

ZTA

ZTA-Based Ceramics by Ceramforge

Chemical Composition

Element/Oxide	15ZTA (ZTA15) - 15% ZrO ₂	20ZTA (ZTA20) - 20% ZrO ₂
Al ₂ O ₃ (Alumina)	~85%	~80%
ZrO ₂ (Zirconia)	~15%	~20%
SiO ₂ (Silica)	<0.5%	<0.5%
MgO (Magnesia) / Y ₂ O ₃ (Yttria) (Stabilizers for Zirconia)	0.1–0.5%	0.1–0.5%
Other Trace Oxides (TiO ₂ , Fe ₂ O ₃ , CaO, etc.)	<0.5%	<0.5%

Note: These values are approximate and may vary depending on the specific processing and material grade.

APPLICATIONS

Aerospace & Defense

Structural components, thermal insulators, and wear-resistant parts.

Pumping

Pump components such as valve seals, bushings, Pistons etc

Industrial Machinery

Bearings, nozzles, and wear plates for extreme environments.

Automotive Energy

High-performance engine parts, and insulation parts.

ZTA

Properties

At **CeramForge**, we prioritize innovation and quality, ensuring that our **ZTA ceramics** deliver unmatched **performance and reliability** across various industries.

	Property	ASTM Method	Units	ZTA 15	ZTA 20
General	Color	-	-	White	White
	Gas Permeability	-	atms-cc/sec	gas tight <10 ⁻¹⁰	gas tight <10 ⁻¹⁰
Mechanical	Water Absorption	C 20-97	%	0	0
	Density	C 20-97	g/cc	4.15	4.30
	Hardness Vickers 500 gm	Vickers 500 gm	kg/mm ²	1470	1450
	Hardness	-	R45N	82	82
	Fracture Toughness	Notched Beam	MPa·m ^{1/2}	6	6
	Flexural Strength (MOR) (3 point) @ RT	F417-87	MPa	580	620
	Tensile Strength @ RT	-	MPa	350	360
	Compressive Strength @ RT	-	MPa	2750	2750
	Elastic Modulus	C848	GPa	330	330
	Poisson's Ratio	C848	-	0.23	0.23
Thermal	C.T.E. 25 - 100°C	C 372-96	x 10 ⁻⁶ /C	6.0	6.0
	Thermal Conductivity @ RT	C 408	W/m K	24	24
	Max Use Temp (Celsius)	-	Celsius (°C)	1500	1500
Electrical	Dielectric Constant @ 1 MHz	D 150-98	-	12.5	12.5
	Dielectric Loss @ 1 MHz	D 150-98	-	0.0006	0.0006
	Volume Resistivity, 25°C	D 257	ohms-cm	1 x 10 ¹⁴	1 x 10 ¹⁴

Note: These values are approximate and may vary depending on the specific processing and material grade.

KEY PROPERTIES

- **Exceptional Wear Resistance**

Ideal for high-friction environments such as pump components, cutting tools, and industrial seals.

- **High Strength & Toughness**

The addition of zirconia (15-20%) enhances fracture toughness and impact resistance, outperforming standard alumina ceramics.

- **Thermal & Chemical Stability**

With excellent resistance to high temperatures and aggressive chemicals, our ZTA ceramics excel in extreme conditions.

- **Precision Engineering**

Our advanced manufacturing processes, including hot isostatic pressing (HIP), precision grinding, and polishing, ensure tight tolerances and superior surface finishes.

Innovating Ceramics. Advancing Industries.

For Further information,
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