

CeramaZirc Ultra Tough HIP

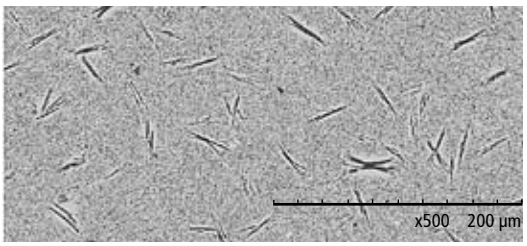
Advanced High Fracture Toughness Zirconia Composite

Dubbed 'ceramic steel', Zirconia (ZrO_2) ceramic materials offer a combination of high hardness, wear and corrosion resistance while still maintaining one of the highest figures for fracture toughness available.

CeramaZirc Ultra Tough HIP is an advanced zirconia-based ceramic composite material based on partially stabilized zirconia and an enhanced crystal structure and is the latest and toughest composite to be introduced by Precision Ceramics.

Key properties of CeramaZirc Ultra Tough HIP

- Use temperatures up to 1500°C
- Hot isostatically pressed (HIP'ed) for superior strength and reliability
- No compromise between bending strength, hardness and fracture toughness
- Remarkably high fracture toughness and impact resistance while maintaining above average values for bending strength and hardness
- Toughening by crack deflection provided by a unique microstructure in a partially stabilized zirconia matrix
- Increased resistance to hydrothermal aging through Ceria partial stabilization



Typical uses of CeramaZirc Ultra Tough HIP

- High pressure equipment- ball valve balls and seats – particularly suitable for applications where mechanical shock, impacts and/or vibrations are present
- Ultra high pressure pumping elements
- Flow control devices for ultra-high pressure equipment - stems and seats for high pressure homogenizers
- Deep well down-hole valves and seats
- Rollers and guides for metal forming

CeramaZirc Ultra Tough HIP

Density [g/cm^3] = 5.7
Flexural Strength [MPa] = 1000
Compressive Strength [MPa] = in excess of 2000
Young's Modulus [GPa] =235
Poisson Ratio =0.29
Hardness HV $_{0.5}$ [GPa] = 13
Fracture toughness K_{Ic} [MPam$^{1/2}$] = 17
Max use temperature [°C] = 1000 *(under load)*, 1500 *(no load)*
*K_{Ic} toughness as measured by the Indentation method

N.B. Values presented are mean values for the samples tested and are given as an indication only for the purpose of comparing between different materials. The properties of the actual material might vary slightly and could be affected by the shape and size of the part.

www.precision-ceramics.com
Advanced Technical Ceramic Solutions

PRECISION CERAMICS USA, INC.
9843 18th St North, Suite 120, St. Petersburg, FL 33716
Tel: (727) 388 5060 Fax: (813) 435 2020
Email: info@precision-ceramics.com
www.precision-ceramics.com