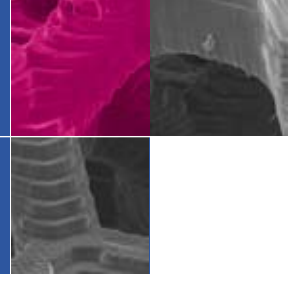
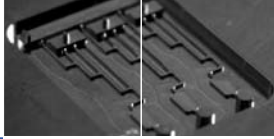
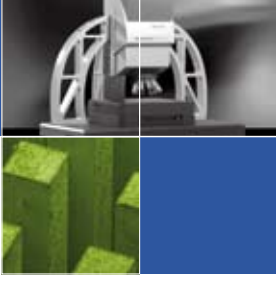


A global approach  
from materials to applications.



A European Large-Scale Project supported through the Seventh Framework Programme  
for Research and Technological Development.





## Today's challenges

The trend towards ever-smaller products showing ever-smaller features down in the range of sub-micron and even nanometer scale is continuously progressing and leading to a demand for polymer-based micro-mechanical systems, which will require complex shaped and even multi-material components which cannot be produced using the available techniques.

In order to support European manufacturers in this context, existing micro fabrication techniques and tools need to be adapted and modified, which means that micro replication technologies such as micro injection moulding and hot embossing have to be improved significantly. Furthermore, automated part-assembly and highly sophisticated quality

control techniques need to be established.

The COTECH project was initiated in order to further develop manufacturing and process technologies for the production of polymer-based micro-mechanical components and systems. The aim of COTECH is to develop and to demonstrate new approaches of converging technologies and hybrid solutions for the manufacturing of polymer-based micro-mechanical components and systems.



## What does "COTECH - COncverging TECHnologies" mean?

To shorten time to market and to reduce costs, the vision of modular desktop or micro factories evolved. The micro factory of the future has to enable the further concentration and combination of complementary techniques (e.g. micro injection moulding and hot embossing, micro injection moulding and localized coating) as well as to significantly improve replication accuracy and possibilities, to realise automated assembly steps and to include highly sophisticated quality control techniques in all steps of the process chain.

To prepare the future micro factory for the polymer processing industry COTECH aims at concentrating and combining complementary techniques by converging technologies and developing hybrid solutions in the full process chain of micro production.

### The following three approaches will be investigated:

- **Concentration and combination of process technologies** enabling the production of multi-material and/or multi-form polymer-based micro-mechanical components and systems.
- **Hybridisation** of complementary replication technologies.
- **Concentration and combination of different processes for master and tool production** needed for the replication processes.

## COTECH goals and objectives

### The main objectives of COTECH are:

- **to develop and to demonstrate** new micro replication techniques supported by emerging tool-making technologies for the manufacturing of polymer-based multi-material components
- **to introduce and to demonstrate** new micro replication techniques combining capabilities of different processes or techniques based on micro injection moulding
- **to implement** global process chains for the manufacturing of polymer-based micro-mechanical components and systems. This will be supported by the use of new advanced simulation models and "in-situ" non destructive testing procedures.
- **to demonstrate** the capability of producing high added value micro devices with advanced functionalities by means of realizing 8 demonstrators coming predominantly from the areas of healthcare and automotive industry.

## COTECH demonstrators

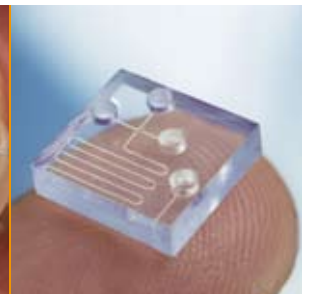
- Multifunctional integrated lighting device
- Self-ligating dental bracket
- Substrate for the production of artificial skin
- Micro socket for signal carriage of a hearing instrument
- Accommodable intra-ocular lens
- Smart diagnostic chip
- Cooling device for electronic components
- Lens for cell phone flash lights



Photos source: Aktion Meditech



Photos source: BVMed



### be innovative

Accommodable intra-ocular lens

### CRP

LED-based rear lamp for cars

### Euroortodoncia

Self-ligating dental brackets

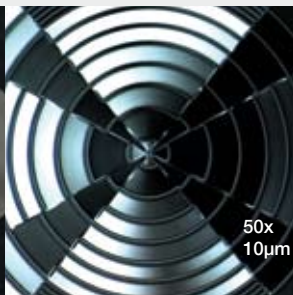
### Greiner Bio-One

Smart diagnostic chip



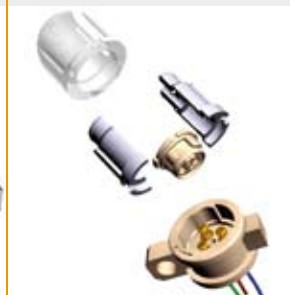
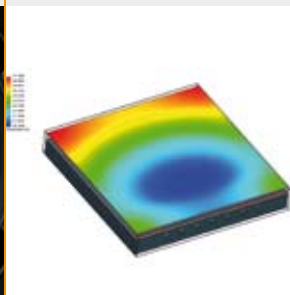
### Heptagon

Micro lens for cell phone flash light



### Atherm

Cooling device

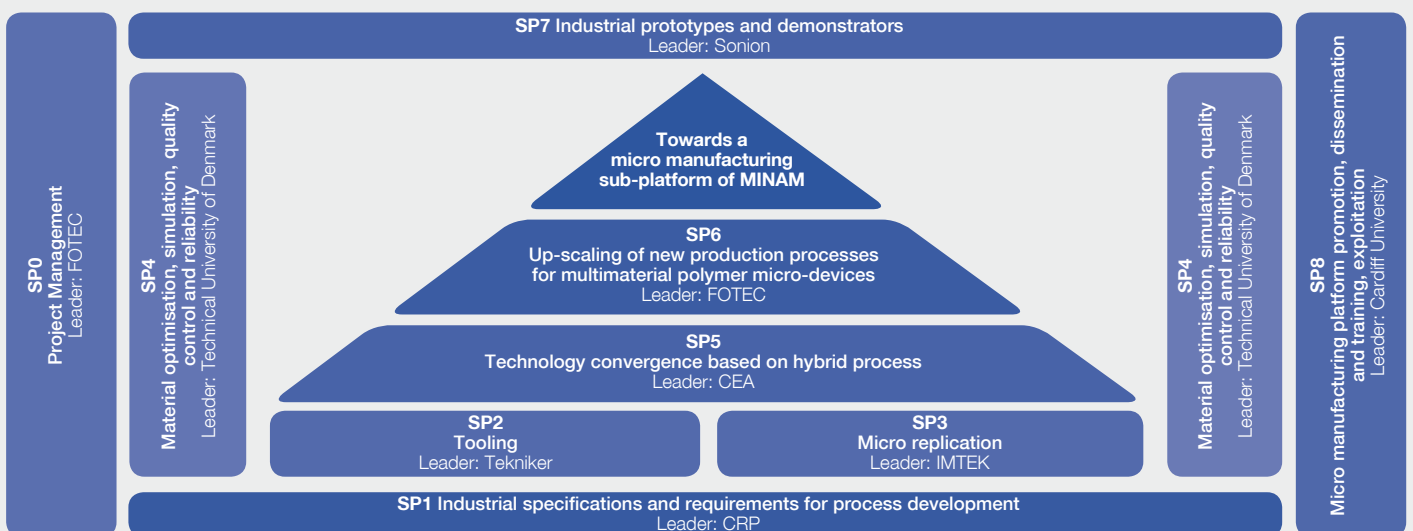


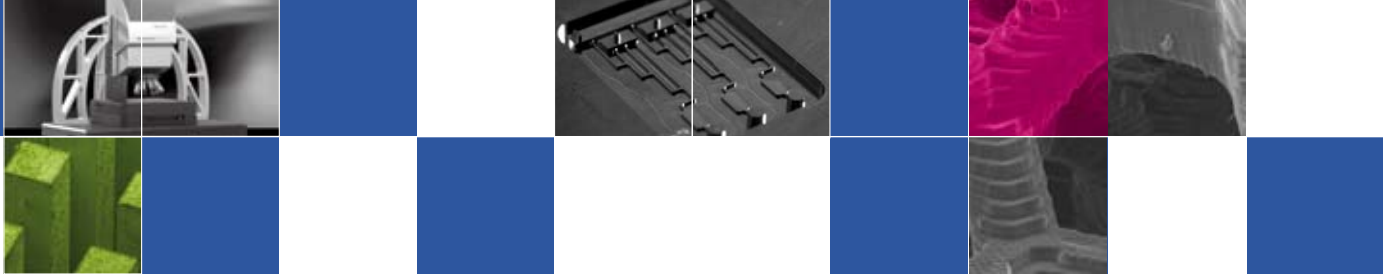
### Sonion

Micro socket for signal carriage of a hearing instrument

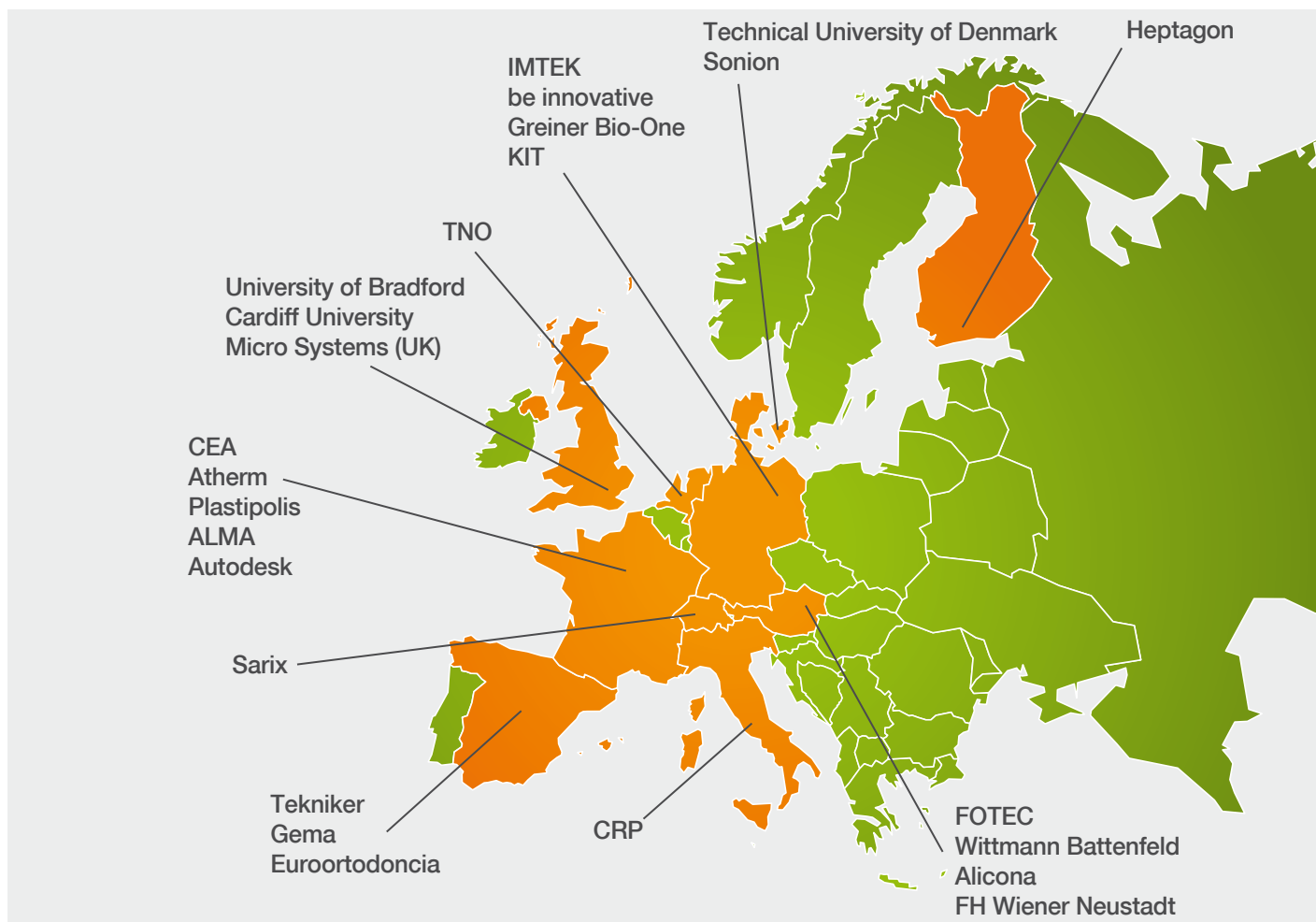


## COTECH work plan





## COTECH consortium



## Acknowledgement

Supported by the European Commission through the Seventh Framework Programme for Research and Development with up to 6 Mio €, out of a total budget of 8,5 Mio €.

The COTECH project addresses the area "NMP – Nanosciences, Nanotechnologies, Materials and new Production Technologies".

The project started on 1<sup>st</sup> of October 2008 and will last 48 months.



[www.fp7-cotech.eu](http://www.fp7-cotech.eu)

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