

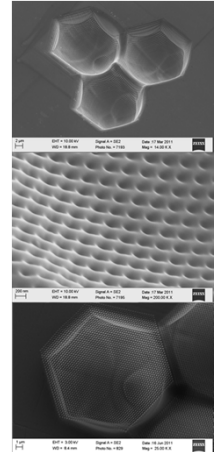
Injection Moulding for Nano- and Microfabrication

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Technological Benefits

- Injection moulding offers decisive advantages for nano- and micro-manufacturing:
 - a wide range of processible polymers, metals, and ceramics
 - very high economic efficiency in medium/large-scale fabrication
 - complex shaped 3D parts (singular items or nanostructured bodies)
 - a large diversity provided by sophisticated sub-variants



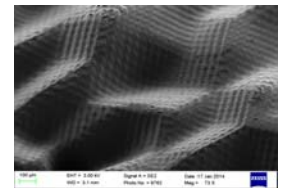
Projects

- Establishing the nano-size area of replication :
Ommatidia (moth-eye) structures; mould inserts made by Focused Ion Beam (FIB)
Replication by both injection moulding and injection compression moulding

User: Cardiff University

- Polymeric Fractal Scaffolds in Biotechnology
Use of fractal surfaces for improved cell motility and controlled growth.
Replicative process enabled identical parts thus statistically reliable results

User: Universidad Politecnica de Madrid

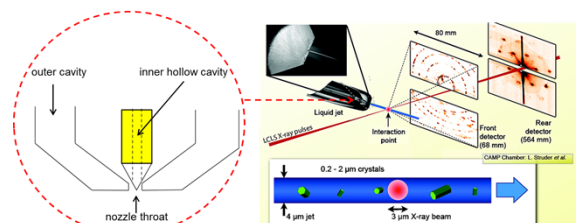


- Processing of nanopowders by Micro Inmould-labelling to enhance PIM towards nano-manufacturing: nanopowder-filled tapes + PIM feedstocks + co-sintering

Users: CEA, SVEREA, Fraunhofer IKTS, Keranor



- Collaborative project with **DESY**:
Liquid jet nozzles for CFEL (European X-ray free-electron laser)

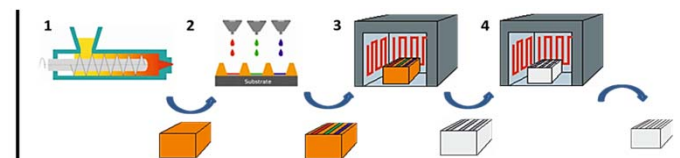


Outlook

- Increased application of multi-material process variants

- Hybridization of processing technologies
e.g. PIM + Additive Manufacturing

1. Micro PIM
2. 3D inkjet printing
3. Debinding
4. Sintering



- Offer the whole range from prototyping up to very large-scale production using polymers, metals, and ceramics