

In the last decade the number of applications of micro components has increased steadily. Mass fabricated products either in the form of micro three-dimensional parts or for larger components with micro/sub-micro structured surfaces have been developed, produced and implemented into many products in different sectors. Due to these major developments, polymer micro products have played a primary role due to the possibility to be replicated by means of high throughput processes based on plastic moulding (injection moulding, micro injection moulding, hot embossing). The integration of multiple subcomponents in a single multi-material part, allows the production of enhanced properties microparts.

In recent years, there is an increasing trend towards miniaturization in many sectors of the European industry due to the extraordinary advantages and new possibilities that multi-material microsystems-based products can offer, becoming, in most cases, in an economic and technological key factor for the majority of industrial applications. Highly miniaturized systems (health care, automotion, communications ...) manufactured by a wide variety of materials and technologies (including the new concept of "converging technologies") represent a global market of several tens of B€ with a significant annual growth, being mostly polymer-based micro-systems. The leading role in the polymer replication industry is played by Small and Medium Enterprises (SMEs) (near to 40.000 enterprises) which employes around 2 Million people and presents a turnover close to 200 B€. However, even European industry is the worldwide technology leader, the increasing market demands imply the need of expansion of micro-fabrication process capabilities for mass manufacture multi-material micro-components and miniaturized parts incorporating functionalized micro or nano features, in order to achieve high quality products and significantly reduce the time to market and costs in order to succeed in this global market place.