

Micro Nano Patterning

Mastermaking

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Material class:	Silicon	Polymer X	Metal X	Ceramic X	Glass	Organic	Other

Short technology description:

The mastermaking process consists of micro structuring processes of mould inserts and shims for replication processes like electroforming, injection moulding and hot embossing. In addition it targets the preparation of these mould inserts to integrate them into a standard mould for replication. The mastermaking facilities are including the following technologies:

- Micro Milling, Kern HSPC 2216
- Micro-EDM, AGIE Comp. 1 Micro & Vertex machines
- Micro EDM Milling system SARIX SX-100-HPM 3D
- Grinding

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    graph LR
      A[Grinding] --> B[Structuring]
      subgraph B [Structuring]
        B1[μ Milling]
        B2[μEDM Milling]
        B3[μ WEDM]
      end
      B --> C[Preparation and Integration of Mould inserts into standard mould tools]
      C --> D[Replication by μ-Injection Moulding or Hot Embossing]
  
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Typical structures and designs:

	<p>Mould insert</p> <ul style="list-style-type: none"> – overall dimensions 10 mm – smallest features 30 μm – produced by micro milling – material: stainless steel
	<p>Mould insert</p> <ul style="list-style-type: none"> – material: stainless steel
	<p>Mould insert</p> <ul style="list-style-type: none"> – with micro fluidic channels – material: brass
	<p>Array of columns</p> <ul style="list-style-type: none"> – machined by wire EDM 80x80 μm – aspect ratio 50:1 – material: tungsten carbide

Special features:	<ul style="list-style-type: none">- High aspect ration for WEDM machining- High speed micro milling down to feature size of 30 μm
Limitations, constraints:	<ul style="list-style-type: none">- Maximum work piece sizes up to 4" or 100mm
Material examples:	<ul style="list-style-type: none">- Metals, e.g. stainless steel- Ceramics, e.g. tungsten carbide- Alloys, e.g. brass- EDM processes limited to conductive material