Growing Up, Additive Processes in MEMS Fabrication and Packaging

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The most important growth factor in nature is light. Its secrets have been the basis of several technological revolutions. Growth through light is the paragon of generative technology.

Light can not only be used for the polymerization of organic materials, but also for the structured growth of inorganic structures. Thus, light provides us with an ideal and cheap tool for production.

For the production of MEMS, we need the capability to combine organic and inorganic materials with their different properties in the smallest possible space. The mechanical, electrical, optical, chemical and biological functions can be deposited from the gaseous or liqued state with nanometer scale accuracy according to the desired property using light.

Today, the question posed by Richard Feynmann at the annual meeting of the American Physical Society at the California Institute of Technology: „Is there a physical process for the synthesis of any arbitrary chemical substance?“ can be answered with „yes“.

The relevant physical processes span a range from the well-known photopolymerization process to the deposition of molecules induced by focused electromegnetic radiation and the two-photon process for polymerization.

An important condition for the economic application of these processes is a build-up rate appropriate to the desired volume, or, figuratively put, „small bricks for small houses and big bricks for big houses“. Also of importance is the compatibility fo the physical processes and conversion to a batch (large-scale, mass-production) process.

The RMPD technologies have combined these principles, offering the possibility of the integration of electronic parts using 3D-CSP, the integration of electrical, optical biological and chemical functions using RMPD-multimat while possesing a build-up rate appropriate to the volume scale.

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