Customized Ceramic Parts

Medical & Dental
- Orthodontics
- Implants and Abutments
- Surgical Instruments

Industrial
- Micro Nozzles
- Synthetic Fibre Production Tools
- Wire Guides

Electronic
- Pick and Place Tools
- Wire Bonding Capillaries
- Glass Fibre Guides

Small Precision Tools (SPT) is the leader in Ceramic Injection Molding (CIM) of complex microminiature components. SPT's CIM process lends itself to high-volume or low-volume components where demanding tolerances are required.

Your one stop solution provider for CIM

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www.spt.net/cim

SPT small precision tools

Ultra Precision Ceramic Injection Molding

SPT small precision tools

CIM Process

CIM is a combination of particulate materials, injection molding and sintering science. CIM is a very repeatable manufacturing process that is best suited for components that are difficult, costly or impractical to produce via traditional techniques.

CIM is a net-shape process that offers designers the advantages of ultra-hard materials without the costs associated with other manufacturing methods.

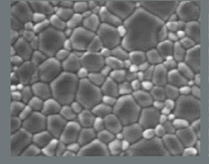
- **Design and Mold Making**
  Design support by SPT Ceramic Engineering and in house mold making – the key for success!

- **Injection Molding**
  Tailored machines are used to inject the feedstock into a mold to achieve highest reproducibility of complex geometries.

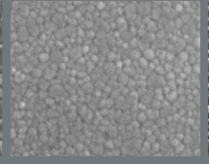
- **Sintering**
  Depending on the material, the parts are sintered in the appropriate parameters of temperature, time and atmosphere.

- **Finishing**
  Most features and surface finish are attainable out of the mold. Applications that require post finishing are then completed.

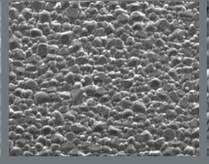
Ceramic Material



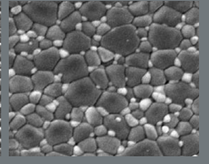
Al_2O_3 99.99% Microstructure



ZrO_2 Microstructure



ZTA with Orange Skin



ZTA Microstructure

Today's **Fine Ceramics** provide excellent solutions to tough engineering challenges; they excel where traditional materials fall short. Thanks to the reproducibility of our manufacturing processes, these multipurpose materials can be produced in an economical manner in a wide variety of shapes and quantities.

In house preparation of our feedstock materials allows optimization of the physical properties of the selected ceramic material.

Typical Characteristics of Ceramics
- Ultra-hard
- Biocompatible
- Chemically inert
- Physically stable
- High strength
- Excellent surface finish
- Insulating
- Tribological

Resistant to
- High temperature
- Wear
- Corrosion
- Bending strength

For more information visit
www.spt.net/cim

Micro holes and complex geometries with challenging tolerances are achievable

SPT pushes the limits of what's possible always further! Wire Bonding Capillaries with tip diameters of 50µm with boreholes of 15µm which are used in microchip manufacturing are a success story among many others.

- 15 µm holes
- Tolerances of ± 1 µm at selected areas
- Hardness 1100-2200 HV1- depending on selected properties
- Translucent Al_2O_3 as choice