



Win-win
Cooperation



DONGGUAN TINOK PRECISION CERAMICS CO., LTD

Web.: www.tinokceramics.com

Add.: Tai'an Road, Chang'an Town, Dongguan City 523867,
China



Based products
Create quality products

2024 Company Profile

About Us | Manufacturing Facilities | Products | Materials & Application

PRECISION CERAMICS MANUFACTURER

Contact: Tina Wu

Mobile: +86-13580880042

Email:

admin@tinokceramics.com

PART 04

Material & Application

材料&应用
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氧化锆材料特性

Properties of zirconia materials

氧化铝材料特性

Properties of alumina materials

项目 item	数值 Data	单位 Unit
密度 Density	6.02	g/cm ³
显微硬度 Microhardness	1200	HV0.5
弯曲硬度 Bending hardness	800	MPa
抗压强度 Compressive strength	3000	MPa
断裂韧性 Fracture toughness	8	MPa.m ^{1/2}
弹性模量 Elastic Modulus	200	GPa
热膨胀系数 Coefficient of thermal expansion	10	10 ⁻⁶ /K
热震稳定性(水冷却) Thermal shock stability (water cooling)	300	ΔT°C
20°C电阻率 The 20°C resistivity	>10 ¹³	ΩCM
最高使用温度 Maximum service temperature	1000	°C

项目 item	数值 Data	单位 Unit
密度 Density	3.85	g/cm ³
显微硬度 Microhardness	1600	HV0.5
弯曲硬度 Bending hardness	310	MPa
抗压强度 Compressive strength	2400	MPa
断裂韧性 Fracture toughness	3-4	MPa.m ^{1/2}
弹性模量 Elastic Modulus	340	GPa
热膨胀系数 Coefficient of thermal expansion	7-8	10 ⁻⁶ /K
热震稳定性(水冷却) Thermal shock stability (water cooling)	200	ΔT°C
20°C电阻率 The 20°C resistivity	>10 ¹⁴	ΩCM
最高使用温度 Maximum service temperature	1600	°C

Property Parameter Data Sheet of Ceramics

Material	Units	Alumina						YS-Zirconia	MgO-Zirconia	Zirconia Toughened Alumina	Silicon Nitride	Silicon Carbide
		99.99% Al ₂ O ₃	99.7% Al ₂ O ₃	99.5% Al ₂ O ₃	99% Al ₂ O ₃	97% Al ₂ O ₃	95% Al ₂ O ₃	YSZ	Mg-PSZ	ZTA	Si ₃ N ₄	SiC
Color	—	White	Ivory	Ivory	Ivory	White	White	White, Black, Blue	White, Yellow	White	Gray-black	Gray-black
Permeability	—	Gas-tight	Gas-tight	Gas-tight	Gas-tight	Gas-tight	Gas-tight	Gas-tight	Gas-tight	Gas-tight	Gas-tight	Gas-tight
Density	g/cm ³	3.95	3.93	3.92	3.9	3.75	3.7	5.9-6.10	≥5.7	4.0~4.3	3.2	3.05 ~ 3.14
Straightness	‰	1	1	1	1	1	1	1	1	1	1	1
Hardness	HRA	90	90	90	89	88	86	88 ~ 90	88 ~ 90	90	92	94
Water Absorption	%	≤0.2	≤0.2	≤0.2	≤0.2	≤0.2	≤0.2	≤0.2	≤0.2	≤0.2	≤0.2	≤0.2
Elastic Modulus	Gpa	395	390	390	370	340	320	210	200	300 ~ 400	300 ~ 320	≥320
Flexural Atrength (Typical 20°C)	Mpa	375	370	370	340	320	304	1200	900	700	650 ~ 750	> 400
Compressive Strength (Typical 20°C)	Mpa	2300	2300	2300	2210	2100	1910	2500	2500	2300~2900	2500	2500
Max Working Temperature	°C	1750	1750	1750	1700	1650	1500	1050	1720	≈1600	1400	1900
Coefficient of Thermal Expansion (25°Cto 800°C)	10 ⁻⁶ /°C	8	7.8	7.8	7.7	7.6	7.5	10	7.8	8.3	3.0 ~ 3.2	4.4
Fracture Toughness	MPa *m ^{1/2}	4.4	4.3	4.3	4.2	4	3.8	10	6 ~ 7	5 ~ 7	6 ~ 7	10
Dielectric Strength (5mmThickness)	AC-kv/mm	9	8.7	8.7	8.7	8.5	8.3	9	9.4	9	15	—
Dielectric Loss (25°C@1MHz)	—	< 0.0001	< 0.0001	< 0.0001	0.0001	0.0002	0.0002	0.001	0.0017	0.0005	—	—
Dielectric Constant	25°C@1MHz	9.8	9.7	9.7	9.5	9.3	9.2	29	28	9.2 ~ 10.5	—	9.66 ~10.03
Electrical Resistivity (25°C)	Ω*mm ² /m	>10 ¹⁴	>10 ¹⁴	>10 ¹⁴	>10 ¹⁴	>10 ¹⁴	>10 ¹⁴	>10 ¹²	>10 ¹⁴	>10 ¹⁴	>10 ¹⁸	>10 ¹²
Thermal Conductivity (25°C)	W/m-K	30	30	30	29	27.5	25	2.5	3	≈27	15 ~ 20	100~120



APPLICATION AREA
SAMPLE DISPLAY
应用领域/样品展示

