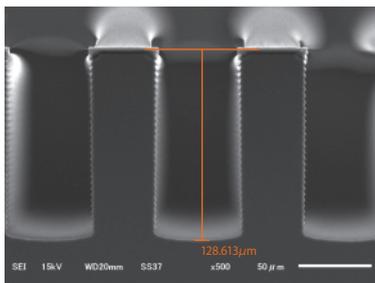


Si DRIE System RIE-400iPB

High-Speed, Deep Silicon Etching for R&D

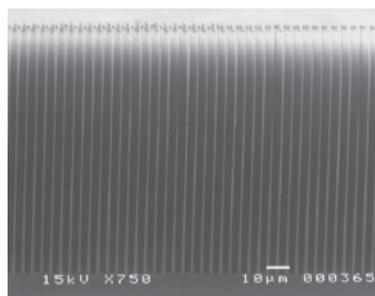
In 2003, Samco became the first of Japan's semiconductor process makers to obtain a Bosch Process License and began selling high-speed, deep silicon etching systems the following year. In 2009, based on positive experiences and achievements with those earlier systems, the "RIE-400iPB" system specializing in high-speed, deep etching of maximum 4-inch silicon wafers for R&D entered the market. The RIE-400iPB has a compact footprint and is easy to maintain. It shows high performance in MEMS processing, and is also very precise in high-speed silicon etching processes. The RIE-400iPB is being used in a wide range of research fields because of its variability in system configuration, and is effective in SiO₂ processing for next generation materials that have recently taken the spotlight. Below are examples of RIE-400iPB process data.

High-speed etching



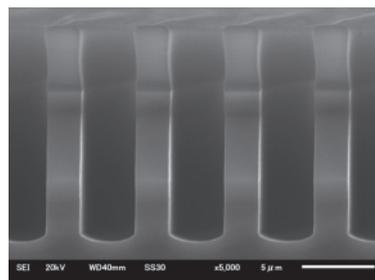
Rate = 18 μm/min
 Pattern Width = 50 μm
 Depth = 128 μm

High-aspect ratio etching



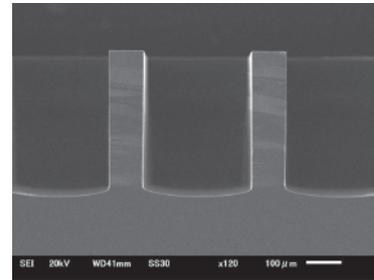
Aspect Ratio = 33
 Pattern Width = 3 μm
 Depth = 100 μm

Low-scallop etching



Pattern Width = 4 μm
 Depth = 10 μm
 Rate = 1.25 μm/min

Wide trench etching

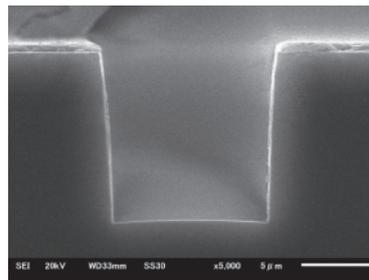


Pattern Width = 300 μm
 Depth = 420 μm
 Rate = 6.4 μm/min

Additionally, the formation of notches, resulting from a charge-up on the insulation layer surface on SOI substrates, can be constrained through process modification.

High-speed SiO₂ etching

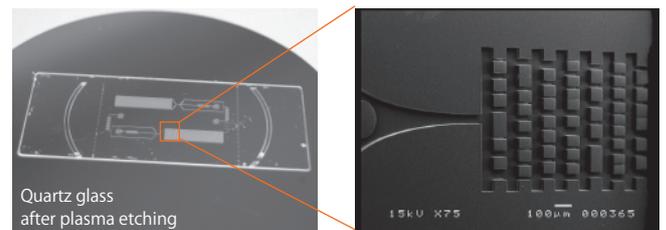
High speed SiO₂ etching is feasible



Rate = 560nm/min
 Pattern Width = 10 μm
 Depth = 11.2 μm

Micro channels, having widths and heights from tens to hundreds of microns, are just one example of SiO₂ applications. Because SiO₂ is a transparent material without its own fluorescence, observation through optic microscopes necessary for biology becomes possible. SiO₂ is superior to simple resin materials like silicone rubber. By using SiO₂, molecule adhesion and transparency, as well as mechanical characteristics affecting surface modification and pressure etc., are greatly improved. The RIE-400iPB, capable of SiO₂ micro processing, is an indispensable tool for microbiological and nano-biological research.

Creation of micro channels



Images provided by Osaka University