

Zirconia Back Cover – ZBC Series

Customized



FEATURES

- high hardness
- Excellent toughness
- Ultra-thin thickness
- Good customizing capability, low cost solution
- Elegant appearance

APPLICATIONS

- Mobile phone cover, wearable devices cover, etc.

ZIRCONIA

Large-screen, thin trend of the electronic products put new requirements on the structural ceramic materials: scratch-proof, light weight, no signal shielded, good heat dissipation, good hand feeling. Compared with Aluminum, glass, or plastic, Zirconia shows excellent characteristics in terms of appearance, texture and material properties. At present, only Zirconia are fully compliant with these characteristics in physical properties.

NO.	Characteristics	Units	Zirconia	Sapphire	304 stainless steel	Tempered glass	Polypropylene
1	Stabilizer content	%	5.2±0.5	-	-	-	-
2	Density	g/cm ³	>6.0	3.97	7.93	1.2-2.0	1-1.4
3	Vickers hardness	HV	1250	1700	600	900	180
4	Melting point	°C	2680	2303	1399-1455	600	250
5	Bend strength at room temperature	/MPa	600-1200	800	≥515	400	≥200
6	Fracture toughness at room temperature	K _{1c} /MPa ^{1/2}	6	2.0	85	3	105
7	Young modulus	GPa	210-238	380	206	70	3.9
8	Coefficient of thermal expansion	×10-6/K	10.2	8.8	16.0	8-10	7-9
9	Thermal conductivity at room temperature	W·(m·k) ⁻¹	1-2	24	12.1	0.4	0.2
10	Thermal shock resistance	ΔT/°C	250	200	400	80	120
11	Dielectric constant	F/m	20-30	11.5 (//c), 9.3 (⊥c)	∞	3.5-3.7	1.5-1.8

BACK COVER PRODUCT COMPARISON

Commonly used back cover product materials are mainly plastic, metal, glass, ceramic. Ceramic material, such as yttria-stabilized zirconia, is a new type of composite material. Both the metallic luster, good ductility, and glass clear, high hardness of the advantages, no worries about scratches.

In the 5G era, the frequency of 30GHz ~ 300GHz between the millimeter wave achieve faster transmission rate than 4G, and with the mobile phone wireless charging technology gradually mature, which put forward higher requirements on the phone back cover.

Overall, the ceramic material on the phone, merged characteristics of metal and glass, is a more ideal high-end mobile phone selection. The main differences between the four are as below:

	Plastic	Metal	Glass	Zirconia
Appearance	Poor	Normal	Normal	Good
Hand feeling	Poor	Normal	Normal	Good
Coloring difficulty	Simple, can do a variety of surface patterns	Ordinary, prone to paint off the situation	Difficulty	Simple, can do a variety of surface patterns
Weight	Thicker thickness, light weight	Thinnest, light weight	Thicker thickness, heavy	Normal
Rigidity	Poor, plastic deformation	Normal	Good	Good
Brittleness	Normal	Good	Poor, but still able to meet the drop test	After the material was modified, the plasticity was significantly enhanced to meet the
Hardness	Poor	Ordinary	Ordinary	Good
Heat dissipation	Poor	Excellent	Normal	Good
Cost	The lowest	Normal	Higher	The highest
Electromagnetic shielding	No effect, can be molded	Great effect, need to use plastic partition	No effect, can be molded	No effect, can be molded
Mobile phone design	No effect	Great effect	No effect	No effect

ZIRCONIA BACK COVER DESIGN

Zirconia ceramic cover can vary in appearance, showing different colors and shapes to meet the 3C industry requirements on the appearance.



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ZIRCONIA BACK COVER DESIGN



- 1) Laser cutting and opening holes, the edge of the structure is less than 0.20mm, small hole diameter can reach 0.2mm;
- 2) The appearance of the product can be processed into matte surface and mirror surface to achieve a sense of jade;
- 3) According to customer design to achieve surface texture processing, improve product beauty;
- 4) According to the customer requirement, the surface color conversion and LOGO processing;
- 5) 3D zirconia back cover, Interpretation of the perfect combination of technology and art.

ZIRCONIA BACK COVER PRODUCT



DESIGN KEY POINT

- 1) Products are advised not to design 3D for the arc.
- 2) Recommended hole or groove is no less than 0.8mm.
- 3) In order to ensure strength, it is advised that the hole spacing no less than 5 mm and the distance from the edge of the hole no less than 3 mm.
- 4) Due to the stability test result of R angle is better, the edge is advised to be designed into the C angle or R angle as far as possible,
- 5) To reduce the cost and improve reliability, it is recommended that the product thickness be designed $0.6 \pm 0.05\text{mm}$.
- 6) It is recommended to minimize the amount of square holes and grooves.

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