

Technical Data:

Product Description

Alumina (Al₂O₃) offers outstanding thermal conductivity and electrical insulation, while Zirconia (ZrO₂) boasts exceptional mechanical strength and wear resistance. Alumina-Zirconia blends the best of both worlds, ideal for high-stress components. Silicon Carbide (SiC) ensures unrivaled hardness and chemical resistance, perfect for challenging environments. Silicon Nitride (Si₃N₄) excels with thermal shock resistance, making it a top choice for gas turbine engine parts. Finally, Boron Carbide brings lightweight armor and abrasion resistance, setting the standard for defense applications.

Features and Applications

Grade	Features	Applications
Alumina (Al ₂ O ₃)	High hardness, wear resistance	Cutting tools, bearings
Zirconia (ZrO ₂)	High fracture toughness, strength	Valves, seals, sensors
Alumina-Zirconia	Improved strength and toughness	Structural components
Silicon Carbide (SiC)	High temperature strength	Automotive, aerospace parts
Silicon Nitride (Si ₃ N ₄)	Thermal shock resistance	Turbine components
Boron Carbide	Extreme hardness, chemical resistance	Armor, nozzles, seal rings

Chemical Composition

Material	Al ₂ O ₃	ZrO ₂	Al ₂ O ₃ -ZrO ₂	SiC	Si ₃ N ₄	B ₄ C
Alumina (Al ₂ O ₃)	99.50%	-	Variable	-	-	-
Zirconia (ZrO ₂)	-	94%	Variable	-	-	-
Alumina-Zirconia	Varied	Varied	Varied	-	-	-
Silicon Carbide	-	-	-	100% SiC	-	-
Silicon Nitride	-	-	-	-	Si ₃ N ₄ 100%	-
Boron Carbide	-	-	-	-	-	B ₄ C 100%

Physical and Mechanical

Alloys	Status	Tensile Strength	Yield Strength	Impact Strength	Hardness	Young's Modulus	Poisson's Ratio	Elongation	Density
		Mpa	Mpa	J	HRB	Gpa	Ratio	% in 25.4 mm	g/cm ³
Alumina (Al ₂ O ₃)	-	330	270	5	1650	370	0.22	0.1	3.9

Note

The above data are reference material science data. This data reference is not binding and is not considered as authoritative test data. If your material requirements are extremely precise, please contact our material engineers. Tel | +86 18926788217 | Web | www.newayprecision.com | Contact Neway



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Zirconia (ZrO ₂)	-	900	600	7	1200	200	0.3	0.5	6.1
Alumina-Zirconia	-	500	400	6	1500	300	0.25	0.3	4.5
Silicon Carbide (SiC)	-	400	350	4	2800	410	0.14	0.3	3.1
Silicon Nitride (Si ₃ N ₄)	-	600	480	5	1500	310	0.24	0.4	3.2
Boron Carbide	-	450	350	3	2800	450	0.15	0.1	2.5

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