

RMPD[®] - Solutions for microfluidic Applications

Micro-fluidic structures made of plastics

The trend in Diagnostics and Therapy is towards personalized medicine ("Point-of-care"). Farmers ask for fast Antibiotica tests on milk. Pharmaceutical industry requires high through put tests to determine efficiency of new pills.

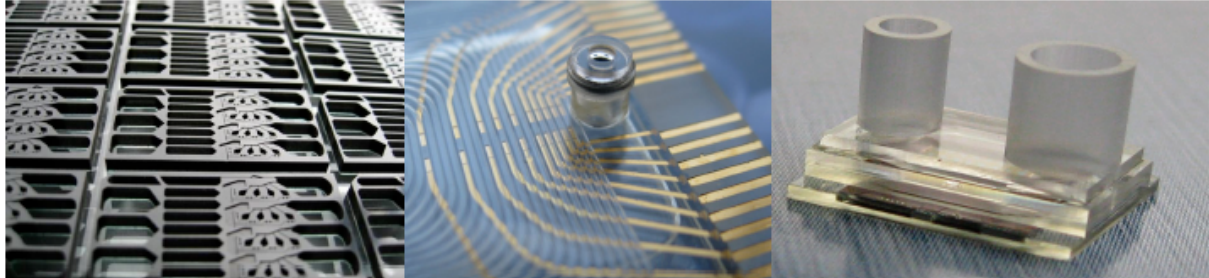
If these demands are familiar to you then you will know about the need for so-called "Lab-on-Chip systems". Fast and cost efficient solutions for development and manufacturing of the required disposals are needed. With RMPD[®], technologies are available that can provide micro-fluidic structures fast and at reasonable prices.

No expensive tools are required, neither for prototyping nor for series production. With the accuracy of the RMPD[®] processes of just a few micrometers and a wide range of materials (more than 300 different plastics), the fluidic systems and "Lab on a Chip" can be produced, in which biological and chemical processes occur by utilizing the intelligent effect of capillary forces.

Compare the capabilities of the RMPD[®] processes with others manufacturing technologies. Contact us, we you convinced to find the best solution for your microfluidics application.

| Materials and Processes | Benefit |
|---|---|
| Multi-material parts enabled | <ul style="list-style-type: none"> • Two or more different materials can be combined in one part to achieve unique functionalities • Combine transparent and black polymer in one part • Combine hydrophilic and hydrophobic materials • Build sealing structures directly on your device |
| Intrinsic hydrophilic and hydrophobic materials | <ul style="list-style-type: none"> • No coating required, property remains for long time (> 2 years) • Capillary flow enhancement • Fluidic stops |
| Low fluorescence materials | <ul style="list-style-type: none"> • Low fluorescence materials to choose from, |
| Microstructure metal layers available | <ul style="list-style-type: none"> • In microfluidics primarily useful for the integration of electrodes |
| Integration of other materials | <ul style="list-style-type: none"> • Integration of other materials, e.g., gaskets, glass window, magnets, |
| Fluidic interconnections | <ul style="list-style-type: none"> • Inserts possible, e.g., O-Rings ($D_a = 1,5 \text{ mm}$, $d_i = 0,75 \text{ mm}$) with underpressure resistance down to 0,3 bar |
| Integration and interconnection | <ul style="list-style-type: none"> • Microelectronic components can be integrated, like thinned silicon chips, peltier elements, and much more |

Success with Solutions for Applied Micro- and Nanotechnologies



| Materials and processes | Benefit |
|---------------------------------------|--|
| Accuracy | <ul style="list-style-type: none"> • Sharp edges, smallest curve angle around 1 micron • Vertical Sidewalls (no draft angle needed) |
| RMPD [®] is a batch process | <ul style="list-style-type: none"> • Many parts are generated at the same time, thus cost reduction |
| Environment friendly | <ul style="list-style-type: none"> • UV light only needed, no baking needed, almost zero shrinkage |
| The only tool is a mask | <ul style="list-style-type: none"> • No expensive tooling required • One week only for a complete re-design cycle • Low redesign cycle costs |
| Design recommendations | Benefit |
| Channels, chambers, cavities, pillars | <ul style="list-style-type: none"> • No draft angle (0°) • High aspect ratios, > 100 possible • Minimum channel width 10 microns • Maximum depth of a structure 20 mm • Surface roughness Ra 20 nm at bottom • Minimum radius at <i>inside</i> corners less than 1 µm • Minimum radius at <i>outside</i> corners less than 1 µm • Minimum distance between two structures 10 microns • Stepped structures possible • Undercuts possible |
| Bottom thickness | <ul style="list-style-type: none"> • 100 µm or less possible, suitable for confocal microscopy |
| Sealing of channels | <ul style="list-style-type: none"> • Options available, e.g., RMPD[®] covalent bond generates “solid” component, adhesive tapes, ... • Standard: chip and cover are same polymer |
| Coatings | <ul style="list-style-type: none"> • Various coatings are possible, e.g., Parylene |
| CAD import/export formats | <ul style="list-style-type: none"> • Solidworks, STEP, IGS, DWG, DXF, |