Technology Metals | Advanced Ceramics

Ceramic Injection Molding

H.C.Starck
Empowering High Tech Materials

Ceramic Injection Molding - Available in all Process Steps

H.C. Starck Ceramics is a leading company in the flexible production of engineering components made of high resistance ceramics. We develop innovative solutions in close cooperation with our clients and implement them quickly. We are equipped to carry out virtually all steps of the process of the net product in our own facilities.

H.C. Starck Ceramics has been working in the field of ceramic injection molding (CIM) for more than 10 years now. In the nineties, the first silicon nitride feedstock was developed at CFI (Cremer Forschungsinstitut). At the beginning of the year 2000, this feedstock was successfully used to produce valve plates for the common rail diesel technology. After the merger of CFI with TeCe in Selb to form H.C. Ceramics in 2001, this CIM technology was continued and expanded.
All processing steps, feedstock, injection, sintering and hard machining, are available at H.C. Starck Ceramics.

The preferred material is silicon nitride. However, recently newer developments include feedstock based on zirconia and silicon carbide. These materials are also available on request.

CIM parts are used for engineering, in medical applications and for design components.

Materials Table

	ZrO_2 white	ND-SSN N7000
Density [g/cm³]	> 6.0	> 3.20
Average fracture strength RT [MPa]	800	800
Weibull module RT [-]	> 10	> 15
Fracture toughness [MPa√m]	5.3	6.7
Hardness (HV 10) [GPa]	12	15
E-module (RT) [GPa]	210	290
Heat conduction (RT) [W/mK]	2	25
Coefficient of thermal expansion (RT-1000 °C) [x10⁻⁶ K⁻¹]	11.0	3.4
Resistivity RT [Ωm]	$10^8 – 10^{13}$	$10^{11} – 10^{12}$
Thermal shock coefficient R1 [K]	280	592
Maximum use temperature [°C]	800	1000

Materials:

- **Silicon nitride**
  Drawing dies
  Medical engineering
  Engineering
- **Zirconia black**
  Design components
- **Zirconia**
  Medical engineering
  Textile engineering
  Engineering
- **Feedstock**
  Silicon nitride
  (others on request)

H.C. Starck Ceramics is a member of "Expertenkreis Keramikspritzguss" in DKG e. V.

The values in this publication are typical values and do not constitute a specification.

HDW 04/09

H.C. Starck Ceramics GmbH

Lorenz-Hutschenreuther-Straße 81
95100 Selb / Germany

T + 49 9287 807-0
F + 49 9287 807-477

info@hcstarck.com
www.hcstarck-ceramics.com

H.C.Starck
Empowering High Tech Materials