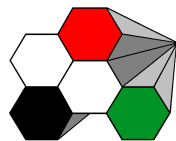
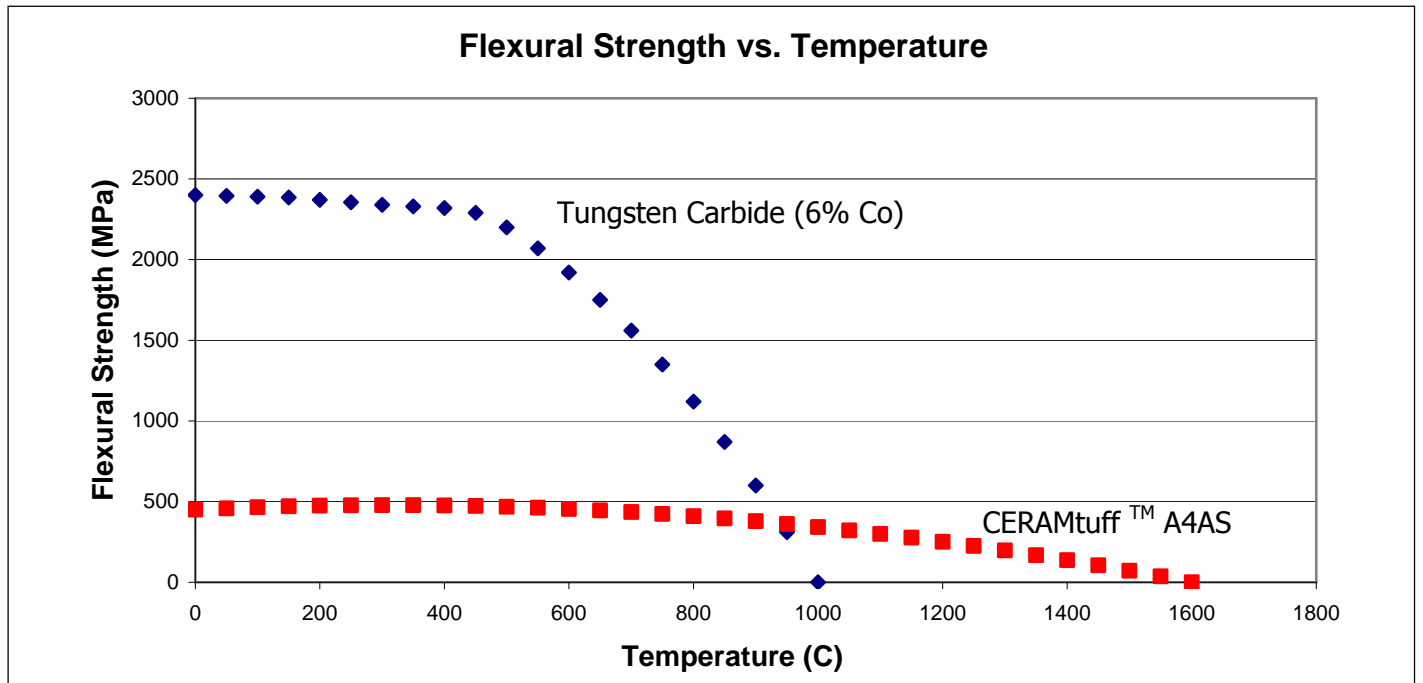


# CERAMtuff™ Wear-Resistant Products

Press-Ready Ceramic Blends Containing Aluminum Oxide and Silar® Silicon Carbide Whiskers

Typical Properties						
Property	Units	CERAMtuff™ Grade		Alumina (99.5%)	Zirconia (TZP)	Tungsten Carbide (with 6% Co)
		A4AS	S7			
Density	g/cm <sup>3</sup>	3.87	3.74	3.89	6.07	14.5
Flexural Strength (4 pt bend)	MPa	450	500	380	1350	2400
Young's Modulus	GPa	385	390	360	205	610
Vickers Hardness	GPa	18.3	18.8	17.0	13.5	20
Fracture Toughness (Indentation)	MPa·m <sup>1/2</sup>	4.5	6.8	4.0	8.5	15
Thermal Conductivity	W / m·K	26	31	25	2.2	94
Coefficient of Thermal Expansion	10 <sup>-6</sup> / °C	7.2	7.0	7.6	10.0	5.0
Thermal Shock Resistance (ΔT)	°C	400	700	200	350	-



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