

# Y-TZP Zirconia Ceramic

Material datasheet · ZrO<sub>2</sub> (Y<sub>2</sub>O<sub>3</sub> stabilized)

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Yorke Precision Industrial Ceramics

Y-TZP zirconia for high-strength, wear-resistant and toughened precision components. Values below are typical and should be confirmed for the specific grade, process and project.

## Chemical & physical properties

| Property                 | Typical value           |
|--------------------------|-------------------------|
| ZrO <sub>2</sub> content | ≥ 99.5%                 |
| Density                  | ≥ 6.0 g/cm <sup>3</sup> |
| Porosity                 | ≤ 0.1%                  |
| Colour                   | White / ivory           |

## Mechanical properties

| Property             | Typical value                |
|----------------------|------------------------------|
| Vickers hardness     | ≥ 12 GPa (≥ 1200 HV)         |
| Flexural strength    | ≥ 900 MPa                    |
| Compressive strength | ≥ 2500 MPa                   |
| Fracture toughness   | 6.0–8.0 MPa·m <sup>1/2</sup> |
| Elastic modulus      | ≥ 200 GPa                    |
| Poisson's ratio      | 0.3                          |

## Thermal properties

| Property                 | Typical value                   |
|--------------------------|---------------------------------|
| Thermal conductivity     | 2.5–3.0 W/(m·K)                 |
| CTE (20–1000°C)          | 10.0–10.5 ×10 <sup>-6</sup> /°C |
| Max service temperature  | 1500°C                          |
| Thermal shock resistance | ΔT ≈ 250°C                      |

## Machining & inspection

| Capability            | Typical range                                          |
|-----------------------|--------------------------------------------------------|
| Dimensional tolerance | ±0.005 mm (project dependent)                          |
| Flatness              | ≤0.001 mm                                              |
| Surface roughness     | Ra ≤0.1 μm                                             |
| Inspection            | CMM, roundness, roughness, visual; records per project |

Typical values only. Final material grade, tolerances and inspection criteria are confirmed by drawing, material certificate and contract. This datasheet is not a warranty of performance.