



# CraftAlloy™ Ceramic Diamond

## Significantly Enhanced Wear Life & Performance with the Strategic Use of the Hardest Materials on Earth

Crafts Technology designs & manufactures components & sub-assemblies that incorporate Ceramic Diamond.

CraftAlloy™ Ceramic Diamond is an engineered material that possess above 75% diamond material with binders such as Silicon Carbide.

CraftAlloy™ Ceramic Diamond is 4x harder than Tungsten Carbide & tougher than Polycrystalline Diamond (PCD).

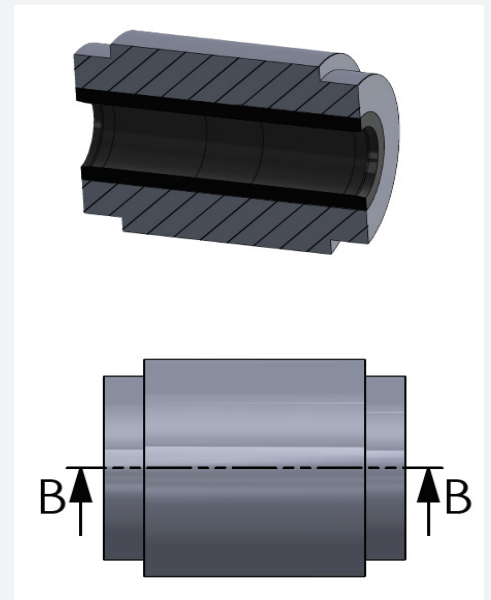
Current restrictions with Diamond level hardness material, like PCD, restrict the use of the material to only relatively small layers. The composition of CraftAlloy™ Ceramic Diamond alleviates this restriction and allows complete parts to be constructed from the material.

**4X HARDER THEN TUNGSTEN CARBIDE**

**EXCEPTIONALLY HIGH CORROSION RESISTANCE**

**ABILITY TO ACHIEVE UNMATCHED COEFFICIENT OF FRICTION**

**ASSEMBLE TO VARYING METALS TO ACHIEVE SUBSTANTIAL BENEFITS**



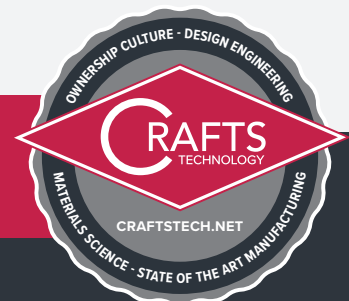
### Application Considerations

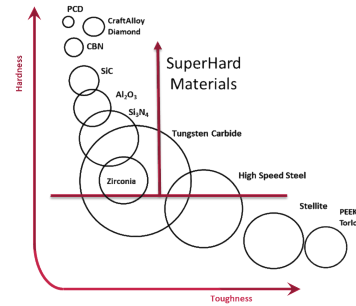
- Composite Machining: Drilling
- Fluid Dispensing: 3D Printing Nozzles
- Injection Molding: Guides & Bushings
- Fluid Handling: Pins, Bushings, Seals
- Battery Tooling: Compaction

Property	Description	Polycrystalline Diamond (PCD)	CraftAlloy™ (Ceramic Diamond)	Tungsten Carbide
Composition	Diamond Content (%vol)	85 - 95	75 - 85	n/a
Diamond Grain Size	Microns, typical	Multiple	15 - 35	Multiple
Density	g/cm <sup>3</sup>	3.9 - 4.1	3.25 - 3.75	12 - 15
Stiffness	Elastic Modulus (Gpa)	850 - 1,150	890	450 - 650
Strength	Transverse Rupture Strength (Mpa)	900 - 1700	935	3,200 - 4,400
	Compressive Strength (Mpa)	4400	5200	4,000 - 7,000
Hardness	Knoop Hardness (3kg load) (kg/mm <sup>2</sup> )	> 4,000	3,750 - 4,000	800 - 1,500
	Thermal Conductivity (W/mK@25C)	500 - 600	360	100
Heat Transfer	Linear CTE @25C	1x10 <sup>-6</sup>	1x10 <sup>-6</sup>	4.5x10 <sup>-6</sup>

Our engineering team is ready to discuss your application and offer solutions.

800-323-6802  
engineering@craftstech.net





# SuperHard Material Properties Guide

Material Family	High Speed Steel	Tungsten Carbide						Zirconia Ceramic			Silicon Nitride	Alumina Ceramic		Silicon Carbide	Diamond	
		M Series	C6-F	C6-SM	C10-SM	C15-SM	N10C-SM	N9.6C0UF	MG-PSZ	3Y-TZP		8Y-FSZ	SSN		ZTA	99.9% Al2O3
Wear Life	-	=	=	=	=	=	=	=	=	=	+	+	+	+	+	+
Toughness	+	+	+	+	+	+	+	+	+	+	=	=	=	-	=	-
Corrosion Resistance	-	=	=	=	=	+	+	+	+	+	+	+	+	+	+	+
Heat Transfer	=	=	=	=	=	=	=	-	-	-	=	-	-	+	=	=
Electrical Conductivity	+	+	+	+	+	+	+	-	-	-	-	-	-	=	+	+
Thermal Stability	-	-	-	-	-	-	-	=	=	=	+	+	+	+	-	-
Raw Material Cost	+	+	+	+	+	+	+	=	=	=	-	=	=	-	-	-
Manufacturing Cost	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
Mass (Density)	=	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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