Micro-ceramic Technology

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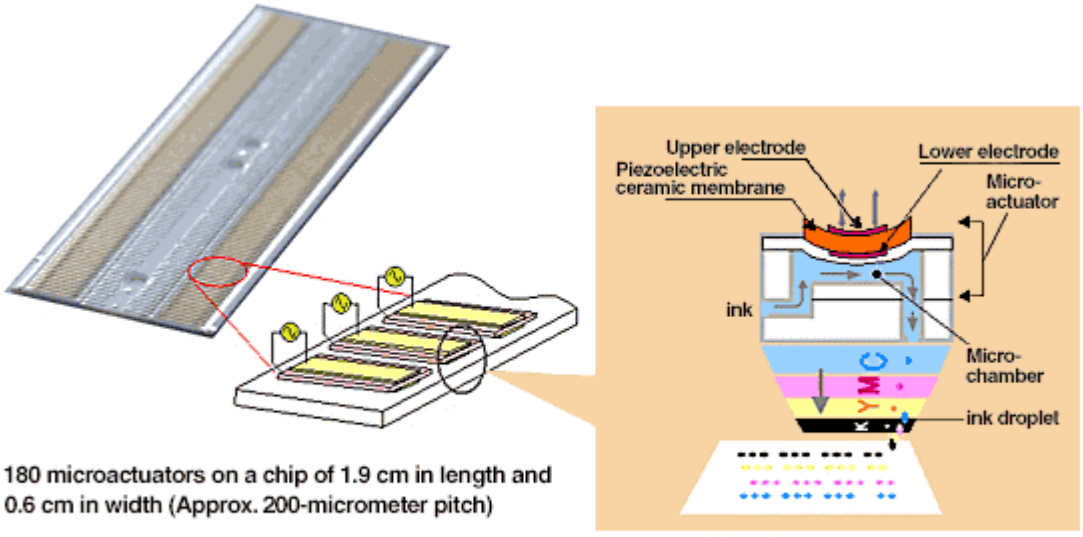
Micro-ceramic Technology

Coupling fine ceramics with advanced thin piezoelectric membranes, NGK aims to create a world of silicon micromachine with ceramics. Tape casting technology for producing ultra-thin ceramics, micro processing technology and high-precision firing technique enables a structure with high durability, reliability and responsibility.

Microactuators

Combining high-performance piezoelectric membranes with ceramic microchamber, microactuators for inkjet printers work as micropumps, which add pressure responding precisely to each signal sent from printers, thereby forcing ink droplets out of nozzles. Microactuators feature high preciseness of controlling ink droplets, realizing the image quality exceeding that of silver halide photographs.

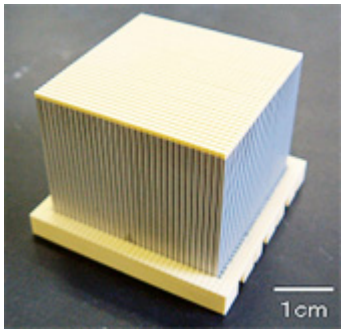


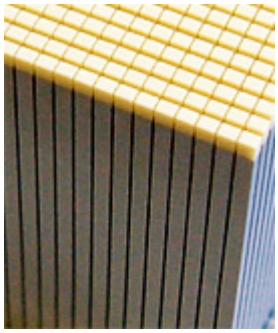
180 microactuators on a chip of 1.9 cm in length and 0.6 cm in width (Approx. 200-micrometer pitch)

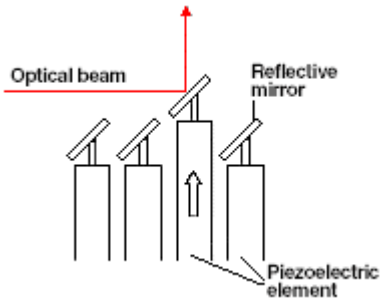
Actuator (ACT) of 50 μm in thickness
Control of 4-picoliter (10^{-12}) ink droplets

Piezo Actuator Arrays

NGK has developed its original micro-ceramic technology that enables two-dimensional array of a number of ultra-thin piezoelectric ceramic elements, which expand and contract when voltage is applied. This technology realizes the piezo actuator arrays, which feature a long stroke. And now under development are mobile communication devices, motion devices and optical communication devices including actuators for optical switches*, by exploiting the technology of integrating extremely small functional elements that have the properties characteristic of piezoelectric ceramics such as large generative force and high responsibility.







Piezo actuator array with 32 X 32 matrix (1024 elements)

(*) Mounted on Mitsubishi Electric Corporation's bascule optical switches.

About Myself

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