

# NANOCHANNEL GLASS MATERIALS

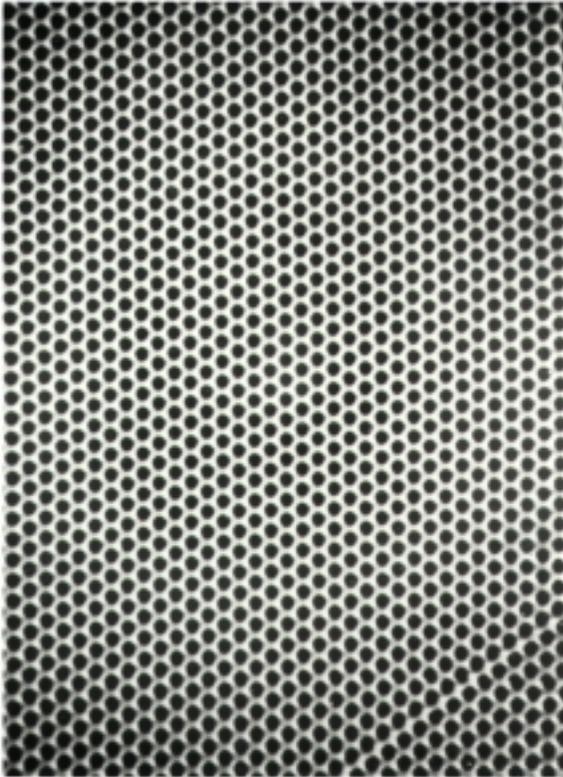


Fig. 1– Scanning Electron Micrograph of 450-nm diameter hollow channels arranged in a hexagonal close packing array



Fig. 2–Bundled glass fibers packed in an array and drawn to reduce overall cross section of individual channels

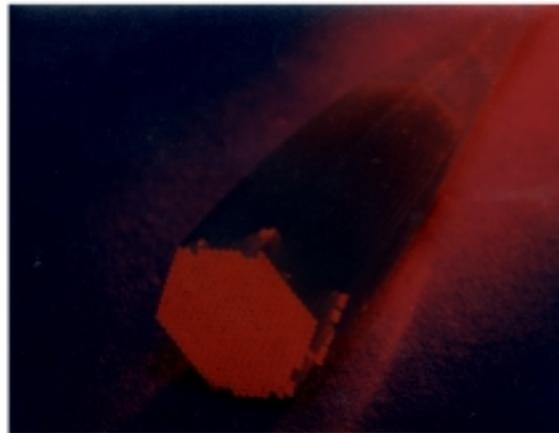


Fig. 3–Glass bundle built up from array filaments in Fig. 2 and drawn down

Nanochannel glass materials are complex glass structures containing large numbers of parallel hollow channels. In its simplest form, the hollow channels are arranged in geometric arrays with packing densities as great as  $10^{11}$  channels/cm<sup>2</sup>. Channel dimensions are controllable from microns to tens of nanometers, while retaining excellent channel uniformity. Exact replicas of the channel glass can be made from a variety of materials. Channel glass applications include:

- Filters for particle sizing for monodispersion of particle sizes
- Material for chromatographic columns
- Unidirectional conductors
- Nonlinear optical devices
- Masks for semiconductor development, including ion implantation, optical lithography, and reactive ion etching.

Three patents have been issued, two others are pending. Nanochannel glass technology is expanding and is available for licensing and cooperative research and development efforts.

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