be the cradle where new research projects dedicated to injection moulding will merge, where advanced courses or training modules will be developed, and where new technological transfer tools will be initiated.

# PIAM

[www.piam.cemef.org/](http://www.piam.cemef.org/)



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