

ZPF -Zero Expansion stiffness ceramics

ZPF is revolutionary ceramics that has zero expansion characteristics same as Low-Expansion-Recrystallized glass with high stiffness. As a substitute for recrystallized glass, ZPF meets current severe requests to pursuit state-of-the-art ultra fine technology. For example, semiconductor equipment(Wafer exposure, Reticle making) where nano size control is needed.

【Feature】

- 1 . Low thermal expansion
- 2 . High stiffness
- 3 . Non-magnetism



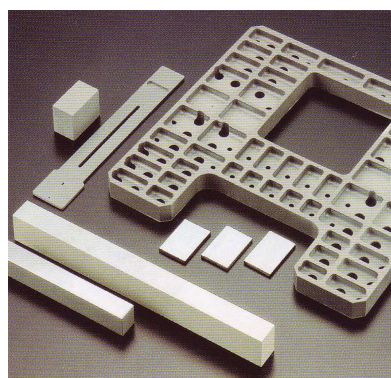
Mirror (25×25×200L)

| | Unit | Test Method | ZPF-N | Conductive ZPF | | | Ref.Zero Expansion |
|--------------------------------|---------------|-------------------------------|--|---|---|--|--------------------|
| | | | | ZPF-E00 | ZPF-E04 | ZPF-ESC | |
| Specific gravity | | Archimedes method | 2.5 | 2.5 | 2.6 | 2.5 | 2.5 |
| young's modulus | Gpa | Resonant method | 150 | 150 | 170 | 150 | 90 |
| CTE | ppm/K at 23°C | JIS-R3251(Laser Interference) | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 |
| Thermal conductivity | W/m · K | JIS-R1611(Laser Flash) | 5 | 5 | 8 | 5 | 2 |
| Specific heat | J/ g · K | JIS-R1611(Laser Flash) | 0.9 | 0.9 | 1.0 | 1.0 | 0.8 |
| Hardness | Gpa | JIS-R1610(Vickers HV10) | 7 | 7 | 7 | 7 | 7 |
| Bending strength | MPa | JIS-R1601(4 points) | 250 | 250 | 300 | 250 | 50 |
| Relative magnetic permeability | | | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Volume resistivity | Ω · c m | 3 terminal method | 10 ¹² | 10 ⁷ | 10 ⁵ | 10 ¹⁰ | 10 ¹³ |
| Other | | | ·Zero Expansion ·Non-magnetism ·High stiffness | ·Conductive →antistatic ·Zero Expansion ·Non-magnetism | ·Conductive →antistatic ·CTE control →Quartz ·Non-magnetism | ·Receptivity Control→ Large clamp ·Zero Expansion ·Non-magnetism | |

【Application】

- Bar mirror, L-shaped mirror
- Electrostatic Chuck
- Parts of XY stage

Exmple Exposure equipment, Reticle making equipment
Wafer test machine, Reticle rework equipment



ZPF example

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This product specification and the catalog value are the references,
and we may change of it without notice.

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