

## Towards Functional Polymers For Nanoimprint Lithography – Strategies And Achievements Of The Napa Materials Subproject

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The progress and performance of nanoimprint lithography (NIL) is closely linked with the availability of resists or polymers, which meet all the specific requirements of this technology. Polymers are needed not only working as classical resists to be removed after the pattern transfer. For other applications, e.g. micro and nanofluidics, they also have to serve as permanent materials. Mechanical properties, especially appropriate flow behaviour, play a key role. Depending on the specific application further properties may become important.

Six partners develop new polymers and provide them to the project partners for testing and various applications. Three main routes are followed as shown in the scheme.

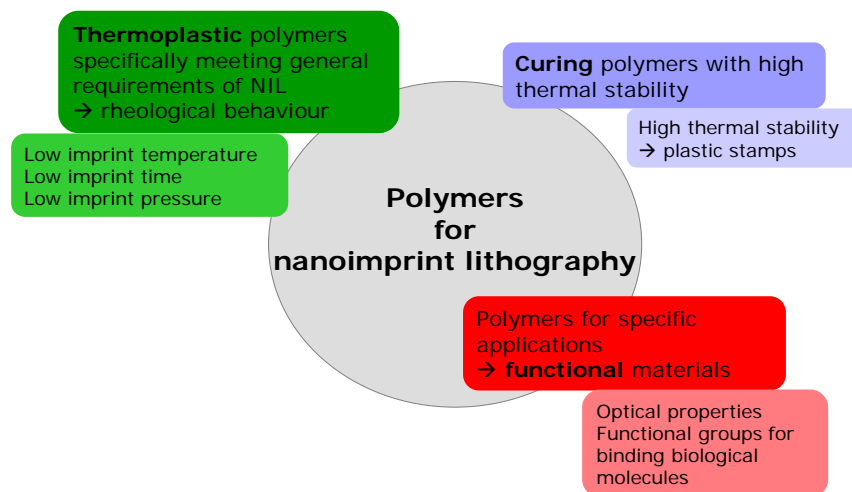


Figure 1: Main routes to polymers for NIL

Copolymerisation is the tool of the polymer chemist to tailor the chemical and physical properties of the polymers. Modification of the polymers is also accomplished by doping of polymers for NIL with various kinds of nanoparticles. Modification of imprinted polymer films or polymer films before imprinting by plasma treatment allows controlling the surface properties and generating defined chemical environment (biocompatibility, hydrophobic, hydrophilic surface). Curing polymers offer the approach to isothermal imprinting and have a large potential for permanent applications.

A survey of the approaches and many examples of polymer modification are presented.