CapTite Capillary Fittings and Microfluidic Chip Manifolds and Interconnects

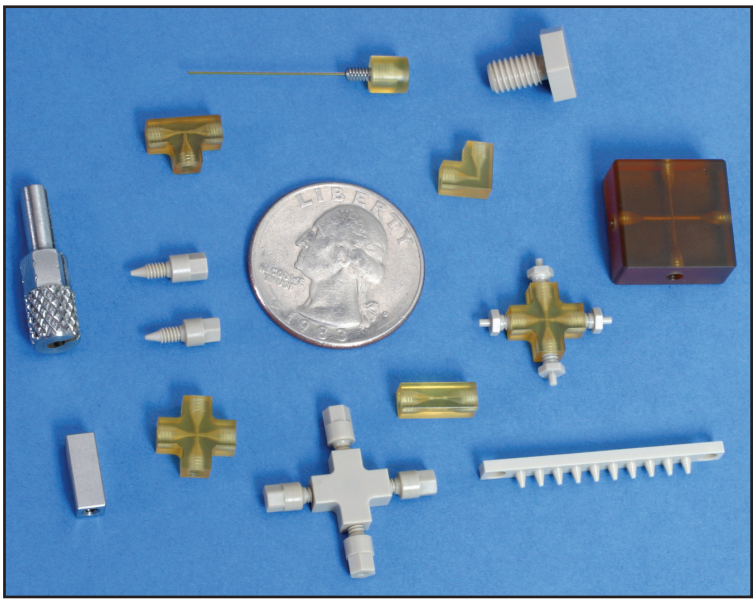
Fact Sheet

Leveraging our strengths in microfluidics and integrated systems, research engineers at Sandia National Laboratories have developed a unique suite of microfluidic capillary fittings and capillary-to-microchip manifolds and interconnects.

These micro-scale machined junctions provide consistent fluid connections with zero dead volume, can be produced at low cost and offer many advantages. Even the smallest connectors can be finger-tightened and manipulated without tools. They can be fabricated from any machinable material, and are chemically resistant, biocompatible, and autoclavable.

The ***CapTite***™ collection of capillary fittings and junctions is designed around a unique one-piece ferrule that eliminates the need for sealing sleeves. The complementary ***ChipTite***™ series of manifolds and interconnects provides an elegant capillary-to-microchip interface.

Microfluidic and lab-on-a-chip products are expected to provide superior benefits in many important markets including pharmaceuticals, biotechnology, life science, defense, public health, and food/agriculture. With applications in proteomics, genomics, HPLC, micro-mechanical and micro-hydraulic assemblies, this innovative product set has the potential to become essential to those markets and more.



The CapTite™ collection of capillary fittings are based on our exclusive one-piece ferrule (patent pending).

The ChipTite™ series of manifolds and interconnects is fully compatible with CapTite™ and is easily adaptable to multiple chip configurations.

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Microfluidic Capillary Fittings and Microfluidic Chip Manifolds and Interconnects

CapTite™ Capillary Fittings

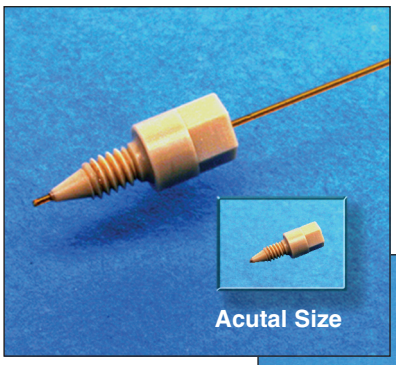
Designed around a unique one-piece ferrule, the CapTite™ collection of capillary fittings and junctions offers a modular solution to microfluidic designs.

Features

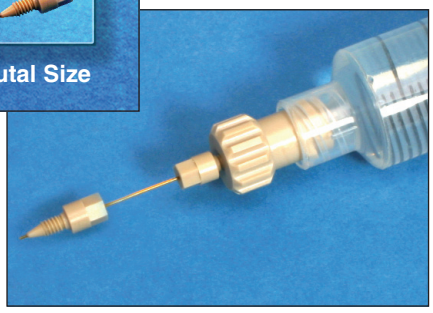
- Applications from vacuum to ultra-high pressure
- Direct swage-seal to microtubes
- Fabricated from any machineable material
- Works with any capillary materials
- One-piece design eliminates need for sleeves
- Easily finger or tool tightened
- Reliable, clean, repeatable make-and-break seal
- Capillary pre-locatable prior to assembly
- Wide range of multi-port and conversion fittings

Specifications

- Approximate dimensions: 3.5 mm × 8 mm long, 2-56 thread series
- Pressure ranges:
  - One-piece TwistTite™: up to 5,000 psi
  - One-piece ToolTite™: up to 10,000 psi
  - Two-piece design: up to 40,000 psi
- Reusable, hundreds of cycles



Cap-Tite™ Ferrule



Cap-Tite™ to Luer-Lock™ Connection

ChipTite™ Microchip Manifolds and Interconnects

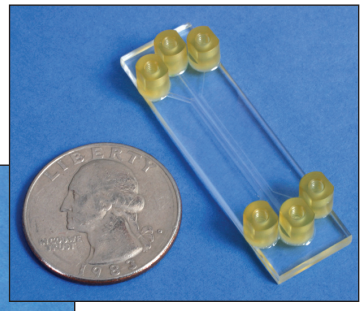
This versatile collection of capillary-to-microchip interface parts is fully compatible with all CapTite™ fittings, providing consistent fluid connections with simple and accurate alignment.

Features

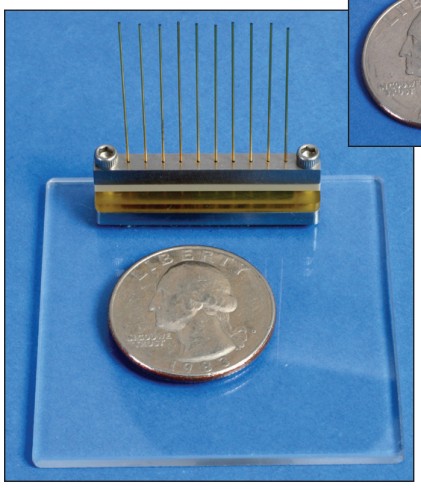
- Reversible seal (make-and-break or chemically solved)
- Applications from vacuum to high pressure
- Can be manufactured from any machineable material
- Amenable to multiple geometries
- Individual, multi-port, and arrayed configurations
- Enables minimum hole spacing
- Bonded or compression seal options
- Easily adapted to multiple chip footprints/configurations

Specifications

- Approximate dimensions: 5.5 mm dia. × 5 mm long
- Minimum port-to-port: 2.5 mm (0.1")
- Pressure Ranges:
  - *Compression type (o-ring seal)*: vacuum to 800 psi
  - *Bonded type*: vacuum to >5,000 psi



Chip-Tite™ Bonded-port



Chip-Tite™ Multi-port

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