CeramAlloy Ultra Hard

Ultra High Performance Zirconia-Alumina Toughened Composite

Alumina-Zirconia (ZTA) ceramic composites are unique ceramic materials by way of exhibiting a combination of high hardness, strength, wear and corrosion resistance characteristics to their alumina component while still maintaining reasonably high fracture toughness specific to its zirconia component.

Precision Ceramics offers a range of high performance Alumina/Zirconia ceramic composite materials consolidated by a combination of conventional sintering and hot isostatic pressing ensuring excellent mechanical properties and increased reliability. Their very high hardness makes them particularly suitable where challenging mechanical wear is present.

CeramAlloy Ultra Hard

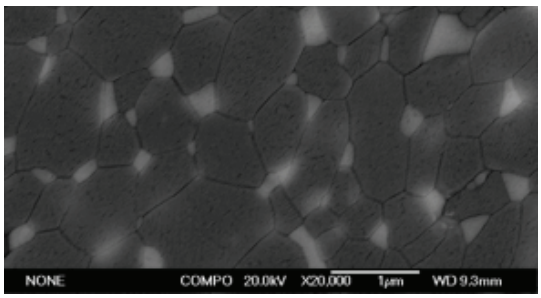
- High performance Alumina/Zirconia ceramic composite
- Hot isostatically pressed for very high mechanical properties and enhanced reliability
- Excellent balance between bending strength, hardness and fracture toughness

Typical Uses of CeramAlloy Ultra Hard

- High pressure equipment - ball valve balls and seats - particularly suitable for high flow/abrasive fluids
- Focusing nozzles for abrasive media
- Ultra high pressure pumping elements
- Deep well down-hole valves and seats
- Rollers and guides for metal forming
- Thread and wire guides
- Metal extrusion dies

Key properties of CeramAlloy Ultra Hard ceramic composite materials

- Use temperatures up to 1,500°C
- Chemical inertness
- Excellent wear resistance
- High bending strength
- High hardness
- Good fracture toughness



CeramAlloy Ultra Hard	
Density [g/cm^3]	4.18
Flexural Strength [MPa]	850
Compressive Strength [MPa]	3000
Young's Modulus [GPa]	350
Poisson Ratio	0.22
Hardness HV $_{0.5}$ [GPa]	21.5
Fracture toughness K_{Ic} [MPa/m^2]	5
Max use temperature [°C]	1500
Thermal expansion coefficient [x10^{-6}/°C]	7.5
Thermal conductivity [w/mK]	20
Thermal shock resistance [ΔT °C]	200

*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.

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